

UNIVERSIDADE DO PORTO
INSTITUTO DE CIÊNCIAS BIOMÉDICAS DE ABEL SALAZAR

Integrated Master Degree in
VETERINARY MEDICINE



For the EAEVE visit

Approved by the Dean

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Table of Contents

INTRODUCTION	1
Chapter 1: OBJECTIVES	2
1.1 FACTUAL INFORMATION	2
1.2 COMMENTS.....	3
1.3 SUGGESTIONS	3
Chapter 2: ORGANIZATION.....	4
2.1 FACTUAL INFORMATION	4
2.2 COMMENTS AND SUGGESTIONS.....	8
Chapter 3: FINANCES	9
3.1 FACTUAL INFORMATION	9
3.1.1 GENERAL INFORMATION.....	9
3.1.2 INFORMATION ON EXTRA INCOME	10
3.1.3 OVERVIEW INCOME (REVENUE) AND EXPENDITURE.....	11
3.2 COMMENTS AND SUGGESTIONS.....	11
Chapter 4: CURRICULUM.....	13
4.1 FACTUAL INFORMATION	13
4.1.1 POWER OF SUBJECTS AND TYPES OF TRAINING.....	15
4.1.2 UNDERGRADUATE CURRICULUM FOLLOWED BY ALL STUDENTS	15
4.1.3 FURTHER INFORMATION ON THE CURRICULUM.....	19
4.1.4 OBLIGATORY EXTRAMURAL WORK	23
4.1.5 SPECIFIC INFORMATION ON THE PRACTICAL TRAINING IN FOOD HYGIENE/PUBLIC HEALTH	24
4.2 COMMENTS.....	26
4.3 SUGGESTIONS	26
Chapter 5: TEACHING AND LEARNING: QUALITY EVALUATION.....	27
5.1 FACTUAL INFORMATION	27
5.2. COMMENTS.....	33
5.3 SUGGESTIONS	33
Chapter 6: FACILITIES AND EQUIPMENT	34
6.1 FACTUAL INFORMATION	34
6.2 and 6.3 COMMENTS AND SUGGESTIONS	45
Chapter 7: ANIMALS AND TEACHING MATERIAL OF ANIMAL ORIGIN	46
7.1 FACTUAL INFORMATION	46
7.2 COMMENTS.....	54
7.3 SUGGESTIONS	54

Chapter 8: LIBRARY AND LEARNING RESOURCES.....	56
Chapter 9: STUDENT ADMISSION AND ENROLMENT	59
9.1 UNDERGRADUATE COURSES.....	59
Chapter 10: ACADEMIC AND SUPPORT STAFF	63
10.1 FACTUAL INFORMATION	63
10.2 COMMENTS AND SUGGESTIONS.....	65
Chapter 11: CONTINUING EDUCATION.....	67
11.1 FACTUAL INFORMATION	67
11.2 COMMENTS AND SUGGESTIONS.....	68
Chapter 12: POSTGRADUATE EDUCATION.....	70
12.1 FACTUAL INFORMATION	70
12.2 COMMENTS AND SUGGESTIONS.....	72
Chapter 13: RESEARCH.....	73
13.1 FACTUAL INFORMATION	73
13.2 COMMENTS AND SUGGESTIONS.....	74

INTRODUCTION

Since the course has been evaluated in 2002, several changes took place at various levels. As in almost all European countries, the course was adapted to the Bologna principles and rules, changing from a DVM to a Master's degree. In this process, several of the suggestions made by the experts' team in the 2002 evaluation were integrated in the study programme. Also, important modifications at the organizational levels were implemented and a higher autonomy of the course direction was achieved, as detailed in Chapter 2. In 2012, the new Porto premises were available and consequently teaching quality was improved in several subjects (e.g. small animal medicine and surgery; food technology) (Chapter 6). The last eight years represented an important challenge to the Establishment, the University and the entire Higher education Portuguese network due to the national impact of the global economic crisis that led to the implementation of hard rules regarding expenses, hiring, and career progression. Students were also affected by the situation, many of them having to simultaneously study and work to be able to pay for their studies (and often to contribute to the family income). In spite of such constraints, it was possible to improve the course quality and to accompany the evolution of the veterinary science in all of its faces.

Chapter 1: OBJECTIVES

1.1 FACTUAL INFORMATION

The Institute of Biomedical Sciences Abel Salazar (ICBAS) is an entity of the organizational model of the University of Porto (U.Porto) being, according to its statutes, a teaching organic unit. The ICBAS mission is to create, transmit and disseminate knowledge in the area of health and life sciences. The scientific domains of ICBAS are framed within the Fundamental and Applied Biology, namely in the areas of Health, Environment, Animal Production and Food Processing and Quality. The ICBAS training emphasizes the preparation of professionals in human medicine, veterinary medicine, aquatic sciences, biochemistry and bioengineering, or specialization in the 2nd and 3rd cycle programs in these and related areas. In pursuit of its mission, ICBAS collaborates closely with other organizational organic units of the U.Porto and it is committed to collaborate and serve the university's community and the society at large. It should be seen, as an integral part of these objectives in its complementarity, the cultural, civic and humanistic education of the ICBAS community, the appreciation of the environment and patrimony, and the preservation of the institution memories, providing an important engine for the development of personal and interpersonal skills and the promotion of lifelong learning.

The Integrated Master Degree in Veterinary Medicine (IMVM) is an essential part of the ICBAS overall mission, particularly in its animal component that, when integrated in the global concepts of "one health" by its institutional proximity of the training in medicine, biochemistry, bioengineering, aquatic sciences (ICBAS) and pharmacy (FFUP), gives the opportunity to acquire specific skills integrated on a mission of global intervention for animal, human and environmental protection. The objectives of our institution are listed in the document "Professional general attributes and capacities for the newly graduated Veterinarian", where an extensive statement of what is expected from the newly graduated Veterinarian is described (appendix 1). This document was elaborated by the Scientific Committee of the IMVM (SCIMVM), promulgated by the Dean upon consultation of the ICBAS Scientific Council and made available to the community in the course web page (SIGARRA). In 2013, the list of competences was integrated in the Course Regulation. Upon a detailed enquiry of all regents of Curricular Units (CU) it was concluded that all objectives were taught during the course curriculum. Revision of

the ICBAS objectives is a competence of its Representative's Commission, integrated in the revision of its statutes requiring approval by 2/3 of its members. Review of the new graduate's attributes and capacities are a competence of the SCIMVM at any time deemed necessary.

1.2 COMMENTS

As mentioned, a recent regents' survey allowed the assumption that all subjects are taught during the course. However, its balance needs also to be evaluated. The course Director required, in 2015, a comprehensive students' analysis of their opinion on strengths and weakness of the curriculum, an important base-document that, in conjunction with the teachers' view, will constitute the basis of the diagnosis and amendment of the curriculum. Its implementation will probably require a different model of coordination, whose strategy is currently being discussed by the SCIMVM. Informal contacts with alumni and stakeholders of the profession allow us to assume that the objectives are currently being achieved with above-average quality.

1.3 SUGGESTIONS

The definition, evaluation and implementation of the course objectives are clearly a dynamic and continuous process that requires constant attention by the course director, in articulation with the SCIMVM, the teachers, students, alumni and stakeholders. The latter two are the hardest to involve and we believe that the creation of an IMVM external relations committee would increase the efficacy of such task.

Chapter 2: ORGANIZATION

2.1 FACTUAL INFORMATION

Details of the establishment:

Name: Instituto de Ciências Biomédicas Abel Salazar (ICBAS)

Address: Rua de Jorge Viterbo Ferreira n.º 228,
4050-313 PORTO
Portugal

Telephone: + 351 220 428 000

Fax: + 351 220 428 090

E-mail address: icmota@icbas.up.pt

Website: www.icbas.up.pt

Title and name of head of the establishment:

Diretor (Dean) António Sousa Pereira (Full Professor)

E-mail address: condir@icbas.up.pt

University: Universidade do Porto

Address: Reitoria da Universidade do Porto,
Praça Gomes Teixeira
4099-002 Porto
Portugal

Telephone: + 351 220 408 000

Fax: +351 220 408 186 / 7

Website: www.up.pt

ICBAS is a college within the University of Porto with full administrative, financial, pedagogical and scientific autonomy, although its statutes have to conform to the University statutes which, in turn, have to conform to the corresponding national legislation. All courses of the national higher education network are overseen and evaluated by the Agency for Assessment and Accreditation of Higher Education - A3ES, a private law foundation established for an indeterminate period of time, with legal status and recognized as being of public utility, with the purpose of promoting and ensuring the quality of higher education. The Agency, a full member of ENQA, is independent in its decisions which must take into account the guidelines prescribed by

the State. The assessment and accreditation regime developed by the Agency is defined by Law (38/2007, of August 16th).

ICBAS has the following government organs: Representatives Council; Dean; Executive Committee; Scientific Committee; Pedagogical Committee. Their statutory competences are described in detail in appendix 2.

Briefly, the Representatives Committee is composed by nine full time professors/investigators, four students, one non-professor/non-researcher, and one co-opted external personality, all but the latter elected by their peers. Its competences include elaborating statutes and regulations, to evaluate the Dean's actions and decisions, to create or extinguish Departments, to organize the Dean's election process and communicate its results to the University Rector, among others.

The Executive Committee is composed by the Dean, two professors (one nominated Vice-Dean), one student, and one non-professor, all designated by the Dean. Their competences include the general management of the Establishment according to its Statutes and the University Statutes, overseen by the Representatives Council.

The Scientific Council is presided by the Dean and composed by 25 full-time professors, being one member elected by each Department; one representative of each research unit; at least 5 professors elected in open lists; and 4 external co-opted elements. The Scientific Council appreciates the strategic plans of ICBAS, the creation or extinction of Departments, research units or courses, the distribution of the teaching workload, academic awards, institutional collaborations, juries, and career promotions, among others.

The Pedagogical Committee has 16 members, equally distributed among teachers and students, elected by their peers. It is headed by one professor, elected by the Council members, and its competences include, among others, to appreciate the teaching guidelines and methods, to promote regular inquiries of the pedagogical performances, to receive and appreciate students' complaints, proposals and special requirements, to elaborate and approve pedagogical rules and regulations, to appreciate proposals of curricular modifications.

ICBAS has two Committees dealing with ethical issues. Projects involving humans or human biological products are appreciated by CETI (Ethics Committee) while projects involving animals or animal biological products are appreciated by ORBEA (Organism responsible for animal welfare). Both organs evaluate and monitor scientific projects, teaching and extension services.

ICBAS is divided into ten Departments - Anatomy, Aquatic Production, Behaviour Sciences, Chemistry, Immunophysiology and Pharmacology, Microscopy, Molecular Biology, Pathology and Molecular Immunology, Population Studies, and Veterinary Clinics - grouping human and material resources, with a minimum of 10 professors and researchers, directly under the supervision of the Executive and Scientific Councils. Each Department has one Director and one Department Council composed by the Director, the Course Directors included in the Department, if any, and representatives of the professors, researchers and non-professors, not surpassing a total of 10 members. The selection methods are defined in each Department's regulation.

The Students Association (AEICBAS) is an independent non-profit organization that promotes the union of all ICBAS' students and organizes events aiming to contributing to the enrichment of the curriculum for both students and professionals. The main role of the association is to be an interface between the students and the Establishment, acting as a "students' union" in defence of their rights; improvement of the teaching quality; help in obtaining better quality of life; and establishing connections with external organizations and institutions as the official representative of the students.

AEICBAS represents students of all courses including doctorates, masters, and integrated masters, totalling nearly 3200 members. The Association has three management bodies: the Executive Board constituted by 45 students (1/5 are students of veterinary medicine), divided by different departments and responsible for administration and activities. Five students compose the Fiscal Council that examines and approves the financial report of the executive board. The most important body is the General Assembly composed by all students with equal rights of vote. Elections for these governing bodies occur every year. AEICBAS is a member of the Veterinary Medicine National Academic Federation, a member of the IVSA.

The next page displays the organogram of the administrative structures showing the position of ICBAS in relation to the university and ministerial structure, followed by its internal organization.

Each of the five undergraduate degrees (Human medicine; Veterinary medicine; Aquatic sciences; Biochemistry; Bioengineering) has one Director, one Scientific Committee and one Monitoring Committee. The Scientific Committee of the IMVM (SCIMVM) is composed by the Director, an Assistant Director and four professors that represent the IMVM major structural branches. The Monitoring Committee is composed by the Director, one professor (distinct from the members of the SC) and two students. Both committees are approved by the Dean upon proposal by the Director. The Director ensures the normal functioning of the IMVM; oversees its quality and promotes the coordination between programs and teaching methods of the various CUs. Each year, the Director elaborates, in coordination with the SCIMVM and the Department Directors, the distribution of teaching workload for approval by the ICBAS Scientific Council and promulgation by the Dean. The need for consensus in the attribution of the teaching workload requires an open dialog and a good coordination between the responsible for one course (course Director) and those that often need to attend to various courses (department Directors), requiring a transversal coordination and a judicious use of resources. The good outcome of such effort is that IMVM students benefit from a solid and pluripotent biomedical basis, complemented with a technical background that encompasses the main areas of the veterinary activity.

The designated CU Regents fulfil the CU sheet on SIGARRA (objectives, program, teaching and evaluation methods, bibliography, special issues), subsequently validated by the IMVM Director, if considered adequate.

The SC and MC supervise the IMVM functioning, debate the needs for change and promote the implementation of corrective measures.

Details on the statutory functions of the several administrative structures may be found in the appendices.

2.2 COMMENTS AND SUGGESTIONS

The recommendations and suggestions made by the team of experts of the 1st EAEVE evaluation were fundamental for the current organization of the IMVM. One major concern was the lack of authoritative powers to decide upon the veterinary curriculum and the orientation of its contents, a concern that was shared by the staff. This problem was definitively solved by the implemented structure.

Chapter 3: FINANCES

3.1 FACTUAL INFORMATION

3.1.1 GENERAL INFORMATION

The financing of ICBAS follows the legal higher education financing rules in Portugal, with an annual State Budget that is proposed by the Government and approved by the National Assembly. The Ministry for Science and Higher Education (MSHE) is responsible for the definition of public funding amongst the Portuguese Universities. Within the University, the distribution of public funding is decided by the Rector's office upon discussion with the Deans of its Establishments (a body named "Management Council"). The Establishments possess financial autonomy albeit they must comply with the public accounting rules and regulations. Public funding constitutes the majority of ICBAS revenue (62.2% in 2014) and is calculated on the basis of a formula that includes the number of students; a cost factor for each specific area; the graduation efficiency of the undergraduate and advanced courses; the qualification of the teaching staff; and a national student basic budgetary allocation. The remaining of the revenue is acquired and managed directly by each Establishment's Dean and includes students fees; research funding; and income from services provided. Undergraduate student fees are annually fixed by the government after a proposal from the Universities (ICBAS received € 999.00 per student for the 2014/2015 academic year). Fees from Masters and PhD students (fixed by the University's General Council) are also considered as income generated by the Establishment.

The internal allocation of funds is decided by the Executive Committee. In 2014, 66% of the expenditure was allocated to salaries and 29% to the acquisition of goods and services. From the latter, nearly 10% was distributed to the Departments, aiming for the improvement of the teaching quality, according to a formula that includes the number and type of training hours; number of teachers with a PhD degree; and the Department scientific productivity. No funding is directly managed by the undergraduate course directors. From the Masters and PhD fees, the Dean retains 20% for overheads and the remaining is managed by the Course Directors. In what concerns research projects, the Dean retains 20-25% for overheads and the remaining is administered by the principal investigator. Income from services provided to the community is subjected to 10-20% of overheads and the remaining is administered by the head of the service. To note that

77% of the services income relates to veterinary activities (pathology; microbiology; small animal veterinary hospital; equine clinics; animal reproduction centre; animal production consulting services).

