



University  
of Glasgow



# School of Veterinary Medicine

Visitation by the European Association of Establishments for Veterinary Education (EAEVE)

2020



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# GLOSSARY

AMR – Annual Monitoring Report  
CAT – Continuous Assessment Task  
CDM – Clinical Decision Making  
CLST – College Library Support Team  
CVR – Centre for Virus Research  
DOPS – Directly Observed Procedural Skills  
ECDP – Early Career Development Programme  
ECS – Division of Equine Clinical Sciences  
EdPSC – Education Policy and Strategy Committee  
ELIR – Enhancement-Led Institutional Review  
EMQ – Extended Matching Questions  
EMS – Extra-Mural Studies  
EPIC – Epidemiology, Population Health & Infectious Disease Control  
EPR – Electronic Patient Record [system]  
FA – Division of Farm Animal Clinical Sciences  
GASPS – Glasgow Academic Student Peer Support  
GUVMA – Glasgow University Veterinary Medical Association (students)  
H&SC – Health & Safety Committee  
IBAHCM/BAHCM – Institute of Biodiversity, Animal Health and Comparative Medicine  
ICAMS/CAMS – Institute of Cardiovascular and Medical Sciences  
III – Institute of Infection, Immunity and Inflammation  
IL – Information Literacy  
ILO – Intended Learning Outcomes  
JHL – James Herriot Library  
LEADS – Learning, Enhancement and Academic Development Service  
MCQ – Multiple-Choice Questions  
MEQ – Modified Essay Questions  
Moodle/Mahara – Virtual Learning Environment  
MPA – Management, Professional and Administrative staff  
MSB – Mary Stewart Building  
MVLS – College of Medical, Veterinary and Life Sciences  
MVPH – Masters in Veterinary Public Health  
NSS – National Student Survey  
OSCE – Objective Structured Clinical Examination  
OV – Official Veterinarian  
PACE – Professional and Clinical Experience  
PGCAP – Postgraduate Certificate in Academic Practice  
QAA – Quality Assurance Agency for Higher Education  
PDSA – Peoples Dispensary for Sick Animals  
PDR/P&DR – Performance & Development Review  
PGR – Postgraduate Research  
PGT – Postgraduate Taught  
PPE – Personal Protection Equipment



# GLOSSARY

PSR – Periodic Subject Review  
RAE – Research Assessment Exercise  
REF – Research Excellence Framework  
RI – Research institute  
RUK – Rest of UK  
SA – Small Animal  
SACS – Division of Small Animal Clinical Sciences  
SAH – Small Animal Hospital  
SAVMA – Student Chapter American Veterinary Medical Association  
School, SVM ≡ VEE  
SCPAHFS – Scottish Centre for Animal Health and Food Safety  
SDL – Self-Directed Learning  
SEPS – Safety and Environmental Protection Service  
SFC – Scottish Funding Council  
SLA – Service Level Agreement  
SMG – Senior Management Group (University)  
SOAP – Subjective Objective Assessment Plan  
SOP/SOPS – Standard Operating Procedure  
SRC – Students' Representative Council  
SSLC – Staff-Student Liaison Committee  
SSPCA/Scottish SPCA – Scottish Society for the Prevention of Cruelty to Animals  
SWAP West – Scottish Widening Access Programme, West of Scotland  
VDS – Veterinary Diagnostic Services  
VLE – Virtual Learning Environment  
VPH – Veterinary Public Health  
VPPH&DI – Division of Veterinary Pathology, Public Health & Disease Investigation  
VSC – Veterinary Schools Council  
VS&E – Division of Veterinary Science & Education  
YACRS – Yet Another Class Response System

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# EXECUTIVE SUMMARY

The preparation of the self-study and the forthcoming site visit encourages healthy analysis and reflection. In this it complements the recent comprehensive review of the curriculum and the University-managed periodic subject review, part of the quality assurance framework for higher education in Scotland. These events coincide with ongoing consultation on both the University's and the School's future strategy.

Since the last EAEVE/RCVS/CoE visitation in 2013 there have been major changes to the physical structure of the School and our approach to the education of future veterinary professionals. The completion of the Mary Stewart building and the accompanying landscaping have modernised the look and feel of the School. More importantly, the new Mary Stewart building was purpose built and designed to enhance the student learning experience. This development offers an excellent social space as well as a number of different study areas ranging from booths that facilitate group discussion to quieter study rooms.

A more fundamental change to student learning was the complete redesign of the curriculum and our approach to professional education. The strategic imperative of the new veterinary programme was to prioritise student outcomes and we believe the changes have helped support a culture that places teaching at the centre of what we do. Changes to the curriculum included a reduction in didactic load, a move away from a course based structure to integrated modules, clinical relevance early in the programme, greater emphasis on clinical and professional skills and a significant overhaul of clinical training to provide opportunities for flexibility and choice as well as optimal group sizes.

The changes were not limited to what we teach and the way we teach but were accompanied by the development of a cadre of staff highly engaged in the delivery of a high quality learning experience and the growth of educational scholarship, all designed to help support students in achieving their potential.

Strong growth in the clinics, especially the Small Animal Hospital, have provided a good supply of cases and supported the costs of clinical teaching. However retention and recruitment of specialised clinicians remains a challenge, as does the potential threat of competition from the private sector. As a result the School is actively consulting on a new management model for the Small Animal Hospital designed to give it greater freedom to operate and provide the best possible clinical training and care for our patients. Carefully curating and growing complementary income streams underpins much of the School's success as government funding lags behind the true cost of veterinary education.

The School is very fortunate to have such dedicated staff who work so hard to ensure our success, whether this is teaching the students, looking after our patients or administering and managing the School. We are looking forward to the visitation and believe that it will help support our ethos of continuous improvement.



**Ewan R Cameron**  
Head of School

# INTRODUCTION

## Introduction

The University of Glasgow was founded in 1451 and is the fourth oldest University in the English-speaking world. The Glasgow Veterinary College started in 1862 just over 100 years after the first veterinary school at Lyon and was incorporated into the University of Glasgow in 1949. The School of Veterinary Medicine is part of the College of Medical Veterinary and Life Sciences and enjoys the same autonomy as other professional schools in the College and University. The Head of School and Heads of Small Animal, Equine and Farm Animal clinics are qualified veterinary surgeons and members of The Royal College of Veterinary Surgeons.

The School's last visitation from EAEVE was in 2013 where it was granted Stage 1 approval status. The School is also fully accredited by the Royal College of Veterinary Surgeons and American Veterinary Medical Association Council on Education. The School is situated on the Gartcubie Campus and boasts a single site that accommodates its administration, core teaching and its small animal, equine and large animal clinics.

Since the last visitation the School has completely redesigned its curriculum and its approach to the teaching of veterinary medicine. The new curriculum has already been subject to internal review and external review through the University managed period subject review process. The period since the last visitation has also witnessed the opening of the Mary Stewart Building that provides social space and a range of study and small group teaching spaces. Academic staff numbers have grown to support the new curriculum and its emphasis on clinical and professional skills.

The recruitment and retention of clinical staff remains a perennial issue and reflects ever-increasing competition from a growing private referral sector. The School has plans to protect the Small Animal Hospital by operating it within a new commercial model and a company structure. Overall the goals of this proposal are to: 1) Enhance the student experience; 2) Ensure sustainability as an excellent teaching platform; 3) Develop clear career pathways for both academic and clinically focussed staff; 4) Offer more attractive terms and conditions for specialist clinical staff; 5) Maintain and grow caseload and income streams; 6) Ensure that the Small Animal Hospital continues to be premier provider of top quality care to our pet owning community.

**The School is seeking accreditation under the ESEVT SOP 2019.**

# Standard 1 **OBJECTIVES, ORGANISATION AND QA POLICY**

## **Standard 1: Objectives, Organisation and QA Policy**

### **1.1 The Vision**

Our vision is to maintain an exciting, innovative and evolving educational experience that prepares our students for a rewarding lifelong career; to conduct high quality animal health and biomedical research in partnership with our institutes; and to promote knowledge and excellence in the application of veterinary medicine. Our aim is to inspire both staff and students and we cherish the values of integrity, creativity, equity, diversity, openness and academic freedom.

The School's mission statement is aligned with and supports the University's strategy – **Glasgow 2020 - a global vision**.

### **The Strategic Goals**

#### **Education**

- Deliver a strong science-based and inquiry-led curriculum that is intellectually challenging and encourages self-directed, questioning and curiosity-driven learning
- Ensure students acquire a broad base of knowledge and skills to provide an excellent foundation for a full spectrum of veterinary and science careers
- Promote self development and the acquisition of professional attributes of the highest standing as well as leadership, self awareness and reflection
- Encourage students to constantly challenge prevailing doctrine and knowledge to advance the practice of veterinary medicine
- Ensure there is diversity of experience and opportunity within and beyond the programme and support students from all national, ethnic and social backgrounds through all stages of the programme

#### **Research**

- Conduct excellent, internationally recognised research in comparative medicine to improve evidence-based policy and practice
- Promote and facilitate collaboration and linkage between clinical and basic science research
- Further the development of multicentre networks and transdisciplinary approaches to advance veterinary clinical research and enhance postgraduate training

#### **Clinical Care**

- Place the interests of the patient above all others
- Deliver the highest possible standards of patient care by maintaining a clinical centre of excellence and applying the most advanced clinical knowledge and practice
- Provide a supportive undergraduate and postgraduate training environment, involving students in the highest standards of clinical teaching

**The School wishes to encourage an aspirational and supportive culture where staff and students from around the world want to come to learn, to be inspired, to advance and share knowledge, and be excited by questions and ideas.**

### **A foundation for the multifaceted role of the Veterinary Surgeon**

Considerable thought and consultation went into the design of the new curriculum and it was informed by the latest thinking in health professional and veterinary education in Europe, North America and the UK. Key goals for the



new curriculum were to rationalise the didactic load, which had become excessive, and to create a programme of education strongly focused on developing the skills and attributes required by veterinary professionals. As such it was mapped to the day one competencies of the Royal College of Veterinary Surgeons and aligned with the Vet Futures goal to provide students with the foundations for the very different career pathways open to them.

## 1.2 Status of the School

The School of Veterinary Medicine is a School within the College of Medical Veterinary and Life Sciences, which is a College of the University of Glasgow.

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Website: <https://www.gla.ac.uk>

Principal and Vice-Chancellor: Professor Sir Anton Muscatelli

The College of Medical Veterinary and Life Sciences

Wolfson Medical School Building

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University Avenue, Glasgow G12 8QQ

Telephone: 0141 330 2738

Website: <https://www.gla.ac.uk/colleges/mvls/>

Vice-Principal and Head of College: Professor Dame Anna Dominiczak

The most senior decision-making body of the University is Court, which has overall fiscal responsibility and approves strategy for the University. The Senate is responsible for academic governance. The Head of the School of Veterinary Medicine is a member of the MVLS College Management Group with the other School Heads, the Vice-Principal & Head of College, the College Chief Operating Officer, College Deans, Directors of Research Institutes, Head of Finance and Head of HR. Organograms showing the academic management structure of the University, and the School's position within it, are included as Appendices 6.1.1 – 6.1.2 with senior officers detailed in Appendix 6.1.3.

## Management Structure of the School

The Head of School is appointed by the University Court and is a qualified veterinary surgeon and a member of the Royal College of Veterinary Surgeons. The Head of School is ultimately responsible for all aspects of School management including staffing, the delivery of the professional curriculum, the running of the clinical facilities and for research in the School. The Head of School is responsible for the School's budget and the finances of the School. The Associate Heads of School and Conveners lead the strategic developments in the learning and teaching, diversity and inclusion, postgraduate and research areas. The Head of Administration, who is line managed by the Chief Operating Officer of the College, leads the professional services and support staff in the Administration unit and the Undergraduate School unit.

With the exception of the Head of School Administration and Head of School all other senior management roles within the School are appointed following open calls for expressions of interest and an informal interview. All roles have terms of office with the opportunity for renewal. The School Executive is the management decision-making body of the School and comprises the senior functional leads for the School's different areas of activity as well as the School's Heads of Division.

The academic management of the veterinary programme is the responsibility of the Programme Leader, supported by the phase and course leaders and the Heads of Division. The Associate Head of School for Learning, Teaching and Assessment (LT&A) has oversight over all undergraduate teaching and assessment in the School. There is faculty, staff and student representation on the Learning and Teaching Committee, the BVMS and BSc Programme Boards,

the Information Services Committee and the Staff Student Liaison Committee, which are the committees that govern education in the School. The Clinical Directors have responsibility for the commercial functions associated with the Small Animal Hospital (SAH), the Glasgow Equine Hospital, Scottish Centre for Production Animal Health and Food Safety (SCPAHFS) and Veterinary Diagnostic Services (VDS), supported by the Director of Commercial Operations.

Management of the School is a partnership between academic and professional services staff. The School Head of Administration is responsible for the School's professional services staff, which operates through two divisions: the Undergraduate School that provides support for the delivery of the programmes and the Administration Division that supports the management and operation of the School. These areas are led by three senior and experienced members of professional services staff who are line managed by the Head of School Administration. Governance is provided through the relevant School committees (Learning and Teaching Committee and the School Executive—see Appendix 6.1.5). In addition to the above the School employs a number of technical staff who support teaching, clinical activity (e.g. nurses) and laboratories.

The key leadership roles of the School are listed below.

#### Head of School:

Professor Ewan Cameron *BVMS PhD MRCVS*

#### Head of School Administration

Ms Sarah Chiodetto *BSc PGCE MBA MCMi MAUA*

#### Deputy Head of School: TBA

#### Associate Head of School: Learning, Teaching & Assessment:

Professor T James Anderson *BVM&S MVM PhD DSAO DipIECVN PFHEA MRCVS*

#### Associate Head of School: Diversity & Inclusion:

Professor Lubna Nasir *BSc (Hons) MSc PhD FHEA*

#### Research Convenor

Professor Tim Parkin *BSc BVSc PhD DipECVPH FHEA FRCVS*

#### Postgraduate Convener

Dr Peter Hastie *PhD MSc PGCAP BSc(Hon) FHEA*

#### Accreditation Champion

Dr Peter Hastie *PhD MSc PGCAP BSc(Hon) FHEA*

#### Senior Financial Analyst

Mr Henry Watson *BAcc ACMA CGMA*

#### Director of Commercial Operations

Mr Ray Girotti *MBA CVPM*

**The organisational structure of the School is shown in Appendix 6.1.4. The School has five academic divisions, mapping to subject areas. These are:**

- Equine Clinical Sciences (including the Glasgow Equine Hospital)  
*Head of Division:* Dr Lance Voute *BVSc PhD CertES(Orth) DipIECVS MRCVS*  
*Staff:* 9 academics, 8 nurses and animal care staff, 3 administrative staff 5 residents and 1 intern in training

- **Farm Animal Clinical Sciences** (including Cochno Farm & Research Centre and the Scottish Centre for Production Animal Health & Food Safety)  
*Heads of Division:* Dr Kathryn Ellis *BVMS DipLECBHM CertCHP PhD MRCVS* and Dr Monika Mihm Carmichael *PhD MRCVS*  
*Staff:* 8 academics, 6 animal care staff, 1 technician, 5 residents and 1 intern in training
- **Small Animal Clinical Sciences** (including the Small Animal Hospital)  
*Head of Division:* Prof. Sandra Corr *BVMS CertSAS DipECVS FHEA PhD MRCVS*  
*Staff:* 35 academics, 53 nurses and paraprofessionals, 12 animal care staff, 15 management, administration and support staff, 20 residents and 12 interns in training
- **Veterinary Pathology, Public Health & Disease Investigation** (including Veterinary Diagnostic Services)  
*Head of Division:* Dr Pamela Johnston *BVM&S PhD MRCVS*  
*Staff:* 14 academics, 3 laboratory managers, 13 technicians, and 6 residents in training
- **Veterinary Science & Education**  
*Head of Division:* Dr Fiona Dowell *BSc (Hons) PhD FHEA*  
*Staff:* 19 academics, 2 management and technical staff

The School also has two support divisions:

- **Veterinary Administration Division**  
*Staff:* 1 manager, 5 administrators
- **Undergraduate School**  
*Staff:* 2 managers, 8 administrators and 5 technicians

### School Committee Structure

The School committee structure is outlined in Appendix 6.1.5 and those responsible for leading the phases and courses of the programme are listed in Appendix 6.1.6. Committee membership and terms of reference can be found in Appendix 6.1.7 and 6.1.8 respectively.

### Formal Collaborations with other Institutions

The School has entered into a series of formal arrangements with a number of North American based colleges delivering pre-vet or equivalent programmes, enabling students from these institutions to elect to complete their degrees at the University of Glasgow:

Cal Poly, San Luis Obispo	Clemson University, South Carolina
University of Connecticut	University of Illinois
University of Maine	University of Missouri
The Ohio State University	Pennsylvania State University
University of Purdue	University of Vermont
Washington State University	University of Rhode Island

The Associate Head of School (LT&A), the BVMS Programme Leader and all of the Clinical Directors are veterinary surgeons and members of the Royal College of Veterinary Surgeons. The following members of staff are responsible for the veterinary teaching programme and the veterinary teaching hospitals:

**Associate Head of School: Learning, Teaching & Assessment:**  
 Professor T James Anderson

Veterinary Programme Leader  
Dr Jenny Hammond

Small Animal Hospital  
Professor Sandra Corr

Weipers Equine Hospital  
Dr Lance Voute

## 1.3 Strategic Plan

The vision and the School's objectives are detailed in Section 1.1 and together represent the Strategic Plan summary. The University operates an annual strategic planning and budget system that requires each School and Research Institute to produce a planning document that captures rolling strategy and incorporates a 12-36 month operational plan. As such our management systems ensure the annual discipline of revisiting strategy and focus on the future direction of the School. The **Strategic and Operating Plan** is also an important instrument in budget setting with the opportunity for the School to outline and justify future investments in staffing, facilities and equipment. The annual planning cycle, involving submission of a standardised document followed by planning meetings with the Head of College, ensures there is a well-developed timetable of preparation and consultation with the School Executive. The document includes: a strategic summary, with key objectives; an analysis of current and future income streams; the opportunity to request investment in the staffing and non-pay budgets; the identification and presentation of new business cases; the opportunity to highlight key events; a description of development activity in teaching, industrial collaborations, commercial activity, research, internationalisation, estates and social responsibility; a risk register; an analysis of performance against primary and secondary KPIs; as well as SWOT and PESTEL analyses. The document has been designed to link University strategy with that of the College and the Schools/RIs and is prepared jointly by the Head of School, the Head of School Administration and the Senior Financial Analyst for the School with input from members of the School Executive.

## SWOT ANALYSIS

### Strengths

Excellent educational experience, reflected in National Student Survey (NSS) and internal/external feedback  
Strongly committed academic and support staff  
Financially strong  
Strong growth in recent years in small animal hospital case numbers with excellent standards of care  
Innovative and modern curriculum at the forefront of veterinary education

### Weaknesses

Research - both volume and quality. Dependent on veterinary research reputation of Institutes but not in a position to control potential drift away from veterinary topics  
Staff morale due to work overload inhibiting scholarship, research and the perception of inequality of opportunity  
Commercial contribution significantly below potential due to retention/recruitment issue  
Efficient processes and systems to support high quality course organisation

### Opportunities

Ownership/partnership of primary care centres  
Commercial services have greater income/contribution potential if we can increase staff retention and enhance academic/clinical working environment  
Expansion of referral, first-opinion and diagnostic services  
Greater UK collaboration, data sharing and bio-banking to enhance veterinary clinical research  
Enhancing diversity of student population

### Threats

Significant reduction of clinical market share due to changes in the industry - rise of corporate practices and increased referral competition

Recruitment and retention of clinical staff

Long-term investment and financial sustainability of the farm

Reducing government funding not reflecting the real cost of veterinary education

### 1.4 Quality Assurance and enhancement management of teaching

As an ancient and UK leading (Russell Group) university, quality assurance procedures at University, College and School level have matured over many years and developed into a robust system to scrutinise quality based on the University's enhancement-led approach to teaching and learning.

#### University Level QA

The arrangements for quality assurance and enhancement are set out in the Quality Enhancement Framework Guide (QEF) as agreed by the Quality Assurance Agency Scotland and Scottish Funding Council. The framework provides for institutional level external review known as Enhancement-Led Institutional Review (**ELIR**) and periodic internal reviews of individual subject areas. The University underwent its most recent ELIR in 2019 and achieved the highest possible outcome. The ELIR Team concluded that the University has effective arrangements for managing academic standards and the student learning experience. Veterinary Medicine last underwent a Periodic Subject Review (PSR) in February 2019. The **PSR self study** and the **PSR final report** are available.

#### School & College level QA

In addition to the periodic subject review all teaching programmes in the University undertake thorough annual reviews of their programmes. These reviews collect information from students through University survey system EvaSys **Course evaluation**, focus group feedback, staff feedback, performance evaluation and external examiner reports. In addition, each final year rotation collects student feedback. This information is collated through the School course monitoring reports, which are compiled by the course leaders of the veterinary programme. Together these course reports are summarised and amalgamated (with the individual reports forming the appendices) and considered by both the Programme Board and School Learning and Teaching Committee. This approach allows both specific details relating to individual courses to be picked up but also helps identify themes that cross courses or even the programmes delivered by the School. Quality assurance is managed and overseen by the College Quality Assurance Officer of the College, an individual who is independent of teaching management within the School. Programme level reports are considered by the College Learning and Teaching Committee and are compiled into a College level report that is subsequently scrutinised by the Academic Standards Committee of the University.

#### Programme Focus Project

The Head of School, the Head of School Administration, the Associate Head (LT&A) of School and the Veterinary Programme Leader hold a series of focus group sessions that allow every member of final year to feed back on the whole programme. Contemporaneous notes are taken and immediately following the meeting with students the staff meet to ensure all the key points are captured. The School's response and agreed actions are published on the School's virtual learning environment within two weeks of the focus group meeting. Such meetings have resulted in a number of focussed reviews, the outcomes of which are reported back to the student body.

#### Staff Student Liaison Committee

The Staff Student Liaison Committee is the School's primary mechanism for two-way communication. The committee comprises the student year representatives, the senior officers of the student association and relevant members of staff. It can deal with issues arising from veterinary teaching and training but its remit extends to every aspect of the student experience.



### Review of the veterinary programme

In addition to the periodic review, the School has put in place its own cycle for reviewing the veterinary programme. Following the roll out of the new curriculum from 2013 the School carried out its first review of the programme in 2018. Subsequent reviews will be carried out every seven years. A detailed and comprehensive report from the first review covered every aspect of the programme.

### National Student Survey

The National Student Survey (NSS) is carried out across the UK and asks final year students about their University experience and the quality of teaching. The results are published and feed into subject level and university league tables. Detailed data and free text comments are made available to the School and provide an insight into the quality of the student experience on an annual basis.

### Quality Improvement

Two other School committees have a remit that relates to quality assurance. Governance, business management and data quality assurance are the responsibility of the **Quality Enhancement Committee** whilst the **Diversity and Inclusion Committee** has a role in quality assuring the School's culture and values.

### 1.5 School Engagement with Stakeholders

The **School's vision, objectives** and **Strategic Plan** are available on its website as is a **full description of the veterinary programme**. The School's **accreditation status** and **employment prospects** are clearly visible on its website with a link to the **self-evaluation report**. The School's current EAEVE status can be found [here](#).

A significant proportion of external stakeholder influence comes through the Veterinary Schools Council (VSC) and other such organisations. The Veterinary Schools Council is the umbrella organisation for the UK, Ireland and Netherlands veterinary schools. The Head of School sits on Council whilst other members of school staff populate the various subcommittees. The VSC has joint annual meetings with the British Veterinary Association and the Royal College of Veterinary Surgeons and other groups such as government veterinary services and the major employers' group on an ad hoc basis. Together with the RCVS and BVA the VSC is part of the Vet Futures project and responsible for specific work streams. Through these exchanges of information and networks the School has a full appreciation of the profession's views on veterinary training and a whole range of initiatives aimed at advancing the profession. The Head of School is also the conduit for the School's relationship with Scottish Government and all major stakeholders of the profession (through the Veterinary Delivery Landscape in Scotland group); the charity sector (through the Scottish Society for Prevention of Cruelty to Animals working group). In addition to the foregoing the School maintains close contact with Scottish based practices through their participation in student admissions; meetings between hospital staff and referring practices; our rotation partners as well as our alumni through scheduled events.

### 1.6 Management of Quality Assurance

The Head of School is, in conjunction with the School Executive, responsible for developing and updating the School's Strategic Plan. Strategic recommendations are brought forward to the School Executive, which meets every month or as necessary. The School Forum, which is open to all members of faculty and staff irrespective of job family association, is held periodically to discuss strategic goals and important issues for the School. School strategic and specific actions can be delegated to the relevant School committee for implementation. The School has several academic committees that report at least three times a year; there is undergraduate and postgraduate student representation on all relevant committees.

The School was last visited in May 2013 and granted full approval.

## 1.7 Recommendations and subsequent actions from last site visits

### Organisation

*The School should continue to monitor the effects of the organisational restructuring on staff profile to ensure that new staff hired into the research institutes have credentials suitable for teaching in the professional programme.*

Response: This is monitored closely and the Head of School and Research Institute Director for Biodiversity Animal Health & Comparative Medicine (the School's sister Institute) consult frequently on succession planning and over the replacement staff that support the School.

### Finances

*The contribution of faculty in the research institutes to the professional teaching programme should be accounted for in future financial reports.* Response: The contribution to teaching from Institute staff is clearly shown in the School's Income and Expenditure accounts.

### Physical Facilities and Equipment

*The School is encouraged to review its biosecurity programme to ensure best practices are in place.* Response: This is regularly reviewed by the relevant clinical areas and the Health & Safety Committee.

*The School should review its accident response and reporting procedure to ensure timely treatment of affected individuals and mitigation of identified risks.* Response: The School is of the view that its health and safety protocols and procedures are not only compliant with UK legislation but operate effectively.

*The School must ensure that all external sites used for core farm animal student training adhere consistently to the RCVS Practice Standard Scheme, Tier 2, farm animal practice.* Response: This is monitored by the Associate Head (LT&A) on an ongoing basis. External sites are normally commissioned through a procurement process and operate under a contract that is consistent with RCVS requirements.

*The School is encouraged to provide more comprehensive animal/case identification on stalls in the Weipers Equine Centre.* Response: Patients are tagged on admission so that we can confirm the identity of an animal in a stable and Stringsoft allows us to see the stable occupancy.

*The School is encouraged to expand use of the excellent Clinical Skills facility.* Response: There has been investment in this facility and considerable investment in clinical and professional skills staff.

*The School is encouraged to implement plans to install a hydraulic post-mortem table in the large animal necropsy facility.* Response: This has been actioned.

*The School should establish guidelines for vehicle safety to prevent objects from flying around in the car during emergency braking.* Response: This has been actioned.

*The temporary building for equine feed should be replaced with a more suitable solution.* Response: This has been actioned.

### Clinical Resources

*The School must carefully monitor equine caseload to ensure all students are able to attain day one clinical skills.* Response: The School has contracted primary care equine practices to boost case material.

*The School must complete contract negotiations with all core distributed clinical sites to ensure the long-term caseload needed for student learning.* Response: Completed.

*The School is encouraged to improve access to a white meat slaughter and processing plant so that all students have the opportunity to experience this activity.* Response: There has been considerable improvement in the range of sites the School can use in support of its public health teaching.

## Library and Information Resources

*The School must ensure that internet access is readily available for students on rotation at the Dogs Trust.* Response: The School no longer uses the Dogs Trust for teaching.

## Students

*The School should develop a method to consistently match the number of admitted students with enrolment targets.* Response: The UK system of making conditional offers means there is always a small year-to-year variation in numbers but over the programme the variance is small.

*The School is encouraged to ensure that changes in timetable be communicated to students in a timely manner.* Response: We believe this aspect of course management is much improved.

## Admission

*The School should develop a system to ensure regular rotation of Admissions Committee members.* Response: The School has reconstituted its admissions committee with periods of office.

*The School and University should provide unified and consistent information on its admission criteria to ensure a fair and unbiased selection process.* Response: We believe the information to prospective students is complete and comprehensive.

*The School should continue to explore methods to standardise the scoring of applicant background and interviews.* Response: Interviews are now highly structured and marked against rubrics and there is a standardised approach to marking the ethical reasoning test.

*The Admissions Committee is encouraged to use outcomes data to inform continuous improvement of the admissions process.* Response: The School is committed to widening participation and diversifying the student body and this is an important objective for the School. Attrition rates are very low.

## Faculty

*The School must not allow any further decline in the number of veterinary qualified staff involved in teaching and should develop a strategy to meet the RCVS guidelines.* Response: The percentage of academic staff that are veterinary surgeons has risen sharply.

## Curriculum

*The School is encouraged to ensure that day one competences are achieved and documented equally well across all species in the core rotations.* Response: The School has made considerable efforts in this area and believes its processes now result in better mapping against competencies.

*The School is encouraged to develop a consistent approach to formative feedback across all rotations.* Response: The introduction of a standardised approach and the introduction of custom designed software has considerably improved the consistency of final year feedback.

*The School is encouraged to monitor staff deployment in relation to the demands of the new curriculum to ensure that course leaders are fully supported in curriculum delivery.* Response: There has been a considerable expansion in the number of academic staff.

## Research Programmes

*The School is encouraged to consider introducing a requirement for all students to undertake a research project, as recommended by the RCVS.* Response: All students have the opportunity to undertake a substantial research project. Mandating this for all students is not considered a good use of resources, neither is it a requirement of the RCVS.



## Standard 2 FINANCES

### Outcomes Assessment

*The School must develop and implement a plan to increase the response rate to recent graduate employer surveys.*

Response: Working through the Vet Schools Council to carry out a national survey with the support of RCVS has helped in this area.

*The University should review its relevant quality assurance processes to improve the speed of response and ensure incorporation of beneficial changes for students.* Response: We believe this area has improved.

### Extra Mural Studies

*The School should consider reviewing its approach to students booking EMS and the information available to international providers so that providers can receive details of the School's and student expectations of EMS and be in a position to provide the best possible learning experience.* Response: Every student presents the host practice/site with a set of learning objectives and areas on which they wish to focus and this is monitored and overseen by School staff responsible for EMS.

### Comments on Standard 1

The School is of the view that it has mature and robust systems of organisation and management designed to deliver a high-quality evolving programme of education. Our committee structure covers the main objectives and business of the School and student representation is present in all relevant committees ensuring good input to governance and policy. Strong linkage and feedback processes are well embedded in our structure with committees reporting to the School Executive Committee. The University has a well-established discipline around strategic planning and budgeting, and this is reviewed and revisited on an annual basis.

### Suggestions for improvement on Standard 1

The School values strong engagement with all staff and students and continues to look at ways everybody has an opportunity to contribute to the development of the School's strategy and its objectives. School forums and an open-door policy are designed to gather a wide range of views but the School could do more scenario planning with groups of staff and students to develop this further. The School holds multiple focus groups and engages in other feedback mechanisms to ensure a strong student voice but greater involvement in the management of the School could be possible. However, greater student input may require the student representative body (Glasgow University Veterinary Medical Association) moving to a sabbatical model and there does not appear to be an appetite for this at present.



## Standard 2: Finances

### 2.1 Factual Information

**2.1.1** The establishments main sources of revenue are public funding, tuition fees from students, revenues from clinical services and research funding from third parties. This income flows directly to the School and an agreed level of expenditure in relation to expected income levels is agreed with MVLS College and University management as part of the annual budgeting process.

The University has a transparent approach to finance and the Head of School and Head of Administration receive a monthly statement on the School's financial position through an Income and Expenditure (I&E) report that details year-to-date actuals and budget as well as full year budget and forecast. This standardised approach, which shows the financial position of the University, College and School, is a very useful instrument for monitoring income, and spend. All the School's income and costs are detailed with the surplus (contribution) being returned to the centre to meet the costs of University overheads and future investments.

Each year the University undertakes a well-structured planning and budgeting round giving each unit the opportunity to consider future financial planning, investments and business plans. Financial planning is closely linked to strategic objectives thus ensuring that plans are aligned to the University, the College and the School's mission and goals. This is an excellent discipline that helps to ensure the spirit of continuous improvement is delivered through careful planning.

#### 2.1.2 *BVMS Tuition Fees – Scotland*

The T-grant is supplemented by tuition fee income for undergraduate and postgraduate students. Tuition fees for Scottish resident students are paid by the Student Awards Agency for Scotland (SAAS), rather than by the individual student with the fees being repaid through the student loan system after graduation. The fees paid by Scottish and all EU students with the exception of students resident in England, Wales and Northern Ireland represent only a small fraction of the cost of education and for session 2019/20 are £1,820.

#### 2.1.3 *BVMS Tuition Fees – RUK*

From 2012/13, and in line with changes to student funding in other parts of the UK, students resident in England, Wales or Northern Ireland are liable for fees, which are paid directly to the University. These fees are considerably higher than those for Scottish/EU students, and for veterinary medicine this fee is set at £9,250 per annum, the maximum fee allowable in the rest of the UK. Although students from the rest of the UK are now making a much greater personal contribution to their education, it is still subsidised with the Scottish Funding Council meeting the remainder of the full economic cost of education.

#### 2.1.4 *BVMS Tuition Fees – International*

International students and UK graduate students undertaking the BVMS programme are liable for full cost fees, which for a student entering the programme in 2019/20 are £29,500 per annum for each of the five years of study. It has been normal practice for such fees to be charged at a flat rate for five years so students do not need to budget for increases during the five-year programme. Despite increasing competition for international students, particularly those from North America we continue to have more applicants than available places and are still able to select high GPA students. However, it continues to be School policy to diversify our international student cohort.

The University, like all institutes of tertiary education in Scotland, receives an annual block grant for teaching and research from the Scottish Funding Council (SFC), an agency of the Scottish Government. The University follows the SFC funding formula to cascade this income to Colleges and Schools/Institutes. The teaching element of the grant (T-grant) is based on student numbers, which are controlled by the SFC, and the band level for student funding, which varies for different subject areas. The research element of the grant is based on the quality and volume of research as determined by the rating in the last (2014) UK-wide Research Excellence Framework (REF), which replaced the Research Assessment Exercise (RAE).

Income growth from the hospitals has been strong despite increased external competition and the general economic uncertainty of recent years.

Commercial activity represents a major income stream for the School. From 2015 through to 2019 hospital income has risen by 31% (£6.7 million to £9.1 million) representing an average rise of over 6% year on year. The rise in income is attributable to the SAH, with growth a result of previous and ongoing investment in both hospital facilities and personnel, resulting in a significant expansion in case numbers.

Income at Weipers Equine Centre has reduced by £85K when comparing the most recent figures to a 2015 baseline. Efforts have been taken to address this by the introduction of an Equine First Opinion service.

**Table 2.1.1 Annual expenditures during the last 3 academic years (EUR)**

Area of Expenditure	AY2019	AY2018	AY2017
Personnel	11,922,661	11,471,429	10,784,850
Operating costs	6,370,376	6,847,181	5,943,526
Maintenance costs	11,287,416	10,876,353	10,105,905
Equipment	299,630	302,250	259,806
Total expenditure	29,880,083	29,497,213	27,094,086

**Table 2.1.2 Annual revenues during the last 3 academic years (in EUR)**

Revenues source	AY2019	AY2018	AY2017
Public Authorities	4,761,460	5,315,992	6,004,558
Tuition fee (standard students)	724,034	787,586	988,009
Tuition fee (full fee students)	10,388,753	9,651,009	9,102,359
Clinical services	9,763,716	8,959,247	8,839,668
Diagnostic services	469,075	503,053	550,979
Other services	518,040	473,843	543,095
Research grants	578,828	823,225	701,122
Continuing education	69,893	144,269	63,950
Donations	3,368,693	614,984	227,137
Other sources	43,770	35,146	25,011
Total revenues	30,686,261	27,308,355	27,045,888

**Table 2.1.3 Annual balance between expenditures and revenues (EUR)**

Academic Year	Total expenditures	Total revenues	Balance
AY2019	29,880,083	30,686,261	806,178
AY2018	29,497,213	27,308,355	-2,188,858
AY2017	27,094,086	27,045,888	-48,198

### Summary and Future Trends

Generally, revenue sources are robust and major changes to funding streams are not anticipated. The School is conscious that to continue to attract international students our offering has to be of the highest quality and active recruitment is essential to maintain the current volume of applications from talented students. However, despite the increasing level of competition, current indications are that application numbers remain strong. At present Scottish

## Standard 3 CURRICULUM

Government funding appears secure but the impact of Brexit is still unclear. Clinical income is an important income stream that makes a significant contribution to defraying the costs of veterinary education. Continued growth in hospital income, in view of increased levels of competition, has been a major achievement and is largely due to the dedication and endeavour of staff in this area. The major threat is one that many other schools face, namely the recruitment and retention of highly trained and experienced clinical staff.

### **Comments on Standard 2**

The reduction in public authority funding is a challenge faced by the University in general, and not limited to veterinary education. Accordingly, the School has strived to diversify its funding to militate against this, with strong international recruitment and investment in Clinical Services. It should also be noted the School expenditure figure includes a notional allocation of overall University costs (which are obviously not within direct School control). The excesses of expenditure over investment (which were mitigated by a significant one-off donation in FY2019) should be viewed in that context.

### **Suggestions for improvement on Standard 2**

The School continually reviews its revenue generation capabilities and accordingly has plans to launch an equine first opinion service this year (which will also increase teaching material for the student body and ultimately allow us to reduce costs by internalising our core equine first opinion teaching).

We are also exploring the possibility of changing the structure of the Clinical Services, by creating a wholly owned subsidiary to operate the Small Animal Hospital, which will provide the flexibility to compete in the rapidly changing UK referral market.

## Standard 3: Curriculum

### 3.1 The BVMS Programme

The curriculum is designed, resourced and managed to ensure all graduates have achieved the graduate attributes expected to be fully compliant with the EU Directive 2005/36/EC (as amended by directive 2013/55/EU) and its Annex V.4.1.

The BVMS programme is designed, in a research rich environment, to imbue the knowledge, philosophy, professional and technical skills such that the graduate is confident to practice the art and science of veterinary medicine and surgery at the level expected of the Day 1 graduate. The programme is based on integration of clinical and science subject areas and has a spiral programme structure, meaning that students will revisit topics as they progress through the programme, each time with increasing clinical focus. In conjunction, there is a vertical theme of professional and clinical skills to develop the personal qualities and skills our graduates need in professional environments. The programme uses realistic scenarios and clinical cases to form the basis for integrating clinical and scientific perspectives of veterinary practice. The programme adopts an active learning approach to encourage students to take responsibility for their own learning and through both team-working and individual activities we prepare students for the profession that requires life-long learning and continuing professional development.

Teaching of basic subjects, including traditional elements such as anatomy, physiology, biomolecular sciences, pharmacology, toxicology, pathology, microbiology and parasitology, alongside applied subjects such as scientific methodology, epidemiology and biostatistics, is embedded within the integrated structure of the Foundation Phase and is revisited, reinforced and developed as students progress through the programme (see table 3.1.2). A wide range of teaching methods are employed utilising traditional didactic teaching in lectures; online/active learning approaches supported by videos, quizzes, e-tutorials, practical and clinical skills teaching etc. These are accessed through our main VLE portal: **BVMS Common Room**.

Animal Production concepts are delivered throughout the BVMS curriculum. In the Foundation Phase of the programme the focus is on learning the principles of dairy, beef, sheep, poultry and pig production, nationally and on a global scale. In addition to this, animal production principles of more niche areas such as aquaculture are also introduced. Animal production concepts include overviews of the agroeconomics of each of the animal production industries; business models; market requirements and products; quality assurance; production cycles; animal handling; feedstuffs and the principles of animal nutrition; breeds, breeding and genetics; herd and flock health management; and the principles of production animal welfare in relation to animal research, animal health and the veterinary profession. Furthermore, within the Foundation Phase the curriculum introduces the major production diseases and infectious agents affecting production animals, coupled with the principles of epidemiological approaches that are used to diagnose, monitor and control diseases in production animals and their populations. The significance of animal production from a public health perspective, e.g. via zoonotic diseases, is also introduced during the Foundation Phase, incorporating the legislative and industry frameworks that are in place relating to food products, hygiene and animal welfare.

As students progress through the programme the animal handling skills which are acquired in the Foundation Phase, reinforced with EMS and assessed through Foundation Phase DOPS, are routinely used within practicals in the Clinical Phase and BVMS5 rotations. Furthermore, normal production targets are reiterated and discussed throughout the Clinical and Professional Phases. The impact of nutrition and disease on these targets is explored, within the context of the production system both at the individual and the herd/flock level. Within the Professional Phase the introduction of mitigation measures to either prevent disease or manage disease when it is present is a strong theme, as well as whether these interventions are justified on a welfare or economic basis.

Clinical subjects include the pathogenesis and diagnosis of disease, diagnostic imaging, medicine, therapeutics, surgery, anaesthesia, emergency and critical care, and underpinning legislation and are reinforced by clinical examination, surgical and diagnostic practical skills, with basic skills and concepts already introduced in the Foundation Phase (see table 3.1.2). As students progress through the Clinical and the Professional Phases of the programme, the clinical subjects are explored in depth, and students learn more advanced procedures and skills (such as anaesthesia, dentistry or rectal palpation in cows) and develop their clinical reasoning skills.

Veterinary Public Health (VPH) is a cross-cutting theme that expands across the Foundation, Clinical and Professional Phase modules. VPH teaching is embedded across the curriculum to enable our students to become skilled diagnosticians for acute and chronic diseases of animals that may affect the owners and families and the surrounding communities. During their training in public health, veterinary undergraduates acquire knowledge and understanding of areas such as legislation, food security and food technology (including food hygiene and food safety), policy development, politics, inspection and auditing, law enforcement, socioeconomics, and religious and cultural traditions. Students are trained in the epidemiology and control of the major endemic and exotic notifiable diseases which affect or pose a risk to the national and international agri-food economy, trade capabilities and human health. VPH training encourages our undergraduate veterinarians to have a holistic and interdisciplinary perspective, and to effectively communicate with various stakeholders both within government, the agri-food industry and society. These skills have wider applicability in all areas of veterinary work.

Food Safety and Hygiene of Foods of Animal Origin is covered by a dedicated module at the end of BVMS3, which is complemented by a series of rotating practicals in the post-mortem facility to examine and discuss production animal organs collected from abattoirs, and the use of virtual reality tools in BVMS4. The students culminate their learning experience in a 2-week VPH rotation in BVMS5 during which they will undertake 2 visits to food premises (including at least one abattoir). They perform an audit report and present findings, conduct an outbreak investigation, review notifiable diseases led by a visiting state veterinarian, conduct practical ante/post-mortem inspections and interpret Food Chain Information, produce learning resources for subsequent years in relevant parasitic zoonotic diseases, and revise and demonstrate the use of mechanical stunning methods in order to ensure the best welfare at slaughter possible. For those that are keen to learn more about the various VPH aspects, we help organise a dedicated week in the summer vacation offered to all students from BVMS3 onwards to experience the potential of the subject in a and will include participation from EU member States from 2021. The VPH Masterclass was cancelled in summer 2020 due to the effects of the covid pandemic.

Teaching of preventative medicine is embedded through the programme and is addressed in both companion and production animals. Important disease specific aspects of preventative medicine supported by research findings are addressed in the Foundation Phase, and developed further when diseases are taught in the Clinical and Professional Phases:

- Teaching relating to small animal and equine sectors focuses on the reduction of health risks associated with inappropriate or excessive nutrition, as well as deworming and vaccination strategies. The management of infectious disease risk on a national or global scale through controls on importation are explored in the Clinical Phase, and our students also discuss the preventative health benefits and ethics of neutering in small animals.
- In the Foundation Phase of the programme students are introduced to the concept that disease in production animals is a complex, multifactorial process, which may derive from inadequacies in nutrition, housing or other routine husbandry measures. Our students learn that in production animals, development of disease will depend on their stage within the production cycle. The diagnosis and management of these diseases, as well as the identification of risk factors is a core component of the Clinical Phase, and our students will be required to build specific health plans. The rotations in the Professional Phase focus on strategies that can quickly identify, manage and prevent disease at the herd or flock level, and students practice the development and implementation of herd and flock health plans. BVMS5 students on the 'Production Animal' selective are required to complete two projects which involve analysis of farm records and practical data gathering to prevent disease and thus improve animal welfare and herd or flock production efficiency.



Professional skills and professionalism are integrated into every year of the BVMS programme with a clear focus on development and assessment of the skills required to work as a competent and capable veterinary professional – further detail of this is given below.

In achieving the objectives above, our students are enabled to meet the requirements of accreditation bodies; EAEVE, Quality Assurance Agency for Higher Education (QAA), AVMA and RCVS, including clinical & day-one core competencies expected of graduating students.

The spiral structure of the BVMS programme is inherently integrated. The School has a range of processes for evaluating and revising the curriculum. Data are gathered across these processes from students, faculty, stakeholders and peer-reviewers, and are considered alongside the examination/assessment outcomes on a rolling basis including the recent Periodic Subject review (2018-19) conducted by the University. Appendix 6.3.1 provides a Summary of Processes for Curriculum Evaluation. The various meetings and review processes detailed in Appendix 6.3.1 illustrate the opportunities for faculty to work together within and/or across modules and/or Phases to identify curricular overlaps, redundancies and omissions; furthermore, this information enables staff to reflect on and develop their teaching quality and effectiveness. The newly developed curriculum map will greatly enhance our capacity to manage curriculum content effectively across the programme.

The outcomes of these evaluations feed into the University structure for reporting and maintaining academic standards. Appendix 6.3.2 provides an Overview of the Learning and Teaching Communication Pathways from a Student perspective, and Appendix 6.3.3 from an Institutional perspective. Detailed information on Quality Enhancement and Assurance and the relative roles and responsibilities of the Schools, Colleges and Senate and related academic committees can be found at the following links:

- [Quality Enhancement and Assurance](#)
- [Senate and Committees](#)

Annual Monitoring and the production of Annual Monitoring Reports at Course, School and College level is an essential element of the University's Quality Assurance and Quality Enhancement processes. Further detail can be found [here](#). A Flowchart outlining the Annual Monitoring Process is available [here](#).

**Table 3.1.1. Curriculum hours in each academic year taken by each student (NOTE: This table describes the core programme. In addition, all BVMS5 students undertake two 3-4 week selective blocks contributing a further nominal 280 hours to the clinical teaching).**

	Lectures	Seminars	Supervised Self Learning	Lab Desk Work	Non-clinical Animal Work	Clinical Animal Work	Others <sup>a</sup>	Total
Academic years	A	B	C	D	E	F	G	H
Year 1	218	3	46	12	40.5	0	48	367.5
Year 2	195	1	36	6	40	0	0	278
Year 3	204.5	15	13.5	2	77.25	0	26.25	338.5
Year 4	164.75	11	27	9	68	0	25.75	305.5
Year 5	0	18	3.5	0	75.5 <sup>b</sup>	757	1	885

<sup>a</sup> includes workshops, feedback sessions, weekly case discussion, student presentations

<sup>b</sup> 70 hours as anatomic pathology and clinical pathology have been interpreted as non-clinical animal work.

**Table 3.1.2. Curriculum hours taken by each student. NOTE: due to the nature of our tagging in the curriculum map the figures represent frequency of events not hours taken. Our suggested title for this table is therefore: Table 3.1.2. Digest of disciplines and subjects (frequency of subject descriptors tagged to teaching event types).**

Subjects	A	B	C	D	E	F	G	H
<b>Basic subjects</b>								
<i>Medical physics</i>	4				3			7
<i>Chemistry (inorganic and organic sections)</i>	14	1			2			17
<i>Animal biology, zoology and cell biology</i>	83	1	1		5			90
<i>Feed plant biology and toxic plants</i>	17				1			18
<i>Biomedical statistics</i>	11	1	1		1		1	15
<b>Specific veterinary subjects</b>								
<b>Basic Sciences</b>								
<i>Anatomy, histology and embryology</i>	269	2	23	6	63		1	364
<i>Physiology</i>	238	5	5	1	12			261
<i>Biochemistry</i>	66	2	3		4			75
<i>General and molecular genetics</i>	51		2		3			56
<i>Pharmacology, pharmacy and pharmacotherapy</i>	169	10	4	1	7		2	193
<i>Pathology</i>	227	5	5	1	19		1	258
<i>Toxicology</i>	51	1			1			53
<i>Parasitology</i>	97	1	1	4	8			111
<i>Microbiology</i>	147	2	2	4	7		1	163
<i>Immunology</i>	73	2			4			79
<i>Epidemiology</i>	124	3	1	1	5			134
<i>Information literacy and data management</i>	68	3	8		10	7	7	103
<i>Professional ethics and communication</i>	91	10	5		13		7	126
<i>Animal health economics and practice management</i>	66	2		2	9		1	80
<i>Animal ethology</i>	14	1			1			16
<i>Animal welfare</i>	136	4	8	2	12	1		163
<i>Animal nutrition</i>	106	3	3		7			119
<b>Clinical Sciences</b>								
<i>Obstetrics, reproduction and reproductive disorders</i>	95	5	15	8	14	8	3	148
<i>Diagnostic pathology</i>	188	8	4	6	17	12	1	236
<i>Medicine</i>	188	11	5	4	16	11		235
<i>Surgery</i>	71	3	5	3	20	7		109
<i>Anesthesiology</i>	43		2		8	7		60
<i>Clinical practical training in common animal species<sup>a</sup></i>								0
<i>Preventive medicine</i>	149	3	2		7	9	1	171
<i>Diagnostic imaging</i>	97	4	7		21	14	2	145
<i>Therapy in common animal species</i>	227	13	5	1	17	11	2	276
<i>Propaedeutics of common animal species<sup>b</sup></i>	160	5	14	7	31	1	3	221
<b>Animal Production</b>								
<i>Animal Production, including breeding, husbandry and economics</i>	129	2	8	1	9	2	2	153
<i>Herd health management</i>	67	4	1	2	5	2		81
<b>Food Safety and Quality, Veterinary Public Health and One Health Concept</b>								
<i>Veterinary legislation including official controls and regulatory veterinary services, forensic veterinary medicine and certification</i>	104	11	5		8	12	3	143
<i>Control of food, feed and animal by-products</i>	49	4	1		3	3	1	61
<i>Zoonoses</i>	128	5	4	2	10	8	2	159
<i>Food hygiene and food microbiology</i>	72	6	2	3	2	2	1	88
<i>Food technology</i>	18				1	1	1	21

A: lectures; B: seminars; C: supervised self learning; D: laboratory and deskbased work, E: non-clinical animal work; F: clinical animal work; G: others (includes workshops, feedback sessions, weekly case discussion, student presentations); H: total

<sup>a</sup> Everything under the section heading "Clinical Sciences" could be tagged as "Clinical practical training in common animal species". We have therefore left this row blank.

<sup>b</sup> these are introductory teaching events related to developing clinical examination skills across all species.



**Table 3.1.4. Curriculum hours taken as electives for each student**

Given the wide range of selectives that are available to our students (Table 3.1.3) it is not possible to detail the specific nature of the curriculum hours for each of our students. All students undertake two selectives generally equating to 4-weeks of full-time work i.e.  $2 \times 4 \times 35$  hours = total 280 hours. This is primarily “F - clinical animal work” supported by tutorials, seminars and supervised self-learning as appropriate to the rotation

**Table 3.1.5. Optional courses proposed to students (not compulsory)**

No optional courses available.

Clinical skills and professionalism are integrated into every year of the BVMS programme and there is a clear focus on development and assessment of the skills required to work as a competent and capable veterinary professional - (see BVMS1-4 Clinical Skills List on the [Rotating Practicals Moodle page](#)). We have ensured a strong alignment between the team responsible for delivery of the clinical skills teaching in early years of the programme and the clinical training in the later years by having a number of core faculty embedded in different clinical environments who are also responsible for the delivery of clinical skills teaching in BVMS1-4.

In the Foundation Phase of the programme, students are introduced to basic clinical skills (including animal handling, laboratory skills, surgical procedures, general clinical exam) through a series of ‘rotating practical’ and module practical sessions (approx. 40 hours per student). All students also attend a series of workshops with a focus on professional development (including resilience training, communication, becoming a professional, clinical reasoning) during the first year of the programme as they transition into study on a professional degree programme. Professionalism is also a theme embedded in the curriculum through didactic sessions and end of module feedback and review sessions

During the Clinical Phase of the programme, students continue to develop their clinical skills (including more advanced surgical procedures, specialised clinical exams, imaging, anaesthesia, dentistry) during module and rotating practical sessions (approx. 35 hours per student). Module 13 (the first module in BVMS3) focuses on veterinary professionalism and includes interactive seminars on clinical reasoning, ethical reasoning, professional conduct, communication and non-accidental injury. Throughout the Clinical Phase, students also participate in the PaCE (Professional and Clinical Experience) thread which develops key professional skills in the areas of communication, teamworking, legal and professional, peer review, echelon learning and health and safety. Key experiences include a weekend working with the nursing team at the Small Animal Hospital and the opportunity to engage in peer review of Foundation Phase students undertaking clinical and professional skills training.

The Professional Phase is structured to enable students to participate as part of the clinical team during a series of clinical rotations. Core rotations are based around 12 students per block, Selective rotations are typically 6-8 students per block; in most of the clinical environments the student groups are further subdivided into the different clinical areas resulting in effective groups sizes of typically 3 students per week. This enables us to create a learning environment where small groups of students are effectively integrated into the clinical workplace allowing them to learn from their own experiences of clinical reasoning with regular personal feedback on their performance. The range of opportunities available to our students throughout the programme, but particularly through BVMS5 and complemented by EMS experience ensures that they experience a good understanding of the breadth of the profession and the range of career options available. This is reinforced by a number of events throughout the programme culminating in a specific Professional Induction Week, which incorporates career & life skills seminars and workshops for students entering the final year of the BVMS programme.

Assessment is key to the professional and clinical skills development strategy. OSCE (Objective Structured Clinical Examinations) are used as the main assessment method for clinical skills in years 1-4 (formative in year 1, summative in years 2-4). DOPS (Directly Observed Procedural Skills) are used in all years, with a strong emphasis in year 5 where they form a key component of the in-clinic assessment during core rotations. An electronic portfolio is used in all years of the programme as a focus for developing reflective practice and professional development planning. The

portfolio specifically encourages students to set their own learning targets and outcomes through the core curriculum and EMS experiences. Students are supported in developing their portfolios (by peer and faculty portfolio advisers) and the portfolio is part of the summative assessment in BVMS2, 4 & 5. Further details on assessment can be found Chapter 8.

As described above, the Professional phase core rotations (intramural, ambulatory and emergency) involve students as part of the clinical team, with a focus on hands-on involvement in patient diagnosis and management. This is facilitated by relatively long rotations (4 weeks in each area) and small group sizes - typically 3 students per week, meaning students generally work closely with clinicians (1:1, 1:2 or 1:3 depending on context) and are expected to take on an active role during their time on rotation. Students take on case responsibility in most rotations where they maintain clinical records and perform patient assessments as well as reporting at clinical rounds. Students are required to write professional reports on several rotations (e.g. necropsy report for PHP rotation, case report for Small animal, Equine or Production animal rotation).

Visits to food premises (including slaughterhouses) occur during the "Core skills in Public Health & Pathology" rotation in BVMS5. The students (small groups of up to 6 students per group) are accompanied by one of the members of VPH faculty (three staff) who have all previously worked as an Official Veterinarian in slaughterhouses. These visits target all relevant areas for Day 1 Competencies. Students complete an audit exercise related to their visit to a slaughter facility (cattle, sheep, pigs, poultry or mixed species) which is presented orally on the last day of the rotation. A second visit during the VPH BVMS5 rotation involves visiting one of a range of food premises related to food processing. The students also have access to the Virtual Abattoir to support their learning experience. A collaborative project (including the University of Surrey School of Veterinary Medicine and the Royal Veterinary College) is underway to develop a new Virtual Abattoir using enhanced reality and 360° technology to deliver a new app for students.

Students have introductory information about their selective choices at the start of the Clinical Phase and there are a series of information sessions designed to help them plan their choices and consider their options. Students are encouraged to discuss selective choices with their adviser, and to seek guidance from relevant faculty, as required. The selection process is initiated two years ahead of time to allow any conflicts to be resolved well in advance. The only limitations are due to available places (some options are capped for numbers) and timetabling (some students may have existing commitments when a specific selective is running).

Students may choose any two selective options. Students submit their preferred choices (top 4) of elective study (2 x 4 weeks total) during the second semester of BVMS3. Allocation of students to selectives is the task of the Professional Phase administrator and where choices are oversubscribed, students are assigned on the basis of providing fair access to opportunities. Students will be given their second/third choice if they are not successful in their first choice. The process for deciding who gets places on oversubscribed options is determined by student availability during the block the selective runs and then by random selection from the pool of those interested. Additional selective opportunities are arranged in high-interest areas; many options have a similar option as an alternative so a student may get allocated to a similar option if their first choice is fully booked.

A provisional timetable is issued in June of BVMS3 to enable students to plan accompanying externships and extramural studies placements in good time. Students may opt to amend their selective choices after this point and the Professional Phase administrator will facilitate this where possible.

Competency assessment methods include OSCEs, DOPS and Portfolio (see Table 1 of the BVMS Programme Assessment Policy (Appendix 4)) and are designed to demonstrate progression in skills across each of the three Phases of the programme. For example, in the early Foundation and Clinical Phases of the programme the OSCEs are used to assess clinical skills in simulated situations, with the DOPS and Portfolio representing a smaller proportion of the competency assessment. Later in the Professional Phase, the DOPS and Portfolio become the more important elements of competency assessment as students develop and evidence their clinical skills in real-life settings. The Portfolio is the record of attainment for each student as they progress through the programme.



### 3.2 BVMS Programme Aims

- To develop an understanding of the structure & function of healthy animals and the role of management practices in promoting animal welfare.
- To develop an understanding of the mechanisms of disease in animals and to recognise the importance of prevention, therapy & surgical intervention in maintaining animal welfare.
- To develop an ethical approach and an appreciation of the broader societal importance of animal health and welfare. This includes the economic, public health, environmental and legal considerations which must inform veterinary practice.
- To support individual personal and professional development to produce confident, adaptable, reflective individuals who have a clear understanding of the roles and responsibilities of the Veterinary Professional.
- To develop an understanding of the scientific method, the role of research and the capacity for critical evaluation which underpins professional decision making.
- To provide opportunities to develop and demonstrate the specific practical, clinical & professional skills, knowledge and attributes which are considered by the relevant accrediting bodies (EAEVE, RCVS, AVMA, QAA) to be essential competencies for the graduating veterinary professional.

The BVMS programme has 3 Phases; Foundation (BVMS1 & BVMS2), Clinical (BVMS3 & BVMS4) and Professional (BVMS5). In both Foundation and Clinical Phases authentic scenarios and cases form the basis for integrating clinical and scientific perspectives of Veterinary practice. In the Professional Phase students work alongside clinicians as part of the clinical team.

The **Foundation Phase** aims to provide a firm foundation in the knowledge and skills required for further clinical study, integrating concepts of structure and function, health and disease, in contexts which emphasise the clinical and societal applications of this knowledge and encourage the development of skills for lifelong learning. In this Phase students will acquire fundamental knowledge and develop the skills and attitudes on which the following years of their training are based, including; anatomy and physiology of the body systems relating to health and disease in domestic animals, as well as looking at the underlying cellular process involved; an insight into common husbandry practice and animal management and how these impact on the animals we care for; professional training starts at the beginning of BVMS1 with classes in fundamental animal handling techniques; and skills such as suturing, communication skills, history taking, clinical examination and clinical reasoning. At the end of the Foundation Phase students have a sound working knowledge of healthy domestic animals, with an introduction to the mechanisms of disease and treatment. In addition, they develop the fundamental personal skills required as they move towards learning based more in professional environments.

The aim of the **Clinical Phase** is to build on the Foundation Phase to provide a broad training in key elements of veterinary professional practice, with a focus on common and important problems and presentations encountered in veterinary work. The approach emphasises complexity and the role of clinical reasoning, as well as continuing to develop skills and attitudes required to work in the clinical environment and to take a greater responsibility for learning in the subsequent Professional Phase of the programme. At the end of the Clinical Phase students are prepared for entering the Professional Phase where they are completely supported in professional and clinical environments to prepare for being a knowledgeable and skilled veterinary professional.

The aim of the **Professional Phase** is to develop the competencies required to enter the Profession as a new graduate, whilst recognising that individual aspirations and interests will vary. The emphasis is on experiential learning, developing autonomous learners who can continue to monitor and maintain their professional competency throughout their careers. In this Phase there are no lectures and the primary emphasis is on small-group involvement in clinical activity, covering the common species of domestic animals. During this time students are involved in all aspects of work in our busy hospitals and will also gain first-hand experience in primary care in practices linked to the School. Though this year of the programme is structured so that they receive clinical experience in core clinical areas, there is also the opportunity to focus on personal interests or explore the breadth of opportunities in the veterinary profession by choosing 'selective' experiences. Selectives may be used to gain experience in niche veterinary activities (such as

wildlife, zoo and exotics) or to gain in-depth clinical experience related to core subjects.

We have developed a number of approaches to develop an academic environment conducive to learning and encourage both self-learning and lifelong learning across the programme:

- **Spiral curriculum** – conscious move away from ‘ologies’ – material is delivered in an integrated systems approach with core concepts introduced early and built on as the students progress up the spiral.
- **Early clinical skills introduction** – students are experiencing core clinical skills from the first week of the programme – skills are revisited and developed as the students progress through the Phases. DOPS assessment also introduced from BVMS1.
- **Active learning ethos** - where key topics are worked through in the form of review and concept tasks, supported by workshops/tutorials and analysis following self-directed engagement with core material online (identified to students as self-directed learning, SDL) in advance of the sessions thus promoting problem-solving and independent learning and also fostering a life-long learning approach.
- **Clinical Reasoning theme** - introduced at the start of the programme and developed through the Phases in the form of self-directed tasks and supporting workshops using staff and peer-tutors.
- **Feedback** - is embedded throughout the programme. The School supports the development of a range of approaches to formative feedback, including self-assessment, peer-assessment, individual feedback on assignments and provision of model and example answers across a range of achievement levels. General feedback on the end of course summative assessments is provided where possible, in addition to individual student grades, cohort grade profiles and the opportunity to review examination scripts on request. The recommended feedback provided for course assessments is described in Table 3 of the Assessment policy (Appendix 4). Students are provided with a range of resources to support them in using formative assessment opportunities and the associated feedback via the Mahara page [Preparing for assessment in the BVMS Programme](#).
- Students are **‘part of the clinical team’** – students are prepared for this through team-based activities in the early years (continual assessment tasks, clinical reasoning workshops, practical activities etc.) and through the PaCE programme introducing them to the professional team early in the programme. The “Professional and Clinical Experience Programme”, or PaCE, was created to facilitate the development of professional practice attributes in our Clinical Phase students. The PaCE programme is structured around 6 different themes: these include echelon teaching, peer review, team-working, client communication, health and safety in the workplace and veterinary legal responsibilities. These skills are important to the success of our future graduates but are often not easily addressed within the curriculum. By BVMS5, students are embedded into the clinical practice of the hospital and clinical environments with very small group numbers and long rotations to facilitate integration into the clinical team.
- **Support for students** - The School provides extensive academic and pastoral support to students to promote an academic environment conducive to learning - this is delivered through an effective course and phase management team, the Adviser Scheme and the Student Support team (see Standard 7 for details).

### 3.3 Programme learning outcomes

Our curriculum is built around ILOs to create a cohesive framework to deliver teaching events in a coherent and coordinated structure. A formal description of the content of the unit of study and detail of the associated learning outcomes is available to staff and students on Mahara ([Phase ILOs](#)) and for each module and rotation in the module book (at the top of each module/rotation Moodle page). ILOs (year level and teaching event specific) are provided for each teaching event on Moodle (e.g. at the start of a lecture PowerPoint or within the guidance notes for each practical, tutorial or SDL).

The alignment of ILOs with the programme learning outcomes and the ESEVT Day One Competences are detailed in a Curriculum map. The detailed Phase, Year and teaching event ILOs map to the overall programme aims (see 3.2). Through a process of constructive alignment we have selected assessment tools to demonstrate attainment of ILOs and therefore Day 1 competences (see Standard 8).

Management of ILOs is the responsibility of the BVMS Programme Board (see 3.4 below). As noted above, full detail



of ILOs at Phase and year level is available to faculty and students on Mahara and for each module & rotation in the module book. The ILOs are reviewed as part of the overall curricular review process detailed in 3.1.

### 3.4 Committee Structure

The School committee structure is outlined in Appendix 6.1.5 and those responsible for leading the phases and courses of the programme are listed in Appendix 6.1.6. Committee membership and terms of reference can be found in Appendix 6.1.7 and 6.1.8, respectively. The committee responsible for the management and delivery of the curriculum (including ILOs) is the BVMS Programme Board. The Programme Board consists of the Programme Director, Deputy Programme Director, Phase Leaders, Course Leaders, Veterinary Educationalist, EMS Coordinator, Veterinary Learning Technologist, Clinical Skills Coordinator, NAVLE Coordinator, Head of School (ex officio), Undergraduate School Manager, Admissions & Student Services Manager, Administrative Assistant (Clerk) and Student Representatives.

The remit and responsibilities of this board are:

- the maintenance, monitoring and enhancement of academic standards
- the maintenance of the quality of the student experience
- to organise and deliver the programme in the light of the strategic aims of the School as determined by the School Learning and Teaching Committee
- to consider the taught programme in relation to the accreditation processes of EAEVE, RCVS and AVMA
- to manage the programme content in the light of the budgetary and staffing opportunities

The board considers equality of opportunity in all aspects of its decision-making.

### 3.5 External Practical Training/Extra Mural Studies (EPT/EMS)

The Extra Mural Studies (EMS) co-ordinator oversees EPT (known locally as EMS) for the 5 years of BVMS students. Every student undertakes 38 weeks of EMS (12 weeks preclinical and 26 weeks clinical) as stipulated by the RCVS, which is embedded as an integral part of the programme. Preclinical EMS is normally spent on animal husbandry-related placements so that students gain experience of the behaviour, management and handling of normal animals in their own environments and understand livestock and farm systems; clinical EMS comprises 26 weeks across a broad range of areas. The UK Vet Schools' EMS co-ordinators meet annually and liaise regularly with each other to streamline and harmonise EMS in the UK and to agree policy and practice as much as possible.

**An overview of our EMS scheme**, its purpose and the support for the system is on our externally-facing Mahara page. Students are encouraged to choose placements to complement and support the core teaching on the programme as well as choosing placements which will help them fulfil career aspirations, those which best suits the student's learning needs, and complements the 'intra-mural' curriculum of the BVMS programme

**Table 3.5.1. Curriculum days of External Practical Training (EPT) for each student**

Fields of Practice	Minimum duration (weeks)	Year of programme
Production animals (pre-clinical)	Dairy 2 weeks; lambing/calving 2 weeks	BVMS1 and/or BVMS2
Companion animals (pre-clinical)	Equine 2 weeks	BVMS1 and/or BVMS2
Production animals (clinical)	See narrative in 3.5 and footnote below*	
Companion animals (clinical)		
FSQ & VPH		
Others (specify)		

\* For preclinical EMS (minimum 60 days (12 weeks) in total), students must gain two weeks experience each with at least three different species (eg. equine, dairy and sheep) and of that, two weeks of dairy and two weeks of equine are mandatory. We also highly recommend is gaining obstetric experience such as lambing or calving. For clinical EMS (minimum 130 days (26 weeks) in total), as per RCVS guidelines, students are encouraged to have a 'base practice' to which they return during their Clinical and Professional Phases of the programme. The number of weeks that should be spent in a base practice, and the number of weeks

that should be spent on different types of placement or with different species is not specified. It is up to the students to fulfil their learning needs and career aspirations.

### 3.6 EPT/EMS providers agreement

The process for liaising with placement providers can be summarised as follows: The students log proposed placements onto the RCVS online Student Experience Log (SEL). The SEL is the method by which EMS can be recorded including notification of placements, logging of experience and recording of feedback from placement providers and tutors. A copy of the clinical EMS agreement form and feedback sheet is included [here](#). The administrator checks that the placements meet EMS criteria and if so, health and safety forms are dispatched to the placement provider. Information about the course and training is also sent to the placement providers for information purposes. When health and safety forms are returned the administrator approves the placement. Following each EMS placement, feedback forms are completed by both the student and the placement provider to enable EMS providers to report back on students' performance during EMS, and equally enable students to report on the quality of the instruction and experience of EMS placements.

Dr Philippa Yam is the academic member of staff responsible for coordination of EMS; she is supported by Alison Halley who is the full-time administrator for EMS.

### 3.7 Learning objectives during EMS

Students are guided to set pre-placement learning objectives and have to reflect on each placement; this is discussed with their Student Adviser to ensure that students are gaining real-life work experience that enhances their university-based studies. There is a wealth of guidance about EMS for our students which can be found on the [EMS Mahara pages](#).

Any negative comments about either the placement provider or the student on placement are investigated by the EMS co-ordinator. Poor feedback about the student will be discussed with the EMS co-ordinator and Student Adviser. Over 3,000 suitable placements are included in our National and International EMS databases. Feedback about the placements provides a method of quality assurance and any unsuitable placements are removed from our database.

### Comments on Standard 3

Strengths of our curriculum:

- integrated approach, spiral curriculum with vertical themes identified to build through the programme in an integrated and coherent manner
- clinical/practical experience from day 1 of Foundation Phase
- active learning ethos - where key topics are worked through in the form of review and concept tasks, supported by workshops/tutorials and analysis following self-directed engagement with core material online (identified to students as self-directed learning, SDL) in advance of the sessions thus promoting problem-solving and independent learning and also fostering a life-long learning approach
- clinical reasoning theme - introduced at the start of the programme and developed through the Phases
- students are 'part of the clinical team' – students are prepared for this through team-based activities in the early years (continual assessment tasks, clinical reasoning workshops, practical activities etc) and through the PaCE programme introducing them to the professional team early in the programme. By BVMS5 students are embedded into the clinical practice of the hospital and clinical environments with very small group numbers and long rotations to facilitate integration into the clinical team.
- Small Animal Hospital, Glasgow Equine Hospital & Practice (Weipers) and SCPAHFS (Galloway) are all on site, with the University's Cochno farm in close vicinity
- range of primary care opportunities
- opportunities for selectives (including international locations)

## Standard 4 **FACILITIES AND EQUIPMENT**

- flexibility and choice (e.g. Selectives, PaCE activities)
- team working embedded in the curriculum
- research opportunities and teaching delivered in a research-rich environment

### **Suggestions for improvement on Standard 3**

- vertical themes – some themes are being reviewed and further developed. A review of VPH teaching and content, for example, has been undertaken after the recruitment of new teaching/research staff, and it will be next academic year before the revisions can be fully incorporated (see Appendix 6.3.4)
- complex curricular structure for new faculty to navigate – the new curriculum map will help to address this
- although the spiral, integrated curriculum and high levels of clinical skills training are a strength, this is also a weakness, as it is staff-intensive and at times requires use of external people to deliver some significant components e.g. clinical training and assessment and aspects of the Clinical Phase – investment in faculty and development of training resources for external staff is helping to address
- due principally to our geographical location there is limited opportunity for access to some clinical resources for core teaching resources e.g. pigs, poultry and exotics; we endeavour to deliver relevant teaching within BVMS1-4 to address these limitations
- we are developing an action plan in response to the recommendations of our recent Periodic Subject Review (2018) through a series of faculty student focus group meetings exploring themes identified by the panel (Appendix 6.3.5).

## Standard 4: Facilities and equipment

### 4.1 Description of the location and organisation of our facilities

The School of Veterinary Medicine is located on the University's Garscube Campus and it is a major part of the College of Medical, Veterinary and Life Sciences (MVLS). Co-located on the campus are other Institutes and Centres of MVLS - the Institute of Biodiversity, Animal Health and Comparative Medicine, the Institute of Infection, Immunity and Inflammation, the Institute of Neuroscience and Psychology, the Institute of Cancer Sciences and the MRC-University of Glasgow Centre for Virus Research. Affiliated staff within many of these Institutes/Centres contribute to veterinary teaching and research provision. Also co-located and closely linked to the College is the Beatson Institute for Cancer Research and the West of Scotland Science Park. Finally, Garscube Campus also houses the University's principal sporting facilities as well as the Wolfson Hall of Residence, which traditionally accommodates veterinary students in their early years of study.

All veterinary teaching and the majority of clinical activities are delivered on Garscube campus, with extensive use also made of the University's Cochno Farm & Research Centre (5 miles). Although the Garscube site is self-sufficient, our students also have access to the main University campus at Gilmorehill (3 miles), where they can utilise the University's substantial library collection (in addition to our own James Herriot library) and access wider provisions for sports, social activities, student support, student services and counselling services. Our facilities can be broadly divided into six main geographical areas:

- The Teaching Complex (comprising the Mary Stewart and McCall Buildings and a linked annexe)
- The Small Animal Hospital
- Glasgow Equine Hospital & Practice (based at the Weipers Centre)
- The Scottish Centre for Production Animal Health & Food Safety
- The Research Complex (incorporating Veterinary Diagnostic Services)
- Cochno Farm & Research Centre

There are also residential houses; North and South Lodge (two persons each), Home Farm House (four persons) and Home Farm Cottage (four persons), within the Estate which provide additional accommodation for duty interns.

Area maps of the Garscube campus and Cochno Farm & Research Centre are shown in Appendices 3.1 and 3.2, respectively.

#### 4.1.1 Teaching Complex

The McCall building has three floors and houses the two principal lecture theatres; seminar rooms; the Clinical Skills Facility (see below); a small mammal unit; the post-mortem unit; two student computer clusters; and administration and staff offices. The Mary Stewart building opened in 2016 as a multi-purpose learning and social hub with a diverse range of teaching spaces to accommodate a variety of learning styles. It is the site of the new entrance to our main teaching complex where it houses a modern café with space for up to 400, a 40-seat seminar room, 10 tutorial rooms, 6 study booths, a student print area, a vending area, the GUVMA office/shop and an internet café (5 PC's). This building is confluent with the Clinical Skills Facility and integrated annex; the latter houses the James Herriot Library and library staff offices, student locker rooms and showers, and one seminar/meeting room.

The Clinical Skills Facility provides a learning environment for the development of the students clinical skills, and contains the following distinct areas:

Principal teaching laboratory	Microscopy Lab
Mock Consulting room	Diagnostic Imaging room
Mock Theatre	Reptile Unit (Jarrett Building)
Scrub area	Exotics & Small Mammal unit
3 multipurpose teaching rooms	

#### 4.1.2 Small Animal Hospital

This is a two-storey purpose build that holds RCVS-accredited Veterinary Hospital status. There are 14 consulting rooms and a spacious and bright reception area with separate cat waiting area. The central treatment area is used for all non-sterile procedures and acts as the main hub of the hospital. There are 12 wards overall; 1 ICU ward, 1 HDU ward, four main dog wards (plus 4 dog runs) and a separate cat ward. In addition, we have a mixed day care ward, exotic animal ward and isolation wards (two for infectious diseases and one for neutropenic patients). The diagnostic imaging area comprises eight rooms with MRI, CT, digital radiography, and general and cardiac ultrasound machines. The hospital has an integrated MRI and CT scanner, and linear accelerator. There are four surgical theatres and a prep room as well as designated changing and scrub areas and facilities for in-house sterilisation of equipment and sterile stores. The Wellness Centre provides facilities for aspects of physiotherapy including hydrotherapy. The comparative oncology suite houses the radioactive iodine cat ward as well as providing rooms for the safe administration of chemotherapy. The suite also contains a linear accelerator maze and control room.

The upper floor of the SAH contains office space for administrative staff, clinical scholars and clinicians as well as student facilities including two seminar/meeting rooms, IT room, and two communal/social areas.

#### 4.1.3 Glasgow Equine Hospital and Practice (Weipers Centre)

The hospital holds RCVS-accredited Veterinary Hospital status. The hospital has one lecture theatre, a seminar/meeting room, social space, small laboratories, clinical skills area and staff offices. The clinical area comprises two surgical suites (connected by changing rooms, scrub area, sterile prep area and laundry), each with dedicated induction, preparation, theatre and recovery areas. It also contains 3 examination rooms (with fixed or mobile stocks), one radiography suite, one nuclear scintigraphy suite, an MRI unit, and an indoor lameness examination hall. The James Armour Stable blocks have 20 hospital boxes (stalls) and two barns together with a staff room, in-house laboratory, nurses office, pharmacy, clinical records room and examination area and an eight PC computer room for students. The floodlit indoor riding arena is located nearby, as is the hard lunge area and horse rescue site. The large animal isolation unit provides secure isolation facilities for both equine and production animal species. It has 4 self-contained stable units, where one unit is equipped with a hoist to aid support of a horse via a sling. Three of the units are used for equid cases and one of the units is utilized for production animals.

A new equine primary care practice is being formally launched in Spring/Summer 2020. This service will complement the existing arrangements with Clyde and MBM Vet Groups and will provide additional capacity for primary care instruction. This new ambulatory service will operate out of the Glasgow Equine Hospital but is resourced by primary care clinicians. The primary care service is designed to provide interactive student teaching. Portable video endoscopy, oroscopy and ultrasonography will allow students to be directly involved in primary care procedures and diagnostic interpretation. Point of care diagnostic testing will be used to allow students to be involved in diagnostic interpretations. The practice management system will allow students to see a patient's entire clinical history (including PaCS diagnostic images and test results) while horse-side. Collectively, this equipment will facilitate a hybrid of demonstration and collaboration teaching styles. In addition, this facility should increase the number of referrals to the hospital, increasing the case-load and providing additional instructional opportunities for students rotating through the hospital. It is anticipated that referrals from the practice will provide a more complete learning experience; students will be able to trace cases back to see the decision making and disease progression that lead to referral and they will also follow cases once they have returned to the Primary Care Service.

#### 4.1.4 The Scottish Centre for Production Animal Health and Food Safety (Galloway Building)

This facility holds RCVS General Practice status. It provides flexible accommodation for up to 30 adult cattle or a larger number of small ruminants, including two secure bull pens. Typically, around 18 cattle and 24 small ruminants are housed. Each pen is equipped with a crush for clinical examination. There is a separate area for pigs, which has three pens and can accommodate up to 15 finishing weight pigs. The centre also contains two areas for clinical examination classes with flexible access crushes and handling facilities for safe handling of all sizes of cattle (including bulls). There are two large calving simulators and rectal simulator models, on purpose-built tables. The facility has a separate teaching area with flexible provision of 2 crushes for handling of adult cattle. There is a boot wash and hand wash area, adjacent to a preparation room where students can access clinical case records and complete paperwork, and which serves as the central area for organisational purposes. The facility contains a pharmacy plus a laboratory that is used for sample processing and basic analyses, as well as reproduction teaching. There are three seminar rooms, including two designated as clean areas (no boots or waterproofs allowed) and one designed as a dirty area immediately adjacent to the teaching area in the main animal accommodation building. There is PC access for students in seminar room 3 (8), laboratory (3) and prep room (4), plus an additional PC cluster with 15 PC's. There is open plan clinical office space, currently home to one academic clinician, two interns and two residents. The facility contains a biozone for cleaning equipment, changing and locker rooms for students and staff, a laundry and a storage room. The facility operates three fully equipped ambulatory vehicles available for transporting students and staff on farm visits.

#### 4.1.5 The Research Complex (incorporating Veterinary Diagnostic Services)

The **Jarrett Building** principally provides the veterinary students with a learning environment to develop their skills in Anatomy, Clinical Pathology, Histopathology and Infectious Diseases. This building houses one small lecture theatre; one principal Gross Anatomy Dissection teaching laboratory, one Histopathology teaching laboratory, one reptile unit (part of the Clinical Skills Facility), several laboratories of the Veterinary Diagnostic Services unit, and a range of additional research laboratories and staff offices. The **Veterinary Diagnostic Services (VDS)** laboratories are located across 3 principal laboratory complexes (Histopathology, Clinical Pathology and Infectious Diseases). The **Henry Wellcome Building for Comparative Medical Sciences** was opened in 2004 and contains several research laboratories; one seminar room/meeting room; staff resource centre with cafeteria; insectory facility; and staff offices. The **Sir Michael Stoker Building** was opened in 2015 and houses the MRC-University of Glasgow Centre for Virus Research, the UK's largest grouping of human and veterinary virologists. This building contains a multitude of research laboratories, meeting rooms and staff offices. The **Urquhart Building for Parasitology** houses research laboratories; one seminar room and staff offices. The **Botham and MacRobert Buildings** both house research laboratories and staff offices.

#### 4.1.6 Cochno Farm and Research Centre

This is a commercial upland pastoral farm extending to 345 hectares and an altitude of 1,200 feet that is located approximately 5 miles from the Garscube campus. The enterprises consist of: 60 cow Holstein dairy herd plus dry cows and youngstock, 40 cow Angus x beef herd (cow-calf/suckler) plus youngstock, 400 Easycare ewes plus rams/lambs, 9 teaching and research Welsh Sec.A ponies and a small number of bee hives as a resource for apiculture. The farm is used extensively for teaching a broad range of topics around production animal (primarily) and equine management/husbandry. In addition, it is used extensively for production animal clinical teaching, including herd/flock health planning and management. In addition to the farm resources available the large mansion house at Cochno affords additional facilities used to support teaching, e.g. changing facilities, small lecture room and meeting/tutorial rooms. Finally, the farm also acts as the University's sole facility for conducting large animal research (including Home Office-licensed research), principally in ruminants, equids and poultry. To support the in vivo research there are also two small laboratories that are used for sample preparation and analyses. These animal and laboratory facilities are also utilised to support research projects, including summer research projects, for BVMS students and postgraduate students.



#### 4.1.7 Extramural Facilities

We utilise several distributed sites that complement our own excellent clinical resources. Clyde Veterinary Group deliver off-site production animal and equine first-opinion teaching in relatively modern specifically designed premises, while MBM Veterinary Group deliver equine first-opinion teaching in relatively modern premises. Some small animal clinical teaching is carried out in very adequate facilities across the Glasgow area via several clinics, namely the PDSA, SSPCA and Dermatology referral service clinics. All of these facilities are adequately resourced and have the number of clients/cases to facilitate effective clinical teaching, primarily in primary care.

In addition to the School's farm a small number of additional privately-owned farms are used to supplement core production animal clinical instruction. There is always a member of our School's production animal faculty, or senior clinical training scholar (resident), who leads and delivers the clinical instruction on-farm.

- Meldrum farm – core (Blair Drummond; 38 miles)
- Kaimhill farm – core (Bridge of Weir; 14 miles)
- Port Nellan farm – core (Gartocharn; 16 miles)

The School has access to an appropriate number of slaughterhouse facilities throughout Scotland. There is adequate provision throughout the year to meet the capacity needs of our students/curriculum. Visits to these sites are normally restricted to small groups, typically no more than 6 individuals, hence each site will likely have <20% of students visiting overall. There is always a key member of veterinary public health faculty with the students at all times leading the teaching session. The following providers are currently used, many of which have cutting plant functionality as well as slaughterhouse:

- Anglo Beef Processors (ABP) - beef (Perth; 64 miles)
- Braehead Foods – game birds, poultry (Kilmarnock; 25 miles – seasonal for game birds but poultry all year round)
- Highland Meats – beef (Saltcoats; 30 miles)
- James Chapman (Butchers) – beef, pigs, sheep (Shotts; 27 miles)
- Robertsons – pigs (Ardrossan; 32 miles)
- Sandyford Abattoir – beef, sheep (Paisley; 10 miles)
- Scottish Agricultural College – poultry (Ayr; 40 miles)
- 2 Sisters Food Group – poultry (Couper Angus; 80 miles)

The School has access to an appropriate number of food processing units throughout Scotland. There is adequate provision throughout the year to meet the capacity needs of our students/curriculum. There is always a key academic member from veterinary public health with the students leading the teaching session. The following providers are currently used:

- Belchers (ready to eat products/cutting) – (Prestwick; 36 miles)
- Caledonian Proteins (category 3 processing plant) – (Motherwell; 20 miles)
- Chapmans (butchers and cutting plant) – (Wishaw; 23 miles)
- Cumbrae Seafoods (oyster beds and depuration plant) – (Ayrshire; 40 miles)
- Fish market (industry, freshness assessment, auditing, holding tanks) – (Glasgow; 8 miles)
- Graham's Dairy (dairy processing plant) – (Bridge of Allan; 37 miles)
- Grayshill (fallen stock plant) – (Cumbernauld; 16 miles)

#### **The strategy and programme for maintaining and upgrading current facilities and equipment**

The strategy for decisions on upgrading or proposing new buildings is largely managed by the School's Executive management team and is documented in the School's strategy document that is revised annually. Proposals are largely focused on current need and horizon-scanning. The program for upgrading and maintaining buildings is managed by the University's Estates & Commercial Services department, which is a centralised service provider covering all areas of the University. In terms of routine or condition-based maintenance, the estates team have a cyclical schedule for many aspects (e.g. painting) and any reactive maintenance required out with the standard cycles (including urgent maintenance) can be requested 24h per day via the Estates online maintenance request system. Where upgrading of buildings is likely to be a significant new capital cost, the School is required to submit a New Project Request to the College of MVLS senior management group for approval.

The strategy for new equipment purchases is largely based on those items required to maintain a high-quality clinical facility in order that the students have the most appropriate clinical environment for instruction, and to ensure that the clinical environment is reflective of that available in many private practices when students enter the workplace post-qualification. The program for upgrading equipment is managed locally within the School via the use of the asset register and serviceable lifespan of the specific equipment with key input from a senior financial analyst to assist the Clinical Directors and Service Leaders.

#### **Physical facilities compliance with relevant legislation**

Legislative compliance for the physical facilities is generally managed by centralised departments within the University. For example, building compliance works are managed by the University's Estates and Commercial Services department, where they manage all aspects of this from architecture, local authority planning, and building warrants through to managing physical maintenance or works via their list of approved building contractors. Legislative compliance from a health, safety and environmental aspect is managed by the University's Safety and Environmental Protection service. All of these services engage key members of School academic and support staff in managing the physical areas. In particular, each area has a member of staff whose responsibility it is to liaise with the relevant university departments to ensure continued legislative compliance, and they also ensure that working practises and SOPs are followed to ensure that academic/clinical and support staff and students also adhere to policies to ensure our continued compliance. Health and Safety (including the local committee), Security and Estates & Commercial Services communication pathways are outlined in Appendices 6.4.1 to 6.4.4.

#### **4.2 Lecture theatres, teaching laboratories, tutorial rooms and other teaching spaces**

The facilities used for lecturing, group work and practical work are outlined in Tables 4.1 to 4.3. Overall these are adequate in number and capacity to meet the needs of our programme. The School has adequate lecture facilities with 2 large lecture theatres (McCall, Ilay, which can accommodate full year groups). It has a moderate-sized lecture theatre (AHTC; which can hold about three quarters of a year group) and a smaller lecture theatre (Jarrett) that is principally used for the BSc Veterinary Biosciences programme and for smaller group teaching on the BVMS programme. It also has a seminar room at Cochno Farm & Research Centre, that is mainly used for small group work. All of the lecture theatres have been refurbished in recent years. An additional seminar room and two blocks of small group teaching rooms/study space (5 rooms in each block) for students are provided in the Mary Stewart Building. The School has invested in high quality image capture equipment so that important teaching material can be recorded and retained, and if required relayed synchronously to one of the principal lecture theatres that lies adjacent to the facility.

We are fortunate to have adequate space to accommodate our large number of administrative, operational and technical support staff, while the office accommodation for academic staff is currently sufficient for our roll, with a proportion of offices refurbished annually on a rolling cycle.

There are extensive high-quality research facilities on site at the Gartnavel campus with the Henry Wellcome Building for Comparative Medicine, which is further linked physically to the 3 other major research buildings, including the MRC-University of Glasgow Centre for Virus Research. The latter is the UK's largest grouping of human and veterinary virologists, with a large number of research teams, all under the Directorship of a veterinarian (Professor Massimo Palmarini). Academic and support staff from the School and two of our partner Research Institutes (Institute of Biodiversity, Animal Health & Comparative Medicine; Institute of Infection, Immunity & Inflammation) occupy these buildings and conduct world-leading collaborative research. The staff and facilities in these buildings continue to support research projects for our BVMS and postgraduate students.

Clinical skills facilities are briefly outlined in Section 4.1. These areas are used extensively for clinical skills training and contain a variety of models for instruction. A full list of skills developed during the **Foundation Phase Clinical Skills and Clinical Phase Clinical Skills** is available.

#### 4.2.1 Recreational, study, locker and food facilities available to students

We continue to benefit from excellent catering and social facilities, particularly within the Mary Stewart Building. In addition to using these facilities during normal working and study hours, the recreational space can be used out with normal hours, and catering can also be provided for events during the day or in the evenings (e.g. CPD events, clinical clubs, alumni events etc.). For study the Mary Stewart Building also has 10 tutorial rooms that are used for dedicated study when they are not booked up. Students frequently use these rooms, in addition to other meeting rooms throughout the School. Our policy is that all meeting or tutorial rooms can be used for individual or group study when not booked.

We maintain a very good library facility on-site (The James Herriot Library), in addition to our students and staff having access to the university's main library, collections and archives at the main Gilmorehill campus.

We have sufficient locker space available to provide lockers for each student. Additional dedicated locker space is also provided in most clinical areas of the School for final year students to utilise when on-clinic.

The Mary Stewart building contains excellent canteen facilities, with vending machines located in other areas of the campus.

Accommodation is offered for all first-year students and is typically provided at the Wolfson Halls, which is co-located on the Garscube campus. Students typically stay in private accommodation across the city in future years.

We enjoy excellent leisure facilities. The university's primary leisure and sporting facility is co-located on the Garscube campus, while other leisure and gym facilities are provided at the Gilmorehill campus. Our veterinary students also have a small gym located adjacent to the locker area. Throughout the buildings on the Garscube campus there are adequate sanitary facilities, including showering facilities in most buildings.

Office space is sufficient for the needs of academic and support staff across the campus. Many academic staff have their own office, and others, in particular part-time staff, sometimes share office space. In the clinical areas there are also shared office spaces for academic, support staff, and clinical scholars to utilise when on clinics. Our research laboratories are extensive, they are co-located on the Garscube campus and they are broadly outlined in section 4.1.5.

### **4.3 Premises for livestock facilities, animal housing, core clinical teaching facilities and equipment used for teaching purposes**

The premises used for housing 'normal' animals are primarily located at Cochno Farm & Research Centre. Section 4.1.6 contains details of the animals housed there. This is a commercial farm managed by the School that is typical of a farm located in the West of Scotland. Horses used for animal handling and husbandry teaching are also located at the Glasgow Equine Hospital, while the School also has reptile and small mammal facilities that are used for hands-on training.

Research animals can be divided into two groups. Large animal research is normally conducted at Cochno Farm & Research Centre, which contains facilities to house cattle, sheep, horses and poultry. These are Home Office-licensed buildings, where some are specific for research (e.g. poultry housing), whereas others are shared spaces with the commercial aspects of the farm. Research animals can also be housed at the Small Animal Hospital, Glasgow Equine Hospital and SCPAHFS, however, Home Office licensed research is normally conducted at Cochno. Research with small laboratory animals is conducted at the Garscube and Gilmorehill campuses in dedicated animal research facilities operated by the university's Biological Services department.

Diseased animals are housed within the Small Animal Hospital, Glasgow Equine Hospital and SCPAHFS. A description of these facilities is outlined in Sections 4.1.2 to 4.1.4, respectively. The provisions in these areas, and equipment available, is detailed in Appendices 6.4.5 and 6.4.6, respectively. Due to significant investment in our clinical teaching areas over the last 15 years we are very well serviced for clinical teaching and the accommodation of

teaching animals.

#### 4.3.1 Diagnostic and clinical support services

The Veterinary Diagnostic Services (VDS) laboratories are located across three principal laboratory complexes (Histopathology, Clinical Pathology and Infectious Diseases) within the Jarrett Building, with a shared common sample reception area. The post-mortem facility is located in close proximity to the Galloway building, which houses our production animal clinical cases.

- The Histopathology Unit is a modern one-stop facility covering all aspects of the discipline from specimen reception through to trimming, processing, sectioning and staining (standard tinctorial and immunohistochemistry).
- The Clinical Pathology Unit is a one-stop facility covering all aspects of the discipline from haematology, immunohaematology, haemostasis and fibrinolysis investigations, clinical chemistry, hormone assays, therapeutic drug monitoring, urinalysis, tissue and fluid cytology analyses.
- The Infectious Diseases Unit consists of several laboratories relative to virology, bacteriology and parasitology. Across these laboratories there are extensive facilities relevant to these specialist areas, such as walk in 4oC fridge, walk in 37oC room, diagnostic testing areas, tissue culture suites, PCR rooms, media preparation room and a host of microscopy suites (including fluorescent microscopy; a room containing a 10-header microscope with large mounted PC screen to facilitate haematology, cytology and histopathology training; and a room containing 6 microscopes for rotation student use.
- The post-mortem facility comprises of two principal areas; one area for necropsy of large animals, with appropriate hydraulic table, static tables, sheep trestles, saws and hoists to facilitate necropsies. The second area contains 10 tables at standing height to facilitate examination (and small group teaching) of abattoir-derived specimens, tissues from large animal necropsies and for necropsy of small animals, laboratory species and wildlife/exotic species. A Class 1 microbiological cabinet is also available to facilitate post-mortems on avians.

#### 4.3.2 Central clinical support services

The principal services that provide support to multiple areas are anaesthesia and diagnostic imaging. It does differ slightly depending on area of the School. The specific equipment used by each support service is detailed in Appendix 6.4.6.

- Diagnostic Imaging:
  - Small Animal Hospital. The diagnostic imaging group has several members of faculty and clinical training scholars, and comprises in-house MRI, CT/radiography functionality, as well as a significant array of ultrasound and endoscopy devices.
  - Glasgow Equine Hospital and Practice. Specialist equine faculty and clinical training scholars perform their own diagnostic imaging with an array of facilities to support them, including MRI, radiography, ultrasound and endoscopy devices.
  - SCPAHFS. For production animals based at the Galloway Building, specialist production animal faculty and clinical training scholars perform their own diagnostic imaging, the majority with ultrasound, but it also has mobile radiography functionality.
  - Over the entire School, although European Diplomates provide the service primarily within the Small Animal Hospital, they can be utilised to support equine and production animal cases if required.
- Anaesthesia. Services are provided by a central anaesthesia team (based at the Small Animal Hospital) across the School, in that they provide anaesthesia services to the Glasgow Equine Hospital and the Galloway building (production animals). An array of anaesthetic equipment is available for small animals as well as specialist equipment for large animals, including equids. The anaesthesia team also provide a pain clinic service, which although largely provided for small animals, can be provided for large animals too.
- Physiotherapy/Hydrotherapy. The Small Animal Hospital has a physiotherapy and hydrotherapy unit to support the array of cases in the hospital.
- Laboratory. Both the Small Animal Hospital and Glasgow Equine Hospital have an array of in-house clinical analysers in use, with back up and more extensive analyses being provided by the School's Veterinary Diagnostic Support unit.

A description of the number and types of facilities used for extra-mural teaching of FSQ and VPH are detailed in section 4.1.7. The School does not have its own slaughterhouse or food processing unit.

#### 4.4 Core clinical teaching facilities

##### 4.4.1 Small Animal Hospital

The Small Animal Hospital provides a 24/7 small animal referral service for veterinarians, and their clients, in Scotland. It also operates an out-of-hours emergency primary care service providing primary care cover from 1800-0800. The latter clinic is run as a separate service by a different team of clinicians, with cases being referred on to the SAH specialist services as appropriate. All case types are accepted; emergency patients at any time, whereas elective cases are generally scheduled for 0900-1700. Staff expertise covers a broad range of disciplines, including Anaesthesia & Pain Management, Behaviour, Cardiorespiratory, Diagnostic Imaging, Emergency & Critical Care, Internal Medicine, Neurology, Oncology, Ophthalmology, Orthopaedics, Physiotherapy & Hydrotherapy, Radiotherapy and Soft Tissue Surgery. The hospital also provides specific services such as referral ultrasound service and radio-iodine-treatment that are directly accessible. Final year students rotate through medicine, anaesthesia and diagnostic imaging as core subjects and can choose the other services as part of their selective options. Students can also participate in the out of hours primary care service as part of their core primary care rotation. Students are involved in consultations, diagnostic investigations and treatments under an appropriate level of supervision. As well as giving practical hands-on learning, core rotations run tutorials to consolidate knowledge taught earlier in the programme.

##### 4.4.2 Glasgow Equine Hospital and Practice

The equine hospital provides a 24/7 equine referral service for veterinarians, and their clients, in Scotland and Northern England. Staff expertise is equally divided between medicine and surgery disciplines, and includes services in anaesthesia, diagnostic imaging, diagnostic services, intensive care, lameness diagnosis & therapy, internal medicine, orthopaedic & soft tissue surgery, physiotherapy and performance horse clinic (dynamic respiratory scope). All diagnostic imaging (radiography, ultrasonography, nuclear medicine and MRI) is provided in-house, while specialist staff of the anaesthesia service that support our services are physically based in the School's Small Animal Hospital, only a short distance from our hospital. All case types are accepted; emergency patients at any time, whereas elective cases are generally scheduled for 0900-1700. The medicine and surgery clinics are each run by one academic staff member who supervises a veterinarian in a training position but other staff will be drawn upon if caseload requires it. One academic medicine clinician, one academic surgery clinician and one veterinarian in a training position provide the 1700-0900 emergency service, and in-patient care, in rotation. Final year BVMS students rotate through the equine hospital and are integral to its activities. The students are expected to take case responsibility, with their involvement in case management being supported to ensure that the experience is positive for each individual and that high levels of patient care are maintained. Student involvement extends to the emergency service, which the students are rostered to, in order to include rest periods. Hospital Rounds, didactic teaching and feedback during the rotation are focussed on assisting the students in gaining as much as possible from the three weeks spent at the hospital.

##### 4.4.3 Scottish Centre for Production Animal Health & Food Safety

The farm animal facility at the University of Glasgow consists of donated cases from farms within an 3-4 hour drive. Farmers donate cases via their own first opinion veterinarian (who deems the animal fit for transport) and a case collection service is provided. The clinic is staffed by one clinician, one intern/resident and 6-7 final year veterinary students. Services offered include diagnostic imaging, farm consultancy, lameness investigation, male fertility assessment and a variety of surgical interventions. Evening and weekend checks are carried out as needed and there is a clinician, one intern/resident and 2 final year veterinary students on-call at all times (no students are on-call when the Core Production Animal rotation is not running). All animals receive a full clinical exam, further diagnostics and treatment as necessary. Animals are never returned to the farm of origin due to biosecurity risks (exception see 4.6 isolation facilities). Animals either are successfully treated and become healthy teaching animals within the hospital or they are euthanased and have a full gross post-mortem examination. Occasionally, successfully treated healthy animals are sent straight to slaughter if fit for human consumption. The hospital does not offer a referral



service and is purely utilised for the teaching of under- and post-graduate students. Final year students have an integral role within the farm animal VTH. Following an induction session to the hospital students are allocated active cases which they have primary responsibility for (under the guidance of the clinician/intern/resident on duty with them). They perform clinical exam, decide on and carry out further work up/diagnostic tests, administer treatments, record clinical notes, decision make regarding euthanasia and communicate with vets and farmers. Rounds occur every morning to discuss each case in turn and further discussion regarding case management occurs with the students throughout the day.

#### 4.4.4 Practice Standards

The Small Animal Hospital has RCVS-accredited Small Animal Veterinary Hospital and Emergency Services Clinic statuses, while the Glasgow Equine Hospital has RCVS-accredited Equine Veterinary Hospital status. SCPAHFS has RCVS-accredited Farm Animal General Practice status.

### 4.5 Student access to a broad range of diagnostic and therapeutic facilities

Students have access to all appropriate teaching, clinical, diagnostic and therapeutic facilities via keycode access or via their electronic university student card. Appropriate access to facilities will be under the direction of key academic/clinical or support staff. Further details on the support services and facilities that students have access to are described in sections 4.3.1 & 4.3.2.

### 4.6 Isolation Facilities

The large animal isolation facility contains four separate, self-contained isolation units utilized for hospitalising three equine patients and one production animal patient. Each isolation unit contains a preparation/records room for changing into PPE, a restricted access ante-room with personnel access to the equine stable (with separate horse access). One of the equine stables has a winch for use in conjunction with a sling for horses requiring such assistance. The single production animal unit is principally used when the patient has the potential to return to the farm of origin, and thus they are kept separate from all other farm animal teaching cases in the Galloway building to minimise the risk of disease transmission to the farm of origin. There is a communal non-restricted area for drug and consumable storage as well as limited laboratory analyses. There is a separate storage area for feed and bedding. The isolation facility has a stand-alone, lockable building for storage of contaminated bedding. Small animal patients can be isolated in a facility physically separate from the rest of the SAH. As for all clinical activities, there are defined operational procedures (SOPs) to ensure the best clinical practice in terms of biosecurity, and to maximise the quality of training/education in animal isolation management and nursing. Information regarding PPE, health and safety, biosecurity and operational procedures are all posted within each isolation unit and accompanying clinical staff utilise these for instruction in isolation procedures.

### 4.7 Ambulatory Clinic for Production Animals

In recent years SCPAHFS has developed a strong ambulatory and routine clinical service to a number of farms in Scotland, including dairy, beef and sheep farms that are utilised to teach field veterinary medicine and herd health management. In addition, the unit also provides these services to the university's own Cochno Farm. We have two large (>500 cow) dairy herds for which we are contracted to provide routine clinical services based around a weekly fertility visit and herd health discussion. This allows an opportunity for both postgraduate and undergraduate teaching as well as developing a number of clinical research projects. We provide clinical services to one of the industry-leading dairy farms in Scotland, which has won the Scottish Dairy Farm of the Year award on two occasions in recent years. The range of clinical activity encompasses high yielding dairy herd health services, beef routine work across a range of enterprises and sheep consultancy. We are active on all farm types from all year round housed dairy herds through to organic beef and dairy herds and extensive sheep flocks.

In addition, we recently started a novel clinical service in association with Scotland's Rural College (SRUC) to provide gross post-mortem services for ruminants which would then feed into the SRUC Disease Surveillance network. This has greatly strengthened our links with SRUC across a range of facets and has enabled diagnostic and surveillance



work in an area of Scotland, which up until now was not well represented. Feedback from referring veterinarians and farmers has been very positive and we hope to build on caseload numbers; case numbers are showing an expected dramatic seasonal spring increase in line with calving and lambing, although we do have cases submitted all year round. With the current (at time of writing, January 2020) changes in SRUC Disease Surveillance services, we may see an increase in submitted material due to the closure of two SRUC centres (Perth and Ayr) that would previously have taken carcasses for submission. This is an area of rapidly changing service provision, set against a backdrop of rapid corporatisation in the Scottish large animal veterinary services provision and may provide an opportunity for further clinical, teaching and research collaborations in the medium term.

#### **4.8 Transport of students, live animals, cadavers and other teaching materials**

SCPAHFS has two 12-seat minibuses and one 9-seat minibus to transport students to farms, abattoirs and food processing facilities. In addition, it also has three 5-seat ambulatory cars to transport students. For transportation of live animals SCPAHFS has two pick-up trucks and two livestock trailers.

The Small Animal & Equine Hospitals have no vehicles, but the new Glasgow Equine Practice will operate two ambulatory vehicles for transportation of staff and students.

Transportation of cadavers/organs is via two vans (one large, one small) operated by anatomy and post-mortem staff.

All vehicles are managed by the university's transport department to ensure compliance with all UK and EU standards. SOPs are available covering the operation of vehicles to ensure staff and student safety, and biosecurity.

#### **4.9 Operational policies and procedures**

The University, College and School all have a commitment to biosecurity, health and safety. Overall the university's **Safety and Environmental Protection Service (SEPS)** has a role in supporting the School and providing overall policies that comply with UK and European legislation. At School level we have a Health and Safety Committee (Appendix 6.4.2) with a clear communication pathway to SEPS (Appendix 6.4.2). The School, and local functional units (e.g. laboratories, clinical areas, farm etc) have their own health and safety manuals, policies, SOPs and risk assessments. SEPS is responsible on behalf of the institution for QA, conducting formal periodic audits of facilities, operational procedures, SOPs, risk assessments etc. They also hold databases of staff formally trained in relevant areas, e.g. radiation protection, fire officers, first aid, biological safety etc, which is also recorded on the university's CORE HR system indicating completion and expiry/renewal dates.

Local policies are posted for staff in students in relevant areas within the physical space, and they are also posted on the virtual learning environment for access at any time by students. When students are preparing for teaching events (practical/clinical skills/within-clinic) the local rules for that area are outlined in a briefing by a key member of academic, clinical or support staff.

#### **Comments on Standard 4**

The School has a range of learning, clinical and social facilities and resources to support and enhance the students' learning journey. The School has been very fortunate over the last 10-15 years to have gained significant financial resource to create excellent clinical and teaching environments on the Garscube campus through a variety of capital projects; the Mary Stewart Building, the Small Animal Hospital, the Weipers Centre and the Scottish Centre for Production Animal Health & Food Safety. The final major area of campus development is the construction of a new post-mortem facility to replace our current aged facility. The process for this development is well under way and will complete the long term plan to redevelop the campus.

#### **Suggestions for improvement on Standard 4**

**Post-mortem facility:** As part of the School's commitment to continue to provide up-to-date clinical teaching facilities, we are currently progressing plans for a new Pathology Suite to replace the existing post-mortem facility and associated facilities used to support teaching, research and commercial activity. The university's Estates and

## Standard 5 **ANIMAL RESOURCES AND TEACHING MATERIAL OF ANIMAL ORIGIN**

Commercial Services department are in the middle of this exercise in conjunction with key School staff where they are working with local authority building control, and architects, to scope out what options and architectural designs would be suitable for our campus. Once the scoping exercise is completed and the School/College review the options, a proposal will be lodged with the University's capital expenditure board for final approval. It is anticipated that the facility will be completed ca. 2022-23.

**Expansion of Clinical Skills Unit:** The new post-mortem facility will afford us the opportunity to reassign the use of the existing post-mortem facility, which is adjacent to the current Clinical Skills facility. As such, there would be potential to reconfigure this space to allow expansion of our Clinical Skills Unit. This ultimately could afford us opportunities to expand our clinical skills provision in large animal cadaver surgery, and should sufficient space be available it could also facilitate the creation of a new Exotic Animal suite, enabling us to house small mammals and reptiles in a single purpose-designed unit, which will include outdoor space access.

**Student lockers:** Looking to the future, the current locker provision for the students' will be upgraded to ensure that it continues to offer sufficient space for students to store PPE etc. Therefore, currently our facilities manager is scoping out locker systems that would have more scope for storing larger amounts of PPE, and they are also scoping out what refurbishment works will be required to reconfigure the student locker area to accommodate a new system of lockers.

**Campus landscape:** As part of the University's Campus Development Plan the external environment has been landscaped to complement the new buildings. Several buildings have been demolished in recent years and the faculty, staff and activities relocated elsewhere on campus. The campus outdoor space is continually evolving to promote biodiversity within the campus, and to provide a relaxing social space for staff, students and visitors.

## Standard 5. Animal resources and teaching material of animal origin

### 5.1. The use of animals in veterinary teaching

Given the nature of the training provided, the use of animals in veterinary teaching is necessary and expected for students to gain Day One Competences. However, the School recognises that this use has ethical implications and may raise welfare issues. We are committed to respectful animal use, upholding the highest ethical standards and protection of the animals involved in educational activities. We recognise that certain teaching activities carry increased risk of welfare harm and these receive special consideration and the application of specific guidance. A working group for ethics and welfare standards for the use of animals in education has been established. A Mahara page with guidelines for the **ethics and welfare standards for the use of animals** has been developed and with this information source we aim to demonstrate awareness of ethical and welfare issues and to adopt an open and transparent approach to their resolution, including mechanisms whereby we may discuss and act on any concerns raised by students and staff.

We recognise and apply the 3Rs principles of Replacement, Reduction and Refinement in the use of animals for teaching. Replacement means that where possible, non-animal alternatives are used (e.g. clinical skills teaching aids such as skin pads, IV injection models, ligature models etc). When animals are used, we use the minimum number necessary to achieve the required educational goals (Reduction e.g. using cadavers for multiple classes, using plastinated specimens, using surplus research animals). We also Refine animal use to minimise negative experiences for animals used for teaching purposes.

The School owns animals kept primarily for teaching purposes – these include small mammals, reptiles, cats, cattle, sheep, pigs, chickens, goats and horses. Animals at Cochno Farm and Research Centre are kept for commercial and teaching purposes, and we are also permitted to use some research animals for teaching. In a small number of cases it is necessary to euthanase animals to provide cadavers or fresh tissue for teaching purposes; these animals are ethically sourced from appropriate suppliers, for example farm animals at the end of production or animals bred for laboratory use.

Animal use for teaching falls into several broad categories:

- Live animals in clinical training – staff/student/School owned animals (e.g. clinical skills training in handling)
- Live animals in professional training – privately owned animals (our own clinics, client farms, collaborating organisations)
- Animals obtained specifically from commercial suppliers for certain practicals (e.g. rabbits, fish, poultry, guinea pigs)
- Preserved specimens/bones and histological slides – historic resources from a range of origins
- Pathology and Public Health teaching material is obtained both from euthanased teaching cases from the production animal teaching in the Galloway building and slaughterhouses; the latter having been removed from the line at post-mortem inspection and would therefore be incinerated if not sourced for teaching purposes. All materials of animal origin and carcasses are used for multiple classes wherever possible (e.g. equine limbs – nerve block classes; equine heads – dental classes; bovine – surgical exercises e.g. caesarean; lower limbs – foot trimming)

We plan the use of animals for teaching in the School and collate the animal-based resources (live and cadaver) required for each teaching session, including: Animal use type- live/cadaver/tissue; Source of animal/tissue; Number of animals per session; number of times each animal will undergo procedure; Nature of the activity; Whether there are any specific welfare concerns. **Summary of use of animals in practical teaching** is available to both staff and students. The information is reviewed annually, so that an accurate description of ongoing animal use is available. Statements on animal use relating to different clinical environments and specific guidance for certain sessions where further guidance has been developed to safeguard animal welfare are available. During extramural studies, students are likely to have training opportunities with animals. The School is not able to monitor or directly influence this animal use but it is covered by the Veterinary Surgeons Act (1986) or relevant local guidelines and legislation.

5.1.1 The programme is designed to ensure that students receive the relevant **core clinical training** prior to

graduation. In most areas, patient numbers, species and variety of cases are more than adequate to support the clinical teaching programme which mainly occurs during BVMS5. We use a combination of facilities for provision of the core rotations in small animal primary care, small animal specialist practice, production animal practice, equine practice, public health & pathology and anaesthesia and diagnostic imaging. We monitor student feedback on caseload adequacy through specific questions on this in the end of rotation feedback which is reviewed at the end of each teaching block and forms part of the annual review of each rotation undertaken by the rotation leader and the Professional Phase leader.

Small animal caseload in the referral hospital includes canine and feline patients, but few small pets or exotics. The proportion of dogs seen at the hospital is higher than cats, but students have good opportunities to work with feline patients during their small animal primary care rotation as well as at the hospital. We do not have a specialist exotic or caged pet clinic in the hospital, so opportunities to develop skills in handling and examination of these species are emphasised earlier in the programme (BVMS1, 2 and 3) and students have occasional opportunities to work with small mammals and rabbits during their core rotation in Small Animal Primary care and opportunities to develop these skills further through selective placements at the University of Edinburgh and Edinburgh Zoo.

The numbers of animals examined/treated within the farm animal ambulatory calls at both Clyde Veterinary Group and the School are substantial to support BVMS5 student learning. Farming in central Scotland is almost exclusively beef, sheep and dairy such that the porcine and camelid caseload is very limited. Steps have been taken to secure additional pig and poultry cases for necropsy which has had a positive impact on overall case numbers for students on the Public Health and Pathology rotation as well as providing exposure to these species.

Equine caseload across the four weeks of the equine core rotation has improved significantly following the inclusion of first opinion practice opportunities during the rotation and the School is committed to further investment in this area through the establishment of a University first opinion equine practice which will provide additional teaching cases.

The array of selective opportunities provides access to cases in areas where the School does not currently have its own caseload – for example in aquaculture, specialist sheep, pig and poultry practice, wildlife and conservation and working Equidae.

### **Number of patients examined/treated by each student and balance between species**

The small animal specialist rotation, equine core rotation, pathology rotation and production animal rotation all provide opportunities for students to participate in extended diagnostic workup across different species contexts. Selective opportunities provide an opportunity for students to spend additional time on an area of interest which often includes a chance to deal with complex cases.

The SAH has a significant number of referral cases both during and outwith normal hours. In addition, the out-of-hours emergency service for first opinion practices has increased the first opinion case load of the hospital. This combined with the first opinion case load attending the PDSA clinic provides a more than adequate number of cases for the teaching of small animal medicine and surgery. In addition, students attend the Scottish Society for the Prevention of Cruelty to Animals (Scottish SPCA) where they carry out neutering and dental procedures under supervision. Students in BVMS1, 2 and 3 undertake scheduled classes for practical handling and examination of small mammals and reptiles which are housed and maintained on site as an important teaching resource.

Food Animal teaching makes maximum use of a hospitalised caseload of diseased animals. The number of food animals admitted to the teaching hospital remains fairly constant as these are purchased specifically for student teaching. Students on the farm animal rotations are also involved in first opinion casework on several beef and dairy farms, including the University's Cochno Farm. In addition, food animal first opinion cases are seen when the students attend the Clyde Veterinary Group. Throughout the programme the students have access to healthy animals both in the farm animal hospital and those housed at Cochno Farm and specific scheduled practical classes cover issues such as condition scoring, lambing, cattle pregnancy diagnosis and clinical examination.

Referred equine cases are seen at the School's equine hospital; first opinion equine cases are currently seen at two local practices through teaching contracts. The School has recently launched a two veterinarian first opinion practice (operating from the equine hospital) with the aim of improving access to first opinion teaching material and enhancing hospital caseload. The BVMS5 working equid selective rotation at the American Fondouk, Morocco, is an innovative learning experience which provides extensive experiential clinical training for undergraduate students with support from equine clinicians from the School.

### **Management of cases by students**

In clinical rotations, BVMS5 students are assigned their own cases for which they have significant involvement and responsibility and working closely with the clinician, help to formulate and deliver a management plan. Clinic rounds (daily in equine, small animal and food animal) provide a forum for students to report their cases and develop their communication skills as well as facilitating effective knowledge transfer and stimulating discussion between students and clinicians.

During their small animal, equine and food animal clinical rotations, BVMS5 students have considerable responsibility in all aspects of case investigation, management, treatment, care of patients and interaction with clients, including:

- initial consultation with clinician present – history taking, physical examination
- diagnostic tests – sampling for clinical pathology, performing radiography, interpreting radiographs, assisting with ultrasound, CT, MRI
- in-patient care including daily clinical examinations and records
- night and weekend duties when on the 'Hospital Care and Emergency'. Equine and farm animal rotations includes caring for patients in the intensive care units (ICU) and dealing with first opinion emergencies as part of the out of hours service provided to local practices and farm clients.
- client communication including updating clients on the patient's progress, communicating discharge instructions
- assisting with anaesthesia and surgery
- participating in triage decision-making to develop competency in planning and management of emergency cases
- performing and assisting with post-mortem examinations and related investigations

At the PDSA first opinion clinic, the students have delegated responsibility for consultations, formulation of problem lists and therapeutic plans, with supervision from the University Veterinary Clinical Lecturer in attendance. At the Scottish SPCA we aim for the students to undertake at least one bitch spay, a dog castration, and a flank cat spay as a minimum under supervision of the University Veterinary Clinical Lecturer. The students will also induce and maintain general anaesthesia on these rotations.

### **Balance between first opinion and referral cases**

Many of the modules in the Clinical Phase underpin the development of day one competencies in primary and referral medicine, in particular through **clinical reasoning** workshops which help students develop skills for primary and referral medicine. As part of their core rotations students spend 2 weeks with the small animal medicine service (referral) and 2 weeks focusing on small animal primary care medicine (private and charity settings). The 8 weeks spent on equine and production animal core rotations typically includes multiple opportunities to develop skills in medicine (primary and referral) and this is supplemented by in depth training in clinical pathology on the public health and pathology rotation to support students clinical reasoning in this area. DOPS assessments are completed in this area.

There is a good balance between first opinion and referral cases used for training students. Across the core rotations in BVMS5, students spend a total of 7 weeks working with first opinion cases (2 weeks on production animal, 1 week on equine, 4 weeks in small animal) and a further 13 weeks working with referral cases (Small Animal Specialist core rotation, Anaesthesia and Diagnostic Imaging core rotation, 2 weeks Large Animal, 3 weeks Equine). The ethos that students should be part of the clinical team underpins learning in both first opinion and referral contexts. Sections



4.4 and 4.5 above also detail the nature of student involvement in clinical cases. This is supplemented by the EMS programme which provides additional opportunities for students to spend 26 weeks, of which up to 16 weeks may be undertaken during BVMS5, learning in a variety of first opinion and referral practice settings. Case examples used throughout the programme (e.g. the case of the week in Foundation Phase) are based on typical first opinion presentations. Information on Emergency and critical care is included under section 5.3.3.

Overall there are sufficient numbers and mix of caseload across species as well as normal healthy animals to deliver clinical training and general instruction.

### **Balance between individual medicine and population medicine**

Students are exposed to both individual and population approaches to veterinary medicine and encouraged to develop an understanding of disease on both levels. Several clinical phase modules are designed to emphasise individual-patient approaches (e.g. systems-based modules in cardiorespiratory and alimentary conditions in companion animal species) whereas others emphasise population approaches (e.g. global veterinary medicine, ruminant production). Students are encouraged to utilise and reflect on the importance of both individual and population approaches during the Professional Phase core rotations where authentic clinical experiences form the basis of their experiential learning. These include hospital and clinic-based placements where an individual animal focus is typically adopted, as well as ambulatory, shelter and public health placements where a population approach is more common.

5.1.2. See 5.1. Policy is decided by the School's working group on 'the use of animals in education'.

All clinical research involving live animals needs to have ethical approval. The School has its own research ethics committee to assess whether clinical research is ethically acceptable or falls under the Animals Scientific Procedures Act 1986 and requires Home Office approval and licencing. The committee is composed of both clinical and research staff, biological services staff and a Home Office Inspector. Guidelines for staff and students and submission forms can be found [here](#).

5.1.3 Anatomy training: Cadaver material for practical anatomy training is sourced fresh from shelters and abattoirs. Students also have access to embalmed and plastinated specimens. Embalmed specimens are stored in formalin whilst fresh specimens are stored in the freezer, or temporarily in the chill. Bones are available in demonstration classes in BVMS1 and 2, and during BVMS2 students are loaned sets of bones for the duration of the year. Clinical waste is collected and disposed of by Stericycle (the waste itself is stored in a 770-litre yellow bin that is housed in a refrigerated room at 4° C). The clinical waste bags must be properly sealed using cable ties. The biological waste (dog cadavers & cat cadavers) are also disposed of by Stericycle and is stored at -20° C in a walk-in freezer room. The biological waste must be double bagged and securely tied using cable ties. The waste formaldehyde solution is collected and disposed of by Veolia (the waste formaldehyde is decanted into 25 litre drums).

Pathology training: Long established and close relationships with two local red meat slaughterhouses continue to be key in provision of products of animal origin for Veterinary Public Health teaching. This typically takes the form of specimens selected by an experienced post-mortem room technician, working in conjunction with local meat hygiene inspectors on an operating slaughter line. Specimens are collected 24 – 72 hours prior to classes, handled carefully, and refrigerated to ensure only fresh and representative material is used. On a weekly basis this will typically consist of a range of internal organs from cattle, sheep, and pigs, including plucks, livers, kidneys and other parts (e.g. limbs or rejected carcasses) displaying both seasonal and year-round pathologies. In a week this will typically consist of 80 – 160kg of material the most useful of which is selected by the facility manager and veterinary pathologist in conjunction with the veterinary public health team. The provision of poultry carcasses has historically been more challenging, and poultry and gamebird carcasses are now being sourced from local poultry slaughterhouses including Auchincruive, Ayr, and from fallen stock firm Grayshill and large numbers of carcasses are available from this source. In addition, production animal pathological specimens are obtained via euthanased teaching cases from the Galloway building. This provides a unique teaching experience for the students as they can follow cases through from clinical presentation to post-mortem findings thus enabling detailed feedback to be given to referring vets and also consolidating the students' learning experience by seeing the pathological presentation of cases they have worked up.



All comparative material (sheep, cow, horse, pig, fish, birds) is disposed of by the post-mortem skip which is kept at 4° C. It is treated as category 1 waste (i.e. as if it could have TSEs) therefore incinerated or rendered and incinerated by Caledonian Proteins, Kilmarnock. Collections are once or twice weekly according to demand. Much of the waste is Category 2 but disposed of as Category 1 as a precaution.

**Table 5.1.1. Cadavers and material of animal origin used in practical anatomical training**

Species	2018/19	2017/18 2016/17	Mean
Cattle	Heart & Lung = 4 Pregnant Uteri = 10-15 Non pregnant uteri = 50 Lactating udder = 2 Non lactating udder = 2 Livers = 4 Feet = 2	Cadavers and material of animal origin used for practical anatomical training are consistent from year to year.	76
Small ruminants	Heart & Lungs = 50 Stomachs = 8 Brains = 55 Eyeballs = 70 – 80 Pregnant Uteri = 45 Non pregnant uteri = 50 Whole carcass = 3		286
Pigs	Stomachs = 70 GI tract =120 (20 - 30 cm in length) Non pregnant uteri = 6		190
Companion animals	Roughly 160 canine cadavers to cover all practical classes. Once dogs are used the heads & limbs are harvested for other anatomy practical classes Intact Male dogs for castration = 23 – 46 depending on availability Cats = 40		200
Equine	Heart & Lungs = 2 GI Tract = 2 Legs = 60 Forelimbs from humerus to hoof = 2		66
Poultry and rabbits	Chickens = 50 Rabbits = 200		250
Aquatic animals	Fish = 50		50
Exotic pets			
Others (specify)			

**Table 5.1.2. Healthy live animals used for pre-clinical training (animal handling, physiology, animal production, propaedeutics, ...)**

Species	2018/19	2017/18	2016/17	Mean
Cattle <sup>a</sup>	5 + 56	5 + 56	5 + 56	61
Small ruminants <sup>a</sup>	8 + 50	8 + 50	8 + 50	58
Pigs <sup>a</sup>	2	2	4	3
Companion animals <sup>b</sup>	50-60	50-60	50-60	55
Equine	4	4	4	4
Poultry and rabbits <sup>a</sup>	6 + 4	6 + 4	4 + 3	9
Exotic pets <sup>c</sup>	17	17	17	17
Others (specify) <sup>d</sup>	18	18	18	18

<sup>a</sup> Animals in Galloway and Cochno; <sup>b</sup>15 dogs used routinely, student and staff dogs used when required, 3 resident cats <sup>c</sup> 6 ferrets, 6 rats, 5 guinea pigs <sup>d</sup>Corn snake x4, Royal python x2, Bearded dragon x1, Plated lizard x1, Leopard gecko x1, Crested gecko x1, Reeves river turtle x2, Burmese mountain tortoise x1, Leopard tortoise x1, Horsefield tortoise x1, Golden Greek tortoise x1, goats x2

**Table 5.1.3. Number of patients\*\* seen intra-murally (in the VTH)**

Species	2018/19	2017/18	2016/17	Mean
Cattle	135	117	149	134
Small ruminants	99	60	92	85
Pigs	-	4	-	1
Companion animals	17,989	16,225	19,478	17,897
Equine	628	619	724	657
Poultry and rabbits	102	95	130	109
Exotic pets	63	47	74	61
Others (specify)				

**Table 5.1.4. Number of patients\*\* seen extra-murally (in the ambulatory clinics)**

Species	2018/19	2017/18	2016/17	Mean
Cattle <sup>a</sup>	7,800	7,085	8,230	7,705
Small ruminants <sup>a</sup>	180	190	183	184
Pigs	0	0	0	0
Companion animals <sup>b</sup>	2,125	2,180	5,114	2,306
Equine	3,870	3,829	5,358	4,352
Poultry and rabbits				
Exotic pets				
Others (specify)	6	6	7	6

<sup>a</sup> These numbers relate to the number of animals examined individually by individual students under supervision as part of our own core ambulatory farm animal provision. It includes animals seen at Cochno (Cattle and Small ruminants), Meldrum, Kaimhill and Portnellan (all Cattle only). The number of animals seen at Clyde Veterinary Group are not included in these data. At Clyde Veterinary Group students attend in groups of 3-4 and on average see 3-4 calls per day to see between 1-100 cattle or sheep. This will be subject to seasonal variation (peaks in spring) and the out of hours calls will vary considerably.

<sup>b</sup> This includes PDSA, Dogs Trust, Scottish SPCA and Dermatology Referral clinic. Time spent at these establishments varies over the three academic years due to changes in contractual arrangements and numbers of students in each year.

Dogs Trust rotation ran until April 2017 hence larger animal numbers seem in academic year 2016/17. Additionally, rotations in 2016/17 ran for an extra block (4 weeks) due to larger year group size. Four mornings and one afternoon clinic in Scottish SPCA ran only in 2016/17. Scottish SPCA surgery rotation: Aug 18-April 19, 3 mornings; April 19-Dec 19, 2 x mornings and 1 full day; Jan 2020 onwards, 2 full days and 2 mornings (one of which is dentistry).

**Table 5.1.5. Percentage (%) of first opinion patients used for clinical training (both in VTH and ambulatory clinics, i.e. tables 5.1.3 & 5.1.4)**

Species	2018/19	2017/18	2016/17	Mean
Cattle	75%	75%	75%	75%
Small ruminants	75%	75%	75%	75%
Pigs	100%	100%	100%	100%
Companion animals	Canine – 20% Feline – 41%	Canine – 21% Feline – 42%	Canine – 29% Feline – 38%	Canine 23% Feline – 40%
Equine	86%	86%	86%	86%
Poultry and rabbits	91%	91%	91%	91%
Exotic pets	83%	80%	90%	84%
Others (unspecified cases seen at PDSA)	100%	100%	100%	100%

Table 5.1.6. Cadavers used in necropsy

Necropsies undertaken within School's core necropsy facilities					
Species	Necropsy total				Undergraduate involvement
	2018/19	2017/18	2016/17	Mean	Timetabled (% total) Timetabled + EMS (% total)
Cattle	168	130	172	157	82 (49%) 113 (67%)
Small ruminants	131	89	135	118	78 (60%) 98 (75%)
Pigs	2	2	14	6	0 (0%) 0 (0%)
Companion animals	183	212	304	233	82 (45%) 127 (69%)
Equine	20	28	38	29	7 (35%) 12 (60%)
Poultry & rabbits	19	15	35	23	8 (42%) 15 (79%)
Aquatic animals	0	0	0	0	0 (0%) 0 (0%)
Exotic pets	4	11	14	10	1 (25%) 2 (50%)
Native wildlife	93	70	130	98	51 (55%) 92 (99%)
Laboratory rodents	7	5	9	7	57 (55%) 101 (97%)

<sup>a</sup> There will be elements of basic gross anatomy in most of the pathology classes in addition to practical anatomical training with numbers listed above. The number of external case samples received by our Veterinary Diagnostic Services remains sufficient to provide first opinion clinical pathological material for student teaching. The number of gross post-mortem examinations remains sufficient for undergraduate teaching. Since 2018 the School has been working in partnership with Scotland's Rural College (currently responsible for veterinary disease surveillance) to act as an additional Veterinary Investigation Centre. This has increased throughput and widened the nature of farm animal post-mortem examination cases.

**Table 5.1.7. Number of visits in herds/flocks/units for training in Animal Production and Herd Health Management**

Species	2018/19	2017/18	2016/17	Mean
Cattle <sup>a</sup>	1,892	2,276	1,960	2,042
Small ruminants <sup>b</sup>	442	522	653	539
Pigs				
Companion animals				
Equine <sup>c</sup>	3,870	3,829	4,871	4,190
Poultry				
Rabbits				
Aquatic animals <sup>d</sup>	8	8	8	8
Others (specify)				

<sup>a</sup> Cochno farm: 60 cow dairyherd; Meldrum farm: 800 cow herd; Rossiebank farm: 500 cow herd; Kaimhill farm: 200 cow herd; Cochno farm: 30 cow beef herd (sell most as stores); Portnellan farm: 40 cows and followers. At Clyde Veterinary Group Students attend in groups of 3-4 and on average see 3-4 calls per day to see between 1-100 cattle or sheep. Thus, over 1 year this is approximately 2,880 calls attended by students with 1-100 animals per call. This will be subject to seasonal variation (peaks in spring) and the out of hours calls will vary considerably. Since 2017 a new computer package was instigated at Clyde allowing for more accurate data collection.

<sup>b</sup> Ovine: approximately 20% of calls from Clyde Veterinary Group are ovine but there is a large seasonal variation. Visits vary between individual and flock examination. Cochno farm: 400 sheep. Goat instruction takes place at Clerkland Dairy Goat farm, Clyde Veterinary Practice and the static goats at the School.

<sup>c</sup> Equine instruction up until 2017/2018 occurred at Avondale and MBM. Clyde included from May 1st 2019.

<sup>d</sup> Visits to Glasgow Fish Market within the VPH BVMS5 rotation to observe the retail and sourcing of fresh fish in the context of food production. Not all students attend all premises. We are currently negotiating with Marine Scotland to visit a salmon production premises in 2020 and are actively looking for more potential aquaculture industry visits in relation to VPH.

**Table 5.1.8 Number of visits to slaughterhouses and related premises for training in FSQ**

Species	2018/19	2017/18	2016/17	Mean
Ruminant slaughterhouses	13	14	13	13.4
Pig Slaughterhouses	4	4	5	4.4
Poultry slaughterhouses	8	7	5	6.7
Related premises**	3/22	3/24	3/25	26.7

\*\* Premises for the production, processing, distribution or consumption of food of animal origin. x/y Game Processing plant/other retail premises

5.1.4 The BVMS Programme Board is the committee with responsibility for management of the BVMS Programme including consideration of the number and variety of animals and materials of animal origin for training across all 5 years of the Programme. The Board manages the School policy on the ethical use of animals in teaching and reviews the annual course monitoring reports from each part of the programme. Adequacy of animal resources is a key element of planning for new activities (module activities, practical sessions, rotation activities, external placements) and is included as a criterion in the selection process for core clinical placement providers. For existing activities, any concerns regarding the adequacy of animal resources (number, variety, clinical services, cadaver materials) to support learning are considered by the relevant Course Leader (with input from staff and student course feedback) and reported on an annual basis (annual course monitoring report). They can also raise specific or urgent concerns with the Phase Leader. The BVMS curriculum review process (which takes place every 7 years) provides a mechanism for consideration of the strategic direction of the BVMS programme and opportunities for consultation with stakeholders and consideration of enhancements in the animal resources (number, variety, priorities) available to support learning. The BVMS Programme Board reports to the School Learning and Teaching committee and, through Phase/Course/Activity leaders and student representatives to the wider staff, students and stakeholders. Changes are implemented by relevant course and phase teams and updates reported to the Programme Board and disseminated via the Student staff liaison committee, 'You said we did', Programme newsletter/Away Day/School Forum meetings.

## 5.2 Practical training at external sites

Off-campus instruction takes place at one large farm animal practice, the Clyde Veterinary Group, one specialist practice, (Dermatology Referrals), one of two equine practices (Clyde Veterinary Group and MBM Veterinary Group) and two small animal charity clinics, (PDSA and Scottish SPCA). All these practices have staff members with subject expertise qualifications as well as appropriate diagnostic imaging facilities, clinical laboratories, information technology and reference resources. For instance, the equine practices are staffed by equine-only veterinarians with a range of experience but include individuals who have practiced for more than 10 years and who hold RCVS Advanced Practitioner status. The emphasis at the practices is on experiential learning, with the students being encouraged to participate in casework at a level that is appropriate to their stage of development. Tutorials are used to compliment the casework by stimulating discussion and reflection on topics.

The learning objectives, learning outcomes and feedback for all off-campus clinical instruction are set by the Professional Phase (BVMS5) Leader in consultation with relevant rotation leaders, and approved by the BVMS Programme Board. Students are monitored and assessed formatively, and feedback is given. If an individual's performance gives cause for concern, this is reported to the BVMS5 Course Leader and a remedial action is agreed.

Contractual arrangements/agreements are in place with the external providers of off-campus instruction.

## 5.3 Nursing care skills and instruction in nursing procedures

5.3.1 Nursing care skills are taught and reinforced at various points in the BVMS Programme. Our clinical skills practicals include a range of nursing skills (e.g. IV fluid administration, IV catheter placement, body condition scoring, handling and restraint) which are delivered in BVMS1-4 of the Programme. A detailed list of **rotating practicals and clinical skills** for all species is available. This is reinforced through the PaCE (Professional and Clinical Experience) Programme in BVMS3 and 4 where each student spends 1-2 shifts working as part of the clinical team alongside the nursing teams at the Small Animal hospital to support patient care and is focused on developing students' skills in teamwork. Students have a detailed induction to this activity including training in nursing approaches particular to the Small Animal hospital, completing clinical records and specific practical skills (e.g. preparing and administering feed, maintaining ward hygiene). There are several skills which students must prepare in advance of attendance and students are given feedback on their performance during their weekend/evening PaCE shift. In BVMS5 Professional Phase students spend time working alongside nursing teams and are required to SOAP patients and have supervised responsibility for their clinical (including nursing care) in small animal, production animal and equine clinical contexts. In equine, nursing skills also include handling and restraint, body condition scoring, bandaging and wound care and students are taught by our grooms, equine nurses and vets. For 3 of the 4-week equine core rotation the students are responsible (under supervision of the groom, equine nurse and vet team) for the SOAP and nursing care of the in and out of hours care for patients passing through the equine hospital.

5.3.2 The restructure of the Professional Phase (BVMS5) course in 2013 included a detailed consideration of optimum group sizes in each rotation. The course is designed to run for 48 weeks each year in order to maximize use of clinical resources and provide for small rotation group sizes. The course is designed around a typical group size of 3-4 students per week (12-16 per block). There is some flexibility in how this is managed for each rotation. For example, the core Production Animal rotation has a slightly higher group size to allow for periods where production animal caseloads are low in the summer months, the Public Health and Pathology rotation operates larger group sizes which are well matched to the style of teaching in this area. Students provide positive feedback on their experience of group sizes in the BVMS5 rotations which is monitored by rotation and course leaders through the specific question on this topic in the end of rotation feedback surveys.

5.3.3 See section 5.3.1 which describes the clinical skills acquisition programme. In addition students have to complete DOPS (Direct Observation of Practical Skills) assessments and information relating to these can be found [here](#).



## **Anaesthesia, routine and referral surgery**

These skills are developed in simulated environments in the clinical skills training in BVMS1-4 (**Clinical skills and rotating practicals; OSCEs**) utilising a range of models, mannequins and cadavers and supported by the clinical skills tutors. In BVMS5, students complete 2 weeks of routine surgery as part of the small animal primary care rotation where they will perform surgery and anaesthesia on client-owned animals under direct and continuous supervision. Students also complete 2 weeks of anaesthesia in the small animal hospital, where the major focus is on patients undergoing referral surgery. Both rotations include DOPS assessments focused on day-one skills in anaesthesia and surgery. In addition to the focused supervised surgical experience, students develop their surgical patient management and anaesthesia skills in their core rotations in production animal practice, small animal practice and equine practice. They also have the opportunity to spend additional time working with one or more of the referral surgery services in the hospital (soft tissue surgery, orthopedic surgery, neurology) as part of their small animal selective.

## **Emergency and critical care**

In preparation for their Professional Phase experience in emergency and critical care, students complete a BVMS3 module in supporting the patient and attend a range of relevant clinical skills practical sessions as well as spending time in BVMS4 PaCE with the out of hours emergency service. These skills include diagnostic imaging skills (interpreting images for emergency patients); anaesthesia skills (use of the anaesthetic machine, breathing systems, monitoring equipment and intermittent positive pressure ventilation); emergency and critical care skills (basic CPR, thoracocentesis and placement of nasal oxygen catheters & feeding tubes); equine and farm animal rescue (restraint, movement of recumbent large animal patients); equine bandaging (applying a distal limb bandage).

Development of day one competencies in emergency and critical care are the focus of the out of hours week in the core small animal primary care rotation, the ICU/emergency elements of the small animal specialist core rotation and the out of hours hospital care element of the equine rotation and the production animal first opinion week. Students will also have further opportunities to develop these skills in their core rotations in production animal practice, equine practice, small animal (primary care and specialist) and through review of relevant samples in the clinical pathology rotation. A 2-4 week selective opportunity is available in emergency and critical care for students who wish to spend additional time developing their skills in this area.

## **Clinical pathology, diagnostic imaging**

Students are prepared in BVMS1-4 through a series of clinical skills practical sessions. They then spend a week with the clinical pathology service and 2 weeks with the diagnostic imaging service in BVMS5. Day 1 skills in both areas are also developed in other rotations (e.g. equine core, production animal core, small animal specialist and small animal primary care). DOPS assessments are completed in both areas.

## **Making and using medical records (including ambulatory services)**

Students are trained in making and using medical records through PaCE activities in BVMS3 (kennel sheet completion), training in the electronic patient record (StringSoft) in BVMS5 induction week and specific induction activities for each of the core rotations in the Professional Phase. There are multiple opportunities to develop these skills on core rotations with students taking responsibility for interrogating or updating medical records in a range of contents (e.g. electronic records in the hospitals and in the charity practices, paper records (where relevant) in ICU and wards, interrogation of records at equine practices and manual recording of data during herd visits. Each student must pass a case report in one of the three key species which is assessed as part of the professional portfolio.

## **Veterinary business, client communication, ethics and professional practice during clinical rotations**

Students are well prepared for clinical rotations as these topics are a significant focus in BVMS1-4 through professional skills and business modules in BVMS3 and 4 and extensive communication skills training in each year. During clinical rotations students participate as active members of the clinical team and are involved in consideration of the business aspects of patient care and in communicating with clients across a range of different contexts (e.g. charity clinic, ambulatory setting, referral hospital). As well as receiving performance feedback on these areas during

and at the end of each rotation, students are encouraged to reflect on these elements in their Professional portfolio, both through EMS related assets and rotation related assets.

### **Isolation procedures, safe chemotherapy, radiation therapy, pathogen surveillance**

Theoretical aspects are covered during BVMS1-4 and through health and safety induction procedures which include the review of relevant protocols (SOPS) together with instructional videos and specific training in key areas. Students' individual exposure to these areas during clinical rotations will depend on their case involvement and choice of selectives. Both small animal hospital selective and core students on small animal specialist rotation spend time with the oncology service and will have an opportunity to practice safe chemotherapy and occasionally radiation therapy. They are made aware of radioactive iodine therapy procedures when on core internal medicine. Isolation procedures for infectious diseases are included in the training in core small animal medicine and selective small animal rotations. Most rotation groups passing through small animal medicine will have exposure to cases (usually with diarrhoea) requiring isolation and training on isolation and barrier nursing of neutropenic patients, patients with wounds and following surgery is provided when suitable cases are presented. Isolation procedures are included in training and induction for equine core (most students will experience working with horses in isolation). There is a farm animal isolation facility though it is rarely used since the focus of production animal teaching in the Galloway building is on cases that do not return to farm of origin due to biosecurity hazards. Pathogen surveillance is a key focus of the pathology and public health rotation. During the infectious disease diagnostic component of the rotation, students spend time in the microbiology laboratories learning how viruses, bacteria and parasites are detected in clinical samples. Through small-group tutorials, students discuss cases involving pathogens with public health significance and these sessions cover the role that diagnostic laboratories play in disease surveillance.

### **Client complaints and oversight of clinical morbidity/mortality**

Students are able to develop their skills in simulated settings in the Clinical phase of the programme where they participate in communication skills training and module based activities (module 13, module 24) with a focus on managing client complaints and patient morbidity/mortality. This is supplemented by the post-mortem demonstration sessions where students review post-mortem findings from recent clinical cases and consider these in the context of the original clinical picture. Where activities of this nature take place in real clinical settings on rotation, students are encouraged to participate in discussions and to reflect on their experiences during clinical rounds/case discussions and as part of the professional portfolio.

5.3.4 Students complete an assessed case report during their Professional phase rotations based on a case seen in the clinic, and a number of other rotation assignments are designed to allow students to spend extended periods in discussion, thinking and reading (see **Rotation asset list**). For example, the 'Options grid' activity as part of the Small Animal Primary Care rotation, the Emergency case scenario presentation as part of the Equine Selective and the Grand Rounds presentation as part of the Small Animal hospital Selective. These are examples of 'assets' included in the students' electronic portfolio where they are linked to course-level intended learning outcomes (e.g. case management, veterinary evidence etc). Student are required to reflect on the learning experience, supported by a portfolio adviser, and identify any further areas for development of their understanding and professional practice. A majority of portfolio reflections are expected to include reference to staff feedback and relevant published literature to encourage students to reflect in-depth on their case-based and experiential learning. Clinical rounds in the teaching hospitals allow ample opportunity for case discussion and encourage further reading.

## Standard 6 **LEARNING RESOURCES**

### **5.4 Patient Record System**

In 2017, the School implemented StringSoft, a new system for client relationship and case management. The rollout began with the Small Animal Hospital after which the system was introduced to Production Animal and is currently being rolled out to Equine facilities; this ensures that all areas of the School use the same methodologies and tools for case management and reporting. Full uptake across all clinical areas is expected in academic year 2019-20. (Eclipse is used by the School's equine first opinion practice because its functionality is better suited to that environment).

StringSoft is utilised for the clinical management of patients through the entire patient episode, from presentation to discharge. StringSoft permits patient records to be reviewed and updated directly by students, ensuring that amendments are 'queued' to be checked and signed off by supervising clinicians. Reports can be created and run for research purposes and these can be added to consultation information and collated as a final report. StringSoft is available on all PCs on-campus via remote desktop and can be accessed off-campus via the secure University VPN. Clinical data held within StringSoft is accessible via a web-based Clinical Search Tool, enabling Faculty and student users to filter and export data using a range of patient identifiers, keywords, dates and diagnostic codes.

Online learning video resources are available to all students and Faculty to familiarise them with basic StringSoft functions, such as searching records, through to advanced actions, such as booking diagnostic procedures. Students gain experience in using this system for end-to-end client relationships and case management at several points during the programme; from being mentored during the Foundation Phase by students in the Clinical Phase, to delivering this as part of their mentoring role during our PaCE programme in Clinical Phase, through to using the system in their Professional Phase final year as part of their regular duties during clinical rotations.

### **Comments on Standard 5**

Overall there is a rich provision of animal species throughout the programme to ensure that students gain a comprehensive exposure to both healthy and diseased animals and cadavers. With intramural provision combined with distributed sites, together with both core rotations and selectives, our students graduate with day one competencies and have a more in-depth understanding of various disciplines of particular interest to them. The new curriculum has incorporated the introduction of clinical studies and skill acquisition in the Foundation Phase (BVMS1 and 2) which continues through to the Professional Phase (BVMS5) ensuring that our graduates have both knowledge and practical skills at the time of graduation.

### **Suggestions for improvements**

We recognise that access to some species can be difficult, particularly for reasons of proximity and biosecurity concerns in high health pig and poultry units. Therefore, steps are being taken to maximise student opportunities in these areas. For instance, we have been consulting with veterinary experts at specialist practices that serve the pig and poultry sectors to refine our provision in pig and poultry medicine and public health and to explore further opportunities for field visits. We are in talks with Scotland's Rural College (SRUC) about field visits to their pig and poultry units, and we continue to deliver School-based backyard pig and poultry teaching to explore the differences that exist between these and commercial units with regards to individual animal medicine, herd/flock health planning and public health. We are continuing to improve our access to pig and poultry cadavers for necropsy and histopathology teaching and have recently entered into a new agreement with a major supplier of this material from fallen stock. Nevertheless, the programme is designed to equip our graduates with generic transferable skills from dexterity to clinical reasoning that enables them to apply knowledge to a range of species.

## Standard 6: Learning resources

**Virtual Learning Environment (VLE):** The University of Glasgow uses a fully supported combination of **Moodle** and **Mahara** as its VLE allowing 24/7 access. The VLE is integrated in day-to-day learning and teaching, including provision for self-directed study. In 2019, we implemented a new structure for our course content, highlighting core weekly learning objectives and active learning activities.

**Library Resources:** The School has a dedicated library, the James Herriot Library (JHL), in the MSB. JHL offers seating for 140 students and access to 4800 print books, as well as an increasing number of e-books (approximately 430 titles in 2019), and around 40,000 electronic and bound journal titles.

**Staff:** The University Staff Development Service and Computing Service offer a diverse range of training courses in all aspects of information management and basic IT skills. From 2018-19, all new Faculty are enrolled on our Vet School Staff Moodle Induction course that covers all key tasks and activities used in teaching our blended learning programme.

**Students:** Formal training in use of the VLE is provided in first year, and students can **submit helpdesk** requests for additional support at any time using our online system - this includes an extensive searchable knowledge base.

**Garscube Information Services Committee (GISC):** The Garscube Information Services Committee (GISC) exists as a mechanism for discussion of campus IT, information resource management and data issues. GISC is chaired by the Learning Technologist and composed of Faculty, Library, IT, and student representatives. Meeting once a term, the committee reports to the School Executive (SE). Students also raise IT issues through ReachOut face-to-face in the James Herriot Library, Library at Gilmorehill or online via **UofG Helpdesk**, or via the Staff Student Liaison Committee (SSLC).

Feedback from students and staff may be returned to GISC for action. Faculty adding items to the **Reading List system** trigger an acquisition workflow for resources not held by the Library or in sufficient quantity; this develops the teaching collection. The research collection is developed by the Librarian in conjunction with Faculty, students and the aforementioned committees.

Information on learning resources is generally distributed to students via the Moodle communication forums. A staff-specific forum and page is also available on Moodle. Staff email lists or direct communication from course or module leaders are also utilised.

### 6.2 Brief description of the library

6.2.1 The JHL is permanently staffed by a Senior Library Assistant who is part of the College Library Support Team (CLST). The CLST Manager provides training and managerial support for JHL from the team, and further cover as required. The qualified College Librarian (CL) is based on the Garscube campus two days a week and the University Library three days a week.

#### 6.2.2 Opening hours and days:

James Herriot Library opening hours	Weekdays	Weekends
<b>During term time</b>	07.15 to 02.00 (staffed 09.00 to 17.00*)	08.00 to 02.00
<b>During vacations</b>	08.00 to 02.00	08.00 to 02.00

\* No staffed service on public holidays.

The University Library is open 07.15-02.00 every day, except for Christmas and New Year Bank holidays, and is staffed 09.00-17.00. The Library offers a free, online document delivery service for items not held by the Library, and an accessibility service for students with disabilities. The Library allows the creation of **online reading lists** specific to each module, with online material accessible directly through the reading list.

*6.2.3 Annual budget:* The budget for 2019-20 is a healthy £163,080, which represents an increase of 38% since the previous accreditation visit. Spending on e-books represented 65% of monograph spending in financial year 2018-19.

*6.2.4 Facilities:* The JHL is situated within the Garscube Campus, with easy access from all major teaching sites on the campus. JHL offers seating for 140, with additional seating (with wireless access and nearby printing facilities) is available in the MSB, providing a mix of tables, booths and some small tutorial rooms.

*6.2.5 Equipment:* Within the JHL, there is a cluster of 10 PCs. Wireless access, self-service printing and photocopying facilities are also available in the Library, as well as power and USB sockets at each desk. A self-issue machine is available in the Library, allowing students to borrow and return items outside of staffed hours.

*6.2.6 Softwares available for bibliographical search:* The discovery search tool, “**Library Search**” on the **Library website**, provides a single point to locate all Library resources, whether electronic or print, including **specialist bibliographic databases**.

*6.2.7 Brief description of the subsidiary libraries:* The University Library is located on the main Gilmorehill Campus and is open from 07.15-02.00 every day except major holidays and is staffed 09.00-17.55. Extending over 12 floors, the University Library provides access to over 2 million books and 20,000 journals, and a full range of IT services.

*6.2.8 Staff:* The School employs a Learning Technologist (1 FTE), and an Information Co-ordinator (1 FTE) to support Faculty and students to use our VLE and to encourage and implement innovation in learning and teaching. An Assessment and Data Specialist (1 FTE) is employed to continuously improve our assessment processes and data management.

IT support is provided by Information Services, the joint Library and IT Directorate. Day-to-day support is provided by the Desktop Technician Team that has a member permanently located at Garscube, and server support for the StringSoft system is provided by a member of the Servers and Services team. Other specialist support (e.g. networking) is provided on an ‘as required’ basis by the appropriate team.

*6.2.9 Hardware:* There are 111 PCs distributed throughout the campus available in all main teaching buildings and charging points for student devices are widely available. Pull printing facilities are available across the campus. Each of the 10 tutorial rooms in the MSB have a networked computer, wall-mounted screen and power outlets for student group work.

*6.2.10 Software:* The University uses a combination of **Moodle** and **Mahara** as its VLE, which supports a fully blended learning approach. Moodle is the primary software giving access to core teaching material and self-directed learning activities. Mahara acts to supplement Moodle through access to an ever-increasing bank of learning material (training videos, etc) and as the basis for the creation of the student portfolio which forms a key component of the BVMS course.

*6.2.11 Available support for development and use of instructional materials:* The School initiated an annual scholarship opportunity in 2014 that runs as a Research-based EMS project. Students work with the Learning Technologist and other Faculty to co-create new learning resources, including videos, quizzes and websites. Students can propose new resources through the TELT Partnership, and are encouraged to share external resources as part of the Moodle glossary – these may be incorporated into teaching following faculty review. Additional resources are generated directly by Faculty with guidance from the Learning Technologist.

The CL provides first-line support for Faculty to support teaching, learning and research. A range of **information literacy self-help resources** are available to students and Faculty, including evidence-based practice and **systematic review resources**.



**6.2.12 On Campus:** The University has invested heavily in its IT infrastructure across the campus, with a resilient Gigabit network linked to the main University campus at 10 Gigabits. Within each building the networking equipment and speeds vary slightly (100 Mbs-1 Gbs), but work is ongoing to improve connectivity speed and reliability across the entire campus, while the number of Wireless Access Points, primarily in student areas, lecture rooms, and seminar rooms, has been increased, enabling greater flexibility for our users.

**6.2.13 Off Campus:** All external providers have a PC and dedicated internet access available for students to access the VLE and other online resources and undertake any digital work related to their placement.

### 6.3 Access to learning resources

As of academic year 2019/20, there are 4834 print books and 170 print periodicals in JHL, 430 veterinary-specific e-books and 374 veterinary-specific e-periodicals; these resources are in addition to the wider-University collections, including the e-theses and research repository resources.

The School utilises our Mahara and Moodle platforms to deliver pre-induction and induction week orientation resources and tasks for new students to aid familiarity with the VLE. All students have access to facilitated training and drop-in sessions at the start of the semester to ensure their devices are networked and they are confident in using our technology tools in a learning context.

First-line support for information literacy is provided by the CLST through in-class sessions and availability for 1:1 student appointments. The CL provides second-line support for students and dedicated training for research students and staff. Several physical training materials (simulators, mannequins, models) are also available:

#### **Small Animal Hospital**

Model	Teaching Purpose
Canine Mannequins (also used in VN training)	Radiographic Positioning, bandaging, etc
Model Canine Skeleton	Anatomic Demonstration
Canine bones	Anatomic Demonstration

#### **Weipers Centre**

Model	Teaching Purpose
1x Equine colic/rectal simulator *	Approach to a horse with colic including rectal examination and abdominocentesis
2x blacksmith buddy (equine limbs) simulator *	Use of hoof testers and shoe removal
8x equine limb simulators *	Bandaging for equine wounds
1 x Equine rescue mannequin simulator *	Approach to large animal rescue techniques

\* Supplemented by video and/or instructional notes on VLE

#### **Production Animal**

Model	Teaching Purpose
Lambing Model*	Ovine obstetrics and for summative OSCE
Calving Model*	Bovine obstetrics and for summative OSCE
Rescue Cow*	Downer cow movement and manipulation

\* Supplemented by video and/or instructional notes on VLE



## Standard 7 **STUDENTS ADMISSION, PROGRESSION AND WELFARE**

### **Clinical Skills Facility**

<b>Model</b>	<b>Teaching Purpose</b>
1 x Cephalic Leg Model *	Blood sampling; IV injections; placement of IV catheters
1 x Equine Jugular Model (full size horse set up with mock jugular vein) *	Blood sampling; IV injections
1 x Equine Suturing Model (full size horse set up with mock wound on neck/flank or leg) *	Suturing
1 x Equine Mannequin	Stable bandaging and wound bandaging
Range of canine mannequins *	Bandaging; radiographic positioning; thoracocentesis; handling and restraint; IVFT set up
Tendon Repair Model	Suture patterns for tendon repair
OVH mannequins	Ovariohysterectomy
OVH, Cervical and Castration Models *	Placement and tying of ligatures during canine neutering
Hand Tie Models *	One and two handed ties
Dental Tartar Models *	Scaling and polishing during dentistry
Rabbit and Cat mannequins	IVFT set up and administration of fluids; handling and restraint

\* Supplemented by video and/or instructional notes on VLE

**6.3.1 Organisation and supervision of the skill labs:** The Clinical Skills Facility is based in the McCall Building, and contains several flexible spaces for training in a number of areas, including general clinical skills (suturing, intravenous access, radiographic procedures, etc.) as well as some animal handling and communication skills. A large range of equipment, including ultrasound and radiography equipment, suturing models and mannequins are available in the facility. These skills are taught as a vertical strand within the BVMS curriculum and complement the module-based teaching units. The clinical skills staff supervise taught classes as well as providing access to the facility for self-directed learning and consolidation. For some classes, peer tutors from higher years in the BVMS course will supplement the teaching staff. Along with the main teaching laboratories (anatomy, histology) in the Jarrett Building, the clinical skills facility is managed by a number of technical staff who assist in the set-up and running of classes.

### **Comments on Standard 6**

- Fully supported VLE systems support a modern, blended learning environment.
- Library and IT Services are consistently highly rated in National Student Survey scores.
- The JHL and the lengthy opening hours are well regarded by students and staff. A recent refurbishment of the JHL and the forthcoming installation of a lecture recording booth demonstrates continual investment and improvement of these services.
- Heavy investment in IT, including Wifi provision, delivers a high performing, robust, IT infrastructure.

### **Suggestions for improvement on Standard 6**

- Wifi provision continues to improve, with a current project to upgrade existing wifi to next-generation technology.
- The University is exploring ways to overcome the challenges of BYOD (Bring Your Own Device) to support learning.
- Provide increased on-site IT support for students and staff.
- The School is leading on the evaluation and implementation of a new online examination delivery system. Over the course of the next two years this system will enable the School to deliver and mark exams online, version control authoring, and analyse the results of papers and individual question performance.
- The Library is continuing efforts to integrate self-help learning resources to the student and staff experience.

## Standard 7: Student admission, progression and welfare

### 7.1 Admission Procedures

The School of Veterinary Medicine advertises the programme, admission procedures and requirements for national and international students, in the following ways:

Detailed information is found on our [web pages](#).

In addition, there are three 'Open Days' per year where around 300 people each day come to learn about the programme and the possible career opportunities available on completion of a veterinary degree. Open Days also include a tour of the Campus. The School participates in presentations overseas to pre-vet Clubs and the annual APVMA (American Pre- Veterinary Medical Association) Symposium which is held in the United States. We have an outreach team, which includes STEM ambassadors, who visit both primary and secondary schools within the Glasgow area, and the University has a team dedicated to marketing of all programmes. Current tuition fees are advertised on the university web pages, and in the University prospectus which is updated and published annually. The link is [here](#).

The minimum requirements for admission to the School are also detailed in the University Prospectus, and the information can be found on the university web pages. In addition, the information is also available on the Universities and Colleges Admissions Service (UCAS) web pages.

Criteria regarding progression are published within the [programme specification](#) on the University Senate website.