In the Portuguese high education system, each graduation course has official teaching staff/student and support staff/teaching staff ratios that constitute the basis for calculating how many lecturers and staff members each University is allowed to include in the official budget. The non-shared ICBAS courses' teaching staff/student and support staff/teaching staff ratios are 1:6 and 1:0.85 for Human Medicine; 1:9 and 1:0.85 for Veterinary Medicine; 1:11 and 1:0.75 for Aquatic Sciences, respectively. The salary of each staff member is annually fixed by the Government.

Funding for major equipment investments has two sources: application for European or national tenders or by direct purchase. The latter is decided by the Executive Committee, upon Department's proposal should the Department funds not suffice. The Executive Committee privileges, but do not restricts its acceptance to, proposals that are subscribed by more than one Department. Building maintenance, general services (cleaning, security, etc.) and library are directly managed by the Executive Committee.

Capital expenditures are funded by EU (European Regional Development Fund) or national funding programs.

No percentage of income has to be given to other Establishments on a regular basis. However, the Rector's office has instituted a cohesion mechanism amongst its Establishments that requires that when one Unit is facing financial problems in a given moment, those that are in good financial health at that moment are required to contribute to help the former. The volume of such contribution is defined by agreement with the Dean of the contributor Establishment.

3.1.2 INFORMATION ON EXTRA INCOME

As stated, no percentage of income has to be given to other bodies on a regular basis. Students pay tuition fees (€ 999.00 per student for the 2014/2015 academic year), decided by the Rector's office within a maximum defined by the MSHE and distributed within the general income management of the Establishment.

3.1.3 OVERVIEW INCOME (REVENUE) AND EXPENDITURE

Table 3.1.1: Income/Revenue (ICBAS)

Year	State (government)		Income generated by the Faculty			Total
	To university administered outside the Faculty	Direct to Faculty	Income from services provide	Research	Student fees	
2012	98.553.818	9.207.484	440.531	839.019	3.380.584	13.867.618
2013	116.498.709	10.004.756	797.459	773.807	3.348.364	14.924.386
2014	115.648.602	9.787.869	566.490	791.493	3.141.240	14.287.092

Table 3.1.2: Income/Revenue (Veterinary Medicine)*

Year	State (government)		Income generated by the Faculty			Total
	To university administered outside the Faculty	Direct to Faculty	Income from services provide	Research	Student fees	
2012			151.327		451.136	602.463
2013			190.486		417.783	608.269
2014			244.198		388.355	632.533

* The fact that all Departments are involved in teaching veterinary subjects hampers the exact estimation of the budget that is exclusively allocated to the IMVM

Table 3.2: Expenditure (ICBAS)

Year	Pay	Non Pay				Total
	Salaries	Teaching support	Research support	Clinical support	Other ¹⁾	
2012	8.350.808	2.183.699	595.056	84.758	2.459.663	13.673.984
2013	9.404.741	2.237.475	460.306	73.796	1.649.816	13.826.133
2014	9.494.697	2.541.512	433.518	175.514	1.600.016	14.245.258

¹⁾ Utilities, buildings, capital, etc.

3.2 COMMENTS AND SUGGESTIONS

Globally, the current financial model allows for the fulfilment of the Establishment mission. ICBAS has never had the need to appeal for the cohesion mechanism funds but rather has been a net contributor for it. In the face of the European economic crisis, that affected Portugal in particular, such management required, and continues to require, hard

work and good monitoring, attention to funding opportunities and the evolution of ICBAS own income in order to compensate for the variability of the State annual funding.

The Executive Committee has had a good flexibility in the management of funds, including a particular sensibility for issues that are specific to Veterinary Medicine. Examples of such are the autonomy of the services management, the direct investments in the Vairão facilities, and the application for European funding for the planned facilities in Maia.

Furthermore, to compensate for the increase of the services' VAT, decided by successive national governments, the Executive committee agreed to reduce its overheads' percentage so that it would not result in a sharp cost increase, thus maintaining an adequate caseload for teaching.

The national austerity policies, however, are causing severe constraints for the evolution of the national higher education. The significant reduction in salaries (around 20%), the impediments for career progression and for hiring new staff members constitute serious barriers for the renewal of the teaching and support staff, attraction of the best qualified elements and motivation for pursuing new qualifications and skills by the existent members.

Should funding increase in the near future (a fact that is far from predictable), the investment should clearly be directed towards staff qualification, enlargement and rejuvenation.

Chapter 4: CURRICULUM

4.1 FACTUAL INFORMATION

In Portugal, every Establishment is autonomous in the definition of the IMVM curriculum, its subjects, their contents and distribution throughout the course. As mentioned in Chapter 2, all courses of the national higher education network are overseen and evaluated by the Agency for Assessment and Accreditation of Higher Education - A3ES and, if considered inadequate, either modifications are required or the course is not credited and cannot carry on. Considering that the national accreditation is vital; that the international recognition is of paramount importance; and that the access to the profession is the main objective for students to apply, the ICBAS' veterinary curriculum was designed on the basis of the EU directive 36/2005 and in concordance with the Bologna process.

The Course Director is responsible for the curricular organization and modification proposals, upon consulting the SCIMVM. Their proposals are presented to the Dean who, after consulting with the Scientific and Pedagogical Councils, is responsible for proposing them to the Rector for publication and implementation. The present curriculum was ratified by the government and its official application started in 2007. Overall it consists of 5.5 years (11 semesters) corresponding to 330 ECTS. The course confers the Master's Degree in Veterinary Medicine upon approval in all core subjects and elaboration, public discussion and approval by a jury, of the final dissertation. The core curriculum is taught during the first 10 semesters (5 years) and composed by a total of 59 CUs distributed as follows: 14 in the first year (7 in the first semester; 7 in the second semester); 13 in the second year (6 + 7); 12 in the third year (6 + 6); 12 in the fourth year (6 + 6); 8 in the fifth year (4+4). The 60th CU (internship) is the sole CU of the 11th semester, constituted by a professional training period or development of a research project, individually chosen by each student.

The exercise of the veterinary profession in Portugal requires a license issued by the national professional body (*Ordem dos Médicos Veterinários*) obtainable only by people with a DVM (pre-Bologna) or MDVM (post-Bologna).

The CUs allocation of hours is proposed by the course director, after consulting the SCIMVM, and takes into account: a) The maximum number of contact hours per week per student, defined by the Rector's office; b) The character of the subjects to be taught

in each CU and the best methods to achieve its objectives (upon discussion with the corresponding regents and Department Directors); c) The best balance between contact and individual/group study, from the students' perspective; d) The best balance between theoretical and practical training; e) Students practical issues such as the need for moving between campuses, time for meals, personal affairs, extracurricular activities, etc. Proposals are then approved by the Dean, upon consulting the Scientific and Pedagogical Councils of the Establishment.

Generally, but not exclusively, the first four semesters are mainly devoted to the acquisition of knowledge in basic subjects and basic sciences; the 5th and 6th semesters may be regarded as "pre-technical" in the sense that they are devoted to the basis of professional skills development; and the last four semesters constitute the technical section of the core curriculum, with a higher emphasis on the applied subjects of the profession.

Curricular integration is promoted through several methods:

- a) As mentioned in Chapter 2, every regent must fulfil the CU sheet on SIGARRA displaying its objectives, program, teaching and evaluation methods, bibliography, and special issues. This information is then reviewed by the Director, validated if considered adequate, or invalidated if in need for modifications.
- b) Regents of basic subjects frequently rely on the collaboration of teachers of pre-technical or technical subjects for the teaching of particular subjects, resulting in the integration of the curriculum and a veterinary-oriented approach of some more general issues.
- c) In the pre-technical and technical subjects it is also common for teachers to be allocated to various CUs for lecturing and practical/clinical teaching of specific themes (e.g. teachers of medical semiology are also involved in the teaching of Clinical pathology and Internal medicine and surgery).
- d) Both teachers and CUs are evaluated yearly by students and the results of such inquiries are scrutinized by the course Direction and used to help in the implementation of modifications deemed necessary.
- e) The Monitoring Committee described in Chapter 2 is also an important tool in the assessment of curricular integration, not only by the detection of gaps and discrepancies but also by helping in the search for the best solutions for their resolution.

4.1.1 POWER OF SUBJECTS AND TYPES OF TRAINING

4.1.1.1 POWER OF SUBJECT

The IMVM curriculum is constituted by core subjects during the first 10 semesters (5 years), followed by the internship, the “elective” part of the curriculum. Although not mandatory, students are strongly encouraged to attend the latter outside the Establishment, under the guidance of one professor.

Attendance is not compulsory in lectures, unless specifically determined by the CU regent. Students are required to attend to a minimum of 3/4 of the practical classes and the verification of this demand is a responsibility of the CU regents.

Extramural work is performed within the practical training of some CUs, including animal farms, food processing industries, slaughterhouses, and an experimental station.

4.1.1.2 TYPES OF TRAINING

4.1.1.2.1 Theoretical training

All UCs include theoretical classes, either in the form of lectures, seminars or self-directed learning. Their weight in the UC calendar is proposed by the regent, evaluated by the SCIMVM and approved by the course Director, if considered appropriate.

4.1.1.2.2 Supervised practical training

All types of supervised practical training exist in the IMVM curriculum, with different weights within CUs, according to their objectives and methods. Planning and implementation follow the procedures described in the previous section. The ICBAS IMVM privileges students “hands-on” training, particularly in the pre-technical and technical subjects.

4.1.2 UNDERGRADUATE CURRICULUM FOLLOWED BY ALL STUDENTS

4.1.2.1 CURRICULUM HOURS

(please see next page)

Table 4.1: General table of curriculum hours taken by all students

Year			Self-directed learning	Hours of training			Other	Total
	Theoretical training			Supervised practical training				
	Lectures	Seminars		Laboratory and desk based work	Non-clinical animal work	Clinical work		
	(A)	(B)		(C)	(D)	(E)		
First	432	4		316	43		14 ^a	809
Second	350	7	42	276	46	10	24 ^a	755
Third	336		16	178	39	225	10 ^a	804
Fourth	432	20	22	203	45	102	8 ^a	832
Fifth	224	16	15	120	51	370	8 ^a	804
Sixth				640 ^b	640 ^b	640 ^b	170 ^c	810
Total	1774	47	95	1093 ^d	224 ^d	707 ^d	64 ^d	4004 ^d

^a unsupervised training with cadavers, animal parts and live healthy animals; journal clubs.

^b (D) OR (E) OR (F)

^c Data analysis and thesis preparation

^d Sixth year not included

Table 4.2: Curriculum hours taken by each student

Subject	Theoretical training			Supervised practical training			Other	Total
	Lectures	Seminars	Self-directed learning	Laboratory and desk based work	Non-clinical animal work	Clinical Training		
	A	B	C	D	E	F		
1st Year:	432	4		316	43		14^a	809
Biophysics	42			28				70
Cell biology	28			28				56
Animal cytogenetics	12			12				24
Animal ethology	28			28				56
Exognosis and animal handling	28				15			43
Quantitative methods	42			42				84
Biological chemistry I	42			28				70
General agriculture and ecology	28			14				42
Systematic anatomy I	28				28		10 ^a	66
General physiology	28			28				56
Molecular genetics	28			28				56
Animal histology and embryology I	28			28				56
General microbiology	28	4		24			4 ^a	60
Biological chemistry II	42			28				70

Subject	A	B	C	D	E	F	G	Total
2nd Year:	350	7	42	276	46	10	24^a	755
Systematic anatomy II	28				28		10 ^a	66
Biochemistry	28			28				56
Veterinary physiology	28			28				56
Animal genetics and breeding	28		8	28				64
Animal histology and embryology II	28			28				56
Veterinary microbiology	28		25	28				81
Clinical anatomy	28				18	10	10 ^a	66
Veterinary deontology	14							14
Economy and business management	28			28				56
Immunology	28			24			4 ^a	56
Animal nutrition	28			28				56
Parasitology	28		2	28				58
General pathology	28	7	7	28				70
3rd Year:	336		16	178	39	225	10^a	804
Pathological anatomy I	28					42		70
Pharmacology and therapeutics I	28			16	12			56
Imagiology	28			24	9	9		70
Animal production I	28			28				56
Surgical semiology	28			12		30		70
Companion Animals medical semiology	28		10	12		30	10 ^a	90
Pathological anatomy II	28					42		70
Anaesthesiology	28			6		36		70
Pharmacology and therapeutics II	28			16	12			56
Pathology and clinics of infectious diseases I	28			42				70
Animal production II	28		6	16	6			56
Farm animals and equine medical semiology	28			6		36		70
4th Year:	432	20	22	203	45	102	8^a	832
Farm animals and equine surgery	28					56		84
Epidemiology	28	4		24				56
Farm animals and equine pathology and clinics I	56	6		14				76
Pathology and clinics of infectious diseases II	28	6	20	33	9			96
Food technology I	28			28				56

Subject	A	B	C	D	E	F	G	Total
Veterinary toxicology	26	2		26			2 ^a	56
Companion animals surgery	28					42		70
Companion Animals pathology and clinics	70			14				84
Farm animals and equine pathology and clinics II	56			14				70
Pathology and clinics of parasitic diseases	28			30	8	4		70
Public health	28	2		20			6 ^a	56
Food technology II	28		2		28			58
5th Year:	224	16	15	120	51	370	8^a	804
Sanitary inspection I	28	10	11	18	14			81
Companion animals medicine and surgery I	28					104		132
Farm animals and equine medicine and surgery I	28			42		42		112
Theriogenology I	28			20	2	28	7 ^a	85
Sanitary Inspection II	28	6	4	18	24			80
Companion animals medicine and surgery II	28					104		132
Farm animals and equine medicine and surgery II	28			15		56		99
Theriogenology II	28			7	11	36	1 ^a	83
6th Year:				640^b	640^b	640^b	170^c	810
Internship				640 ^b	640 ^b	640 ^b	170 ^c	810
Grand Total	1774	47	95	1103^d	224^d	719^d	64^d	4026^d

^a unsupervised training with cadavers, animal parts and live healthy animals; journal clubs.

^b (D) OR (E) OR (F)

^c Data analysis and thesis preparation

^d Sixth year not included

Table 4.3: Curriculum hours in EU-listed subjects offered and to be taken as electives¹

Subject	Theoretical training		Supervised practical training			Other	Hours to be taken by each student per subject group
	Seminars	Self-directed learning	Laboratory and desk based work	Non-clinical animal work	Clinical work		
	A	B	C	D	E	F	
Basic subjects							
Basic sciences							
Clinical sciences							
Animal production							
Food hygiene/ Public health							
Professional knowledge							

¹ Not applicable

Table 4.4: Curriculum hours in subjects not listed in Table 4.2 to be taken by each student, including Diploma work (final graduation thesis, or final graduation work)¹

Subject	Theoretical training			Supervised practical training			Other	Total
	Lectures	Seminars	Self-directed learning	Laboratory and desk based work	Non-clinical animal work	Clinical Training		
	A	B	C	D	E	F	G	

¹ Not applicable

4.1.3 FURTHER INFORMATION ON THE CURRICULUM

The 2002 EAEVE evaluation provided valuable suggestions that were used to review and modify the IMVM curriculum.

The creation of the course direction with powers to distribute the teaching workload in cooperation with the Heads of Department; to verify and validate the CU plans and reports; and to monitor their regular functioning by assessing the students' surveys and the Monitoring committee suggestions, resulted in a much more independent management without compromising the advantages of ICBAS' nature, i.e. the multidisciplinary nature of its teaching within the "one health" philosophy.