### 7.2 Number of students admitted

**Table 7.2.1 Number of new veterinary students admitted by the University of Glasgow**

Type of students	2019	2018	2017	Mean
Standard Home students*	51	42	49	47.33
Rest of UK students	16	19	24	19.67
Full Fee students	72	76	59	69
Total	139	137	132	136

\* Scottish Government funded Home/EU students

**Table 7.2.2. Number of veterinary undergraduate students registered at the University of Glasgow**

Year of Programme	2019	2018	2017	Mean
First year	150	143	133	142
Second year	127	126	134	129
Third Year	129	137	122	129.33
Fourth Year	135	112	119	122
Fifth year	107	122	112	113.66
Total	648	640	620	636

**Table 7.2.3. Number of veterinary students graduating annually**

Type of students	2019	2018	2017	Mean
Standard Home students*	41	41	81	54.33
Rest of UK students	20	14	12	15.33
Full Fee students	59	54	49	54
Total	120	109	142	124

\* Scottish Government funded Home/EU students

**Table 7.2.4. Average duration of veterinary studies**

Duration (5 years)	% of students who graduated in 2019
5 years	93.33
plus 1 year	3.33
plus 2 years	1.66
plus 3 years or more	1.66

**Table 7.2.5. Number of postgraduate students registered at the Establishment**

	2019	2018	2017	Mean
Interns				
-Small Animal	20	19	19	19.3
-Production Animal	2	1	1	1.3
-Equine	1	0	0	0.3
Residents <sup>a</sup>				
-Small Animal	25	23	21	23
-Production Animal	6	4	4	4.6
-Equine	5	5	6	5.3
-Pathology	6	6	6	6
PhD Students	28	29	28	28.3
Others				
-MSc Research	7	5	4	5.3
-MSc Adv Prac Vet Nurse	17	15	10	14
-MVPH	5	9	10	8

<sup>a</sup>all residents are enrolled on the Master of Veterinary Medicine (MVM) programme.

### 7.3. Selection and Progression Criteria

7.3.1 Description of the admission procedures for standard students:

#### A) Selection criteria

##### Non-Academic Entrance Requirements

Applicants are required to demonstrate that they have acquired a certain level of practical experience that not only ensures their knowledge of the veterinary profession, but also provides the selection panel with evidence of the candidate's motivation. Practical experience should be as varied as possible and in addition to at least two weeks' work experience with a veterinarian, it should include a selection of the following: specialist veterinary practice (small animal, food animal, equine), farming experience (beef, sheep, pigs, poultry); lambing experience; stables; kennels/cattery; veterinary investigation laboratory and abattoir. However, the volume of experience is judged against opportunity to ensure those with less access are not disadvantaged.

In addition to the foregoing, the Admissions Panel take due cognisance of a variety of achievements, interests and skills not directly related to the applicant's vocational aspirations. In this way we seek to recruit to the profession talented and creative individuals who excel in a wide variety of endeavours. Specific examples would include those

who undertake charity work, Duke of Edinburgh Awards, or who are highly accomplished in sport and/or music.

### **Minimum Academic Entrance Requirements for Admission**

The minimum requirements for admission to the School are detailed in the University Prospectus which is published annually. An outline of the programme is linked. The information is also in the Universities and Colleges Admissions Service Handbook.

### **Scottish Certificate of Education (SCE)**

Normally five SCE Highers, minimum four at band 'A', one of which should be in Chemistry, and one at band 'B'. Subjects must include Chemistry, Biology and either Mathematics or Physics, and all five Highers must be passed at one sitting of the examination. Candidates are then expected to complete a sixth year at school and generally offers will be made conditional upon them achieving high grade passes in their sixth year subjects at Higher, Advanced Higher, or 'A' level as appropriate.

### **General Certificate of Education (GCSE)**

Normally three 'A' level passes at Grade A in Chemistry, Biology and one other subject.

### **Alternative routes into Higher Education**

The School supports a Scottish initiative to offer an alternative route of entry to talented individuals who wish to re-enter Higher Education to follow a professional career (SWAP West). This route is shared with the other health professions (medicine, dentistry, nursing and pharmacy). Following a competitive selection process, candidates follow an intensive one year course in basic sciences. Success in this course allows individuals to be considered for interview in the selection process.

The University of Glasgow actively participates in the Scottish government funded Widening Participation Programme which targets pupils of low progression schools in low socio-economic areas based on the Scottish Index of Multiple Deprivation. The targeted pupils come from diverse backgrounds including ethnic minorities, care leavers, adult returners and individuals with disabilities.

In addition, the School is actively involved in Reach Scotland, a national project that aims to raise awareness and to encourage, support and prepare secondary school pupils from S4-S6 wishing to pursue a professional degree at one of the following Universities: Aberdeen, Dundee, Edinburgh, Glasgow and St Andrews. More information on widening participation can be found at the University web page.

### **Interview Process**

All UK and overseas applications, with the exception of those from North America, are made through the University and Colleges Admission Service (UCAS). On receipt of the UCAS forms, courses of study and qualifications are verified. Applicants with unsatisfactory subject combinations, poor examination results and/or poor predictions in pending examinations are rejected. Remaining applications are scrutinised by members of the Admissions Panel and approximately 250 are called for interview. North American applications are scrutinised by the Admissions Team and approximately 120 are called for interview in the United States. A presentation to applicants is held each morning. This includes a question and answer session and parents/friends are invited to attend. In exceptional circumstances, overseas applicants may be offered telephone interviews at the discretion of the Panel. Overseas applicants are encouraged to take the opportunity to visit the School before finalising their decision.

The 'interview' process is designed to objectively assess evidence of motivation, relevant communication and observation skills, awareness of the opportunities and challenges presented by a career in veterinary medicine, resilience, ethical reasoning and candidate's knowledge of current and controversial veterinary matters. The 'interview' consists of three stages; a computer based ethical awareness test and two 15-minute interviews. The ethical awareness test is based on situational judgement tests. This part of the admissions process has been designed to evaluate ethical sensitivity, empathy, altruism, critical and creative thinking and judgement. The responses to three

scenarios are marked relative to defined rubrics. The interview panels consist of an Admissions officer and a Member of Academic staff/and or a practising veterinary surgeon. The first interview assesses performance (1-4 scale) against five areas/characteristics, communication skills, initiative, leadership qualities, confidence, work/life balance; the second interview assesses performance (on a 1-4 scale) against five areas/characteristics, practical experience, awareness of animal welfare, observation skills (from animal experience), understanding of topical biomedical issues and independent thinking. The scores from the two panels are ranked and success determined relative to cut off points for the interview and the ethical awareness test.

A tour of the School is organised by our students where the applicants have the opportunity to gain a student perspective on the course and other aspects of studying in Glasgow. Results of applications are communicated to candidates by e-mail within eight weeks of interview.

### **B) Policy for Disabled and Ill Students**

Appropriate support can be provided for many circumstances even if the effects of disability or ill health are substantial and it is important to know that we consider any disability or health condition on an individual basis and no health condition in itself would automatically preclude a student from studying veterinary medicine. However, because of a requirement to ensure patients, clients and colleagues are not harmed through involvement in veterinary training if a student has a condition which would make it impossible for them to work safely with patients, clients or colleagues, or to acquire the skills necessary to complete training, even with adjustments and support, then they cannot be accepted onto the undergraduate veterinary medicine programme. See [veterinary students fitness standards](#).

### **C) Composition and Training of the Selection Committee**

The School has an Executive Admissions Committee that sets the admissions strategy and policy and an Admissions Panel which is composed of 24 members of academic staff and 20 veterinary practitioners. The Head of School and Associate Head of School (Learning, Teaching & Assessment) act as ex officio members of the Panel. The Admissions Panel is convened by the Student Services Manager, who is a senior member of administrative staff within the Undergraduate School. The Convener of the Admissions Panel is responsible to the Associate Head of School (Learning, Teaching & Assessment), who in turn is responsible to the Head of School.

All members of the Admissions Committee and the Admissions panel are required to undertake On-line training in Equality and Diversity and Unconscious Bias and members of staff attend interview training. Every member of the panel is given specific written instructions regarding the conduct of the interview, are invited to ask questions and confirm that they understand the selection criteria. Any new members on the interview panel are required to observe the interview process prior to taking part in the process itself.

### **D) Appeal Process - Advertisement of the criteria and transparency of the procedures:**

The University has a duty to maintain and enhance the quality of provision for students and to provide an effective system for handling appeals and complaints. The University upholds the principle that students should have a full opportunity to raise [appeals](#) against academic decisions without fear of disadvantage and in the knowledge that confidentiality will be respected.

#### 7.3.2. Description of the admission procedures for full fee students

##### **Full Fee Students**

Graduate entrants are expected to have an Upper Second Class or First-Class Honours Degree in an appropriate subject area such as Animal Science, Zoology, Biochemistry or Physiology. Since 2002, all North American applications are made through VMCAS (Veterinary Medical Colleges Admissions Service).

Candidates from North America will normally be considered for admission after they have satisfactorily completed three years of a college course, which includes Inorganic Chemistry, Organic Chemistry, Biology, Physics or Mathematics. An analogous standard is sought from other nationalities.

For applicants whose first language is not English, the University sets a minimum English Language proficiency level. <https://www.gla.ac.uk/undergraduate/degrees/veterinarymedicine/#/international,non-academicrequirements,englishlanguage requirements>.

### **Alternative route of entry for USA students from selected Animal Science Programmes**

The School has developed partnerships with selected animal science departments whereby sophomore/junior students can enter a specified track in which they do the last year of their undergraduate degree as a 'study abroad' year at the University of Glasgow. During this year the students attend and participate in the first year of the BVMS programme, but all credits awarded are transferred back to their home institution. If the students pass all of necessary assessments, they are allowed admission to the University of Glasgow but are given accelerated entry and join the second year of the BVMS Program.

7.3.3. How the Establishment adapts the number of admitted students to the available educational resources

The target number of students for acceptance onto the BVMS programme is set cognisant of the available educational resources and at a level that allows for some variation around the expected conversion rate of offers to places and to provide spare capacity to accommodate any students who have to re-sit any year of the programme.

7.3.4. Prospective number of new students admitted by the Establishment for the next three academic years

It is anticipated that the number of new students admitted for the next three academic years will remain between 135 – 145.

### **7.4 Policies and procedures on how applicants with disabilities or illnesses are considered**

The School will provide all reasonable support to enable disabled students or those with health conditions to complete their studies. All students are complete pre-arrival health screening forms which are reviewed by our Occupational Health Service. Appropriate support can be provided for many circumstances even if the effects of disability or ill health are substantial and it is important to know that no health condition in itself would automatically preclude a student from studying veterinary medicine and we consider any disability or health condition on an individual basis. However, because of a requirement to ensure patients, clients and colleagues are not harmed through involvement in veterinary training if a student has a condition which would make it impossible for them to work safely with patients, clients or colleagues, or to acquire the skills necessary to complete training, even with adjustments and support, then they cannot be accepted onto the undergraduate veterinary medicine programme. See **veterinary students fitness standards**

### **7.5 The basis for decisions on progression**

7.5.1 A student cannot proceed to the second, third, fourth and final years of the curriculum until they have successfully completed all the courses including achieving a pass in all compulsory but non-graded assessments and achieved grade D3 or better in the degree examinations in the preceding session. Students who do not attain a D3 or better, with the permission of the Progress Committee may repeat a year. In this circumstance a student will be allowed to carry any assessment, for one year only, in which they have achieved D3 or better. In repeating a year, they are required to attend all compulsory classes and submit all required work related to the assessment they are carrying, so that their skills/knowledge remain current, as well as the classes and assessments required for the assessment for which they were unsuccessful.

7.5.2 All students are allocated an academic adviser who can support them or guide them where to seek help with academic matters if required. For students who have failed at the first sitting of an examination assistance is provided over the summer prior to the 2nd diet of examinations. The University also offers learning support and psychological counselling, so that students can discuss any challenges they are facing in their studies. This may include concentration disorders, exam anxiety, stress, overwhelming workload and emotional crises.

7.5.3 The advertisement to students and transparency of these criteria/procedures

Criteria regarding progression are published within the programme specification on the University Senate website, the



supplementary regulations within the University Code of Assessment and on the BVMS Mahara website.

7.5.4 Description of the rate and main causes of attrition:

Year	Reason for Attrition*		Total and (% of original cohort)
	Academic	Personal	
2010	9	1	10 (7.4)
2011	9	3	12 (8.8)
2012	5	1	6 (4.5)
2013	3	3	6 (5.0)
2014	3	3	6 (5.0)

\* defined as students who leave the course and never return

7.5.5 The Executive Admissions Committee has the responsibility for monitoring and reviewing recruitment and admissions practices/policies in place for all Undergraduate Programmes within the School. Practices/policies are reviewed annually to ensure that they comply with any changes in legislation and to support the values and vision of the School. The Committee ensures recruitment and admission practices are fair, explicit, and implemented consistently to support equality of opportunity. The Committee monitors student numbers and reviews planned admissions limits and tuition fees, which are determined by the College. The Committee reports to the School of Veterinary Medicine Learning and Teaching Committee for preparation and annual review of the School’s Admissions Policy, including criteria, to be presented to the School Learning and Teaching Committee for approval. Admissions criteria are available on the School website and in the University Prospectus.

**7.6 Mechanisms for the exclusion of students from the programme**

Students can be excluded through lack of academic progress or through misconduct. Lack of progress is monitored by the Progress Committee

Students excluded have the right of appeal to the College and if unsuccessful to the Senate. Misconduct is reported to the Senate for initiation of an investigation process. Details of the regulations governing the **Code of Appeal and Conduct** and **Fitness to Practice** are available to all staff and students on the University website.

**7.7 Services to support the physical, emotional and welfare needs of students**

The University and School are committed to supporting and providing all reasonable support to enable disabled students or those with health conditions to complete their studies. The University and School recognise that a positive approach to the management of physical and mental health is crucial to student learning and academic achievement. The University and School offer a wide range of services to help students make the most of their degree.

The School Student Support office is located within the McCall building and this arrangement facilitates student/staff interaction. Students are encouraged to seek help at the earliest opportunity, be it for either academic or personal reasons, and have access to support via many routes. Other routes are also provided via the University website including registration, testing, mentoring and counselling. The School Student Adviser scheme, peer support and academic support are detailed further below. Where appropriate, support staff endeavour to provide solutions from within the School but where this is not possible students are referred to University Support Services or externally. All students are provided with a variety of routes to support. Formal support is recorded and held in a confidential matter by the Undergraduate School. Confidential disclosure of relevant information may be made to Boards of Examiners, Progress and Appeals Committees.

The School aims to promote a climate that provides inclusion and equity for our diverse student body and encourages a welcoming environment for both learning and social activity. We are proud to have such a diverse student body. The School achieved Bronze and Silver Athena SWAN awards in 2015 and 2019 respectively. To support its work in this area the School has an action plan covering support for students and staff; key career transition points; and

organisation and culture. Progress with delivering the plan is overseen by an Athena SWAN/Diversity and Inclusion Group which includes staff and student representatives.

The School has a visible LGBTQ+ community that is fully supported both by the staff and is affiliated to the vet student union (GUVMA). There is an active private Facebook group where members can communicate freely and safely and there are many social and welfare events to raise awareness of the group within the School.

**Registration:** To become a fully registered student of the University, students matriculate online at Registry. Students are required to do this every year before the start of their program of study and use MyCampus - the University's student information system. All students receive full details of how to log into MyCampus by email.

**Teaching administration:** Moodle Forums, are a valuable resource where students and lecturers can exchange questions, answers and ideas and are the primary method of communication between BVMS staff and students, and also between students. Staff will use Forums such as the "Announcement forum" to disseminate information to students; this page is for general news and announcements from staff relevant to all BVMS students and staff. The "I Need Help Forum" is for problems or questions that do not relate to teaching and staff will add to the responses where appropriate. The various modules, rotations and rotating practical Moodle pages have their own dedicated "Discussion forums" which are used to confer on any aspects of each module. Students can ask and answer questions relating to course content and staff add to the responses where appropriate.

At the start of each academic session the course leader indicates their mechanisms of support for that year which complement other formal mechanisms. Teaching staff have an open-door policy and will also proactively discuss academic issues with students they identify as needing support during face to face sessions such as practical classes. Students who do not engage with moodle activities, deadlines or are noticed missing from practical classes are identified and contacted. Students who do not perform well in continuous assessment tasks (formative and summative) or other forms of assessment are invited to meet with course leaders who will advise on steps to improve performance and inform students of the support available both at School and University level.

If students are experiencing study difficulties and think that these may be caused by a specific learning difficulty such as dyslexia or dyspraxia, a screening test is available through the University. This test helps students ascertain their learning style, indicate if study skills support is needed and highlights any indicators of dyslexia or dyspraxia. Students can then be referred to a Chartered Educational Psychologist for a full psychological assessment.

At School level, such students are also advised to discuss progress with their Adviser, the Student Support Office, and other module leaders as necessary in order to ascertain if there is a general problem or whether it is module specific.

At University level, the central Student Learning Service can be accessed freely by students and is designed to offer professional advice regarding study techniques and a range of learning issues.

**Mentoring and tutoring:** In addition to the student support staff, each student has an allocated Student Adviser, and the Chief Adviser of Studies for the five-year programme oversees this scheme. (See 'Mentoring and Advising' below). The Adviser, who is a veterinary surgeon, has two responsibilities towards the student: one is to provide pastoral care, the other to assist with personal and career development. Information for students about the scheme can be found on the Student Adviser scheme Mahara page. Student Advisers are intended to be an approachable point of contact within the School. Although Advisers are willing to listen while problems are explained, and they will do so in confidence, they are not expected to have all the skills and the knowledge to deal with health, relationship and financial difficulties that students often encounter. They can however help with accessing the relevant experts in the University Student Support Services. Concerns which relate directly to a particular course are best discussed with individual Course leaders in the first instance, with the Adviser providing back up and support. There is a Student Adviser Handbook available for staff in which they can find useful information and advice to help them in this role. The Advisers' background places them in an ideal position to assist with personal development by providing help with the

development of critical reflection skills, planning extra-mural studies (EMS) and externships, advice on selection of electives, career development and guidance on CV writing, as well as being able to provide references for a student when required. Two meetings between student and Adviser are scheduled for each academic year (Semester 1 and Semester 2), and it is highly recommended for the student to attend; the scheme works well when both staff and students engage. Additional meetings are scheduled as the need arises so that any problems can be dealt with as soon as possible; Advisers have an 'open door' policy.

**Careers advice:** Prior to the start of final year, students are encouraged to attend the 'Society of Practising Veterinary Surgeons' conference dedicated to students nearing graduation and providing a wealth of information about future careers. During the Induction week of BVMS5 – Professional phase, there is extensive information about job interviews, the Veterinary Defence Society, NAVLE examinations together with potential career advice with representatives from a breadth of charities and companies at the annual veterinary careers fair (Appendix 6.7.1). To complement this the School Careers page is available to students which provides links to large organisations such as the Association of Veterinary Teaching & Research Workers (AVTRW), British Veterinary Association (BVA), USDA Food Safety & Inspection Service, Academy of Rural Veterinarians and Banfield's Hospitals. Students also are directed to MyVetFuture which is constructed under the auspices of BVA with a view to providing relevant information at all stages of a veterinary career. Employment opportunities, posted to us, are transmitted to the students via notice boards and e-mail. Through the EMS scheme students build relationships with practices and other employers, and often this provides a source of future employment. Due to the vocational nature of the degree, students are encouraged to seek advice from senior members of School staff and their Advisers. The University also has a Careers Service and one-to-one interviews with the University Careers Manager are available at Garscube. Further assistance for undergraduates is offered with help CV writing, formulation of application letters and obtaining references. The Students' Representative Council (SRC) Advice Centre provides confidential advice, information and representation on a wide range of subjects. The service is free of charge and open to all Glasgow University students

**Listening and counselling:** The Student Support Services provide pastoral care through the Student Support Office. A variety of student support services are maintained at the University level including but not limited to: Student Counselling & Advisory Service, Student Disability Service, the International Office, Health, Chaplaincy, Financial Support, Accommodation and other areas. Student interests within the University are represented at all levels including Senate and Court through the auspices of the Students Representative Council that represents and supports individual students.

Several mental health initiatives and courses are run throughout the programme and further support is available centrally through the University. The University Counselling and Psychological service offers a drop-in and an appointment service and has an excellent website advising on self-help strategies and links to helpful services. The service will be available on site at Garscube from 2020. Big White Wall is a safe space online and a free service for University of Glasgow students. It is accessible 24/7 and provides online peer and professional support by trained counsellors; it is completely anonymous.

The School has developed a peer support scheme for students in collaboration with the University of Glasgow's Counselling & Psychological Services, who provide over 30 hours of necessary training for students who volunteer. Student volunteers are trained to provide emotional support and advice to fellow students. To date 19 veterinary students have been trained. The skills taught include being a good listener, helping others to feel more comfortable with social, academic and personal relationships, helping others to make decisions without giving advice, and managing and communicating around sensitive issues. An emphasis is placed on the listener learning their own limits within the listening situation, and when best to refer the person on to an appropriate agency within the University. Post-training supervision is an integral part of the Scheme and ensures that supporters are not acting (or being asked to act) as counsellors. Supervision provides a space for supporters to reflect on their practice and develop and enhance their skills as well as providing an opportunity for the work to be monitored. Additionally, the compulsory, fortnightly supervision provides regular support and continuing personal development to the supporters. Glasgow Academic Student Peer Support (GASPS) is a student run and facilitated resource for Glasgow veterinary students and is hosted on Facebook. If students need assistance with a specific component of the course, they can sign up to

be tutored by another student. Students are free to post any questions onto the page and get support and advice from others. The Q&A sessions are mostly geared towards first years (for now) but everything else is for all the years. The Q&A sessions will be expanded to third years to aid transition to the clinical phase of the course.

**Assistance in case of illness:** Should a student become ill, they are required to note this on MyCampus which is checked by School staff weekly. If a student is ill for more than a few days, they will be contacted by Student Support and appropriate help instigated on a case by case basis. Absences which affect assessment may be considered for classification as **Good Cause**. Each case is considered by the School good cause committee and if upheld is subject to the University regulations governing Good Cause, full details of which can be accessed through the Senate Office.

**Impairment and disability:** The Student Disability Service provides a dedicated service for registered students with disabilities or specific learning difficulties, assessing and putting in place appropriate provision. Disabilities include chronic health problems (eg. Crohn's disease, diabetes), physical impairments (e.g. hard of hearing, visual impairment), Autistic spectrum disorder, mental health difficulties (e.g. depression, eating disorders) and specific learning difficulties. Provision is vast and could include assistive technology, extended library loans, increased adviser support or adjusted access. Students with disabilities or chronic health conditions which may affect their performance in examinations can register with the student disability service so that where relevant, course teams are able to plan and implement "reasonable adjustment" for examination procedures, provide assistive technology and arrange support. The remit of the Disability Service does not extend to students with a temporary disability (such as limb fracture) therefore there is a School Disability Co-ordinator who is responsible for providing support and implementing actions required in such circumstance.

**Clubs and organisations:** There are a variety of student clubs and organisations (200+) across the University. The lists and further information can be found at: University Clubs University Sport Glasgow University Veterinary Medical Association (GUVMA) is a student-run group which serves as a governing body for Glasgow University veterinary students. It provides a forum for its members to interact on a professional and social level. GUVMA coordinates charity fundraisers, social events, and educational opportunities. The association represents the students, sporting clubs and societies within the School. GUVMA is part of the Association of Veterinary Students (UK and Eire), and the International Association of Veterinary Students. In 2011 the first student Chapter of AVMA (SAVMA) was established at Glasgow. We were delighted to be the first SAVMA Chapter out with North America and the Caribbean. The Student AVMA coordinates student chapter functions, promotes the exchange of ideas and information among students, and represents its members in matters that concern them, both as students and as future veterinarians. There are also benefits including educational opportunities, careers advice and access to additional professional insurance.

GUVMA welcomed the introduction of the SAVMA Chapter and recognises its importance given the significant number of North American students on the programme and both associations are working closely together for the benefit of the student body as a whole.

The School has a very strong Clinical Club which is organised by GUVMA. The aim of the Clinical Club is to inform students on a variety of topics selected by the student body. The Club runs evening meetings and is extremely well attended. Kind sponsorship by various organisations often provides refreshments after a talk and an opportunity for students to pose questions to the speaker(s), who are leaders in their field.

### **7.8 Mechanisms in place by which students can convey their needs and wants to the Establishment**

There are a number of formal and informal mechanisms through which students may communicate their needs complaints comments and suggestions, throughout the programme.

**Module roundup sessions:** Students may be asked to complete questionnaires within each module in which they can express their opinion of module teaching events and how the module was run.

**Staff – student quality assurance/focus group meetings:** A representative group of students will be invited to

## Standard 8 **STUDENT ASSESSMENT**

attend a meeting with appropriate course and module leaders twice in each academic session.

**National Student Survey (NSS):** The NSS is a national survey that has been conducted by an independent market research company annually since 2005. It asks undergraduate students (mainly final year) to provide honest feedback on what it has been like to study their programme. The results compiled to provide year on year comparative data, and this is publicly available to prospective students, their families and advisers.

**Staff Student Liaison Committee:** Each year has two class representatives. These representatives, the GUVMA President, Vice-President and Student Representative Council representative, the Associate Head of School (Learning, Teaching & Assessment), and all course leaders sit on the Staff/Student Liaison Committee, which is convened by the Head of Student Support and meets three times per year. Staff are expected to respond to matters raised at these meetings in a timely fashion. The minutes from this committee are published on Mahara so that all staff and students have access to them.

**Annual Course Monitoring:** The Annual Course Monitoring Cycle is performed to encourage staff reflection on the operation of courses and modules with a view to maintaining and enhancing quality and standards in teaching and learning. It is carried out by Course Leaders and co-ordinated by School Quality Assurance Officer and members of the Veterinary Medicine Undergraduate School. Annual Course Monitoring is undertaken at the end of each session and is followed by a full reporting process through the School to the Senate of the University with responses being made, as appropriate, at each level. The reporting procedure is designed to ensure that issues arising from monitoring are properly considered and responses provided and to demonstrate that quality and standards are assured. Reports from the Annual Course Monitoring cycle can be found [here](#). Students have access to an online anonymous comments system where they can log any concerns or areas for improvement.

### **Comments on Standard 7**

It is our view that we have a well-defined admissions policy that is publicly available through a variety of well recognised routes eg University Prospectus and UCAS. School staff make up the majority of members on the Admissions Panel and the Admissions Committee reviews policy and procedure on an annual basis. We believe a particular strength of the Admissions Panel is the strong representation from veterinary practitioners. Traditionally the interview is considered to be an important part of the admissions process as it allows evidence of motivation and resilience to be explored in depth and facilitates the assessment of additional non-academic criteria. The high number of applicants (standard and full fee paying), the low rates of attrition and high rates of progression and graduation attest to the success of the existing systems associated with the advertising selection and admission of students onto the programme. In addition, we have strong student support provision in place to ensure student success on the Programme.

### **Suggestions for improvement on Standard 7**

There is currently a lack of diversity in the profession and more needs to be done to tackle it. People from all backgrounds and experiences should feel that the profession is open to them and everyone should have the same opportunity. While both the School and the Profession are actively trying to address this issue, it continues to be a challenge.



## Standard 8: Student Assessment

### 8.1 Assessment Strategy

The BVMS programme has an Assessment Policy (Appendix 4). This document is available through the VLE to all faculty and students on the **BVMS policies page**. Much of the information below is extracted from this policy. The aim of the Assessment Policy is to provide a clear guidance for course teams and a consistent and effective approach to assessment across the BVMS programme. The policy is designed to be used in conjunction with guidance from the University of Glasgow Learning Enhancement & Academic Development Service and the Senate office as well as the relevant guidance from the College of Medical, Veterinary and Life Sciences. The policy relates specifically to the BVMS programme although many of the elements will be common to other programmes at the School. Extensive consultation on the BVMS Curriculum, including assessment, has included faculty, students, employers and external examiners. The policy should be considered in conjunction with the **Programme Assessment information** which is made available to students, faculty and external examiners via the School's Virtual Learning environment.

Assessment in the context of the BVMS programme encompasses two distinct but related themes: (i) knowledge and application; and (ii) clinical competency. This reflects the nature of the professional degree programme which must meet the competency requirements of the accrediting bodies as well as the academic standards of the university.

A range of question types are used to assess different knowledge/skills (Further detail below and in the Assessment Policy (Appendix 4)):

- *theoretical knowledge* - Multiple choice questions, Practical spot questions, Modified essay questions, Extended matching questions, Data interpretation questions, Clinical decision-making questions, and Continuous assessment tasks (different formats typically include presentation, poster, research proposal or factsheet)
- *pre-clinical practical skills* - Objective structured clinical examinations, Directly observed procedural skills
- *clinical practical skills* - Objective structured clinical examinations, Directly observed procedural skills
- *'soft' skills* - Professional Portfolio, Continuous assessment tasks (different formats typically include presentation, poster, research proposal or factsheet).

### 8.2 Assessment Methods

**Assessment methods** for each course are described in the Course information and form an element of the programme of assessment which runs through all three Phases. Within the course assessments there will be some elements which may vary over time; these may include the formative and coursework assessments for each module and the specific question formats used in written examinations. Assessment methods are selected based on the ILO(s) to be assessed, giving due consideration to validity, reliability and feasibility.

- validity – does the assessment assess what it is intended to assess?
- reliability – is the assessment fair and consistent in making pass/fail and grading decisions?
- feasibility – can the assessment be effectively delivered with the available resources?

The University sets out the process by which the School make awards to students who have completed components of the programme; the regulations which govern these decisions are set out in the **Code of Assessment**. This is designed to “deliver transparently fair and consistent outcomes in all student assessment”. Assessment during the BVMS programme is underpinned by this Code. The Code of Assessment describes the use of the main assessment Schedules (**Schedule A** and **Schedule B**) and how the grade descriptors within these Schedules are designed to evaluate each student's performance against the ILOs of the programme.

Barrier assessments are designed at the end of each year of the programme. Specific requirements for completion of each year and thus progression through the programme are described in the relevant course information for Foundation, Clinical or Professional Phase (**Mahara Assessment page**). For all Phases, a candidate who fails to obtain a passing grade in the Knowledge and Application Assessment will be required to repeat all elements of that category of assessment at the second diet. A candidate who fails to obtain a passing grade in the Competency



Assessment will be required to repeat only the failed elements of that category of assessment at the second diet (i.e. either the OSCE or the Portfolio). Candidates must obtain a passing grade in both assessment categories in order to progress to the next year.

A candidate is only entitled to two attempts at the end-of-year professional degree exam. If a candidate fails the exam again at the second attempt then they will be liable for exclusion from the programme. The candidate's performance on the programme will then be discussed by the Progress Committee (see **Regulations, Resits and Progression** for details).

The School supports the development of a range of approaches to formative feedback, including self-assessment, peer-assessment, individual feedback on assignments, and provision of model and example answers across a range of achievement levels. General feedback on the end of course summative assessments is provided where possible, in addition to individual student grades, cohort grade profiles and the opportunity to review examination scripts on request. The recommended feedback provided for course assessments is described in Table 3 of the Assessment policy (Appendix 4).

Students are provided with a range of resources to support them in using formative assessment opportunities and the associated feedback via the Mahara page "**Preparing for assessment in the BVMS Programme**"

Student facing information can be found on Mahara "**Regulations, Resits and Progression**"

The University upholds the principle that students should have a full opportunity to raise appeals against academic decisions without fear of disadvantage and in the knowledge that confidentiality shall be respected. An appeal is defined as a request for a review of a decision of an academic body charged with making judgements concerning student progression, assessment or awards.

There are only two grounds for appeal: (i) Unfair or Defective Procedure; and (ii) Failure to take into account medical or other adverse personal circumstances. The Senate office provides clear guidance on the processes involved on the **Academic Appeals** section of their website.

### 8.3 Process to review assessment outcomes

The BVMS programme has an Assessment Policy (Appendix 4) which is managed by the BVMS Programme Board (see Chapter 3 for description of the committee structure). The Assessment Policy is available to staff, students and appropriate stakeholders via the VLE. The principles of the Assessment policy underpin our assessment design: course leaders and faculty involved in assessment are familiar with the policy. The policy is reviewed by the School Learning and Teaching Committee on an annual basis, with amendments recommended based on consultation with the relevant individuals and groups including the BVMS Programme Board.

**The University of Glasgow Assessment policy** states that "assessment of student performance that certifies competence must authentically reflect the expected behaviours of individual professions". In the context of the BVMS programme these requirements are described by the Accrediting bodies (EAEVE, RCVS and AVMA). The ILOs of each course within the BVMS programme are mapped to the requirements of the accrediting bodies, and this information is combined with that provided by assessment blueprinting to ensure that the programme assesses the full range of requirements. Through a process of constructive alignment, we have selected assessment tools to demonstrate attainment of the year and programme ILOS and therefore the Day One Competences; this is consistent with the University assessment policy.

### 8.4 Assessment Strategies

Standard setting describes the process used to determine the passing standard for a given assessment. The School employs a criterion-referenced standard setting process consistent with Part 2 of the Guide to the Code of Assessment. Standard setting procedures are used where a conversion scheme must be employed to translate

numerical marks (derived from relatively objective assessment formats) to grade bands on the 22-point scale. The two methods currently used are the Angoff method (for written test items) and the Borderline Regression Method (for OSCE assessment).

The BVMS Programme adopts an active learning ethos - key topics are worked through in the form of review and concept tasks, supported by workshops/tutorials and analysis following self-directed engagement with core material online (identified to students as self-directed learning, SDL) in advance of the sessions thus promoting problem-solving and independent learning and also fostering a life-long learning approach.

The Professional portfolio which has both summative & formative roles, focuses on gathering and interpretation of evidence, including feedback across a range of tasks and assessments, to inform and plan future personal learning strategies.

### 8.5 Methods of formative and summative assessment

The School has developed effective processes to ensure fairness, validity and reliability of assessment outcomes including moderation. These are summarised in a Process Flow depicting the Examination Preparation process in Appendix 6.8.1

Steps are taken after each assessment to ensure the fairness and reliability of the assessment process: the guidance on marking and moderation is based on the **Good practice guidelines** developed by the University of Glasgow with reference to the **QAA Code of practice for the assurance of academic quality and standards in higher education**. Double marking (ie marking conducted by two assessors independently) is not required routinely for non-honours assessments and in the context of the BVMS programme double marking will only be applied to the Professional Portfolio where it represents over 80% of the competency assessment for a course.

Moderation (ie independent review of assessments by a second marker), is required for a range of assessments including:

- professional portfolio where it represents 20% or less of the competency assessment for a course
- clinical decision-making questions
- data interpretation questions
- modified essay questions
- continuous assessment tasks

The process requires 10% of the marked scripts for each assessment to be moderated by the course leader or a nominated representative. Full details can be found in the BVMS Programme Assessment Policy (Appendix 4).

Course assessments are evaluated through the School Quality Assurance and Enhancement Officer process which reports to that of the University. The School Quality Assurance Officer is responsible for managing the quality assurance procedures. A major element of this process in relation to assessment involves our External Examiners who are appointed for a period of four years to review assessment processes and student performance. External Examiners are sent appropriate course information, annual monitoring reports, draft examination papers, blueprints and solutions to questions. External Examiners visit the School during the examination period to take part in the Board of Examiners process following which they are required to submit a formal report to the University Senate Office. External Examiners reports form part of the Annual Monitoring Report which feeds into the University system for monitoring courses annually.

## Standard 9 **ACADEMIC AND SUPPORT STAFF**

Competency assessment methods include OSCEs, DOPS and Portfolio (see Table 1 of the Assessment policy, Appendix 4) and are designed to demonstrate progression in clinical skills and competencies across each of the three Phases of the programme.

The Portfolio forms part of the competency course assessment at the end of each Phase of the programme (BVMS2, BVMS4 & BVMS5). The BVMS Portfolio aims to provide a vehicle for the student to demonstrate that they have achieved specific ILO's which map on to the RCVS & ESEVT Day-One competencies as well as AVMA Clinical Competencies. The Portfolio also has an important formative role, as students use it to document and plan their learning. Students are required to submit their Portfolio for formative assessment at the end of BVMS1 and BVMS3.

### **Comments on Standard 8**

Assessment across the programme is a strength, alongside the new curriculum we introduced a number of new practices introduced in recent years:

- coherent assessment policy
- standardisation of practices
- strong clinical skills assessments (including DOPS and OSCEs in every Phase)
- portfolio embedded throughout the programme
- authentic assessment for learning through continual assessment tasks, DOPs etc

### **Suggestions for improvement on Standard 8**

We are currently undertaking an "Assessment review" which is expected to report by the end of the 2019-20 academic year.

This will:

1. Evaluate the currently delivered continuous assessment tasks in relation to their contributions to a summative grade and suitability of feedback for student learning in Years 1-4 of the BVMS course.
2. Explore the introduction of distinct schedule A and B items for in-course summative assessment.
3. Refine existing work-based assessment methods and trial introduction of additional methods to increase assessment of competency.

## Standard 9: Academic and support staff

### 9.1 Staff Recruitment and Succession Planning

The academic and administrative structure has been designed to support the educational mission of the School whilst strengthening the science and species-based disciplines that underpin the teaching of Veterinary Medicine. The School's approach to professional veterinary training underwent significant reform during the period 2013-2018, representing the most radical change to teaching in the history of the School. The School Executive actively manages its staffing plan and during the period under review we have invested in faculty to meet the demands of the more student-centred approach and the expansion of small group teaching with a greater emphasis on competency-based training and assessment.

The School holds a pay budget that supports faculty and staff positions across the School. The annual planning and budgeting meeting with the College offers the opportunity to request increased resources required to meet strategic objectives and to support new business initiatives. The School Executive considers the best use of vacant posts arising from departures or retirements; usually this results in replacement in the same discipline or role but on occasions the School Executive may wish to redirect this resource to another area. A post release form is then forwarded to the College Operations Group for final approval.

### 9.2 Staff involved with the programme

**Table 9.2.1. Academic staff of the veterinary programme**

Type of contract	AY*	AY-1	AY-2	Mean
Permanent (FTE)	86.71	79.71	76.91	81.11
Temporary:	See note 2	See note 2	See note 2	See note 2
Interns (FTE)	25	20	20	21.7
Residents (FTE)	48	38	37	41
PhD students (FTE)	28	29	28	28.3
Practitioners (FTE)	See note 3	See note 3	See note 3	See note 3
Others (specify) (FTE)	See note 4	See note 4	See note 4	See note 3
Total (FTE)	187.7	166.7	161.9	172.1

1. Figures include vacancies

2. To avoid double counting, temporary staff are not enumerated as they mainly cover maternity leave and other vacancies

3. In addition to permanent staff school teaching is supported by those on fractional contracts, self-employed, graduate teaching assistants and those employed by a third party. Some of these adjunct teachers are veterinary qualified and some come from outside the profession. Typically, each year the School uses 28 visiting lecturers, 14 graduate teaching assistants, 7 external portfolio assessors (practitioners), and 12 external OSCE and DOPs assessors (mainly practitioners).

4. Around 7 institute academic staff deliver an average of 28 hours and make a significant contribution to veterinary teaching, especially in the underpinning scientific disciplines. Another 12 institute faculty make a more modest contribution (figures not included in Table 9.2.1).

**Table 9.2.2. Percentage (%) of veterinarians in academic staff**

Type of contract	AY*	AY-1	AY-2	Mean
Permanent (FTE)	90.8	90	89.6	90.1
Temporary (FTE)	NA	NA	NA	NA

**Table 9.2.3. Support staff of the veterinary programme**

Type of contract	AY*	AY-1	AY-2	Mean
Permanent (FTE)	131.5	129.7	118.9	126.7
Temporary (FTE)	4.0	4.9	10.2	6.4
Total (FTE)	135.4	134.7	129.1	133.1

**Table 9.2.4. Research staff of the Establishment** (see note 1)

Type of contract	AY*	AY-1	AY-2	Mean
Permanent (FTE)	1	1	1	1
Temporary (FTE)	1	0	0	0.33
Total (FTE)	2	1	1	1.33

Research grants mostly run through research institutes and therefore most research staff are based in the research institute.

### Predicated future numbers

The number of academic and support staff is unlikely to change significantly in the foreseeable future. There has been a steady increase in academic staff and some support roles within the Small Animal Hospital but it is now expected that these will stabilise.

### Selection, recruitment and training of teaching staff

The School Executive considers the best use of vacant posts arising from departures or retirements; usually this results in replacement in the same discipline or role but on occasions the School Executive may wish to redirect this resource to another area. For every post recruited a detailed job description is prepared that defines the qualifications, knowledge and experience that are essential for the role. The University is an equal opportunities employer and those sitting on appointment panels undergo training in recruitment and unconscious bias. Interviews are structured and candidates scored on the essential and desirable criteria for the job role. Appointed staff receive induction training.

The University has replaced academic probation with the Early Career Development Programme (ECDP). This programme has been designed to give longer support to early career staff and continues until academic staff reach Grade 9 (Senior Lecturer level), typically 5-7 years from appointment at Grade 7 or Grade 8 (Lecturer level). The opportunities for training and development have been greatly enhanced and are an integral part of the programme. An important component of ECDP is the Postgraduate Certificate in Academic Practice (PGCAP). This training is undertaken by all teaching faculty within the School and associated Research Institutes, including those faculty embedded in partner practices. All staff on ECDP are appointed a mentor to help support objective setting, development planning and advise on learning opportunities. Further details on the programme can be found [here](#). In addition to the foregoing there is on-going task-specific training within the School. This includes training in DOPS, OSCE and portfolio assessments. Faculty also engage in exam question writing workshops covering a range of exam question styles such as MCQ, EMQ, CDM (run on a rolling basis – typically annually).

### Selection, recruitment and training of support staff

Selection and recruitment are as described above and again appointed staff receive induction and on the job training. The University's Employee and Organisation Development portal offers an extensive range of courses and skills training free to both academic and support members of staff. The coverage is diverse and includes courses on leadership and management, information management, computer skills, research skills and a suite of programmes associated with developing teaching skills. Training courses can be found [here](#). This demonstrates the University's commitment to enhancing the generic and managerial skill base of staff. As described in 9.3 the School holds conference support and training support budgets to allow staff to develop their specialised knowledge and skills.

### Rules Governing outside Work

The University recognises the value of consultancy work and faculty are normally permitted up to 30 working days for outside bodies with permission of the line manager. Below £5000 staff can receive 100% of the income but above

£5000 20% of the income flows to the University. Faculty can choose to have the income placed in a University discretionary account using a fee waiver form. The policy can be found [here](#).

### 9.3 Opportunities for staff development

#### Opportunities for specialist training and career development

In addition to the training and development opportunities described above the School has set aside budgets for conference and research support, faculty/staff training including specialist training for technical staff, clinical faculty/staff CPD and nurse training. Furthermore, the School makes provision for personal development and study time is set-aside for residents and early career staff preparing for their PhD, diploma and board specialist exams. Longer study leave/sabbatical may be granted on the basis of one semester in four or one academic year in eight. In addition, unpaid study leave may be granted more frequently.

#### Rewarding excellent performance

The University's annual appraisal scheme described below under 9.4 is the Performance and Development Review (PDR) system. The evaluation of staff performance is directly linked to one-off and consolidated financial rewards so that staff excelling in their role can be recognised and acknowledged. This can be as individuals or as teams. In addition, staff can be nominated for a variety of awards such as the College and University Teaching Excellence Award.

#### Job Security, stability and career tracks

Tenure as such does not exist within the British university system and staff are either employed on open-ended (permanent) or on fixed-term contracts. UK employment law and University HR policies restrict the use of fixed term posts; as such faculty staff can only be on a fixed term contract if there is a defined length to a project or employees are in a training role with a defined end point. These include contracts covering maternity leave and other absences. With regard to employment practices the University is aligned to the public sector, which enjoy a very high level of job security and where widespread compulsory redundancy is almost unknown. Thus, the great majority of faculty appointments are open-ended and underpinned by secure and stable core funding.

Faculty are employed on different career development pathways (tracks) depending on their role and job description. These include the Research & Teaching (R&T) Track (5 faculty); the Teaching Learning and Scholarship (TLS) Track for those focussed on teaching and professional training (23 faculty); and the Academic Clinical (AC) Track for those with a significant clinical service commitment as well as clinical teaching duties (56 faculty). Both the University's promotion criteria and its career development structure have been aligned to these different career tracks. Thus, objective setting and considerations around promotion are appropriate to the role of the individual member of faculty ensuring there is parity of opportunity within the University for staff engaged in research, teaching and clinical service. Promotion to Grade 10 (professorial rank) has been achieved in all three of the tracks within the School demonstrating it is possible to attain the highest academic grade through a career focused on different activities. There is no difference in job security between the different tracks.

### 9.4 Professional growth, mentoring and support

The University has a sophisticated and highly structured system for encouraging and rewarding academic development, scholarship and achievement. There are two main elements that support this: 1) the Annual Performance and Development Review (P&DR) and 2) promotion procedures. Annual monitoring is managed through P&DR, which represents an opportunity to review faculty/staff objectives, achievements and readiness for promotion. Although the areas of performance (research and scholarship; knowledge exchange and impact; learning and teaching; leadership and management; and esteem) are common to the different career tracks the criteria are adjusted to reflect high-level performance in the different pathways. For example, it is expected that research outputs for TLS faculty are focussed on pedagogy or demonstrate the impact of scholarship on teaching whilst research outputs by clinical staff demonstrate importance to, and influence on, clinical practice. This framework has been designed to ensure consistent, transparent and fair progression processes are applied to all academic staff regardless of their differing roles within the University. With regard to monitoring equity our ongoing Athena Swan project collects



data (by year) thus scrutinising promotion, recognition and reward against gender and other protected characteristics.

### **Promotion and supporting development**

There is one promotion round each year based on self-application. The College Progression and Promotion Committee (CPPC) review the applications. For Grade 7 and 8 levels the case for promotion is decided at this level, for Grade 9 and 10 level promotions the College committee establishes a prima facie case, which together with external referees' reports are forwarded to the Principal's Board of Review. The University has developed and refined clear and evidence-based criteria for faculty promotion through Grades 7 to 10. A full description of the criteria for the different career tracks can be found [here](#).

The University, the School and the College place great emphasis on staff mentorship. Mentoring is an intrinsic part of the Early Career Development Programme that supports staff up to Senior Lectureship level. In addition, through the School's Athena Swan programme, mentorships opportunities are available to all and the School operates a matching process for mentors and mentees. As part of staff support the School runs promotion workshops that aim to ensure staff understand the process and are well supported.

### **Staff involvement in School Management**

Faculty and staff within the School manage all aspects of School activity. The senior management roles are described in Section 1. This includes the Head of School, the Head of School Administration, those responsible for all major areas of activity (e.g. research, teaching, equality) as well as leaders in teaching at programme, phase, course and module levels. In line with our equal opportunity policy these management roles are usually filled following an open call for expression of interest and a discussion with the relevant senior manager. Staff have the opportunity to hold the senior management team of the School to account through the committee structure, including the School Forum and divisional meetings that are generally open to all staff.

### **9.5 Assessment of teaching staff**

P&DR (described under 9.4) has a strong focus on learning and teaching and how staff contribute to an excellent student experience. Data from student feedback on courses and modules, the programme focus group and the national student survey can inform these discussions and future objective setting for staff. Data from the EvaSys system is available and can be individualised at the request of staff. Through these routes and through student participation in relevant committees the School is well placed to assess the teaching contribution of staff.

### **Procedures for managing allocation, recruitment, performance development and promotion of staff**

The use of vacancies and new posts has input from the Heads of Division of the School and is agreed at the School Executive, informed by the School's strategy and objectives. Recruitment itself is managed by the recruitment panel, which is constituted in line with University recruitment procedures. It is normal practice for the Head of School or their delegate to convene on all academic panels, and the Head of College to convene professorial panels.

The University promotion policy is described under 9.4. Whilst support for promotion is provided at School level through workshops, one-to-one meetings and statements of support the Committee responsible for the deciding on the outcome is the College Progression and Promotions Committee for levels up to Grade 9 and the Principal's Board of Review for level 9 and above.

Performance and Development Review is a University wide process but is managed locally with line managers holding meetings with every individual member of staff and the outcomes across the School being reviewed by the School Executive.

The School weekly listings and monthly newsletter keeps staff apprised of new appointments and the School runs twice-yearly welcome events for new staff, open to all staff in the School, so they can meet and be introduced to those recently recruited.

## Standard 10 **RESEARCH PROGRAMMES, CONTINUING AND POSTGRADUATE EDUCATION**

### **Comments on Standard 9**

The quality of staff define the quality of the School and we are very fortunate in having such dedicated, hard working and professional staff within the School. The University strongly believes in the importance of training and supporting its academic and support staff. The Early Career Development Programme, incorporating a post graduate certificate in academic practice (PGCAP), which supports staff up to Senior Lecturer level is a significant improvement on previous approaches to staff development. In addition, a multitude of training and learning opportunities are available to all staff including three different levels of leadership training and the University is rightly proud of the investment it has made in this area. We view the development of different career tracks (Research and Teaching; Teaching, Learning & Scholarship;, and Academic Clinical) as a significant advantage to veterinary academics at Glasgow as it allows staff to be recognised for excelling in the role they perform.

### **Suggestions for improvement on Standard 9**

The recruitment and retention of clinical staff who currently can be very well remunerated in the private sector remains a perennial issue. The School is currently looking at developing an enhanced package for some of its clinical staff in order to improve recruitment and to better retain staff.

## Standard 10: Research programmes, continuing and postgraduate education

### 10.1 Research Activities

At the time of the incorporation of the Faculty of Veterinary Medicine into the College of Medical, Veterinary and Life Sciences in 2010, members of staff joined either the School of Veterinary Medicine or one of several new Research Institutes (RIs). The majority of research active staff in the Faculty of Veterinary Medicine joined the Institute of Biodiversity, Animal Health and Comparative Medicine (IBAHCM). Other research active members of staff joined the Institute for Infection, Immunity and Inflammation (III), which incorporates the Centre for Virus Research (CVR), or the Institute of Cardiovascular and Medical Sciences (ICAMS). Additionally, some original research active members of staff chose to remain within the new School. As a result, the 'research environment' to which UG and PG students are exposed is cross-cutting, inter-disciplinary and involves College members of staff from the School, IBACHM, III, CVR and ICAMS. Several members of staff in the RIs continue to teach on the BVMS programme, collaborate with research active members of staff in the School and co-supervise PhD students registered in the School or one of the RIs.

All staff in the School are encouraged and supported, both financially and academically, to maintain their research activity. This ensures that the professional program is continually updated to reflect the most recent advances in the very wide range of fields in which colleagues work. The very applied nature of much of our research results in this information being readily incorporated into our teaching material as lectures are updated on an annual basis.

Of particular note is that in each year of the BVMS programme 'Blue-sky lectures' are organised which involve a 1-2 hour interactive lecture from a researcher at the cutting edge of current scientific endeavour, generally outwith the BVMS curriculum. Examples of titles of recent lectures include: 'Canine intervertebral disc herniation: evidence based or defensive medicine'; 'Opportunities and challenges of a career in 'One Health'; and 'Livestock and Climate Change – just a lot of hot air?'.

Table 10.1.1. List of the major funded research programmes in the Establishment which were ongoing during the last full academic year prior the Visitation (AY\*) is noted at Appendix 6.10.1.

### 10.2 Student training in scientific method and research techniques relevant to evidence-based veterinary medicine and opportunities to participate in research programmes

The following summarises where different aspects of research-related topics are covered within the professional program and how the themes build throughout the curriculum to ensure students are fully equipped with relevant research skills at the time of graduation whether going into research, clinical practice or elsewhere to ensure they become 'lifelong learners':

10.2.1 Research methodology is introduced in the Foundation Phase with training delivered in literature searches, diagnostic methodologies, data interpretation as well as statistical analyses of data and epidemiological concepts, such as measures of disease frequency and study design. Assignments are assessed in a summative CAT format focussing on the conduct of a literature review and presentation of a research topic in BVMS1. This is then consolidated and further reinforced in BVMS2 when students are asked to write a mock vacation research scholarship application.

10.2.2 Evidence-based veterinary medicine research activities are delivered in the Clinical and Professional Phases of the programme. Students are introduced to the concepts of critical paper evaluation focussing on the need to be clear about how to identify and select study groups, control groups and outcome measures. They specifically engage in the statistical evaluation of diagnostic tests, test result interpretation, as well as epidemiological and herd data analyses. Students are also required to present and evaluate other open source (e.g. governmental) resources to identify key issues for veterinarians as well as understanding their regulatory background. All of this work is assessed in formative or summative CAT tasks.

10.2.3 The School hosts student-led public engagement events and there is a very popular CAT task in which students select a paper to critically review, following discussion of the book by Ben Goldacre “Bad Science”. In the 2018/19 session, 113 papers were reviewed and graded by staff, and 14 students with outstanding scores received a copy of the book.

10.2.4 Finally, in the Clinical and Professional Phases of the programme, students practise summarising scientific veterinary data to enable effective presentation of diagnostic or treatment measures based on their background literature searches and evaluations. These results are presented in clinic, journal clubs, tutorials and/or submitted as formal assignments as part of the Professional Phase of the programme.

We provide undergraduate students the opportunity to engage directly with high quality research via our summer student programmes. It is School policy that should an application for external funding be unsuccessful internal funding will be provided to ensure that every student who wants to undertake a summer research studentship has the opportunity to do so. A list of summer studentships conducted over the last few years is available (Base Room) covering a very wide range of topics and species including, for example, work on feline calicivirus, canine obesity, dairy cattle mastitis, footpad dermatitis in broiler chickens, equine sarcoids, and ovine endoparasites, alongside a significant number of projects focussing on wildlife conservation and biodiversity.

Additionally, there are research project opportunities at the start of the Clinical Phase of the programme and in the Professional Phase (up to 12 weeks of research selective as one of the Professional Phase rotations). These are laboratory/farm or data-based projects, with defined literature search, data capture and analytical components, followed by presentations and contributions to manuscript preparation, which are used as assets for the professional assessment.

Students also have the opportunity to intercalate at the end of the third year of the programme and complete the final year of a different undergraduate course elsewhere in the University. This will very often include a prolonged period of time spent on a solo research project. For example, a recent intercalating student in Physiology spent 30 days (60% of his time over a 10-week period) of the first semester solely allocated to the conduct of a research project. That student, although on a primarily human-focussed physiology degree course, applied his newly acquired knowledge and skills to addressing heat stress in eventing horses as part of a research group within the Weipers Centre that was part-funded to provide evidence to inform policy for the Tokyo Olympics in August 2020.

The Head of College Scholars’ List Scheme, founded in 2012, is aimed at recognising outstanding undergraduate Level 2 and Level 3 scholars from across all the whole of the College of MVLS. Students who are placed in the top 10% of their class in the previous year and who take an active part in the associated extracurricular scheme are added to the Scholars List. The list is an extracurricular vehicle to foster the next generation of biomedical researchers. It stimulates awareness of modern biomedical research and exposes students to the reality, excitement and challenge of research. All students on the list are invited to take part in a number of collective and small group events aimed at exposing them to cutting edge biomedical research underway at the University of Glasgow. Funds are specifically set aside to support ‘list’ students undertaking summer research placements with funding being awarded following a competitive application process in which the student is expected to seek out appropriate inter-disciplinary supervision and write their own project application.

The BVMS Professional Portfolio is the primary competency assessment in the final year of the programme, representing a significant project of personal development and designed to evidence academic achievement at SCQF Level 11 (Masters level). Students are required to present a specific range of assets for assessment providing evidence of achievement of intended learning outcomes and professional competencies for the phase. Students are supported in their Portfolio development by rotation teams (specific asset development) and a team of Portfolio advisers through face-to-face or online meetings. Criteria for assessment reflect expectations of a Masters level assessment and comprise: coherence and presentation, achievement of intended learning outcomes, quality of critical reflection and use of relevant literature. A professional panel conducts the assessment process; each portfolio is

reviewed by two assessors (one internal and one external) and critical decisions (e.g. pass/fail) are agreed by the panel. Further detail on Portfolio assessment including a copy of the assessment rubric is available [here](#).

### 10.3 Students registered at postgraduate clinical training

**Table 10.3.1. Number of students registered at postgraduate clinical training**

Training	Number of students			
	2018-2019*	2017-2018	2016-2017	Mean
Interns:				
Companion animals	23	19	19	20.3
Equine	1	0	0	0.3
Production animals	2	1	1	1.3
Others (specify)	0	0	0	0
<b>TOTAL</b>	<b>26</b>	<b>20</b>	<b>20</b>	<b>22</b>
Residents: (EBVS disciplines)				
ECVDI	5	3	3	3.7
ECVIM	9	6	8	7.7
ECVAA	6	4	5	5
ECVN	7	4	3	4.7
ECVS	7	7	6	6.7
ECEIM	2	2	2	2
ECBHM	4	5	5	4.7
ECSRHM	1	0	0	0.3
ECVPH	1	1	0	0.7
<b>TOTAL</b>	<b>42</b>	<b>32</b>	<b>32</b>	<b>35.3</b>
Others (non-EBVS programmes)				
ACVP	5	4	4	4.3
FRCPPath	1	1	2	1.3
<b>TOTAL</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>5.7</b>

\* The last full academic year prior the Visitation

**Table 10.3.2. Number of students registered at postgraduate research training**

Degrees	Number of students			
	2018-2019*	2017-2018	2016-2017	Mean
PhD programmes:				
Veterinary Medicine	21	22	19	20.7
Animal Nutrition	3	2	2	2.3
Veterinary Clinical Studies	0	0	2	0.7
Veterinary Parasitology	1	1	1	1
Cardiovascular Sciences	1	1	1	1
Infection and Immunity	1	1	1	1
Civil Engineering	1	1	1	1
<b>TOTAL</b>	<b>28</b>	<b>28</b>	<b>27</b>	<b>27.7</b>
Masters programmes:				
Master of Veterinary Medicine	46	36	31	37.7
<b>TOTAL</b>	<b>46</b>	<b>36</b>	<b>31</b>	<b>37.7</b>

**Table 10.3.3. Number of students registered at other postgraduate programmes in the Establishment but not related to either clinical or research work (including any external/distance learning courses)**

Programmes	Number of students			
	2018-2019*	2017-2018	2016-2017	Mean
Masters in Veterinary Public Health	5	10	11	8.7
Advanced Practice in Veterinary Nursing	15	10	-	12.5
One Health	4	-	-	-
Wildlife and Livestock Management	8	10	7	8.3



**Table 10.3.4. Number of attendees to continuing education courses provided by the Establishment**

Course	Number of participants			
	2018-2019	2017-2018	2016-2017	Mean
Clinical Club (8 meetings per year) Small animal focus (average number of attendees at each meeting in each year) The full list of titles for all 24 clinical clubs over the last 3-years can be found at Appendix 6.10.2.	42	54	45	47
Nursing Clinical Club – 3 sessions: ‘Practical CPR for nurses’; ‘Common canine and feline intoxications’ and ‘Transfusion medicine’.		Mean = 11		
Groundworks in Haematology and Cytology		15		
PRP CPD Event with VBS Direct		14		
Clinical Nursing Event		105		
Registered Veterinary Nursing – 3 sessions ‘Introduction to suturing for RVN’s’; ‘Advanced suturing for RVN’s’ and ‘Surgical lump removal for RVN’s’.			Mean = 15	
Official Veterinarian (OV) course (3-week course)	13	31	26	23
Introduction to Ultrasound in Small Animal Practice	27	24	22	24
Ultrasound in Small Animal Practice – Level 2	33	33	17	28
Student Veterinary Nurse OSCE Training	20			
Equine CPD covering: (full titles below)*				
1. Mare and Foal	17			
2. Equine Lameness	18			
3. Equine Colic	20			
4. Equine Imaging	18			
Stop! Ewe should think Biosecurity	12	12		12
Sheep lameness – where are we?	12			
Calf health and colostrum management	25			
Calf health, PM and lung scanning	6			
Update on sheep medicine	12			
Health challenges for sheep flocks		12		
Small Ruminant Conditions: Sheep in the UK, what do they do and are they lucky?			200 (mixed attendees)	

\* Help the foal won’t stand!; Bent legs and other foal related surgeries; Medical issues from nursing to weaning; Surgeries to enhance mare breeding; Review/update on lameness assessment; When forelimb lameness isn’t located in the leg; Taking the hocus pocus out of regenerative treatments; Update on laminitis diagnosis and treatment; I’m not sure when to refer; Debunking the myths of colic surgery; Maximising post op care at home; Diagnosing and managing the colitis case; All I’ve got is a tendon probe, what else can I scan?; Maximising radiographic studies while minimising radiation exposure; Endoscopic case discussions; Venturing above the carpus and tarsus.

We expect numbers of students on postgraduate programmes to grow slowly over the next 3-years as the number of students either fully- or part-funded by the School internal funding grows. We expect the number of fully externally funded PhD students to remain static.

One of the roles of the residents (and interns) is to supervise the activities of BVMS5 students on clinical rotations in the respective hospitals so that the undergraduate students are actively involved in managing cases as part of the team. Limitations for 'hands-on' involvement are generally expediency (typically emergency admissions), safety and the individual student's ability. With respect to student ability, the aim of hospital staff is to provide the students with opportunities that enable them to develop over the course of the rotation – initial ability, confidence level, rate of development and aspirations differ between students but close contact with the students, particularly by the residents allows the learning experience to be 'tailored' to an individual's needs. The interns and residents in many ways act as role models and unofficial mentors to the undergraduate students, as they are usually recently graduated and of a similar age. However, a minimal requirement is that each student acts professionally and in a collegiate manner, is able to obtain a relevant medical history, perform a thorough clinical examination, administer medication (under supervision) and work in a manner that is safe for themselves, others and the patients. In these areas, there is no conflict with residents and interns; the residents and interns contribute to the assessment system which enables monitoring of student performance.

An area of potential conflict between students and resident or intern is performing technical skills, e.g. placement of a bandage. Although a judgement is made for every situation, the list of DOPS indicates specific skills and the type of skills that students should be allowed to perform during the rotation. Ensuring that undergraduate students are given these opportunities is prioritised. This is helpful in setting and maintaining expectations for all parties involved.

The situation in the Farm Animal Hospital (SCPAHFS) is somewhat different: Postgraduate clinical training forms a key activity of the group and we are an accredited centre for both ECBHM (European College of Bovine Health Management) and ECSRHM (European College of Small Ruminant Health Management) training. We currently have four ECBHM residency posts and one ECSRHM post and all residents are required to achieve clinical credentials including case-logs, case reports and clinical research. The heart of the teaching activity for the Division revolves around the Galloway Building. Clinical cases (mainly cattle and sheep, but occasionally goats, pigs, poultry and new-world camelids) are referred as donations to the teaching hospital following examination by referring veterinarians in the field. This unique teaching model allows us unprecedented teaching opportunities for the BVMS students as cases belong to the University once referred. Under supervision of a staff clinician and postgraduate clinician, final year students on farm animal rotations are responsible for clinical examination, appropriate diagnostic testing and treatment and follow-up of cases. This allows them a degree of responsibility, treatment planning and record keeping that is an excellent stepping-stone to the demands of veterinary practice; additionally, cases are used by postgraduates for their case logs and clinical case reports. Due to biosecurity restrictions, cases do not return to the farm of origin, but are hospitalised for a variable time dependent on presenting problem. Potential conflicts in case management are avoided by daily discussion in staff clinician-lead clinical rounds regarding on-going 'active' cases and inclusion of both postgraduates and undergraduates in clinical decision-making: an opportunity facilitated by the fact that the cases are owned by the university rather than an external client. Aside from hospital-based teaching, the Division delivers a wide variety of farm animal, food safety and animal welfare teaching across the BVMS and BSc courses by means of lectures, practicals, farm visits, tutorials and problem-based learning (PBL) sessions. These are held at the Garscube campus, the University farm at Cochno and across a number of extra-mural farms for which we provide ambulatory and / or routine clinical consultancy services. Postgraduate students participate in all aspects of teaching delivery, but are primarily focussed on practical clinical teaching, particularly routine farm visits. We have two large (>500 cow) dairy herds for which we are contracted to provide routine clinical services based around a weekly fertility visit and herd health discussion and the postgraduate students lead in the delivery of this including report writing. Undergraduate students accompany the postgraduates on the farm visits and participate in weekly herd health discussions, all of which is under overall clinician supervision. This allows an opportunity for both postgraduate and undergraduate teaching as well as developing a number of clinical research projects and clinical case reports. In 2018 we started a novel clinical service in association with Scotland's Rural College (SRUC) to provide gross post-mortem

services for ruminants which would then contribute to the SRUC Disease Surveillance network. This has greatly strengthened our links with SRUC across a range of facets and has enabled diagnostic and surveillance work in an area of Scotland, which up until now was not well represented. Postgraduate students contribute to the provision of this service, which supplements their learning and provides case material for undergraduate teaching.

Members of staff deliver CPD both internally (for the School) and externally (nationally and internationally). Focussing on internally delivered CPD, staff provide bespoke courses, such as introductory and advanced ultrasound in small animals, and the very successful OV Course, run for Food Standards Scotland. More general CPD is provided by the Small Animal Hospital Clinical club, which delivers monthly CPD for 8 months of the year (for two hours on the last Thursday of every month). This CPD club has been running for over twelve years and practitioners from across the central belt of Scotland benefit from a wide range of topics (including some non-clinical subjects) delivered in a relaxed and varied format (including lectures, practical and interactive sessions). Each session attracts 30 – 50 delegates and feedback is very positive (available if required). Our delegates suggest topics and themes for the next season so that the club endeavours to meet the needs of our local community veterinary surgeons. Ongoing sponsorship means that refreshments and dinner are also provided. The club is run by keen clinicians and residents with a passion for being able to provide tailored enjoyable local CPD, they are supported by an administrative assistance with the same passion for CPD. A small group of enthusiastic BVMS students attend as stewards and help with set-up and benefit from free attendance for every talk.

#### **10.4 How research activities provide opportunities for student training and staff promotion, and how research approaches, methods and results are integrated into the veterinary teaching programmes**

The School of Veterinary Medicine Quality Enhancement Committee oversees quality assurance across all aspects of SVM work (described in detail at section 1.4)

Since the implementation of the new curriculum in 2013, the performance of the curriculum and its component parts has been subjected to an annual School-level review process and University-level Periodic Subject Review. In turn, the separate phases of the curriculum are critically examined. This includes assessment of the requirements to provide each of the particular aspects of research-related teaching outlined in section 10.2. As these aspects of the curriculum appear throughout the programme there is constant scrutiny of research-related teaching.

The College of MVLS Graduate School and its Higher Degrees Committee oversee all postgraduate research programmes (both by research and taught) within the College. Within the School, our own Graduate School (led by PG Convenor Dr. Peter Hastie) is responsible for review of all postgraduate research students. All students go through an annual review of their work and progress to date with at least two independent assessors. Dr. Hastie provides information to the School's Research and Postgraduate Committee (chaired by Professor Tim Parkin). This committee meets approximately six times per year and is responsible for shaping the research direction of the School, assessing and making decisions on internal funding calls (PhDs and Small Grants), reviewing and advising on the research proposals that accompany applications for new Clinical Residencies and ensuring that other postgraduate or research issues within the School are addressed or promoted as appropriate.

All School-wide communications are made via the weekly School Newsletter and individual decisions about applications are communicated (with feedback if necessary) via direct email and face-to-face meetings. Our webpages (and facebook/twitter accounts) are the primary methods used to communicate necessary information to our stakeholders regarding continuing education. At all CPD events feedback is sought about the current programme and requests are made for suggestions as to what would be the most appropriate subjects for future CPD series. There is constant evaluation of each CPD event and popular, well reviewed provision is repeated as and when requested.

### **Comments on Standard 10**

Funding for clinical veterinary research of most relevance to clinical colleagues remains difficult. Hence the programme we have put in place using Veterinary Fund Bequests and Donations to fund both PhDs and small grants. It is important to note that all PhDs funded through this scheme must have Co-PIs from one of our affiliate research institutes, thus exposing the postgraduate student to a full range of research opportunities and skills. We are encouraged by the continued interest in research by a small but significant proportion of the undergraduate student population.

### **Suggestions for improvement on Standard 10**

Further development of ways to expose our undergraduate students to the opportunities of a career in research are a priority. This year we combined a 'Garscube PhD afternoon' with an Inspire activity to better integrate undergraduate students with early career researchers in the hope that they will understand exactly how varied the life of Veterinary Researcher can be.

We aim to develop a more robust method of understanding exactly how effective Vet Fund small grants are at generating future larger externally funded research grants.

**ESEVT Indicators (see Annex 4)**

**Complete the raw data in the Excel file and include here the calculated Indicators**

<b>Name of the Establishment: School of Veterinary Medicine, University of Glasgow</b>					
<b>Date of the form filling: 10th March 2020</b>					
<b>Calculated Indicators from raw data</b>		<b>Establishment values</b>	<b>Median values<sup>1</sup></b>	<b>Minimal values<sup>2</sup></b>	<b>Balance<sup>3</sup></b>
<b>I1</b>	n° of FTE academic staff involved in veterinary training / n° of undergraduate students	0.128	0.160	0.126	0.002
<b>I2</b>	n° of FTE veterinarians involved in veterinary training / n° of students graduating annually	0.591	0.869	0.590	0.001
<b>I3</b>	n° of FTE support staff involved in veterinary training / n° of students graduating annually	1.024	0.943	0.566	0.458
<b>I4</b>	n° of hours of practical (non-clinical) training	425.000	905.67	595.00	-170.000
<b>I5</b>	n° of hours of clinical training	744.000	932.92	670.00	74.000
<b>I6</b>	n° of hours of FSQ & VPH training	271.500	287.00	174.40	97.100
<b>I7</b>	n° of hours of extra-mural practical training in FSQ & VPH	16.000	68.00	28.80	-12.800
<b>I8</b>	n° of companion animal patients seen intra-murally / n° of students graduating annually	144.722	70.48	42.01	102.713
<b>I9</b>	n° of ruminant and pig patients seen intra-murally / n° of students graduating annually	1.768	2.686	0.464	1.305
<b>I10</b>	n° of equine patients seen intra-murally / n° of students graduating annually	5.313	5.053	1.298	4.015
<b>I11</b>	n° of rabbit, rodent, bird and exotic seen intra-murally / n° of students graduating annually	1.377	3.353	1.545	-0.168
<b>I12</b>	n° of companion animal patients seen extra-murally / n° of students graduating annually	25.388	6.796	0.223	25.165
<b>I13</b>	n° of individual ruminants and pig patients seen extra-murally / n° of students graduating annually	63.795	15.948	6.295	57.500
<b>I14</b>	n° of equine patients seen extra-murally / n° of students graduating annually	35.194	2.106	0.595	34.599
<b>I15</b>	n° of visits to ruminant and pig herds / n° of students graduating annually	20.876	1.333	0.547	20.329
<b>I16</b>	n° of visits of poultry and farmed rabbit units / n° of students graduating annually	0.000	0.115	0.045	-0.045
<b>I17</b>	n° of companion animal necropsies / n° of students graduating annually	1.884	2.074	1.400	0.484
<b>I18</b>	n° of ruminant and pig necropsies / n° of students graduating annually	2.272	2.324	0.970	1.302
<b>I19</b>	n° of equine necropsies / n° of students graduating annually	0.232	0.303	0.093	0.139
<b>I20</b>	n° of rabbit, rodent, bird and exotic pet necropsies / n° of students graduating annually	0.267	2.051	0.693	-0.426
<b>I21*</b>	n° of FTE specialised veterinarians involved in veterinary training / n° of students graduating annually	0.270	0.196	0.063	0.206
<b>I22*</b>	n° of PhD graduating annually / n° of students graduating annually	0.038	0.15	0.09	-0.050
<b>1</b>	Median values defined by data from Establishments with Approval status in April 2016				
<b>2</b>	Recommended minimal values calculated as the 20th percentile of data from Establishments with Approval status in April 2016				

**Equine Clinical Sciences**

Dixon	Claire	Miss	Clinician in Equine Medicine	1	MRCVS
Hotchkiss	Joel	Dr	Lecturer	1	MRCVS
McMaster	Mattie	Miss	Clinician in Equine Surgery	1	MRCVS
Parkin	Timothy	Professor	Professor of Veterinary Epidemiology	1	MRCVS
Sutton	David	Dr	Senior Veterinary Clinician (Equine Medicine)	1	MRCVS
Tannahill	Victoria	Miss	Clinician in Equine Surgery	1	MRCVS
Voute	Lance	Dr	Senior Veterinary Clinician in Equine Medicine	1	MRCVS

**Farm Animal Clinical Sciences**

Denholm	Katharine	Mrs	Veterinary Clinical Teacher in Farm Animal	0.6	MRCVS
Ellis	Kathryn	Dr	Senior Veterinary Clinician	0.6	MRCVS
Hamer	Kim	Miss	Veterinary Clinician	1	MRCVS
Hotchkiss	Emily	Dr	Veterinary Clinical Teacher in Farm Animal	0.4	MRCVS
King	George	Mr	Veterinary Clinician	1	MRCVS
Mihm Carmichael	Monika	Dr	Senior Lecturer- Farm Animal Reproduction	0.8	MRCVS
Orr	Jayne	Miss	Lecturer	1	MRCVS
Tomlinson	Martin	Mr	University Clinician	1	MRCVS
Viora	Lorenzo	Dr	Veterinary Clinician	1	MRCVS

**Small Animal Clinical Sciences**

Addison	Elena	Miss	Clinician in Small Animal Surgery	1	MRCVS
Ashworth	Sophie	Mrs	Veterinary Clinician	1	MRCVS
Bell	Andrew	Mr	Senior Academic Clinician	1	MRCVS
Brannan	Nicola	Mrs	Small Animal Diagnostic Imager	0.8	
Cameron	Gillian	Mrs	Small Animal Diagnostic Imager	1	
Corr	Sandra	Professor	Professor in Small Animal Orthopaedic Surgery	1	MRCVS
Fontaine	Samantha	Ms	Lecturer	1	
Gordon	Caroline	Dr	Clinician in Diagnostic Imaging	0.4	MRCVS
Gutierrez Quintana	Rodrigo	Mr	Senior Veterinary Clinician in Small Animal Neurology	1	MRCVS
Hammond	Gawain	Mr	Senior Veterinary Clinician - Small Animal Imaging	1	MRCVS
Helm	Jenny	Miss	Senior Veterinary Clinician in Small Animal Oncology	0.8	MRCVS
Jose-Lopez	Roberto	Mr	Veterinary Clinician	1	MRCVS
King	Alison	Dr	Senior Lecturer - Small Animal Diagnostic Imaging	0.8	MRCVS
Kropf	Josephine	Ms	Clinician in Veterinary Anaesthesia	1	MRCVS
Lopes	Mariana	Ms	Clinician	1	MRCVS
Marshall	William	Mr	Clinician in Small Animal Surgery	1	MRCVS
McBrearty	Alix	Mrs	Veterinary Clinician	0.7	MRCVS
McInerney	Jennie	Ms	University Lecturer - Clinical	0.8	MRCVS
McKenzie	Jennifer	Miss	Veterinary Clinician (Out of Hours)	1	MRCVS
Morris	Joanna	Professor	Professor of Veterinary Oncology	1	MRCVS
Murison	Pamela	Professor	Professor in Veterinary Anaesthesia	1	MRCVS
Pawson	Patricia	Dr	Senior Veterinary Clinician in Anaesthesia & Analgesia	0.8	MRCVS
Piening	Yasmine	Dr	University Clinician	1	MRCVS



Pizarro del Valle	Jose Carlos	Dr	Clinician in Emergency Critical Care	1	MRCVS
Ramsey	Ian	Professor	Professor of Small Animal Medicine	1	MRCVS
Ridyard	Alison	Ms	Senior Clinician	1	MRCVS
Stalin	Catherine	Mrs	Senior University Clinician	0.6	MRCVS
Ward	Patricia	Miss	Veterinary Clinician in Small Animal Medicine	1	MRCVS
Woodhouse	Kerry	Dr	Senior Clinician in Veterinary Anaesthesia	1	MRCVS
Yool	Donald Andrew	Professor	Professor in Small Animal Soft Tissue Surgery	1	MRCVS
<b>Veterinary Pathology, Public Health &amp; Disease Investigation</b>					
Allan	Kathryn	Dr	Clinician in Veterinary Infectious Disease	1	MRCVS
Busin	Valentina	Dr	Veterinary Clinician in Disease Investigation	1	MRCVS
Cameron	Ewan	Professor	Professor	1	MRCVS
Gray	Alexander	Mr	Clinician in Veterinary Pathology, Public Health and Disease Investigation	1	MRCVS
Haining	Hayley	Dr	Senior Veterinary Clinician in Clinical Pathology	1	MRCVS
Johnston	Pamela	Dr	Senior Clinician	1	MRCVS
Marchesi	Francesco	Dr	Senior University Clinician	1	MRCVS
Mellor	Dominic	Professor	Professor of Epidemiology and Veterinary Public Health	1	MRCVS
Millins	Caroline	Dr	Clinician in Anatomic Pathology	1	MRCVS
Rupp	Angelika Frances	Dr	Clinician in Veterinary Pathology	1	MRCVS
Waugh	Eispeth	Ms	Clinician in Veterinary Clinical Pathology	1	MRCVS
Weir	William	Dr	Senior University Clinician	1	MRCVS
Yusta	Noelia	Ms	Lecturer	1	MRCVS
<b>Veterinary Science &amp; Education</b>					
Anderson	Louise	Ms	Lecturer	1	MRCVS
Anderson	Thomas	Professor	Professor of Veterinary Neurology and Neurosurgery	1	MRCVS
Carman	Maureen	Mrs	Lecturer	0.8	MRCVS
Dowell	Fiona	Dr	Senior Lecturer in Veterinary Pharmacology	1	
Everest	Paul	Dr	Senior Lecturer	1	
Eynon	Paul Andrew	Mr	Lecturer	1	MRCVS
Hammond	Jennifer	Mrs	Senior Lecturer	0.6886	MRCVS
Hastie	Peter	Dr	Senior Lecturer	1	
Jeffcoate	Ian	Dr	Senior Lecturer	1	
MacEachern	Karen	Dr	Senior Lecturer	1	MRCVS
Marshall	Zamantha	Dr	Lecturer	1	MRCVS
McDonald	Hayley	Dr	University Clinician	1	MRCVS
McLaughlin	Mark	Dr	Lecturer in Veterinary Anatomy	1	
Nasir	Lubna	Professor	Professor of Comparative Oncology	0.9	
Nicolson	Lesley	Dr	Senior Lecturer in Veterinary Biosciences	0.9	
Roberts	Mark	Professor	Professor of Molecular Bacteriology	1	
Wolfe	Elizabeth	Miss	Lecturer	1	
Yam	Philippa	Dr	Senior Lecturer in Veterinary Biosciences	0.5	MRCVS

The table below summarises the Title, Course code, position in the curriculum, module names and whether each is compulsory or elective. See Table 3.1.1. for curriculum hours in each academic year taken by each student.

<b>Title</b>	<b>BVMS1</b>	<b>BVMS2</b>	<b>BVMS3</b>	<b>BVMS4</b>	<b>BVMS5</b>
<b>Course Code</b>	VETMED1022 VETMED1023	VETMED2022 VETMED2023	VETMED3022 VETMED3023	VETMED4019 VETMED4021	VETMED5042 VETMED5043
<b>Credit value</b>	Notional 120	Notional 120	Notional 120	Notional 120	Notional 180
<b>Position in Curriculum (year, semester)</b>	1 <sup>st</sup> year, Semester 1 and 2	2 <sup>nd</sup> year, Semester 1 and 2	3 <sup>rd</sup> year, Semester 1 and 2	4 <sup>th</sup> year, Semester 1 and 2	5 <sup>th</sup> year, Full year
<b>Modules (compulsory or elective – indicated by *)</b>	Six modules – all compulsory: 1. Getting Started: A Little Bit of Everything 2. Natural Defences 3. Digestion 4. Infectious Agents 5. Reproduction 6. Urinary System	Six modules – all compulsory: 7. Skin and Bones 8. Neural Networks 9. Breathe Easy – Respiration 10. In A Heartbeat – Cardiovascular System 11. Niche Species 12. Integrated Body Systems	Seven modules – all compulsory: 13. Being A Vet Is Being Professional 14. Supporting the Patient 15. Cardiorespiratory & Haemopoietic 16. Alimentary 17. Urinary Endocrinology & Oncology 18. Ruminant Production 1: Birth To Point Of Production 19. Veterinary Public Health – Aspects of Food Safety.	Seven modules – all compulsory: 20. Global Veterinary Medicine 21. Ruminant Production 2 22. Reproduction & Fertility 23. Neurolocomotor 24. Skin, Eye, Niche Practice & Pets, Zoo/Wildlife 25. 25a. Intensive Farming Medicine; 25b. Business & Financial Skills	Six Core rotations – all compulsory plus two elective* rotations: 1. Core Skills In Equine Practice 2. Core Skills In Production Animal Practice 3. Core Skills In Small Animal Practice 4. Core Skills In Anaesthesia & Diagnostic Imaging 5. Core Skills In Public Health & Pathology 6. Core Skills In Emergency And Critical Care In addition, each student does 2 Selectives*.



University of Glasgow

Garscube campus map



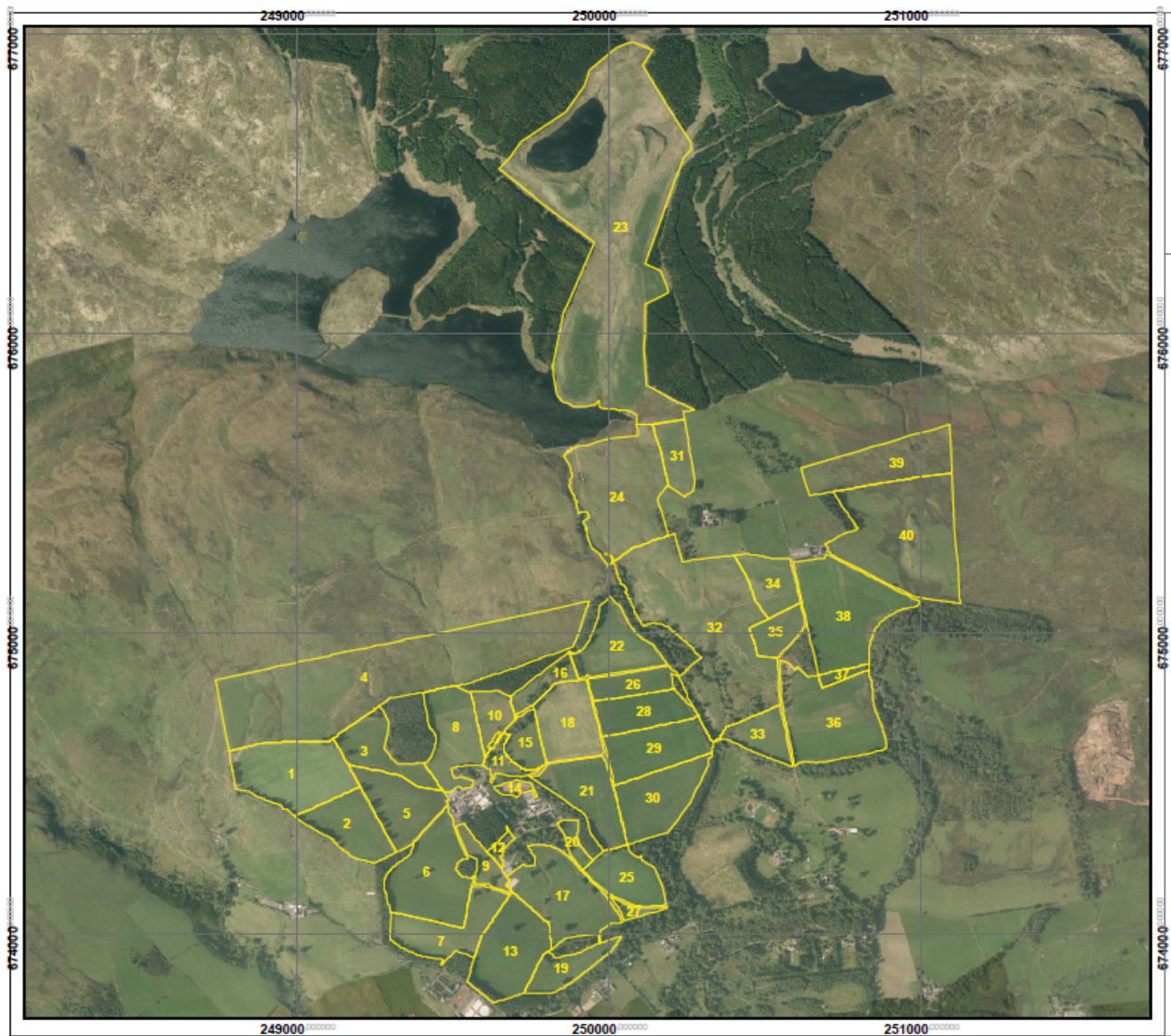
- A** Acre Road
  - B** Beatson Institute & Wolfson Wohl Cancer Research Centre
  - G** Garscube Sports Pavilion
  - K** Kelvin Campus
  - N** North Lodge
  - S** Small Animal Hospital
  - V** School of Veterinary Medicine
  - W** Weipers Centre for Equine Welfare
- ..... Site Boundary
  - Vehicular Access
  - Pedestrian/Cycling Access
  - Jogging Track
  - P** Main Car Parks
  - B** Bus Stops
  - P** Cycle parking
  - I** Gate
  - Ⓜ** Security Checkpoint / Information
  - Ⓜ** Observatory
  - Ⓜ** Kelvin Conference Centre

Key to buildings and departments

Alastair Currie Building	B3
Astronomy - Observatory	A1
Cancer Research UK Building (Beatson Institute)	B1
Cancer Research UK external store	B4
Estates & Buildings office/workshop	V24
Fleming Pavilion	A4
Gardener's house	H5
Garscube Maintenance Building	G2
Garscube Sports Pavilion	G1
Greenhouse	H6
Henry Wellcome Building for Comparative Medical Sciences	V21
Home Farm Building 1	H3
Home Farm Building 2	H2
Ian Botham Building	V15
Indoor Riding Arena	V4
Jarrett Building	V17
Kelvin Conference Centre	K1
Main Gatehouse	H1
McCall Building	V9
MacRobert Wing	V16
Mary Stewart Building	V5
MRC-University of Glasgow MRI Facility	V23
Naval Architecture & Marine Engineering - Tank	A2
Wellcome Surgical Institute	V19
North Lodge	N
Pavilion caretaker's house	H4
Scottish Centre for Production Animal Health and Food Safety	V14
Sir Michael Stoker Building	V6
South Lodge	V12
Alexander Stone Building	B2
Tennis Pavilion	H7
Urquhart Building	V22
Weipers Centre for Equine Welfare	V3
Weipers Stable Block 1	V2
Weipers Stable Block 2	V25
Wind Tunnel - Acre Road	A3
Wolfson Hall - A Block (student residents)	K2
Wolfson Hall - B Block (students & staff)	K3
Wolfson Hall - C Block	K4
Wolfson Hall - D Block	K5
Wolfson Hall - E Block (students & staff)	K6
Wolfson Hall - Amenity Block	K7
Wolfson Wohl Cancer Research Centre	B5

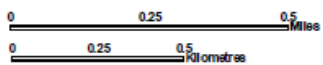
Updated April 2017

The University operates a 24hr CCTV surveillance system for the purpose of crime prevention and safety. For further information telephone: 0141 330 4282



**K** Scale 1:15,000  
 1 cm equals 150 Metres  
 1 cm equals 164 Yards  
 1 inch equals 417 Yards

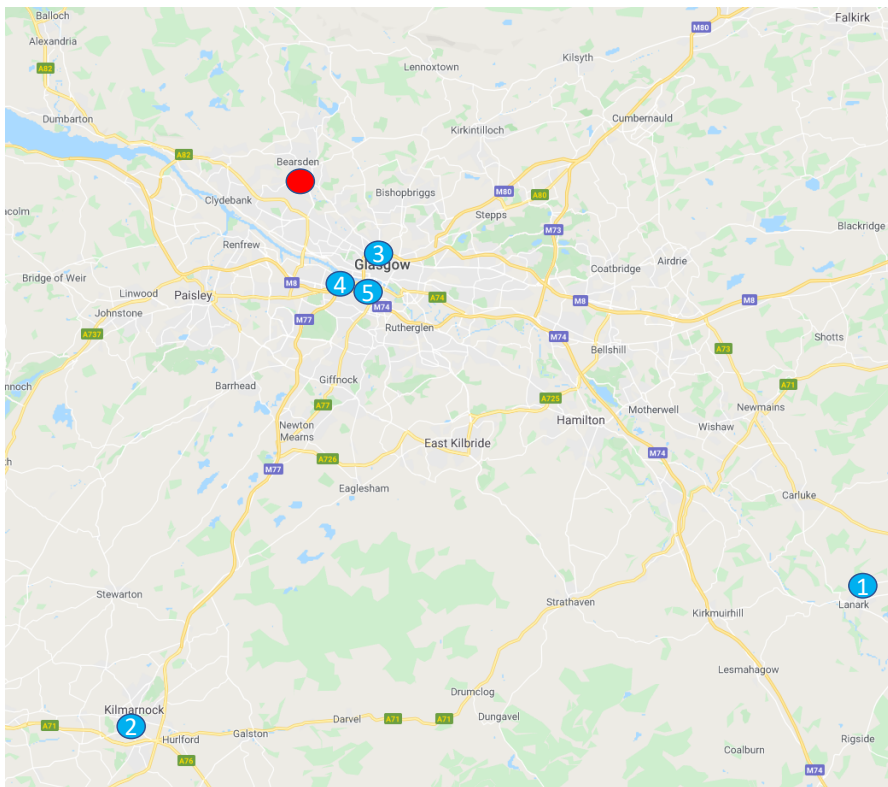
**Yellow** Land Parcel Boundary



*In order to comply with Ordnance Survey licence conditions this IACS Land Parcel map can only be used by you or your agent for official dealings with the Scottish Government. If you wish to use this map for any other purpose you are required to enter separate licensing arrangements with Ordnance Survey.*







University of Glasgow,  
School of Veterinary Medicine ●

**Off-site core vet practices**

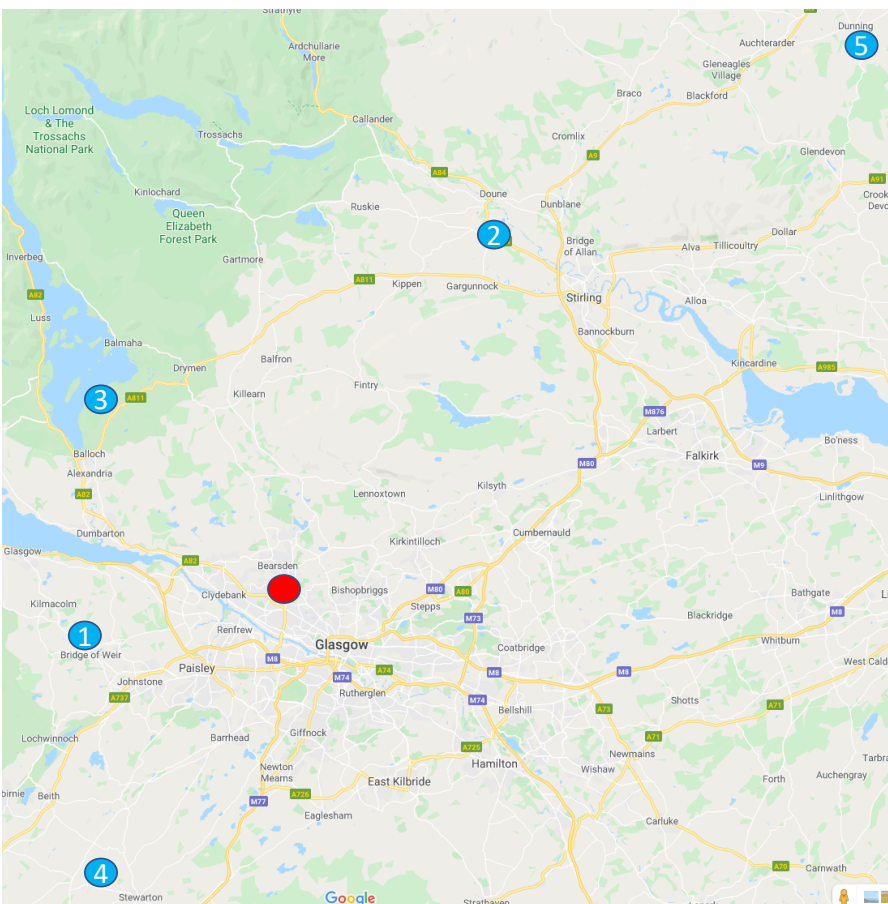
Clyde Veterinary Group  
(equine & production animal; 34 miles) ①

MBM Veterinary Group  
(equine; 26 miles) ②

PDSA Pet Aid Hospital  
(small animal; 4 miles) ③

Scottish SPCA (small  
animal; 5 miles) ④

Dermatology Referral  
Services (mixed, although  
mainly small animal; 5  
miles) ⑤



University of Glasgow,  
School of Veterinary Medicine ●

**Off-site core farms**

Kaimhill farm (dairy – 160  
cows; 15 miles) ①

Meldrum farm (large dairy  
– 800 cows; 38 miles) ②

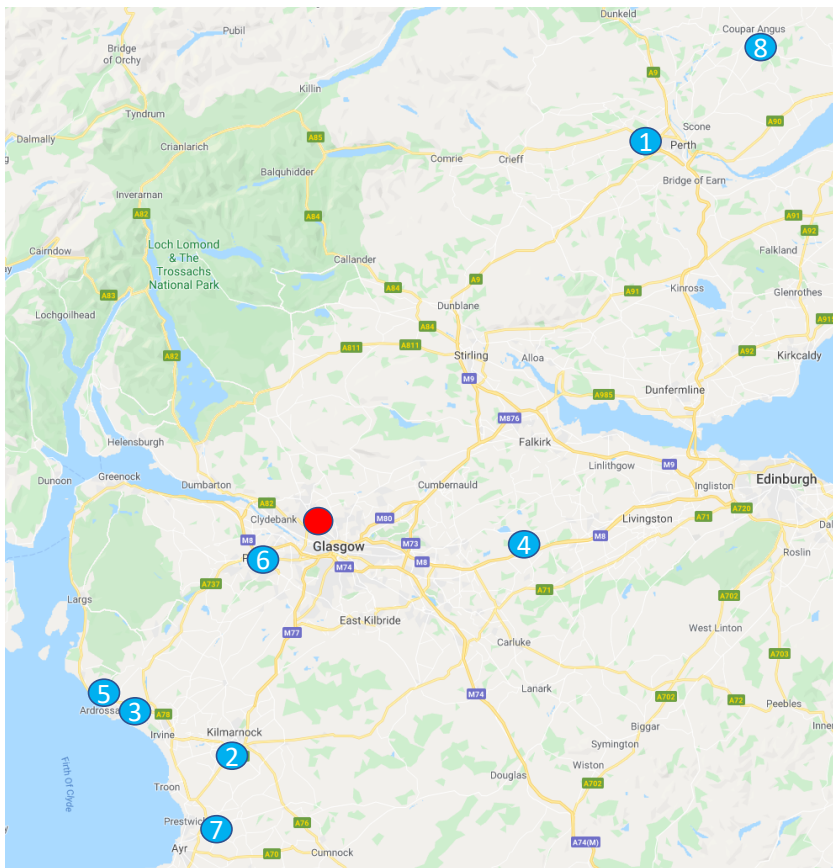
Portnellan farm (organic  
beef; 18 miles) ③

**Off-site selective farms**

Clerklands (dairy goat; 26  
miles) ④

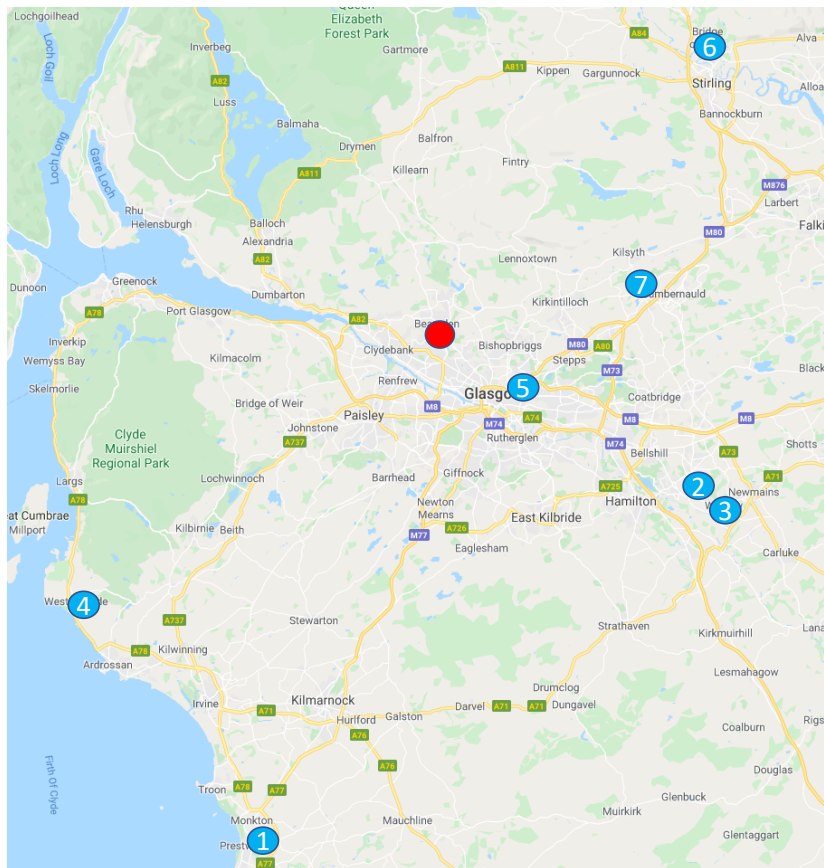
Rossiebank farm (large  
dairy – 500 cows; 62 miles) ⑤





University of Glasgow,  
School of Veterinary Medicine ●

- Abattoirs**
- Anglo Beef Processors (beef; 64 miles) ①
- Braehead Foods ( game birds & poultry; 25 miles) ②
- Highland meats (beef; 30 miles) ③
- James Chapman butchers (beef, pigs, sheep; 27 miles) ④
- Robertsons (pigs; 32 miles) ⑤
- Sandyford (beef, sheep; 10 miles) ⑥
- SRUC (poultry; 40 miles) ⑦
- 2 Sisters Food Group (poultry; 80 miles) ⑧



University of Glasgow,  
School of Veterinary Medicine ●

- Foodstuff processing units**
- Belchers (read-to-eat products, cutting plant; 36 miles) ①
- Caledonian proteins (Cat.3 processing plant; 20 miles) ②
- Chapmans (butchers & cutting plant; 23 miles) ③
- Cumrae seafood (oyster beds, depuration plant; 40 miles) ④
- Fish market (industry, freshness assessment, auditing, holding tanks; 8 miles) ⑤
- Grahams dairy (dairy processing plant; 37 miles) ⑥
- Grayshill (fallen stock plant; 16 miles) ⑦

# BVMS Programme Assessment Policy

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## The Aim of the Policy

The aim of the assessment policy is to provide a clear guidance for course teams and a consistent and effective approach to assessment across the BVMS programme. The policy is designed to be used in conjunction with guidance from the University of Glasgow Learning Enhancement & Academic Development Service and Senate office as well as the relevant guidance from the College of Medical Veterinary and Life Sciences.

## Scope of the Policy

The policy relates specifically to the BVMS programme although many of the elements will be common to the other programmes at the School of Veterinary Medicine. Extensive consultation on the BVMS Curriculum, including assessment, has included staff, students, employers and external examiners.

The policy should be considered in conjunction with the [Programme Assessment information](#) which is made available to students, staff and external examiners via the School's Virtual Learning environment. The Programme assessment information links can be found at the end of this document.

## Review

The policy will be reviewed by the School Learning and Teaching committee on an annual basis, with amendments recommended based on consultation with the relevant individuals and groups.

## Other related Policies, Codes and Procedures

The policy relates to the following documents:

1. [The University of Glasgow Assessment Policy](#)

The policy sets out the principles that underpin the way assessment is undertaken in this institution and outlines the roles and responsibilities that inform assessment practices. Good practice examples are also provided.

2. [The University of Glasgow Regulations](#)

Academic regulations and key procedures are published in the *University Regulations*. The Regulations include the Code of Assessment. Students are assessed based on regulations described in the Regulations of the year of their enrolment on the Programme.

3. [The University of Glasgow Code of Assessment](#)

The definitive version of the Code of Assessment is published in the University Regulations at the link above

#### 4. [The Guide to the Code of Assessment](#)

This guide to the Code contains some worked examples of how to apply the code in particular situations

### Principles of assessment

The School of Veterinary Medicine adopts the assessment principles set out in the University of Glasgow Assessment Policy (2.1), stating that assessment should be:

- Fair and equitable
- Reliable
- Valid
- Evidence-informed
- Academically defensible

### Purpose of assessment in the BVMS programme

The purpose of assessment in the BVMS programme is:

- To provide feedback to students on their learning
- To provide feedback to staff on course design, teaching and student learning
- To judge whether and to what extent students have met the intended learning outcomes of the course/year
- To establish whether students have the necessary knowledge and skills to progress to the next stage of the programme
- To maintain standards and provide information to accrediting bodies, employers and the public about the knowledge and skills of students and graduates of the programme

### Design of assessment

Design processes are supported by the University's guidance: [Course & Programme design](#) and reflecting the principles outlined above and in the University assessment policy.

### Assessment of Intended Learning Outcomes

The Intended Learning Outcomes of the BVMS Programme are described in terms of Programme Outcomes (outcomes of the overall BVMS Programme) which are related to specific phase outcomes describing the expected performance of students at the end of each phase of the Programme. Phase outcomes relate to year outcomes – the specific outcomes for each year of the phase. Learning opportunities and teaching events within modules and rotations are all designed to deliver the course/year intended learning outcomes.

The course/year intended learning outcomes are used to plan and design assessment. The course leader is responsible for planning assessment for each course to ensure that each year-level intended learning outcome is assessed. This process is known as Blueprinting. A formal record of

the blueprint for the examination should be submitted to the external examiner as part of the assessment review process. A copy will also be kept on record by the Undergraduate school.

The Curriculum mapping process required for Blueprinting (and consistent with section 5 of the University assessment policy) includes mapping course/year-level Intended learning outcomes (ILOs) to teaching and learning activities. The blueprint demonstrates how the course/year level ILOs are assessed through the course assessments.

## Selection of Assessment methods

Assessment methods for each course are described in the course information and form an element of the programme of assessment which runs through all three phases. For this reason, a change to the assessment methods for a course may be considered a *major change* and if so, would be subject to the University course review and approval process.

Within the course assessments there will be some elements which may vary over time; these may include the formative and coursework assessments for each module and the specific question formats used in written examinations.

Assessment methods are selected based on the intended learning outcome(s) to be assessed, giving due consideration to validity, reliability and feasibility.

Validity – does the assessment assess what it is intended to assess?

Reliability – is the assessment fair and consistent in making pass/fail and grading decisions?

Feasibility – can the assessment be effectively delivered with the available resources?

Assessment in the context of the BVMS programme encompasses two distinct but related themes: clinical competency and knowledge & application. This reflects the nature of the professional degree programme, which must meet the competency requirements of the accrediting bodies as well as the academic standards of the university.

Assessment methods are selected for each theme based on the stage of training. To ensure students have the opportunity to become familiar with different assessment methods, there is consistency in assessment methods used within each phase and often between different phases of the programme.

Table 1 provides a summary of the summative assessment formats used in the BVMS programme:

**Table 1: Assessment formats employed in the BVMS programme**

<b>Assessment Type</b>	<b>Typical question length</b>	<b>Typical question format</b>	<b>In BVMS Programme these are used to assess...</b>
Multiple choice questions (MCQ)	1 minute per question	Stem plus 5 options Single best answer	Knowledge Comprehension Application
Practical spot questions	2 minutes per question	Image, sample or specimen provided.	Knowledge Comprehension Application
Modified Essay questions (MEQ)	30 minutes per question	Multiple short answers components e.g.  Single sentence, words, labels or short description  Bullet points, diagram, table or short notes	Knowledge Comprehension Application Synthesis
Extended matching questions (EMQ)	6 minutes per question	Stem plus multiple options 4 cases (diagnosis &/or case management)	Comprehension Application Analysis Synthesis
Data interpretation questions (DI)	6 or 10 minutes per question	Data: test results, ECG, population data, dose calculation, experimental data etc. 3-5 sections based on data analysis either short answer, form completion or multiple response formats.	Analysis Synthesis Evaluation Application
Clinical decision making questions (CDM)	Typically 6 minutes per question	Stem: Clinical case information presented (may include images etc) based on diagnosis and case management Response: 2-3 sections either short	Knowledge Application Synthesis

		answer, form completion or multiple response formats.	
Objective structured clinical examinations (OSCE)	6 minutes per question	Assessor and student information sheets and mark scheme	Practical, Clinical and Communication skills
Directly observed Procedural skills (DOPS)	Approx. 10-20 minutes per DOPS	Openly available mark scheme	Practical & Clinical & Professional skills
Professional Portfolio	N/A	Specified minimum number of assets submitted as a structured electronic Portfolio	Clinical & Professional Skills Synthesis and Evaluation Reflection
Continuous assessment tasks	Various – typically open book so no time limit	Different formats typically include presentation, poster, research proposal or factsheet	Practical & Clinical & Professional skills Application Analysis Synthesis and Evaluation



Assessment methods used in each phase are shown in table 2

**Table 2: Assessment methods used in each phase**

Phase	Assessment of knowledge and understanding	Assessment of clinical competency
<b>Foundation</b>	Multiple choice questions Modified Essay questions Data interpretation questions Practical spot questions Continuous Assessment Tasks	Directly observed procedural skills Objective structured clinical examinations Professional Portfolio
<b>Clinical</b>	Multiple choice questions Practical spot questions Extended matching questions Clinical decision making questions Continuous Assessment Tasks	Directly observed procedural skills Objective structured clinical examinations Professional Portfolio
<b>Professional</b>	Extended matching questions Clinical decision making questions	Directly observed procedural skills Professional Portfolio

## Progression in assessment

The University Assessment Policy (section 3.4) advocates a student centred approach to assessment, with a focus on:

- Assessment **of** learning: summative course assessments
- Assessment **for** learning: provides formative feedback on performance which will aid further learning
- Assessment **as** learning: students engaging in self-assessment with the gathering and interpretation of evidence to inform and plan future personal learning strategies, and the development of students as self-regulated learners.

Within the courses of the BVMS Programme, assessment design includes all three elements.

- Summative course assessments which consist of two assessment categories: Knowledge & Application and Competency.
- Formative course assessments which provide opportunities to encounter assessment techniques which will be used for summative assessment and provide timely feedback on learning.

The Professional portfolio, which has both summative & formative roles, focuses on gathering and interpretation of evidence to inform and plan future personal learning strategies.

Competency assessment methods include OSCEs, DOPS and Portfolio (see Table 1) and are

designed to demonstrate progression in skills across each of the three phases of the programme. For example, in the early Foundation and Clinical phases of the programme the OSCE is used to assess clinical skills in simulated situations, with the DOPS and Portfolio representing a smaller proportion of the competency assessment. Later on in Professional phase, the DOPS and Portfolio become the more important element of competency assessment as students develop and evidence their clinical skills in real-life settings.

Assessment of knowledge and understanding follows a similar progression across the programme, reflecting the expectations that students are increasingly able to integrate information from different parts of the Programme and demonstrate the higher academic skills such as synthesis, evaluation and analysis. For example, Foundation phase assessment methods such as the modified essay question and data interpretation question provide a structured approach to assessing these skills, which is then developed through the clinical decision making questions used later in the programme where this knowledge and understanding is assessed in specific clinical scenarios.

## Assessment Criteria

The University Assessment policy (section 6.1) stipulates that an understanding of the criteria against which pieces of work are assessed is essential for both markers and students.

In the context of the BVMS Programme, the approach to this may vary depending on the purpose and nature of assessment.

For summative course assessments students are provided with intended learning outcomes and grade descriptors (either Schedule A or Schedule B) which describe the criteria for award of a given grade. Programme assessment information describes how the outcomes of individual assessments are interpreted in the grading process. Detailed descriptions of assessment criteria may be provided for summative assessment formats such as DOPS (Directly Observed Procedural Skills) and Professional Portfolio.

For formative course assessments the assessment criteria will be clearly stated and where possible, students invited to self-assess against the criteria before submitting work.

## Standard setting

Standard setting describes the process used to determine the passing standard for a given assessment. The School of Veterinary Medicine employs a criterion referenced standard setting process consistent with Part 2 of the Guide to the Code of Assessment. Standard setting procedures are used where a conversion scheme must be employed to translate numerical marks (derived from relatively objective assessment formats) to grade bands on the 22-point scale

The two methods currently used are the Angoff method (for written test items) and the Borderline Regression method (for OSCE assessment).

## Post-exam processes

Steps are taken after each assessment to ensure the fairness and reliability of the assessment process.

## Marking & Moderation

The guidance on marking and moderation is based on the [Good practice guidelines](#) developed by the University of Glasgow with reference to the QAA Code of practice for the assurance of academic quality and standards in higher education: Assessment of students.

Double marking is not required routinely for non-honours assessments and in the context of the BVMS programme double marking will only be applied to the Professional Portfolio where it represents over 80% of the competency assessment for a course.

The good practice guidelines state:

“Every individual summative assessment which forms part of the assessment scheme for a course must be moderated. The process of moderation will depend to some extent on how each particular assessment is marked.”

In the context of the BVMS programme, moderation is required for:

- Professional Portfolio where it represents 20% or less of the competency assessment for a course
- Clinical decision making questions
- Data interpretation questions
- Modified essay questions

The process requires 10% of the marked scripts for each assessment to be moderated by the course co-ordinator or a nominated representative. Good practice guidance is applied as follows:

Where there are only one or two minor disagreements there should be a discussion with the initial marker and, in individual cases the mark may be adjusted with the basis for the agreement on the mark awarded being noted. If discrepancies are not minor the phase leader should be brought in to help in the process of resolving the dispute.

Where there is significant variation between the marking of the moderator and that of the initial marker which does not involve consistent variation in one direction a further sample should be reviewed by another moderator (this may be the external examiner). If this suggests a similar pattern, all of the grades [marks] awarded by the initial marker must be reviewed by him/her in light of the feedback from the two moderators. This will typically result in a re-mark for the question.

In cases where there is a consistent disagreement in one direction, a further sample should be selected and reviewed. If this discloses the same consistent variation then there should be a discussion with the initial marker and agreement should be reached on a course of action which may involve all of the assessments marked by the marker concerned being adjusted as suggested by the consistent variation (e.g. question pass mark reduced). The local exam rules (available on request) provide specific guidance on how this should be done.

## Post-exam analysis

The performance of individual exam questions are reviewed after the examination based on specific criteria. For example, a question which was failed by a large proportion of students taking the exam will be reviewed by both internal and external examiners. A current list of criteria for identifying question for review is outlined in the local examination rules (available on request).

## Feedback

The University Assessment policy (7.1-2) identifies the importance of feedback in providing information on student learning and how they can improve. Responsibilities lie with both staff and students to ensure that the feedback process is effective, specifically:

- Feedback must relate to the criteria that have been used in the assessment
- Students should be informed when they are likely to receive feedback and in what format
- Students are expected to read and analyse feedback in terms of what it says about their learning on the course and be given an opportunity to discuss feedback with the relevant member of staff

The School of Veterinary Medicine supports the development of a range of approaches to formative feedback, including self-assessment, peer-assessment, individual feedback on assignments and provision of model and example answers across a range of achievement levels.

General feedback on the end of course summative assessments is provided where possible, in addition to individual student grades and the opportunity to review examination scripts on request.

The recommended feedback provided for course assessments is shown in Table 3:

**Table 3: Recommendations for feedback on course assessments**

Assessment type	Individual feedback	Whole class feedback
Continuous assessment task (formative)	One or more of: <ul style="list-style-type: none"> <li>• Peer feedback (written)</li> <li>• Group feedback (written)</li> <li>• Individual score or grade (where possible this should include report of performance against each of the assessment criteria)</li> </ul>	One or more of: <ul style="list-style-type: none"> <li>• Model answers (e.g. quiz)</li> <li>• Module feedback sessions to include verbal feedback to class on CAT performance</li> </ul>
Continuous assessment task (summative)	<ul style="list-style-type: none"> <li>• Individual score or grade (where possible this should include report of performance against each of the assessment criteria)</li> </ul>	<ul style="list-style-type: none"> <li>• Module feedback sessions to include verbal feedback to class on CAT performance</li> </ul>
Clinical rotations	<ul style="list-style-type: none"> <li>• Written feedback from staff on rotation assignments</li> <li>• Written feedback from staff on rotation performance</li> </ul>	
DOPS	<ul style="list-style-type: none"> <li>• Verbal feedback</li> <li>• Written feedback on assessment performance using checklist and comments box on form</li> </ul>	<ul style="list-style-type: none"> <li>• Pass rate for each DOPS</li> <li>• For Foundation and Clinical Phase, assessor feedback describing</li> </ul>

		common mistakes for each DOPS
Written or computer based assessment (formative)	<ul style="list-style-type: none"> <li>Individual score or grade (where possible this should include report of performance against each of the assessment criteria/ILOs)</li> </ul>	<ul style="list-style-type: none"> <li>Model answers</li> <li>Pass rate for each test item</li> <li>Assessor feedback describing common mistakes/omissions for each test item</li> </ul>
Written or computer based assessment (summative)	<ul style="list-style-type: none"> <li>Individual score or grade</li> <li>Opportunity to review item mark sheet on request</li> </ul>	<ul style="list-style-type: none"> <li>Pass rate for each test item</li> <li>Assessor feedback describing common mistakes/omissions for each test item</li> </ul>
OSCE (formative)	<ul style="list-style-type: none"> <li>1 minute per station verbal feedback from assessor</li> <li>Individual Pass/Fail score sheet</li> </ul>	<ul style="list-style-type: none"> <li>Pass rate for each station</li> <li>Assessor feedback describing common mistakes for each station</li> </ul>
OSCE (summative)	<ul style="list-style-type: none"> <li>Individual competency Grade reported on Schedule B</li> <li>Students who have a grade D or less on the competency assessment will have an opportunity to review specific station performance on request</li> </ul>	<ul style="list-style-type: none"> <li>Pass rate for each station</li> <li>Assessor feedback describing common mistakes for each station</li> </ul>
Portfolio (formative)	<ul style="list-style-type: none"> <li>Peer feedback (written)</li> <li>Appointments available for Portfolio adviser verbal feedback</li> <li>Written feedback from Portfolio assessor</li> </ul>	<ul style="list-style-type: none"> <li>Annual publication of good practice examples for each phase</li> <li>Annual publication of Portfolio FAQ for each phase</li> </ul>
Portfolio (summative)	<ul style="list-style-type: none"> <li>Individual competency Grade reported on Schedule B</li> <li>Written feedback from Portfolio assessor</li> </ul>	<ul style="list-style-type: none"> <li>Annual publication of good practice examples for each phase</li> <li>Annual publication of Portfolio FAQ for each phase</li> </ul>

The specific timelines for provision of feedback are described in the relevant course information.

## Processes for Evaluation and Monitoring assessment

Specific procedures to ensure the quality of assessments include:

- Assessor training
- Post examination analysis of items and reliability
- Question review panels
- Blueprinting
- Standard setting

Course assessments are evaluated through the School Quality Assurance process which reports to that of the University.

The School Quality Officer is responsible for managing the quality assurance procedures. The 2 major elements of this process in relation to assessment are:

1. Appointment of External Examiners

External Examiners are sent appropriate course information, annual monitoring reports, draft examination papers, blueprints and, where appropriate, solutions to questions. Draft examination papers should be sent to the External Examiners in good time, to allow them to suggest and discuss amendments. External examiners reports form part of the Annual Monitoring Report.

2. Annual Monitoring reports

The University has instituted a system for monitoring courses annually. This requires each undergraduate and taught postgraduate course or programme to complete a review at the end of the academic session, the Annual Monitoring Report (AMR). The AMR is reviewed by course leaders, and forms a key component of the School Annual Monitoring Report which is reviewed by the Staff Student Liaison committee, School Learning and Teaching committee and College Learning and Teaching committee who may make recommendations for changes to assessment processes.

### **Providing information about assessment**

The University assessment policy (8.1) stipulates that modes of assessment must be clearly conveyed through course materials and through discussions between students and their teachers.

In the context of the BVMS Programme all courses will timetable a session on course assessments as part of their induction process, and where necessary additional training and support will be provided.

Assessment information at Programme level will be made available on the Virtual Learning Environment (VLE) and students directed to this for information. In addition, course information will be provided on the VLE which describes the details of assessment formats within that course.

Changes to assessment will be communicated via announcement forums on the VLE (Virtual Learning Environment) or via email where changes affect a smaller number of students. The course notice boards display copies of key assessment information.

### **Assessment of Competence**

The University of Glasgow Assessment policy states that “assessment of student performance that certifies competence must authentically reflect the expected behaviours of individual professions”. In the context of the BVMS programme these requirements are described by the Accrediting bodies (RCVS, AVMA & EAEVE).

The intended learning outcomes of each course within the BVMS Programme are mapped to the requirements of the accrediting bodies, and this information is combined with that provided by



assessment blueprinting to ensure that the Programme assesses the full range of requirements. This is consistent with the University assessment policy (section 11.1)

### **Policy consultation**

Assessment policy developed by Jennifer Hammond in consultation with BVMS Course and Phase leaders.

Reviewed by School Learning and Teaching committee 7<sup>th</sup> November 2013

Reviewed by 2013 Curriculum development group on 25<sup>th</sup> March 2014

Reviewed by BVMS Programme Board on 9<sup>th</sup> April 2014

Amendments August 2016 approved by BVMS Programme Board

Amendments March 2017 approved by BVMS Programme Board (22/03/17)

Amendments February 2019 approved by BVMS Programme Board (27/02/19)

### **Links to Programme assessment pages**

[Overview](#)

[Portfolio](#)

[OSCEs](#)

[DOPS](#)

[Written Assessment](#)

Authors	Title	Year	Source title	Volume	DOI
Borlace, T., Gutierrez-Quintana, R., Taylor-Brown, F.E., De Decker, S.	Comparison of medical and surgical treatment for acute cervical compressive hydrated nucleus pulposus extrusion in dogs	2017	Veterinary Record	181	10.1136/vr.104528
Borsanelli, A.C., Gaetti-Jardim, E., Schweitzer, C.M., Viora, L., Busin, V., Riggio, M.P., Dutra, J.S.	Black-pigmented anaerobic bacteria associated with ovine periodontitis	2017	Veterinary Microbiology	203	10.1016/j.vetmic.2017.03.032
Bowman, A., Dowell, F.J., Evans, N.P.	'The effect of different genres of music on the stress levels of kennelled dogs'	2017	Physiology and Behavior	171	10.1016/j.physbeh.2017.01.024
Braceland, M., Houston, K., Ashby, A., Matthews, C., Haining, H., Rodger, H., Eckersall, P.D.	Technical pre-analytical effects on the clinical biochemistry of Atlantic salmon ( <i>Salmo salar</i> L.)	2017	Journal of Fish Diseases	40	10.1111/jfd.12476
Brocal, J., José López, R., Hammond, G., Gutierrez-Quintana, R.	Intracerebral haemorrhage in a dog with steroid-responsive meningitis arteritis	2017	Veterinary Record Case Reports	5	10.1136/vetreccr-2017-000436
Cleaveland, S., Sharp, J., Abela-Ridder, B., Allan, K.J., Buza, J., Crump, J.A., Davis, A., Del Rio Vilas, V.J., De Glanville, W.A., Kazwala, R.R., Kibona, T., Lankester, F.J., Lugelo, A., Mimbaga, B.T., Rubach, M.P., Swai, E.S., Waldman, L., Haydon, D.T., Hampson, K., Halliday, J.E.B.	One health contributions towards more effective and equitable approaches to health in low- and middle-income countries	2017	Philosophical Transactions of the Royal Society B: Biological Sciences	372	10.1098/rstb.2016.0168
Coia, M.E., Hammond, G., Chan, D., Drees, R., Walker, D., Murtagh, K., Stone, J., Bexfield, N., Reeve, L., Helm, J.	Retrospective evaluation of thoracic computed tomography findings in dogs naturally infected by <i>Angiostrongylus vasorum</i>	2017	Veterinary Radiology and Ultrasound	58	10.1111/vru.12505
Coutous, R.M., Raftery, A.G., Shiels, B.R., Sutton, D.G.M., Weir, W.	Molecular confirmation of <i>Sarcocystis fayeri</i> in a donkey	2017	Veterinary Parasitology	240	10.1016/j.vetpar.2017.04.026
Dall, G.V., Vieusseux, J.L., Korach, K.S., Arao, Y., Hewitt, S.C., Hamilton, K.J., Dzierzak, E., Boon, W.C., Simpson, E.R., Ramsay, R.G., Stein, T., Morris, J.S., Anderson, R.L., Risbridger, G.P., Britt, K.L.	SCA-1 Labels a Subset of Estrogen-Responsive Bipotential Repopulating Cells within the CD24+ CD49fhi Mammary Stem Cell-Enriched Compartment	2017	Stem Cell Reports	8	10.1016/j.stemcr.2016.12.8022
de Vicente, F., Hammond, G.	Ultrasonographic identification of the dorsal atlantoaxial ligament in dogs	2017	Veterinary Surgery	46	10.1111/vsu.12702
Fontaine, S.J., McCulloch, E., Eckersall, P.D., Haining, H., Patterson Kane, J.C., Morris, J.S.	Evaluation of the modified Glasgow Prognostic Score to predict outcome in dogs with newly diagnosed lymphoma	2017	Veterinary and Comparative Oncology	15	10.1111/vco.12296

Fullman, N., Barber, R.M., Abajobir, A.A., Abate, K.H., Abbafati, C., Abbas, K.M., Abd-Allah, F., Abdulle, A.M., Abera, S.F., Aboyans, V., Abu-Raddad, L.J., Abu-Rmeileh, N.M.E., Adedeji, I.A., Adetokunboh, O., Afshin, A., Agrawal, A., Agrawal, S., Kiadaliri, A.A., Ahmadieh, H., Ahmed, M.B., Aichour, A.N., Aichour, I., Aichour, M.T.E., Akseer, N., Al Lami, F.H., Alahdab, F., Al-Aly, Z., Alam, K., Abbafati, C., Abbas, K.M., Abd-Allah, F., Abdulle, A.M., Abera, S.F., Aboyans, V., Abu-Raddad, L.J., Abu-Rmeileh, N.M.E., Abyu, G.Y., Adedeji, I.A., Adetokunboh, O., Afarideh, M., Agrawal, A., Agrawal, S., Ahmad Kiadaliri, A., Ahmadieh, H., Ahmed, M.B., Aichour, A.N., Aichour, I., Aichour, M.T.E., Akinyemi, R.O., Akseer, N., Alahdab, F., Al-Giles, L., Orr, J., Viora, L., Gutierrez-Quintana, R., Logue, D., Guevar, J.	Measuring progress and projecting attainment on the basis of past trends of the health-related Sustainable Development Goals in 188 countries: An analysis from the Global Burden of Disease Study 2016	2017	The Lancet	390	10.1016/S0140-6736(17)32336-X
Abbafati, C., Abbas, K.M., Abd-Allah, F., Abdulle, A.M., Abera, S.F., Aboyans, V., Abu-Raddad, L.J., Abu-Rmeileh, N.M.E., Abyu, G.Y., Adedeji, I.A., Adetokunboh, O., Afarideh, M., Agrawal, A., Agrawal, S., Ahmad Kiadaliri, A., Ahmadieh, H., Ahmed, M.B., Aichour, A.N., Aichour, I., Aichour, M.T.E., Akinyemi, R.O., Akseer, N., Alahdab, F., Al-Giles, L., Orr, J., Viora, L., Gutierrez-Quintana, R., Logue, D., Guevar, J.	Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016	2017	The Lancet	390	10.1016/S0140-6736(17)32366-8
Gutierrez-Quintana, R., Logue, D., Guevar, J.	Ruminant neurological disease: A retrospective cohort study	2017	Veterinary Record	181	10.1136/vr.104326
Gutierrez-Mecinas, M., Bell, A.M., Marin, A., Taylor, R., Boyle, K.A., Furuta, T., Watanabe, M., Polgár, E., Todd, A.J., Hammond, J.A., Hancock, J., Martin, M.S., Jamieson, S., Mellor, D.J.	Preprothyrin A is expressed by a distinct population of excitatory neurons in the mouse superficial spinal dorsal horn including cells that respond to noxious and pruritic stimuli	2017	Pain	158	10.1097/j.pain.0000000000000778
Hammond, J.A., Hancock, J., Martin, M.S., Jamieson, S., Mellor, D.J.	Development of a new scale to measure ambiguity tolerance in veterinary students	2017	Journal of Veterinary Medical Education	44	10.3138/jvme.0216-040R
Hancock, J., Hammond, J.A., Roberts, M., Mattick, K., Hay, S.T., Abajobir, A.A., Abate, K.H., Abbafati, C., Abbas, K.M., Abd-Allah, F., Abdulle, A.M., Abebo, T.A., Abera, S.F., Aboyans, V., Abu-Raddad, L.J., Ackerman, I.N., Adedeji, I.A., Adetokunboh, O., Afshin, A., Aggarwal, R., Agrawal, S., Agrawal, A., Kiadaliri, A.A., Ahmed, M.B., Aichour, A.N., Aichour, I., Aichour, M.T.E., Alvar, S., Akinyemiju, T.F., Akseer, N., Al Lami, F.H., Alahdab, F., Al-Aly, Z., Alam, K., Hiby, E., Atema, K.N., Brimley, R., Hammond-Seaman, A., Jones, M., Rowan, A., Fogelberg, E., Kennedy, M., Balaram, D., Nel, L., Cleaveland, S., Hampson, K., Townsend, S., Lembo, T., Rooney, N., Whay, H.R., Pritchard, J., Murray, J., van Dijk, L., Waran, N., Bacon, H., Knobel, D., Tasker, L., Baker, C., Hiby, L.	Comparing tolerance of ambiguity in veterinary and medical students	2017	Journal of Veterinary Medical Education	44	10.3138/jvme.0916-150R1
Hancock, J., Hammond, J.A., Roberts, M., Mattick, K., Hay, S.T., Abajobir, A.A., Abate, K.H., Abbafati, C., Abbas, K.M., Abd-Allah, F., Abdulle, A.M., Abebo, T.A., Abera, S.F., Aboyans, V., Abu-Raddad, L.J., Ackerman, I.N., Adedeji, I.A., Adetokunboh, O., Afshin, A., Aggarwal, R., Agrawal, S., Agrawal, A., Kiadaliri, A.A., Ahmed, M.B., Aichour, A.N., Aichour, I., Aichour, M.T.E., Alvar, S., Akinyemiju, T.F., Akseer, N., Al Lami, F.H., Alahdab, F., Al-Aly, Z., Alam, K., Hiby, E., Atema, K.N., Brimley, R., Hammond-Seaman, A., Jones, M., Rowan, A., Fogelberg, E., Kennedy, M., Balaram, D., Nel, L., Cleaveland, S., Hampson, K., Townsend, S., Lembo, T., Rooney, N., Whay, H.R., Pritchard, J., Murray, J., van Dijk, L., Waran, N., Bacon, H., Knobel, D., Tasker, L., Baker, C., Hiby, L.	Global, regional, and national disability-adjusted life-years (DALYs) for 333 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016	2017	The Lancet	390	10.1016/S0140-6736(17)32130-X
Hiby, E., Atema, K.N., Brimley, R., Hammond-Seaman, A., Jones, M., Rowan, A., Fogelberg, E., Kennedy, M., Balaram, D., Nel, L., Cleaveland, S., Hampson, K., Townsend, S., Lembo, T., Rooney, N., Whay, H.R., Pritchard, J., Murray, J., van Dijk, L., Waran, N., Bacon, H., Knobel, D., Tasker, L., Baker, C., Hiby, L.	Scoping review of indicators and methods of measurement used to evaluate the impact of dog population management interventions	2017	BMC Veterinary Research	13	10.1186/s12917-017-1051-2
Hough, D., Bellingham, M., Haraldsen, I.R., McLaughlin, M., Robinson, J.E., Solbakk, A.K., Evans, N.P.	A reduction in long-term spatial memory persists after discontinuation of peripubertal GnRH agonist treatment in sheep	2017	Psychoneuroendocrinology	77	10.1016/j.psyneuen.2016.11.029

Hough, D., Bellingham, M., Haraldsen, I.R.H., McLaughlin, M., Rennie, M., Robinson, J.E., Solbakk, A.K., Evans, N.P.	Spatial memory is impaired by peripubertal GnRH agonist treatment and testosterone replacement in sheep	2017	Psychoneuroendocrinology	75	10.1016/j.psyneuen.2016.10.016
Jacinto, A.M.L., Ridyad, A.E., Aroch, I., Watson, P.J., Morrison, L.R., Chandler, M.L., Kuzi, S.	Thromboembolism in dogs with protein-losing enteropathy with non-neoplastic chronic small intestinal disease	2017	Journal of the American Animal Hospital Association	53	10.5326/JAAHA-MS-6328
Jackson, A., Ellis, K.A., McGoldrick, J., Jonsson, N.N., Stear, M.J., Forbes, A.B.	Targeted anthelmintic treatment of parasitic gastroenteritis in first grazing season dairy calves using daily live weight gain as an indicator	2017	Veterinary Parasitology	244	10.1016/j.vetpar.2017.07.023
Lee, S.M., Williamson, K., Weir, W., Hulme-Moir, L., Haining, H.	Use of hyaluronidase in the comparison between manual and automated hematology analysis with the ADVIA 120 to improve analysis of feline body cavity effusions	2017	Journal of Veterinary Diagnostic Investigation	29	10.1177/1040638716685133
Allah, F., Abera, S.F., Abovans, V., Adetokunboh, O., Årnlöv, J., Afshin, A., Agrawal, A., Kiadaliri, A.A., Ahmadi, A., Ahmed, M.B., Aichour, A.N., Aichour, I., Aichour, M.T.E., Aiyar, S., Al-Eyadhy, A., Alahdab, F., Al-Aly, Z., Alam, K., Alam, N., Alam, T., Alene, K.A., Ali, S.D., Alizadeh-	Global, regional, and national age-sex specific mortality for 264 causes of death, 1980-2016: A systematic analysis for the Global Burden of Disease Study 2016	2017	The Lancet	390	10.1016/S0140-6736(17)32152-9
Raimondi, F., Shihab, N., Gutierrez-Quintana, R., Smith, A., Trevail, R., Sanchez-Masian, D., Smith, P.M.	Magnetic resonance imaging findings in epileptic cats with a normal interictal neurological examination: 188 cases	2017	Veterinary Record	180	10.1136/vr.104142
Reid, J., Scott, E.M., Calvo, G., Nolan, A.M.	Definitive Glasgow acute pain scale for cats: Validation and intervention level	2017	Veterinary Record	180	10.1136/vr.104208
Romero-Fernandez, N., José-López, R., Durand, A., Gutierrez-Quintana, R.	Successful medical management of an epidural abscess in a dog	2017	Veterinary Record Case Reports	5	10.1136/vetreccr-2017-000448
Ryan, R., Gutierrez-Quintana, R., ter Haar, G., De Decker, S.	Prevalence of thoracic vertebral malformations in French bulldogs, Pugs and English bulldogs with and without associated neurological deficits	2017	Veterinary Journal	221	10.1016/j.tvjl.2017.01.018
Rzechorzek, N.M., Liuti, T., Stalin, C., Marioni-Henry, K.	Restored vision in a young dog following corticosteroid treatment of presumptive hypophysitis	2017	BMC veterinary research	13	10.1186/s12917-017-0983-x
Spencer, S.E., Knowles, T., Ramsey, I.K., Tasker, S.	Pyrexia in cats: Retrospective analysis of signalment, clinical investigations, diagnosis and influence of prior treatment in 106 referred cases	2017	Journal of Feline Medicine and Surgery	19	10.1177/1098612X17733624

Terron-Canedo, N., Weir, W., Nicolson, L., Britton, C., Nasir, L.	Differential expression of microRNAs in bovine papillomavirus type 1 transformed equine cells	2017	Veterinary and Comparative Oncology	15	10.1111/vco.12216
Thierry, F., Handel, I., Hammond, G., King, L.G., Corcoran, B.M., Schwarz, T.	Further characterization of computed tomographic and clinical features for staging and prognosis of idiopathic pulmonary fibrosis in West Highland white terriers	2017	Veterinary Radiology and Ultrasound	58	10.1111/vru.12491
Tomb, R.M., Maclean, M., Coia, J.E., Graham, E., McDonald, M., Atreya, C.D., MacGregor, S.J., Anderson, J.G.	New Proof-of-Concept in Viral Inactivation: Virucidal Efficacy of 405 nm Light Against Feline Calicivirus as a Model for Norovirus Decontamination	2017	Food and Environmental Virology	9	10.1007/s12560-016-9275-9
Vernon, J.C., Durand, A., Guevar, J., José-López, R., Hammond, G., Stalin, C., Gutierrez-Quintana, R.	Vertebral venous system abnormalities identified with magnetic resonance imaging in sighthounds	2017	Veterinary Radiology and Ultrasound	58	10.1111/vru.12492
Vos, T., Abajobir, A.A., Abbafati, C., Abbas, K.M., Abate, K.H., Abd-Allah, F., Abdulle, A.M., Abebo, T.A., Abera, S.F., Aboyans, V., Abu-Raddad, L.J., Ackerman, I.N., Adamu, A.A., Adetokunboh, O., Afarideh, M., Afshin, A., Agarwal, S.K., Aggarwal, R., Agrawal, A., Agrawal, S., Ahmad Wang, H., Abajobir, A.A., Abate, K.H., Abbafati, C., Abbas, K.M., Abd-Allah, F., Abera, S.F., Abraha, H.N., Abu-Raddad, L.J., Abu-Rmeileh, N.M.E., Adedeji, I.A., Adedoyin, R.A., Adetifa, I.M.O., Adetokunboh, O., Afshin, A., Aggarwal, R., Agrawal, A., Agrawal, S., Ahmad Kiadaliri, A., Ahmed, M.B.,	Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016	2017	The Lancet	390	10.1016/S0140-6736(17)32154-2
Yam, P.S., Naughton, G., Butowski, C.F., Root, A.L.	Inaccurate assessment of canine body condition score, bodyweight, and pet food labels: A potential cause of inaccurate feeding	2017	Veterinary Sciences	4	10.3390/vetsci4020030
Yamaoka, T.T., Flaherty, D., Pawson, P., Scott, M., Auckburally, A.	Comparison of arterial blood pressure measurements obtained invasively or oscillometrically using a Datex S/5 Compact monitor in anaesthetised adult horses	2017	Veterinary Anaesthesia and Analgesia	44	10.1016/j.vaa.2016.05.008
Acosta, N., López, E., Lewis, M.D., Llewellyn, M.S., Gómez, A., Román, F., Miles, M.A., Yeo, M.	Hosts and vectors of Trypanosoma cruzi discrete typing units in the Chagas disease endemic region of the Paraguayan Chaco	2017	Parasitology	144	10.1017/S00311820160021663

Aftab, A., Hanley, N., Baiocchi, G.	Transferability of Policies to Control Agricultural Nonpoint Pollution in Relatively Similar Catchments	2017	Ecological Economics	134	10.1016/j.ecolecon.2016.11.004
Al-Fahdi, A., Alqamashoui, B., Al-Hamidhi, S., Kose, O., Tageldin, M.H., Bobade, P., Johnson, E.H., Hussain, A.-R., Karagenc, T., Tait, A., Shiels, B., Bilgic, H.B., Babiker, H.	Molecular surveillance of Theileria parasites of livestock in Oman	2017	Ticks and Tick-borne Diseases	8	10.1016/j.ttbdis.2017.05.008
Andrews, C., Nettle, D., Larriva, M., Gillespie, R., Reichert, S., Briot, B.O., Bedford, T., Monaghan, P., Spencer, K.A., Bateson, M.	A marker of biological age explains individual variation in the strength of the adult stress response	2017	Royal Society Open Science	4	10.1098/rsos.171208
Apfelbeck, B., Helm, B., Illera, J.C., Mortega, K.G., Smiddy, P., Evans, N.P.	Baseline and stress-induced levels of corticosterone in male and female Afrotropical and European temperate stonechats during breeding	2017	BMC Evolutionary Biology	17	10.1186/s12862-017-0960-1
Arief, R.A., Hampson, K., Jatikusumah, A., Widyastuti, M.D.W., Sunandar, Basri, C., Putra, A.A.G., Willyanto, I., Estoepangestie, A.T.S., Mardiana, I.W., Kesuma, I.K.G.N., Sumantra, I.P., Doherty, P.F., Saliman, M.D., Gilbert, J., Unger, F.	Determinants of vaccination coverage and consequences for rabies control in Bali, Indonesia	2017	Frontiers in Veterinary Science	3	10.3389/fvets.2016.00123
Atherton, M.J., Vazquez-Sanmartin, S., Sharpe, S., Waugh, E.M., Morris, J.S.	A metastatic secretory gastric plasmacytoma with aberrant CD3 expression in a dog	2017	Veterinary Clinical Pathology	46	10.1111/vcp.12503
Auer, S.K., Killen, S.S., Rezende, E.L.	Resting vs. active: a meta-analysis of the intra- and inter-specific associations between minimum, sustained, and maximum metabolic rates in vertebrates	2017	Functional Ecology	31	10.1111/1365-2435.12879
Bakuza, J.S., Gillespie, R., Nkwengulila, G., Adam, A., Kilbride, E., Mable, B.K.	Assessing <i>S. mansoni</i> prevalence in Biomphalaria snails in the Gombe ecosystem of western Tanzania: The importance of DNA sequence data for clarifying species identification	2017	Parasites and Vectors	10	10.1186/s13071-017-2525-6
Baker, J.S., Denwood, M.J., Nkwengulila, G., Mable, B.K.	Estimating the prevalence and intensity of Schistosoma mansoni infection among rural communities in Western Tanzania: The influence of sampling strategy and statistical approach	2017	PLoS Neglected Tropical Diseases	11	10.1371/journal.pntd.0005937
Banerjee, S., Cason, T.N., de Vries, F.P., Hanley, N.	Transaction costs, communication and spatial coordination in Payment for Ecosystem Services Schemes	2017	Journal of Environmental Economics and Management	83	10.1016/j.jeem.2016.12.005



Barbier, E.B., Czajkowski, M., Hanley, N.	Is the Income Elasticity of the Willingness to Pay for Pollution Control Constant?	2017	Environmental and Resource Economics	68	10.1007/s10640-016-0040-4
Barry, J., Newton, M., Dodd, J.A., Evans, D., Newton, J., Adams, C.E.	The effect of foraging and ontogeny on the prevalence and intensity of the invasive parasite <i>Anguillicola crassus</i> in the European eel <i>Anguilla anguilla</i>	2017	Journal of Fish Diseases	40	10.1111/jfd.12596
Becker, D.J., Chumchal, M.M., Bentz, A.B., Platt, S.G., Cziriák, G.Á., Rainwater, T.R., Altizer, S., Streicker, D.G.	Predictors and immunological correlates of sublethal mercury exposure in vampire bats	2017	Royal Society Open Science	4	10.1098/rsos.170073
Benavides, J.A., Rojas Paniagua, E., Hampson, K., Valderrama, W., Streicker, D.G.	Quantifying the burden of vampire bat rabies in Peruvian livestock	2017	PLoS Neglected Tropical Diseases	11	10.1371/journal.pntd.0006105
Bilgiç, H.B., Bakırcı, S., Kose, O., Unlu, A.H., Hacilarloğlu, S., Eren, H., Weir, W., Karagenc, T.	Prevalence of tick-borne haemoparasites in small ruminants in Turkey and diagnostic sensitivity of single-PCR and RLB	2017	Parasites and Vectors	10	10.1186/s13071-017-2151-3
Bilgiç, H.B., Ünlü, A.H., Aksulu, A., Bakırcı, S., Hacilarloğlu, S., Eren, H., Weir, W., Karagenc, T.	Selection of Genetic Markers to Determine Diversity in <i>Theileria annulata</i> Populations after Recombination	2017	Turkiye parazitolojii dergisi	41	10.5152/tpd.2017.4970
Bilgiç, H.B., Karagenc, T., Bakırcı, S., Eren, H., Weir, W.	Loop mediated isothermal amplification (LAMP) of theileria annulata DNA [Theileria annulata DNA'sinin loop aracılı izotermal yöntemle (LAMP) çoğaltılması]	2017	Ankara Üniversitesi Veteriner Fakültesi Dergisi	64	10.1501/Vetfak_000000028101
Boden, L.A., Auty, H., Reeves, A., Rydevik, G., Bessel, P., McKendrick, I.J.	Animal health surveillance in Scotland in 2030: Using scenario planning to develop strategies in the context of "Brexit"	2017	Frontiers in Veterinary Science	4	10.3389/fvets.2017.00201
Boonekamp, J.J., Bauch, C., Mulder, E., Verhulst, S.	Does oxidative stress shorten telomeres?	2017	Biology Letters	13	10.1098/rsbl.2017.0164
Boonekamp, J.J., Dijkstra, R., Dijkstra, C., Verhulst, S.	Canalization of development reduces the utility of traits as fitness biomarkers: feather fault bars in nestling birds	2017	Functional Ecology	31	10.1111/1365-2435.12765
Braceland, M., Tinsley, J., Cockerill, D., Bickerdike, R., McLoughlin, M.F., Eckersall, P.D.	Selective precipitation reaction: a novel diagnostic test for tissue pathology in Atlantic salmon, <i>Salmo salar</i> , infected with salmonid alphavirus (SAV3)	2017	Journal of Fish Diseases	40	10.1111/jfd.12587
Brandani, G.B., Vance, S.J., Schor, M., Cooper, A., Kennedy, M.W., Smith, B.O., MacPhee, C.E., Cheung, D.L.	Adsorption of the natural protein surfactant Rsn-2 onto liquid interfaces	2017	Physical Chemistry Chemical Physics	19	10.1039/c6cp07261e
Briga, M., Koetsier, E., Boonekamp, J.J., Jimeno, B., Verhulst, S.	Food availability affects adult survival trajectories depending on early developmental conditions	2017	Proceedings of the Royal Society B: Biological Sciences	284	10.1098/rspb.2016.2287

Brocal, J., Gamino, V., Guevar, J., Gutierrez-Quintana, R., Marchesi, F., Hammond, G., Stalin, C.	IMAGING DIAGNOSIS—MAGNETIC RESONANCE IMAGING AND HISTOPATHOLOGICAL FEATURES OF A SKULL BASE CHORDOMA IN A CAT	2017	Veterinary Radiology and Ultrasound	58	10.1111/vru.12373
Calladine, J., Humphreys, E.M., Gilbert, L., Furness, R.W., Robinson, R.A., Fuller, R.J., Littlewood, N.A., Pakeman, R.J., Ferguson, J., Thompson, C.	Continuing influences of introduced hedgehogs <i>Erinaceus europaeus</i> as a predator of wader ( <i>Charadrii</i> ) eggs four decades after their release on the Outer Hebrides, Scotland	2017	Biological Invasions	19	10.1007/s10530-017-1422-4
Campobello, D., Lindström, J., Di Maggio, R., Sarà, M.	An integrated analysis of micro- and macrohabitat features as a tool to detect weather-driven constraints: A case study with cavity nesters	2017	PLoS ONE	12	10.1371/journal.pone.0174090
Capilla-Lasheras, P., Dominoni, D.M., Babayan, S.A., O'Shaughnessy, P.J., Mladenova, M., Woodford, L., Pollock, C.J., Barr, T., Baldini, F., Helm, B.	Elevated immune gene expression is associated with poor reproductive success of urban blue tits	2017	Frontiers in Ecology and Evolution	5	10.3389/fevo.2017.00064
Caudell, M.A., Quinlan, M.B., Subbiah, M., Call, D.R., Roulette, C.J., Roulette, J.W., Roth, A., Matthews, L., Quinlan, R.J.	Antimicrobial use and veterinary care among agro-pastoralists in Northern Tanzania	2017	PLoS ONE	12	10.1371/journal.pone.01710328
Cleaveland, S., Hampson, K.	Rabies elimination research: Juxtaposing optimism, pragmatism and realism	2017	Proceedings of the Royal Society B: Biological Sciences	284	10.1098/rspb.2017.1880
Conan, A., O'Reilly, C.E., Ogola, E., Ochieng, J.B., Blackstock, A.J., Omoro, R., Ochieng, L., Moke, F., Parsons, M.B., Xiao, L., Roellig, D., Farag, T.H., Nataro, J.P., Kotloff, K.L., Levine, M.M., Mintz, E.D., Breiman, R.F., Cleaveland, S., Knobel, D.L.	Animal-related factors associated with moderate-to-severe diarrhea in children younger than five years in western Kenya: A matched case-control study	2017	PLoS Neglected Tropical Diseases	11	10.1371/journal.pntd.00015795
Cooper, A., Vance, S.J., Smith, B.O., Kennedy, M.W.	Frog foams and natural protein surfactants	2017	Colloids and Surfaces A: Physicochemical and Engineering Aspects	534	10.1016/j.colsurfa.2017.01.049
Cooper, A., Ilboudo, H., Alibu, V.P., Ravel, S., Enyaru, J., Weir, W., Noyes, H., Capewell, P., Camara, M., Milet, J., Jannonneau, V., Camara, O., Matovu, E., Bucheton, B., MacLeod, A.	APOL1 renal risk variants have contrasting resistance and susceptibility associations with African trypanosomiasis	2017	elife	6	10.7554/elife.25461
Corr, S.A., Gardner, D.S., Langley-Hobbs, S., Ness, M.G., Kitchener, A.C., Sinclair, K.D.	Radiographic assessment of the skeletons of Dolly and other clones finds no abnormal osteoarthritis	2017	Scientific Reports	7	10.1038/s41598-017-15902-8
Correia-Gomes, C., Henry, M.K., Auty, H.K., Gunn, G.J.	Exploring the role of small-scale livestock keepers for national biosecurity—The pig case	2017	Preventive Veterinary Medicine	145	10.1016/j.prevetmed.2017.06.005

Costantini, D., Smith, S., Killen, S.S., Nielsen, J., Steffensen, J.F.	The Greenland shark: A new challenge for the oxidative stress theory of ageing?	2017	Comparative Biochemistry and Physiology - Part A : Molecular and Integrative Physiology	203	26	10.1016/j.cbpa.2016.09.026
Craft, M.E., Vial, F., Miguel, E., Cleaveland, S., Ferdinands, A., Packer, C.	Interactions between domestic and wild carnivores around the greater Serengeti ecosystem	2017	Animal Conservation	20	12305	10.1111/acv.12305
Craine, J.L., Hurst, J., Lamberton, P.H.L., Cheke, R.A., Griffin, C.E., Wilson, M.D., Mendes de Araújo, C.P., Basáñez, M.-G., Post, R.J.	The genomic architecture of novel simuliid damnosus wolbachia prophage sequence elements and implications for onchocerciasis epidemiology	2017	Frontiers in Microbiology	8	2	10.3389/fmicb.2017.00858
Cram, D.L., Monaghan, P., Gillespie, R., Clutton-Brock, T.	Effects of early-life competition and maternal nutrition on telomere lengths in wild meerkats	2017	Proceedings of the Royal Society B: Biological Sciences	284	1383	10.1098/rspb.2017.1383
Crispell, J., Zadoks, R.N., Harris, S.R., Paterson, B., Collins, D.M., de-Lisle, G.W., Livingstone, P., Neill, M.A., Biek, R., Lycett, S.J., Kao, R.R., Price-Carter, M.	Using whole genome sequencing to investigate transmission in a multi-host system: Bovine tuberculosis in New Zealand	2017	BMC Genomics	18	x	10.1186/s12864-017-3569-1
Cui, C.X., Hanley, N., McGregor, P., Swales, K., Turner, K., Yin, Y.P.	Impacts of regional productivity growth, decoupling and pollution leakage	2017	Regional Studies	51	167865	10.1080/00343404.2016.1167865
Czajkowski, M., Budziński, W., Campbell, D., Giergiczy, M., Hanley, N.	Spatial Heterogeneity of Willingness to Pay for Forest Management	2017	Environmental and Resource Economics	68	0	10.1007/s10640-016-0044-0
Czajkowski, M., Hanley, N., Nyborg, K.	Social Norms, Morals and Self-interest as Determinants of Pro-environment Behaviours: The Case of Household Recycling	2017	Environmental and Resource Economics	66	3	10.1007/s10640-015-9964-3
Dangerfield, C.E., Whalley, A.E., Hanley, N., Gilligan, C.A.	What a difference a stochastic process makes: Epidemiological-based real options models of optimal treatment of disease	2017	Environmental and Resource Economics	70	x	10.1007/s10640-017-0168-x
Dario, M.A., Lisboa, C.V., Costa, L.M., Moratelli, R., Nascimento, M.P., Costa, L.P., Reis Leite, Y.L., Llewellyn, M.S., Das Chagas Xavier, S.C., Rodrigues Roque, A.L., Jansen, A.M.	High Trypanosoma spp. diversity is maintained by bats and triatomines in Espírito Santo state, Brazil	2017	PLoS ONE	12	8412	10.1371/journal.pone.0181284
Dario, M.A., da Rocha, R.M.M., Schwabl, P., Jansen, A.M., Llewellyn, M.S.	Small subunit ribosomal metabarcoding reveals extraordinary trypanosomatid diversity in Brazilian bats	2017	PLoS Neglected Tropical Diseases	11	15790	10.1371/journal.pntd.0001579
Davies, V., Reeve, R., Harvey, W.T., Maree, F.F., Husmeier, D.	A sparse hierarchical Bayesian model for detecting relevant antigenic sites in virus evolution	2017	Computational Statistics	32	6	10.1007/s00180-017-0730-6

de Souza, W.M., Romero, M.F., Fumagalli, M.J., Modha, S., de Araujo, J., Queiroz, L.H., Durigon, E.L., Figueiredo, L.T.M., Murcia, P.R., Gifford, R.J.	Chapparronaviruses occur in at least three vertebrate classes and have a broad biogeographic distribution	2017	Journal of General Virology	98	10.1099/jgv.0.000671
Ding, H., Gao, Y.-M., Deng, Y., Lamberton, P.H.L., Lu, D.-B.	A systematic review and meta-analysis of the seroprevalence of <i>Toxoplasma gondii</i> in cats in mainland China	2017	Parasites and Vectors	10	10.1186/s13071-017-1970-6
Duckett, D.G., McKee, A.J., Sutherland, L.-A., Kyle, C., Boden, L.A., Auty, H., Bessel, P.R., Mckendrick, I.J.	Scenario planning as communicative action: Lessons from participatory exercises conducted for the Scottish livestock industry	2017	Technological Forecasting and Social Change	114	10.1016/j.techfore.2016.07.034
Elliott, S.A.M., Sabatino, A.D., Heath, M.R., Turrell, W.R., Bailey, D.M.	Landscape effects on demersal fish revealed by field observations and predictive seabed modelling	2017	PLOS ONE	12	10.1371/journal.pone.0189011
Elliott, S.A.M., Turrell, W.R., Heath, M.R., Bailey, D.M.	Juvenile gadoid habitat and ontogenetic shift observations using stereo-video baited cameras	2017	Marine Ecology Progress Series	568	10.3354/meps12068
Ellis, C.R., Feltham, H., Park, K., Hanley, N., Goulson, D.	Seasonal complementary in pollinators of soft-fruit crops	2017	Basic and Applied Ecology	19	10.1016/j.baae.2016.11.017
Emami, S.N., Lisa, R.-C., Ferguson, H.M.	The transmission potential of malaria-infected mosquitoes ( <i>An.gambiae</i> -Keele, <i>An.arabiensis</i> -Ifakara) is altered by the vertebrate blood type they consume during parasite development	2017	Scientific Reports	7	10.1038/srep40520
Ferguson, E.A., Matthiopoulos, J., Insall, R.H., Husmeier, D.	Statistical inference of the mechanisms driving collective cell movement	2017	Journal of the Royal Statistical Society. Series C: Applied Statistics	66	10.1111/rssc.12203
Ferrazza, R.A., Garcia, H.D.M., Schmidt, E.M.S., Carmichael, M.M., Souza, F.F., Burchmore, R., Sartori, R., Eckersall, P.D., Ferreira, J.C.P.	Quantitative proteomic profiling of bovine follicular fluid during follicle development	2017	Biology of Reproduction	97	10.1093/biolre/iox148
Georgopoulos, S.P., Parkin, T.D.H.	Risk factors for equine fractures in Thoroughbred flat racing in North America	2017	Preventive Veterinary Medicine	139	10.1016/j.prevetmed.2016.12.006
Gilbert, L., Brunner, K., Lande, U., Klingen, I., Grøva, L.	Environmental risk factors for ixodes ricinus ticks and their infestation on lambs in a changing ecosystem: Implications for tick control and the impact of woodland encroachment on tick-borne disease in livestock	2017	Agriculture, Ecosystems and Environment	237	10.1016/j.agee.2016.12.041
Gilbert, L., Johnson, D.	Plant-Plant Communication Through Common Mycorrhizal Networks	2017	Advances in Botanical Research	82	10.1016/bs.abr.2016.09.001

Gillan, V., Maitland, K., Laing, R., Gu, H., Marks, N.D., Winter, A.D., Bartley, D., Morrison, A., Skuce, P.J., Rezanoff, A.M., Gilleard, J.S., Martinelli, A., Britton, C., Devaney, E.	Increased expression of a microRNA correlates with anthelmintic resistance in parasitic nematodes	2017	Frontiers in Cellular and Infection Microbiology	7	10.3389/fcimb.2017.00457
Giorello, A.N., Kennedy, M.W., Butti, M.J., Radman, N.E., Córscico, B., Franchini, G.R.	Identification and characterization of the major pseudocoelomic proteins of the giant kidney worm, <i>Dictyophyme renale</i>	2017	Parasites and Vectors	10	10.1186/s13071-017-2388-x
Gower, C.M., Gehre, F., Marques, S.R., Lamberton, P.H.L., Lwambo, N.J., Webster, J.P.	Phenotypic and genotypic monitoring of <i>Schistosoma mansoni</i> in Tanzanian schoolchildren five years into a preventative chemotherapy national control programme	2017	Parasites and Vectors	10	10.1186/s13071-017-2533-6
Griffith, S.C., Crino, O.L., Andrew, S.C., Noman, F.Y., Adkins-Regan, E., Alonso-Alvarez, C., Bailey, I.E., Bittner, S.S., Bolton, P.E., Boner, W., Boogert, N., Boucaud, I.C.A., Briga, M., Buchanan, K.L., Caspers, B.A., Cichoń, M., Clayton, D.F., Derégnaucourt, S., Forstmeier, W., Guillelte, L.M., Hartley, I.R., Healy, S.D., Hill, D.L., Holveck, M.-J., Hurlley, L.L., Ihle, M., Tobias Krause, E., Mainwaring, M.C., Marasco, V., Mariette, M.M., Martin-Wintle, M.S., McCowan, L.S.C., McMahon, M., Monaghan, P., Nager, R.G., Naguib, M., Nord, A., Potvin, D.A., Prior, N.H., Riebel, K., Romero-Haro, A.A., Royle, N.J., Rutkowska, J., Schuett, W., Swaddle, J.P., Tobler, M., Trompf, L., Varian-Ramos, C.W., Vignal, C., Villain, A.S., Williams, T.D.	Variation in Reproductive Success Across Captive Populations: Methodological Differences, Potential Biases and Opportunities	2017	Ethology	123	10.1111/eth.12576
Gu, H.Y., Marks, N.D., Winter, A.D., Weir, W., Tzelos, T., McNeilly, T.N., Britton, C., Devaney, E.	Conservation of a microRNA cluster in parasitic nematodes and profiling of miRNAs in excretory-secretory products and microvesicles of <i>Haemonchus contortus</i>	2017	PLoS Neglected Tropical Diseases	11	10.1371/journal.pntd.00016056
Hanley, N., Boyce, C., Czajkowski, M., Tucker, S., Noussair, C., Townsend, M.	Sad or Happy? The Effects of Emotions on Stated Preferences for Environmental Goods	2017	Environmental and Resource Economics	68	10.1007/s10640-016-0048-9
Hawkes, F., Manin, B.O., Ng, S.H., Torr, S.J., Drakeley, C., Chua, T.H., Ferguson, H.M.	Evaluation of electric nets as means to sample mosquito vectors host-seeking on humans and primates	2017	Parasites and Vectors	10	10.1186/s13071-017-2277-3