The weight of **Basic subjects** was substantially reduced. A veterinary perspective was reinforced in all basic subjects and, with some residual exceptions, all classes are taught

to veterinary-only students. This allowed for the introduction in the first two years of subjects such as animal handling and basic husbandry. The overall contents and integration of **Animal Production** subjects were also reviewed and updated. General Agriculture and Rural Economics for example, were improved and adapted to national conditions, namely the integration between livestock and agriculture/forestry systems of production, particularly important in the extensive or semi-extensive animal production systems prevalent in marginal agricultural areas.

Animal behaviour and animal welfare issues are taught in several CUs (e.g. Ethics; Public Health; Animal Production; Sanitary Inspection), covering issues such as EU legislation; Quality Welfare System and the EU Strategy for Animal Welfare; veterinary legislation and ethics in companion, farm, wild and laboratory animals; protection of animals during transport and at time of slaughter. A strong effort was developed in the transversal teaching of animal production subjects in various CUs (Animal Production; Farm animal internal medicine and surgery; Epidemiology) highlighting the relationship between animal health and welfare and production performance; study of risk factors and risk indicators; relationship between disease processes and animal and farm losses; welfare indicators; biosecurity and disease control; and herd health plans.

Teaching of **Clinical Sciences** is performed in various facilities and by several members of the staff, both professors and practitioners, in order to be as broad, intensive and “hands-on” as possible. To train veterinarians capable of performing clinical duties at a highest level, specific strategies are used:

- a) Integrated and vertical teaching – Small animal clinical sciences are mainly taught from the 3rd to the 5th year of the curriculum. In the 3rd year students practice mainly in healthy animals (e.g., medical semiology and diagnostic imaging) with incursions to the hospital in particular situations (radiology; ultrasound and anaesthesia of clinical cases). In the 4th year, students participate in the surgical treatment of clinical cases (2nd semester), while the teaching of small animal internal medicine is mainly theoretical. This allows students to acquire sufficient knowledge on the diseases of the various organs and systems and to actively practice in the majority of the cases of the hospital from day one of the 5th year (Small animal medicine and surgery I and II). It has been a common belief amongst teachers and students that this system provides a consistent learning process that benefits the final result. Similarly, the teaching staff dedicated to equine and farm animal subjects follows the students from the 3rd year (e.g. medical semiology and diagnostic

imaging) to the 5th year, where clinical “hands-on” work and sessions of case discussions take place. Many interface areas with direct clinical implications from within basic sciences and subjects are taught with a close interaction between teaching personnel. Examples are the participation of clinical teachers in physiology themes and the involvement of teachers from the histology area in the teaching of the laboratory diagnosis of small animal haematological diseases.

- b) Practical training – Small animal clinical training takes place at the small animal hospital where students work 4 hours/week during the academic calendar (56 hours/semester), plus two periods of 24 hours per semester in emergency services. Students of the 3rd, 4th and 5th years are also admitted, on a voluntary basis, to the hospital activities whenever there are no scheduled practical classes (e.g. holidays, weekends, etc.). As mentioned, in some CUs (e.g. imaging, anaesthesia) practical classes are also performed in the hospital. Practical training in small animal surgery (42 hours) takes also place in the hospital with the students participating in real case surgeries. For practical training in dairy cattle, students are involved in the ambulatory clinics with, on average, 16 hours of clinical duties per semester, complemented by a weekly class (3 hours) where the cases dealt with are discussed and/or the Establishment’s cow herd is treated. As in the small animal hospital, students are also admitted, on a voluntary basis, to the ambulatory activities in all periods where there are no scheduled practical classes. Training in beef cattle, swine, and small ruminants takes place at the “Herdade da Abóbada” Experimental Station, in Alentejo, southern Portugal, where students spend three days practicing with these species (nearly 24 hours total). Practices in rabbits, poultry and swine population medicine are performed in corresponding farms (nearly 15 hours total). Throughout the graduation, students interact with a group of 20 horses owned by the university. Clinical training with horses is based on cases admitted to the Equine Clinical Centre at Vairão and on the treatment of the Establishment horses (about 27 hours). Training in animal reproduction takes place in the Animal Reproduction Centre of Vairão (CRAV) encompassing 42h/semester in canine, bovine and equine theriogenology; at the “Herdade da Abóbada” for small ruminants, swine and beef cattle; and nearly 20h of ambulatory reproductive services in dairy cattle and horses.
- c) Small groups – Allocation of a reduced number of students per practitioner results in a closer relation between teachers and students and a higher opportunity for supervised “hands-on” training, with benefits in the final results. In the small animal

hospital, teachers associate with four full-time and one part-time practitioner, allowing for a distribution of students in groups of 3 per practitioner. The dairy cattle ambulatory services (1 practitioner for 2 students), and the “in house” (1 instructor for 4 to 6 students) and ambulatory equine reproduction services (1 instructor for 2 to 3 students) are also examples of clinical training in small groups.

SPECIFIC INFORMATION ON THE PRACTICAL CLINICAL TRAINING

Practical clinical training (including mobile clinic) is mandatory for all students and constitutes the major part of the clinical CUs in the 4th and 5th years. It takes place during the academic calendar although, as mentioned, students are admitted to participate in clinical duties outside these periods. Adding all periods of practical clinical training, each student is required by the end of his/her formation to have completed a minimum of:

- a) 260 hours on small animal practical training;
- b) 32 hours on dairy cattle practical training;
- c) 54 hours on dairy cattle and horse reproduction medicine training;
- d) 24 hours on beef cattle, small ruminants and swine (semi-extensive systems) practical training;
- e) 27 hours on horse practical training;
- f) 15 hours on rabbits, poultry and swine (intensive systems) medicine.

In practical clinical training, students are fully involved in collecting the anamnesis' data, performing physical examination of the patients, elaborate the list of differential diagnosis, select and perform special examinations (neurological exam, ophthalmologic exam, etc.) and ancillary diagnostic tests (collection of samples, test execution and interpretation), plan and execute treatments and patient follow-up as much as possible.

Due to biosafety issues and regulations, as well as economic constraints, only in extremely rare instances a farmer will hospitalize his/her animals. Therefore, a modest number of dairy cows or other farm animals are brought in to be examined and treated at the Veterinary Centre in Vairão. As a consequence, most clinical and surgical (including obstetrics) practice in dairy cattle is performed by students during the ambulatory services. Using two fully equipped vans, 6 experienced practitioners accompanied by 2 to 3 students during 28 weeks/year, are responsible by daily rounds based on an on-call service (clinics and surgery) or on a pre-programmed visiting schedule (reproduction services, including pregnancy diagnosis). From April to the end of June, the van

assigned for reproduction services is used for visiting dairy farms in the mornings and horse stud farms in the afternoons. Practical training at the “Herdade da Abóbada” involves groups of 12 to 18 students working with one teacher and two practitioners, mainly focused in preventive medicine, surgical and clinical procedures and reproductive biotechnologies. Management practices are also discussed.

Clinical training is structured in order to allow students to practice medicine and surgery from day one of the 5th year. In order to achieve this, 3rd year students are trained on collecting historical information, performing physical and system-oriented (e.g. cardiovascular examination) examinations, ancillary tests (e.g. electrocardiography, urinalysis, blood analysis), performing and interpreting diagnostic imaging procedures, pre-surgical actions, anaesthetic protocols, and basic surgical techniques. In the 4th year, students participate in surgical procedures in live animals and organs and animal parts (uterus, udders, limbs). Added to the theoretical classes on the most common pathologies in domestic species (mostly in the 4th year), this training allows for students to be enrolled in clinical services during the entire 5th year.

4.1.4 OBLIGATORY EXTRAMURAL WORK

Extramural training is organized within each appropriate subject by the corresponding regents. In the first theoretical class, the teacher presents a layout of all activities, including the extramural work.

Table 4.5: Obligatory extramural work that students must undertake as part of their course

Nature of work	Minimum period		Year in which work is carried out
	hours	% of total study time*	
Visit to the Coastal Station of Aguda (ELA)	2	13%	1st (CU- Exognosis and Animal Management)
Visit to a farm holding (horticulture)	4	29%	1st (CU- General Agriculture and Ecology)
Visit to dairy farms	8	29%; 14%	1st (CU- General Agriculture and Ecology); 2 nd (CU- Economy and business management)
Visits to swine, rabbit and poultry farms	9	32%; 21%	3 rd (CUs- Animal Production II; Infectious diseases I)

Visit to the vivarium of aquatic (fish, molluscs, etc.) animals of CIIMAR	2	7%	4th (CU- Veterinary Toxicology)
Ecotoxicological and environmental field and laboratory work at CIIMAR	4	14%	4th (CU- Veterinary Toxicology)
Ambulatory clinics of dairy cows	32	21%	5th (CU- Internal Medicine and Surgery of Farm Animals and Equines I and II)
Reproductive and clinical work in beef cattle, small ruminant and swine at the Abobada Experimental Station	24	29%	5th (CU- Internal Medicine and Surgery of Farm Animals and Equines II)
Reproduction ambulatory Services	20	24%	5th (CU- Theriogenology I and II)
Practical work in rabbits, poultry and swine farms	15	22%	5th (CU- Internal Medicine and Surgery of Farm Animals and Equines I)
Visit to meat/ dairy processing unit	3	11%	4th (CU- Food technology)
Practice of sanitary inspection in bovine slaughterhouse, deboning room and meat processing unit	9	21%	5th (CU- Sanitary inspection I)
Practice of sanitary inspection in swine slaughterhouse, deboning room and meat processing unit	5	12%	5th (CU- Sanitary inspection I)
Practice of sanitary inspection in poultry slaughterhouse, cutting and deboning room and meat processing unit	6	14%	5th (CU- Sanitary inspection II)
Practice of sanitary inspection in rabbit slaughterhouse and meat processing unit	3	7%	5th (CU- Sanitary inspection II)
Practice of sanitary inspection in fish official market	3	7%	5th (CU- Sanitary inspection II)
Practice of sanitary inspection in fish canning factory	3	7%	5th (CU- Sanitary inspection II)
Practice of audits of good hygiene practices and HACCP-based procedures	4	10%	5th (CU- Sanitary inspection II)

* Calculated on the basis of total practical training of the corresponding CUs

4.1.5 SPECIFIC INFORMATION ON THE PRACTICAL TRAINING IN FOOD HYGIENE/PUBLIC HEALTH

The teaching of food technology embraces the acquisition of knowledge in the structure, composition, properties, and processing of the main animal products by allowing students to manufacture vegetable-based products, canned fish, cheeses, yogurts, ice-creams and several meat processed products (cooked ham, fresh sausages and frankfurters, hamburgers, mortadella and liver pate); and the safety assessment by

performing microbial analysis of foodstuffs, raw materials, water and food contact surfaces. Students must submit an analysis report that includes technical assessment of results in accordance with the EU and other microbiological criteria for foodstuffs and food ingredients.

In sanitary inspection, practical training is performed in four slaughterhouses (bovine, swine, poultry and lagomorphs) with dressing and deboning rooms and meat processing units; collective restauration services (canteens) and by visiting one fish official market and one fish canning factory. All students have practical mandatory training in slaughtering of bovine, swine, poultry and rabbits, cutting and deboning operations, following the official veterinarian inspection tasks (analysis of food chain information, ante-mortem inspection, animal welfare surveillance, post-mortem inspection, identification and management of specified risk materials and other animal by-products, laboratory testing and health marking of carcasses). In the poultry slaughterhouse, students individually train the post mortem examination of broilers. Ritual slaughter methods are not observed in practical training. Wastewater and animal by-products treatment plants are visited.

In the fish official market, students observe the whole fish circuit, from landing to final selling. Fishing boats and methods are observed; fish species are identified; sanitary inspection teams explain and demonstrate their activities; boxing, icing, transport and refrigeration procedures are seen and discussed. In the fish canning factory, students follow the products from raw materials to final products. The quality laboratory is visited and all procedures explained and shown.

Small groups of 7 to 8 students perform audits in collective restauration services (University canteens), including premises and documentation (including HACCP manuals and internal controls) aiming at confirming that the appropriate procedures are followed. To support the audit, students collect samples for laboratory analysis of raw and ready-to-eat food, drinking water, and food contact surfaces. A technical report is written by the students stressing the strengths, weaknesses, threats and corrective measures. Results and final conclusions are orally presented and the report is sent to the operator.

In practical classes of public health, students face problems exposed by the regent, aiming to produce evidence-based answers by searching bibliography; participating in regent's oriented discussions among pairs; present and debate their conclusions. Several

seminars addressing relevant domains of the veterinary activity, particularly related with the official veterinary services, are organized at the end of the semester.

4.2 COMMENTS

The ICBAS' IMVM is balanced amongst the fundamental areas of the veterinary profession, also benefiting from the Establishment's biomedical identity. Obviously, veterinary Omni-competence is impossible to achieve, but the students are sensitized to the varied veterinary activities and the fundamental skills are provided. Considering that exercising the profession requires competences in all major areas, our option was to aim for a solid preparation within the 5 years of mandatory curriculum, rather than dispersing students among distinct elective subjects. Rectoral determinations on the maximum workload for students hamper the possibility for adding elective subjects to the core curriculum. Therefore, such decision would necessarily result in the reduction of training in essential subjects that is deleterious for students. To surpass this problem, the number of ECTS of the course would have to enlarge from 330 to 360 ECTS (the duration before its adaptation to Bologna). Unfortunately such proposal was denied by the Portuguese Education Ministry.

Animal production training would benefit from a larger exposure to farms. Financial constraints hamper the development of an intra-mural teaching farm so external arrangements have been made. It is our intention to further develop contacts and protocols to enlarge the students' exposure to these production units.

Practical training in equine medicine and surgery is still not optimal. Efforts for its increase are currently being made by the IMVM Direction so that students may be exposed to more equine cases and those that are particularly interested in the subject may have access to external services.

4.3 SUGGESTIONS

The potential implementation of a new curriculum, currently under internal discussion, will allow for an improvement of the training paradigm, including innovation and entrepreneurship albeit not distorting its objectives, in order to meet the new challenges of the profession. This process will be accompanied by a course management modification to improve both the horizontal (between CUs of the same year/semester) and vertical (between CUs within the same scientific/technical areas) integration of teaching.

Chapter 5: TEACHING AND LEARNING: QUALITY EVALUATION

5.1 FACTUAL INFORMATION

5.1.1 THE TEACHING PROGRAMME

As stated in Chapter 2, the responsibility for the definition of the course objectives and its achievement, coordination and regular functioning relies on the IMVM Director, assisted by the SCIMVM and Monitoring Committee. Its proposals must, by law, be presented and accepted by the Dean, upon consultation of the Executive, Pedagogical and/or Scientific Councils of ICBAS, and, in some cases, by the Rector.

The general rules for the evaluation and pedagogical orientation of the students have been published by the Rector's office and constitute the methodological basis for the course directions of the entire University. Items such as the CU sheet components; evaluation regimens; scoring improvement; frauds; etc. are regulated, serving as guidelines for courses management.

Preparation of each academic year starts at the beginning of the previous semester with the elaboration of the classes' timetables, the occupancy planning of the rooms and the exam periods, taking into account the specific needs of each subject, their logical sequence and needed time allocation. This process is conducted by the ICBAS pedagogical Council, in coordination with the Departments and Course Directors.

It is also during this period that the CU Regents fulfil the CU sheet on SIGARRA (objectives, program, teaching and evaluation methods, bibliography, and special issues), subsequently validated by the IMVM Director if considered adequate, or improved through a dialog process between the Director and the CU regent.

In accordance with the ICBAS base-concept – to create, transmit and disseminate knowledge in the areas of health and life - the general pedagogical philosophy of the course emphasizes a strong basic multidisciplinary approach, integrating technical aspects in all stages of the course - basic subjects and sciences; pre-technical and technical training - aimed to address the particular aspects of veterinary sciences with emphasis on granting every student the chance and responsibility to receive a "hands-on" experience and exposition to professional realities.

The pedagogical strategy has been based on having a core of disciplines organized in a logical sequence of topics, both vertically and horizontally. The course did not adopt, at this point, a curriculum strictly based on less classical schemes of organization, since

those schemes did not proved yet to produce better results either regarding the quality of acquired competences or the “teaching efficiency” (less effort for a similar result). However, under the framework of what can be called a "classical" curriculum, the teaching staff has been encouraged to adopt and implement newer teaching strategies. Such encouragement derives from a number of initiatives (conferences, debates, short courses, etc.) organized by teachers, students and directive bodies, including the Rector’s office. Long-distance teaching methods, like the “e-learning”, are successful examples implemented by some teachers and useful for both undergraduate students and professionals.

The introduction of new approaches in teaching under the current curricular model has been a natural phenomenon as concepts such as "self-learning", "problem-based learning", "interactive-assisted learning" or "interactive lectures" have been implemented in several CUs. We recognize however, that this is not a scenario that applies to all areas, since the implementation of new approaches to teaching methods is mainly the responsibility of the CU regents. The success or failure of such methodologies is assessed by the IMVM Director using the students’ surveys; CU success rates; and the opinion of teachers whose teaching efficacy relies on the acquired knowledge and competences of particular previous subjects.

To the bibliographic references indicated in each CU sheet, complementary bibliography; class notes (mostly power-point presentations); published manuscripts; national and European legislation; and web sites are indicated as study documents. Upon admittance to ICBAS, all students receive an electronic individual identification and password, allowing for the access to the library resources, including published manuscripts.

Extramural activities (mandatory for all students) take place in research laboratories (mostly affiliated to the University), livestock farms, slaughterhouses, units of food processing, University’s canteens, and experimental stations, among others, regulated by institutional protocols. Whenever possible, such classes are not limited to the observation of activities but extend to a “hands-on” experience in live animals, cadavers, carcasses and animal food products with a veterinary perspective.

As stated in Chapter 1, the IMVM objectives are listed in the document “Professional general attributes and capacities for the newly graduated veterinarian”, where an extensive statement of what is expected from the newly graduated is described. This document was elaborated by the SCIMVM, promulgated by the Dean and integrated in

the Course Regulation. Upon a detailed enquiry of the CU Regents, evaluation of the CU sheets, consultation of the students and of the Monitoring Committee, it was concluded that all objectives were taught throughout the curriculum. One other important source for the evaluation of the acquired competences is the external evaluation of the 6th year's students by outside elements (external supervisor) from whom an evaluation report is required and the participation in the final jury is asked for – and accepted in the majority of the cases – allowing for an external and independent assessment of the students' competences. Finally, the Rector's office conducts alumni surveys two years after their graduation, mostly devoted to the monitoring of their professional activities but where a teaching quality evaluation is asked. In the last survey, conducted in 2013, veterinary medicine alumni graded the quality of their training with a score of 4.75 in a scale from 0 to 5.

5.1.2 THE TEACHING ENVIRONMENT

In accordance with the Portuguese law and the University of Porto's regulation, ICBAS elaborated a Regulation for teachers' evaluation including both scientific and pedagogical performances. Until its publication teachers were required to submit a biannual report of Pedagogical, Research and Extension Activities for consideration by the ICBAS Scientific Council.

IMVM's teachers can voluntarily apply for participation in the project "De Par em Par na U.Porto", which consists in a reciprocal lessons' observation and is an action of multidisciplinary and volunteer training with guaranteed confidentiality. The lectures observation in real time is based on the concept of critical friend (peer observation), where the observed teacher gather, from the observer, information about his/her practices in the classroom in order to increase his/her pedagogical sensitivity, acting both as the observed subject and the observer. Still with a voluntary character, IMVM's teachers have the opportunity to participate in pedagogical training activities provided by the Rector's office and its organic units.

The update of the teaching staff is largely based on scientific production; provision of services (e.g.: medicine and surgery, histopathology, microbiology) and as consultants to companies in several areas (e.g.: animal production, food safety). The coordination of research projects and publishing of scientific papers in conferences and journals of recognized quality guarantee that the teaching staff remains at the forefront of the different areas of scientific knowledge. The provision of services allows for an intimate

and constant contact with labour markets and their needs, fundamental for the integration of knowledge in the reality of the country. Currently there is no system for directly rewarding teaching excellence, namely via accelerated promotion.

5.1.3 THE EXAMINATION SYSTEM

As previously stated the general rules for students' evaluation have been published by the Rector's office and constitute the methodological basis for the entire University. According to this document, evaluation may assume three forms: Distributed with a final exam; distributed without final exam; final exam only. The latter may be written, oral, practical, or any combinations of the above. The distributed evaluation may rely on laboratory or field/clinical procedures; written tests; reports; individual or group projects; oral evaluations; or classroom participation. The examination procedures (and corresponding weight in the final classification) of each CU are detailed in its corresponding sheet at the start of the semester. The official evaluation scale is between 0 and 20 and students approve with 10 or more points.

There are three evaluation periods per semester: One intermediate evaluation week by mid-semester; one final evaluation week at the end of the semester; and one final examination period of 4 weeks. Teaching is not permitted during the examination periods. Timetabling and scheduling of the evaluation periods is a responsibility of the pedagogical Council. With the exception of the 6th year (internship) evaluation, no external elements are engaged in the exams. The final examination period is constituted by two periods: The first is named "regular examination period" (3 weeks) and the second "appeal examination period" (1 week).

There is no legal limit to the number of times a student may attempt to pass a particular CU. However, recent legal changes limit the number of years for the student to graduate, depending on the relationship between the number of years of enrolment and the number of credits obtained.

This system works according to the following table:

Table 5.1.3.1. Relationship between number of years enrolled and credits obtained for a student to be allowed continue his/her studies

Number of years enrolled	Minimum number of credits obtained
3	60
4	110
5	160
6	210
7	260
8	310
9	360

The students do not have to pass an examination before they can start other CUs, with exception of enrolment in the 6th year. For entering this year, students must have approved all previous 59 CUs. There is a final “rescuing period” of examinations for the 5th year students that still need to pass no more than 30 ECTS to enter the final year.

Upon completing the 6th year internship, students must present a report or a thesis to be presented and discussed before a jury, designated by the IMVM Director that, whenever possible, includes at least one external member.

5.1.4 EVALUATION OF TEACHING AND LEARNING

At the end of each semester, students are requested to evaluate the CUs they attended and corresponding teachers through an on-line anonymous enquiry that is common to the entire University. The results of these enquiries are published in the CU sheet, with restricted access under the control of the Pedagogical Council, and used for various purposes:

- a) Individual self-assessment and corrections if necessary;
- b) Evaluation by the CU regent for implementation of modifications deemed necessary;
- c) Evaluation by the IMVM Director for the request of CU modifications, if considered necessary, and/or distribution of the CU regents and teachers in the following year;
- d) Assessment by each teacher individual evaluator, for inclusion in the staff evaluation process.

The latter is one of the components of a teachers’ evaluation system that was implemented by the Rector’s office where all teachers are yearly evaluated on the basis of a series of factors, including research (number of PhD students; scientific projects;

publications), teaching (lecturing workload; results of students' enquiries; teaching and curricular innovations), transfer of knowledge (scientific/cultural divulgation; social and economic valuation of knowledge), and Establishment's management duties (participation in academic juries; management responsibilities).

At the end of each semester, CU regents are required to produce an UC final report, another component for the course evaluation by its Director.

5.1.5 STUDENT WELFARE

The student's welfare system of the University of Porto is under the direct supervision of the Rector's office and applies to all students. They have a Health Insurance covering all major conditions related with the fulfilment of the objectives of the course, including physical accidents during the entire course, including extramural work.

The orientation and integration of students is assigned to the Student Support Office, dependent of the ICBAS Executive Council, which is responsible for:

- a) Promoting the welfare of ICBAS students in the University and in the national and international academic community;
- b) Promoting the academic and professional integration of the students;
- c) Promoting the reception, accommodation and integration of new students;
- d) Providing updated information about courses, postgraduate, masters and doctoral programs;
- e) Supporting the students in special situations, either academic or personal;
- f) Providing information on scholarships and research;
- g) Providing information on international mobility programs.

Much of the information is available via SIGARRA or communicated to students by email. The IMVM direction is also available for individual counselling of students. Furthermore, ICBAS students may apply for support from the Social Services of the University (SASUP) that renders social support to students with financial needs, namely in the areas of accommodation, food, scholarships, legal support, medical assistance and school materials.

SASUP possesses 9 residence halls, 11 canteens and 7 snack-bars, one of them located at ICBAS. Finally, students have free access to sport activities at the Sport Centre of the University of Porto (CDUP).

5.2. COMMENTS

Since the 2002 evaluation, the computerization of data (CU sheets, enquiries, etc.) had a high impact on the IMVM management and monitoring. Likewise, the recent teacher's evaluation system will permit a better basis for the teaching workload distribution. The students' enquiries are also an important tool for the course management, although they are still scarcely participated, hampering the extraction of solid conclusions. Efforts are currently being made by the Rector's office to improve the contribution of the students. The participation of external elements in the evaluation of the 6th year report (Master Thesis) is of paramount importance in the evaluation of the quality of our students. When such participation is impossible (e.g. foreign advisors), a written report on the performance of the student is required and used for the same purposes.

Regarding the student's welfare, the recent enlargement of the canteen allows for mitigating the lack of space for meals and socialization. Moreover, the access to auditoriums and classrooms outside the teaching timetables allows for group work that is not allowed in the library due to noise restrictions.

Moving into Porto's new facilities resulted in an obvious positive impact in teaching and learning quality, an issue that will be addressed in Chapter 6.

5.3 SUGGESTIONS

The improvements of the course administration may be further developed by implementing decentralized management systems; increasing the students' participation in the evaluation processes; and implementing a system for directly rewarding teaching excellence.

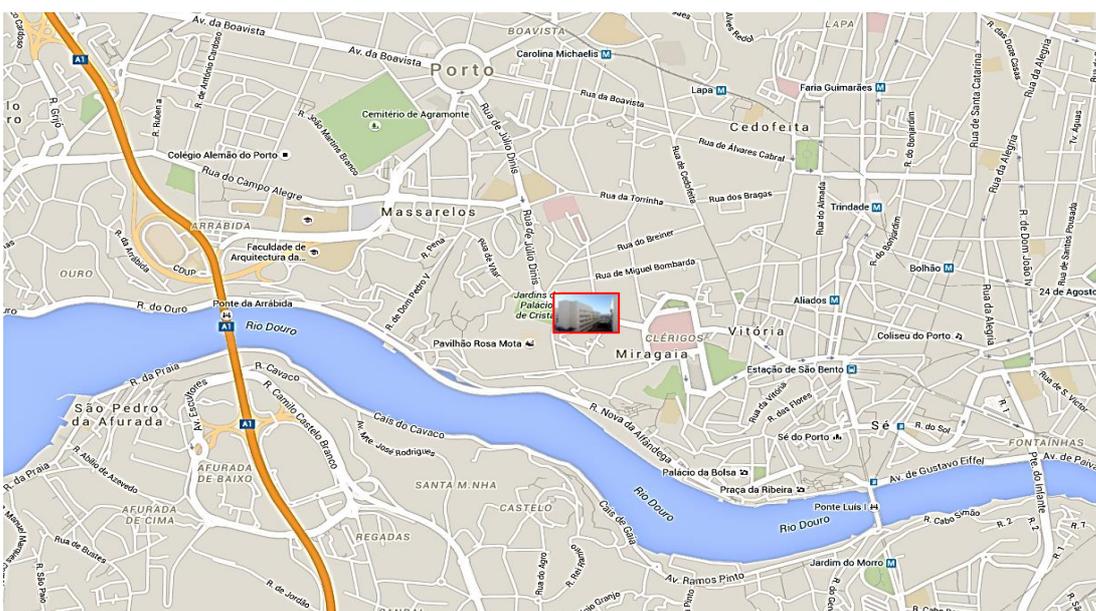
Chapter 6: FACILITIES AND EQUIPMENT

6.1 FACTUAL INFORMATION

6.1.1 PREMISES IN GENERAL

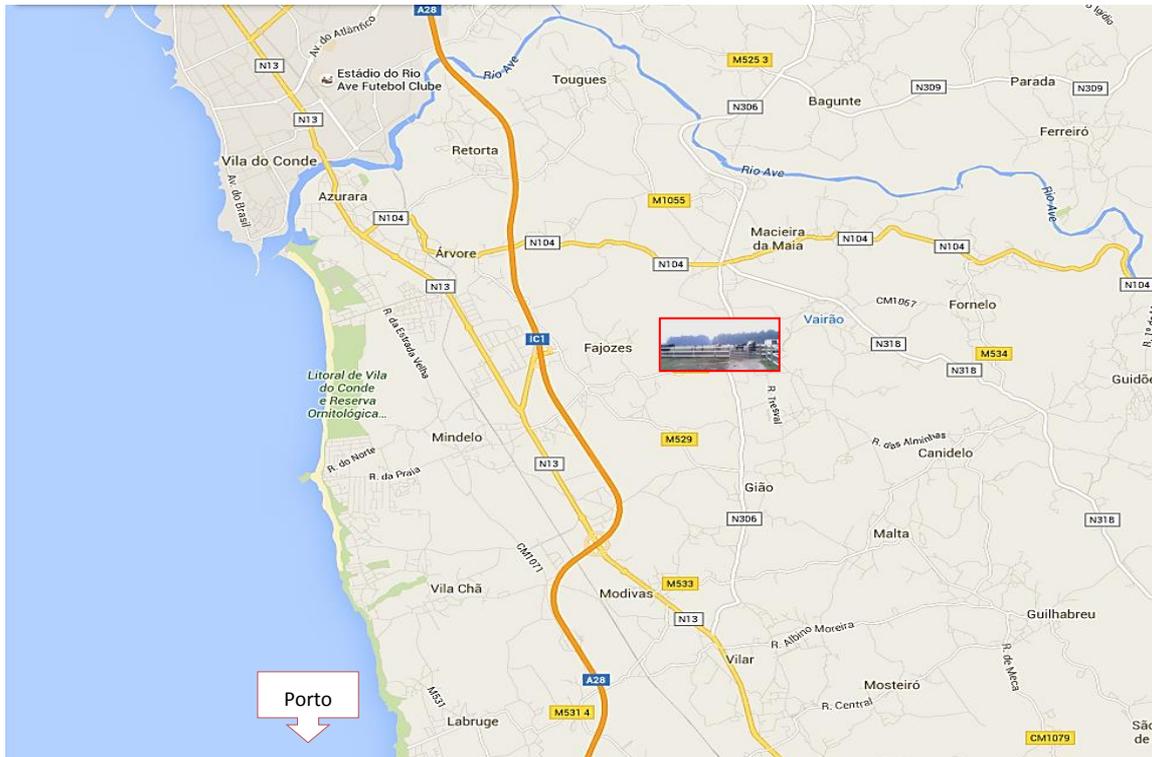
The IMVM uses mainly the ICBAS facilities at Porto and Vairão, complemented by the access to the premises of other institutions and companies where teaching activities take place under specific protocols.