Henderson, L.J., Evans, N.P., Heidinger, B.J., Herborn, K.A., Arnold, K.E.	2017	Royal Society Open Science	4	10.1098/rsos.170875
Hernandez-Castro, L.E., Paterno, M., Villacis, A.G., Andersson, B., Costales, J.A., De Noia, M., Ocaña-Mayorga, S., Yumiseva, C.A., Grijalva, M.J., Llewellyn, M.S.	2017	PLoS Neglected Tropical Diseases	11	10.1371/journal.pntd.00015710
Hill, D.L., Wall, E.	2017	Journal of Dairy Science	100	10.3168/jds.2016-11047
Hine, C., Kim, H.-J., Zhu, Y., Harputlugil, E., Longchamp, A., Matos, M.S., Ramadoss, P., Bauerle, K., Brace, L., Asara, J.M., Ozaki, C.K., Cheng, S.-Y., Singha, S., Ahn, K.H., Kimmelman, A., Fisher, F.M., Pissios, P., Withers, D.J., Selman, C., Wang, R., Yen, K., Longo, V.D., Cohen, P., Bartke, A., Kopchick, J.J., Miller, R., Hollenberg, A.N., Mitchell, J.R.	2017	Cell Metabolism	25	10.1016/j.cmet.2017.05.003
Hoffmann, C., Zimmermann, F., Biek, R., Kuehl, H., Nowak, K., Mundry, R., Agbor, A., Angedakin, S., Arandjelovic, M., Blankenburg, A., Brazolla, G., Corogenes, K., Couacy-Hymann, E., Deschner, T., Dieguez, P., Dierks, K., Düx, A., Dupke, S., Eshuis, H., Formenty, P., Yuh, Y.G., Goedmakers, A., Gogarten, J.F., Granjon, A.-C., McGraw, S., Grunow, R., Hart, J., Jones, S., Junker, J., Kiang, J., Langergraber, K., Lapuente, J., Lee, K., Leendertz, S.A., Léguillon, F., Leinert, V., Löhrich, T., Marrocoli, S., Mätz-Rensing, K., Meier, A., Merkel, K., Metzger, S., Murai, M., Niedorf, S., De Nys, H., Sachse, A., Van Schijndel, J., Thiesen, U., Ton, E., Wu, D., Wieler, L.H., Boesch, C., Klee, S.R., Wittig, R.M., Calvignac-Spencer, S., Leendertz, F.H.	2017	Nature	548	10.1038/nature23309
Hooker, O.E., Van Leeuwen, T.E., Adams, C.E.	2017	Journal of Animal Ecology	86	10.1111/1365-2656.12632
Howson, E.L.A., Armson, B., Madi, M., Kasanga, C.J., Kandusi, S., Sallu, R., Chepkwony, E., Siddie, A., Martin, P., Wood, J., Mioulet, V., King, D.P., Lembo, T., Cleaveland, S., Fowler, V.L.	2017	Transboundary and Emerging Diseases	64	10.1111/tbed.12451



Innocent, G.T., Gilbert, L., Jones, E.O., McLeod, J.E., Gunn, G., McKendrick, I.J., Albon, S.D.	Combining slaughterhouse surveillance data with cattle tracing scheme and environmental data to quantify environmental risk factors for liver fluke in cattle	2017	Frontiers in Veterinary Science	4	10.3389/fvets.2017.00065
Jacobs, A., Womack, R., Chen, M., Gharbi, K., Elmer, K.R.	Significant synteny and colocalization of ecologically relevant quantitative trait loci within and across species of salmonid fishes	2017	Genetics	207	10.1534/genetics.117.300093
Jacquot, M., Nomikou, K., Palmirini, M., Mertens, P., Bielek, R.	Bluetongue virus spread in Europe is a consequence of climatic, landscape and vertebrate host factors as revealed by phylogeographic inference	2017	Proceedings of the Royal Society B: Biological Sciences	284	10.1098/rspb.2017.0919
Johnston, R.J., Boyle, K.J., Vic Adamowicz, W., Bennett, J., Brouwer, R., Ann Cameron, T., Michael Hanemann, W., Hanley, N., Ryan, M., Scarpa, R., Tourangeau, R., Vossler, C.A.	Contemporary guidance for stated preference studies	2017	Journal of the Association of Environmental and Resource Economists	4	10.1086/691697
Khan, N.H., Llewellyn, M.S., Schönian, G., Sutherland, C.J.	Variability of cutaneous leishmaniasis lesions is not associated with genetic diversity of Leishmania tropica in Khyber Pakhtunkhwa province of Pakistan	2017	American Journal of Tropical Medicine and Hygiene	97	10.4269/ajtmh.16-0887
Kilbey, A., Terry, A., Wotton, S., Borland, G., Zhang, Q., Mackay, N., McDonald, A., Bell, M., Wakelam, M.J.O., Cameron, E.R., Neil, J.C.	RunX1 Orchestrates Sphingolipid Metabolism and Glucocorticoid Resistance in Lymphomagenesis	2017	Journal of Cellular Biochemistry	118	10.1002/jcb.25802
Killen, S.S., Norin, T., Halsey, L.G.	Do method and species lifestyle affect measures of maximum metabolic rate in fishes?	2017	Journal of Fish Biology	90	10.1111/jfb.13195
Kim, S.-Y., Metcalfe, N.B., da Silva, A., Velando, A.	Thermal conditions during early life influence seasonal maternal strategies in the three-spined stickleback	2017	BMC Ecology	17	10.1186/s12898-017-0144-x
Kinnaird, J.H., Singh, M., Gillan, V., Weir, W., Calder, E.D., Hostettler, I., Tatu, U., Devaney, E., Shiels, B.R.	Characterization of HSP90 isoforms in transformed bovine leukocytes infected with Theileria annulata	2017	Cellular Microbiology	19	10.1111/cmi.12669
Kleczkowski, A., Ellis, C., Hanley, N., Goulson, D.	Pesticides and bees: Ecological-economic modelling of bee populations on farmland	2017	Ecological Modelling	360	10.1016/j.ecolmodel.2017.06.008
Koite, S.W., Larcombe, S.D., Jadhao, S.G., Magar, S.P., Warthi, G., Kurkure, N.V., Glass, E.J., Shiels, B.R.	PCR diagnosis of tick-borne pathogens in Maharashtra state, India indicates fitness cost associated with carrier infections is greater for crossbreed than native cattle breeds	2017	PLoS ONE	12	10.1371/journal.pone.0174595

Kurosawa, A., Tojinbara, K., Kadowaki, H., Hampson, K., Yamada, A., Makita, K.	The rise and fall of rabies in Japan: A quantitative history of rabies epidemics in Osaka Prefecture, 1914–1933	2017	PLoS Neglected Tropical Diseases	11	10.1371/journal.pntd.0005435
Lamberton, P.H.L., Faust, C.L., Webster, J.P.	Praziquantel decreases fecundity in <i>Schistosoma mansoni</i> adult worms that survive treatment: Evidence from a laboratory life-history trade-offs selection study	2017	Infectious Diseases of Poverty	6	10.1186/s40249-017-0324-0
Lempereur, L., Larcombe, S.D., Durrani, Z., Karagenc, T., Bilgic, H.B., Bakirci, S., Haciarioglu, S., Kinnaird, J., Thompson, J., Weir, W., Shiels, B.	Identification of candidate transmission-blocking antigen genes in <i>Theileria annulata</i> and related vector-borne apicomplexan parasites	2017	BMC Genomics	18	10.1186/s12864-017-3788-1
Lindeberg, H., Burchmore, R.J.S., Kennedy, M.W.	Pulse of inflammatory proteins in the pregnant uterus of European polecats ( <i>Mustela putorius</i> ) leading to the time of implantation	2017	Royal Society Open Science	4	10.1098/rsos.161085
Llewellyn, M.S., Leadbeater, S., Garcia, C., Sylvain, F.-E., Custodio, M., Ang, K.P., Powell, F., Carvalho, G.R., Greer, S., Elliot, J., Derome, N.	Parasitism perturbs the mucosal microbiome of Atlantic Salmon	2017	Scientific Reports	7	10.1038/srep43465
Loughridge, A.B., Hess, A.M., Parkin, T.D., Kawcak, C.E.	Qualitative assessment of bone density at the distal articulating surface of the third metacarpal in Thoroughbred racehorses with and without condylar fracture	2017	Equine Veterinary Journal	49	10.1111/evj.12544
Lowe, A.D., Bawazeer, S., Watson, D.G., McGill, S., Burchmore, R.J.S., Pomeroy, P.P., Kennedy, M.W.	Rapid changes in Atlantic grey seal milk from birth to weaning - Immune factors and indicators of metabolic strain	2017	Scientific Reports	7	10.1038/s41598-017-16187-7
Luthersson, N., Mannfalk, M., Parkin, T.D.H., Harris, P.	Laminitis: Risk Factors and Outcome in a Group of Danish Horses	2017	Journal of Equine Veterinary Science	53	10.1016/j.jevs.2016.03.006
Lynch, E.W.J., Coyle, C.S., Stevenson, T.J.	Photoperiodic and ovarian steroid regulation of histone deacetylase 1, 2, and 3 in Siberian hamster ( <i>Phodopus sungorus</i> ) reproductive tissues	2017	General and Comparative Endocrinology	246	10.1016/j.ygcen.2016.12.008
Mable, B.K., Haggmann, J., Kim, S.-T., Adam, A., Kilbride, E., Weigel, D., Stift, M.	What causes mating system shifts in plants? <i>Arabidopsis lyrata</i> as a case study	2017	Heredity	118	10.1038/hdy.2016.99
Macpherson, M.F., Kleczkowski, A., Healey, J.R., Quine, C.P., Hanley, N.	The effects of invasive pests and pathogens on strategies for forest diversification	2017	Ecological Modelling	350	10.1016/j.ecolmodel.2017.02.003
Macpherson, M.F., Kleczkowski, A., Healey, J.R., Hanley, N.	Payment for multiple forest benefits alters the effect of tree disease on optimal forest rotation length	2017	Ecological Economics	134	10.1016/j.ecolecon.2017.01.008

Marasco, V., Stier, A., Boner, W., Griffiths, K., Heidinger, B., Monaghan, P.	Environmental conditions can modulate the links among oxidative stress, age, and longevity	2017	Mechanisms of Ageing and Development	164 2	10.1016/j.mad.2017.04.01
Marcos-López, M., Rodger, H.D., O'Connor, I., Braceland, M., Burchmore, R.J.S., Eckersall, P.D., MacCarthy, E.	A proteomic approach to assess the host response in gills of farmed Atlantic salmon <i>Salmo salar</i> L. affected by amoebic gill disease	2017	Aquaculture	470	10.1016/j.aquaculture.2017.06.12.009
Martin, J.E., McKeegan, D.E.F., Sparrey, J., Sandilands, V.	Evaluation of the potential killing performance of novel percussive and cervical dislocation tools in chicken cadavers	2017	British Poultry Science	58	10.1080/00071668.2017.1280724
McKenzie, D.J., Blasco, F.R., Beirão, T.C., Killen, S.S., Martins, N.D., Taylor, E.W., Rantin, F.T.	Physiological determinants of individual variation in sensitivity to an organophosphate pesticide in Nile tilapia <i>Oreochromis niloticus</i>	2017	Aquatic Toxicology	189	10.1016/j.aquatox.2017.06.001
McLennan, D., Armstrong, J.D., Stewart, D.C., Mckelvey, S., Boner, W., Monaghan, P., Metcalfe, N.B.	Shorter juvenile telomere length is associated with higher survival to spawning in migratory Atlantic salmon	2017	Functional Ecology	31	10.1111/1365-2435.12939
Mpolya, E.A., Lembo, T., Lushasi, K., Mancy, R., Mbunda, E.M., Makungu, S., Maziku, M., Sikana, L., Jaswant, G., Townsend, S., Meslin, F.-X., Abela-Ridder, B., Ngeleja, C., Changalucha, J., Mtema, Z., Sambo, M., Mchau, G., Rysava, K., Nanai, A., Kazwala, R., Cleaveland, S., Hampson, K.	Toward elimination of dog-mediated human rabies: Experiences from implementing a large-scale demonstration project in Southern Tanzania	2017	Frontiers in Veterinary Science	4	10.3389/fvets.2017.00021
Mulvey, L., Sands, W.A., Salin, K., Carr, A.E., Selman, C.	Disentangling the effect of dietary restriction on mitochondrial function using recombinant inbred mice	2017	Molecular and Cellular Endocrinology	455	10.1016/j.mce.2016.09.001
Nadin-Davis, S.A., Colville, A., Trewby, H., Biek, R., Real, L.	Application of high-throughput sequencing to whole rabies viral genome characterisation and its use for phylogenetic re-evaluation of a raccoon strain incursion into the province of Ontario	2017	Virus Research	232	10.1016/j.virusres.2017.02.007
Nakagawa, S., Johnson, P.C.D., Schielzeth, H.	The coefficient of determination R <sup>2</sup> and intra-class correlation coefficient from generalized linear mixed-effects models revisited and expanded	2017	Journal of the Royal Society Interface	14	10.1098/rsif.2017.0213

Nettle, D., Andrews, C., Reichert, S., Bedford, T., Kolenda, C., Parker, C., Martin-Ruiz, C., Monaghan, P., Bateson, M.	Early-life adversity accelerates cellular ageing and affects adult inflammation: Experimental evidence from the European starling	2017	Scientific Reports	7	10.1038/srep40794
Ngowo, H.S., Kaindoa, E.W., Matthiopoulos, J., Ferguson, H.M., Okumu, F.O.	Variations in household microclimate affect outdoor-biting behaviour of malaria vectors [version 1; referees: 2 approved, 1 approved with reservations]	2017	Wellcome Open Research	2	10.12688/wellcomeopenres.12928.1
Nogales, A., Chauché, C., DeDiego, M.L., Topham, D.J., Parrish, C.R., Murcia, P.R., Martínez-Sobrido, L.	The K186E amino acid substitution in the canine influenza virus H3N8 NS1 protein restores its ability to inhibit host gene expression	2017	Journal of Virology	91	10.1128/JVI.00877-17
Nogales, A., Rodriguez, L., Chauché, C., Huang, K., Reilly, E.C., Topham, D.J., Murcia, P.R., Parrish, C.R., Martínez-Sobrido, L.	Temperaturesensitive live-attenuated canine influenza virus H3N8 vaccine	2017	Journal of Virology	91	10.1128/JVI.02211-16
Nogales, A., Huang, K., Chauché, C., DeDiego, M.L., Murcia, P.R., Parrish, C.R., Martínez-Sobrido, L.	Canine influenza viruses with modified NS1 proteins for the development of live-attenuated vaccines	2017	Virology	500	10.1016/j.virol.2016.10.008
Noguera, J.C., Metcalfe, N.B., Monaghan, P.	Postnatal nutrition influences male attractiveness and promotes plasticity in mating preferences	2017	Die Naturwissenschaften	104	10.1007/s00114-017-1524-y
Noreikiene, K., Öst, M., Seltmann, M.W., Boner, W., Monaghan, P., Jaatinen, K.	Nest cover and faecal glucocorticoid metabolites are linked to hatching success and telomere length in breeding Common Eiders (Somateria mollissima)	2017	Canadian Journal of Zoology	95	10.1139/cjz-2016-0242
O'Hanlon, N.J., McGill, R.A.R., Nager, R.G.	Increased use of intertidal resources benefits breeding success in a generalist gull species	2017	Marine Ecology Progress Series	574	10.3354/meps12189
O'Reilly, E.L., Burchmore, R.J., Sparks, N.H., Eckersall, P.D.	The effect of microbial challenge on the intestinal proteome of broiler chickens	2017	Proteome Science	15	10.1186/s12953-017-0118-0
Pakaliete, K., Aigars, J., Czajkowski, M., Strake, S., Zawajska, E., Hanley, N.	Understanding the distribution of economic benefits from improving coastal and marine ecosystems	2017	Science of the Total Environment	584-585	10.1016/j.scitotenv.2017.01.097
Panhans, M., Lavric, L., Hanley, N.	The Effects of Electricity Costs on Firm Relocation Decisions: Insights for the Pollution Havens Hypothesis?	2017	Environmental and Resource Economics	681	10.1007/s10640-016-0051-1

Peel, A.J., Wood, J.L.N., Baker, K.S., Breed, A.C., Carvalho, A.D., Fernández-Loras, A., Gabrieli, H.S., Gembu, G.-C., Kakengi, V.A., Kailba, P.M., Kityo, R.M., Lembo, T., Mba, F.E., Ramos, D., Rodriguez-Prieto, I., Suu-Ire, R., Cunningham, A.A., Hayman, D.T.S.	How Does Africa's Most Hunted Bat Vary Across the Continent? Population Traits of the Straw-Coloured Fruit Bat ( <i>Eidolon helvum</i> ) and Its Interactions with Humans	2017	Acta Chiropterologica	19	10.3161/15081109ACC2017.19.1.006
Pepin, K.M., Davis, A.J., Streicker, D.G., Fischer, J.W., VerCauteren, K.C., Gilbert, A.T.	Predicting spatial spread of rabies in skunk populations using surveillance data reported by the public	2017	PLoS Neglected Tropical Diseases	11	10.1371/journal.pntd.0005822
Pinilla, M.J., Tranquille, C.A., Blunden, A.S., Chang, Y.M., Parkin, T.D.H., Murray, R.C.	Histological Features of the Distal Third Metacarpal Bone in Thoroughbred Racehorses, With and Without Lateral Condylar Fractures	2017	Journal of Comparative Pathology	157	10.1016/j.jcpa.2017.04.002
Piper, E.K., Jonsson, N.N., Gondro, C., Vance, M.E., Lew-Tabor, A., Jackson, L.A.	Peripheral cellular and humoral responses to infestation with the cattle tick <i>Rhipicephalus microplus</i> in Santa Gertrudis cattle	2017	Parasite Immunology	39	10.1111/pim.12402
Pitaksakulrat, O., Kiatsopit, N., Laoprom, N., Webster, B.L., Webster, J.P., Lamberton, P.H.L., Laha, T., Andrews, R.H., Petney, T.N., Blair, D., Carlton, E.J., Spear, R.C., Sithithaworn, P.	Preliminary genetic evidence of two different populations of <i>Opisthorchis viverrini</i> in Lao PDR	2017	Parasitology Research	116	10.1007/s00436-017-5401-1
Pollock, C.J., Capilla-Lasheras, P., McGill, R.A.R., Helm, B., Dominoni, D.M.	Integrated behavioural and stable isotope data reveal altered diet linked to low breeding success in urban-dwelling blue tits ( <i>Cyanistes caeruleus</i> )	2017	Scientific Reports	7	10.1038/s41598-017-04575-y
Porphyre, T., Correia-Gomes, C., Chase-Topping, M.E., Gamado, K., Auty, H.K., Hutchinson, I., Reeves, A., Gunn, G.J., Woolhouse, M.E.J.	Vulnerability of the British swine industry to classical swine fever	2017	Scientific Reports	7	10.1038/srep42992
Prentice, J.C., Marion, G., Hutchings, M.R., McNeilly, T.N., Matthews, L.	Complex responses to movement-based disease control: When livestock trading helps	2017	Journal of the Royal Society Interface	14	10.1098/rsif.2016.0531
Recknagel, H., Hooker, O.E., Adams, C.E., Elmer, K.R.	Ecosystem size predicts eco-morphological variability in a postglacial diversification	2017	Ecology and Evolution	7	10.1002/ece3.3013
Reichert, S., Froy, H., Boner, W., Burg, T.M., Daunt, F., Gillespie, R., Griffiths, K., Lewis, S., Phillips, R.A., Nussey, D.H., Monaghan, P.	Telomere length measurement by qPCR in birds is affected by storage method of blood samples	2017	Oecologia	184	10.1007/s00442-017-3887-3
Roberts, M., Hanley, N., Williams, S., Cresswell, W.	Terrestrial degradation impacts on coral reef health: Evidence from the Caribbean	2017	Ocean and Coastal Management	149	10.1016/j.ocecoaman.2017.09.005
Roberts, M., Hanley, N., Cresswell, W.	User fees across ecosystem boundaries: Are SCUBA divers willing to pay for terrestrial biodiversity conservation?	2017	Journal of Environmental Management	200	10.1016/j.jenvman.2017.05.070

Rodríguez, A., Burgon, J.D., Lyra, M., Irisarri, I., Baurain, D., Blaustein, L., Göçmen, B., Künzel, S., Mable, B.K., Nolte, A.W., Veith, M., Steinfartz, S., Elmer, K.R., Philippe, H., Vences, M.	Inferring the shallow phylogeny of true salamanders (Salamandra) by multiple phylogenomic approaches	2017	Molecular Phylogenetics and Evolution	115	10.1016/j.ympev.2017.07.009
Rodríguez, L., Nogales, A., Murcia, P.R., Parrish, C.R., Martínez-Sobrido, L.	A bivalent live-attenuated influenza vaccine for the control and prevention of H3N8 and H3N2 canine influenza viruses	2017	Vaccine	35	10.1016/j.vaccine.2017.06.060
Rodríguez, L., Nogales, A., Reilly, E.C., Topham, D.J., Murcia, P.R., Parrish, C.R., Martínez Sobrido, L.	A live-attenuated influenza vaccine for H3N2 canine influenza virus	2017	Virology	504	10.1016/j.virol.2017.01.020
Ryan, M.R., Cleaveland, S.	Zoonotic diseases: Sharing insights from interdisciplinary research	2017	Veterinary Record	180	10.1136/vr.j1261
Salin, K., Auer, S.K., Villasevil, E.M., Anderson, G.J., Cairns, A.G., Mullen, W., Hartley, R.C., Metcalfe, N.B.	Using the MitoB method to assess levels of reactive oxygen species in ecological studies of oxidative stress	2017	Scientific Reports	7	10.1038/srep41228
Sambo, M., Johnson, P.C.D., Hotopp, K., Changalucha, J., Cleaveland, S., Kazwala, R., Lembo, T., Lugelo, A., Lushasi, K., Maziku, M., Mbanda, E., Mtema, Z., Sikana, L., Townsend, S.E., Hampson, K.	Comparing methods of assessing dog rabies vaccination coverage in rural and urban communities in Tanzania	2017	Frontiers in Veterinary Science	4	10.3389/fvets.2017.00033
Sánchez, M.J., Azor, P.J., Molina, A., Parkin, T., Rivero, J.L.L., Valera, M.	Prevalence, risk factors and genetic parameters of cresty neck in Pura Raza Español horses	2017	Equine Veterinary Journal	49	10.1111/evj.12569
Sandorf, E.D., Campbell, D., Hanley, N.	Disentangling the influence of knowledge on attribute non-attendance	2017	Journal of Choice Modelling	24	10.1016/j.jocm.2016.09.003
Santana, A.M., da Silva, D.G., Clemente, V., Bernardes, P.A., Pizauro, L.J.L., Santana, C.H., Thomas, F.C., McCulloch, E., Eckersall, P.D., Fagliari, J.J.	Erythrogram, leukogram, and acute phase protein reference intervals for healthy newborn Murrah buffalo calves (Bubalus bubalis) within the first month of life	2017	Comparative Clinical Pathology	26	10.1007/s00580-017-2447-x
Schrama, D., Richard, N., Silva, T.S., Figueiredo, F.A., Conceição, L.E.C., Burchmore, R., Eckersall, D., Rodrigues, P.M.L.	Enhanced dietary formulation to mitigate winter thermal stress in gilthead sea bream (Sparus aurata): a 2D-DIGE plasma proteome study	2017	Fish Physiology and Biochemistry	43	10.1007/s10695-016-0315-2
Sheremet, O., Healey, J.R., Quine, C.P., Hanley, N.	Public Preferences and Willingness to Pay for Forest Disease Control in the UK	2017	Journal of Agricultural Economics	68	10.1111/1477-9552.12210
Simonsen, M.K., Siwertsson, A., Adams, C.E., Amundsen, P.A., Præbel, K., Knudsen, R.	Allometric trajectories of body and head morphology in three sympatric Arctic charr (Salvelinus alpinus (L.)) morphs	2017	Ecology and Evolution	7	10.1002/ece3.3224
Smith, V.A., McBrearty, A.R., Watson, D.G., Mellor, D.J., Spence, S., Knottenbelt, C.	Hair nicotine concentration measurement in cats and its relationship to owner-reported environmental tobacco smoke exposure	2017	Journal of Small Animal Practice	58	10.1111/jsap.12616



Soady, K.J., Tornillo, G., Kendrick, H., Meniel, V., Olijnyk-Dallis, D., Morris, J.S., Stein, T., Gusterson, B.A., Isacke, C.M., Smalley, M.J.	The receptor protein tyrosine phosphatase PTPRB negatively regulates EGF2-dependent branching morphogenesis	2017	Development (Cambridge)	144	10.1242/dev.149120
Stevenson, T.J., Kumar, V.	Neural control of daily and seasonal timing of songbird migration	2017	Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology	203	10.1007/s00359-017-1193-5
Stevenson, T.J.	Environmental and hormonal regulation of epigenetic enzymes in the hypothalamus	2017	Journal of Neuroendocrinology	29	10.1111/jne.12471
Stevenson, T.J.	Circannual and circadian rhythms of hypothalamic DNA methyltransferase and histone deacetylase expression in male Siberian hamsters ( <i>Phodopus sungorus</i> )	2017	General and Comparative Endocrinology	243	10.1016/j.ygcen.2016.11.011
Strickson, S., Emmerich, C.H., Goh, E.T.H., Zhang, J., Kelsall, I.R., MacArtney, T., Hastie, C.J., Knebel, A., Pegg, M., Marchesi, F., Arthur, J.S.C., Cohen, P.	Roles of the TRAF6 and Pellino E3 ligases in MyD88 and RANKL signaling	2017	Proceedings of the National Academy of Sciences of the United States of America	114	10.1073/pnas.1702367114
Taylor, L.H., Hampson, K., Fahrion, A., Abela-Ridder, B., Nel, L.H.	Difficulties in estimating the human burden of canine rabies	2017	Acta Tropica	165	10.1016/j.actatropica.2017.05.007
Terry, A., Kilbey, A., Naseer, A., Levy, L.S., Ahmad, S., Watts, C., Mackay, N., Cameron, E., Wilson, S., Neil, J.C.	Barriers to infection of human cells by feline leukemia virus: Insights into resistance to zoonosis	2017	Journal of Virology	91	10.1128/JVI.02119-16
Torres, C., Hanley, N.	Communicating research on the economic valuation of coastal and marine ecosystem services	2017	Marine Policy	75	10.1016/j.marpol.2016.10.017
Torres-Dowdall, J., Pierotti, M.E.R., Härer, A., Karagic, N., Woltering, J.M., Henning, F., Elmer, K.R., Meyer, A.	Rapid and Parallel Adaptive Evolution of the Visual System of Neotropical Midas Cichlid Fishes	2017	Molecular Biology and Evolution	34	10.1093/molbev/msx143
Tranquille, C.A., Murray, R.C., Parkin, T.D.H.	Can we use subchondral bone thickness on high-field magnetic resonance images to identify Thoroughbred racehorses at risk of catastrophic lateral condylar fracture?	2017	Equine Veterinary Journal	49	10.1111/evj.12574
Trewby, H., Nadin-Davis, S.A., Real, L.A., Biek, R.	Processes underlying rabies virus incursions across US–Canada border as revealed by whole-genome phylogeography	2017	Emerging Infectious Diseases	23	10.3201/eid2309.170325
Trewby, H., Wright, D.M., Skuce, R.A., McCormick, C., Mallon, T.R., Presho, E.L., Kao, R.R., Haydon, D.T., Biek, R.	Relative abundance of <i>Mycobacterium bovis</i> molecular types in cattle: A simulation study of potential epidemiological drivers	2017	BMC Veterinary Research	13	10.1186/s12917-017-1190-5

Van Leeuwen, T.E., Killen, S.S., Metcalfe, N.B., Adams, C.E.	Differences in early developmental rate and yolk conversion efficiency in offspring of trout with alternative life histories	2017	Ecology of Freshwater Fish	26	10.1111/eff.12281
van Osch, S., Hynes, S., O'Higgins, T., Hanley, N., Campbell, D., Freeman, S.	Estimating the Irish public's willingness to pay for more sustainable salmon produced by integrated multi-trophic aquaculture	2017	Marine Policy	84	10.1016/j.marpol.2017.07.005
Vieira, B.P., Furness, R.W., Nager, R.G.	Using field photography to study avian moult	2017	Ibis	159	10.1111/ibi.12445
Votier, S.C., Fayet, A.L., Bearhop, S., Bodey, T.W., Clark, B.L., Grecian, J., Guilford, T., Hamer, K.C., Jeglinski, J.W.E., Morgan, G., Wakefield, E., Patrick, S.C.	Effects of age and reproductive status on individual foraging site fidelity in a long-lived marine predator	2017	Proceedings of the Royal Society B: Biological Sciences	284	10.1098/rspb.2017.1068
Wakefield, E.D., Owen, E., Baer, J., Carroll, M.J., Daunt, F., Dodd, S.G., Green, J.A., Guilford, T., Mavor, R.A., Miller, P.I., Newell, M.A., Newton, S.F., Robertson, G.S., Shoji, A., Soanes, L.M., Votier, S.C., Wanless, S., Bolton, M.	Breeding density, fine-scale tracking, and large-scale modeling reveal the regional distribution of four seabird species:	2017	Ecological Applications	27	10.1002/eap.1591
Welbers, A.A.M.H., van Dis, N.E., Kolvoort, A.M., Ouyang, J., Visser, M.E., Spoelstra, K., Dominoni, D.M.	Artificial light at night reduces daily energy expenditure in breeding great tits ( <i>Parus major</i> )	2017	Frontiers in Ecology and Evolution	5	10.3389/fevo.2017.00055
Welden, N.A., Cowie, P.R.	Degradation of common polymer ropes in a sublittoral marine environment	2017	Marine Pollution Bulletin	118	10.1016/j.marpolbul.2017.02.072
Welsh, C.E., Parkin, T.D.H., Marshall, J.F.	Use of large-scale veterinary data for the investigation of antimicrobial prescribing practices in equine medicine	2017	Equine Veterinary Journal	49	10.1111/evj.12638
Welsh, C.E., Duz, M., Parkin, T.D.H., Marshall, J.F.	Disease and pharmacologic risk factors for first and subsequent episodes of equine laminitis: A cohort study of free-text electronic medical records	2017	Preventive Veterinary Medicine	136	10.1016/j.prevetmed.2017.06.012
Westman, M.E., Malik, R., Hall, E., Harris, M., Hosie, M.J., Norris, J.M.	Duration of antibody response following vaccination against feline immunodeficiency virus	2017	Journal of Feline Medicine and Surgery	19	10.1177/1098612X1667321992
Wilson, P.W., Suther, C.S., Bain, M.M., Icken, W., Jones, A., Quinlan-Pluck, F., Olori, V., Gautron, J., Dunn, I.C.	Understanding avian egg cuticle formation in the oviduct: a study of its origin and deposition	2017	Biology of Reproduction	97	10.1093/biolre/iox070
Zeng, L.-Q., Zhang, A.-J., Killen, S.S., Cao, Z.-D., Wang, Y.-X., Fu, S.-J.	Standard metabolic rate predicts growth trajectory of juvenile Chinese crucian carp ( <i>Carassius auratus</i> ) under changing food availability	2017	Biology Open	6	10.1242/bio.025452

Amengual-Batle, P., Rusbridge, C., José-López, R., Golini, L., Shelton, G.D., Mellersh, C.S., Gutierrez-Quintana, R.	Two mixed breed dogs with sensory neuropathy are homozygous for an inversion disrupting FAM134B previously identified in Border Collies	2018	Journal of Veterinary Internal Medicine	32	10.1111/jvim.15312
Anderson, G., Mackay, N., Gilroy, K., Hay, J., Borland, G., McDonald, A., Bell, M., Hassanudin, S.A., Cameron, E., Neil, J.C., Kilbey, A.	RUNX-mediated growth arrest and senescence are attenuated by diverse mechanisms in cells expressing RUNX1 fusion oncoproteins	2018	Journal of Cellular Biochemistry	119	10.1002/jcb.26443
Basripuzi, N.H., Salisi, M.S., Isa, N.M.M., Busin, V., Cairns, C., Jenvey, C., Stear, M.J.	Boer goats appear to lack a functional IgA and eosinophil response against natural nematode infection	2018	Veterinary Parasitology	264	10.1016/j.vetpar.2018.10.014
Benato, L., Hammond, J.	Rabbit neutering in primary-care education: Insights from a surgical clinic	2018	Journal of Veterinary Medical Education	45	10.3138/jvme.0916-149r
Bennet, E.D., Parkin, T.D.H.	Fédération Equestre Internationale (FEI) endurance events: Riding speeds as a risk factor for failure to qualify outcomes (2012–2015)	2018	Veterinary Journal	236	10.1016/j.tvjl.2018.04.012
Bennet, E.D., Parkin, T.D.H.	Fédération Equestre Internationale endurance events: Risk factors for failure to qualify outcomes at the level of the horse, ride and rider (2010–2015)	2018	Veterinary Journal	236	10.1016/j.tvjl.2018.04.011
Borsanelli, A.C., Lappin, D.F., Viora, L., King, G., Bennett, D., Dutra, I.S., Riggio, M.P.	Evaluation of tissue levels of Toll-like receptors and cytokine mRNAs associated with bovine periodontitis and oral health	2018	Research in Veterinary Science	118	10.1016/j.rvsc.2018.04.008
Borsanelli, A.C., Lappin, D.F., Viora, L., Bennett, D., Dutra, I.S., Brandt, B.W., Riggio, M.P.	Microbiomes associated with bovine periodontitis and oral health	2018	Veterinary Microbiology	218	10.1016/j.vetmic.2018.03.016
Brocal, J., De Decker, S., José-López, R., Manzanilla, E.G., Penderis, J., Stalin, C., Bertram, S., Schoenebeck, J.J., Rusbridge, C., Fitzpatrick, N., Gutierrez-Quintana, R.	C7 vertebra homeotic transformation in domestic dogs – are Pug dogs breaking mammalian evolutionary constraints?	2018	Journal of Anatomy	233	10.1111/joa.12822
Brocal, J., De Decker, S., José-López, R., Guevar, J., Ortega, M., Parkin, T., Ter Haar, G., Gutierrez-Quintana, R.	Evaluation of radiography as a screening method for detection and characterisation of congenital vertebral malformations in dogs	2018	Veterinary Record	182	10.1136/vr-104388
Chauché, C., Nogales, A., Zhu, H., Goldfarb, D., Ahmad Shanzha, A.I., Gu, Q., Parrish, C.R., Martínez-Sobrido, L., Marshall, J.F., Murcia, P.R.	Mammalian adaptation of an avian influenza A virus involves stepwise changes in NS1	2018	Journal of Virology	92	10.1128/JVI.01875-17

Chaudhury, S., O'Connor, C., Cañete, A., Bittencourt-Silvestre, J., Sarrou, E., Prendergast, Á., Choi, J., Johnston, P., Wells, C.A., Gibson, B., Keeshan, K.	Age-specific biological and molecular profiling distinguishes paediatric from adult acute myeloid leukaemias	2018	Nature Communications	9	10.1038/s41467-018-07584-1
Dicker, D., Nguyen, G., Abate, D., Abate, K.H., Abay, S.M., Abbafati, C., Abbasi, N., Abbastabar, H., Abd-Allah, F., Abdela, J., Abdelalim, A., Abdel-Rahman, O., Abdi, A., Abdollahpour, I., Abdulkader, R.S., Abdurahman, A.A., Abebe, H.T., Abebe, M., Abebe, Z., Abebo, T.A., Aboyans, Fullman, N., Yearwood, J., Abay, S.M., Abbafati, C., Abd-Allah, F., Abdela, J., Abdelalim, A., Abebe, Z., Abebo, T.A., Aboyans, V., Abraha, H.N., Abreu, D.M.X., Abu-Raddad, L.J., Adane, A.A., Adedoyin, R.A., Adetokunboh, O., Adhikari, T.B., Afarideh, M., Afshin, A., Agarwal, G., Agius, Gamito-Gómez, A., Gutierrez-Quintana, R., Wessmann, A.	Global, regional, and national age-sex-specific mortality and life expectancy, 1950-2017: A systematic analysis for the Global Burden of Disease Study 2017 Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected subnational locations: A systematic analysis from the Global Burden of Disease Study 2016 Congenital malformations resembling VACTERL association in a golden retriever	2018	The Lancet	392	10.1016/S0140-6736(18)31891-9
Gladden, N., McKeegan, D., Viora, L., Ellis, K.A.	Postpartum ketoprofen treatment does not alter stress biomarkers in cows and calves experiencing assisted and unassisted parturition: A randomised controlled trial	2018	Veterinary Record	183	10.1136/vr.104913
Abbasi, N., Abbastabar, H., Abd-Allah, F., Abdela, J., Abdelalim, A., Abdollahpour, I., Abdulkader, R.S., Abebe, Z., Abera, S.F., Abil, O.Z., Abraha, H.N., Abu-Raddad, L.J., Abu-Rmeileh, N.M.E., Accrombessi, M.M.K., Acharya, D., Acharya, P., Ackerman, I.N., Adamu, A.A., Adebayo, O.M., Adekanmbi, V., Adetokunboh, O.O., Adib, M.G., Adsuar, King, A.	Global, regional, and national incidence, prevalence, and years lived with disability for 354 Diseases and Injuries for 195 countries and territories, 1990-2017: A systematic analysis for the Global Burden of Disease Study 2017 An insight into digital radiography use in small animal practice in the UK Effects of midazolam on cardiovascular responses and isoflurane requirement during elective ovariohysterectomy in dogs Severe intraoperative hypoxaemia in a horse due to failure of an oxygen concentrator and auxiliary oxygen supply	2018	Veterinary Record	182	10.1136/vr.k798
Kropf, J., Hughes, J.M.L.		2018	Irish Veterinary Journal	71	10.1186/s13620-018-0136-7
Kropf, J., Hughes, J.M.L.		2018	Veterinary Record Case Reports	6	10.1136/vetreccr-2018-000740

Abbasi, N., Abbastabar, H., Abd-Allah, F., Abdela, J., Abdelalim, A., Abdollahpour, I., Abdulkader, R.S., Abebe, M., Abebe, Z., Abil, O.Z., Aboyans, V., Abraham, A.R., Aburaddad, L.J., Abu-Rmeileh, N.M.E., Accrombessi, M.M.K., Acharya, D., Acharya, P., Ackerman, I.N., Adamu, A.A.,	adjusted life-years (DALYs) for 359 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990-2017: A systematic analysis for the Global Burden of Disease Study 2017	2018	The Lancet	392	10.1016/S0140-6736(18)32335-3
Lobacz, M.A., Serra, F., Hammond, G., Oevermann, A., Haley, A.C.	IMAGING DIAGNOSIS—MAGNETIC RESONANCE IMAGING OF DIFFUSE LEPTOMENINGEAL OLIGODENDROGLIOMATOSIS IN A DOG WITH “DURAL TAIL SIGN”	2018	Veterinary Radiology and Ultrasound	59	10.1111/vru.12441
McCarroll, C.S., He, W., Foote, K., Bradley, A., McGlynn, K., Vidler, F., Nixon, C., Nather, K., Fattah, C., Riddell, A., Bowman, P., Elliott, E.B., Bell, M., Hawksby, C., Mackenzie, S.M., Morrison, L.J., Terry, A., Blyth, K., Smith, G.L., McBride, M.W., Kubin, T., Braun, T., Nicklin, S.A., Cameron, E.R., Loughrey, C.M.	Runx1 deficiency protects against adverse cardiac remodeling after myocardial infarction	2018	Circulation	137	10.1161/CIRCULATIONAHA.117.028911
McNaught, K.A., Morris, J., Lazzarini, K., Millins, C., José-López, R.	Spinal extradural T-cell lymphoma with paraneoplastic hyper eosinophilia in a dog: clinicopathological features, treatment, and outcome	2018	Clinical Case Reports	6	10.1002/ccr3.1503
Murray, C.J.L., Callender, C.S.K.H., Kuikoff, X.R., Srinivasan, V., Abate, D., Abate, K.H., Abay, S.M., Abbasi, N., Abbastabar, H., Abdela, J., Abdelalim, A., Abdelrahman, O., Abdi, A., Abdoli, N., Abdollahpour, I., Abdulkader, R.S., Abebe, H.T., Abebe, M., Abebe, Z., Abebo, T.A., Abejje, A.N., Aboyans, V., Abraha, H.N.,	Population and fertility by age and sex for 195 countries and territories, 1950–2017: a systematic analysis for the Global Burden of Disease Study 2017	2018	The Lancet	392	10.1016/S0140-6736(18)32278-5
Nair, A., Dolan, J., Tanner, K.E., Kerr, C.M., Jones, B., Pollock, P.J., Kellett, C.F.	Ultrasound-guided adductor canal block: a cadaver study investigating the effect of a thigh tourniquet	2018	British Journal of Anaesthesia	121	10.1016/j.bja.2018.04.044
Raftery, A.G., Jallow, S., Rodgers, J., Sutton, D.G.M.	Safety and efficacy of three trypanocides in confirmed field cases of trypanosomiasis in working equines in The Gambia: A prospective, randomised, non-inferiority trial	2018	PLoS Neglected Tropical Diseases	13	10.1371/journal.pntd.0007175
Reid, J., Wiseman-Orr, L., Scott, M.	Shortening of an existing generic online health-related quality of life instrument for dogs	2018	Journal of Small Animal Practice	59	10.1111/jsap.12772

Root, A.L., Parkin, T.D., Hutchison, P., Warnes, C., Yam, P.S.	Canine pseudopregnancy: An evaluation of prevalence and current treatment protocols in the UK	2018	BMC Veterinary Research	14	10.1186/s12917-018-1493-1
Shrestha, A., Loukas, C., Le Kernec, J., Fioranelli, F., Busin, V., Jonsson, N., King, G., Tomlinson, M., Viora, L., Voute, L.	Animal lameness detection with radar sensing	2018	IEEE Geoscience and Remote Sensing Letters	15	10.1109/LGRS.2018.2832650
Simões, P.B.A., Campbell, M., Viora, L., Gibbons, J., Geraghty, T.E., Eckersall, P.D., Zadoks, R.N.	Pilot study into milk haptoglobin as an indicator of udder health in heifers after calving	2018	Research in Veterinary Science	116	10.1016/j.rvsc.2017.05.024
Abate, K.H., Abbafati, C., Abbasi, N., Abbastabar, H., Abd-Allah, F., Abdela, J., Abdelalim, A., Abdollahpour, I., Abdulkader, R.S., Abebe, M., Abebe, Z., Abera, S.F., Abil, O.Z., Abraha, H.N., Abrham, A.R., Abu-Raddad, L.J., Abu-Rmeileh, N.M.E., Accrombessi, M.M.K., Acharya, D., Acharya, P., Adamu, A.A., Adane, A.A., Adebayo, O.M., Adedoyin, R.A., Adekambi, V., Ademi, Z., Adetokunboh,	Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990-2017: A systematic analysis for the Global Burden of Disease Study 2017	2018	The Lancet	392	10.1016/S0140-6736(18)32225-6
Stevenson, A., Kavanagh, K., Pan, J., Stevenson, L., Griffin, H., Doorbar, J., Scott, E., Deeny, M., Cuschieri, K., Graham, S.V.	Risk stratification of cervical disease using detection of human papillomavirus (HPV) E4 protein and cellular MCM protein in clinical liquid based cytology samples	2018	Journal of Clinical Virology	108	10.1016/j.jcv.2018.08.011
Thomas, F.C., Geraghty, T., Simões, P.B.A., Mshelbwala, F.M., Haiming, H., Eckersall, P.D.	A pilot study of acute phase proteins as indicators of bovine mastitis caused by different pathogens	2018	Research in Veterinary Science	119	10.1016/j.rvsc.2018.06.015
Wyatt, S., Gonçalves, R., Gutierrez-Quintana, R., De Decker, S.	Outcomes of nonsurgical treatment for congenital thoracic vertebral body malformations in dogs: 13 cases (2009-2016)	2018	Journal of the American Veterinary Medical Association	253	10.2460/javma.253.6.768
Wyse, C.A., Zhang, X., McLaughlin, M., Biello, S.M., Hough, D., Bellingham, M., Curtis, A.M., Robinson, J.E., Evans, N.P.	Circadian rhythms of melatonin and behaviour in juvenile sheep in field conditions: Effects of photoperiod, environment and weaning	2018	Physiology and Behavior	194	10.1016/j.physbeh.2018.06.001
Abbasi, N., Abbastabar, H., Abd-Allah, F., Abdela, J., Abdelalim, A., Abdollahpour, I., Abdulkader, R.S., Abebe, H.T., Abebe, M., Abebe, Z., Abeje, A.N., Abera, S.F., Abil, O.Z., Abraha, H.N., Abrham, A.R., Abu-Raddad, L.J., Accrombessi, M.M.K., Acharya, D., Adamu, A.A., Adebayo,	Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980-2017: a systematic analysis for the Global Burden of Disease Study 2017	2018	The Lancet	392	10.1016/S0140-6736(18)32203-7



Abdullah, N., Kelly, J.T., Graham, S.C., Birch, J., Gonçalves-Carneiro, D., Mitchell, T., Thompson, R.N., Lythgoe, K.A., Logan, N., Hosiie, M.J., Bavro, V.N., Willett, B.J., Heaton, M.P., Bailey, D.	Structure-guided identification of a nonhuman morbillivirus with zoonotic potential	2018	Journal of Virology	92	10.1128/JVI.01248-18
Adriko, M., Faust, C.L., Carruthers, L.V., Moses, A., Tukahebwa, E.M., Lambertson, P.H.L.	Low Praziquantel Treatment Coverage for Schistosoma mansoni in Mayuge District, Uganda, Due to the Absence of Treatment Opportunities, Rather Than Systematic Non-Compliance	2018	Tropical Medicine and Infectious Disease	3	10.3390/tropicalmed3040111
Allan, K.J., Halliday, J.E.B., Moseley, M., Carter, R.W., Ahmed, A., Goris, M.G.A., Hartskeerl, R.A., Keyyu, J., Kibona, T., Maro, V.P., Maze, M.J., Mimbaga, B.T., Tarimo, R., Crump, J.A., Cleaveland, S.	Assessment of animal hosts of pathogenic Leptospira in northern Tanzania	2018	PLoS Neglected Tropical Diseases	12	10.1371/journal.pntd.0006444
Alvarado, N.S., Stevenson, T.J.	Appetitive information seeking behaviour reveals robust daily rhythmicity for Internet-based food-related keyword searches	2018	Royal Society Open Science	5	10.1098/rsos.172080
Andrews, C., Nettle, D., Reichert, S., Bedford, T., Monaghan, P., Bateson, M.	A marker of biological ageing predicts adult risk preference in European starlings, <i>Sturnus vulgaris</i>	2018	Behavioral Ecology	29	10.1093/beheco/ary009
Ascencio, M.E., Florin-Christensen, M., Mamoun, C.B., Weir, W., Shiels, B., Schnittger, L.	Cysteine proteinase C1A paralogs profiles correspond with phylogenetic lineages of pathogenic piroplasmids	2018	Veterinary Sciences	5	10.3390/vetsci5020041
Atkinson, G., Groom, B., Hanley, N., Mourato, S.	Environmental Valuation and Benefit-Cost Analysis in U.K. Policy	2018	Journal of Benefit-Cost Analysis	9	10.1017/bca.2018.6
Auer, S.K., Dick, C.A., Metcalfe, N.B., Reznick, D.N.	Metabolic rate evolves rapidly and in parallel with the pace of life history	2018	Nature Communications	9	10.1038/s41467-017-02514-z
Auer, S.K., Salin, K., Anderson, G.J., Metcalfe, N.B.	Individuals exhibit consistent differences in their metabolic rates across changing thermal conditions	2018	Comparative Biochemistry and Physiology - Part A : Molecular and Integrative Physiology	217	10.1016/j.cbpa.2017.11.021
Awad, H., Al-Hamidhi, S., El Hussein, A.-R.M., Yousif, Y.M.Z., Taha, K.M., Salih, D.A., Weir, W., Babiker, H.A.	Theileria lestoquardi in Sudan is highly diverse and genetically distinct from that in Oman	2018	Infection, Genetics and Evolution	62	10.1016/j.meegid.2018.04.014
Babayana, S.A., Sinclair, A., Duprez, J.S., Selman, C.	Chronic helminth infection burden differentially affects haematopoietic cell development while ageing selectively impairs adaptive responses to infection	2018	Scientific Reports	8	10.1038/s41598-018-22083-5
Babayana, S.A., Orton, R.J., Streicker, D.G.	Predicting reservoir hosts and arthropod vectors from evolutionary signatures in RNA virus genomes	2018	Science	362	10.1126/science.aap9072

Babayan, S.A., Liu, W., Hamilton, G., Kilbride, E., Rynkiewicz, E.C., Clerc, M., Pedersen, A.B.	The immune and non-immune pathways that drive chronic gastrointestinal helminth burdens in the wild	2018	Frontiers in Immunology	9	10.3389/fimmu.2018.000956
Baldini, F., Rougé, J., Kreppel, K., Mkandawile, G., Mapua, S.A., Sikulu-Lord, M., Ferguson, H.M., Govella, N., Okumu, F.O.	First report of natural <i>Wolbachia</i> infection in the malaria mosquito <i>Anopheles arabiensis</i> in Tanzania	2018	Parasites and Vectors	11	10.1186/s13071-018-3249-1
Barkema, H.W., Orsel, K., Nielsen, S.S., Koets, A.P., Rutten, V.P.M.G., Bannantine, J.P., Keefe, G.P., Kelton, D.F., Wells, S.J., Whittington, R.J., Mackintosh, C.G., Manning, E.J., Weber, M.F., Heuer, C., Forde, T.L., Ritter, C., Roche, S., Corbett, C.S., Wolf, R., Griebel, P.J., Kastelic, J.P., De Buck, J.	Knowledge gaps that hamper prevention and control of <i>Mycobacterium avium</i> subspecies paratuberculosis infection	2018	Transboundary and Emerging Diseases	65	10.1111/tbed.12723
Becker, D.J., Bergner, L.M., Bentz, A.B., Orton, R.J., Altizer, S., Streicker, D.G.	Genetic diversity, infection prevalence, and possible transmission routes of <i>Bartonella</i> spp. in vampire bats	2018	PLoS Neglected Tropical Diseases	12	10.1371/journal.pntd.0006786
Becker, D.J., Czirják, G.Á., Volokhov, D.V., Bentz, A.B., Carrera, J.E., Camus, M.S., Navara, K.J., Chizhikov, V.E., Fenton, M.B., Simmons, N.B., Recuenco, S.E., Gilbert, A.T., Altizer, S., Streicker, D.G.	Livestock abundance predicts vampire bat demography, immune profiles and bacterial infection risk	2018	Philosophical Transactions of the Royal Society B: Biological Sciences	373	10.1098/rstb.2017.0089
Becker, D.J., Streicker, D.G., Altizer, S.	Using host species traits to understand the consequences of resource provisioning for host-parasite interactions	2018	Journal of Animal Ecology	87	10.1111/1365-2656.12765
Benavides, J.A., Shiva, C., Virhuez, M., Tello, C., Appelgren, A., Vendrell, J., Solassol, J., Godreuil, S., Streicker, D.G.	Extended-spectrum beta-lactamase-producing <i>Escherichia coli</i> in common vampire bats <i>Desmodus rotundus</i> and livestock in Peru	2018	Zoonoses and Public Health	65	10.1111/zph.12456
Benjamins, S., Dodd, J., Thorburn, J., Milway, V.A., Campbell, R., Bailey, D.M.	Evaluating the potential of photo-identification as a monitoring tool for flapper skate ( <i>Dipturus intermedius</i> )	2018	Aquatic Conservation: Marine and Freshwater Ecosystems	28	10.1002/aqc.2937
Bennison, A., Bearhop, S., Bodey, T.W., Votier, S.C., Grecian, W.J., Wakefield, E.D., Hamer, K.C., Jessopp, M.	Search and foraging behaviors from movement data: A comparison of methods	2018	Ecology and Evolution	8	10.1002/ece3.3593
Bilić, P., Kuleš, J., Galan, A., Gomes de Pontes, L., Guillemin, N., Horvatić, A., Festa Sabes, A., Mrijak, V., Eckersall, P.D.	Proteomics in Veterinary Medicine and Animal Science: Neglected Scientific Opportunities with Immediate Impact	2018	Proteomics	18	10.1002/pmic.201800047
Bilić, P., Guillemin, N., Kovačević, A., Beer Ljubić, B., Jović, I., Galan, A., Eckersall, P.D., Burchmore, R., Mrijak, V.	Serum proteome profiling in canine idiopathic dilated cardiomyopathy using TMT-based quantitative proteomics approach	2018	Journal of Proteomics	179	10.1016/j.jpro.2018.03.0107

Bodey, T.W., Cleasby, I.R., Votier, S.C., Hamer, K.C., Newton, J., Patrick, S.C., Wakefield, E.D., Bearhop, S.	Frequency and consequences of individual dietary specialisation in a wide-ranging marine predator, the northern gannet	2018	Marine Ecology Progress Series	604	10.3354/meps12729
Bohmann, K., Gopalakrishnan, S., Nielsen, M., Nielsen, L.D.S.B., Jones, G., Streicker, D.G., Gilbert, M.T.P.	Using DNA metabarcoding for simultaneous inference of common vampire bat diet and population structure	2018	Molecular Ecology Resources	18	10.1111/1755-0998.12891
Brackley, R., Lucas, M.C., Thomas, R., Adams, C.E., Bean, C.W.	Comparison of damage to live v. euthanized Atlantic salmon <i>Salmo salar</i> smolts from passage through an Archimedean screw turbine	2018	Journal of Fish Biology	92	10.1111/jfb.13596
Brown, R., Hing, C.T., Fornace, K., Ferguson, H.M.	Evaluation of resting traps to examine the behaviour and ecology of mosquito vectors in an area of rapidly changing land use in Sabah, Malaysian Borneo	2018	Parasites and Vectors	11	10.1186/s13071-018-2926-1
Brunker, K., Lemey, P., Marston, D.A., Fooks, A.R., Lugelo, A., Ngeleja, C., Hampson, K., Biek, R.	Landscape attributes governing local transmission of an endemic zoonosis: Rabies virus in domestic dogs	2018	Molecular Ecology	27	10.1111/mec.14470
Buckley, J., Holub, E.B., Koch, M.A., Vergeer, P., Mable, B.K.	Restriction associated DNA-genotyping at multiple spatial scales in <i>Arabidopsis lyrata</i> reveals signatures of pathogen-mediated selection	2018	BMC Genomics	19	10.1186/s12864-018-4806-7
Budziński, W., Campbell, D., Czajkowski, M., Demšar, U., Hanley, N.	Using Geographically Weighted Choice Models to Account for the Spatial Heterogeneity of Preferences	2018	Journal of Agricultural Economics	69	10.1111/1477-9552.12260
Burgess, M.D., Smith, K.W., Evans, K.L., Leech, D., Pearce-Higgins, J.W., Branston, C.J., Briggs, K., Clark, J.R., Du Feu, C.R., Lewthwaite, K., Nager, R.G., Sheldon, B.C., Smith, J.A., Whytock, R.C., Willis, S.G., Phillimore, A.B.	Tritrophic phenological match-mismatch in space and time	2018	Nature Ecology and Evolution	2	10.1038/s41559-018-0543-1
Carolus, J.F., Hanley, N., Olsen, S.B., Pedersen, S.M.	A Bottom-up Approach to Environmental Cost-Benefit Analysis	2018	Ecological Economics	152	10.1016/j.ecolecon.2018.06.009
Carruthers, M., Yurchenko, A.A., Augley, J.J., Adams, C.E., Herzyk, P., Elmer, K.R.	De novo transcriptome assembly, annotation and comparison of four ecological and evolutionary model salmonid fish species	2018	BMC Genomics	19	10.1186/s12864-017-4379-x
Carugati, M., Biggs, H.M., Maze, M.J., Stoddard, R.A., Cash-Goldwasser, S., Hertz, J.T., Halliday, J.E.B., Saganda, W., Lwezaula, B.F., Kazwala, R.R., Cleaveland, S., Matro, V.P., Rubach, M.P., Crump, J.A.	Incidence of human brucellosis in the Kilimanjaro Region of Tanzania in the periods 2007-2008 and 2012-2014	2018	Transactions of the Royal Society of Tropical Medicine and Hygiene	112	10.1093/trstmh/try033

Cash-Goldwasser, S., Maze, M.J., Rubach, M.P., Biggs, H.M., Stoddard, R.A., Sharples, K.J., Halliday, J.E.B., Cleaveland, S., Shand, M.C., Mmbaga, B.T., Muiruri, C., Saganda, W., Lwezuala, B.F., Kazwala, R.R., Maro, V.P., Crump, J.A.	Risk factors for human brucellosis in Northern Tanzania	2018	American Journal of Tropical Medicine and Hygiene	98	10.4269/ajtmh.17-0125
Caudell, M.A., Mair, C., Subbiah, M., Matthews, L., Quinlan, R.J., Quinlan, M.B., Zadoks, R., Keyyu, J., Call, D.R.	Identification of risk factors associated with carriage of resistant <i>Escherichia coli</i> in three culturally diverse ethnic groups in Tanzania: a biological and socioeconomic analysis	2018	The Lancet Planetary Health	2	10.1016/S2542-5196(18)30225-0
Channumsin, M., Ciosi, M., Masiga, D., Turner, C.M.R., Mable, B.K.	<i>Sodalis glossinidius</i> presence in wild tsetse is only associated with presence of trypanosomes in complex interactions with other tsetse-specific factors 06 Biological Sciences 0604 Genetics	2018	BMC Microbiology	18	10.1186/s12866-018-1285-6
Checchi, F., Funk, S., Chandramohan, D., Chappuis, F., Haydon, D.T.	The impact of passive case detection on the transmission dynamics of gambiense Human African Trypanosomiasis	2018	PLoS Neglected Tropical Diseases	12	10.1371/journal.pntd.0006276
Cleaveland, S., Thumbi, S.M., Sambo, M., Lugelo, A., Lushasi, K., Hampson, K., Lankester, F.	Proof of concept of mass dog vaccination for the control and elimination of canine rabies [Proof of concept of mass dog vaccination for the control and elimination of canine rabies]	2018	Revue scientifique et technique (International Office of Epizootics)	37	10.20506/rst.37.2.2824
Clements, E.A., Thomas, R., Adams, C.E.	An investigation of salmonid host utilization by the endangered freshwater pearl mussel ( <i>Margaritifera margaritifera</i> ) in north-west Scotland	2018	Aquatic Conservation: Marine and Freshwater Ecosystems	28	10.1002/aqc.2900
Constantinou, C.C., Lew-Tabor, A., Jackson, L.A., Jorgensen, W.K., Piper, E.K., Mayer, D.G., Johnson, L., Venus, B., Jonsson, N.N.	Local immune response to larvae of <i>Rhipicephalus microplus</i> in Santa Gertrudis cattle	2018	Parasite Immunology	40	10.1111/pim.12515
Cooper, B., Adriaenssens, B., Killen, S.S.	Individual variation in the compromise between social group membership and exposure to preferred temperatures	2018	Proceedings of the Royal Society B: Biological Sciences	285	10.1098/rspb.2018.0884
Cozens, D., Sutherland, E., Marchesi, F., Taylor, G., Berry, C.C., Davies, R.L.	Temporal differentiation of bovine airway epithelial cells grown at an air-liquid interface	2018	Scientific Reports	8	10.1038/s41598-018-33180-w
Cram, D.L., Monaghan, P., Gillespie, R., Dantzer, B., Duncan, C., Spence-Jones, H., Clutton-Brock, T.	Rank-Related Contrasts in Longevity Arise from Extra-Group Excursions Not Delayed Senescence in a Cooperative Mammal	2018	Current Biology	28	10.1016/j.cub.2018.07.021

Cross, P.C., van Manen, F.T., Viana, M., Alimberg, E.S., Bachen, D., Brandell, E.E., Haroldson, M.A., Hudson, P.J., Stahler, D.R., Smith, D.W.	Estimating distemper virus dynamics among wolves and grizzly bears using serology and Bayesian state-space models	2018	Ecology and Evolution	8	10.1002/ece3.4396
de Souza, W.M., Romeiro, M.F., Sabino-Santos, G., Maia, F.G.M., Fumagalli, M.J., Modha, S., Nunes, M.R.T., Murcia, P.R., Figueiredo, L.T.M.	Novel orthohepeviruses in wild rodents from São Paulo State, Brazil	2018	Virology	519	10.1016/j.virol.2018.03.025
de Souza, W.M., Fumagalli, M.J., de Araujo, J., Sabino-Santos, G., Maia, F.G.M., Romeiro, M.F., Modha, S., Nardi, M.S., Queiroz, L.H., Durigon, E.L., Nunes, M.R.T., Murcia, P.R., Figueiredo, L.T.M.	Discovery of novel anelloviruses in small mammals expands the host range and diversity of the Anelloviridae	2018	Virology	514	10.1016/j.virol.2017.11.001
Denwood, M.J., Kleen, J.L., Jensen, D.B., Jonsson, N.N.	Describing temporal variation in reticuloruminant pH using continuous monitoring data	2018	Journal of Dairy Science	101	10.3168/jds.2017-12828
Dominoni, D.M., de Jong, M., Bellingham, M., O'Shaughnessy, P., van Oers, K., Robinson, J., Smith, B., Visser, M.E., Helm, B.	Dose-response effects of light at night on the reproductive physiology of great tits ( <i>Parus major</i> ): Integrating morphological analyses with candidate gene expression	2018	Journal of Experimental Zoology Part A: Ecological and Integrative Physiology	329	10.1002/jez.2214
Doyle, S.R., Laing, R., Bartley, D.J., Britton, C., Chaudhry, U., Gilbeard, J.S., Holroyd, N., Mable, B.K., Maitland, K., Morrison, A.A., Tait, A., Tracey, A., Berriman, M., Devaney, E., Cotton, J.A., Sargison, N.D.	A Genome Resequencing-Based Genetic Map Reveals the Recombination Landscape of an Outbred Parasitic Nematode in the Presence of Polyploidy and Polyandry	2018	Genome Biology and Evolution	10	10.1093/gbe/evx269
Eaton, S., Zúñiga, C., Czyzewski, J., Ellis, C., Genney, D.R., Haydon, D., Mirzai, N., Yahr, R.	A method for the direct detection of airborne dispersal in lichens	2018	Molecular Ecology Resources	18	10.1111/1755-0998.12731
Eaton, S., Ellis, C., Genney, D., Thompson, R., Yahr, R., Haydon, D.T.	Adding small species to the big picture: Species distribution modelling in an age of landscape scale conservation	2018	Biological Conservation	217	10.1016/j.biocon.2017.11.012
Elliott, S.A.M., Allan, B.A., Turrell, W.R., Heath, M.R., Bailey, D.M.	Survival of the fittest: Explanations for gadoid imbalance in heavily fished seas	2018	Aquatic Conservation: Marine and Freshwater Ecosystems	28	10.1002/aqc.2926
Fieberg, J.R., Forester, J.D., Street, G.M., Johnson, D.H., ArchMiller, A.A., Matthiopoulos, J.	Used-habitat calibration plots: a new procedure for validating species distribution, resource selection, and step-selection models	2018	Ecography	41	10.1111/ecog.03123
Franco-Martínez, L., Tvarijonavičiute, A., Horvatić, A., Guillemin, N., Cerón, J.J., Escribano, D., Eckersall, D., Kocaturk, M., Yilmaz, Z., Lamy, E., Martínez-Subiela, S., Mirjak, V.	Changes in salivary analytes in canine parvovirus: A high-resolution quantitative proteomic study	2018	Comparative Immunology, Microbiology and Infectious Diseases	60	10.1016/j.cimid.2018.09.011
Fu, S.-J., Peng, J., Killen, S.S.	Digestive and locomotor capacity show opposing responses to changing food availability in an ambush predatory fish	2018	Journal of Experimental Biology	221	10.1242/jeb.173187

Furness, R.W., Garthe, S., Trinder, M., Matthiopoulos, J., Wanless, S., Jeglinski, J.	Nocturnal flight activity of northern gannets <i>Morus bassanus</i> and implications for modelling collision risk at offshore wind farms	2018	Environmental Impact Assessment Review	73	10.1016/j.eiar.2018.06.006
Garber, A., Hastie, P.M., Handel, I., Murray, J.M.D.	In vitro fermentation of different ratios of alfalfa and starch or inulin incubated with an equine faecal inoculum	2018	Livestock Science	215	10.1016/j.livsci.2017.05.002
Goldstein, E.J., Harvey, W.T., Wilkie, G.S., Shepherd, S.J., MacLean, A.R., Murcia, P.R., Gunson, R.N.	Integrating patient and whole-genome sequencing data to provide insights into the epidemiology of seasonal influenza A(H3N2) viruses	2018	Microbial genomics	4	10.1099/mgen.0.000137
Gordon, T.A.C., Harding, H.R., Clever, F.K., Davidson, I.K., Davison, W., Montgomery, D.W., Weatherhead, R.C., Windsor, F.M., Armstrong, J.D., Bardonnet, A., Bergman, E., Britton, J.R., Côté, I.M., D'agostino, D., Greenberg, L.A., Harborne, A.R., Kahilainen, K.K., Metcalfe, N.B., Mills, S.C., Milner, N.J., Mittermayer, F.H., Montorio, L., Nedelec, S.L., Prokkola, J.M., Rutterford, L.A., Salvanes, A.G.V., Simpson, S.D., Vainikka, A., Pinnegar, J.K., Santos, E.M.	Fishes in a changing world: learning from the past to promote sustainability of fish populations	2018	Journal of Fish Biology	92	10.1111/jfb.13546
Guerrero, J., Byrne, A.W., Lavery, J., Presho, E., Kelly, G., Courcier, E.A., O'Keefe, J., Fogarty, U., O'Meara, D.B., Ensing, D., McCormick, C., Biek, R., Skuce, R.A., Allen, A.R.	The population and landscape genetics of the European badger ( <i>Meles meles</i> ) in Ireland	2018	Ecology and Evolution	8	10.1002/ece3.4498
Guzzo, M.M., Van Leeuwen, T.E., Hollins, J., Koeck, B., Newton, M., Webber, D.M., Smith, F.I., Bailey, D.M., Killen, S.S.	Field testing a novel high residence positioning system for monitoring the fine-scale movements of aquatic organisms	2018	Methods in Ecology and Evolution	9	10.1111/2041-210X.12993
Halsey, L.G., Killen, S.S., Clark, T.D., Norin, T.	Exploring key issues of aerobic scope interpretation in ectotherms: absolute versus factorial	2018	Reviews in Fish Biology and Fisheries	28	10.1007/s11160-018-9516-3
Halsey, L.G., Wright, S., Racz, A., Metcalfe, J.D., Killen, S.S.	How does school size affect tail beat frequency in turbulent water?	2018	Comparative Biochemistry and Physiology - Part A: Molecular and Integrative Physiology	218	10.1016/j.cbpa.2018.01.015
Harkins, C.P., McAleer, M.A., Bennett, D., McHugh, M., Fleury, O.M., Pettigrew, K.A., Oravcová, K., Parkhill, J., Proby, C.M., Dawe, R.S., Geoghegan, J.A., Irvine, A.D., Holden, M.T.G.	The widespread use of topical antimicrobials enriches for resistance in <i>Staphylococcus aureus</i> isolated from patients with atopic dermatitis	2018	British Journal of Dermatology	179	10.1111/bjd.16722
Harkins, C.P., Pettigrew, K.A., Oravcová, K., Gardner, J., Hearn, R.M.R., Rice, D., Mather, A.E., Parkhill, J., Brown, S.J., Proby, C.M., Holden, M.T.G.	The Microevolution and Epidemiology of <i>Staphylococcus aureus</i> Colonization during Atopic Eczema Disease Flare	2018	Journal of Investigative Dermatology	138	10.1016/j.jid.2017.09.023



Hemmink, J.D., Sitt, T., Pelle, R., de Klerk-Lorist, L.-M., Shiels, B., Toye, P.G., Morrison, W.I., Weir, W.	Ancient diversity and geographical sub-structuring in African buffalo <i>Theileria parva</i> populations revealed through metagenetic analysis of antigen-encoding loci	2018	International Journal for Parasitology	48	10.1016/j.ijpara.2017.10.006
Herborn, K.A., Jerem, P., Nager, R.G., McKeegan, D.E.F., McCafferty, D.J.	Surface temperature elevated by chronic and intermittent stress	2018	Physiology and Behavior	191	10.1016/j.physbeh.2018.04.004
Hollins, J., Thambithurai, D., Koeck, B., Crespel, A., Bailey, D.M., Cooke, S.J., Lindström, J., Parsons, K.J., Killen, S.S.	A physiological perspective on fisheries-induced evolution	2018	Evolutionary Applications	11	10.1111/eva.12557
Honkanen, H.M., Rodger, J.R., Stephen, A., Adams, K., Freeman, J., Adams, C.E.	Counterintuitive migration patterns by Atlantic salmon <i>Salmo salar</i> smolts in a large lake	2018	Journal of Fish Biology	93	10.1111/jfb.13650
Honkanen, H.M., Dodd, J.A., Fordyce, J.R., Boylan, P., Adams, C.E.	Density- and species-dependent errors in single-pass timed electrofishing assessment of riverine salmonids	2018	Ecology of Freshwater Fish	27	10.1111/eff.12327
Honrado, C., Cluffreda, L., Spencer, D., Ranford-Cartwright, L., Morgan, H.	Dielectric characterization of <i>Plasmodium falciparum</i> -infected red blood cells using microfluidic impedance cytometry	2018	Journal of the Royal Society, Interface	15	10.1098/rsif.2018.0416
Hopkins, C.R., Bailey, D.M., Potts, T.	Navigating future uncertainty in marine protected area governance: Lessons from the Scottish MPA network	2018	Estuarine, Coastal and Shelf Science	207	10.1016/j.ecss.2018.04.020
Howson, E.L.A., Armson, B., Lyons, N.A., Chepkwony, E., Kasanga, C.J., Kandusi, S., Ndujilo, N., Yamazaki, W., Gizaw, D., Cleaveland, S., Lembo, T., Rauh, R., Nelson, W.M., Wood, B.A., Mioulet, V., King, D.P., Fowler, V.L.	Direct detection and characterization of foot-and-mouth disease virus in East Africa using a field-ready real-time PCR platform	2018	Transboundary and Emerging Diseases	65	10.1111/tbed.12684
Hughes, M.R., Van Leeuwen, T.E., Cunningham, P.D., Adams, C.E.	Parentally acquired differences in resource acquisition ability between brown trout from alternative life history parentage	2018	Ecology of Freshwater Fish	27	10.1111/eff.12323
Hume, J.B., Recknagel, H., Bean, C.W., Adams, C.E., Mable, B.K.	RADseq and mate choice assays reveal unidirectional gene flow among three lamprey ecotypes despite weak assortative mating: Insights into the formation and stability of multiple ecotypes in sympatry	2018	Molecular Ecology	27	10.1111/mec.14881
Ibrahim, A.M., Sabet, S., El-Ghor, A.A., Kamel, N., Anis, S.E., Morris, J.S., Stein, T.	Fibulin-2 is required for basement membrane integrity of mammary epithelium	2018	Scientific Reports	8	10.1038/s41598-018-32507-x

Jacobs, A., De Noia, M., Praebel, K., Kanstad-Hanssen, Ø., Paterno, M., Jackson, D., McGinnity, P., Sturm, A., Elmer, K.R., Llewellyn, M.S.	Genetic fingerprinting of salmon louse ( <i>Lepeophtheirus salmonis</i> ) populations in the North-East Atlantic using a random forest classification approach	2018	Scientific Reports	8	10.1038/s41598-018-19323-z
Jacobs, A., Hughes, M.R., Robinson, P.C., Adams, C.E., Elmer, K.R.	The genetic architecture underlying the evolution of a rare piscivorous life history form in brown trout after secondary contact and strong introgression	2018	Genes	9	10.3390/genes9060280
Jenjan, H.B.B., Garduño-Paz, M., Huntingford, F.A., Adams, C.E.	Gill development in sympatric morphs of Arctic charr from Loch Awe, Scotland: A hidden physiological cost of macrobenthos feeding?	2018	Ecology of Freshwater Fish	27	10.1111/eff.12388
Jerem, P., Jenni-Eiermann, S., Herborn, K., McKeegan, D., McCafferty, D.J., Nager, R.G.	Eye region surface temperature reflects both energy reserves and circulating glucocorticoids in a wild bird	2018	Scientific Reports	8	10.1038/s41598-018-20240-4
Jonsson, N.N., Klafke, G., Corley, S.W., Tidwell, J., Berry, C.M., Caline, H.H.K.-T.	Molecular biology of amitraz resistance in cattle ticks of the genus <i>Rhipicephalus</i>	2018	Frontiers in Bioscience - Landmark	23	10.2741/4617
Kaab, H., Bain, M.M., Eckersall, P.D.	Acute phase proteins and stress markers in the immediate response to a combined vaccination against Newcastle disease and infectious bronchitis viruses in specific pathogen free (SPF) layer chicks	2018	Poultry Science	97	10.3382/ps/pex340
Kadowaki, H., Hampson, K., Tojinbara, K., Yamada, A., Makita, K.	The risk of rabies spread in Japan: A mathematical modelling assessment	2018	Epidemiology and Infection	146	10.1017/S0950268818001267
Kerfua, S.D., Shirima, G., Kusiluka, L., Ayebazibwe, C., Mwebe, R., Cleaveland, S., Haydon, D.	Spatial and temporal distribution of foot-and-mouth disease in four districts situated along the Uganda-Tanzania border: Implications for cross-border efforts in disease control	2018	The Onderstepoort journal of veterinary research	85	10.4102/ojvr.v85i1.1528
Kerfua, S.D., Shirima, G., Kusiluka, L., Ayebazibwe, C., Mwebe, R., Cleaveland, S., Haydon, D.	Spatial and temporal distribution of foot-and-mouth disease in four districts situated along the Uganda-tanzania border: Implications for cross-border efforts in disease control	2018	Onderstepoort Journal of Veterinary Research	85	10.4102/ojvr.v85i1.1716
Killen, S.S., Esbaugh, A.J., F. Martins, N., Tadeu Rantin, F., McKenzie, D.J.	Aggression supersedes individual oxygen demand to drive group air-breathing in a social catfish	2018	Journal of Animal Ecology	87	10.1111/1365-2656.12758
Lehtonen, T.K., Elmer, K.R., Lappalainen, M., Meyer, A.	Genetic evidence for panmixia in a colony-breeding crater lake cichlid fish	2018	Scientific Reports	8	10.1038/s41598-018-19266-5

Liu, C., Emami, S.N., Pettersson, J., Ranford-Cartwright, L., Faye, I., Parmryd, I.	Vγ9Vδ2 T cells proliferate in response to phosphoantigens released from erythrocytes infected with asexual and gametocyte stage <i>Plasmodium falciparum</i>	2018	Cellular Immunology	334	10.1016/j.cellimm.2018.08.012
Liu, Z., Kontoleon, A.	Meta-Analysis of Livelihood Impacts of Payments for Environmental Services Programmes in Developing Countries	2018	Ecological Economics	149	10.1016/j.ecolecon.2018.02.008
Liu, Z., Gong, Y., Kontoleon, A.	How do Payments for Environmental Services Affect Land Tenure? Theory and Evidence From China	2018	Ecological Economics	144	10.1016/j.ecolecon.2017.08.007
Logan, G., Newman, J., Wright, C.F., Lasecka-Dykes, L., Haydon, D.T., Cottam, E.M., Tuthill, T.J.	Deep sequencing of foot-and-mouth disease virus reveals RNA sequences involved in genome packaging	2018	Journal of Virology	92	10.1128/JVI.01159-17
López-Arrabé, J., Monaghan, P., Cantarero, A., Boner, W., Pérez-Rodríguez, L., Moreno, J.	Sex-specific associations between telomere dynamics and oxidative status in adult and nestling pied flycatchers	2018	Physiological and Biochemical Zoology	91	10.1086/697294
Lord, J.S., Torr, S.J., Auty, H.K., Brock, P.M., Byamungu, M., Hargrove, J.W., Morrison, L.J., Miramba, F., Vale, G.A., Stanton, M.C.	Geostatistical models using remotely-sensed data predict savanna tree decline across the interface between protected and unprotected areas in Serengeti, Tanzania	2018	Journal of Applied Ecology	55	10.1111/1365-2664.13091
Lothian, A.J., Newton, M., Barry, J., Walters, M., Miller, R.C., Adams, C.E.	Migration pathways, speed and mortality of Atlantic salmon ( <i>Salmo salar</i> ) smolts in a Scottish river and the near-shore coastal marine environment	2018	Ecology of Freshwater Fish	27	10.1111/eff.12369
Mable, B.K., Brysting, A.K., Jørgensen, M.H., Carbonell, A.K.Z., Kiefer, C., Ruiz-Duarte, P., Lagesen, K., Koch, M.A.	Adding complexity to complexity: Gene family evolution in polyploids	2018	Frontiers in Ecology and Evolution	6	10.3389/fevo.2018.00114
Maia, F.G.M., de Souza, W.M., Sabino-Santos, G., Fumagalli, M.J., Modha, S., Murcia, P.R., Figueiredo, L.T.M.	A novel polyomavirus in sigmodontine rodents from São Paulo State, Brazil	2018	Archives of Virology	163	10.1007/s00705-018-3913-8
Marasco, V., Boner, W., Griffiths, K., Heidinger, B., Monaghan, P.	Environmental conditions shape the temporal pattern of investment in reproduction and survival	2018	Proceedings of the Royal Society B: Biological Sciences	285	10.1098/rspb.2017.2442
Martin, J.E., Sandercock, D.A., Sandilands, V., Sparrey, J., Baker, L., Sparks, N.H.C., McKeegan, D.E.F.	Welfare risks of repeated application of on-farm killing methods for poultry	2018	Animals	8	10.3390/ani8030039
Martin, J.E., Sandilands, V., Sparrey, J., Baker, L., McKeegan, D.E.F.	On farm evaluation of a novel mechanical cervical dislocation device for poultry	2018	Animals	8	10.3390/ani8010010