The fairly new Porto complex, inaugurated in 2012 and run in cooperation with the Faculty of Pharmacy (FFUP), is located in the historical centre of the city, organized in four buildings covering a total area of 28,000 sq. meters, roughly distributed in a proportion of 60% to ICBAS and 40% to FFUP. The front building contains the administration offices (ICBAS only), the Noble Hall (common), the library (common), support services (informatics, reprography, audio-visual, and maintenance), the ICBAS Students association facilities, and ten auditoriums (common). The remaining three buildings are dedicated to teaching, research, and services, and accommodate the staff offices. Sub-ground level has a common car parking, covering the area of the three buildings altogether, and the security central. Building 1 includes the small animal Veterinary Hospital (UPVet), the vivarium and the aquariums. The cafeteria/canteen is located in the ground level of building 2, while the kennel is located on its roof. Generally, teaching laboratories are mainly located at the first level, with the exception of the Hospital (ground level) and the Anatomy Department (third level).



Location of the ICBAS/FFUP complex at Porto.

ICBAS also runs a teaching campus in Vairão (about 30 km North of Porto) with a total area of 13 ha by profiting from a long term protocol with the DRAEM (Ministry of Agriculture) granting special utilization rights (building and forage production), where the Establishment operates the Veterinary Centre for Equine and Farm Animals.



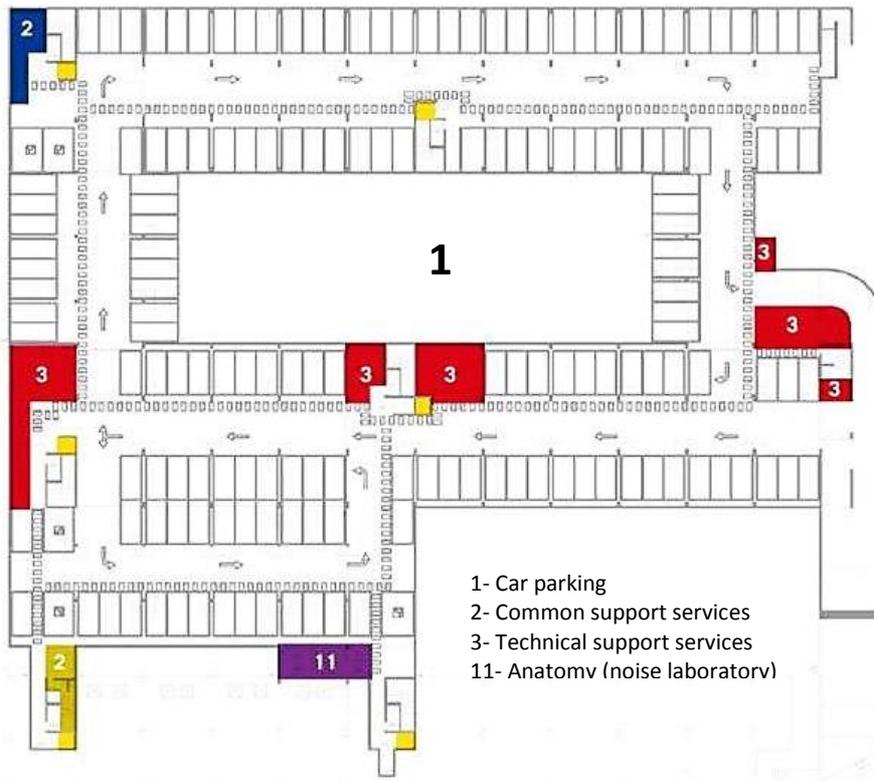
Location of the ICBAS facilities at Vairão.

The Centre has paddocks for horses; a pasture area; an open barn for small ruminants; indoor cow pens; smaller indoor pens for swine/small ruminants; two laboratories for assisted reproduction (horses and dogs); an embryology laboratory; 10 boxes for horses; surgery and recovery rooms for large animals; a pharmacy; isolation facilities for large animals; staff offices; and facilities for students.

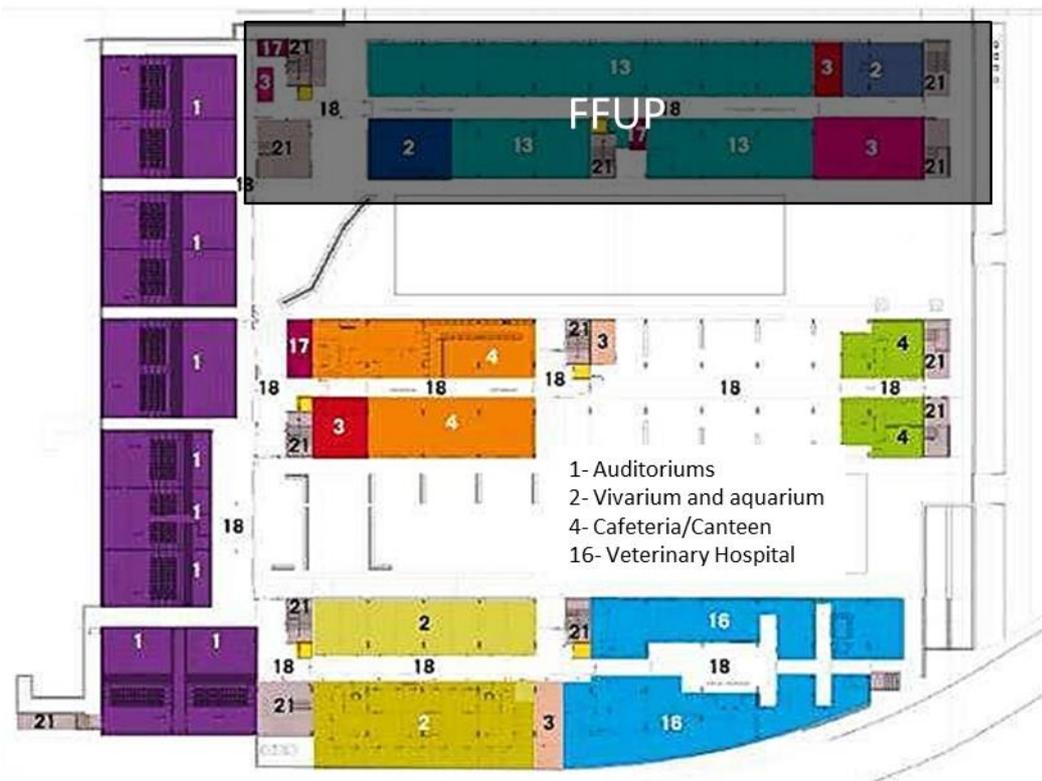
ICBAS has teaching and research protocols with the National Institute of Agrarian and Veterinary Research (INIAV), located a few hundred meters from the Centre, and with the “Herdade da Abóbada”, an experimental station of the Ministry of Agriculture, located in Alentejo, near the city of Serpa. These two protocols allow for practical classes in topics that otherwise would be difficult to implement at ICBAS, such as large animal necropsies (INIAV) and production, clinics and reproduction on beef cattle, swine and small ruminants (“Abóbada”).

ICBAS Porto Complex

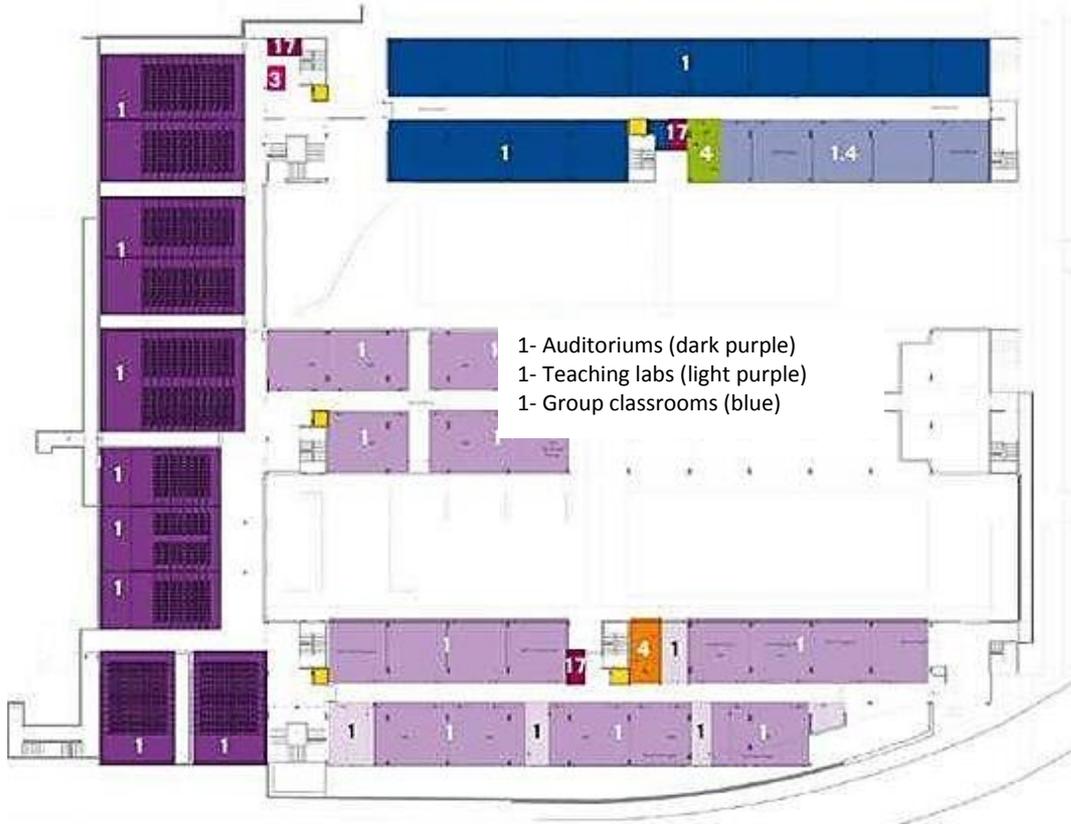
Floor -1



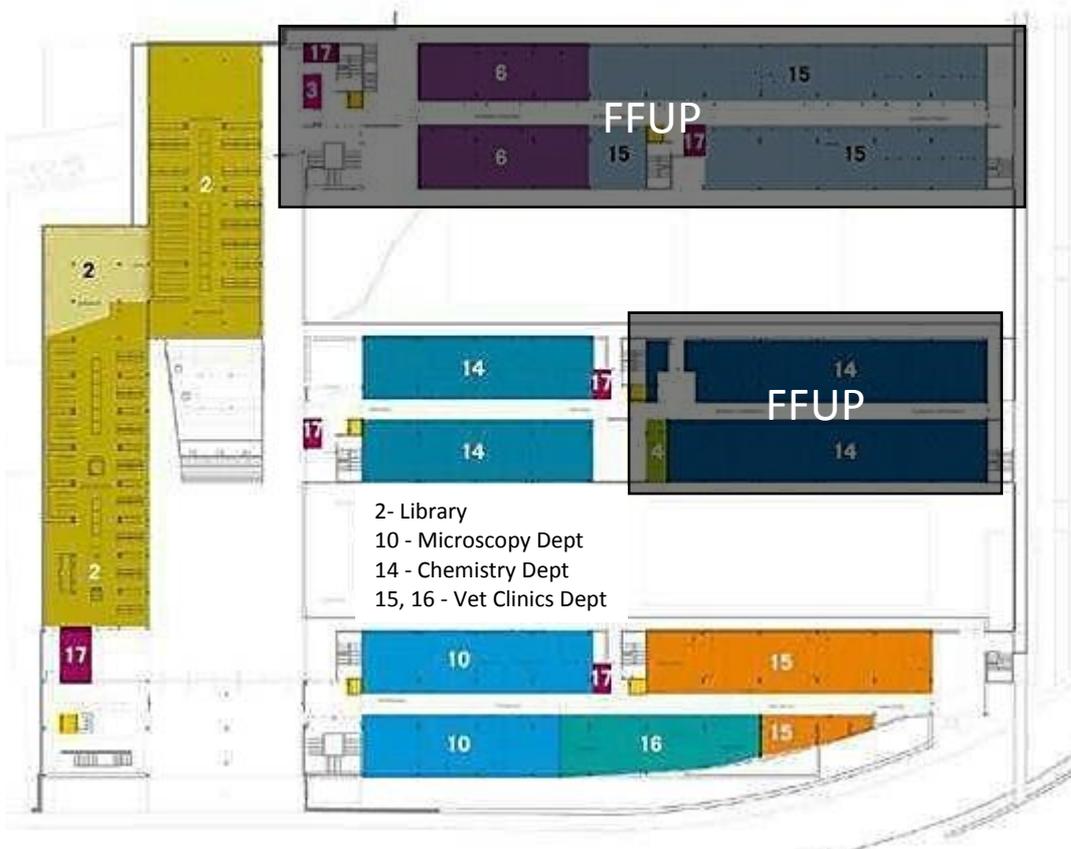
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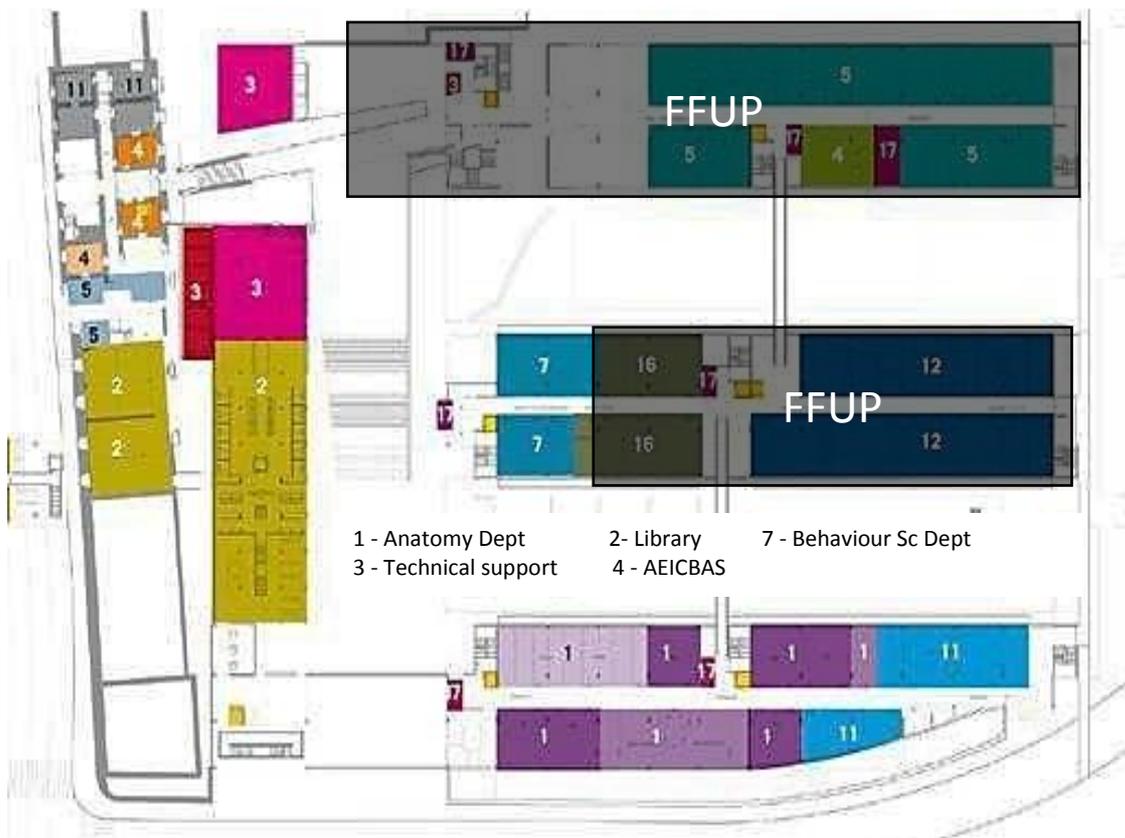
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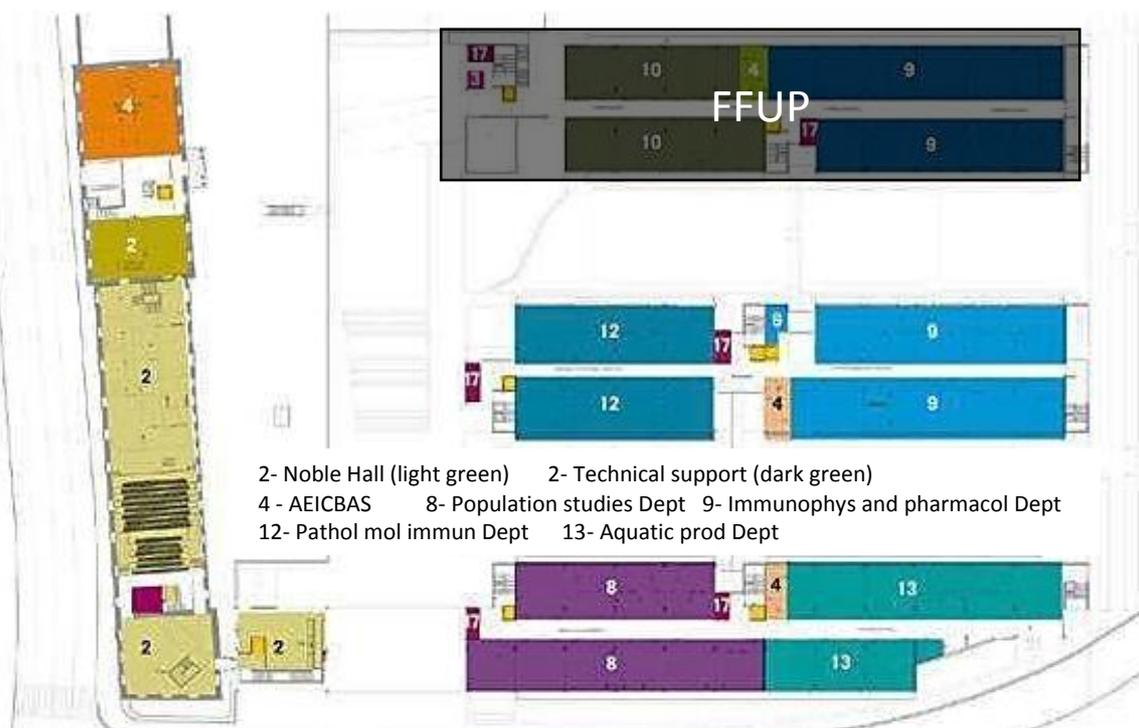
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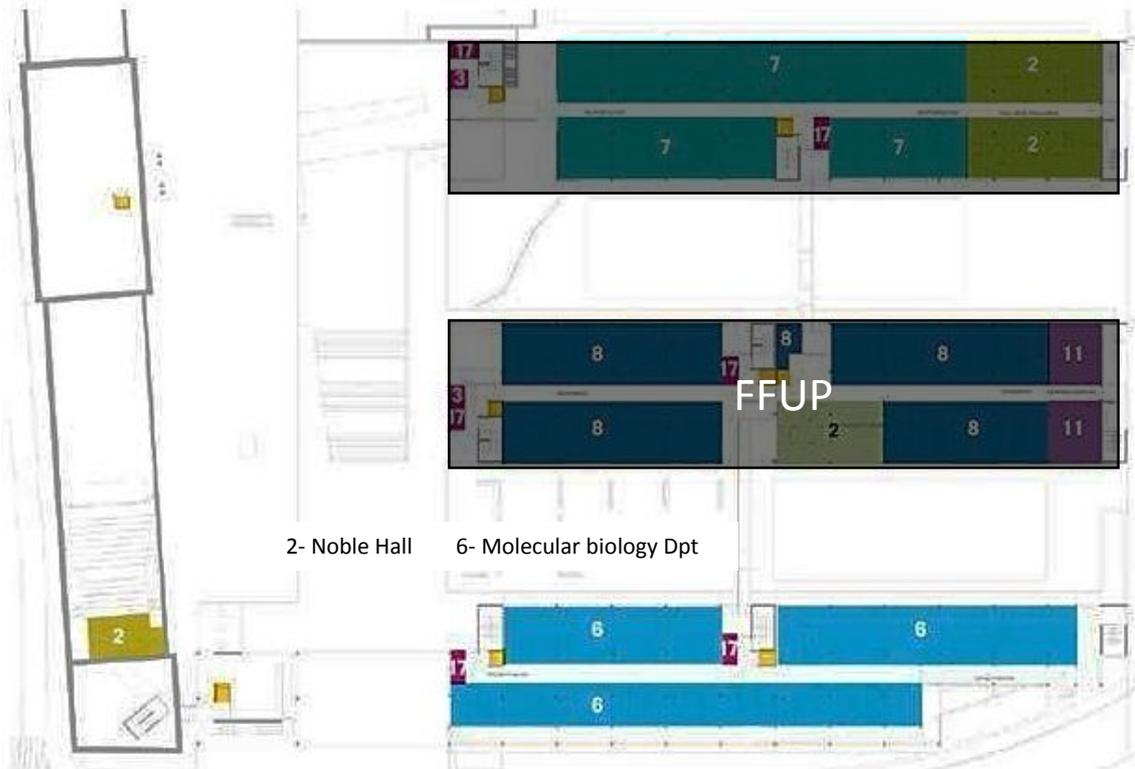
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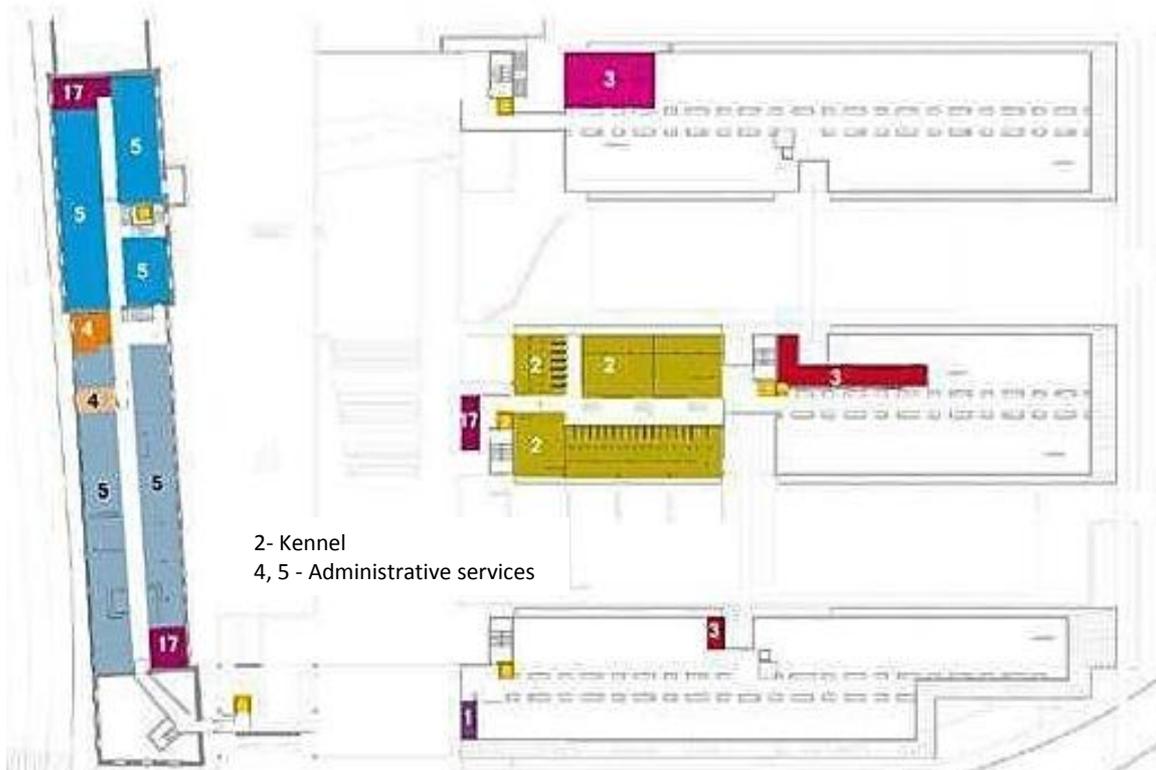
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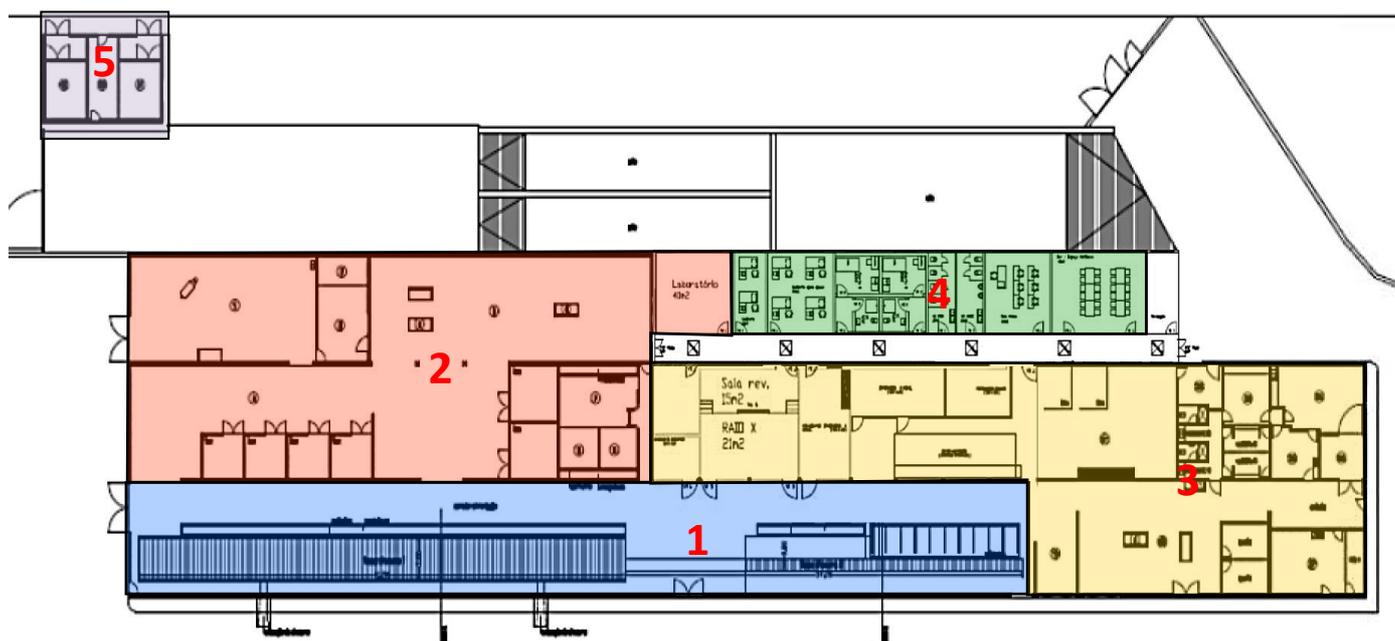
Floor 5



Floor 6



ICBAS facilities at Vairão



- 1 – Farm animal barns
- 2 – Reproduction
- 3 – Large animals Clinical Services
- 4 – Staff and students' facilities
- 5 – Isolation

6.1.2 PREMISES USED FOR CLINICS AND HOSPITALISATION

Premises refer to both buildings (Porto and Vairão).

Table 6.1: Places available for hospitalization and animals to be accommodated

	Species	No. places
Regular hospitalization	dogs*	39
	cats/exotic pets*	22
	cattle**	6
	horses**	11
	small ruminants**	6
	pigs	0
	horse paddocks**	4
Isolation facilities	small animals*	5
	farm animals and horses**	2

* Porto; **Vairão

6.1.3 PREMISES FOR ANIMALS

At the Porto building, a kennel with individual lodging capacity for 24 dogs and two play areas (approx. 550 sq. m) provides lodging of a Beagle colony exclusively dedicated to teaching.

At the Vairão Centre there is one small ruminants paddock with capacity for 16 animals; one indoor barn for 10 cows and 8 calves; one 2 ha pasture for horses; and one 1 ha pasture for cows.

6.1.4 PREMISES USED FOR THEORETICAL, PRACTICAL AND SUPERVISED TEACHING

At the Porto building, classrooms and other multifunction rooms are shared between the two Establishments (ICBAS and FFUP) and ICBAS courses. Exceptions are some veterinary-specific laboratories and clinical facilities.

Table 6.2: Premises for clinical work and student training

Small animals*	consulting rooms	5
	surgical suites	2
	treatment area	1
	ultrasound room	1
	radiology room	1
	CT scan room	1
	chemotherapy room	1
Equine and farm animals**	examination areas	2
	surgical suites	1
	stallion semen collection room	1
	radiology room	1
	canine reproduction room	1
	embryology laboratory	1

* Porto; **Vairão

Table 6.3.1: Premises for lecturing at Porto (shared with FFUP)

Number of places per lecture hall:										
Hall	1	2	3	4	5	6	7	8	9	10
Places	143	143	80	80	80	234	117	117	130	143
Total number of places in lecture halls: 1267										

Table 6.4.1: Premises for group work at Porto (shared with FFUP)

Room	1*	2*	3	4	5	6	7	8
Places	40	40	36	36	25	25	25	25
Total number of places in rooms for group work: 252								

*Computer rooms (ICBAS only)

Table 6.4.2: Premises for group work at Vairão (IMVM only)

Room	1	2
Places	25	25
Total number of places in rooms for group work: 50		

Table 6.5.1: Premises for practical work at Porto (ICBAS only)

Laboratory	1 ^a	2 ^a	3 ^a	4 ^a	5 ^a	6 ^a	7 ^b	8 ^b	9 to 20 ^c
Places	25	25	25	25	25	15	25	25	(12x25)
Total number of places in laboratories: 490									

^a Veterinary Medicine only (semiology 1 and 2; food technology and microbiology; parasitology; infectious diseases; necropsy room); ^b Anatomy; ^c General use

Table 6.5.2: Premises for practical work at Vairão (IMVM only)

Laboratory	1 ^a	2 ^b	3 ^c
Places	8	10	3
Total number of places in laboratories: 21			

^a Horse reproduction ;^b Dog reproduction; ^c Embryo Lab

ICBAS approved, in 2013, the General Conduct and Safety Guidelines where the major issues are described, publicly available in Portuguese and English in the ICBAS webpage. These rules are complemented by specificities to be followed in areas (e.g. small animal Hospital; Anatomy) where particularities require further actions.

6.1.5 DIAGNOSTIC LABORATORIES AND CLINICAL SUPPORT SERVICES

Diagnostic laboratories

The veterinary pathology laboratory provides necropsy and histopathology diagnostic services for ICBAS' clinical services and outside veterinary practitioners. Facilities include equipment for histological diagnosis, histochemistry, immunohistochemistry and

access to the ICBAS electron microscope, and the services are provided by veterinary pathologists.

The histology laboratory provides cytology services to ICBAS' clinical services. Fully equipped with the necessary equipment, the service is provided by two veterinarians, authors of a published book in veterinary cytology.

The parasitology laboratory, run by one veterinary professor, provides diagnostic services in some diagnostic areas for the internal clinical services.

Two microbiology laboratories also support the clinical services, mainly in the bacteriology area. Both are run by veterinary professors and equipped with the necessary instruments for accurate testing.

Central clinical support services

Due to its different nature (individual medicine vs. herd and farm medicine) and the distance and location of both services, each unit (small animal hospital; reproduction and large animal clinical services) is managed separately in terms of purchases, service scheduling, fees collection and acquisition of external or internal services.