Masembe, C., Sreenu, V.B., Da Silva Filipe, A., Wilkie, G.S., Ogweng, P., Mavega, F.J., Muwanika, V.B., Biek, R., Palmirini, M., Davison, A.J.	Genome sequences of five African swine fever virus genotype IX isolates from domestic pigs in Uganda	2018	Microbiology Resource Announcements	7	10.1128/MRA.01018-18
Maze, M.J., Cash-Goldwasser, S., Rubach, M.P., Biggs, H.M., Galloway, R.L., Sharples, K.J., Allan, K.J., Halliday, J.E.B., Cleaveland, S., Shand, M.C., Muiruri, C., Kazwala, R.R., Saganda, W., Lwezaula, B.F., Mmbaga, B.T., Maro, V.P., Crump, J.A.	Risk factors for human acute leptospirosis in northern Tanzania	2018	PLoS Neglected Tropical Diseases	12	10.1371/journal.pntd.0006372
McIntyre, J., Hamer, K., Morrison, A.A., Bartley, D.J., Sargison, N., Devaney, E., Laing, R.	Hidden in plain sight - Multiple resistant species within a strongyle community	2018	Veterinary Parasitology	258	10.1016/j.vetpar.2018.06.012
McLean, S., Persson, A., Norin, T., Killen, S.S.	Metabolic Costs of Feeding Predictively Alter the Spatial Distribution of Individuals in Fish Schools	2018	Current Biology	28	10.1016/j.cub.2018.02.043
McLennan, D., Armstrong, J.D., Stewart, D.C., McKelvey, S., Boner, W., Monaghan, P., Metcalfe, N.B.	Telomere elongation during early development is independent of environmental temperatures in Atlantic salmon	2018	Journal of Experimental Biology	221	10.1242/jeb.178616
McLennan, D., Rush, E., McKelvey, S., Metcalfe, N.B.	Timing of Atlantic salmon <i>Salmo salar</i> smolt migration predicts successful passage through a reservoir	2018	Journal of Fish Biology	92	10.1111/jfb.13606
McLennan, D., Armstrong, J.D., Stewart, D.C., McKelvey, S., Boner, W., Monaghan, P., Metcalfe, N.B.	Links between parental life histories of wild salmon and the telomere lengths of their offspring	2018	Molecular Ecology	27	10.1111/mec.14467
Millins, C., Dickinson, E.R., Isakovic, P., Gilbert, L., Wojciechowska, A., Paterson, V., Tao, F., Jahn, M., Kilbride, E., Birtles, R., Johnson, P., Biek, R.	Landscape structure affects the prevalence and distribution of a tick-borne zoonotic pathogen	2018	Parasites and Vectors	11	10.1186/s13071-018-3200-1
Møller, A.P., Balbontin, J., Dhondt, A.A., Remeš, V., Adriaensen, F., Biard, C., Camprodon, J., Cichoń, M., Doligez, B., Dubiec, A., Eens, M., Eeva, T., Goodenough, A.E., Gosler, A.G., Gustafsson, L., Heeb, P., Hinsley, S.A., Jacob, S., Juškaitis, R., Laaksonen, T., Leclercq, B., Massa, B., Mazgajski, T.D., Nager, R.G., Nilsson, J.-Å., Nilsson, S.G., Norte, A.C., Pinxten, R., Robles, H., Solonen, T., Sorace, A., van Noordwijk, A.J., Lambrechts, M.M.	Effects of interspecific coexistence on laying date and clutch size in two closely related species of hole-nesting birds	2018	Journal of Animal Ecology	87	10.1111/1365-2656.12896
Moore, I., Dodd, J.A., Newton, M., Bean, C.W., Lindsay, I., Jarosz, P., Adams, C.E.	The influence of aquaculture unit proximity on the pattern of <i>Lepeophtheirus salmonis</i> infection of anadromous <i>Salmo trutta</i> populations on the isle of Skye, Scotland	2018	Journal of Fish Biology	92	10.1111/jfb.13625

Murray, J.M.D., Hanna, E., Hastie, P.	Equine dietary supplements: An insight into their use and perceptions in the Irish equine industry	2018	Irish Veterinary Journal	71	10.1186/s13620-018-0115-3
Muvhali, P.T., Bonato, M., Engelbrecht, A., Malecki, I.A., Hough, D., Robinson, J.E., Evans, N.P., Cloete, S.W.P.	The effect of extensive human presence at an early age on stress responses and reactivity of juvenile ostriches towards humans	2018	Animals	8	10.3390/ani8100175
Nadin-Davis, S.A., Fu, Q., Trewby, H., Biek, R., Johnson, R.H., Real, L.	Geography but not alternative host species explain the spread of raccoon rabies virus in Vermont	2018	Epidemiology and Infection	146	10.1017/S0950268818001759
Nadler, L.E., Killen, S.S., Domenici, P., McCormick, M.I.	Role of water flow regime in the swimming behaviour and escape performance of a schooling fish	2018	Biology Open	7	10.1242/bio.031997
Nati, J.J.H., Lindström, J., Yeomans, W., Killen, S.S.	Physiological and behavioural responses to hypoxia in an invasive freshwater fish species and a native competitor	2018	Ecology of Freshwater Fish	27	10.1111/eff.12394
Needham, K., Czajkowski, M., Hanley, N., LaRiviere, J.	What is the causal impact of information and knowledge in stated preference studies?	2018	Resource and Energy Economics	54	10.1016/j.reseneeco.2018.09.001
Newton, M., Dodd, J.A., Barry, J., Boylan, P., Adams, C.E.	The impact of a small-scale riverine obstacle on the upstream migration of Atlantic Salmon	2018	Hydrobiologia	806	10.1007/s10750-017-3364-3
Ng'habi, K., Viana, M., Matthiopoulos, J., Lyimo, I., Killeen, G., Ferguson, H.M.	Mesocosm experiments reveal the impact of mosquito control measures on malaria vector life history and population dynamics	2018	Scientific Reports	8	10.1038/s41598-018-31805-8
Noguera, J.C., Metcalfe, N.B., Monaghan, P.	Experimental demonstration that offspring fathered by old males have shorter telomeres and reduced lifespans	2018	Proceedings of the Royal Society B: Biological Sciences	285	10.1098/rspb.2018.0268
Norin, T., Mills, S.C., Crespel, A., Cortese, D., Killen, S.S., Beldade, R.	Anemone bleaching increases the metabolic demands of symbiont anemonefish	2018	Proceedings of the Royal Society B: Biological Sciences	285	10.1098/rspb.2018.0282
O'Hanlon, N.J., Nager, R.G.	Identifying habitat-driven spatial variation in colony size of Herring Gulls <i>Larus argentatus</i>	2018	Bird Study	65	10.1080/00063657.2018.1518970

Oppel, S., Bolton, M., Carneiro, A.P.B., Dias, M.P., Green, J.A., Masello, J.F., Phillips, R.A., Owen, E., Quillfeldt, P., Beard, A., Bertrand, S., Blackburn, J., Boersma, P.D., Borges, A., Broderick, A.C., Catry, P., Cleasby, I., Clingham, E., Creuwels, J., Crofts, S., Cuthbert, R.J., Dallmeijer, H., Davies, D., Davies, R., Dilley, B.J., Dinis, H.A., Dossa, J., Dunn, M.J., Efe, M.A., Fayet, A.L., Figueiredo, L., Frederico, A.P., Gjerdrum, C., Godley, B.J., Granadeiro, J.P., Guilford, T., Hamer, K.C., Hazin, C., Hedd, A., Henry, L., Hernández-Montero, M., Hinke, J., Kokubun, N., Leat, E., Tranquilla, L.M., Metzger, B., Militão, T., Montrond, G., Mullié, W., Padgett, O., Pearmain, E.J., Pollet, I.L., Pütz, K., Quintana, F., Ratcliffe, N., Ronconi, R.A., Ryan, P.G., Saldanha, S., Shoji, A., Sim, J., Small, C., Soanes, L., Takahashi, A., Trathan, P., Triveipiece, W., Veen, J., Wakefield, E., Weber, N., Weber, S., Zango, L., González-Solís, J., Croxall, J.	Spatial scales of marine conservation management for breeding seabirds	2018	Marine Policy	98	10.1016/j.marpol.2018.08.024
O'Reilly, E.L., Bailey, R.A., Eckersall, P.D.	A comparative study of acute-phase protein concentrations in historical and modern broiler breeding lines	2018	Poultry Science	97	10.3382/ps/pey272
Ouyang, J.Q., Isaksson, C., Schmidt, C., Hutton, P., Bonier, F., Dominoni, D.	A New Framework for Urban Ecology: An Integration of Proximate and Ultimate Responses to Anthropogenic Change	2018	Integrative and comparative biology	58	10.1093/icb/icy110
Pacios-Palma, I., Moreno, S., Selman, C., Rouco, C.	Oxidative stress in wild European rabbits naturally infected with myxoma virus and rabbit haemorrhagic disease virus	2018	European Journal of Wildlife Research	64	10.1007/s10344-018-1203-0
Page, A.P.	The sensory amphidial structures of <i>Caenorhabditis elegans</i> are involved in macrocyclic lactone uptake and anthelmintic resistance	2018	International Journal for Parasitology	48	10.1016/j.ijpara.2018.06.003
Page, M.M., Schuster, E.F., Mudaliar, M., Herzyk, P., Withers, D.J., Selman, C.	Common and unique transcriptional responses to dietary restriction and loss of insulin receptor substrate 1 (IRS1) in mice	2018	Aging	10	10.18632/aging.101446
Page, R.	Liberating links between datasets using lightweight data publishing: An example using plant names and the taxonomic literature	2018	Biodiversity Data Journal	6	10.3897/BDJ.6.e27539



Papanikolopoulou, L.A., Smeti, E., Roelke, D.L., Dimitrakopoulos, P.G., Kokkoris, G.D., Danielidis, D.B., Spatharis, S.	Interplay between r- and K-strategists leads to phytoplankton underlying under pulsed resource supply	2018	Oecologia	186 x	10.1007/s00442-017-4050-
Parcell, B.J., Oravcova, K., Pinheiro, M., Holden, M.T.G., Phillips, G., Turton, J.F., Gillespie, S.H.	<i>Pseudomonas aeruginosa</i> intensive care unit outbreak: winnowing of transmissions with molecular and genomic typing	2018	Journal of Hospital Infection	98 5	10.1016/j.jhin.2017.12.00
Parkin, T.D.H., Brown, J., Macdonald, E.B.	Occupational risks of working with horses: A questionnaire survey of equine veterinary surgeons	2018	Equine Veterinary Education	30	10.1111/eve.12891
Parsons, K.J., Son, Y.H., Crespel, A., Thambithurai, D., Killen, S., Harris, M.P., Albertson, R.C.	Conserved but flexible modularity in the zebrafish skull: implications for craniofacial evolvability	2018	Proceedings of the Royal Society B: Biological Sciences	285	10.1098/rspb.2017.2671
Paul, E., Kiwelu, I., Mmbaga, B., Nazareth, R., Sabuni, E., Muro, A., Ndaro, A., Halliday, J.E.B., Chilongola, J.	<i>Toxoplasma gondii</i> seroprevalence among pregnant women attending antenatal clinic in Northern Tanzania	2018	Tropical Medicine and Health	46 9	10.1186/s41182-018-0122-
Peacock, T.P., Harvey, W.T., Sadeyen, J.-R., Reeve, R., Iqbal, M.	The molecular basis of antigenic variation among A(H9N2) avian influenza viruses	2018	Emerging Microbes and Infections	7 y	10.1038/s41426-018-0178-
Peters, L., Spatharis, S., Dario, M.A., Dwyer, T., Roca, I.J.T., Kintner, A., Kanstad-Hanssen, Ø., Llewellyn, M.S., Praebel, K.	Environmental DNA: A new low-cost monitoring tool for pathogens in salmonid aquaculture	2018	Frontiers in Microbiology	9 9	10.3389/fmicb.2018.0300
Piggott, C.V.H., Verspoor, E., Greer, R., Hooker, O., Newton, J., Adams, C.E.	Phenotypic and resource use partitioning amongst sympatric, lacustrine brown trout, <i>Salmo trutta</i>	2018	Biological Journal of the Linnean Society	124 2	10.1093/biolinnean/bly03
Pitaksakulrat, O., Webster, B.L., Webster, J.P., Laha, T., Saijuntha, W., Lamberton, P.H.L., Kiatsopit, N., Andrews, R.H., Petney, T.N., Sithithaworn, P.	Phylogenetic relationships within the <i>Opisthorchis viverrini</i> species complex with specific analysis of <i>O. viverrini sensu lato</i> from Sakon Nakhon, Thailand by mitochondrial and nuclear DNA sequencing	2018	Infection, Genetics and Evolution	62	10.1016/j.meegid.2018.04
Porphyre, T., Rich, K.M., Auty, H.K.	Assessing the economic impact of vaccine availability when controlling foot and mouth disease outbreaks	2018	Frontiers in Veterinary Science	5	10.3389/fvets.2018.00047
Prada, J.M., Touloupou, P., Adriko, M., Tukahebwa, E.M., Lamberton, P.H.L., Hollingsworth, T.D.	Understanding the relationship between egg- and antigen-based diagnostics of <i>Schistosoma mansoni</i> infection pre- and post-treatment in Uganda	2018	Parasites and Vectors	11 z	10.1186/s13071-017-2580-
Quagotto, M.-M., Barton, P.S., Morris, C.D., Moss, S.E.W., Pomeroy, P.P., McCafferty, D.J., Bailey, D.M.	Seal carrion is a predictable resource for coastal ecosystems	2018	Acta Oecologica	88	10.1016/j.actao.2018.02.0

Railey, A.F., Lembo, T., Palmer, G.H., Shirima, G.M., Marsh, T.L.	Spatial and temporal risk as drivers for adoption of foot and mouth disease vaccination	2018	Vaccine	36	10.1016/j.vaccine.2018.06.069
Recknagel, H., Kamenos, N.A., Elmer, K.R.	Common lizards break Dollo's law of irreversibility: Genome-wide phylogenomics support a single origin of viviparity and re-evolution of oviparity	2018	Molecular Phylogenetics and Evolution	127	10.1016/j.ympev.2018.05.029
Richardson, P.L., Wakefield, E.D., Phillips, R.A.	Flight speed and performance of the wandering albatross with respect to wind	2018	Movement Ecology	6	10.1186/s40462-018-0121-9
Roberts, M., Cresswell, W., Hanley, N.	Prioritising Invasive Species Control Actions: Evaluating Effectiveness, Costs, Willingness to Pay and Social Acceptance	2018	Ecological Economics	152	10.1016/j.ecolecon.2018.05.027
Robertson, E., Harcus, Y., Johnston, C.J.C., Page, A.P., Walkinshaw, M.D., Maizels, R.M., Houston, D.R.	Demonstration of the anthelmintic potency of marimastat in the heligmosomoides polygyrus rodent model	2018	Journal of Parasitology	104	10.1645/18-33
Rodriguez, L., Reedy, S., Nogaes, A., Murcia, P.R., Chambers, T.M., Martinez-Sobrido, L.	Development of a novel equine influenza virus live-attenuated vaccine	2018	Virology	516	10.1016/j.virol.2018.01.005
Rosa, I.M.D., Rentsch, D., Hopcraft, J.G.C.	Evaluating forest protection strategies: A comparison of land-use systems to preventing forest loss in Tanzania	2018	Sustainability (Switzerland)	10	10.3390/su10124476
Sakavara, A., Tsirtsis, G., Roelke, D.L., Mancy, R., Spatharis, S.	Lumpy species coexistence arises robustly in fluctuating resource environments	2018	Proceedings of the National Academy of Sciences of the United States of America	115	10.1073/pnas.1705944115
Salin, K., Villasevil, E.M., Anderson, G.J., Auer, S.K., Selman, C., Hartley, R.C., Mullen, W., Chinopoulos, C., Metcalfe, N.B.	Decreased mitochondrial metabolic requirements in fasting animals carry an oxidative cost	2018	Functional Ecology	32	10.1111/1365-2435.13125
Salin, K., Villasevil, E.M., Anderson, G.J., Selman, C., Chinopoulos, C., Metcalfe, N.B.	The RCR and ATP/O indices can give contradictory messages about mitochondrial efficiency	2018	Integrative and Comparative Biology	58	10.1093/icb/cy085
Sallé, G., Laing, R., Cotton, J.A., Maitland, K., Martinelli, A., Holroyd, N., Tracey, A., Berriman, M., Smith, W.D., Newlands, G.F.J., Hanks, E., Devaney, E., Britton, C.	Transcriptomic profiling of nematode parasites surviving vaccine exposure	2018	International Journal for Parasitology	48	10.1016/j.ijpara.2018.01.004
Sambo, M., Hampson, K., Chagalucha, J., Cleaveland, S., Lembo, T., Lushasi, K., Mbunda, E., Mtema, Z., Sikana, L., Johnson, P.C.D.	Estimating the size of dog populations in Tanzania to inform rabies control	2018	Veterinary Sciences	5	10.3390/vetsci5030077
Santana, A.M., Silva, D.G., Thomas, F.C., Bernardes, P.A., Pizauro, L.J.L., Santana, C.H., Burchmore, R.J.S., Eckersall, P.D., Fagliari, J.J.	Blood serum acute phase proteins and iron dynamics during acute phase response of <i>Salmonella enterica</i> serotype Dublin experimentally infected buffalo calves	2018	Veterinary Immunology and Immunopathology	203	10.1016/j.vetimm.2018.07.014

Santana, A.M., Thomas, F.C., Silva, D.G., McCulloch, E., Vidal, A.M.C., Burchmore, R.J.S., Fagliari, J.J., Eckersall, P.D.	Reference 1D and 2D electrophoresis maps for potential disease related proteins in milk whey from lactating buffaloes and blood serum from buffalo calves (Water buffalo, Bubalus bubalis)	2018	Research in Veterinary Science	1180	10.1016/j.rvsc.2018.04.010
Santana, A.M., Silva, D.G., Clemente, V., Pizauro, L.J.L., Bernardes, P.A., Santana, C.H., Eckersall, P.D., Fagliari, J.J.	Blood gas and serum biochemical RIs for healthy newborn Murrah buffaloes (Bubalus bubalis)	2018	Veterinary Clinical Pathology	47	10.1111/vcp.12561
Schmidt, E.M.S., Rubio, C.P., Thomas, F., Ferreira, J.C.P., Eckersall, D.P.	Acute phase proteins in bitches subjected to conventional and minimally invasive ovariohysterectomy	2018	Pesquisa Veterinaria Brasileira	38	10.1590/1678-5150-PVB-5132
Sheremet, O., Ruokamo, E., Juutinen, A., Sventon, R., Hanley, N.	Incentivising Participation and Spatial Coordination in Payment for Ecosystem Service Schemes: Forest Disease Control Programs in Finland	2018	Ecological Economics	152	10.1016/j.ecolecon.2018.06.004
Smeti, E., Roelke, D.L., Tsirtsis, G., Spatharis, S.	Species extinctions strengthen the relationship between biodiversity and resource use efficiency	2018	Ecological Modelling	384	10.1016/j.ecolmodel.2018.06.006
Souza, W.M., Fumagalli, M.J., Torres Carrasco, A.O., Romeiro, M.F., Modha, S., Seki, M.C., Gheller, J.M., Daffre, S., Nunes, M.R.T., Murcia, P.R., Acrani, G.O., Figueiredo, L.T.M.	Viral diversity of Rhipicephalus microplus parasitizing cattle in southern Brazil	2018	Scientific Reports	8	10.1038/s41598-018-34630-1
Stevenson, T.J., Alward, B.A., Ebling, F.J.P., Fernald, R.D., Kelly, A., Ophir, A.G.	The Value of Comparative Animal Research: Krogh's Principle Facilitates Scientific Discoveries	2018	Policy Insights from the Behavioral and Brain Sciences	5	10.1177/23727322177450597
Tamvakis, A., Anagnostopoulos, C.-N., Tsirtsis, G., Niros, A.D., Spatharis, S.	Optimized Classification Predictions with a New Index Combining Machine Learning Algorithms	2018	International Journal on Artificial Intelligence Tools	27	10.1142/S0218213018500124
Thambithurai, D., Hollins, J., Van Leeuwen, T., Rácz, A., Lindström, J., Parsons, K., Killen, S.S.	Shoal size as a key determinant of vulnerability to capture under a simulated fishery scenario	2018	Ecology and Evolution	8	10.1002/ece3.4107
Toepfner, N., Herold, C., Otto, O., Rosendahl, P., Jacobi, A., Kräter, M., Stächele, J., Menschner, L., Herbig, M., Ciuffreda, L., Ranford-Cartwright, L., Grzybek, M., Coskun, Ü., Reithuber, E., Garriss, G., Mellroth, P., Henriques-Normark, B., Tregay, N., Suttorp, M., Bornhäuser, M., Chilvers, E.R., Berner, R., Guck, J.	Detection of human disease conditions by single-cell morpho-rheological phenotyping of blood	2018	eLife	7	10.7554/eLife.29213

Torney, C.J., Grant C. Hopcraft, J., Morrison, T.A., Couzin, I.D., Levin, S.A.	From single steps to mass migration: The problem of scale in the movement ecology of the serengeti wildebeest	2018	Philosophical Transactions of the Royal Society B: Biological Sciences	373	10.1098/rstb.2017.0012
Townsend, M., Davies, K., Hanley, N., Hewitt, J.E., Lundquist, C.J., Lohrer, A.M.	The challenge of implementing the marine ecosystem service concept	2018	Frontiers in Marine Science	519	10.3389/fmars.2018.0035
Tuiskula-Haavisto, M., Honkatukia, M., Dunn, I.C., Bain, M.M., De Koning, D.J., Preisinger, R., Schmutz, M., Arango, J., Fischer, D., Vilkki, J.	Validated quantitative trait loci for eggshell quality in experimental and commercial laying hens	2018	Animal Genetics	49	10.1111/age.12671
Turnbull, F., Jonsson, N.N., Kenyon, F., Skuce, P.J., Bisset, S.A.	P-glycoprotein-9 and macrocyclic lactone resistance status in selected strains of the ovine gastrointestinal nematode, <i>Teladorsagia circumcincta</i>	2018	International Journal for Parasitology: Drugs and Drug Resistance	804	10.1016/j.ijppdr.2018.01.0804
Viana, M., Faust, C.L., Haydon, D.T., Webster, J.P., Lamberton, P.H.L.	The effects of subcurative praziquantel treatment on life-history traits and trade-offs in drug-resistant <i>Schistosoma mansoni</i>	2018	Evolutionary Applications	11	10.1111/eva.12558
Vieira, B.P., Furness, R.W., Nager, R.G.	Visual Observation to Identify Sexes in Subspecies of Adult Black Skimmers ( <i>Rynchops Niger</i> )	2018	Waterbirds	41	10.1675/063.041.0207
Voorhees, I.E.H., Dalziel, B.D., Glaser, A., Dubovi, E.J., Murcia, P.R., Newbury, S., Toohey-Kurth, K., Su, S., Kriti, D., Van Bakel, H., Goodman, L.B., Leutenegger, C., Holmes, E.C., Parrish, C.R.	Multiple incursions and recurrent epidemic fade-out of H3N2 canine influenza A virus in the United States	2018	Journal of Virology	92	10.1128/JVI.00323-18
Waddell, E.H., Crotti, M., Loughheed, S.C., Cannatella, D.C., Elmer, K.R.	Hierarchies of evolutionary radiation in the world's most species rich vertebrate group, the Neotropical <i>Pristimantis</i> leaf litter frogs	2018	Systematics and Biodiversity	16	10.1080/14772000.2018.1503202
Wang, E., Ramesh, K., Killen, S., Viola, I.M.	On the nonlinear dynamics of self-sustained limit-cycle oscillations in a flapping-foil energy harvester	2018	Journal of Fluids and Structures	83	10.1016/j.jfluidstructs.2018.09.005
Weiden, N.A., Abylkhani, B., Howarth, L.M.	The effects of trophic transfer and environmental factors on microplastic uptake by plaice, <i>Pleuronectes platessa</i> , and spider crab, <i>Maja squinado</i>	2018	Environmental Pollution	239	10.1016/j.envpol.2018.03.110
Weiden, N.A., Wolseley, P.A., Ashmore, M.R.	Citizen science identifies the effects of nitrogen deposition, climate and tree species on epiphytic lichens across the UK	2018	Environmental Pollution	232	10.1016/j.envpol.2017.09.020
Wilbourn, R.V., Moatt, J.P., Froy, H., Walling, C.A., Nussey, D.H., Boonekamp, J.J.	The relationship between telomere length and mortality risk in non-model vertebrate systems: A meta-analysis	2018	Philosophical Transactions of the Royal Society B: Biological Sciences	373	10.1098/rstb.2016.0447

Woodford, L., Bianco, G., Ivanova, Y., Dale, M., Elmer, K., Rae, F., Larcombe, S.D., Helm, B., Ferguson, H.M., Baldini, F.	Vector species-specific association between natural Wolbachia infections and avian malaria in black fly populations	2018	Scientific Reports	10.1038/s41598-018-22550-z	8
Zepeda Mendoza, M.L., Xiong, Z., Escalera-Zamudio, M., Runge, A.K., Thézé, J., Streicker, D., Frank, H.K., Loza-Rubio, E., Liu, S., Ryder, O.A., Samaniego Castruita, J.A., Katzourakis, A., Pacheco, G., Taboada, B., Löber, U., Pybus, O.G., Li, Y., Rojas-Anaya, E., Bohmann, K., Carmona Baez, A., Arias, C.F., Liu, S., Greenwood, A.D., Bertelsen, M.F., White, N.E., Bunce, M., Zhang, G., Sichert-Pontén, T., Gilbert, M.P.T.	Hologenic adaptations underlying the evolution of sanguivory in the common vampire bat	2018	Nature Ecology and Evolution	10.1038/s41559-018-0476-8	28
Zhan, B., Arumugam, S., Kennedy, M.W., Tricoche, N., Lian, L.-Y., Asojo, O.A., Bennuru, S., Bottazzi, M.E., Hotez, P.J., Lustigman, S., Klei, T.R.	Ligand binding properties of two Brugia malayi fatty acid and retinol (FAR) binding proteins and their vaccine efficacies against challenge infection in gerbils	2018	PLoS neglected tropical diseases	10.1371/journal.pntd.0006772	12
Zhu, H., Gifford, R.J., Murcia, P.R.	Distribution, diversity, and evolution of endogenous retroviruses in perissodactyl genomes	2018	Journal of Virology	10.1128/JVI.00927-18	92
Addison, E., Conte, A.	Management of severe stifle trauma: 1. Stifle luxation	2019	Journal of Feline Medicine and Surgery	10.1177/1098612X19843211	21
Bartley, D.J., Hamer, K., Andrews, L., Sargison, N.D., Morrison, A.A.	Multigenic resistance to monepantel on a UK sheep farm	2019	Veterinary Parasitology: X	10.1016/j.vpoa.2019.1000103	1
Bijland, S., Thomson, G., Euston, M., Michail, K., Thümmler, K., Mücklich, S., Crawford, C.L., Barnett, S.C., McLaughlin, M., Anderson, T.J., Linington, C., Brown, E.R., Kalkman, E.R., Edgar, J.M.	An in vitro model for studying CNS white matter: Functional properties and experimental approaches	2019	F1000Research	10.12688/f1000research.16802.1	8
Busin, V., Viora, L., King, G., Tomlinson, M., Lekernek, J., Jonsson, N., Fioranelli, F.	Evaluation of lameness detection using radar sensing in ruminants	2019	Veterinary Record	10.1136/vr.105407	185
Cossarizza, A., Chang, H.-D., Radbruch, A., ACS, A., Adam, D., Adam-Klages, S., Agace, W.W., Aghaepour, N., Akdis, M., Allez, M., Almeida, L.N., Alvisi, G., Anderson, G., Andrä, I., Annunziato, F., Anselmo, A., Bacher, P., Baldari, C.T., Bari, S., Barnaba, V., Barros-Martins, J., Battistini, L.,	Guidelines for the use of flow cytometry and cell sorting in immunological studies (second edition)	2019	European Journal of Immunology	10.1002/eji.201970107	49
Coulouts, R.M., Phipps, P., Dalley, C., Lewis, J., Hammond, T.-A., Shiels, B.R., Weir, W., Sutton, D.G.M.	Equine piroplasmosis status in the UK: An assessment of laboratory diagnostic submissions and techniques	2019	Veterinary Record	10.1136/vr.104855	184
Coulouts, R.M., McDonald, M., Rafferty, A.G., Shiels, B.R., Sutton, D.G.M., Weir, W.	Analysis of Theileria equi diversity in The Gambia using a novel genotyping method	2019	Transboundary and Emerging Diseases	10.1111/tbed.13454	

De Decker, S., Packer, R.M.A., Cappello, R., Harcourt-Brown, T.R., Rohdin, C., Gomes, S.A., Bergknut, N., Shaw, T.A., Lowrie, M., Gutierrez-Quintana, R.	Comparison of signalment and computed tomography findings in French Bulldogs, Pugs, and English Bulldogs with and without clinical signs associated with thoracic hemivertebra	2019	Journal of Veterinary Internal Medicine	33	10.1111/jvim.15556
Dixon, C.E., Bedenice, D.	Transplacental infection of a foal with Anaplasma phagocytophilum	2019	Equine Veterinary Education		10.1111/eve.13233
Doyle, S.R., Sankaranarayanan, G., Allan, F., Berger, D., Jimenez Castro, P.D., Collins, J.B., Crellen, T., Duque-Correa, M.A., Ellis, P., Jaleta, T.G., Laing, R., Maitland, K., McCarthy, C., Moundai, T., Softley, B., Thiele, E., Ouakou, P.T., Tushabe, J.V., Webster, J.P., Weiss, A.J., Lok, J., Devaney, E., Kaplan, R.M., Cotton, J.A., Berriman, M., Holroyd, N.	Evaluation of DNA Extraction Methods on Individual Helminth Egg and Larval Stages for Whole-Genome Sequencing	2019	Frontiers in Genetics	10	10.3389/fgene.2019.0082
Dunbar, D., Kwok, W., Graham, E., Armitage, A., Irvine, R., Johnston, P., McDonald, M., Montgomery, D., Nicolson, L., Robertson, E., Weir, W., Addie, D.D.	Diagnosis of non-effusive feline infectious peritonitis by reverse transcriptase quantitative PCR from mesenteric lymph node fine-needle aspirates	2019	Journal of Feline Medicine and Surgery	21	10.1177/1098612X18809165
Duz, M., Marshall, J.F., Parkin, T.D.	Proportion of nonsteroidal anti-inflammatory drug prescription in equine practice	2019	Equine Veterinary Journal	51	10.1111/evj.12997
Francesio, A., Durand, A., Viora, L., Orr, J., Millins, C., José-López, R.	Clinical and magnetic resonance imaging findings of a cerebellar medulloblastoma in a heifer	2019	Clinical Case Reports	7	10.1002/ccr3.1925
Gladden, N., Ellis, K., Martin, J., Viora, L., McKeegan, D.	A single dose of ketoprofen in the immediate postpartum period has the potential to improve dairy calf welfare in the first 48 h of life	2019	Applied Animal Behaviour Science	212	10.1016/j.applanim.2019.01.007
Gladden, N., Rodríguez, V.G., Marchesi, F., Orr, J., Murdoch, F.	Multiple congenital ocular abnormalities including microphthalmia, microphakia and aphakia in a Simmental cross bull	2019	Veterinary Record Case Reports	7	10.1136/vetreccr-2018-000702
Gray, A., Capewell, P., Loney, C., Katzer, F., Shiels, B.R., Weir, W.	Sheep as host species for zoonotic Babesia venatorum, United Kingdom	2019	Emerging Infectious Diseases	25	10.3201/eid2512.190459
Gummary, L., Johnston, P.E.J., Sutton, D.G.M., Rafferty, A.G.	Two cases of hepatopathy and hyperferreraemia managed with deferoxamine and phlebotomy	2019	Equine Veterinary Education	31	10.1111/eve.12913
Gutierrez-Quintana, R., McLaughlin, M., Grau Roma, L., Hammond, G., Gray, A., Lowrie, M.	Spongiform leucoencephalomyelopathy in border terriers: Clinical, electrophysiological and imaging features	2019	Veterinary Record	185	10.1136/vr.105240
Haining, H., Stevenson, L., Barron, R., Waugh, E.	"The Cavalry is coming"	2019	Veterinary Clinical Pathology	48	10.1111/vcp.12776



Hamer, K., McIntyre, J., Morrison, A.A., Jennings, A., Kelly, R.F., Leeson, S., Bartley, D.J., Chaudhry, U., Busin, V., Sargison, N.	The dynamics of ovine gastrointestinal nematode infections within ewe and lamb cohorts on three Scottish sheep farms	2019	Preventive Veterinary Medicine	171	10.1016/j.prevetmed.2019.104752
Hamer, K., Burgess, S., Busin, V., Sargison, N.D.	Performance of the Psoroptes ovis antibody enzyme-linked immunosorbent assay in the face of low-level mite infestation	2019	Veterinary Record	185	10.1136/vr.105304
Hamilton, A.W., Davison, C., Tachtatzis, C., Andonovic, I., Michie, C., Ferguson, H.J., Somerville, L., Jonsson, N.N.	Identification of the rumination in cattle using support vector machines with motion-sensitive bolus sensors	2019	Sensors (Switzerland)	19	10.3390/s19051165
Hareardóttir, H., Thierry, F., Murison, P.J.	Anaesthesia management of a pug (in late-stage pregnancy) with lung lobe torsion	2019	Veterinary Record Case Reports	7	10.1136/vetreccr-2018-000765
Homer, L.M., Gomes, B.A.J., Murphy, M.C., Hammond, G.J.C., Parkin, T.D.H., Broome, C.J.A.	Effect of osteoarthritis on the repeatability of patella tendon angle measurement in dogs	2019	Veterinary Surgery	48	10.1111/vsu.13118
Hough, D., Robinson, J.E., Bellingham, M., Fleming, L.M., McLaughlin, M., Jama, K., Haraldsen, I.R.H., Solbakk, A.K., Evans, N.P.	Peripubertal GnRH and testosterone co-treatment leads to increased familiarity preferences in male sheep	2019	Psychoneuroendocrinology	108	10.1016/j.psyneuen.2019.06.008
Jaffey, J.A., Pavlick, M., Webster, C.R., Moore, G.E., McDaniel, K.A., Blois, S.L., Brand, E.M., Reich, C.F., Motschenbacher, L., Hostnik, E.T., Su, D., Lidbury, J.A., Raab, O., Carr, S.V., Mabry, K.E., Fox-Alvarez, W., Townsend, S., Palermo, S., Nakazono, Y., Ohno, K., VanEerde, E., Fieten, H., Huisman, A.H., Cooley-Lock, K., Dunning, M., Kisielewicz, C., Zola, A., Caldin, M., Conti-Patara, A., Ross, L., Mansfield, C., Lynn, O., Claus, M.A., Watson, P.J., Swallow, A., Yool, D.A., Gommeren, K., Knops, M., Cepelcha, V., de Rooster, H., Lobetti, R., Dossin, O., Jolivet, F., Papazoglou, L.G., Pappalardo, M.C.F., Manczur, F., Ducás-Györki, Z., O'Neill, E.J., Martinez, C., Gal, A., Owen, R.L., Gunn, E., Brown, K., Harder, L.K., Griebisch, C., Anfinson, K.P., Gron, T.K., Marchetti, V., Heilmann, R.M., Pazzi, P., DeClue, A.E.	Effect of clinical signs, endocrinopathies, timing of surgery, hyperlipidemia, and hyperbilirubinemia on outcome in dogs with gallbladder mucocele	2019	Veterinary Journal	251	10.1016/j.tvjl.2019.105350
King, J.N., Martin, M., Chetboul, V., Ferasin, L., French, A.T., Strehlau, G., Seewald, W., Smith, S.G.W., Swift, S.T., Roberts, S.L., Harvey, A.M., Little, C.J.L., Caney, S.M.A., Simpson, K.E., Sparkes, A.H., Mardell, E.J., Bomassi, E., Muller, C., Sauvage, J.P., Diquérou, A., Schneider, M.A., Brown, L.J., Clarke, D.D., Rousselot, J.-F.	Evaluation of benazepril in cats with heart disease in a prospective, randomized, blinded, placebo-controlled clinical trial	2019	Journal of Veterinary Internal Medicine	33	10.1111/jvim.15572

Kropf, J., Hughes, J.L.	Effect of midazolam on the quality and duration of anaesthetic recovery in healthy dogs undergoing elective ovariohysterectomy or castration	2019	Veterinary Anaesthesia and Analgesia	10.1016/j.vaa.2019.05.00468
Loyola, L., Achuthan, V., Gilroy, K., Borland, G., Kilbey, A., MacKay, N., Bell, M., Hay, J., Aiyer, S., Fingerman, D., Villanueva, R.A., Cameron, E., Kozak, C.A., Engelman, A.N., Neil, J., Roth, M.J.	Disrupting MLV integrase: BET protein interaction biases integration into quiescent chromatin and delays but does not eliminate tumor activation in a MYC/Runx2 mouse model	2019	PLOS Pathogens	10.1371/journal.ppat.1008154
McKenzie, J., Cooper Murphy, M., Broome, C., Tayvari, H., Gutierrez-Quintana, R.	Imaging characteristics and treatment of a penetrating brain injury caused by an oropharyngeal foreign body in a dog	2019	Veterinary Radiology and Ultrasound	10.1111/vru.12527
McNaught, K.A., Morris, J.S., McLaughlin, M.	Preliminary assessment of serum clusterin as a potential biomarker for canine lymphoma	2019	Veterinary and Comparative Oncology	10.1111/vco.12550
Miller, C., Pawson, P.	Anaesthetic management of a phaeochromocytoma excision in a dog	2019	Veterinary Record Case Reports	10.1136/vetreccr-2019-000931
Milodowski, E.J., Amengual-Batle, P., Beltran, E., Gutierrez-Quintana, R., De Decker, S.	Clinical findings and outcome of dogs with unilateral masticatory muscle atrophy	2019	Journal of Veterinary Internal Medicine	10.1111/jvim.15373
Mullins, R.A., Sanchez Villamil, C., de Rooster, H., Kummeling, A., White, R.N., Thieman Mankin, K.M., Tivers, M.S., Yool, D.A., Anderson, D.M., Pratschke, K.M., Gordo, I., Brissot, H., Singh, A., Olive, M., Billet, J.P., Selmic, L.E., Kirby, B.M.	Effect of prophylactic treatment with levetiracetam on the incidence of posttenuation seizures in dogs undergoing surgical management of single congenital extrahepatic portosystemic shunts	2019	Veterinary Surgery	10.1111/vsu.13141
Abdulkader, R.S., Abebe, Z., Abraha, H.N., Afarideh, M., Afshari, M., Ahmadi, A., Aichour, A.N., Aichour, I., Aichour, M.T.E., Akseer, N., Al-raddadi, R.M., Alahdab, F., Alkerwi, A., Allebeck, P., Alvis-guzman, N., Anber, N.H., Anjomshoa, Pascoe, B., Williams, L.K., Calland, J.K., Meric, G., Hitchings, M.D., Dyer, M., Ryder, J., Shaw, S., Lopes, B.S., Chintoo-Uta, C., Allan, E., Vidal, A., Fearnley, C., Everest, P., Pachebat, J.A., Cogan, T.A., Stevens, M.P., Humphrey, T.J., Wilkinson, T.S., Cody, A.J., Colles, F.M., Jolley, K.A., Maiden, M.C.J., Strachan, N., Pearson, B.M., Linton, D., Wren, B.W., Parkhill, J., Kelly, D.J., van Vliet, A.H.M., Forbes, K.J., Sheppard, S.K.	Global, regional, and national burden of suicide mortality 1990 to 2016: Systematic analysis for the Global Burden of Disease Study 2016	2019	BMJ (Online)	10.1136/bmj.194
	Domestication of campylobacter jejuni NCTC 11168	2019	Microbial Genomics	10.1099/mgen.0.000279

Qi, Y., Montague, P., Loney, C., Campbell, C., Shafie, I.N.F., Anderson, T.J., McLaughlin, M.	In vitro evidence consistent with an interaction between wild-type and mutant SOD1 protein associated with canine degenerative myelopathy	2019	European Journal of Neuroscience	50	10.1111/ejn.14526
Ryan, R., Gutierrez-Quintana, R., Haar, G.T., De Decker, S.	Relationship between breed, hemivertebra subtype, and kyphosis in apparently neurologically normal french bulldogs, english bulldogs, and pugs	2019	American Journal of Veterinary Research	80	10.2460/ajvr.80.2.189
Smith, P.A.D., Burnside, S., Helm, J.R., Morris, J.S.	Owner perceptions of radiotherapy treatment for veterinary patients with cancer	2019	Veterinary and Comparative Oncology	17	10.1111/vco.12454
Tannahill, V.J., Giavitto, A., Munroe, G.A.	Medial pterygoid myositis in a Thoroughbred gelding	2019	Equine Veterinary Education		10.1111/eve.13051
Tayari, H., Bell, A.	Dexmedetomidine infusion as perioperative adjuvant in a dog undergoing craniotomy	2019	Veterinary Record Case Reports	7	10.1136/vetreccr-2018-000727
VanWormer, E., Mazet, J.A.K., Hall, A., Gill, V.A., Boveng, P.L., London, J.M., Gelatt, T., Fadely, B.S., Lander, M.E., Sterling, J., Burkanov, V.N., Ream, R.R., Brock, P.M., Rea, L.D., Smith, B.R., Jeffers, A., Henstock, M., Rehberg, M.J., Burek-Huntington, K.A., Cosby, S.L., Hammond, J.A., Goldstein, T.	Viral emergence in marine mammals in the North Pacific may be linked to Arctic sea ice reduction	2019	Scientific Reports	9	10.1038/s41598-019-51699-4
Wyatt, S., De Risio, L., Driver, C., José-López, R., Pivetta, M., Beltran, E.	Neurological signs and MRI findings in 12 dogs with multiple myeloma	2019	Veterinary Radiology and Ultrasound	60	10.1111/vru.12759
Zhu, H., Damdinjav, B., Gonzalez, G., Patrono, L.V., Ramirez-Mendoza, H., Amat, J.A.R., Crispell, J., Parr, Y.A., Hammond, T.-A., Shilegdamba, E., Leung, Y.H.C., Peiris, M., Marshall, J.F., Hughes, J., Gilbert, M., Murcia, P.R.	Absence of adaptive evolution is the main barrier against influenza emergence in horses in Asia despite frequent virus interspecies transmission from wild birds	2019	PLoS Pathogens	15	10.1371/journal.ppat.1007531
Alam, M.M., Sanchez-Azqueta, A., Janha, O., Flannery, E.L., Mahindra, A., Mapesa, K., Char, A.B., Sriranganadane, D., Brancucci, N.M.B., Antonova-Koch, Y., Crouch, K., Simwela, N.V., Millar, S.B., Akinwale, J., Mitcheson, D., Solyakov, L., Dudek, K., Jones, C., Zapatero, C., Doerig, C., Nwakanma, D.C., Vázquez, M.J., Colmenarejo, G., Lafuente Monasterio, M.J., Leon, M.L., Godoi, P.H.C., Elkins, J.M., Waters, A.P., Jamieson, A.G., Álvaro, E.F., Ranford-Cartwright, L.C., Marti, M., Winzeler, E.A., Gamo, F.J., Tobin, A.B.	Validation of the protein kinase PfCLK3 as a multistage cross-species malarial drug target	2019	Science	365	10.1126/science.aau1682

Albuquerque, A.C.A., Bassetto, C.C., Almeida, F.A., Hildersley, K.A., McNeilly, T.N., Britton, C., Amarante, A.F.T.	Differences in immune responses to Haemonchus contortus infection in the susceptible Ile de France and the resistant Santa Ines sheep under different anthelmintic treatments regimens	2019	Veterinary Research	50	10.1186/s13567-019-0722-3
Al-Khafaji, A.M., Clegg, S.R., Pinder, A.C., Luu, L., Hansford, K.M., Seelig, F., Dinnis, R.E., Margos, G., Medlock, J.M., Feil, E.J., Darby, A.C., McGarry, J.W., Gilbert, L., Plantard, O., Sasser, D., Makepeace, B.L.	Multi-locus sequence typing of Ixodes ricinus and its symbiont Candidatus Midichloria mitochondrii across Europe reveals evidence of local co-cladogenesis in Scotland	2019	Ticks and Tick-borne Diseases	10	10.1016/j.ttbdis.2018.08.016
Allen, L., Reeve, R., Nousek-McGregor, A., Villacampa, J., MacLeod, R.	Are orchid bees useful indicators of the impacts of human disturbance?	2019	Ecological Indicators	103	10.1016/j.ecolind.2019.02.046
Armson, B., Wadsworth, J., Kibona, T., Mshanga, D., Fowler, V.L., Knowles, N.J., Mioulet, V., Reeve, R., King, D.P., Bachanek-Bankowska, K., Lembo, T.	Opportunities for enhanced surveillance of foot-and-mouth disease in endemic settings using milk samples	2019	Transboundary and Emerging Diseases	66	10.1111/tbed.13146
Armstrong, T., Khursigara, A.J., Killen, S.S., Fearnley, H., Parsons, K.J., Esbaugh, A.J.	Oil exposure alters social group cohesion in fish	2019	Scientific Reports	9	10.1038/s41598-019-49994-1
Auty, H., Mellor, D., Gunn, G., Boden, L.A.	The Risk of Foot and Mouth Disease Transmission Posed by Public Access to the Countryside During an Outbreak	2019	Frontiers in Veterinary Science	6	10.3389/fvets.2019.00381
Bain, M.M., Zheng, J., Zigler, M., Whenham, N., Quinlan-Pluck, F., Jones, A.C., Roberts, M., Icken, W., Olori, V.E., Dunn, I.C.	Cuticle deposition improves the biosecurity of eggs through the laying cycle and can be measured on hatching eggs without compromising embryonic development	2019	Poultry Science	98	10.3382/ps/pey528
Baker, L., Matthiopoulos, J., Müller, T., Freuling, C., Hampson, K.	Optimizing spatial and seasonal deployment of vaccination campaigns to eliminate wildlife rabies	2019	Philosophical Transactions of the Royal Society B: Biological Sciences	374	10.1098/rstb.2018.0280
Bao, R., Onishi, K.G., Tolla, E., Ebling, F.J.P., Lewis, J.E., Anderson, R.L., Barrett, P., Prendergast, B.J., Stevenson, T.J.	Genome sequencing and transcriptome analyses of the Siberian hamster hypothalamus identify mechanisms for seasonal energy balance	2019	Proceedings of the National Academy of Sciences of the United States of America	116	10.1073/pnas.1902896116
Barakzai, S.Z., Wells, J., Parkin, T.D.H., Cramp, P.	Overground endoscopic findings and respiratory sound analysis in horses with recurrent laryngeal neuropathy after unilateral laser ventriculocordectomy	2019	Equine Veterinary Journal	51	10.1111/evj.12993
Bauch, C., Boonekamp, J.J., Korsten, P., Mulder, E., Verhulst, S.	Epigenetic inheritance of telomere length in wild birds	2019	PLoS Genetics	15	10.1371/journal.pgen.1007827

Baylis, A.M.M., Tierney, M., Orben, R.A., Warwick-Evans, V., Wakefield, E., Grecian, W.J., Trathan, P., Reisinger, R., Ratcliffe, N., Croxall, J., Campioni, L., Catry, P., Crofts, S., Boersma, P.D., Galimberti, F., Granadeiro, J., Handley, J., Hayes, S., Hedd, A., Masello, J.F., Montevecchi, W.A., Pütz, K., Quillfeldt, P., Rebstock, G.A., Sanvito, S., Staniland, J.J., Brickle, P.	Important At-Sea Areas of Colonial Breeding Marine Predators on the Southern Patagonian Shelf	2019	Scientific Reports	9	10.1038/s41598-019-44695-1
Behdenna, A., Lembo, T., Calatayud, O., Cleaveland, S., Halliday, J.E.B., Packer, C., Lankester, F., Hampson, K., Craft, M.E., Czupryna, A., Dobson, A.P., Dubovi, E.J., Ernest, E., Fyumagwa, R., Hopcraft, J.G.C., Mentzel, C., Mzimhiri, I., Sutton, D., Willett, B., Haydon, D.T., Viana, M.	Transmission ecology of canine parvovirus in a multi-host, multi-pathogen system	2019	Proceedings. Biological sciences	286	10.1098/rspb.2018.2772
Bergner, L.M., Orton, R.J., da Silva Filipe, A., Shaw, A.E., Becker, D.J., Tello, C., Biek, R., Streicker, D.G.	Using noninvasive metagenomics to characterize viral communities from wildlife	2019	Molecular Ecology Resources	19	10.1111/1755-0998.12946
Bilgic, H.B., Aksulu, A., Bakirci, S., Unlu, A.H., Kose, O., Hacılarlioglu, S., Weir, W., Karagenc, T.	Infection dynamics of <i>Theileria annulata</i> over a disease season following cell line vaccination	2019	Veterinary Parasitology	265	10.1016/j.vetpar.2018.11.012
Blanco-Lobo, P., Rodriguez, L., Reedy, S., Oladunni, F.S., Nogales, A., Murcia, P.R., Chambers, T.M., Martinez-Sobrido, L.	A bivalent live-attenuated vaccine for the prevention of equine influenza virus	2019	Viruses	11	10.3390/v11100933
Blum, M., McLaughlin, E., Hanley, N.	Accounting for Sustainable Development over the Long-Run: Lessons from Germany	2019	German Economic Review	20	10.1111/geer.12148
Boyce, C., Czajkowski, M., Hanley, N.	Personality and economic choices	2019	Journal of Environmental Economics and Management	94	10.1016/j.jeem.2018.12.004
Brady, N., O'Reilly, E.L., McComb, C., Macrae, A.I., Eckersall, P.D.	An immunoturbidimetric assay for bovine haptoglobin	2019	Comparative Clinical Pathology	28	10.1007/s00580-018-2863-6
Brock, P.M., Fornace, K.M., Grigg, M.J., Anstey, N.M., William, T., Cox, J., Drakeley, C.J., Ferguson, H.M., Kao, R.R.	Predictive analysis across spatial scales links zoonotic malaria to deforestation	2019	Proceedings of the Royal Society B: Biological Sciences	286	10.1098/rspb.2018.2351
Browning, T.J., Al-Hashem, A.A., Hopwood, M.J., Engel, A., Wakefield, E.D., Achterberg, E.P.	Nutrient regulation of late spring phytoplankton blooms in the midlatitude North Atlantic	2019	Limnology and Oceanography		10.1002/lno.11376
Buckley, J., Daly, R., Cobbold, C.A., Burgess, K., Mable, B.K.	Changing environments and genetic variation: Natural variation in inbreeding does not compromise short-term physiological responses	2019	Proceedings of the Royal Society B: Biological Sciences	286	10.1098/rspb.2019.2109

Bulmer, L.S., Murray, J.-A., Burns, N.M., Garber, A., Wemelsfelder, F., McEwan, N.R., Hastie, P.M.	High-starch diets alter equine faecal microbiota and increase behavioural reactivity	2019	Scientific Reports	9	10.1038/s41598-019-54039-8
Burns, N.M., Bailey, D.M., Wright, P.J.	A method to improve fishing selectivity through age targeted fishing using life stage distribution modelling	2019	PLOS ONE	14	10.1371/journal.pone.0214459
Cáceres, C., Spatharis, S., Kaiserli, E., Smeti, E., Flowers, H., Bonachela, J.A.	Temporal phosphate gradients reveal diverse acclimation responses in phytoplankton phosphate uptake	2019	ISME Journal	13	10.1038/s41396-019-0473-1
Caillat, M., Cordes, L., Thompson, P., Matthiopoulos, J., Smout, S.	Use of state-space modelling to identify ecological covariates associated with trends in pinniped demography	2019	Aquatic Conservation: Marine and Freshwater Ecosystems	29	10.1002/aqc.3130
Calatayud, O., Esperón, F., Cleaveland, S., Biek, R., Keyyu, J., Eblate, E., Neves, E., Lembo, T., Lankester, F.	Carnivore parvovirus ecology in the Serengeti ecosystem: Vaccine strains circulating and new host species identified	2019	Journal of Virology	93	10.1128/JVI.02220-18
Capewell, P., Atkins, K., Weir, W., Jamongneau, V., Camara, M., Clucas, C., Swar, N.-R.K., Ngoyi, D.M., Rotureau, B., Garside, P., Galvani, A.P., Bucheton, B., MacLeod, A.	Resolving the apparent transmission paradox of African sleeping sickness	2019	PLoS Biology	17	10.1371/journal.pbio.3000105
Carroll, M.J., Wakefield, E.D., Scragg, E.S., Owen, E., Pinder, S., Bolton, M., Waggitt, J.J., Evans, P.G.H.	Matches and mismatches between seabird distributions estimated from at-sea surveys and concurrent individual-level tracking	2019	Frontiers in Ecology and Evolution	7	10.3389/fevo.2019.00333
Carruthers, L.V., Moses, A., Adriko, M., Faust, C.L., Tukahebwa, E.M., Hall, L.J., Ranford-Cartwright, L.C., Lamberton, P.H.L.	The impact of storage conditions on human stool 16S rRNA microbiome composition and diversity	2019	PeerJ	2019	10.7717/peerj.8133
Catry, P., Clark, T.J., Crofts, S., Stanworth, A., Wakefield, E.D.	Changes and consistencies in marine and coastal bird numbers on Kidney Island (Falkland Islands) over half a century	2019	Polar Biology	42	10.1007/s00300-019-02587-0
Changalucha, J., Steenson, R., Grieve, E., Cleaveland, S., Lembo, T., Lushasi, K., Mchau, G., Mtema, Z., Sambo, M., Nanai, A., Govella, N.J., Dilip, A., Sikana, L., Ventura, F., Hampson, K.	The need to improve access to rabies post-exposure vaccines: Lessons from Tanzania	2019	Vaccine	37	10.1016/j.vaccine.2018.08.086
Chatters, G.L., Johnson, P.C.D., Cleaveland, S., Crispell, J., De Glanville, W.A., Doherty, T., Matthews, L., Mohr, S., Nyasebwa, O.M., Rossi, G., Salvador, L.C.M., Swai, E., Kao, R.R.	Analysing livestock network data for infectious disease control: An argument for routine data collection in emerging economies	2019	Philosophical Transactions of the Royal Society B: Biological Sciences	374	10.1098/rstb.2018.0264



Cheng, Z.A., Alba-Perez, A., Gonzalez-Garcia, C., Donnelly, H., Llopis-Hernandez, V., Jayawarna, V., Childs, P., Shields, D.W., Cantini, M., Ruiz-Cantu, L., Reid, A., Windmill, J.F.C., Addison, E.S., Corr, S., Marshall, W.G., Dalby, M.J., Salmeron-Sanchez, M.	Nanoscale Coatings for Ultralow Dose BMP-2-Driven Regeneration of Critical-Sized Bone Defects	2019	Advanced Science	6	10.1002/adv.201800361
Church, G.E., Furness, R.W., Tyler, G., Gilbert, L., Votier, S.C.	Change in the North Sea ecosystem from the 1970s to the 2010s: Great skua diets reflect changing forage fish, seabirds, and fisheries	2019	ICES Journal of Marine Science	76	10.1093/icesjms/fsy165
Clark, T.J., Matthiopoulos, J., Bonnet-Lebrun, A.-S., Campioni, L., Catry, P., Marengo, I., Poncet, S., Wakefield, E.	Integrating habitat and partial survey data to estimate the regional population of a globally declining seabird species, the sooty shearwater	2019	Global Ecology and Conservation	17	10.1016/j.gecco.2019.e00554
Clark, T.J., Bonnet-Lebrun, A.-S., Campioni, L., Catry, P., Wakefield, E.	The depth of Sooty Shearwater <i>Ardenna grisea</i> burrows varies with habitat and increases with competition for space	2019	Ibis	161	10.1111/ibi.12631
Cleasby, I.R., Wakefield, E.D., Morrissey, B.J., Bodey, T.W., Votier, S.C., Bearhop, S., Hamer, K.C.	Using time-series similarity measures to compare animal movement trajectories in ecology	2019	Behavioral Ecology and Sociobiology	73	10.1007/s00265-019-2761-1
Clerc, M., Fenton, A., Babayan, S.A., Pedersen, A.B.	Parasitic nematodes simultaneously suppress and benefit from coccidian coinfection in their natural mouse host	2019	Parasitology International Journal for Parasitology: Parasites and Wildlife	146	10.1017/S0031182019000192
Clerc, M., Babayan, S.A., Fenton, A., Pedersen, A.B.	Age affects antibody levels and anthelmintic treatment efficacy in a wild rodent	2019	Wildlife	8	10.1016/j.jppaw.2019.03.004

Coghlan, A., Tyagi, R., Cotton, J.A., Holroyd, N., Rosa, B.A., Tsai, I.J., Laetsch, D.R., Beech, R.N., Day, T.A., Hallsworth-Pepin, K., Ke, H.-M., Kuo, T.-H., Lee, T.J., Martin, J., Maizels, R.M., Mutowo, P., Ozersky, P., Parkinson, J., Reid, A.J., Rawlings, N.D., Ribeiro, D.M., Swapna, L.S., Stanley, E., Taylor, D.W., Wheeler, N.J., Zamanian, M., Zhang, X., Allan, F., Allen, J.E., Asano, K., Babayan, S.A., Bah, G., Beasley, H., Bennett, H.M., Bisset, S.A., Castillo, E., Cook, J., Cooper, P.J., Cruz-Bustos, T., Cuéllar, C., Devaney, E., Doyle, S.R., Eberhard, M.L., Emery, A., Eom, K.S., Gilleard, J.S., Gordon, D., Harcus, Y., Harsha, B., Hawdon, J.M., Hill, D.E., Hodgkinson, J., Horák, P., Howe, K.L., Huckvale, T., Kalbe, M., Kaur, G., Kikuchi, T., Koutsovoulos, G., Kumar, S., Leach, A.R., Lomax, J., Makepeace, B., Matthews, J.B., Muro, A., O'Boyle, N.M., Olson, P.D., Osuna, A., Partono, F., Pfarr, K., Rinaldi, G., Foronda, P., Rollinson, D., Sambias, M.G., Sato, H., Schnyder, M., Scholz, T., Shafie, M., Tanya, V.N., Toledo, R., Tracey, A., Urban, J.F., Wang, L.-C., Zarlenga, D., Blaxter, M.L., Mitreva, M., Berriman, M.	Comparative genomics of the major parasitic worms	2019	Nature Genetics	51	10.1038/s41588-018-0262-1
Coyle, C.S., Caso, F., Tolla, E., Barrett, P., Onishi, K.G., Tello, J.A., Stevenson, T.J.	Ovarian hormones induce de novo DNA methyltransferase expression in the Siberian hamster suprachiasmatic nucleus	2019	Journal of Neuroendocrinology		10.1111/jne.12819
Craig, A.D., Bedford, M.R., Hastie, P., Khattak, F., Olukosi, O.A.	The effect of carbohydrates or prebiotic oligosaccharides on growth performance, nutrient utilisation and development of small intestine and immune organs in broilers fed nutrient-adequate diets based on either wheat or barley	2019	Journal of the Science of Food and Agriculture	99	10.1002/jsfa.9537
Crispell, J., Benton, C.H., Balaz, D., De Maio, N., Ahkmetova, A., Allen, A., Biek, R., Presho, E.L., Dale, J., Hewinson, G., Lycett, S.J., Nunez-Garcia, J., Skuce, R.A., Trewby, H., Wilson, D.J., Zadoks, R.N., Delahay, R.J., Kao, R.R.	Combining genomics and epidemiology to analyse bi-directional transmission of mycobacterium bovis in a multi-host system	2019	eLife	8	10.7554/eLife.45833
Czajkowski, M., Zagórska, K., Hanley, N.	Social norm nudging and preferences for household recycling	2019	Resource and Energy Economics	58	10.1016/j.reseneeco.2019.07.004

Davies, V., Harvey, W.T., Reeve, R., Husmeier, D. de Souza, W.M., Fumagalli, M.J., de Araujo, J., Ometto, T., Modha, S., Thomazelli, L.M., Durigon, E.L., Murcia, P.R., Figueiredo, L.T.M.	Improving the identification of antigenic sites in the H1N1 influenza virus through accounting for the experimental structure in a sparse hierarchical Bayesian model	2019	Journal of the Royal Statistical Society. Series C: Applied Statistics	68	10.1111/rssc.12338
de Souza, W.M., Fumagalli, M.J., Sabino-Santos, G., Maia, F.G.M., Modha, S., Nunes, M.R.T., Murcia, P.R., Figueiredo, L.T.M.	Discovery of novel astrovirus and calicivirus identified in ruddy turnstones in Brazil	2019	Scientific Reports	9	10.1038/s41598-019-42110-3
Deakin, Z., Hamer, K.C., Sherley, R.B., Bearhop, S., Bodey, T.W., Clark, B.L., James Grecian, W., Gummerly, M., Lane, J., Morgan, G., Morgan, L., Phillips, R.A., Wakefield, E.D., Votier, S.C.	A novel hepacivirus in wild rodents from South America	2019	Viruses	11	10.3390/v11030297
Dinis, M., Merabet, K., Martínez-Freiria, F., Steinfartz, S., Vences, M., Burgon, J.D., Elmer, K.R., Donaire, D., Hinckley, A., Fahd, S., Joger, U., Fawzi, A., Slimani, T., Vello-Antón, G.	Sex differences in migration and demography of a wide-ranging seabird, the Northern Gannet	2019	Marine Ecology Progress Series	622	10.3354/meps12986
Dominoni, D.M., Kjellberg Jensen, J., de Jong, M., Visser, M.E., Spoelstra, K.	Allopatric diversification and evolutionary melting pot in a North African Palearctic relict: The biogeographic history of Salamandra atra	2019	Molecular Phylogenetics and Evolution	130	10.1016/j.ympev.2018.10.018
Doyle, S.R., Illingworth, C.J.R., Laing, R., Bartley, D.J., Redman, E., Martinelli, A., Holroyd, N., Morrison, A.A., Rezansoff, A., Tracey, A., Devaney, E., Berriman, M., Sargison, N., Cotton, J.A., Gilleard, J.S.	Artificial light at night, in interaction with spring temperature, modulates timing of reproduction in a passerine bird	2019	Ecological Applications		10.1002/eap.2062
Dunn, I.C., Woolliams, J.A., Wilson, P.W., Icken, W., Caverro, D., Jones, A.C., Quinlan-Pluck, F., Williams, G.O.S., Olori, V., Bain, M.M.	Population genomic and evolutionary modelling analyses reveal a single major QTL for ivermectin drug resistance in the pathogenic nematode, Haemonchus contortus	2019	BMC Genomics	20	10.1186/s12864-019-5592-6
Eckersall, P.D.	Genetic variation and potential for genetic improvement of cuticle deposition on chicken eggs	2019	Genetics Selection Evolution	51	10.1186/s12711-019-0467-5
Eppink, F.V., Hanley, N., Tucker, S.	Review: Proteomic approaches to control lactational parameters in dairy cows	2019	Animal	13	10.1017/S1751731118003476
Escribano, D., Horvatić, A., Contreras-Aguilar, M.D., Guillemin, N., Cerón, J.J., Tecles, F., Martínez-Miró, S., Eckersall, P.D., Manteca, X., Mrijač, V.	How Best to Present Complex Ecosystem Information in Stated Preference Studies?	2019	Ecological Economics	158	10.1016/j.ecolecon.2018.12.020
	Changes in saliva proteins in two conditions of compromised welfare in pigs: An experimental induced stress by nose snaring and lameness	2019	Research in Veterinary Science	125	10.1016/j.rvsc.2019.06.008

Escribano, D., Horvatić, A., Contreras-Aguilar, M.D., Guillemin, N., Cerón, J.J., Lopez-Arjona, M., Hevia, M.L., Eckersall, P.D., Manteca, X., Mrljak, V.	Identification of possible new salivary biomarkers of stress in sheep using a high-resolution quantitative proteomic technique	2019	Research in Veterinary Science	1242	10.1016/j.rvsc.2019.04.01
Faust, C.L., Crotti, M., Moses, A., Oguttu, D., Wamboko, A., Adriko, M., Adekanle, E.K., Kabatereine, N., Tukahabwe, E.M., Norton, A.J., Gower, C.M., Webster, J.P., Lamberton, P.H.L.	Two-year longitudinal survey reveals high genetic diversity of <i>Schistosoma mansoni</i> with adult worms surviving praziquantel treatment at the start of mass drug administration in Uganda	2019	Parasites and Vectors	126	10.1186/s13071-019-3860-6
Filis, P., Walker, N., Robertson, L., Eaton-Turner, E., Ramona, L., Bellingham, M., Amezaga, M.R., Zhang, Z., Mandon-Pepin, B., Evans, N.P., Sharpe, R.M., Cotinot, C., Rees, W.D., O'Shaughnessy, P., Fowler, P.A.	Long-term exposure to chemicals in sewage sludge fertilizer alters liver lipid content in females and cancer marker expression in males	2019	Environment International	124003	10.1016/j.envint.2019.01.003
Fornace, K.M., Alexander, N., Abidin, T.R., Brock, P.M., Chua, T.H., Vythilingam, I., Ferguson, H.M., Manin, B.O., Wong, M.L., Ng, S.H., Cox, J., Drakeley, C.	Local human movement patterns and land use impact exposure to zoonotic malaria in Malaysian borneo	2019	eLife	8	10.7554/eLife.47602
Fumagalli, M.J., de Souza, W.M., de Araujo, J., Modha, S., Queiroz, L.H., Durigon, E.L., Murcia, P.R., Figueiredo, L.T.M.	Krykfié dicistrovirus: A novel dicistrovirus in velvety free-tailed bats from Brazil	2019	Infection, Genetics and Evolution	75	10.1016/j.meegid.2019.10.4036
Gilbert, G., MacGillivray, F.S., Robertson, H.L., Jonsson, N.N.	Adverse effects of routine bovine health treatments containing triclabendazole and synthetic pyrethroids on the abundance of dipteran larvae in bovine faeces	2019	Scientific Reports	9	10.1038/s41598-019-40800-6
Gillan, V., Simpson, D.M., Kinnaird, J., Maitland, K., Shiels, B., Devaney, E.	Characterisation of infection associated microRNA and protein cargo in extracellular vesicles of <i>Theileria annulata</i> infected leukocytes	2019	Cellular Microbiology	21	10.1111/cmi.12969
González Jiménez, M., Babayan, S.A., Khazaeli, P., Doyle, M., Walton, F., Reedy, E., Glew, T., Viana, M., Ranford-Cartwright, L., Niang, A., Siria, D.J., Okumu, F.O., Diabaté, A., Ferguson, H.M., Baldini, F., Wynne, K.	Prediction of mosquito species and population age structure using mid-infrared spectroscopy and supervised machine learning [version 3; peer review: 2 approved]	2019	Wellcome Open Research	4	10.12688/wellcomeopenres.15201.3
Goudarzi, F., Hemami, M.-R., Rancilhac, L., Malekian, M., Fakheran, S., Elmer, K.R., Steinfartz, S.	Geographic separation and genetic differentiation of populations are not coupled with niche differentiation in threatened Kaiser's spotted newt ( <i>Neureergus kaiserii</i> )	2019	Scientific Reports	9	10.1038/s41598-019-41886-8
Graham, H., de Bell, S., Hanley, N., Jarvis, S., White, P.C.L.	Willingness to pay for policies to reduce future deaths from climate change: evidence from a British survey	2019	Public Health	17401	10.1016/j.puhe.2019.06.001

Grecian, W.J., Williams, H.J., Votier, S.C., Bearhop, S., Cleasby, I.R., Grémillet, D., Hamer, K.C., Nuz, M.L., Lescoé, A., Newton, J., Patrick, S.C., Phillips, R.A., Wakefield, E.D., Bodey, T.W.	Individual spatial consistency and dietary flexibility in the migratory behavior of northern gannets wintering in the northeast Atlantic	2019	Frontiers in Ecology and Evolution	7	10.3389/fevo.2019.00214
Griffiths, V.F., Sheremet, O., Hanley, N., Baker, J., Bull, J.W., Milner-Gulland, E.J.	Local people's preferences for biodiversity offsets to achieve 'no net loss' for economic developments	2019	Biological Conservation	236	10.1016/j.biocon.2019.05.049
Groeschel, M., Forde, T., Turvey, S., Joffe, A.M., Hui, C., Naidu, P., Mavrot, F., Kutz, S., Singh, A.E.	An unusual case of Erysipelothrix rhusiopathiae prosthetic joint infection from the Canadian Arctic: Whole genome sequencing unable to identify a zoonotic source	2019	BMC Infectious Diseases	19	10.1186/s12879-019-3913-7
Guzzo, M.M., Mochnac, N.J., Durhack, T., Kissinger, B.C., Killen, S.S., Treberg, J.R.	Effects of repeated daily acute heat challenge on the growth and metabolism of a cold water stenothermal fish	2019	Journal of Experimental Biology	222	10.1242/jeb.198143
Hampson, K., Abela-Ridder, B., Bharti, O., Knopf, L., Léchenne, M., Mindekem, R., Tarantola, A., Zinsstag, J., Trotter, C.	Modelling to inform prophylaxis regimens to prevent human rabies	2019	Vaccine	37	10.1016/j.vaccine.2018.11.010
Hampson, K., Ventura, F., Steenson, R., Mancy, R., Trotter, C., Cooper, L., Abela-Ridder, B., Knopf, L., Ringenier, M., Tenzin, T., Ly, S., Tarantola, A., Moyengar, R., Oussiguéré, A., Bonfoh, B., Narayana, D.A., Sudarshan, M.K., Muturi, M., Mwatondo, A., Wambura, G., Andriamandimby, S.F., Baril, L., Edosa, G.T., Traoré, A., Jayme, S., Kotzé, J., Gunsekera, A., Chitnis, N., Hattendorf, J., Laager, M., Lechenne, M., Zinsstag, J., Chagalucha, J., Mtema, Z., Lugelo, A., Lushaji, K., Yurachai, O., Metcalf, C.J.E., Rajeev, M., Blanton, J., Costa, G.B., Sreenivasan, N., Wallace, R., Briggs, D., Taylor, L., Thumbi, S.M., Huang, N.T.T.	The potential effect of improved provision of rabies post-exposure prophylaxis in Gavi-eligible countries: a modelling study	2019	The Lancet Infectious Diseases	19	10.1016/S1473-3099(18)30512-7
Hay, J., Gilroy, K., Huser, C., Kilbey, A., McDonald, A., MacCallum, A., Holroyd, A., Cameron, E., Neil, J.C.	Collaboration of MYC and RUNX2 in lymphoma simulates T-cell receptor signaling and attenuates p53 pathway activity	2019	Journal of Cellular Biochemistry	120	10.1002/jcb.29143
Herzog, C.M., de Glanville, W.A., Willett, B.J., Kibona, T.J., Cattadori, I.M., Kapur, V., Hudson, P.J., Buza, J., Cleaveland, S., Björnstad, O.N.	Pastoral production is associated with increased peste des petits ruminants seroprevalence in northern Tanzania across sheep, goats and cattle	2019	Epidemiology and Infection	147	10.1017/S0950268819001262

Honkanen, H.M., Boylan, P., Dodd, J.A., Adams, C.E.	Life stage-specific, stochastic environmental effects overlay density dependence in an Atlantic salmon population	2019	Ecology of Freshwater Fish	28	10.1111/eff.12439
Horswill, C., Kindsvater, H.K., Juan-Jordá, M.J., Dulvy, N.K., Mangel, M., Matthiopoulos, J.	Global reconstruction of life-history strategies: A case study using tunas	2019	Journal of Applied Ecology	56	10.1111/1365-2664.13327
Horvatić, A., Guillemin, N., Kaab, H., McKeegan, D., O'Reilly, E., Bain, M., Kuleš, J., Eckersall, P.D.	Quantitative proteomics using tandem mass tags in relation to the acute phase protein response in chicken challenged with <i>Escherichia coli</i> lipopolysaccharide endotoxin	2019	Journal of Proteomics	192	10.1016/j.jprot.2018.08.009
Hrynicky, T.A., Barasa, V., Benschop, J., Cleaveland, S., Crump, J.A., Davis, M., Mariki, B., Mmbaga, B.T., Mtui-Malamsha, N., Prinsen, G., Sharp, J., Sindiyo, E., Swai, E.S., Thomas, K.M., Zadoks, R., Waldman, L.	Street-level diplomacy and local enforcement for meat safety in northern Tanzania: Knowledge, pragmatism and trust	2019	BMC Public Health	19	10.1186/s12889-019-7067-1
Hughes, E.C., Kibona, T.K., De Glanville, W.A., Lankester, F., Davis, A., Carter, R.W., De Jong, R.M.F., Nyasebwa, O.M., Claxton, J.R., Cleaveland, S., Allan, K.J.	<i>Taenia multiceps</i> coenurosis in Tanzania: A major and under-recognised livestock disease problem in pastoral communities	2019	Veterinary Record	184	10.1136/vr.105186
Hughes, M.R., Hooker, O.E., Van Leeuwen, T.E., Kettle-White, A., Thorne, A., Prodöhl, P., Adams, C.E.	Alternative routes to piscivory: Contrasting growth trajectories in brown trout ( <i>Salmo trutta</i> ) ecotypes exhibiting contrasting life history strategies	2019	Ecology of Freshwater Fish	28	10.1111/eff.12421
Ibáñez-Shimabukuro, M., Florencia Rey-Burusco, M., Gabrielsen, M., Franchini, G.R., Riboldi-Tunnicliffe, A., Roe, A.J., Griffiths, K., Cooper, A., Córscico, B., Kennedy, M.W., Smith, B.O.	Structure and ligand binding of As-p18, an extracellular fatty acid binding protein from the eggs of a parasitic nematode	2019	Bioscience Reports	39	10.1042/BSR20191292
Jacobs, A., Carruthers, M., Eckmann, R., Yohannes, E., Adams, C.E., Behrmann-Godel, J., Elmer, K.R.	Rapid niche expansion by selection on functional genomic variation after ecosystem recovery	2019	Nature Ecology and Evolution	3	10.1038/s41559-018-0742-9
Jayaraman, S., Harris, C., Paxton, E., Donachie, A.-M., Vaikinen, H., McCulloch, R., Hall, J.P.J., Kenny, J., Lenzi, L., Hertz-Fowler, C., Cobbold, C., Reeve, R., Michael, T., Morrison, L.J.	Application of long read sequencing to determine expressed antigen diversity in <i>Trypanosoma brucei</i> infections	2019	PLoS Neglected Tropical Diseases	13	10.1371/journal.pntd.0007262
Jerem, P., Jenni-Eiermann, S., McKeegan, D., McCafferty, D.J., Nager, R.G.	Eye region surface temperature dynamics during acute stress relate to baseline glucocorticoids independently of environmental conditions	2019	Physiology and Behavior	210	10.1016/j.physbeh.2019.112627



Joly, K., Gurarie, E., Sorum, M.S., Kaczensky, P., Cameron, M.D., Jakes, A.F., Borg, B.L., Nandintsetseg, D., Hopcraft, J.G.C., Buuveibaatar, B., Jones, P.F., Mueller, T., Walzer, C., Olson, K.A., Payne, J.C., Yadamtsuren, A., Hebblewhite, M.	Longest terrestrial migrations and movements around the world	2019	Scientific Reports	9	10.1038/s41598-019-51884-5
Jonsson, N.N., Ferguson, H.J., Koh-Tan, H.H.C., McCartney, C.A., Cernat, R.C., Strachan, E.M., Thomson, W., Snelling, T.J., Harvey, C.D., Andonovic, I., Michie, C., Wallace, R.J.	Postmortem observations on rumen wall histology and gene expression and ruminal and caecal content of beef cattle fattened on barley-based rations	2019	Animal		10.1017/S1751731119002878
Jonsson, N.N., Gilbert, G., MacGillivray, F.S.	Livestock Management in Red-Billed Cough Feeding Habitat in Great Britain and the Isle of Man	2019	Rangeland Ecology and Management		10.1016/j.rama.2019.10.009
Jonsson, N.N., Kleen, J.L., Wallace, R.J., Andonovic, I., Michie, C., Farish, M., Mitchell, M., Duthie, C.-A., Jensen, D.B., Denwood, M.J.	Evaluation of reticuloruminal pH measurements from individual cattle: Sampling strategies for the assessment of herd status	2019	Veterinary Journal	243	10.1016/j.tvjl.2018.11.006
Kaab, H., Bain, M.M., Bartley, K., Turnbull, F., Wright, H.W., Nisbet, A.J., Birchmore, R., Eckersall, P.D.	Serum and acute phase protein changes in laying hens, infested with poultry red mite	2019	Poultry Science	98	10.3382/ps/pey431
Kafouris, S., Smeti, E., Spatharis, S., Tsirtsis, G., Economou-Amilli, A., Danielidis, D.B.	Nitrogen as the main driver of benthic diatom composition and diversity in oligotrophic coastal systems	2019	Science of the Total Environment	694	10.1016/j.scitotenv.2019.133773
Keeping, J.A., Reeve-Arnold, K.E., Burns, N.M., Catarina, N., Bailey, D.M., McNeill, D.C.	Computer-aided photo-identification of a rare stingray, <i>Megatrygon microps</i>	2019	Journal of Fish Biology		10.1111/jfb.14242
Kerfua, S.D., Shirima, G., Kusiluka, L., Ayeabazibwe, C., Martin, E., Arinaitwe, E., Cleaveland, S., Haydon, D.T.	Low toptotype diversity of recent foot-and-mouth disease virus serotypes O and A from districts located along the Uganda and Tanzania border	2019	Journal of Veterinary Science	20	10.4142/jvs.2019.20.e4
Khan, A., Fujita, A.W., Randle, N., Regidor-Cerrillo, J., Shaik, J.S., Shen, K., Oler, A.J., Quinones, M., Latham, S.M., Akanmori, B.D., Cleaveland, S., Innes, E.A., Ryan, U., Slapeta, J., Schares, G., Ortega-Mora, L.M., Dubey, J.P., Wastling, J.M., Grigg, M.E.	Global selective sweep of a highly inbred genome of the cattle parasite <i>Neospora caninum</i>	2019	Proceedings of the National Academy of Sciences of the United States of America	116	10.1073/pnas.1913531116
Kilarski, W.W., Martin, C., Pisano, M., Bain, O., Babayan, S.A., Swartz, M.A.	Inherent biomechanical traits enable infective filariae to disseminate through collecting lymphatic vessels	2019	Nature Communications	10	10.1038/s41467-019-10675-2
Koene, J.P., Crotti, M., Elmer, K.R., Adams, C.E.	Differential selection pressures result in a rapid divergence of donor and refuge populations of a high conservation value freshwater fish <i>Coregonus lavaretus</i> (L.)	2019	Evolutionary Ecology	33	10.1007/s10682-019-09995-y

Krauth, S.J., Balen, J., Gobert, G.N., Lamberton, P.H.L.	A call for systems epidemiology to tackle the complexity of schistosomiasis, its control, and its elimination	2019	Tropical Medicine and Infectious Disease	10.3390/tropicalmed40104021
Kreppel, K., Caminade, C., Govella, N., Morse, A.P., Ferguson, H.M., Baylis, M.	Impact of ENSO 2016-17 on regional climate and malaria vector dynamics in Tanzania	2019	Environmental Research Letters	10.1088/1748-9326/ab26c7
Lankester, F., Davis, A., Kinung'Hi, S., Yoder, J., Bunga, C., Alkara, S., Mzimhiri, I., Cleaveland, S., Palmer, G.H.	An integrated health delivery platform, targeting soil-transmitted helminths (STH) and canine mediated human rabies, results in cost savings and increased breadth of treatment for STH in remote communities in Tanzania	2019	BMC Public Health	10.1186/s12889-019-7737-1916
Larcombe, S.D., Kolte, S.W., Ponnudurai, G., Kurkure, N., Magar, S., Velusamy, R., Rani, N., Rubinibala, B., Rekha, B., Alagesan, A., Weir, W., Shiels, B.R.	The impact of tick-borne pathogen infection in Indian bovines is determined by host type but not the genotype of Theileria annulata	2019	Infection, Genetics and Evolution	10.1016/j.meegid.2019.10753972
Lee, B.P., Mulvey, L., Barr, G., Garratt, J., Goodman, E., Selman, C., Harries, L.W.	Dietary restriction in ILSXISS mice is associated with widespread changes in splicing regulatory factor expression levels	2019	Experimental Gerontology	10.1016/j.exger.2019.110128736
Li, S., Gilbert, L., Vanwambeke, S.O., Yu, J., Purse, B.V., Harrison, P.A.	Lyme Disease Risks in Europe under Multiple Uncertain Drivers of Change	2019	Environmental health perspectives	10.1289/EHP4615
Lisci, C., Lewis, J.E., Daniel, Z.C.T.R., Stevenson, T.J., Monnier, C., Marshall, H.J., Fowler, M., Ebling, F.J.P., Ferri, G.-L., Cocco, C., Jethwa, P.H.	Photoperiodic changes in adiposity increase sensitivity of female Siberian hamsters to systemic VGF derived peptide TLQP-21	2019	PLoS ONE	10.1371/journal.pone.022141517
Liu, Z., Xu, J., Yang, X., Tu, Q., Hanley, N., Kontoleon, A.	Performance of Agglomeration Bonuses in Conservation Auctions: Lessons from a Framed Field Experiment	2019	Environmental and Resource Economics	10.1007/s10640-019-00330-1
Lumb, F.E., Crowe, J., Doonan, J., Suckling, C.J., Selman, C., Harnett, M.M., Harnett, W.	Synthetic small molecule analogues of the immunomodulatory Acanthocheilonema viteae product ES-62 promote metabolic homeostasis during obesity in a mouse model	2019	Molecular and Biochemical Parasitology	10.1016/j.molbiopara.2019.111232
Luthersson, N., Bolger, C., Fores, P., Barfoot, C., Nelson, S., Parkin, T., Harris, P.	Effect of Changing Diet on Gastric Ulceration in Exercising Horses and Ponies After Cessation of Omeprazole Treatment	2019	Journal of Equine Veterinary Science	10.1016/j.jevs.2019.05.008317
Maia, M.F., Kapulu, M., Muthui, M., Wagah, M.G., Ferguson, H.M., Dowell, F.E., Baldini, F., Cartwright, L.-R.	Detection of Plasmodium falciparum infected Anopheles gambiae using near-infrared spectroscopy	2019	Malaria Journal	10.1186/s12936-019-2719-1819

Mair, C., Nickbakhsh, S., Reeve, R., McMenamin, J., Reynolds, A., Gunson, R.N., Murcia, P.R., Matthews, L.	Estimation of temporal covariances in pathogen dynamics using Bayesian multivariate autoregressive models	2019	PLoS Computational Biology	15	10.1371/journal.pcbi.1007492
Marasco, V., Boner, W., Griffiths, K., Heidinger, B., Monaghan, P.	Intergenerational effects on offspring telomere length: Interactions among maternal age, stress exposure and offspring sex	2019	Proceedings of the Royal Society B: Biological Sciences	286	10.1098/rspb.2019.1845
Marks, N.D., Winter, A.D., Gu, H.Y., Maitland, K., Gillan, V., Ambroz, M., Martinelli, A., Laing, R., MacLellan, R., Towne, J., Roberts, B., Hanks, E., Devaney, E., Britton, C.	Profiling microRNAs through development of the parasitic nematode <i>Haemonchus</i> identifies nematode-specific miRNAs that suppress larval development	2019	Scientific Reports	9	10.1038/s41598-019-54154-6
Martin, J.E., Sandilands, V., Sparrey, J., Baker, L., Dixon, L.M., McKeegan, D.E.F.	Welfare assessment of novel on-farm killing methods for poultry	2019	PLoS ONE	14	10.1371/journal.pone.0212872
Martin, J.E., McKeegan, D.E.F., Magee, D.L., Armour, N., Pritchard, D.G.	Pathological consequences of low atmospheric pressure stunning in broiler chickens	2019	Animal		10.1017/S1751731119001411
Matthiopoulos, J., Field, C., MacLeod, R.	Predicting population change from models based on habitat availability and utilization	2019	Proceedings of the Royal Society B: Biological Sciences	286	10.1098/rspb.2018.2911
Maxwell, N.B., Buchanan, C.G., Evans, N.P.	Hair cortisol concentrations, as a measure of chronic activity within the hypothalamic-pituitary-adrenal axis, is elevated in dogs farmed for meat, relative to pet dogs, in South Korea	2019	Animal Welfare	28	10.7120/09627286.28.4.389
McGonigal, R., Barrie, J.A., Yao, D., McLaughlin, M., Cunningham, M.E., Rowan, E.G., Willison, H.J.	Glial sulfatides and neuronal complex gangliosides are functionally interdependent in maintaining myelinating axon integrity	2019	Journal of Neuroscience	39	10.1523/JNEUROSCI.2095-2018.2018
McLennan, D., Recknagel, H., Elmer, K.R., Monaghan, P.	Distinct telomere differences within a reproductively bimodal common lizard population	2019	Functional Ecology	33	10.1111/1365-2435.13408
McLennan, D., Auer, S.K., Anderson, G.J., Reid, T.C., Bassar, R.D., Stewart, D.C., Cauwelier, E., Sampayo, J., McKelvey, S., Nislow, K.H., Armstrong, J.D., Metcalfe, N.B.	Simulating nutrient release from parental carcasses increases the growth, biomass and genetic diversity of juvenile Atlantic salmon	2019	Journal of Applied Ecology	56	10.1111/1365-2664.13429
McWhinnie, K.C., Parsons, K.J.	Shaping up? A direct comparison between 2D and low-cost 3D shape analysis using African cichlid mandibles	2019	Environmental Biology of Fishes	102	10.1007/s10641-019-00879-2

Meza, F.C., Kreppel, K.S., Maiti, D.F., Milwale, A.T., Mirzai, N., Killeen, G.F., Ferguson, H.M., Govella, N.J.	Mosquito electrocuting traps for directly measuring biting rates and host-preferences of <i>Anopheles arabiensis</i> and <i>Anopheles funestus</i> outdoors	2019	Malaria Journal	10.1186/s12936-019-2726-18x
Michelot, T., Blackwell, P.G., Chamailé-Jammes, S., Matthiopoulos, J.	Inference in MCMC step selection models	2019	Biometrics	10.1111/biom.13170
Michelot, T., Blackwell, P.G., Matthiopoulos, J.	Linking resource selection and step selection models for habitat preferences in animals	2019	Ecology	100 10.1002/ecy.2452
Miller, J.A.O., Furness, R.W., Trinder, M., Matthiopoulos, J.	The sensitivity of seabird populations to density-dependence, environmental stochasticity and anthropogenic mortality	2019	Journal of Applied Ecology	56 10.1111/1365-2664.13448
Mira, A., Unlu, A.H., Bilgic, H.B., Bakirci, S., Hacilarifoglu, S., Karagenc, T., Carletti, T., Weir, W., Shiels, B., Shkap, V., Aktas, M., Florin-Christensen, M., Schnittger, L.	High genetic diversity and differentiation of the <i>Babesia ovis</i> population in Turkey	2019	Transboundary and Emerging Diseases	10.1111/tbed.13174
Modha, S., Hughes, J., Bianco, G., Ferguson, H.M., Helm, B., Tong, L., Wilkie, G.S., Kohl, A., Schnettler, E.	Metaviromics Reveals Unknown Viral Diversity in the Biting Midge <i>Culicoides impunctatus</i>	2019	Viruses	11 10.3390/v11090865
Monaghan, P., Metcalfe, N.B.	The deteriorating soma and the indispensable germline: Gamete senescence and offspring fitness	2019	Proceedings of the Royal Society B: Biological Sciences	286 10.1098/rspb.2019.2187
Mwanga, E.P., Minja, E.G., Mrimi, E., Jiménez, M.G., Swai, J.K., Abbasi, S., Ngowo, H.S., Siria, D.J., Mapua, S., Stica, C., Maia, M.F., Olotu, A., Sikulu-Lord, M.T., Baldini, F., Ferguson, H.M., Wynne, K., Selvaraj, P., Babayan, S.A., Okumu, F.O.	Detection of malaria parasites in dried human blood spots using mid-infrared spectroscopy and logistic regression analysis	2019	Malaria Journal	10.1186/s12936-019-2982-189
Mwanga, E.P., Mapua, S.A., Siria, D.J., Ngowo, H.S., Nangacha, F., Mgando, J., Baldini, F., González Jiménez, M., Ferguson, H.M., Wynne, K., Selvaraj, P., Babayan, S.A., Okumu, F.O.	Using mid-infrared spectroscopy and supervised machine-learning to identify vertebrate blood meals in the malaria vector, <i>Anopheles arabiensis</i>	2019	Malaria Journal	10.1186/s12936-019-2822-18y
Nanda, S.K., Petrova, T., Marchesi, F., Gierlinski, M., Razsoikov, M., Lee, K.L., Wright, S.W., Rao, V.R., Cohen, P., Simon Arthur, J.C.	Distinct signals and immune cells drive liver pathology and glomerulonephritis in ABIN1[D485N] mice	2019	Life Science Alliance	2 10.26508/lsa.201900533
Needham, K., Hanley, N.	Valuing a managed realignment scheme: What are the drivers of public willingness to pay?	2019	Ocean and Coastal Management	170 10.1016/j.ocecoaman.2018.12.015

Nelli, L., Ferguson, H.M., Matthiopoulos, J.	Achieving explanatory depth and spatial breadth in infectious disease modelling: Integrating active and passive case surveillance	2019	Statistical Methods in Medical Research	10.1177/0962280219856380
Newton, M., Barry, J., Dodd, J.A., Lucas, M.C., Boylan, P., Adams, C.E.	A test of the cumulative effect of river weirs on downstream migration success, speed and mortality of Atlantic salmon ( <i>Salmo salar</i> ) smolts: An empirical study	2019	Ecology of Freshwater Fish	28 10.1111/eff.12441
Nickbakhsh, S., Mair, C., Matthews, L., Reeve, R., Johnson, P.C.D., Thorburn, F., Von Wissmann, B., Reynolds, A., McMenamin, J., Gunson, R.N., Murcia, P.R.	Virus-virus interactions impact the population dynamics of influenza and the common cold	2019	Proceedings of the National Academy of Sciences of the United States of America	10.1073/pnas.1911083111166
Nkwabi, A.K., Metzger, K., Beyers, R., Magige, F., Mduma, S.A.R., Hopcraft, J.G.C., Sinclair, A.R.E.	Bird community responses to changes in vegetation caused by increasing large mammal populations in the Serengeti woodlands	2019	Wildlife Research	46 10.1071/WR18001
O'Hanlon, N.J., Alonso, S., Miller, J.A.O., McGill, R.A.R., Nager, R.G.	Landscape-mediated variation in diet is associated with egg size and maculation in a generalist forager	2019	Ibis	10.1111/ibi.12739
Onishi, K.G., Prendergast, B.J., Stevenson, T.J.	Trait-specific effects of exogenous triiodothyronine on cytokine and behavioral responses to simulated systemic infection in male Siberian hamsters	2019	Hormones and Behavior	110 10.1016/j.yhbeh.2019.02.017
Owen, E., Wakefield, E., Hollinrake, P., Leitch, A., Steel, L., Bolton, M.	Breeding together, feeding apart: Sympatrically breeding seabirds forage in individually distinct locations	2019	Marine Ecology Progress Series	620 10.3354/meps12979
Page, A.P., Roberts, M., Félix, M.-A., Pickard, D., Page, A., Weir, W.	The golden death bacillus <i>Chryseobacterium nematophagum</i> is a novel matrix digesting pathogen of nematodes	2019	BMC Biology	17 10.1186/s12915-019-0632-x
Page, R.D.M.	Ozymbandias: A biodiversity knowledge graph	2019	PeerJ	2019 10.7717/peerj.6739

Paniz-Mondolfi, A.E., Tami, A., Grillet, M.E., Márquez, M., Hernández-Villena, J., Escalona-Rodríguez, M.A., Blohm, G.M., Mejías, I., Urbina-Medina, H., Risquez, A., Castro, J., Carvajal, A., Walter, C., López, M.G., Schwabl, P., Hernández-Castro, L., Miles, M.A., Hotez, P.J., Lednický, J., Morris, J.G., Crainey, J., Luz, S., Ramírez, J.D., Sordillo, E., Llewellyn, M., Canache, M., Araque, M., Oletta, J.	Resurgence of vaccine-preventable diseases in Venezuela as a regional public health threat in the Americas	2019	Emerging Infectious Diseases	25	10.3201/eid2504.181305
Perry, W.B., Solberg, M.F., Besnier, F., Dyrhovden, L., Matre, I.H., Fjellidal, P.G., Ayllon, F., Greer, S., Llewellyn, M., Taylor, M.I., Carvalho, G., Glover, K.A.	Evolutionary drivers of kype size in atlantic salmon (salmo salar): domestication, age and genetics	2019	Royal Society Open Science	6	10.1098/rsos.190021
Plevin, S., McLellan, J., van Schie, H., Parkin, T.	Ultrasound tissue characterisation of the superficial digital flexor tendons in juvenile Thoroughbred racehorses during early race training	2019	Equine Veterinary Journal	51	10.1111/evj.13006
Priede, I.G., Drazen, J.C., Bailey, D.M., Kuhn, L.A., Fabian, D.	Abyssal demersal fishes recorded at station M (34°50'N, 123° 00'W, 4100 m depth) in the northeast Pacific Ocean: An annotated checklist and synthesis	2019	Deep-Sea Research Part II: Topical Studies in Oceanography	10.1016/j.dsr2.2019.104648	
Probert, J.R., Parr, C.L., Holdo, R.M., Anderson, T.M., Archibald, S., Courtney Mustaphi, C.J., Dobson, A.P., Donaldson, J.E., Hopcraft, G.C., Hempson, G.P., Morrison, T.A., Beale, C.M.	Anthropogenic modifications to fire regimes in the wider Serengeti-Mara ecosystem	2019	Global Change Biology	25	10.1111/gcb.14711
Pulsawat, P., Soongrung, T., Satitsuksanoa, P., Le Mignon, M., Khemili, S., Gillis, D., Nony, E., Kennedy, M., Jacquet, A.	The house dust mite allergen Der p 5 binds lipid ligands and stimulates airway epithelial cells through a TLR2-dependent pathway	2019	Clinical and Experimental Allergy	49	10.1111/cea.13278
Purisotayo, T., Jonsson, N.N., Mable, B.K., Verreynne, F.J.	Combining molecular and incomplete observational data to inform management of southern white rhinoceros (Ceratotherium simum simum)	2019	Conservation Genetics	10.1007/s10592-019-01166-4	
Putman, R., Nelli, L., Matthiopoulos, J.	Changes in bodyweight and productivity in resource-restricted populations of red deer (Cervus elaphus) in response to deliberate reductions in density	2019	European Journal of Wildlife Research	65	10.1007/s10344-018-1251-5
Quintana, J.F., Kumar, S., Ivens, A., Chow, F.W.N., Hoy, A., Fulton, A., Dickinson, P., Martin, C., Taylor, M., Babayan, S.A., Buck, A.H.	Comparative analysis of small RNAs released by the filarial nematode Litomosoides sigmodontis in vitro and in vivo	2019	PLOS Neglected Tropical Diseases	13	10.1371/journal.pntd.0007811



Rached, M.-T., Millership, S.J., Pedroni, S.M.A., Choudhury, A.I., Costa, A.S.H., Hardy, D.G., Glegola, J.A., Irvine, E.E., Selman, C., Woodberry, M.C., Yadav, V.K., Khadayate, S., Vidal-Puig, A., Virtue, S., Frezza, C., Withers, D.J.	2019	Molecular Metabolism	Deletion of myeloid IRS2 enhances adipose tissue sympathetic nerve function and limits obesity	2019	10.1016/j.molmet.2018.11.010
Rácz, A., Dwyer, T., Killen, S.S.	2019	Zebrafish	Overview of a disease outbreak and introduction of a step-by-step protocol for the eradication of mycobacterium haemophilum in a zebrafish system	2019	10.1089/zeb.2018.1628
Railey, A.F., Lankester, F., Lembo, T., Reeve, R., Shirima, G., Marsh, T.L.	2019	World Development Perspectives	Enhancing livestock vaccination decision-making through rapid diagnostic testing	2019	10.1016/j.wdp.2019.10011644
Rajeev, M., Edosa, G., Hanitriniaina, C., Andriamandimby, S.F., Guis, H., Ramiandrasoa, R., Ratovoson, R., Randrianasolo, L., Andriamananjara, M., Heraud, J.-M., Baril, L., Metcalf, C.J.E., Hampson, K.	2019	Vaccine	Healthcare utilization, provisioning of post-exposure prophylaxis, and estimation of human rabies burden in Madagascar	2019	10.1016/j.vaccine.2018.11.01137
Rancilhac, L., Goudarzi, F., Gehara, M., Hemami, M.-R., Elmer, K.R., Vences, M., Steinfarz, S.	2019	Molecular Phylogenetics and Evolution	Phylogeny and species delimitation of near Eastern <i>Neureurgus</i> newts (Salamandridae) based on genome-wide RADseq data analysis	2019	10.1016/j.ympev.2019.01.003133
Ranford-Cartwright, L., Gómez-Díaz, E.	2019	Briefings in functional genomics	Plasmodium comparative genomics	2019	10.1093/bfpg/elz020
Recknagel, H., Elmer, K.R.	2019	Oecologia	Differential reproductive investment in co-occurring oviparous and viviparous common lizards ( <i>Zootoca vivipara</i> ) and implications for life-history trade-offs with viviparity	2019	10.1007/s00442-019-04398-w190
Rezansoff, A.M., Laing, R., Martinelli, A., Stasiuk, S., Redman, E., Bartley, D., Holroyd, N., Devaney, E., Sargison, N.D., Doyle, S., Cotton, J.A., Gilleard, J.S.	2019	International Journal for Parasitology	The confounding effects of high genetic diversity on the determination and interpretation of differential gene expression analysis in the parasitic nematode <i>Haemonchus contortus</i>	2019	10.1016/j.ijpara.2019.05.049112
Ribeiro, R., Eze, J.I., Gilbert, L., Wint, G.R.W., Gunn, G., MacRae, A., Medlock, J.M., Auty, H.	2019	Parasites and Vectors	Using imperfect data in predictive mapping of vectors: A regional example of <i>Ixodes ricinus</i> distribution	2019	10.1186/s13071-019-3784-1121

Rineau, F., Malina, R., Beenaerts, N., Arnauts, N., Bardgett, R.D., Berg, M.P., Boerema, A., Bruckers, L., Clerinx, J., Davin, E.L., De Boeck, H.J., De Dobbelaer, T., Dondini, M., De Laender, F., Ellers, J., Franken, O., Gilbert, L., Gudmundsson, L., Janssens, I.A., Johnson, D., Lizin, S., Longdoz, B., Meire, P., Meremans, D., Milbau, A., Moretti, M., Nijls, I., Nobel, A., Pop, I.S., Puetz, T., Reyns, W., Roy, J., Schuetz, J., Seneviratne, S.I., Smith, P., Solmi, F., Staes, J., Thiery, W., Thijs, S., Vanderkelen, I., Van Landuyt, W., Verbruggen, E., Witters, N., Zscheischler, J., Vangronsveld, J.	Towards more predictive and interdisciplinary climate change ecosystem experiments	2019	Nature Climate Change	10.1038/s41558-019-0609-93
Riotte-Lambert, L., Matthiopoulos, J.	Communal and efficient movement routines can develop spontaneously through public information use	2019	Behavioral Ecology	10.1093/beheco/ary180
Rodríguez-Muñoz, R., Boonekamp, J.J., Fisher, D., Hopwood, P., Tregenza, T.	Slower senescence in a wild insect population in years with a more female-biased sex ratio	2019	Proceedings of the Royal Society B: Biological Sciences	10.1098/rspb.2019.0286
Rodríguez-Muñoz, R., Boonekamp, J.J., Liu, X.P., Skicko, I., Fisher, D.N., Hopwood, P., Tregenza, T.	Testing the effect of early-life reproductive effort on age-related decline in a wild insect population	2019	Evolution	10.1111/evo.13679
Rodríguez-Muñoz, R., Boonekamp, J.J., Liu, X.P., Skicko, I., Haugland Pedersen, S., Fisher, D.N., Hopwood, P., Tregenza, T.	Comparing individual and population measures of senescence across 10 years in a wild insect population	2019	Evolution	10.1111/evo.13674
Rysava, K., Miranda, M.E., Zapatos, R., Lapiz, S., Rances, P., Miranda, L.M., Roces, M.C., Friar, J., Townsend, S.E., Hampson, K.	On the path to rabies elimination: The need for risk assessments to improve administration of post-exposure prophylaxis	2019	Vaccine	10.1016/j.vaccine.2018.11.37.066
Salin, K., Villasevil, E.M., Anderson, G.J., Lamarre, S.G., Melanson, C.A., McCarthy, I., Selman, C., Metcalfe, N.B.	Differences in mitochondrial efficiency explain individual variation in growth performance	2019	Proceedings of the Royal Society B: Biological Sciences	10.1098/rspb.2019.1466
Sánchez-Hernández, J., Nunn, A.D., Adams, C.E., Amundsen, P.-A.	Causes and consequences of ontogenetic dietary shifts: a global synthesis using fish models	2019	Biological Reviews	10.1111/brv.12468
Sandøe, P., Corr, S.A., Lund, T.B., Forkman, B.	Aggregating animal welfare indicators: can it be done in a transparent and ethically robust way?	2019	Animal Welfare	10.7120/09627286.28.1.028167
Sanou, A., Moussa Guelbéogo, W., Nelli, L., Hyacinth Toé, K., Zongo, S., Ouédraogo, P., Cissé, F., Mirzai, N., Matthiopoulos, J., Sagnon, N., Ferguson, H.M.	Evaluation of mosquito electrocuting traps as a safe alternative to the human landing catch for measuring human exposure to malaria vectors in Burkina Faso	2019	Malaria Journal	10.1186/s12936-019-3030-185

Sarker, S.K., Matthiopoulos, J., Mitchell, S.N., Ahmed, Z.U., Mamun, M.B.A., Reeve, R.	1980s–2010s: The world's largest mangrove ecosystem is becoming homogenous	2019	Biological Conservation	10.1016/j.biocon.2019.05.236011	
Sarker, S.K., Reeve, R., Paul, N.K., Matthiopoulos, J.	Modelling spatial biodiversity in the world's largest mangrove ecosystem – The Bangladesh Sundarbans: A baseline for conservation	2019	Diversity and Distributions	10.1111/ddi.12887	
Sbragaglia, V., Nuñez, J.D., Dominoni, D., Coco, S., Fanelli, E., Azzurro, E., Marini, S., Noguerras, M., Ponti, M., del Rio Fernandez, J., Aguzzi, J.	Annual rhythms of temporal niche partitioning in the Sparidae family are correlated to different environmental variables	2019	Scientific Reports	10.1038/s41598-018-37954-0	
Schneider, K., Adams, C.E., Elmer, K.R.	Parallel selection on ecologically relevant gene functions in the transcriptomes of highly diversifying salmonids	2019	BMC Genomics	10.1186/s12864-019-6361-2	
Schwabl, P., Imamura, H., Van den Broeck, F., Costales, J.-A., Manguashca-Sánchez, J., Miles, M.A., Andersson, B., Grijalva, M.J., Llewellyn, M.S.	Meiotic sex in Chagas disease parasite <i>Trypanosoma cruzi</i>	2019	Nature Communications	10.1038/s41467-019-11771-z	
Semango, G., Hamilton, C.M., Kreppel, K., Katzer, F., Kibona, T., Lankester, F., Allan, K.J., Thomas, K.M., Claxton, J.R., Innes, E.A., Swai, E.S., Buza, J., Cleaveland, S., de Glanville, W.A.	The sero-epidemiology of neospora caninum in cattle in northern Tanzania	2019	Frontiers in Veterinary Science	10.3389/fvets.2019.00327	
Skúlason, S., Parsons, K.J., Svanbäck, R., Räsänen, K., Ferguson, M.M., Adams, C.E., Amundsen, P.-A., Bartels, P., Bean, C.W., Boughman, J.W., Englund, G., Guðbrandsson, J., Hooker, O.E., Hudson, A.G., Kahilainen, K.K., Knudsen, R., Kristjánsson, B.K., Leblanc, C.A.L., Jónsson, Z., Öhlund, G., Smith, C., Snorrason, S.S.	A way forward with eco evo devo: an extended theory of resource polymorphism with postglacial fishes as model systems	2019	Biological Reviews	10.1111/brv.12534	
Slater, J.M., Gilbert, L., Johnson, D., Karley, A.J.	Limited effects of the maternal rearing environment on the behaviour and fitness of an insect herbivore and its natural enemy	2019	PLoS ONE	10.1371/journal.pone.020149965	
Spatharis, S., Lamprinou, V., Meziti, A., Kormas, K.A., Danielidis, D.D., Smeti, E., Roelke, D.L., Mancy, R., Tsirtsis, G.	Everything is not everywhere: Can marine compartments shape phytoplankton assemblages?	2019	Proceedings of the Royal Society B: Biological Sciences	10.1098/rspb.2019.1890	
Spiri, A.M., Meli, M.L., Riond, B., Herbert, I., Hosie, M.J., Hofmann-Lehmann, R.	Environmental contamination and hygienic measures after feline calicivirus field strain infections of cats in a research facility	2019	Viruses	10.3390/v11100958	

Stefan, T., Matthews, L., Prada, J.M., Mair, C., Reeve, R., Stear, M.J.	Divergent allele advantage provides a quantitative model for maintaining alleles with a wide range of intrinsic merits	2019	Genetics	10.1534/genetics.119.302 212 022
Streicker, D.G., Fallas González, S.L., Luconi, G., Barrientos, R.G., Leon, B.	Phylogenetics reveals extinction–recolonization dynamics underpin apparently endemic vampire bat rabies in Costa Rica	2019	Proceedings of the Royal Society B: Biological Sciences	286 10.1098/rspb.2019.1527
Studer, N., Lutz, H., Saegerman, C., Gönczi, E., Meli, M.L., Boo, G., Hartmann, K., Hosie, M.J., Moestl, K., Tasker, S., Belák, S., Lloret, A., Boucraut-Baralon, C., Egberink, H.F., Pennisi, M.-G., Truyen, U., Frymus, T., Thiry, E., Marsilio, F., Addie, D., Hochleithner, M., Tkalec, F., Vizi, Z., Brunetti, A., Georgiev, B., Ludwig-Begall, L.F., Tschuor, F., Mooney, C.T., Eliasson, C., Orro, J., Johansen, H., Juuti, K., Krampfl, I., Kovalenko, K., Šengaut, J., Sobral, C., Borska, P., Kovariková, S., Hofmann-Lehmann, R.	Pan-European study on the prevalence of the feline leukaemia virus infection - Reported by the european advisory board on cat diseases (ABCD Europe)	2019	Viruses	11 10.3390/v11110993
Theonest, N.O., Carter, R.W., Amani, N., Doherty, S.L., Hughson, E., Keyyu, J.D., Mable, B.K., Shirima, G.M., Tarimo, R., Thomas, K.M., Haydon, D.T., Buza, J.J., Allan, K.J., Halliday, J.E.B.	Molecular detection and genetic characterization of Bartonella species from rodents and their associated ectoparasites from northern Tanzania	2019	PLOS ONE	14 3667 10.1371/journal.pone.022
Thomson, S., Innes, E.A., Jonsson, N.N., Katzer, F.	Shedding of Cryptosporidium in calves and dams: Evidence of re-infection and shedding of different gp60 subtypes	2019	Parasitology	146 829 10.1017/S0031182019000
Thorburn, J., Neat, F., Burrett, I., Henry, L.-A., Bailey, D.M., Jones, C.S., Noble, L.R.	Ontogenetic variation in movements and depth use, and evidence of partial migration in a benthopelagic elasmobranch	2019	Frontiers in Ecology and Evolution	7 10.3389/fevo.2019.00353
Tokimatsu, K., Dupuy, L., Hanley, N.	Using Genuine Savings for Climate Policy Evaluation with an Integrated Assessment Model	2019	Environmental and Resource Economics	72 2 10.1007/s10640-018-0292-
Torney, C.J., Lloyd-Jones, D.J., Chevallier, M., Moyer, D.C., Maliti, H.T., Mwita, M., Kohi, E.M., Hopcraft, G.C.	A comparison of deep learning and citizen science techniques for counting wildlife in aerial survey images	2019	Methods in Ecology and Evolution	10 10.1111/2041-210X.13165
Traoré, A., Badolo, A., Guelbeogo, M.W., Sanou, A., Viana, M., Nelli, L., Zongo, S., Toé, H.K., Traoré, A.S., Ranson, H., Sagnon, N.	Anopheline species composition and the 1014F-genotype in different ecological settings of Burkina Faso in relation to malaria transmission	2019	Malaria Journal	18 8 10.1186/s12936-019-2789-

Trask, A.E., Fenn, S.R., Bignal, E.M., McCracken, D.I., Monaghan, P., Reid, J.M.	Evaluating the efficacy of independent versus simultaneous management strategies to address ecological and genetic threats to population viability	2019	Journal of Applied Ecology	56	10.1111/1365-2664.13464
Turnbull, F., Devaney, E., Morrison, A.A., Laing, R., Bartley, D.J.	Genotypic characterisation of moneypantel resistance in historical and newly derived field strains of <i>Teladorsagia circumcincta</i>	2019	International Journal for Parasitology: Drugs and Drug Resistance	11	10.1016/j.ijpddr.2019.10.02
Ulgezen, Z.N., Käpylä, T., Meerlo, P., Spoelstra, K., Visser, M.E., Dominoni, D.M.	The preference and costs of sleeping under light at night in forest and urban great tits	2019	Proceedings of the Royal Society B: Biological Sciences	286	10.1098/rspb.2019.0872
Veldhuis, M.P., Kihwele, E.S., Croomsigt, J.P.G.M., Ogotu, J.O., Hopcraft, J.G.C., Owen-Smith, N., Olff, H.	Large herbivore assemblages in a changing climate: incorporating water dependence and thermoregulation	2019	Ecology Letters	22	10.1111/ele.13350
Veldhuis, M.P., Ritchie, M.E., Ogotu, J.O., Morrison, T.A., Beale, C.M., Estes, A.B., Mwakilema, W., Ojwang, G.O., Parr, C.L., Probert, J., Wargute, P.W., Grant Hopcraft, J.C., Olff, H.	Cross-boundary human impacts compromise the Serengeti-Mara ecosystem	2019	Science	363	10.1126/science.aav0564
Ventura, F., Matthiopoulos, J., Jęglinski, J.W.E.	Minimal overlap between areas of high conservation priority for endangered Galapagos pinnipeds and the conservation zone of the Galapagos Marine Reserve	2019	Aquatic Conservation: Marine and Freshwater Ecosystems	29	10.1002/aqc.2943
Wakefield, E.D., Furness, R.W., Lane, J.V., Jeglinski, J.W.E., Pinder, S.J.	Immature gannets follow adults in commuting flocks providing a potential mechanism for social learning	2019	Journal of Avian Biology	50	10.1111/jav.02164
Wambura, G., Mwatondo, A., Muturi, M., Nasimiyu, C., Wentworth, D., Hampson, K., Bichanga, P., Tabu, C., Juma, S., Ngere, I., Thumbi, S.M.	Rabies vaccine and immunoglobulin supply and logistics: Challenges and opportunities for rabies elimination in Kenya	2019	Vaccine	37	10.1016/j.vaccine.2019.05.035
Wentworth, D., Hampson, K., Thumbi, S.M., Mwatondo, A., Wambura, G., Chng, N.R.	A social justice perspective on access to human rabies vaccines	2019	Vaccine	37	10.1016/j.vaccine.2019.01.065
Westman, M., Norris, J., Malik, R., Hofmann-Lehmann, R., Harvey, A., McLuckie, A., Perkins, M., Schofield, D., Marcus, A., McDonald, M., Ward, M., Hall, E., Sheehy, P., Hosie, M.	The diagnosis of feline leukaemia virus (FeLV) infection in owned and group-housed rescue cats in Australia	2019	Viruses	11	10.3390/v11060503
Wongsangchan, C., McKeegan, D.E.F.	The views of the UK public towards routine neutering of dogs and cats	2019	Animals	9	10.3390/ani9040138
Yeates, J., McKeegan, D.	Ten steps for resolving ethical dilemmas in veterinary practice	2019	In Practice	41	10.1136/inp.11423

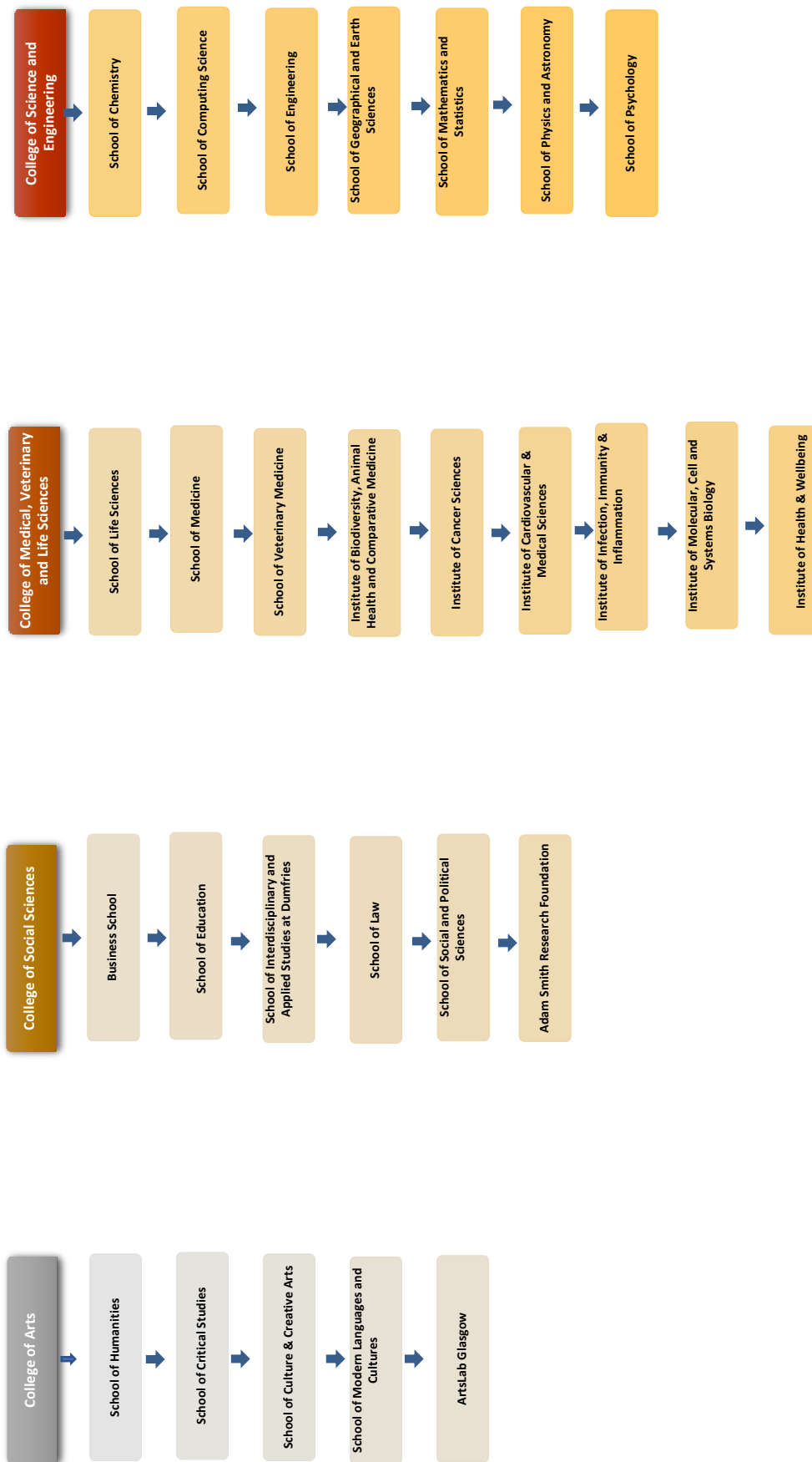
Bennet, E.D., Parkin, T.D.H.	The impact of the mandatory rest period in Fédération Equestre Internationale endurance events	2020	Equine Veterinary Journal	52	10.1111/evj.13148
Kaczmarek, A., José-López, R., Czopowicz, M., Lazzarini, K., Leblond, G., Stalin, C., Gutierrez-Quintana, R.	Postencephalitic epilepsy in dogs with meningoencephalitis of unknown origin: Clinical features, risk factors, and long-term outcome	2020	Journal of Veterinary Internal Medicine		10.1111/jvim.15687
McAloon, C.G., Kelly, E., Rackard, S., McAloon, C., Beltman, M., O'Grady, L., Viora, L., Crowe, M., Doherty, M.L., Ryan, E.G.	Using examination performance data and focus groups to inform teaching - A case study from final year students of veterinary medicine	2020	Irish Veterinary Journal	73	10.1186/s13620-020-0155-3
McCagherty, J., Yool, D.A., Paterson, G.K., Mitchell, S.R., Woods, S., Marques, A.I., Hall, J.L., Mosley, J.R., Nuttall, T.J.	Investigation of the in vitro antimicrobial activity of triclosan-coated suture material on bacteria commonly isolated from wounds in dogs	2020	American Journal of Veterinary Research	81	10.2460/ajvr.81.1.84
Palczynski, L.J., Bleach, E.C.L., Brennan, M.L., Robinson, P.A.	Appropriate dairy calf feeding from birth to weaning: "it's an investment for the future"	2020	Animals	10	10.3390/ani10010116
Palczynski, L.J., Bleach, E.C.L., Brennan, M.L., Robinson, P.A.	Giving calves 'the best start': Perceptions of colostrum management on dairy farms in England	2020	Animal Welfare	29	10.7120/09627286.29.1.045
Powell, C.D., Dhanoa, M.S., Garber, A., Murray, J.-A.M.D., López, S., Ellis, J.L., France, J.	Models based on the mitscherlich equation for describing typical and atypical gas production profiles obtained from in vitro digestibility studies using equine faecal inoculum	2020	Animals	10	10.3390/ani10020308
Bergner, L.M., Orton, R.J., Benavides, J.A., Becker, D.J., Tello, C., Biek, R., Streicker, D.G.	Demographic and environmental drivers of metagenomic viral diversity in vampire bats	2020	Molecular Ecology	29	10.1111/mec.15250
Cleasby, I.R., Owen, E., Wilson, L., Wakefield, E.D., O'Connell, P., Bolton, M.	Identifying important at-sea areas for seabirds using species distribution models and hotspot mapping	2020	Biological Conservation	241	10.1016/j.biocon.2019.108375
Craig, A.D., Khattak, F., Hastie, P., Bedford, M.R., Olukosi, O.A.	Xylanase and xylo- oligosaccharide prebiotic improve the growth performance and concentration of potentially prebiotic oligosaccharides in the ileum of broiler chickens	2020	British Poultry Science	61	10.1080/00071668.2019.1673318



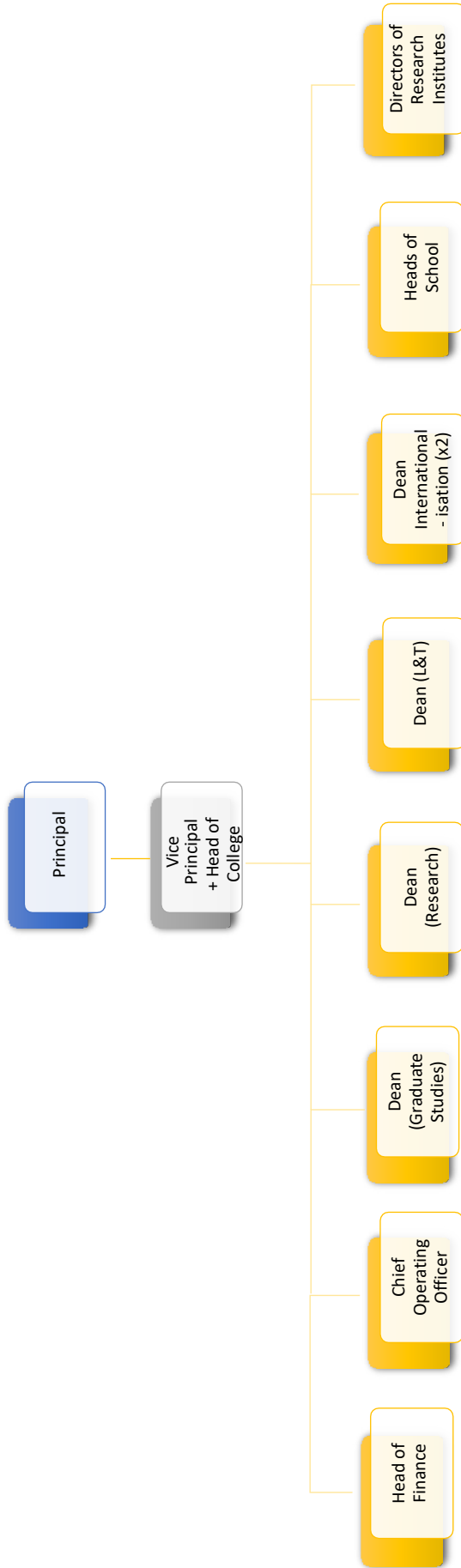
Dantzer, B., van Kesteren, F., Westrick, S.E., Boutin, S., McAdam, A.G., Lane, J.E., Gillespie, R., Majer, A., Haussmann, M.F., Monaghan, P.	Maternal glucocorticoids promote offspring growth without inducing oxidative stress or shortening telomeres in wild red squirrels	2020	Journal of Experimental Biology	223	10.1242/jeb.212373
Dominoni, D., Smit, J.A.H., Visser, M.E., Halfwerk, W.	Multisensory pollution: Artificial light at night and anthropogenic noise have interactive effects on activity patterns of great tits ( <i>Parus major</i> )	2020	Environmental Pollution	256	10.1016/j.envpol.2019.11.2563314
Garduno-Paz, M.V., Huntingford, F.A., Garrett, S., Adams, C.E.	A phenotypically plastic magic trait promoting reproductive isolation in sticklebacks?	2020	Evolutionary Ecology	34	10.1007/s10682-019-10015-2
Hanks, E., Todd, H., Palarea-Albaladejo, J., McNeilly, T.N., Britton, C., Ballingall, K.T.	A novel technique for retrospective genetic analysis of the response to vaccination or infection using cell-free DNA from archived sheep serum and plasma	2020	Veterinary Research	51	10.1186/s13567-020-0737-9
Herzog, C.M., de Glanville, W.A., Willett, B.J., Cattadori, I.M., Kapur, V., Hudson, P.J., Buza, J., Swai, E.S., Cleaveland, S., Bjørnstad, O.N.	Identifying Age Cohorts Responsible for Peste Des Petits Ruminants Virus Transmission among Sheep, Goats, and Cattle in Northern Tanzania	2020	Viruses	12	10.3390/v12020186
Honkanen, H.M., Rodger, J., Stephen, A., Adams, K., Freeman, J., Adams, C.E.	Summer survival and activity patterns of estuary feeding anadromous <i>Salmo trutta</i>	2020	Ecology of Freshwater Fish	29	10.1111/eff.12485
Hughes, A., Lissenden, N., Viana, M., Toé, K.H., Ranson, H.	<i>Anopheles gambiae</i> populations from Burkina Faso show minimal delayed mortality after exposure to insecticide-treated nets	2020	Parasites and Vectors	13	10.1186/s13071-019-3872-2
Li, C., Wang, J., Chen, J., Schneider, K., Veettil, R.K., Elmer, K.R., Zhao, J.	Native bighead carp <i>Hypophthalmichthys nobilis</i> and silver carp <i>Hypophthalmichthys molitrix</i> populations in the Pearl River are threatened by Yangtze River introductions as revealed by mitochondrial DNA	2020	Journal of Fish Biology		10.1111/jfb.14253
Little, S., Levy, J., Hartmann, K., Hofmann-Lehmann, R., Hosie, M., Olah, G., Denis, K.S.	2020 AAAP Feline Retrovirus Testing and Management Guidelines	2020	Journal of Feline Medicine and Surgery	22	10.1177/1098612X19899592240
McDougall, C.W., Hanley, N., Quilliam, R.S., Needham, K., Oliver, D.M.	Valuing inland blue space: A contingent valuation study of two large freshwater lakes	2020	Science of the Total Environment	715	10.1016/j.scitotenv.2020.136921
McInnes, M.G., Burns, N.M., Hopkins, C.R., Henderson, G.P., McNeill, D.C., Bailey, D.M.	A new model study species: high accuracy of discrimination between individual freckled hawkfish ( <i>Paracirrhites forsteri</i> ) using natural markings	2020	Journal of Fish Biology		10.1111/jfb.14255

Meginnis, K., Hanley, N., Mujumbusi, L., Lambertson, P.H.L., Monforte Monteiro, S.R., Rossmeisl, J.H., Russell, J., Holmes, M.A., Wessmann, A., Morris, J., Dobson, J.M., Vanhaesebrouck, A.E.	Non-monetary numeraires: Varying the payment vehicle in a choice experiment for health interventions in Uganda	2020	Ecological Economics	170	10.1016/j.ecolecon.2019.106569
Ortega-López, L.D., Pondeville, E., Kohl, A., León, R., Betancourth, M.P., Almire, F., Torres-Valencia, S., Saldarriaga, S., Mirzai, N., Ferguson, H.M.	Effect of radiotherapy on freedom from seizures in dogs with brain tumors	2020	Journal of Veterinary Internal Medicine	138	10.1111/jvim.15695
Paul, C., Hanley, N., Meyer, S.T., Fürst, C., Weisser, W.W., Knoke, T.	The mosquito electrocuting trap as an exposure-free method for measuring human-biting rates by Aedes mosquito vectors	2020	Parasites and Vectors	138	10.1186/s13071-020-3887-8
West, S.E., Büker, P., Ashmore, M., Njoroge, G., Weiden, N., Muhoza, C., Osano, P., Makau, J., Njoroge, P., Apondo, W.	Estimating viral bottleneck sizes for FMDV transmission within and between hosts and implications for the rate of viral evolution	2020	Interface Focus	10	10.1098/rsfs.2019.0066
Yu, K., Matzapetakis, M., Horvatić, A., Terré, M., Bach, A., Kuleš, J., Yeste, N., Gómez, N., Arroyo, L., Rodríguez-Tomàs, E., Peña, R., Guillemin, N., de Almeida, A.M., Eckersall, P.D., Bassols, A.	On the functional relationship between biodiversity and economic value	2020	Science Advances	6	10.1126/sciadv.aax7712
	Particulate matter pollution in an informal settlement in Nairobi: Using citizen science to make the invisible visible	2020	Applied Geography	114	10.1016/j.apgeog.2019.102133
	Metabolome and proteome changes in skeletal muscle and blood of pre-weaning calves fed leucine and threonine supplemented diets	2020	Journal of Proteomics	216	10.1016/j.jprot.2020.103677

# Colleges and their Schools and Research



# MVLS College Management



**Chancellor**

Sir Kenneth Calman KCB SL MD PhD FRCP FRCS FRSE (*elected 2006*)

**Rector**

Aamer Anwar MA(Hons) DipRCR LLB DipLP NP (*elected 2017*)

**Principal and Vice Chancellor**

Professor Sir Anton Muscatelli MA PhD FRSA FRSE AcSS (*app 2009; appointment extended to 2024*)

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 Vice-Principal (Academic Planning & Technological Innovation), Professor Frank Cotton BSc PhD CEng FRAeS  
 Vice-Principal & Head of College of Medical, Veterinary & Life Sciences, Professor Dame Anna Dominiczak  
 DBE MD FRCP FAHA FRSE FMedSci,  
 Vice-Principal (Research), Professor Chris Pearce FICE CEng  
 Vice-Principal & Head of College of Science & Engineering, Professor Muffy Calder OBE FRSE FRENG FBCS  
 Vice-Principal & Head of College of Arts, Professor Roibeard Ó Maolalaigh BA MA PhD  
 Vice-Principal (Corporate Engagement and Innovation), Miss Bonnie Dean OBE BA MBA FRGS FRSA  
 Vice-Principal and Clerk of Senate, Professor Jill Morrison MBChB MSc PhD FRCGP FRCP(Edin) FHEA FAcadMed  
 Vice-Principal & Head of College of Social Sciences, Professor Sara Carter OBE FRSE  
 Vice-Principal (Learning & Teaching), Professor Moira Fischbacher-Smith BA PhD MPH PFHEA CMgr MCMi RSMF  
 Vice-Principal (External Relations), Miss Rachel Sandison MA MBA FCIM

**Dean of Faculties**

Professor Graham Caie MA PhD FRSE FEA FRSA (*app 2018*)

**Deans for Global Engagement**

Professor James Conroy PhD FAcSS, Europe  
 Professor David Fearn BSc PhD FRSE CMath FIMA, The Americas  
 Professor Paul Garside PhD FRSB FRSE, Africa and Middle East  
 Professor Konstantinos Kontis BEng MSc PhD CEng FIMechE FRAeS FAIAA, China and East Asia

**Chief Operating Officer and University Secretary**

Dr David Duncan MA PhD

**Director of Finance**

Mr Robert Fraser BSc MBA CA

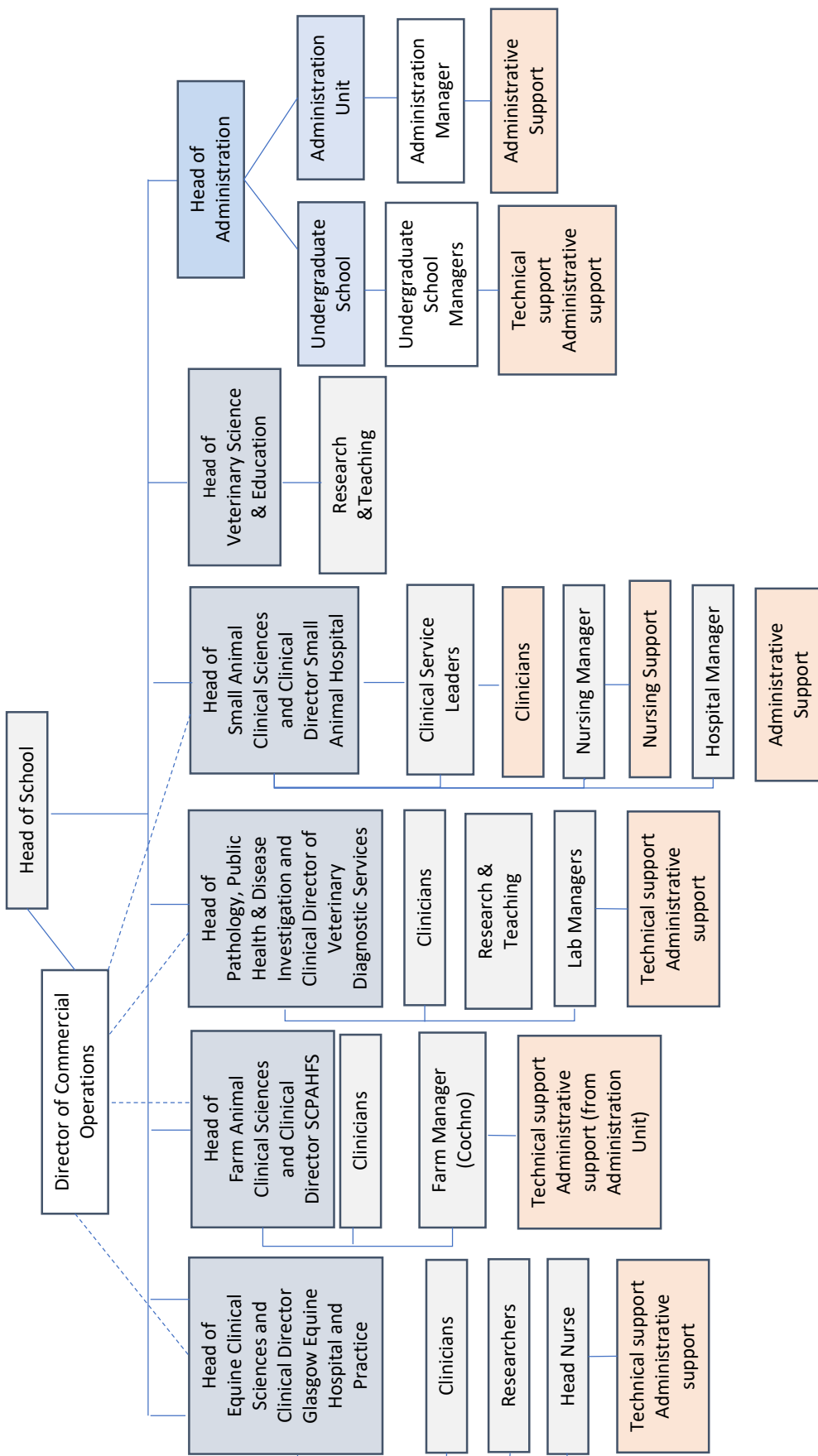
**University Librarian**

Ms Susan Ashworth MA MA(lib)

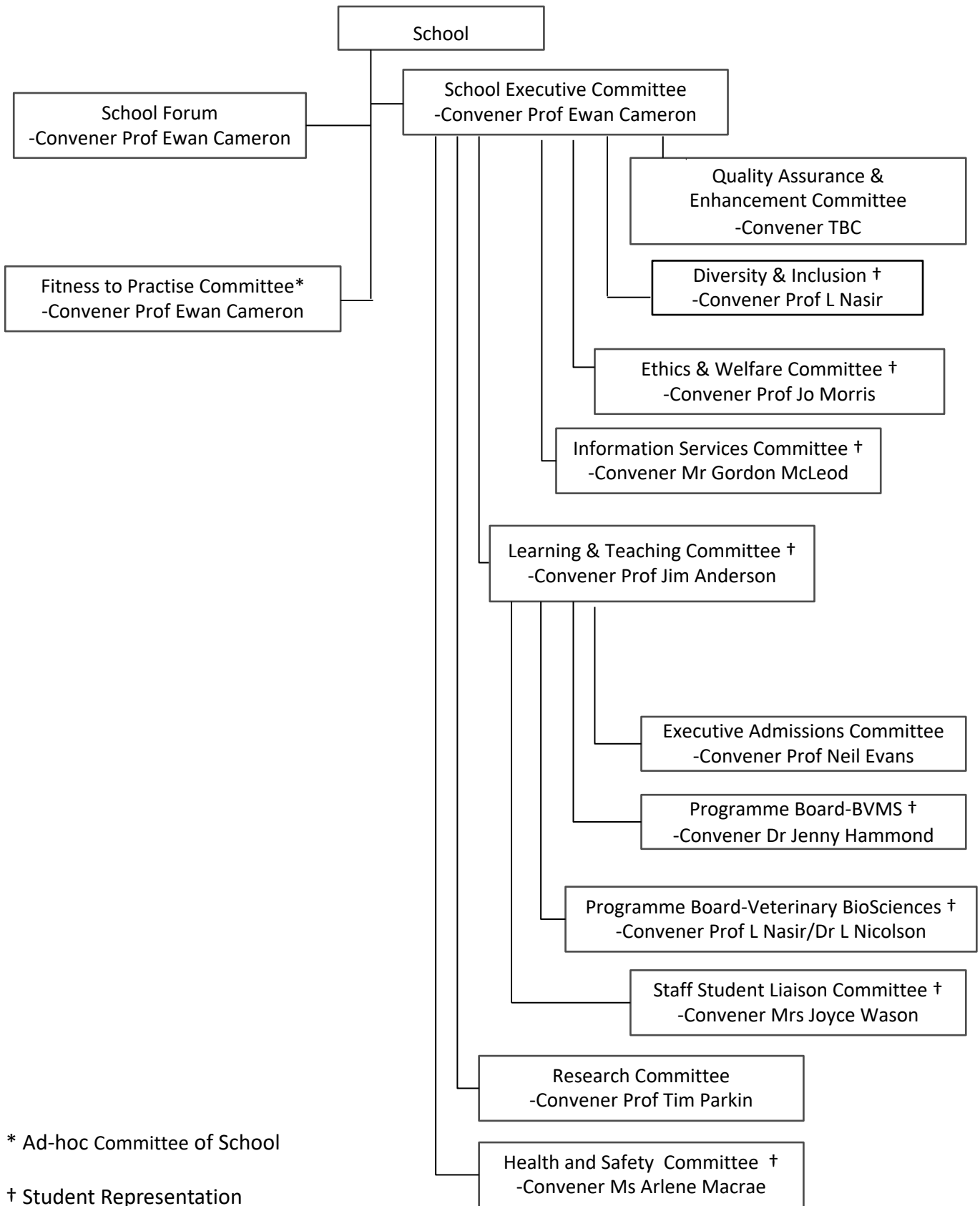
**Clerk to the General Council**

Ms Amber Higgins BSc

School of Veterinary Medicine – Organisational Structure







BVMS Phase, Course and Module Leaders 2019-20										
Phase Leader	Course Leader	Clinical Skills Leader	Module	Module Title	Module Leaders	Administrative Assistant				
BVMS 1 Foundation Phase	Dr Fiona Dowell	Lissann Wolfe	1	Getting Started: A little bit of everything	George King	Marion Howat Ext: 4867				
			2	Natural Defences	Elspeth Waugh					
			3	Digestion	Joel Hutchings					
			4	Infectious Agents	Paul Everest					
			5	Reproduction	Michelle Bealgham/Monica Milim Carmichael					
			6	Urinary System	Luna Nisir					
BVMS 2 Foundation Phase	Dr Fiona Dowell	Lissann Wolfe	7	Skin and Bones	<b>Module Leaders</b> Sam Fontaine Mark McLaughlin	<b>Administrative Assistant</b> Marion Howat Ext: 4867				
			8	Neural Networks	Lesley Nicolson					
			9	Breathe Easy - Respiration	Pamela Johnston					
			10	In a Heart Beat - Cardiovascular	Karen MacEachern (Interim)					
			11	Niche Species	Zamantha Marshall					
			12	Integrated Body Systems	Jenny Hammond					
BVMS 3 Clinical Phase	Dr Alison King	Lissann Wolfe	13	Being Professional	Jenny Hammond	<b>Administrative Assistant</b> Lumba Chirwa Ext: 2812				
			14	Supporting the Patient	Pat Pawson					
			15	Cardiorespiratory & Haemopoietic	Maureen Carrain					
			16	Alimentary	Alison Ridyard					
			17	Urinary, Endocrinology & Oncology	Katharine Denholm					
			18	Ruminant Production 1	Jo Morris					
			19	Veterinary Public Health - Aspects of Food Safety	Noelma Tosto					
			BVMS 4 Clinical Phase	Dr Alison King	Lissann Wolfe		20	Global Veterinary Medicine	Willie Weir	<b>Administrative Assistant</b> Lumba Chirwa Ext: 2812
							21	Ruminant Production 2	Lorenzo Viora	
							22	Reproduction & Fertility	Monika Wilim-Carmichael	
							23	Neuroanatomist	Kate Stalin	
							24	Skin & Eye, Niche & Pets, Zoo & Wildlife	Louise Anderson	
25	Intensive Animal Medicine/Business & Finance	Pamela Johnston & Zamantha Marshall								
BVMS 5 Professional Phase	Dr Jenny Hammond	Lissann Wolfe	<b>Core Rotation</b>		<b>Core Rotation Leaders</b>	<b>Administrative Assistant</b> Kathryn Stephen Ext: 8009				
			BVMS5 CORE - PA		Jayne Orr					
			BVMS5 CORE - SMALL ANIMAL PRIMARY CARE		Maureen Carrain, Paul Eyrion, Louise Anderson, Jennifer McKenzie					
			BVMS5 CORE - SMALL ANIMAL SPECIALIST		Alix McBeatty					
			BVMS5 CORE - EQ		Joel Hutchings					
			BVMS5 CORE - PHP		Hayley Haining, Noella Yusta, Francesco Marchesi					
			BVMS5 CORE - ANDI		Pat Pawson/Gawain Hammond					
			<b>Selective Rotation</b>		<b>Selective Rotation Leaders</b>					
			BVMS5 Selective - HERD HEALTH		Lorenzo Viora					
			BVMS5 Selective - WILD (Scottish Wildlife & Conservation)		Karen MacEachern					
			BVMS5 Selective - SAH		William Marshall/Elena Addison					
			BVMS5 Selective - INT - Equine Medicine & Surgery		Mattie McMaster					
			BVMS5 Selective - SHEEP PRACTICE		George King					
			BVMS5 Selective - DAIRY PRACTICE (Devon)		George King					
			BVMS5 Selective - DAIRY PRACTICE (UCDavis)		George King					
			BVMS5 Selective - INT WILD (International Wildlife Conservation & Management (SA))		Karen MacEachern					
			BVMS5 Selective - Oncology		Jo Morris					
			BVMS5 Selective - ECC		Yasmine Pening					
			BVMS5 Selective - EXT - Equine Medicine & Surgery		Viky Tamahill					
			BVMS5 Selective - MOROCCO WORKING EQUIDS		David Sutton					
			BVMS5 Selective - PATHOLOGY		Hayley Haining					
			BVMS5 Selective NICHE - EXOTICS & ZOO		Jenny Hammond					
			BVMS5 Selective NICHE - AQUACULTURE		Jenny Hammond					
			BVMS5 Selective NICHE - PIGS & POULTRY		Jenny Hammond					
BVMS5 Selective NICHE - SHEEP		Jenny Hammond								
BVMS5 Selective NICHE - DAIRY		Jenny Hammond								
BVMS5 Selective NICHE - LAB ANIMAL		Jenny Hammond								
BVMS5 Selective NICHE - RESEARCH		Jenny Hammond								
BVMS5 Selective - Shakes / Medicine		Maureen Carrain								
Selective - DISEASE SURVEILLANCE		Valentina Bush								
Selective - INFECTIOUS DISEASE		Willie Weir								

University of Glasgow  
School of Veterinary Medicine

COMMITTEE MEMBERSHIP 2019-20

COMMITTEE	MEMBERSHIP
School Forum	Head of School (Convener), all faculty, staff and postgraduate students (including clinical scholars) in the School of Veterinary Medicine and affiliated with the School, President(s) of GUVMA <i>By Invitation:</i> Director BAHCM, Director Ill, Mrs Freda Scott-Park (Practitioner Representative), SRC representative <i>Clerk: Mrs Caroline Hutchinson</i>
School Executive	Head of School (Convener) (ERC), Head of School Administration (SEC), Deputy Head of School (TBC), Associate Heads of School (TJA, LN), Research Convener (TP), Postgraduate Convener (PH), Accreditation Champion (PH), Heads of Divisions (PJ, FD, SC, LV, KE/MMC), College HR Manager (DT), Senior Financial Analyst (HW) <i>Clerk: Mrs Caroline Hutchinson</i>
Executive Admissions Committee	Assessment Officer (NE) (Convener), BVMS Foundation Phase Leader (FD) (Deputy Convener), Head of School (ERC), Admissions & Student Support Officer (JW), BVMS Programme Board Convener (JH), Associate Head D&I (LN), Chief Advisers (PY & JR) Programme Board Convener (LN) Clinical Phase Leader (AK), Widening Participation Lead (KMacE), <i>Clerk: Mrs Jill Kerr</i>
Diversity and Inclusion Committee	Associate Head D & I (LN) and Head of School Administration (SEC) (Co-Chairs), Sub Committee Conveners (CS, DD, JH, PH, TJA, TP,) UoG Gender Equality Officer (KF), MVLS Athena Swan Data Officer (KMCD), HR & PGR Administrator (MH), Engagement Leads (JB & KMacE), University Gender Steering Committee Rep (MB), LGBTQ+ Rep (PE), UG Student Reps (RC & TJ), PG Rep (SK) <i>Clerk: Ms Gillian Ironside</i>
BSc Programme Board	Programme Director(s) (Convener(s)) (LNa/LNi), Assessment Officer (NE), Programme Course Leaders/Deputies (MMcL/AK, LNa/MB, GK/PH, PE/LNi, HH/PJ, TP/BW/MR, FD/NE, LNa/MMcL, DMcK/KMacE, TP, JR/LNa, MR/PE, MIR/TP/PE), Undergraduate School Manager (AWM), Admissions & Student Support Manager (JW), Representative from SLS (TBC), Student Representative (TBC – L1, Isabella McTernan L2, Eleanor Graham L3, Zoe Burns L4, Louise McNicol L4) <i>Clerk: Mr Pete Murphy</i>
BVMS Programme Board	Programme Director (JH), Associate Head of Learning & Teaching (TJA), Deputy (Associate Head Learning & Teaching) (NE), Phase/ Course Leaders (FD, AK, JH, JHelim, GH, ZM, CS, PM, PJ), Veterinary Educationalist (JH), EMS Co-ordinator (PY), Veterinary Learning Technologist (GMcL). Clinical Skills Co-ordinator (LW), NAVLE Co-ordinator (ZM), Clinical Reasoning Champion (MC), Head of School ( <i>ex officio</i> ) (ERC), Undergraduate School Manager (AWM), Admissions & Student Services Manager (JW), Student Representatives (TJ/ZMacI) <i>Clerk: Mrs Lumba Chirwa</i>
Clinical Services Board	Head of School (Convener) (ERC), Director of SAH (SC), Director of Commercial Operations (RG), Hospital Manager (MSh), Senior Financial Analyst (HW), Head of College Finance (DM) Deputy Head of MVLS HR (DT), Head of Division Equine Clinical Sciences (LV), Head of Division VPPHDI (PJ), Head of Division Farm Animal Clinical Sciences (KE/MMC joint) <i>Clerk: Mrs Julie Norden</i>
Ethics & Welfare Committee	Prof Jo Morris (Convener), IBAH&CM Rep (Dr Dorothy McKeegan), SACS rep (RGQ), NVS (Colin Macaldowie), Michael Wilkinson and Abigail Brown) Home Office Rep (Kim Willoughby), ECS Rep (vac), FACS Rep (GK), PPH&DI Rep (WW) <i>Clerk: Ms Gillian Ironside</i>

Fitness to Practise Committee	Head of School (Convener), Fitness to Practise Officer (TJA), Gawain Hammond, Professor Nick Jonsson, Mrs Alison King, Mr George King, Professor Christopher Loughrey, Dr Karen MacEachern, Dr Zamantha Marshall, Professor Dom Mellor, Professor Jo Morris, Miss Jayne Orr, Dr Pat Pawson, Dr Lorenzo Viora, Dr Willie Weir, Dr Philippa Yam Clerk: <i>Mrs Caroline Hutchinson</i>
Information Services Committee	Learning Technologist (Convener) (GMcL), Deputy Convener (GH)/ Clinical Issues SAH (GH), Library Issues (SA), Central IT (BW), College IT (TM), Learning & Technology (KG), L&T Technologies (New Curriculum) (FD), Business IT (PMcL), School IT (JMck), Learning & Teaching (TJA), Clinical (tbc), Inst Infection & Immunity (JH), PG Representative (tbc), Inst Cancer Sciences (SM), Bio-informatics (WW), Cochno Representative (CM), Director Veterinary Biosciences (LNa/LNi), Deputy HoS/Inst Biodiversity/New Curriculum (MB), Garscube Co-ordinator (MR) Clerk: <i>TBC</i>
Learning & Teaching Committee	Associate Head of School (L&T) (Convener) (TJA), Deputy Associate Head (L&T) (NE), School QAE Officer (NE), Programme Directors (JH,LNa/LNi,PH), Phase Leaders (FD, AK, JH), Undergraduate School Manager (AWM), Student Services Manager (JW), Head of School Administration (SEC), TELT Representative (FD), President(s) of GUVMA, Institute Representatives (SG, NE), PGS Representative (SJ), College BoS representatives, SRC representative Clerk: <i>Kathryn Stephen</i>
Quality Assurance and Enhancement Committee	Members of faculty and staff drawn from the School (AWM, DY, RG, SF) Clerk: <i>tbc</i>
Research & PGR Committee	Prof T Parkin (Convener), Dr C Stalin, Prof J Morris, Dr K Ellis, Dr M McLaughlin, Prof M Bain, Dr M Mihm Carmichael, Dr P Murcia, Dr P Hastie, Prof S Corr, Dr W Weir Clerk: <i>Mrs M Henderson</i>
Safety Committee	Arlene Macrae (Convener), Area/Building Safety Group representatives SCPAHFS (JO); Cochno (DH); Weipers (MG); Teaching/Admin (GG); SAH (MSh); Diagnostics & PM Room (LS), Head of School Administration (SEC), Clerk: <i>Ms Gillian Ironside</i>
Staff Student Liaison Committee	Joyce Wason (Convener), Course Leaders, Class representatives (UG & PG), President(s) GUVMA and SCAVMA, Head of School Administration (SEC), EMS Co-ordinator (PY), Learning Technologist (GM), Quality Assurance Officer (NE), Chief Advisers of Studies (PY & JR), PG Convener (PH), Undergraduate School Manager (Programme Support) (AWM), College Support Librarian (KV) Clerk: <i>Mrs Gillian Gillespie</i>

University of Glasgow  
School of Veterinary Medicine

COMMITTEE REMITS 2019-20

NAME OF COMMITTEE	CHAIR OF COMMITTEE	FREQUENCY OF MEETINGS	REMIT
School Forum	Head of School	Twice per year	A discussion forum at which matters of importance can be addressed collectively. Whilst management decisions are taken by the School Executive, the School's academic governance is overseen by the School Forum, which is open to all members of faculty staff and postgraduate students (including clinical scholars).
School Executive	Head of School	Monthly	To oversee the management of the responsibilities of the School and support and advise the Head of School accordingly.
Diversity and Inclusion Committee	Director of Diversity & Inclusion	Every 2 months	To commit to ensure fairness and equity in all School processes and activities, to ensure the School culture supports inclusion and values diversity of all people including all protected characteristics (age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex) considering the intersection of gender and other factors, to coordinate and implement the Athena SWAN Silver action plan
Executive Admissions Committee	Assessment Officer	Twice per year	To develop the strategy for UG recruitment and admission and ensure that practices are fair, explicit, and implemented consistently to support equality of opportunity, encouraging diversity and sustaining the School's strong international recruitment programme, to monitor student numbers and

			review planned admissions targets and tuition fees, to review policy and practice annually and bring forward recommendations to the School Learning and Teaching Committee.
BSc Programme Board	Associate Head of School (Learning & Teaching)	One per term	To maintain and monitor academic standards; to maintain the quality of the student experience; to organise and deliver the programme in the light of the strategic aims of the School as determined by the School Learning and Teaching Committee; and to manage the programme content in the light of budgetary and staffing opportunities
BVMS Programme Board	Associate Head of School (Learning & Teaching)	One per term	To maintain and monitor academic standards; to maintain the quality of the student experience; to organise and deliver the programme in the light of the strategic aims of the School as determined by the School Learning and Teaching Committee; to consider the taught programme in relation to the accreditation processes of the RCVS, AVMA and EAVE; and to manage the programme content in the light of budgetary and staffing opportunities.
Clinical Services Board	Head of School	Monthly	To support all new initiative proposal and resource challenges relevant to the provision of clinical services within the School, to ensure that this provision is consistent with the School's core objectives and to report to the School Executive on a regular basis.
Ethics & Welfare Committee	Professor J Morris	One per term	To maintain the integrity of the research conducted by the research community, and of all those with whom they have professional relations, and to critically evaluate research activities in relation to the ethical standards set out by the Home Office.' The School of Veterinary Medicine Research Ethics

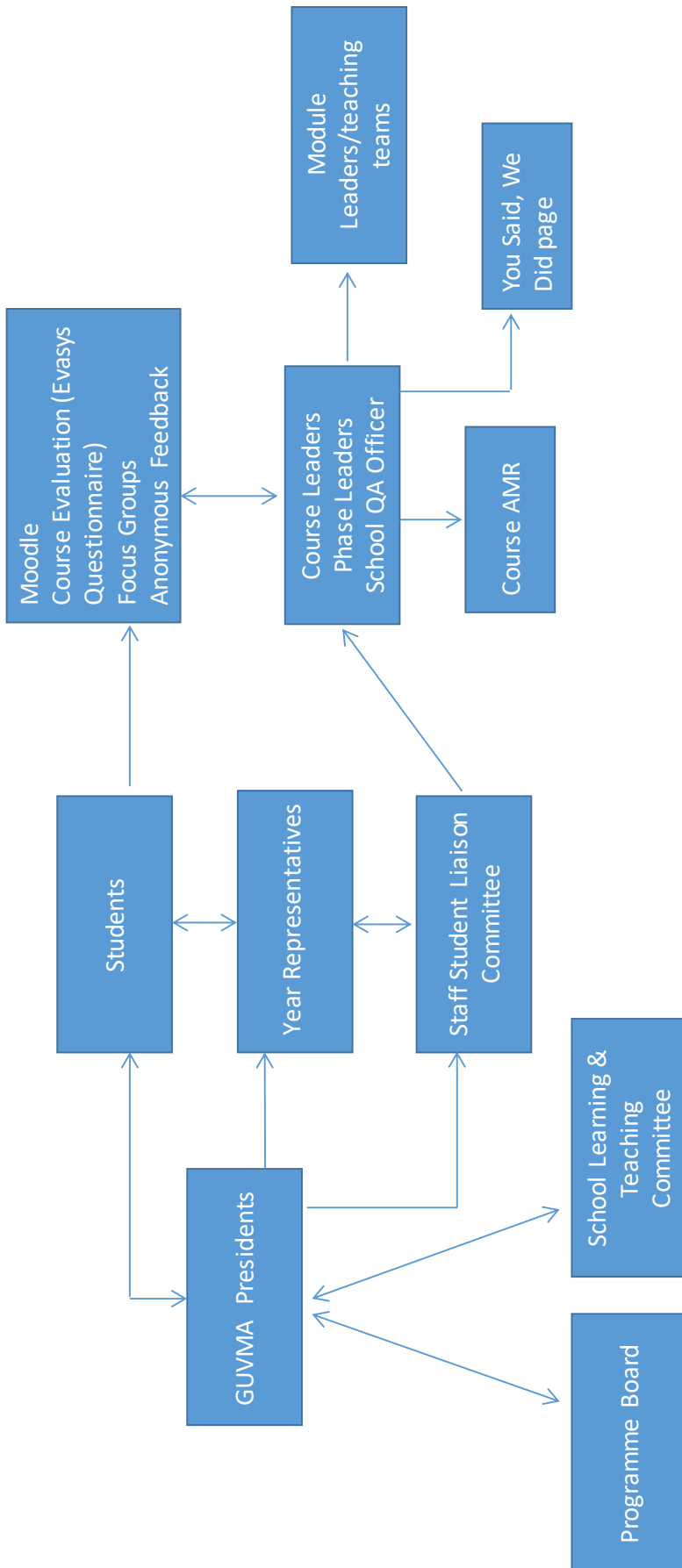


				Committee provides advice and feedback on ethics applications. The Committee considers all research involving veterinary clinical cases, samples, tissues or data. The Committee does not consider research relating to the collection of data from human subjects (that may be related to veterinary clinical cases). These applications are dealt with by the College of Medical, Veterinary and Life Sciences Ethics Committee.
Fitness to Practise Committee	Professor Ewan Cameron	As required		To assess fitness to practice in terms of academic attainment <b>and</b> in accordance with relevant professional concerns and expectations.
Information Services Committee	Mr G McLeod	One per term		To consider options appraisal for future Information Technology and/or Audio-visual development, hardware/software upgrading and replacement, and to monitor and promote all procedures and policies affecting Information Technology and Audio-visual resources.
Learning & Teaching Committee	Associate Head of School (Learning & Teaching)	One per term		Responsibility for strategic, quality and enhancement, regulatory and student matters programme/course development and approval.
Quality Assurance and Enhancement Committee	tbc	Every two months		Promote quality assurance in every aspect of school management and delivery, to promote a culture of quality enhancement across the School, forward recommendations to the School Executive to enhance internal processes, to feed back to the Executive any concerns on general management of the School, to scrutinise important school papers (eg annual strategy and operational planning documents) and the annual course monitoring documents), to take oversight of the management of data for accreditation purposes
Research & PGR Committee	Professor T Parkin	Every two months		The remit of the Committee focuses on research and

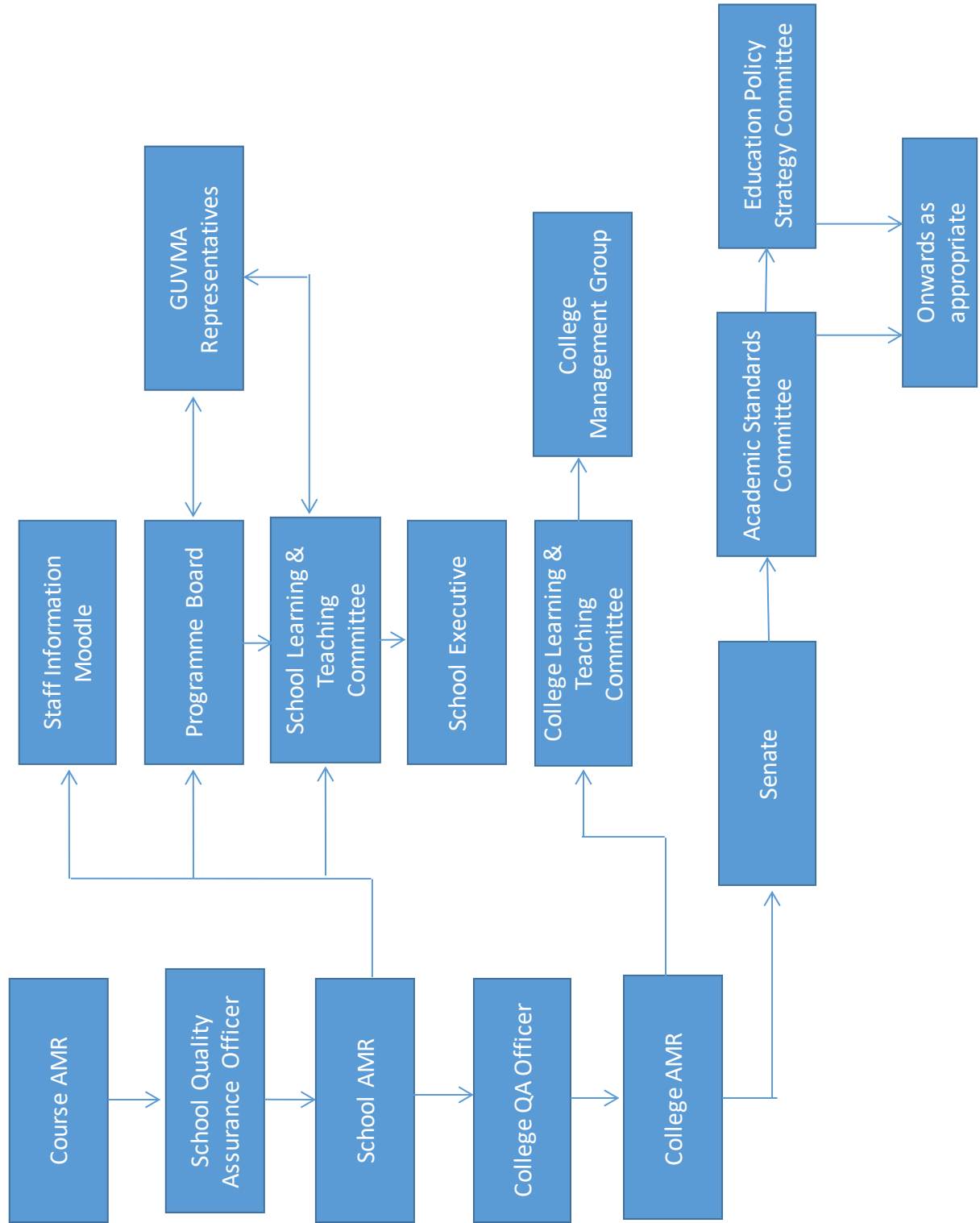
			knowledge exchange activity across the School. The Committee reports to the School Executive and meets approximately every two months.
Health and Safety Committee	Ms A Macrae	One per term	Responsibility for the promotion, compliance and review of policies relevant to the health, safety and welfare of all persons when on School of Veterinary Medicine premises and of staff and students when engaged upon activities relevant to the School of Veterinary Medicine purposes, by means of recommendations to the School Executive.
Staff Student Liaison Committee	Mrs J Wason	Twice per year	The Staff Student Liaison Committee provides a formal platform for communication and discussion between academic and administrative staff and representatives of the student body relating to matters connected with improving the student experience for undergraduate and post graduate students within the School of Veterinary Medicine.