6.1.6 SLAUGHTERHOUSE FACILITIES

The practical work on red meat inspection is developed in two different slaughterhouses: “Carnes Landeiro SA”, nearly 40 km north of Porto (in Nine, between Vila Nova de Famalicão and Barcelos), works with cattle; “Seara Indústria de Carnes Lda”, nearly 30 km north of Porto (in Vila Nova de Famalicão), is a swine slaughterhouse. “Avicasal SA” is a poultry slaughterhouse 113 km south of Porto (in São Pedro do Sul) that provides access to the practical training in the area. The practical training on lagomorphs' inspection is developed in “Litoral Coelho”, a slaughterhouse located nearly 100 km south of Porto (in Tocha).

6.1.7 FOODSTUFF PROCESSING UNIT

Cutting and deboning rooms

The two red meat slaughterhouses include deboning, cutting rooms and meat processing units. Similarly, the poultry unit possesses and allows students to accompany its cutting and deboning unit.

Fish canning factories (“Ramirez & C^a SA”; “Fábrica de Conservas Belamar”)
“Ramirez” locates 6 km northwest of ICBAS (Matosinhos) and “Belamar” is 30 km north of Porto (Vila do Conde). Both factories possess quality control laboratories and water effluent treatment plants.

Fishing docks, fish auction and fish market (“Docapesca Portos e Lotas, SA”)
“Docapesca”, located 5 km northwest of ICBAS (Leixões harbor, Matosinhos), is the largest fishing port in Portugal.

Collective restauration services (“SASUP”)

The U.Porto’s 15 visited canteens and snack bars are distributed among the 14 Faculties in the city.

Dairy processing unit (“Lacticínios Marinhas Ld.”)

“Lacticínios Marinhas”, located 45 km north of Porto (Esposende), is an internationally awarded traditional cheese and butter factory.

Meat processing unit (“Realsabor Ld.”)

“Realsabor”, located 10 km south of Porto (Vila Nova de Gaia), is mainly dedicated to fermented and cured meat products.

6.1.8 WASTE MANAGEMENT

Waste materials are primarily separated by the units and laboratories, maintaining their characteristics, for treatment by external specialized and certified companies. Risk 3 solids are incinerated or pre-treated and land-fielded; risk 4 solids are incinerated; liquids are separated and treated accordingly to their chemical and physical nature.

All residues are stored in adequate and color-identified containers provided by the mentioned companies, with contents dully identified.

Sewage is drained to a particular facility where it is pre-treated before entering the general sewer system.

For large animals’ carcasses there is a specific collection and disposal service provided by the Ministry of Agriculture.

6.1.9 FUTURE CHANGES

In complement to the existing facilities, a new complex is being planned in the region of Maia (16 km north of Porto) aimed at the improvement of equine management and treatment, among others.

6.2 and 6.3 COMMENTS AND SUGGESTIONS

The existence of two main units (Porto and Vairão) 30 km apart has many advantages and some drawbacks. Advantages include the proximity to the largest concentration of dairy farms in the country and to the INIAV facilities. It is also located in a place of easy access to trailers with horses. This proximity enables to maximize the contact between the Establishment and the farming community, reflected in the high large animal caseload and the dynamic program of equine reproduction. ICBAS Porto facilities are at the centre of the second largest city in the country, ensuring a high small animal clinical caseload. Most of the research centres in life sciences are also nearby, allowing for a close contact between institutions. The disadvantage of the need to move students between the two campuses is minimized by having a good public transportation system and a University-owned shuttle service between the local Metro station and the Vairão Centre.

Chapter 7: ANIMALS AND TEACHING MATERIAL OF ANIMAL ORIGIN

7.1 FACTUAL INFORMATION

7.1.1 ANATOMY

At the IMVM anatomy is taught in three CUs: Systematic anatomies I and II and Clinical anatomy. The dog is the reference animal model with whom the cat, horse, cow, sheep, goat and pig are compared. Skeletons and individual bones of domestic animals, obtained by maceration of cadavers, are used to teach osteology. Radiographic anatomy is also used to illustrate bone morphology.

Table 7.1: Material used in practical anatomical training

	Dog		Ruminant		Equine		Other	
	2013/14	2014/15	2013/14	2014/15	2013/14	2014/15	2013/14	2014/15
Live animals	0	0	0	0	0	0	0	0
Cadavers	77	77	1	1	0	0	41 ^a	41 ^a
Prosected parts of cadavers	94	94	113	113	66	66	64 ^c	64 ^c
Skeletons	1	1	7 ^e	7 ^e	8 ^e	8 ^e	4 ^d	4 ^d
Bones	186	186	30	30	12	12	74 ^a	74 ^a
Anatomical Models	15	15	16	16	7	7	12 ^a	12 ^a
Radiographs	25	25	0	0	1	1	10 ^b	10 ^b

^a swine; rabbits; cats; poultry

^b cats

^c swine; cats

^d cats; poultry

^e forelimb and hindlimb skeletons

Cadavers of dogs are obtained from the City Pound and used accordingly to the EC Regulations, kept frozen prior to classroom dissection. Food animal viscera are obtained from official slaughterhouses after granting the authorization of the National veterinary authority (DGAV). Some are preserved by freezing while others, formerly fixed in 10% formaldehyde, are currently fixed and preserved by immersion in a saturated sodium chloride solution. The circulatory and nervous systems are studied in previously dissected cadavers and their parts. Vascular resin castings obtained by injection/corrosion are used to teach angiology.

In Clinical anatomy, dogs, cows and horses cadavers, or their parts (e.g. heads), and radiographies are used for the identification of anatomical structures and interpretation of their topographical changes in the clinical setting. Although we recognize the benefits of live anatomy, animal welfare issues and time-consuming difficulties restrain the use of such practices. Hence, surface anatomy is trained on refrigerated cadavers or their parts. Classes devoted to avian and rabbit anatomy use non-eviscerated cadavers purchased from official slaughterhouses and dissected cadavers preserved by immersion in a saturated sodium chloride solution as well as skeletons and individual bones.

7.1.2 PATHOLOGY

Companion animal cadavers for necropsy are obtained from private clinics and hospitals; rabbits and pigs from farms; and wild animals from zoos and wildlife parks. They are transported in an identified vehicle inside adequate containers and accompanied by the appropriate documentation. Poultry necropsies are performed in the slaughterhouse, by using a separate room, and in farms. According to the national legislation, cattle necropsies are performed in the farms. Horses are also necropsied *in loco*.

Table 7.2: Number of necropsies over the past 3 years

Species	Number of necropsies			Average
	Year 2014/15	Year 2013/14	Year 2012/13	
Food Producing Animals:				
Cattle	12	5	5	74
Small ruminants	0	0	1	
Pigs	23	48	71	
Other farm animals**	20	19	18	
Equine	1	1	0	0.7
Poultry	176	176	166	328.3
Rabbits	115	142	210	
Companion Animals/Exotic:				
Dogs	88	99	111	155.7
Cats	46	38	59	
Other*	5	2	19	

* partridges; seagulls; iguanas; hedgehogs; birds of prey; turtles; ferrets; ducks; other wild birds

** fish

7.1.3 ANIMAL PRODUCTION

As mentioned in 4.2, financial constraints preclude the existence of an ICBAS owned teaching farm. Therefore, the teaching of animal husbandry, herd health, and techniques of handling production animals are initiated using the resident ruminants and horses and expanded and complemented by visits and work in dairy farms around Vairão where the students go regularly. For swine, small ruminants and beef cattle, the “Herdade da Abóbada” Station is also used in this respect (450 beef cattle, 1100 sheep, 250 goats and 50 breeding sows). Poultry, swine and rabbit production is taught by specially organized visits to production units with whom ICBAS has agreements. Students are also acquainted with management of dairy farms during the ambulatory services.

7.1.4 FOOD HYGIENE/PUBLIC HEALTH

All students have practical mandatory *ante mortem* and *post mortem* inspection training in bovine, swine, lagomorphs and poultry slaughterhouses, where they are exposed to the following slaughtered populations:

Species	Slaughter throughput (animals/hour)	Approximate number of animals contacted by the students	
		ante mortem	post mortem
Bovine	75	225	225
Swine	225	500	500
Poultry	8 500	5 000	1 000
Lagomorphs	800	1 000	250

The contact with food products of animal origin occurs in the industrial premises described in Chapter 6. Furthermore, raw materials of animal origin are obtained from retailers for the training of food technology. For the same purpose, food additives are obtained from a specialized supplier.

7.1.5 CONSULTATIONS AND PATIENT FLOW SERVICES

7.1.5.1 CONSULTATION

Companion animal training takes place in the ICBAS’ Hospital (UPVet), including appointed consultations and surgeries (9.00 a.m. to 8.00 p.m.), hospitalization, and emergency services (both 24/24 h). Students of the 4th (companion animal surgery) and 5th (companion animal medicine and surgery) years and interns are fully involved in all services (see Chapter 4).

Equine and farm animal staff is present at the Vairão Centre on weekdays, from 9 a.m. to 5 p.m. A 24 h/365 d on call service is available for horses (clinics and reproduction), based on the ICBAS' staff, and for bovine by contract with a private veterinary company ("SVA- Serviços Veterinários Associados") and a dairy coop ("Cooperativa Agrícola de Vila do Conde"). These services involve, during the official classes' calendar, the 5th year students (internal medicine and surgery of farm animals and equine; theriogenology). During the equine breeding season (April to July), routine services are extended into weekends and holydays, with the participation of, at least, one intern and one resident. Assisted reproduction services in dogs are also offered year-round at the Vairão Centre.

7.1.5.2 PATIENT FLOW

Table 7.3: Number of cases: a) received for consultation, and b) hospitalized in the past three years.

Species	Number of cases						Average
	Year 2014/15		Year 2013/14		Year 2012/13		
	a	b	a	b	a	b	
Food Producing Animals:							
Bovine	58	58	59	59	61	61	80.7
Ovine, Caprine	36	36	13	13	15	15	
Porcine	0		0		0		
Other farm animals	0		0		0		
Poultry	0		0		0		0
Rabbits	0		0		0		
Equine	115	54	86	55	76	57	92.3
Companion Animals/ Exotic:							
Canine	3620	738	3540	644	2891	495	4755
Feline	1306	273	1342	249	1110	194	
Other**	111	23	161	30	184	32	

** birds, rodents, reptiles/chelonians

7.1.6 VEHICLES FOR ANIMAL TRANSPORT

A commercial van (Fiat Doblo) is available for the transportation of dogs between Vairão and Porto. Transportation of animals to and from the large animal clinic is done at the owners' expense and responsibility.

7.1.7 ON-CALL EMERGENCY SERVICE

A 24 h., 365 d on call service is available for horses (clinics and reproduction), based on the ICBAS' staff, and for bovine by contract with a private veterinary company ("SVA-Serviços Veterinários Associados") and a dairy coop ("Cooperativa Agrícola de Vila do Conde").

7.1.8 ON FARM TEACHING AND OUTSIDE PATIENT CARE

7.1.8.1 AMBULATORY (MOBILE) CLINIC

Ambulatory dairy farm clinical services are permanently assured by 6 practitioners, one staff member and five from the mentioned two private services, using 2 fully-equipped ICBAS vans (6 seat Fiat Scudo). Daily services are based on on-call services (medicine and surgery) and on programmed visiting schedules (reproduction services, including pregnancy diagnosis). Each practitioner is accompanied by 2 undergraduate students on weekdays during 28 weeks/year and by interns, residents or voluntary undergraduate students in the other periods. During equine breeding season, reproduction services visit dairy farms in the mornings and horse stud farms in the afternoons, including weekends whenever services are needed. Since 2012, rabbit, poultry and swine farms are visited during the academic year (1 practitioner accompanied by 10-15 5th year students).

From 2012/13 to 2014/15, the number of farm visits was:

Dairy: 2361; Equine: 82; Swine: 12; Poultry: 32; Rabbit: 27

Table 7.4a: Number of cases seen by the ambulatory (mobile clinics) in the past three years.

Species	Number of patients			Average
	Year 2014/15	Year 2013/14	Year 2012/13	
Food Producing Animals:				
Cattle	3142	2955	3310	3135.7
Poultry (n° of flocks)	34	30	28	56.3
Rabbits (n° production units)	32	27	18	
Equine	15	29	38	27.3

7.1.8.2 OTHER ON FARM SERVICES AND OUTSIDE TEACHING

As previously mentioned, all students spend three full-time days dedicated to practical training in beef cattle, small ruminants and pigs at the “Herdade da Abóbada” where farm management, reproductive control and clinical examination procedures are practiced. The Station owns 450 beef cattle; 1350 small ruminants; and 278 swine. Animals with potential health or reproductive problems (on average 80-120 cows, 100 small ruminants and 100 swine) are identified, separated from the herd and handled accordingly by students under supervision of one professor and two practitioners. Furthermore, breeding soundness evaluation of bulls (40 animals); rams (40 animals); and boars (20 animals); artificial insemination of ewes (on average 320 animals); preparation of teaser rams; and semen handling and preservation are also trained by students.

7.1.9 OTHER INFORMATION

Companion animal services:

UPVet welcomes the collaboration with outside entities for mutual benefits (clinical assistance and students training). Currently there are protocols with the City Hall for neutering dogs and cats adopted from the municipal animal shelter; one animal welfare associations Federation (“Animalife”), aimed at the neutering of stray animals (cats and dogs); one association for the training of assistance dogs (“Ânimas”); one private Veterinary Blood Bank (“Banco de Sangue Animal”) and one of the largest private Veterinary Hospitals in the city (“Centro Hospitalar Veterinário”), the latter for CT scans. Compared to regional private practices, UPVet is at the level of the largest hospitals in facilities, equipment, expertise and services provided. It may be said that response time is not as fast as in some private clinics and hospitals but the main objective of the Hospital (to teach students with a “hands on” approach) forces us to operate at a slower pace, although no patient is left untreated. During the academic year, undergraduate students are fully engaged in the Hospital practice on weekdays. As mentioned in Chapter 4, students are also admitted to the Hospital at any other time of the year, on a voluntary basis. Furthermore, the Hospital receives interns, preferentially from other Veterinary Establishments, during the entire year. During summer holidays, the Hospital receives high school students by collaborating in a University program named “Junior University” and in short two-week courses for veterinary students, promoted by the Portuguese Veterinary Medicine Academic Federation. The percentage

of referrals, second and third opinions is estimated to be around 15%. UPVet has an excellent relationship with the majority of the private units of the region. Besides referrals, both teachers and practitioners are frequently contacted by private practitioners to assist in the decision-making process or plan for the referral of cases for special procedures (e.g. digestive endoscopy; CT scans). Although professors and practitioners have special areas of interest and expertise, and are often requested to consult patients in such areas, they are all prepared to practice general medicine and surgery. The hospital also counts with the collaboration, two mornings per week, of a practitioner dedicated to exotic species. While client lists and scheduling are computer-based, patient records are kept on paper files for several reasons: All software on the market are predominantly orientated for financial management (centralized in the administrative services at ICBAS) and not aimed at the management of clinical information; computer record keeping implies the acquisition of several workstations plus a centralized high-power computer whose costs are currently above its budget; the adequate loading of data would require an almost exclusivity of personnel, not possible at the moment, or the possibility of being introduced by students but not definitive until validation by a staff member, impossible using the current marketed software; finally, to be rigorous information must be, as much as possible, selected from programmed menus and not in open free text boxes (risk that spelling mistakes hamper data retrieval), again something in which software are scarce. Most of the clinical data is registered by the students, followed by a revision and validation by the responsible practitioner. Services provided are immediately charged and billed to the client. Every day a report is sent to the main administrative office in the central building of ICBAS together with the currency or proof of payment. The collected funds are a part of the Establishment's revenue and managed, after taxation and overheads collection, by the Director of the Hospital (see Chapter 3).