Process	Who is involved	Frequency	Purpose/Outcomes/Actions
<b>Student Centred Processes</b>			
End of Semester Questionnaires (EVASYs)	Each year cohort	Twice yearly	Data collated and analysed. Summary response document available to students; fed back to teaching teams and Programme Board; used to inform Annual Monitoring Report.
Focus Group Meetings	Each year cohort	Twice yearly	Minutes and action list created – available to students; fed back to teaching teams and Programme Board; used to inform Annual Monitoring Report.
Optional feedback mechanisms (optional Moodle feedback facility, face to face sessions with module/course leaders, meetings with class reps)	Each year cohort	Ongoing	Data reviewed and analysed. Feeds into processes such as teaching teams meetings etc
<b>Staff Centred Processes (note outcomes of many of these processes are recorded on “SVM Staff Information” Moodle pages: <a href="https://moodle.gla.ac.uk/course/view.php?id=13033">https://moodle.gla.ac.uk/course/view.php?id=13033</a>)</b>			
Module team meetings and Divisional teaching meetings	Module leader and staff teaching on the module	Annual (minimum) – usually in the weeks preceding annual delivery	Discussion/action in relation to any changes or developments in light of student feedback, staff changes, evolution of module content
Phase team meetings	Phase Leader and associated Course Leaders, Clinical Skills Coordinator	Ad hoc – in the initial development of the new curriculum these were frequent, now occur regularly	Discussion of matters arising from staff and students – actions as required. To review and develop aspects of the curriculum.
Programme team meetings	Programme Leader, Phase Leaders, Clinical Skills Coordinator, GUVMA Presidents	Regular (approx. monthly)	To address matters arising and plan activities for review and development of the curriculum
Programme Away Days	Programme Leader plus Phase and Course Leaders, Clinical Skills Coordinator, Portfolio Coordinator, EMS coordinator, Chief Adviser of studies, Clinical Skills coordinator, Course Support staff, Learning Technologist, NAVLE Champion, Clinical Reasoning Champion, Student Representation, Head of Student Support, Head of School	Annual (minimum), typically twice per year.	Discussion of major themes arising, ongoing review of the Programme and consideration of upcoming external influences on the Programme. Actions decided as appropriate to support mid-long-term planning.
Phase Away Days	Programme Leader plus Phase, Course and Module Leaders, Clinical Skills	Annual	Discussion of major themes arising and ongoing review of the Phase. Actions decided as appropriate to support mid-long term planning.

	Coordinator, Portfolio Coordinator		
<b>Annual Monitoring Report</b>	Quality Assurance and Enhancement Officer, Phase, Course and Module Leaders, Clinical Skills Coordinator, Portfolio Coordinator	Annual	Coordinated by the Schools Quality Assurance and Enhancement Officer, this process allows the School to reflect and ensure the Programmes meets the expectations of staff and students, to look for opportunities to develop and enhance provision and to close the feedback loop, reporting actions and outcomes to staff and students.
Examination/Assessment Outcomes	Phase, Course and Module Leaders, Clinical Skills Coordinator, Portfolio Coordinator and teaching teams	After both first and second diets of examinations.	Examination data is scrutinised by the course team and External Examiners at the level of individual questions, component papers and overall performance. Feedback on assessment outcomes to students is provide in the format of individual scores and cohort grade profiles for each assessment instrument and for the assessment as a whole. Outcomes of assessment are reviewed on a cumulative basis for each year of the Programme – these are reporting to and discussed at the Programme Board on an annual basis.
Septennial Review	Staff identified to lead key themes for the review	Every 7 years	Evaluation of key aspects of the curriculum, reporting to the Programme Board with recommendations for changes in the short-medium term.
<b>External Processes</b>			
External Examiner reports	External Examiners for each Year	Annual	External Examiners comment on the syllabus, learning objectives, general assessment scheme and specific summative assessments of the course and are consulted regarding proposals for course changes. The report feeds into staff meetings, Programme Board and the Annual Monitoring Report process.
Employers survey	Employers of new/recent graduates	Annual	Feeds into planning and development of the curriculum
Recent Graduate Survey	Graduates	Annual	Feeds into planning and development of the curriculum
Liaison with Professional Groups and external organisations	Staff	Ad hoc	Staff with External Examiner roles at other schools have the opportunity to Benchmark and bring back lessons learned from other schools



Appendix 6.3.3 - Learning and Teaching Communication Pathway, Institutional View





### Developments in the Veterinary Public Health (VPH) curriculum

VPH is a core theme running throughout the spiral curriculum at the University of Glasgow Veterinary School. The recruitment of two new members of faculty in October 2019 (Senior Lecturer and Lecturer in VPH), adding to the very experienced lecturer already in post, demonstrates our commitment to further developing and expanding this theme. The Senior Lecturer will act as the new director of VPH provision in both teaching and research and is an epidemiologist and Royal College of Veterinary Surgeons (RCVS) Recognised Specialist in State Veterinary Medicine. All three members of the VPH team have practised as Official Veterinarians (OV), combining national and international OV experience in slaughterhouses in England, Northern Ireland, Scotland and New Zealand. Two of the faculty members have state veterinary service experience in the field in Northern Ireland and England, including first-hand experience of epizootic disease control. Two of the VPH team are qualified to doctoral level. One is a current resident for the European Diploma in Animal Welfare Science, Ethics and Law (AWSEL), a sub-speciality of the European College of Animal Welfare and Behavioural Medicine, and another is preparing to apply to the European College of Veterinary Public Health to become a resident in the food science sub-speciality. The director of VPH currently supervises three PhD students (all external to the university), with a fourth currently in the postgraduate application process at the University of Glasgow. The VPH team therefore has an appropriate blend of breadth, depth and experience within the discipline.

The addition of new faculty to the VPH team has provided a suitable opportunity to review the current VPH provision in the School; this is an ongoing process. Meetings were held in November 2019 to introduce the new members of faculty in the VPH team to faculty colleagues from across the School and to discuss how VPH is currently taught across the curriculum. These course meetings have served as a welcome opportunity to reinforce a VPH-related focus across teaching events, across the subdisciplines and throughout the three course phases. Following these meetings, curriculum mapping has taken place to demonstrate the VPH theme throughout the undergraduate course and to highlight current emphases and identify areas with scope for further strengthening.

Changes will be made to the VPH content to update the current teaching materials and integrate further learning technologies, including the new ‘virtual abattoir’ software that is currently under development in a collaborative project with the University of Surrey and Royal Veterinary College, London. The curriculum will be further developed with a research-led approach which further integrates peer-reviewed science into the VPH content. The course will encourage students to consider their potential approach to VPH in private veterinary practise, research, industry and the state sectors to ensure that they can be effective VPH practitioners in whatever field of veterinary science they choose to work in their future careers. There is scope to integrate social science approaches and literature to help students understand the socioeconomic and sociocultural rationales behind stakeholder attitudes and behaviours in relation to VPH, particularly attitudes towards zoonotic risk and disease control, a specialism of the new director<sup>1,2</sup>. We also intend to further develop contacts within the agri-food industry in Scotland. For example, negotiations to visit more aquaculture-related facilities are already in process, and new premises have been added to the list of potential visits in connection with bovine and ovine milk processing and cheese production.

The WHO Study Group on future trends in VPH which met in Teramo, Italy in 1999, defined VPH as: “The sum of all contributions to the physical, mental and social well-being of humans through an understanding and application of veterinary science”<sup>3</sup>. Mindful of this definition, our further refinement of the curriculum will widen the focus of our teaching to more fully encompass a multi-species and globally-focused *One Health* approach while still retaining our core VPH focus and strength in food hygiene and processing. Cognisant of the increasing importance of the human-animal-environment nexus in infection and disease<sup>4</sup>, emerging zoonoses such as MERS-CoV, Nipah virus and Ebola emphasize the need to prepare veterinary graduates to play their role in human health protection, preventative medicine and ecosystem health in the 21<sup>st</sup> century.

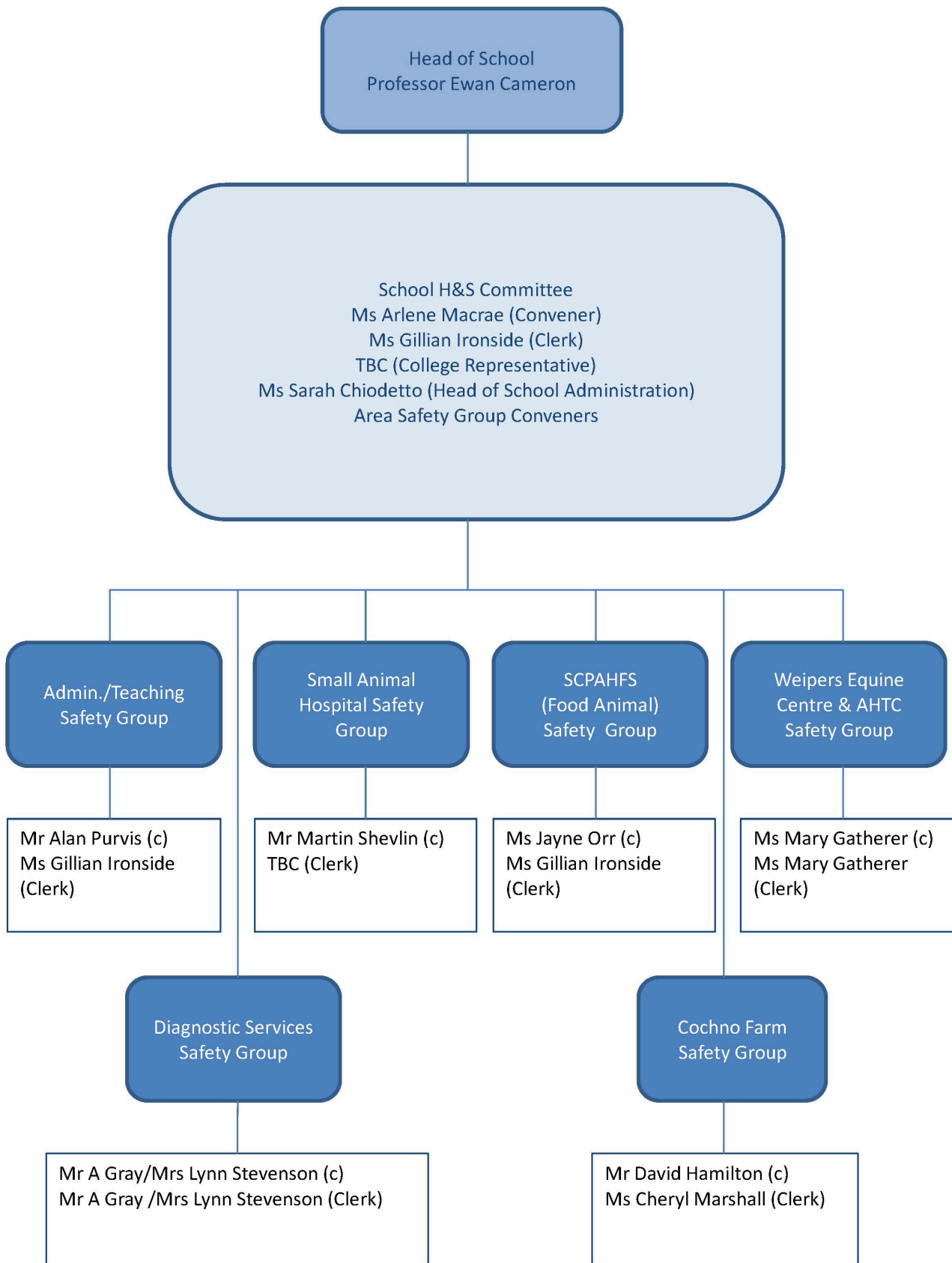
## References

- 1 Robinson, P.A. (2017) Farmers and bovine tuberculosis: contextualising statutory disease control within everyday farming lives. *Journal of Rural Studies*, 55, 168-180.
- 2 Robinson, P.A. (2019) Farmer and veterinarian attitudes towards the risk of zoonotic *Mycobacterium bovis* infection in Northern Ireland. *Veterinary Record*, 185, 344.
- 3 Report of a WHO Study Group: *Future Trends in Veterinary Public Health*. World Health Organization, Geneva. 2002.
- 4 Mwangi, W., de Figueiredo, P., Criscitiello, M.F. (2016) One Health: Addressing global challenges at the nexus of human, animal, and environmental health. *PLoS Pathogens*, 12(9): e1005731.

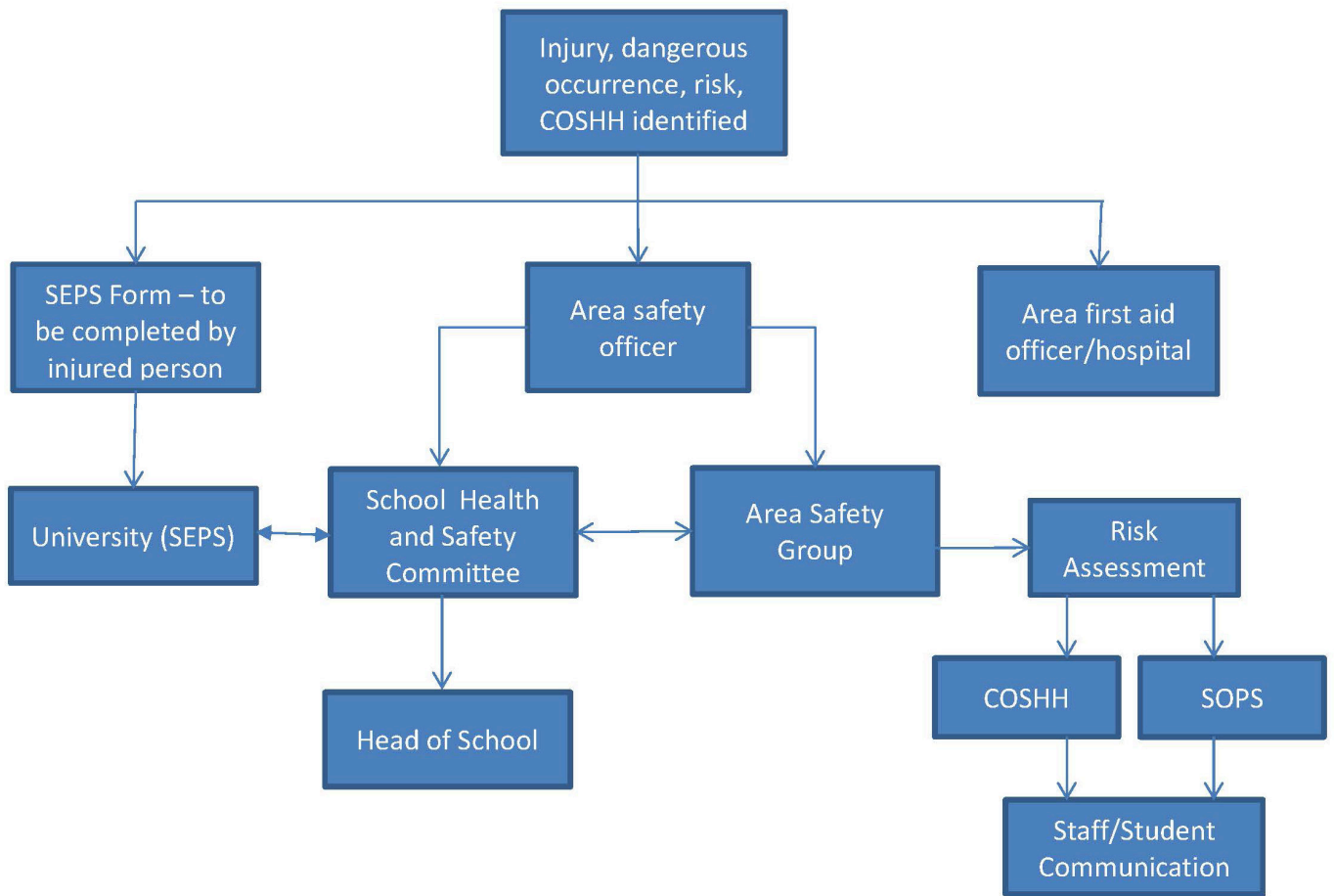
Meeting topic	Suggested date & time	Venue	Recommendation addressed in the meeting	Key questions
Active learning	Weds 9 <sup>th</sup> October 12- 2pm	Mary Stewart Building seminar room	The Panel recommends that, in the context of the different forms of active learning used within the BVMS curriculum, the School reflect on how best to communicate to students the reasons for, and the benefits arising from, this approach, and whether a more staged introduction of active learning would be appropriate. [Paragraph 4.1.5]	How do we communicate the reasons for developing skills in active learning?  How do we introduce active learning throughout the Programme?  What active learning approaches are most effective and feasible?
Induction	Thursday 24 <sup>th</sup> October 12- 2pm	Lomond room	The Panel recommends that the School reflect on the initial induction information provided to students about the resources available through Moodle and Mahara, as well as the live guidance, to best ensure that students make optimum use of the excellent resources, particularly where these materials are intended to facilitate active learning. [Paragraph 4.1.13]	What are the challenges for students getting started on the BVMS programme  How do we make the transition easier?  Can we organise or signpost our VLE materials in a better way?
Portfolio	Wednesday 6 <sup>th</sup> November 12- 2pm	Mary Stewart Building seminar room	The Panel recommends that the School consider how best to articulate to BVMS students the value and purpose of the portfolio. This could involve insights from Associate Staff and recent graduates being shared, and also	How can we articulate the value and purpose of the Portfolio?  Who can help us do this and how?

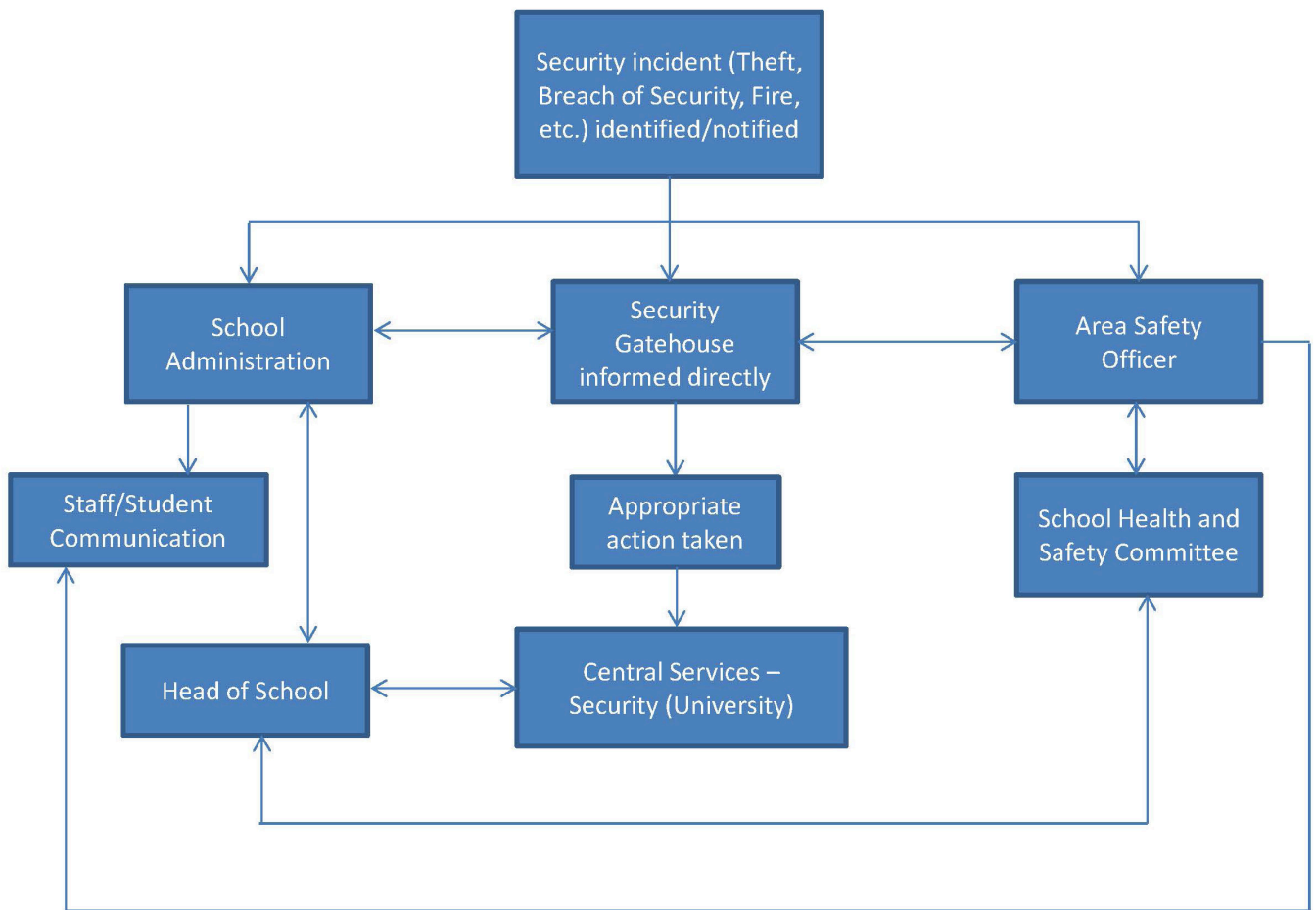
				possibly from the BSc students who appeared more comfortable with the portfolio work than the BVMS students (though it is recognised that the scale of the undertaking on the BVMS is significantly greater). [Paragraph 4.2.9]	
Liaison with associate staff and wider profession ( <i>suggest that external stakeholders also invited to attend this meeting – or perhaps all of them?</i> )	Wednesday 13 <sup>th</sup> November 12-2pm	Mary Stewart Building Seminar Room	Following on from the commendation of the School for its training and support of both Associate Staff and demonstrators, the Review Panel recommends that the School consider (within the bounds of available funding) how to make optimum use of such a valuable resource on the BVMS programme, emphasising the ‘authentic’ value of their insights as experienced practitioners. [Paragraph 4.4.16]	How can we best involve external practitioners on the BVMS programme?  What are the practical issues that need to be considered?  Which opportunities are considered a priority?	
Wellbeing, counselling and student support ( <i>suggest that this meeting is planned in close consultation with the post-holder and student</i> )	Weds 27 <sup>th</sup> November 12-2pm	Lomond room	The Panel heard that plans were in train for the introduction, on a pilot basis, of specialised counselling support at Garscube from the beginning of the 2019-20 session. The Review Panel recommends that the School reflect carefully on how to encourage and facilitate students’ use of this resource (noting the intensive timetabling of teaching during the day) while also	What are our ambitions for the pilot of counselling support?  How can we facilitate access for students?  How should this relate to other support resources?  How can we evaluate the success of this pilot?	

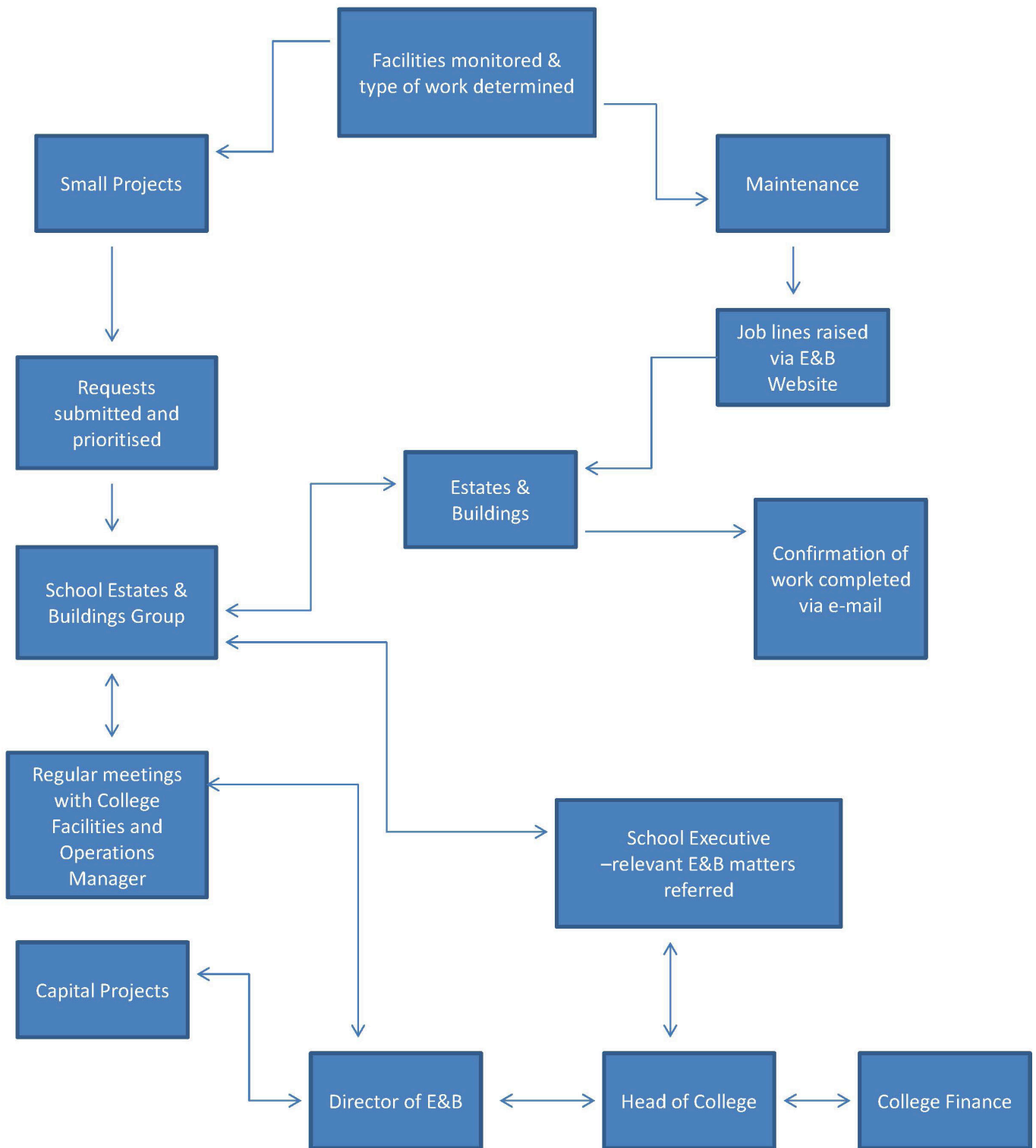
<p><i>support team)</i></p>			<p>promoting complementary resources such as the on-line Big White Wall. Noting that the counselling support was to be introduced on a pilot basis, it would also be important to consider at an early stage how (in conjunction with Student and Academic Services) to evaluate its success. [Paragraph 3.3.4]</p>	<p>What outcomes do we hope to see?</p>
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**Small Animal Hospital**

1. 14 Consulting Rooms
2. 10 Wards
3. 4 Dog Runs
4. 4 Changing Areas
5. 3 Cleaners Areas
6. 2 Communal/Social Areas
7. 2 Student IT areas
8. 8 Diagnostic Imaging Rooms
9. 1 Student Laboratory
10. 1 ICU Ward
11. 1 HDU Ward
12. 1 Kitchen (Food Preparation Area)
13. 1 Laundry
14. 1 Pharmacy
15. 2 Seminar/Meeting Rooms
16. 11 Offices
17. 1 Oncology Suite
18. 7 Store Rooms
19. 4 Operating Theatres
20. 1 Wellness Centre (including physiotherapy and hydrotherapy)
21. 2 Client Waiting Areas
22. 1 Endoscopy suite

**Scottish Centre for Production Animal Health & Food Safety**

1. 3 Seminar/Meeting Rooms
2. 1 Flexible Accommodation for approximately 30 adult cattle
3. 2 Secure Bull Pens
4. 3 Pig Pens
5. 2 Clinical Examination Class Areas
6. 1 Separate teaching Area
7. 1 Preparation Room
8. 1 Pharmacy
9. 1 Teaching Laboratory
10. 1 Clinical Office (open plan)
11. 1 Biozone Area
12. 1 Boot Wash and Hand Wash Area
13. 1 Changing/locker Room for Students
14. 1 Changing/locker Room for Staff
15. 1 Laundry
16. 1 Store
17. 1 Student IT room

**Weipers Centre Equine Hospital**

1. 1 Examination Room
2. 1 Examination/Ultrasonography Room
3. 1 Examination/Endoscopy Room
4. 1 Outpatient Holding Area
5. 1 Lameness Hall
6. 1 Radiography Room
7. 1 Radiology Viewing Room
8. 1 Nuclear Scintigraphy Room
9. 1 Clinical Record Store
10. 2 Anaesthetic Induction Rooms
11. 2 Preparation Rooms
12. 2 Operating Rooms
13. 2 Anaesthetic Recovery Rooms
14. 2 Hospital Stable-units including intensive care unit and laminitis stable
15. 1 in-house Laboratory
16. 1 Pharmacy
17. 1 equipment consumables store
18. 1 tack room
19. 1 Feed prep/store room (container)
20. 5 Faculty/Staff Offices
21. 1 Administrator's Office
22. 1 Staff Kitchen
23. 1 Student Clinical Tutorial Room
24. 1 Indoor exercise arena
25. 1 Isolation unit
26. 1 student IT room

**Small Animal Hospital****Imaging**

- Siemens Magnetom 1.5T MRI Scanner
- Siemens Somatom Spirit CT Scanner
- Siemens Multix TOP X-Ray System
- 2 x Agfa CR 15-X Digitizer
- 2 x Barco high quality LCD Monitors for both X –Ray rooms
- 3 x student PCs with clearview canvas
- 2 x Macintosh Osirix workstations
- Mindray DP50 portable ultrasound machine
- Philips BV Libra C – arm Fluoroscopy unit
- 2 x Agfa NX Workstations
- 6 x high quality LCD Monitors for Reading Room (student computers)
- Visbion image workstation with double Barco monitors
- Clearview canvas Vet workstation with double Barco monitors
- Mindray DP30 portable ultrasound machine
- Sonoscape Ultrasound Machine
- GE logic e9 Ultrasound machine
- GE Logic Ultrasound machine
- GE vivid ultrasound machine
- Olympus KeyMed Endoscopy stack and scopes
- Karl Storz endoscopy stack and scopes

**Physiotherapy/Hydrotherapy**

- Hydro Physio water treadmill unit
- K-laser

**Laboratory**

- IDEXX Vetstat
- IDEXX Procyte DX
- IDEXX Catalyst DX
- Zeiss Microscope

**Cardiology**

- Holter Novacor Vista
- Pacemaker
- ECG

**Oncology**

- Siemens Oncor Impression Plus Linear Accelerator with:
  - photons (6MV, 10MV) and
  - electrons (6meV, 8MeV, 10meV, 12 MeV, 15 MeV and 18MeV)
  - electron applicators (5cm circle, 10 x 10cm, 15 x 15cm, 20 x 20cm, 25 x 25cm)
  - 80 leaf MLC

- Electronic Portal Imaging Device (MV)
- Treatment couch with extension (250kg max) Model 550 TxT (Siemens)
- External LAP lasers for treatment set-up, Model LAP AP-KG
- QA equipment Linear Accelerator
- Farmer Dosemeter NE2670 (Thermo)
- Dosechecker NE2630 (Thermo)
- Prowess Panther planning software (v5.51)
- Lantis record and verify software (v8.3)
- CCTV camera, camera control unit and monitor Model VSP-8500
- Anaesthesia machines
- Small Animal Anaesthesia Machine
- Small animal Anaesthesia Ventilation System
- Anaesthesia patient monitors
- 2 litre suction equipment, New Askir 30 (CA-MI)
- Biological safety cabinet (class I and II) for drug preparation BIOAIR Safeflow 0.9
- Berner Drug SpillKit XP Z+
- Closed system delivery equipment (SPIROS)
- Cat weigh scales, model MS-2400 (Marsden)
- 2 x plastic measuring calipers (Draper 4817PB)
- 1 x metal measuring calipers
- Syringe driver - Alaris 2 x T 1.25A 250V (Cardinal Health)

#### Theatre & ICU

- 2 x pulse oximeters
- 5 x anaesthetic machines
- 4 x multiparameter anaesthetic monitors
- 4 x stock trolleys for anaesthesia equipment
- 6 x new scavenging systems
- Arthroscope
- Phaco Machine
- Neuro Drills
- Colibri Ortho Drills
- Desouter Drill
- TPLO Saw
- Integra Cusa Excel
- 3 x Mrs Eichmann operating tables
- Anetic Aid QA4 operating table
- 5 x Diathermo MB Gima diathermy units
- 5 x Medline high vac suction carousel
- 8 x Brandon medical surgical operating lights
- 4 x LG wall mounted tv screens
- 4 x Wall mounted touch screen computers
- Ligasure unit Valleylab SN: L6B11607V
- 4 x 3M Bair hugger unit model 505
- Brandon ceiling mounted surgical camera
- QED warming cabinet model (GP/75/W/B), SN: 07EO68
- ZEISS surgical microscope S5



- DEKO 25 instrument washer
- 2x LTE Touchclave PL autoclaves SN: K11469/ SN: K11468
- Karl Storz Endoscopy stack including: light source, insufflator, shaver, irrigation system.
- Laparoscopy scope 5mm & 10mm
- Arthroscopes: 1.9mm & 2.4mm & 2.7mm
- Shaver unit and burrs multiple sizes
- 23 x Laparoscopy ligasure hand pieces
- 2 x Light cables
- Large laparoscopy instrument kit
- Small laparoscopy instrument kit
- Thoracoscopy instruments
- VIZUAL Phaco Console SN: 5510294
- 3 x Phaco instrument kits including phaco handpiece & needles
- OPTHO lazer unit
- 5 x OPTHO standard instrument kits
- 9 x Standard soft tissue instrument kits
- 5 x Minor kits
- 4 x Exlap kits small ( 2 small; 2 large)
- 2 x Thoracotomy kit (1 small; 1 large)
- Vascular kit
- Airway kit
- >150 x Miscellaneous soft tissue instruments
- 12 x Ligasure hand pieces
- 20 x SUB/ AUS/ Pleural port kits
- >20 x MILA wound/ chest drains
- 6 x TA stapling devices & 55 x stapler cartridges
- 6 x GIA staplers & 29 x stapler cartridges
- 25 x LDS/ surgiclip staplers
- INTEGRA CUSS EXCEL machine SN: HGF1500704IE
- 5 x Neuro instrument kits
- 7 x Neuro high powered burrs
- CUSSA headpiece & 24 x single use tips
- HEINE Neuro Surgical Loupes
- Medtronic electrodiagnostic machine
- 3D printer
- 2 x MINI Driver Drill/ SAW & blades
- Desoutter Drill/ SAW & blades
- AO drill & blades
- Oscillating saw & blades
- 2 x Slocum TPLO saw & blades
- 2 x COLIBRI saw/ drill & blades
- 2 x COLIBRI TPLO attachments & blades
- 4 x General ortho kits
- 12 x Miscellaneous ortho kits
- SOP kit +plates 2.0mm & 2.7/3.5mm
- 4.5mm Screw set

- 3 x 2.7/ 3.5mm screw sets
- 2 x 2.7/3.5mm LCP screw sets
- 1.5/ 2.0/ 2.4mm LCP screw set
- >100 x Miscellaneous ortho instruments
- >100 x Miscellaneous ortho implants
- Total hip replacement instrument kit & drill & implants
- >20 x Bone graft implants/ materials & cement

## **Glasgow Equine Hospital**

### **Operating rooms**

- Operating tables
  - Telgte I
  - Telgte II
- Anaesthesia machines
  - LAPD-1000 Large Animal Anaesthesia Machine
  - Model 2800C Large animal Anaesthesia Ventilation System
  - Tefonius T40 large animal ventilator
  - 2x Datex-Ohmeda S/5 patient monitors
- 450L capacity medical steam autoclave

### **Arthroscopy /laparoscopy**

- Arthroscopy/ Laparoscopy tower
  - 2 x Hopkins telescope 30°, 4mm Ø, wide angle (Karl Storz)
  - Equine laparoscope 57cm 0°, 10mm Ø, wide angle (Karl Storz)
  - MediCap USB100 video recorder

### **Surgical instrumentation**

- VetArt 980 II surgical diode laser
- General surgical packs for routine surgical procedures
- AO\ASIF instrumentation
  - 3.5/4.5/5.5 cortical sets
  - DCP/LCP/ LC-DCP sets
- Air drill
- Arthroscopic instrument set
- Laparoscopic instrument set
- Ophthalmic instrument set
- Kerf cut cylinder and implant kit
- LigaSure electro-surgical unit and instruments
- LDS, GIA & TA staplers
- Motorised shaver system
- CryoPro

### **Endoscopy**

- Primary:
  - 3.3m Endomed gastroscope (MED Equus)
  - 1.5m Endomed endoscope (MED Equus)

- Dental endoscope (MED Equus)
- Dynamic Respiratory Scope DRS 067 (Optomed)
  - PE portable videoscope (Optomed)
- Secondary
  - 1.5m endoscope (Karl Storz)
  - 3 m gastroscope (Karl Storz)
  - Isolation unit 1.8m endoscope (Olympus)

### Ultrasonography

- Vivid S6
  - 12L-RS 6-13 MHz 47mm footprint linear probe. Colour, power & PW Doppler.
  - M4S-RS 1.5-3.6 MHz 20x28mm footprint phased array probe. Colour, power, CW & PW Doppler. max depth 30cm
  - 4C-RS 1.8-6.0 MHz 60mm radius Convex probe. Colour, power & PW Doppler, max depth is 30cm
- Vivid i ultrasound machine
  - 3S-RS phased array transducer (1.5-3.6MHz)
  - 4C-RS curved array transducer (1.8-6MHz)
  - 12L-RS linear array transducer (6-13MHz)
- Mindray DP-50 ultrasound machine
  - Rectal transducer (5.0-8.5MHz)
  - Linear transducer (5-10MHz)
  - Convex array transducer (2-6MHz)

### Radiography

- Powerlight 90 x-ray generator, outputs of 40 to 90kv and max 30mA
- Indico 100RF 80kV x-ray generator, gantry mounted 150kV x-ray tube; maximum system output of 125kV @ 830mA
- CR25X digitiser & imaging cassettes
- Atomscope portable x-ray generator (Veterinary X-rays, UK); outputs of 100kV @ 30mA, 50kV @ 60mA
- Ziehm Vision 3D C-Arm

### Nuclear medicine

- Mediso Nucline 530x390mm FOV gamma camera
- Equistand camera mounting system
- Micas X processing software, which includes motion correction facility

### Magnetic resonance imaging (MRI)

- Esoate O-Scan MRI Scanner
- Custom MRI compatible equine table

### Orthopaedic

- Lameness locator
- Radial shockwave therapy unit

### Dental equipment

- HDE evolution flexidisc dental unit

- Flexi-Float equine dental unit

#### **Clinical laboratory**

- i-Stat I portable clinical analyser
- i-Stat II portable clinical analyser
- VetScan VS2 blood biochemistry analyser
- Vet abc haematology machine
- Cytopspin
- EBA 270 Centrifuge
- Incubator
- CH20 microscope
- Microhaematocrit centrifuge

#### **Miscellaneous**

- KruuseTelevet 100 – Telemetric ECG and Holter
- Kowa SL-14 Portable slit lamp
- ITV ice maker
- Freezer for plasma storage
- Fixed equine stocks
- 2 x portable equine stocks
- Equine TBTN net sling
- Small transport stretcher/bed for foals

#### **Teaching**

- Colic and Theriogenology simulator
- 2 x Blacksmith Buddy – shoe removal
- 6 x Wound limb simulators
- Horse rescue mannequin
- 2 x Cadaver headstands for dentistry/endoscopy
- 2 x Anatomical limbs

#### **Glasgow Equine Practice**

Two vans for the Equine Primary care equipped with;

- Temperature controlled and monitored vaccine fridges
- PPE and horse restraint equipment
- Controlled drugs safe with access audit software
- Lockable storage drawers
- Equipment for:
  - Full oral exam including motorised dental floats
  - Ophthalmic exam
  - Gastrointestinal / colic exam
  - Wound management
  - Orthopaedic exam
  - Medical exam
  - Point of care lactate and haematocrit analysis

A mobile practice management system optimised for primary care use:

- Mobile clinical history access
- Mobile access to all patient diagnostic imaging Inc. DICOM
- Mobile invoicing
- Student entries into clinical history and general final year student access (not immediately, by the time of student allocation)
- Batch and stock tracking
- Powerful search functions for research and student case research
- iPads for horse-side use.

### **Shared equipment with the Glasgow Equine Hospital and Practice**

- Portable digital radiography system
- Battery X-ray generator
- Electronic dose meters
- X-ray blocks, cassette holders, generator stand and lead protection.
- Portable ultrasound (shared with the Equine Hospital)
- Portable Oral Endoscopy
- Portable endoscopy with respiratory endoscope and gastroscope – DICOM imagery.
- Portable equine scales

### **Practice Pharmacy within the Glasgow Equine Hospital and Practice**

- Temperature controlled and monitored Vaccine fridge
- Temperature data loggers
- Controlled drug safe requiring 2 user access and access auditing software.

### **Veterinary Diagnostic Services**

#### **Post Mortem suite**

- Hydraulic Post Mortem table
- Medizine Oscillating Autopsy saw
- Nikon D200 Digital Camera
- Nikon D700 Digital camera
- Nikon 105mm lens
- Nikon 60mm Lens
- Nikon D610 digital camera
- Nikon 18-200mm lens
- Small Weigh balance
- Platform weigh balance
- Sony HDR-SR1 Digital Video camera
- Large animal weigh balance 1000kg
- 2x 1 ton Rope hoists
- 1 ton chain hoist
- Bespoke wheelbarrow

- Camera Tripod
- Hanna Waterproof pH meter
- Trovan chip reader
- 2x Cash Special captive bolt pistol
- Cash X captive bolt pistol
- Greener's Humane killer (Bell gun).310
- Cash Humane Slaughtering pistol .32
- 4x Chest freezers
- Upright freezer
- Wesley power washer
- Class 1 Microbiological Safety cabinet
- WD My Book 1000gb
- Innatech Hard drive 500gb
- Warrior 200kg sack barrow
- Posturerite high back chair
- Varidesk adjustable desk
- Epson Stylus photo RX640 printer
- Canon Imagerunner 40001
- Sharpenset Whetstone electric knife sharpener
- Wellsaw carcass splitting saw

### **Histopathology**

- Balance
- 3x Tissue Processor (2x Sakura tissue tek models, 1x Thermo Scientific Excelsior AS)
- Vacuum oven
- Embedding centre
- Cold plate
- 2x Wax bowers
- Compressor
- Cassette writer
- Slide writer
- 5x Hotplates
- Benchttop freezer
- Paraffin section mounting bath x2
- Semi-automated microtome (Thermo-Shandon Finesse)
- Incubator
- pH meter
- magnetic stirrer
- Downflow workstation
- 3x Microscopes (1x Leitz laborlux, 2x Olympus CX models)
- Access retrieval unit
- Fridge/freezer
- 2x Autostainer (Dako)
- 3x PC
- Cryostat (Leica)
- Vortex mixer



- Decloaking chamber
- Semi-automated Microtome
- Paraffin wax dispenser
- Lec benchtop freezer
- Embedding module
- Cold Module
- Fridge

### **Clinical Pathology**

- Benchtop Centrifuge
- 9x PC
- 10 roller sample mixer
- 10MP Camera
- Economy Incubator Size 1 with fan
- Micro Centrifuge Dual Speed
- Micro Haematocrit Centrifuge
- Acute Phase Protein Analyser
- 2x Printer
- Fume Cupboard
- 7x Microscope (2x Leitz, 5x Olympus)
- Sample tube mixer
- Cell tally counter x6
- Sample tube mixer
- 2x Fridge
- 2x Freezer (-20C)
- Biochemistry Analyser (Dimension Expand)
- Biochemistry Hormone Analyser (Immulite Xpi2000)
- HbA1c Analyser(DCA Vantage)
- Haematology Analyser (ADVIA 120)
- Centrifuge (Cytospin4)
- Visible Spectrophotometer (Genesys 30)
- Coagulometer (Amelung KC4Delta)

### **Infectious Diseases**

- 15x centrifuges (various sizes)
- 4x mixers
- 8x microplate or orbital shakers
- Boiling bath
- 4x waterbaths
- Dry heat block#
- Dry bath
- 5x BioMAT class II microbiological cabinets
- 2x Gelaire microbiological cabinets
- 2x Labcaire PCR workstations
- Labcaire downflow station
- Envair Class I hood
- Don whitely MACS VA500 microaerophilic cabinet

- 2x pharmacy fridges
- 4x fridges
- 15x freezers (-20C)
- 3x freezers (-80C)
- 9x Incubators
- 4x Anaerobic Jars
- 10x microscopes (1x Leica, 7x Leitz, 1x Zeiss, 1x Olympus; two of the 10 are Fluorescent)
- 6x electrophoreses systems and associated powerpacks
- Mastercycler EP gradient S
- TACO mini nucleic acid extract machine
- Labsystems multiskan Ascent spectrophotometer
- 4x balances
- Vacuum pump
- pH meter
- White/UV transilluminator
- 2x Colworth Stomacher 80 machines
- 2x MAT sterilising agent vapourising units
- 3x microtitre plate readers (reflective mirror)
- 2x Cameras
- 10x PCs

### **Clinical Skills Facility**

- 5x professional mannequins
- 2x full size horse mannequins
- Full size cow mannequin
- Assorted mannequins dog, cat and reptile
- 5x anaesthetic machines
- Full range of small animal Breathing systems
- Anaesthetic face mask
- Assortment of theatre equipment
- Small mammal equipment
- X-ray positioning equipment
- 8x laryngoscopes
- 9x Oscopes
- 3x Digital Oscopes
- 9x Ophthalmoscopes
- Surgical instruments - assorted
- E.T Tubes assorted
- 4x Centrifuge
- 15x microscopes
- 20x refractometers
- X-ray calipers
- 100x skin pads + jigs
- Cat handling Eqpt

- Thermometers
- 15x clippers
- Nail clippers (assorted)
- Assortment of stable bandages and gamgees
- 5x Ultrasound Machines
- 2x Xray machines and plates
- Dental radiography machine plus mobile mount and plates
- Digital xray developer
- 7x Dental carts
- Dental instruments assorted
- 6x PCs with clear canvas software for viewing digital images
- 12x mobile dissecting tables
- 10x examination tables
- 6x Glucometers
- 2x Pulse Oximeters
- 2x Capnographs
- 2x Doppler blood pressure Monitors plus assorted cuffs
- 2x Cardell Blood pressure monitors
- 13x Mock legs for IV access

#### **Teaching Laboratory 1 (Anatomy Gross Laboratory)**

- LCD Projector
- Document Camera
- 7x TV Monitors
- Digital audio mix processor
- Audio amplifier
- Induction loop amplifier
- Matrix switcher
- PC
- Desktop control panel
- UHF transmitter
- 10x Microscopes
- 8x Wall mounted X- Ray viewers
- 2x Mobile X-Ray viewers
- X-Ray machine
- Haptic cow computer based model.
- 37x Stainless steel dissection trollies
- Horse rectal examination model
- 6x Colorimeters
- 12x Boxed pipettes
- 6x ECG machines
- 2x Ultrasound machines and probes
- 5x Animal clippers

**Teaching Laboratory 2 (Histopathology)**

- PC
- Digital Overhead Projector Screen Projector
- Compound Microscope with camera
- 10x Overhead Monitors
- 63x Compound Microscopes
- 47x Stereo Microscopes

**Cochno Farm & Research Centre**

All of the items below are used extensively for clinical skills/animal handling practical classes. Many more items of equipment are on the farm, as would be associated with a commercial farming business.

- 5x cattle crushes, with associated race areas (3 of the crushes have electronic or mechanical weighing systems)
- Bull foot trimming crush
- 2x cow foot trimming crushes
- 3 sheds with a series of locking head yokes for cattle restraint for clinical skills training
- Sheep turnover crate
- 2x portable sheep weigh crates
- Electronic sheep weighing system with auto ID
- Equine weigh scale
- Farm Matters software for data capture for subsequent analyses by students
- Life size cow mannequin (for halter and casting rope placement training)
- Life size cow rescue mannequin (for rescue situation training)
- 8x phantom ewe lambers

**Scottish Centre for Production Animal Health & Food Safety**

- 3 X Berlingo ambulatory vehicles for farm visits
- John Deere 6230 Tractor
- JCB 180 Skid Steer
- Marshall Trailer
- 4 x cattle crushes
- Foot Trimming crush
- Milkol milking machine
- 1 Tonne bulk feed bin
- 2 x calving models
  - Incl. 15 bovine uteri
- 4 x calving aids/jacks
- Upright freezer
- 2 x fridges
- Haematospin 1300 centrifuge
- 2 x Easiscan scanners + 3 batteries

- 3 x Easiscan E3 scanners + 7 batteries
- Siui cts 900 laptop scanner
- 12 x microscopes
- 8 x refractometers

**Portnellan/Kaimhill car:**

- Thermometers x 3
- Stethoscope
- Paper towel
- Bucket and brush x 2
- Nitrile Gloves (all sizes)
- Rectal gloves (2 boxes)
- Lube
- Surgical spirit
- FAM (or similar)
- Mouth gag
- Hibiscrub
- Needles, syringes, scalpel blades etc
- Scissors
- Cotton wool & basic bandage gear
- Off licence drug book
- Portnellan book
- Dispensing pharmacy labels
- Pens (biros and marker pens)
- Sharps & rubbish bin
- Sample pots (large and small)
- A few vacutainers each colour top
- Urine dipsticks
- Fluorescence strips
- Swabs of each type
- Halter
- Head torch
- Weigh tapes – beef and dairy
- Hoof testers and hoof knives
- No drugs

**Herd visits car:**

**Examination Box 1**

- Thermometers (2)
- Stethoscope (2)
- Urine dipsticks (Ketostix, pH, Vet 10)
- Small blood sampling kit
- Examination gloves (S, M and L)
- Rectal gloves
- Lubrication gel

- Surgical spirit
- Razors
- Gigli wire and handles
- Silver aluminum spray
- Iodinated povidone (1 x 250 ml)

**Surgery Box 2**

- Surgery kit (3)
- Uterus forceps (2)
- Miscellaneous instruments
- Sterile drapes (6)
- Sterile gloves (different sizes)
- Sterile gowns
- Sterile swabs
- Scalpel blades
- Supramid metric 4 (1) + 6 (2)
- Catgut metric 5 (1)
- PGA metric 7 (3)
- Nylon tape (2) + Buhner needle
- Rumens trocars (2)
- Assorted sutures with needle

**IV Fluids 3**

- 1 x 3L 7.2% NaCl
- 1 x 5L 7.2% NaCl
- 2 x 2L 0.9% NaCl
- 1 x 1L 0.9% NaCl
- 2 x 5L Hartmans
- Fluid administration giving sets

**Sampling Box 4**

- Large blood sampling Kit
- Milk and Feces sampling tubes
- Sampling swabs
- Syringes (different sizes)
- Needles
- IV catheters

**Various**

- One Kg gel powder
- Halter
- Eight Kg incineration bags
- 500 ml lube bottle

- Consent forms and Drugs stickers
- Weighing tapes (x3)
- Meters (x3)
- Cow Magnets (x5)
- Mouth Gag
- AI catheters

#### Others

- Buckets (2)
- Brushes
- Disinfectant
- Surgical Scrub
- Cooling box
- Ketone meter
- Fluorets
- Ketone strips
- Glucose strips
- US goggles
- Glove boxes stock
- Paper roll

#### On call car

##### Examination Box

Thermometers (3)  
 Stethoscope  
 Examination lights (1)  
 Urine dipsticks  
 Fluorets  
 Sterile sample tubes  
 Vaginal swabs  
 CMT test-kit  
 Examination gloves (2 boxes)  
 Rectal gloves (2 boxes)  
 Lubrication gel  
 Surgical spirit  
 Paper roll  
 Scissors (2)  
 Mouth gag  
 Measurement tape (heart girth)

##### Medicine Box

2 x Alamycin LA  
 2 x Betamox LA  
 2 x Pen/Strep  
 1 x Norodine 24

1 x Zeleris  
 1 x Synulox RTU  
 1 x Pharmasin  
 2 x Tetracycline aerosol  
 1 x Meflosyl  
 1 x Recocam  
 1 x Colvasone  
 1 x Buscopan  
 1 x Rompun 2%  
 1 x Vitesel  
 1 x Vitbee 1000  
 Needles – Syringes – IV catheters  
 Blood samples tubes (serum, LH, EDTA)  
 Vacutainers  
 Scalpel blades

##### Surgery Box

Surgery kit  
 Uterus forceps  
 Miscellaneous instruments  
 Sterile drapes (2)  
 Sterile gloves (different sizes)  
 Sterile gowns (2)  
 Sterile swabs  
 Instrument cleaner (3)  
 Syringes – Needles – Scalpel blades  
 Supramid metric 3 (1) + 6 (2)  
 Catgut metric 3 (1) + 6 (2)  
 Lambing ropes (3)  
 Nylon tape (2) + Buhner needles  
 Rumen trocars (2)  
 Willcain (2)

##### Repro Box

1 x CIDR  
 2 x Receptal  
 2 x Estrumate  
 1 x Planipart  
 Needles (18G) – Syringes (2ml + 5ml)

##### Fluids (oral – IV)

2 x 3L 7.2% NaCl  
 2 x 3L 0.9% NaCl  
 Effydral tablets (1 box)  
 2 x giving set  
 IV catheters



Other

6 x Calciject 5

2 x Calciject 6

4 x Magniject 9

4 x Glucose 40%

1 box Pro-rumen

1 x Ketol 1L

Flutter valves (2)

Buckets (3)

Brush

Disinfectant

Surgical Scrub

Hoof knives (3 x left, 3 x right)

Bandages

Cotton wool

Animalintex (2)

## PROGRAMME FOR 2019

### DAY 1 – MONDAY 29 APRIL 2019

**Chair: Dr Jenny Hammond**, Senior Lecturer and BVMS Programme Leader

**08.15 - 09.00**            **BREAKFAST** The Barn (*Sponsored by Glasgow Vet School*)  
Come and enjoy breakfast in The Barn

#### Ilay Lecture Theatre

**09.00 – 09.30**            **Assemble in Ilay Lecture Theatre for Induction Briefing**  
Professor Ewan Cameron

**09.30 – 10.00**            **An introduction to Professional Phase**  
Dr Jenny Hammond

**10.00-10.20**            **Your Final Year Assessments in Depth (Portfolio)**  
Dr Jenny Hammond

**10.20– 10.30**            **\*Selective Opportunities – Herd Health**  
Mr Martin Tomlinson

**10.30 – 11.00**            **BREAK**

**11.00 - 12.00**            **\*North American Veterinary Licensing Examination (NAVLE)**  
Dr Zamantha Marshall

**12.00 – 13.00**            **LUNCH**

**13.00 – 14.00**            **Case Report, Literature Search Skills & Referencing**  
Dr Jennifer Hammond & Mr Neil Carey (*Glasgow University Library and Information Services*)

**14.00 - 14.30**            **“A career in veterinary research: where, why and how?”**  
Dr Tom McNeilly  
Moredun Research Institute

**14.30 – 15.15**            **Veterinary Internship & Residency Matching Programme (VIRMP)and  
Veterinary Postgraduate Education (VPE) – What else is there to learn?**  
Mr William Marshall

**15.15 – 15.30**            **BREAK**

**15.30 – 17.00**            **An Introduction to StringSoft**  
Prof Ian Ramsey & Sharon Reid

## DAY 2 – TUESDAY 30 APRIL 2019

## Illy Lecture Theatre

09.30 – 09.40	<b>Your Final Year Assessments in Depth (DOPS)</b> Mr Andy Bell
09.40 – 10.00	<b>Small Animal Hospital Orientation</b> Mr Andy Bell
10.00 – 10.30	<b>BREAK</b>
10.30 – 11.00	<b>Core Rotations Production Animal Practice/Working Safely (Production Animal)</b> Miss Jayne Orr
11.00 – 11.45	<b>“Making mistakes and making the most of them”</b> Erin Thompson 2017 GUVS graduate
11.45 – 12.00	<b>*Selective Opportunities – Sheep &amp; Dairy Practice</b> Mr George King
12.00 – 13.00	<b>LUNCH</b> - The Barn ( <i>Sponsored by the British Veterinary Association</i> )
13.00 - 14.00	<b>Dealing with Stress in the Veterinary Profession</b> Dr Rosie Allister Vet Helpline
14.00 – 15.00	<b>Euthanasia and Dealing with Client Grief</b> Mrs Maureen Carnan & Dr Zamantha Marshall

**DAY 3 – WEDNESDAY 1 MAY 2019****Illy Lecture Theatre**

<b>09.00 -09.30</b>	<b>Working Safely in the Small Animal Hospital</b> Dr Martin Shevlin
<b>09.30 – 10.30</b>	<b>RCVS Knowledge EBVM toolkit</b> Ms Alexandra Raftery
<b>10.30 – 10.50</b>	<b>Core Rotations Small Animal - Specialist</b> Mrs Alix McBrearty
<b>10.50 – 11.05</b>	<b>Social Media in the Workplace</b> Dr Fiona Dowell
<b>11.05 - 11.15</b>	<b>BREAK</b>
<b>11.15 – 11.45</b>	<b>Core Rotations Anaesthesia &amp; Diagnostic Imaging</b> Dr Pat Pawson/ Mr Gawain Hammond
<b>12.00 - 13.00</b>	<b>Infection Control in the SAH</b> Ms Lorraine Jackson
<b>13.00 – 13.15</b>	<b>*Selective Opportunities – Exotics/Fish/Pigs/Lab/Poultry/Research</b> Dr Jenny Hammond
<b>13.15 – 14.00</b>	<b>LUNCH</b>
<b>14.00 – 14.30</b>	<b>*Selective Opportunities – Wildlife &amp; Conservation/WLM</b> Dr Karen MacEachern
<b>14.30 – 15.00</b>	<b>VDS Leadership Talk</b> Training Dept
<b>15.00 – 16.30</b>	<b>“How to Avoid Trouble!”</b> Mr David McKeown, Member Services Director Veterinary Defence Society
<b>17.00</b>	<b>VDS Pizza (The Barn)</b>

**DAY 4 – THURSDAY 2 MAY 2019****Illy Lecture Theatre****Chair: Professor Jim Anderson BVM&S**, Associate Head (Learning, Teaching & Assessment)

<b>09.30 – 09.45</b>	<b>*Selective Opportunities – Equine Practice</b> Dr Joel Hotchkiss
<b>09.45 – 10.00</b>	<b>NSS Survey</b> Professor Ewan Cameron & Ms Sarah Chiodetto
<b>10.00 - 10.20</b>	<b>Core Rotations Equine Practice</b> Dr Joel Hotchkiss
<b>10.20 - 10.40</b>	<b>Core Rotations Public Health &amp; Pathology</b> Ms Noelia Yusta/ Dr Hayley Haining/ Dr Francesco Marchesi
<b>10.40 - 11.00</b>	<b>*Selective Opportunities – Pathology</b> Dr Caroline Millins/ Dr Hayley Haining
<b>11.00 – 11.30</b>	<b>*Selective Opportunities – Small Animal Hospital Selective</b> Mr William Marshall
<b>11.30 – 11.40</b>	<b>BREAK</b>
<b>11.40 – 12.00</b>	<b>*Selective Opportunities – Morocco Working Equids</b> Dr David Sutton
<b>12.00 – 13.00</b>	<b>LUNCH</b> - The Barn ( <i>Sponsored by RCVS</i> )
<b>13.00 - 15.00</b>	<b>Professional Development Phase</b> Mrs Jill Hubbard, PDP Dean Royal College of Veterinary Surgeons  <b>Overview of the College</b> Ms Amanda Boag (President) Royal College of Veterinary Surgeons  <b>Code of Professional Conduct</b> Ms Eleanor Ferguson (Registrar / Director of Legal Services) Royal College of Veterinary Surgeons
<b>15.00 – 16.00</b>	<b>Core Rotations Small Animal – Primary Care</b> Mrs Maureen Carnan/ Mrs Louise Anderson/Mr Paul Eynon/Miss Jennifer McKenzie
<b>16.00 – 17.00</b>	<b>Visiting Talk</b>

## DAY 5 – FRIDAY 3 MAY 2019

## Illy Lecture Theatre

- 09.30 – 10.30**      **British Veterinary Association**  
Mr Simon Doherty, President - *SKYPE presentation*  
(Facilitated in attendance by Sharleni Inbanathan (BVA))
- 10.30 – 12.00**      **Job Interview – Session – Group A**  
Mrs Katrina Gardner (*Glasgow University Careers Service*)  
**Don't Sell Yourself Short: CV session – Group B (McCall LT)**  
Dr Adrian Nelson- Pratt, Society of Practising Veterinary Surgeons (SPVS)
- LUNCH**
- 10.30 – 15.30**      **Careers Fair (Held in Mary Stewart Building)**
- Vets4Pets / Companion Care Vets*  
*APHA (Animal and Plant Health Agency)*  
*Independent Vet Care*  
*VetsNow*  
*Pets'n'Vets*  
*Towcester and Onley Equine Vets*  
*PDSA*  
*BVA*  
*Animal Trust*  
*Vet Partners*  
*Bright Leaf Recruitment*  
*JHP Recruitment*  
*Lloyd & Cowan Veterinary Recruitment*  
*The Vet Service*  
*VetSure*  
*SPVS*  
*Nantwich Vet Group*  
*MediVet*  
*FIVP (Federation of Independent Veterinary Practices)*  
*Banfield Pet Hospital*
- 14.00 – 15.30**      **Job Interview – Session – Group B**  
Mrs Katrina Gardner (*Glasgow University Careers Service*)  
**Don't Sell Yourself Short: CV session – Group A (McCall LT)**  
Dr Adrian Nelson- Pratt, Society of Practising Veterinary Surgeons (SPVS)
- 15.30 - 16.00**      **Animal Trust – UKs first not-for-profit veterinary company**  
Kirsty Warren, Lead Vet at Tingley Animal Trust, Leeds
- 16.00 - 16.30**      **Final Year Q&A Session**  
Gregor Coull & Ellie Glover
- 16.30 – 17.00**      **Glasgow Young Vet Network**  
Mrs Louise Anderson
- 17.00**                **Final Year Jackets – Pick up**

**NOTE:**

The Compulsory workshop - Feedback in Professional Phase will be on the Moodle scheduler for students to book a slot.

**Compulsory Workshop - Jenny Hammond, MSB Seminar room****Feedback in Professional Phase**

<b>Monday</b>	<b>12.00 - 13.00</b>
<b>Tuesday</b>	<b>12.00 - 13.00</b>
<b>Thursday</b>	<b>11.00 – 12.00</b>
<b>Thursday</b>	<b>12.00 – 13.00</b>

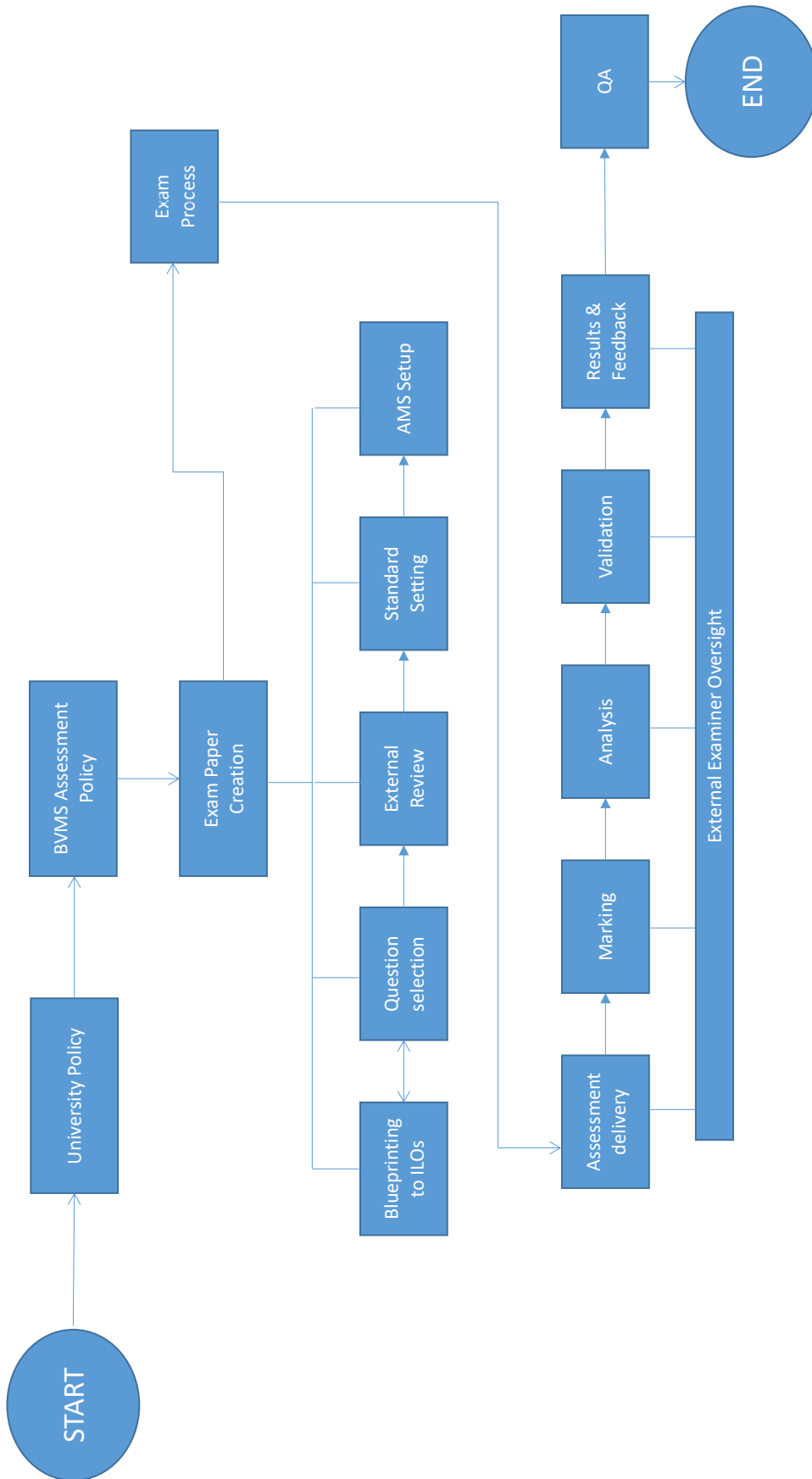
**Compulsory Workshops: Groups will be posted****Job Interview – Ilay LT**

<b>Friday</b>	<b>10.30 - 12.00</b>	<b>Group A</b>
<b>Friday</b>	<b>14.00 – 15.30</b>	<b>Group B</b>

**Don't Sell Yourself Short: CV session - SPVS - McCall LT**

<b>Friday</b>	<b>10.30 - 12.00</b>	<b>Group B</b>
<b>Friday</b>	<b>14.00 – 15.30</b>	<b>Group A</b>





Project Title	Duration (Years)	Grant Income per year*
A microbial basis for Atlantic Salmon energetics	3.00	£195,953
A One Health approach to pan-valent morbillivirus vaccines	3.00	£124,723
A One-Health approach to dissecting the diverse zoonotic causes of non-malaria febrile illness	4.00	£43,668
Affordable, scalable, low technology transfluthrin emanators for protecting against Zika transmission in low income countries	3.00	£26,780
AfricanBioServices	4.25	£178,017
Atypical bovine morbillivirus infections in the Serengeti ecosystem	3.00	£150,994
Beyond 2020 (Burrishoole Ecosystem Observatory Network 2020)	4.00	£30,236
Biodiversity offset markets for wetland conservation	2.00	£54,141
Brucellosis in Kenya - Modelling Transmission & Interventions Across Systems	1.00	£77,506
Coastal marine behaviour of Atlantic salmon	3.00	£53,695
Contracts for effective and lasting delivery of agri-environmental public goods	4.00	£98,771
Coulouts HBLB Postdoc	3.00	£84,769
Cultural, social and economic influences on ongoing schistosomiasis transmission, despite a decade of mass treatment, and the potential for change	2.00	£112,371
Decompression killing of laboratory rodents: a humane alternative to carbon dioxide?	3.00	£149,205
Development of a new tool for malaria mosquito surveillance to improve vector control	2.00	£294,506
DIFIE	2.00	£70,441
Dissecting variation in host responsiveness to a recombinant vaccine designed to control teladorsagiosis in sheep	3.00	£80,168
Ecology of insecticide resistant vectors: consequences for the effectiveness of malaria control strategies	3.00	£97,832
Effect of circadian disruption on telomere dynamics	3.00	£190,320
Enhancing the Health and Productivity of Livestock (PEHPL)	4.00	£83,488
EPIC 2018/19 - Gilbert	0.58	£51,383
EPIC Centre of Expertise in Animal Disease Outbreaks	1.00	£886,089
Evolutionary ecology and dynamics of pharyngeal microbial communities in humans	3.00	£43,836
From egg-laying to live-bearing: Unravelling the genetics of a major evolutionary transition	3.75	£120,510
From observation to intervention: overcoming weak data with new approaches to complex biological problems	3.17	£57,445
How your partner's past stress affects your current and future health	2.00	£82,985

Human Frontier Science Program	3.00	£85,771
Identification of the photoreceptor for light detection in the avian brain	1.67	£77,619
Impounded lochs salmon smolt tracking project: consumable costs	1.58	£28,421
Improving capacity for foot and mouth disease surveillance and prevention in Africa through direct community engagement	2.00	£48,117
Improving sarcoid management: An epidemiological and molecular approach	3.50	£46,601
Improving the efficacy of malaria prevention in an insecticide resistant Africa	3.00	£81,481
Investigating the epidemiology of endemic Giardia in Scotland using a whole genome sequencing approach	2.50	£115,344
Investigating genetic composition of Onchocerca worms pre- and post-drug treatment: Improving the ability to test macrofilaricidal drug efficacy	4.00	£205,673
Joint Doctorate in Molecular Animal Nutrition	4.00	£168,410
Karimjee Conservation Scholars	3.00	£125,534
Lankester NIH proposal - rabies project	5.00	£47,126
Lembo Royal Society May 2018	3.00	£74,792
Living apart together? The common biological determinants of space use patterns in animals	2.00	£43,950
Maintaining a unique parasite life cycle and development of post-genomic resources	3.00	£69,005
Managing viral emergence at the interface of bats and livestock	5.00	£195,277
Marine migration of salmon in the Cromarty Firth	3.00	£92,577
Mathematical Theory and Biological Applications of Diversity	2.00	£50,296
Mechanisms underlying the growth-lifespan trade-off	3.00	£86,324
Molecular determinants of equine influenza virus virulence	3.00	£78,009
Monepantel: anthelmintic resistance and the development of tools for sustainable use	1.00	£446,102
Novel molecular approaches for understanding the epidemiology of endemic anthrax	3.00	£101,938
Operationalising One Health Interventions in Tanzania (OOHTZ)	1.50	£225,665
Painted Wolves of the Serengeti	3.00	£144,976
PALE-Blu	3.50	£146,412
PHYSFISH	5.00	£230,772
Predicting the risk of equine fatal injury during racing	2.00	£44,109
RAE: The Ingenious Circus	1.17	£25,707
Rapid, accurate, on-farm diagnosis and monitoring of mastitis in dairy cows	2.50	£93,614
Reducing the risk of equine injury in endurance rides continued	2.00	£69,500
Resistance in Agriculture: Investigation of Anthelmintic Drug Uptake and Resistance Mechanisms in Gastrointestinal Nematode Parasites of Livestock	3.00	£128,810

Salmon Gut Project	1.50	£67,763
SAREE	3.00	£67,828
SCHISTO-PERSIST	5.00	£221,235
Seabirds and wind - the consequences of extreme prey taxis in a changing climate	5.00	£98,859
SeaMonitor	3.50	£111,459
Serengeti Biodiversity Monitoring	3.50	£186,267
Social networking in plants: biodiversity as a selective force for inter-plant signalling	3.00	£33,262
Social, economic and environmental drivers of zoonoses in Tanzania (SEEDZ)	4.00	£564,470
SPEEDIER	3.00	£122,278
Studies on Ecology, Colonization and Genetic Diversity of the Afro-tropical Malaria Vector, Anopheles funestus	2.00	£82,517
Sundarbans fisheries: a model system for the application of landscape ecology and social science approaches to management	0.33	£80,698
Supporting Evidence-Based Interventions to Achieve Agricultural Development Goals (SEBI)	2.50	£376,972
Supporting the National Action Plan for Antimicrobial Resistance (SNAP-AMR) in Tanzania	3.00	£589,154
Sustainable Interventions for an Emerging Livestock Disease Problem in East Africa	1.50	£37,832
The BUG consortium Building Upon the Genome: using H. contortus genomic resources to develop novel interventions to control endemic GI parasites	5.50	£246,371
The identification of toxic pathways associated with canine degenerative myelopathy mutant SOD1 protein: a potential model of fALS	1.50	£31,246
The Influence of Individual Physiology on Group Behaviour in Fish Schools	7.00	£76,096
The interactive effects of physiology and climate change on capture vulnerability of individual fish	2.00	£38,031
The interplay between life history evolution and population dynamics can help us conserve data-poor species and reveal how they evolved	3.00	£81,148
The predictability and limits of evolution to increased temperature: insights from a natural 'experiment'	4.00	£222,448
The rates and routes of transmission of multidrug resistant Klebsiella clones and genes into the clinic from environmental sources.	3.00	£57,138
The Science of Rabies Elimination	5.00	£458,046
Understanding cultural, social, and epidemiological drivers of human anthrax infection in rural African communities	1.33	£74,918
Unravelling the impact of artificial light at night on circadian disruption, immunity, and infection risk	4.00	£274,400
Unravelling the biological determinants of space use patterns in animals	2.00	£83,435
US-UK Collab: Mycobacterial Transmission Dynamics in Agricultural Systems: Integrating Phylogenetics, Epidemiology, Ecology and Economics	4.00	£94,909
Water Voles in the City	1.00	£56,135
Why do fish fail at high temperatures?	3.00	£172,428

\* Only including those research programmes with grant income of at least £25,000 per year.

Clinical Club 'Canine and feline diabetes mellitus'
Clinical Club 'Case based ophthalmology'
Clinical Club 'Top tips for common soft tissue surgery techniques in practice'
Clinical Club 'A step by step guide to neurolocalisation'
Clinical Club 'Understanding proteinuria'
Clinical Club 'Understanding Bleeding Disorders'
Clinical Club 'An Update about canine mast cell tumours'
Clinical Club 'Locomotor/Skeletal Imaging Rounds'
Clinical Club 'Should we neuter pets? A review of the positive and negative effects on the individual animal's health and welfare'
Clinical Club 'A case-based approach to anaesthesia of sick patients'
Clinical Club 'Corticosteroids – the best little drugs in town?'
Clinical Club 'An approach to the emergency cardiac case'
Clinical Club 'The diagnosis and management of canine anal sac adenocarcinomas'
Clinical Club 'Clinical pathology: 'Interpretation of CBCs and basic biochemistry from your in-house analysers'
Clinical Club 'Understanding Hepatobiliary and Pancreatic Disease in Cats'
Clinical Club 'A selection of neurological cases (videos) with a focus on central localisations'
Clinical Club 'Living life to the full as a vet - a guide to building mental resilience'
Clinical Club 'Radiology of Common Abdominal Disease'
Clinical Club 'GI workups and helpful tips for 'ex-laps'
Clinical Club 'Canine Hypoadrenocorticism – An update'
Clinical Club 'Orthopaedic Emergencies and the Link between Owner and Pet Obesity'
Clinical Club 'Emerging Infectious Disease'
Clinical Club 'The broken heart – an update on mitral valve disease'
Clinical Club 'What's new in the management of canine epilepsy'





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