Assisted reproduction services:

CRAV involves students in its canine, bovine and equine services. Teaching outside periods of formal classes is frequent, on a voluntary basis for individual students or small groups, in equine and canine theriogenology topics or *in vitro* bovine embryo production. During the equine breeding season, the theriogenology group is reinforced with at least one intern, which can be a recently graduated veterinarian or a student in her/his 6th year. A formal protocol with the Portuguese Kennel Club establishes CRAV

as the preferential provider of assisted reproduction services for the PKC northern associates.

Comparing with outside practices, CRAV is above average in terms of facilities, equipment, expertise, and responsiveness and similar to the best in hours of service. Relationship with outside practitioners is very good with nearly 15% of cases being referrals in 2014/15. Besides referrals, group members are frequently contacted by private practitioners to assist in decision-making processes or plan for the referral of cases. They are frequently invited to participate in meetings and workshops in canine, bovine and equine theriogenology. Patient records are kept on hard copies for bovine and canine, and in hard copies and digitalized forms for equine (EquineLogbook™). The collected funds are a part of the Establishment's revenue and managed, after taxation and overheads collection, by the CRAV Director (see Chapter 3).

Indoor equine clinical services:

Mainly based on referrals, these services complement those provided by the private sector, including diagnostic imaging and surgery. The Centre has an agreement with regional horse traders for stallion sterilization, performed in the practical classes of surgery.

Comparing with outside practices, the Centre has facilities, arthroscopic equipment, and know-how in arthroscopic surgery with no match in Northern Portugal. Furthermore, when requested for complex orthopaedic surgeries, the Centre cooperates with specialized private equine orthopaedic surgeons.

The collected funds are a part of the Establishment's revenue and managed, after taxation and overheads collection, by the CCEV Director (see Chapter 3).

Ambulatory clinics:

The service relies on dairy cattle farmers of the region that are associated to several cooperatives. ICBAS provides the vehicles, equipment and some expendables, and receives the training of students by very experienced practitioners with excellent implementation in the region, and increases the visibility and awareness of the Establishment. Comparing with other private practices, these services are above average in terms of equipment, expertise, and responsiveness. Records are kept on paper files and the cases are used for discussion in sessions of 10-15 students. No funds are collected by the Establishment from these services. Equine ambulatory reproductive services are provided mostly in stud farms of the region and some in the central and southern Portugal, as part of the CRAV services. CRAV's services are paid for.

7.1.10 OTHER SPECIES

Practice of fish handling, including clinical procedures (vaccination; anaesthesia; microchip implants), is provided using animals from the ICBAS aquarium. Furthermore, students may, on a voluntary basis, visit fish farms and participate in the general, sanitary, and reproductive management.

7.2 COMMENTS

Although old anatomical preparations were preserved using formaldehyde, they are currently preserved in saturated sodium chloride solutions so students are not exposed to the former in concentrations that may be dangerous. Furthermore, at present the preservation methods abandoned formaldehyde.

The low number of necropsies in large animals is due to three main reasons:

1. National biohazards regulations oblige that, with very few exceptions (individually authorized), necropsies have to be performed *in loco*.
2. Furthermore, cadavers must be fully closed before transported for incineration, a very time-consuming task, when necropsies are properly performed, that compromises subsequent clinical duties.
3. The low income of food animal producers demotivate farmers to request or agree with the necropsy procedures when a clinical diagnosis was obtained and no public health issues are involved.

The cooperation with outside slaughterhouses and food industry provides an invaluable tool for the practice of food hygiene and public health subjects in real context.

As stated in Chapter 4, practical training in equine medicine and surgery is still not optimal. Efforts for its increase are currently being made by the IMVM Direction so that students may be exposed to more equine cases and those that are particularly interested in the subject may have access to external services.

Swine production in the region is scarce and swine farm visits are mainly approached on a herd health perspective, although it is possible that individual diseased animals are found during such visits. Individual swine cases and practices (e.g. castration) are performed in the “Herdade da Abóbada” classes.

7.3 SUGGESTIONS

The IMVM direction is committed to further improving the teaching of animal production by increasing the number of farm visits in several CUs, in order to sensitize

students to the reality of the intensive, semi-intensive and extensive production systems of the most prevalent domestic species in the country.

Chapter 8: LIBRARY AND LEARNING RESOURCES

8.1 FACTUAL INFORMATION

All Establishments of the University of Porto have their own Library, and there are no access restrictions to any of these libraries by students and staff.

8.1.1 LIBRARY AND OTHER INFORMATION TECHNOLOGY SERVICES

At the ICBAS/FFUP complex, the library is jointly administrated by staff from both Establishments, thus including documentation on all degrees. The management committee is chaired by two professors from the two Establishments, each one appointed by the respective Dean, and governed according to an internal regulation. There are 6 full time employees (4 with college degree), all with special training in library sciences. The library also has a Reference Librarian, a trained professional who helps users with their information and research needs (e.g. to locate information and resources; to guide through the research process; and to teach how to use the various online periodical databases, catalogues, and the web). The library regularly provides group-training to its users, either in person or online, for better performance and efficiency in the use of its facilities and services.

The ICBAS/FFUP library is open from Monday to Friday, from 8:00h to 19:45h. In August (the official vacation month), open hours are from 9:00h to 17:00h. On weekends only the electronic services are available. During the examination periods, the largest reading room is open all night to increase places available for studying.

The Library has a reading service distributed over 2 floors (344 seats), organized into the following functional areas:

- Level 1: Reading rooms intended for individual study.
- Level 2: Reading room and 20 individual offices (14 with computer terminals).

In the reading rooms (supplied with monographs and periodical publications), users have free access to the documents and can consult any work that is on the shelves. In addition, users may use other materials, such as personal computers.

The library utilizes 6 major electronic search and access systems for national and international documentation: SJR, UP-Repository, EBSCO, B-ON, ISI-Web of Knowledge and SCOPUS. It also has an active national exchange program with other research and academic libraries, which allows its users to use bibliographic materials

from collections within the network when it cannot be purchased, is out-of-print, or is otherwise difficult to find.

Available periodicals can be viewed at the library site. There is an area dedicated to Veterinary Medicine where all monographs are exposed. Presently, the library has 963 records in the Veterinary Medicine bibliographic database, including books, periodicals, reprints and scientific articles. Portuguese public Universities have several contracts with different national and international publishers allowing for the search and download of the major publications with interest to Veterinary Science. The online access is done through the B-On. The library has a “Publication Request Service” for requesting scientific articles, whether they exist in the library or not, by filling the appropriate form available on the library web page (<http://www.icbas-ff.up.pt/biblioteca/>). Furthermore, the library also has a “Suggestion of Purchase Service” in the web page by which users may suggest the purchase of new books.

Library instructors teach students on how to use library resources, scholarly research processes, and several other technological tools.

The library offers distinct instructional options such as:

Instruction sessions by request: Focused on a particular resource or a course assignment requested by instructors, students, or staff members.

Open workshops: Free of charge and offered regularly throughout the year upon registration.

8.2 COMMENTS

Although the library is provided with most of the major books in Veterinary Sciences, the acquisition of the latest editions and the purchase of more than one copy per book are hampered by the dependence on the available budget and its dispersion between the needs of all courses.

Likewise, and in spite of the described access tools, veterinary-related periodicals that are readily accessible, in particular for students, are somehow limited by budgetary issues.

The library timetable seems adequate to the students’ demands, in particular during examination periods when it is open almost 24/24h. Although the total reading spaces are adequate for simultaneous use by both Establishments, the occupancy of the second room for examinations limits its use in the period when students would probably needed it the most, forcing them to search for other study spaces. In order to alleviate this

problem, extra study rooms (auditoriums and group classrooms) are accessible during the examination periods.

The library staff runs periodic inquiries regarding services quality and so far the expressed opinions are positive.

The University of Porto has a wide range of IT facilities that includes computer rooms for students, wireless internet, individual institutional e-mail address, and a computer office for the resolution of staff and student's individual problems. Therefore, almost all administrative tasks may be performed on-line, including enrolment, access to individual data, CU summaries and documents, communication, document printing, etc.

8.3 SUGGESTIONS

The ICBAS/FFUP Library intends, in the near future, to extend its collection of veterinary books and specific electronic resources. Similarly to what is being implemented in the Small animal hospital, a small library will be also be available at the Vairão Centre in order to allow for an immediate practical support. The Library is also planning to organize thematic expositions and workshops for veterinary students.

Chapter 9: STUDENT ADMISSION AND ENROLMENT

9.1 UNDERGRADUATE COURSES

9.1.1 UNDERGRADUATE STUDENT NUMBERS

Undergraduate students are allowed to enrol in a maximum of 75 ECTS per year, not surpassing 42 ECTS per semester (except in the first year when maximums are 60 and 30 ECTS respectively). There are no special requirements for completing courses prior to start other subjects, with the exception of the 6th year that requires approval in all previous CUs. According to a Rector's Directive, students must complete graduation within a maximum of 8 years, after which their enrolment prescribes.

Table 9.1: Undergraduate student composition in year prior to visitation (2014/15)

Total number of undergraduate students	383
Total number of male students	93
Total number of female students	290
Number of foreign students*:	
from EU countries	7
from non-EU countries	6

* *Mobility programmes*

9.1.2 STUDENT ADMISSION

In Portugal, students enter the university after a minimum 12-year educational track. During the last year of the secondary school they have to take the National exams whose grades are conjugated with the frequency grades for calculation of the final scores. Students must approve all disciplines of the secondary school and obtain sufficient scores in Biology/Geology and Physics/Chemistry to be admitted in the IMVM. For admission purposes into public veterinary education Establishments, students are ranked by the average grade obtained in the last three years of the secondary studies, and the grades obtained on the National exams of the two mentioned subjects (Biology/Geology and Physics/Chemistry). The average grade of these two components (with the same relative weights) makes the final grade with which students are ranked. National exams are prepared and graded by the National Evaluation Office and approved by the Ministry of Education.

Depending on the students' choices and the *numerus clausus*, determined by each Establishment and approved by the Ministry, students are ranked by the scores obtained and offered admission at the different Universities and Faculties. All application procedures are centrally-controlled by the National Higher Education admission board, directly dependent on the Ministry of Education.

Table 9.2: Intake of veterinary students in the past five years

Year	Number applying for admission	Number admitted	
		'Standard' intake	Other entry mode*
2014/2015	367	56	23
2013/2014	269	57	26
2012/2013	506	61	28
2011/2012	322	60	14
2010/2011	621	60	17
Average	417	58.8	21.6

* adults older than 23 years (after taking a special exam to enter the university); students that already have another degree; students with a 1st cycle diploma in adequate area; university students from other degrees; transfer of students from other veterinary education Establishments.

The number of non-“standard” vacancies is determined by the Establishment upon proposal of the course direction. For the near future we do not envisage changes in the number of veterinary students entering the Establishment.

9.1.3 STUDENT FLOW

Table 9.3: Student flow and total number of undergraduate veterinary student

Number of students present after admitted year 1			Additionally admitted students
2009/2010	1st year	79	0
2010/2011	2nd year	43	8* + 12**
2011/2012	3rd year	44	22*
2012/2013	4th year	44	14*
2013/2014	5th year	39	42* + 1**
2014/2015	6th year	55	1* + 1**

* retained students

** transferred from other veterinary education Establishments.

Table 9.4: Number of students graduating annually over the past five years

Year	Number graduating
2014/2015	57
2013/2014	62
2012/2013	62
2011/2012	55
2010/2011	44
Average	56

Table 9.5: Average duration of studies (distribution of undergraduate students graduating in the year 2014/15 – number of years after admission in the school)

Duration of attendance	number
year 0	27
year 1	16
year 2	8
year 3	3
year 4	3
year 5	0
year > 5	0
Total	57

Regardless of their admission regimen, all students register in the first year. When coming from other life sciences schools, they may apply for accreditation of subjects with similar programmatic contents and working hours. Each individual application is evaluated by members of the SCIMVM and granted if considered adequate. After this process, students are allocated to the academic year where the most advanced CU is located. Students with subjects from different years have to adapt to the existing timetables to guarantee their presence in classes that are mandatory.

9.2 COMMENTS

Students admitted to the ICBAS' IMVM consistently have the highest admission grade point average of the country. Therefore, their basic knowledge is above average, providing a good basis for progression and compliance with the course demands.

As mentioned, the number of admissions is a centralized decision of the Ministry of Science, Technology and High Education, upon proposal of the Establishments. To date,

both the Rector's office and the Ministry accepted the number of admissions proposed by the IMVM Direction. Such number is calculated on the basis of available resources (facilities, equipment, and staff) so that the defined day-one skills may be attained by each student. However, as previously stated, there are circumstantial problems that require improvement in some areas, particularly regarding facilities and teaching staff. Dropping out is still one problem, although unrelated to the students preparation or any IMVM inherent cause, but rather the reflex of a high social value attributed to the human medical profession that results in a very disproportionate number of candidates versus admissions to that program. Therefore, a non-negligible number of students, upon failing admission to human medicine, choose the "nearest" degree, i.e. veterinary medicine. Since the former is the course with the highest admission grades, such students often blocking admission of those that, although selecting veterinary medicine as their first choice, do not have such high admission grades. Some of the former, once given the opportunity, drop out veterinary medicine to move to human medicine. The course direction has been able to compensate for these students by admitting additional students (table 9.3) whose selection privileges the occupancy of the vacant places in nearly the same stages of the course.

9.3 SUGGESTIONS

In order to compensate for the drop out numbers, the IMVM has a significant number of non-"standard" admissions. There are, however, legal limitations to these contingents. A proposal of the IMVM direction for the admission of foreign students was not accepted by the Ministry of Science and Higher Education, for unknown reasons.

Chapter 10: ACADEMIC AND SUPPORT STAFF

10.1 FACTUAL INFORMATION

Table 10.1: Personnel in the establishment provided for veterinary training

	Budgeted posts (FTE)		Nonbudgeted posts (FTE)		Total (FTE)	
	VS	NVS	VS	NVS	VS	NVS
1. Academic staff						
Teaching staff	34.1	43.1	0.1	0.3	34.2	44.4
Research staff	1				1	
Others*	1		5		6	
Total FTE						
Total FTE (VS + NVS)	79.2		5.4		85.6	
FTE providing last year teaching (5 th year)	20.8		5.1		25.9	
2. Support staff						
a) responsible for the care and treatment of animals	4				4	
b) responsible for the preparation of practical and clinical teaching.	39		5		44	
c) responsible for administration, general services, maintenance, etc.	47**				47	
d) engaged in research work						
e) others (please specify)						
Total support staff	90		5		95	
3. Total staff	169.2		10.4		180.6	

* Clinical services

**15 elements belonging to the University shared services

Table 10.2: Allocation of academic (VS and non VS) teaching staff – expressed as FTE – and support staff to the various departments

Department name			Academic teaching staff						Support staff		
	Full prof.		Associate prof.		Assistant prof.		Assistant		Technical/	Animal carers	Admin.*
	VS	NVS	VS	NVS	VS	NVS	VS	NVS	(b + d + e)	(a)	(c)
Anatomy			1	1					4		
Molecular Biology		3		4		1			4		
Behavioural Sciences				1					1		
Veterinary Clinics		0.1	2.3	1	15.3	0.3	2.5		9	4	1
Populations Studies		2	1	2	1	3			1		
Immuno-Physiology and Pharmacology	1	2		3	3	4			8		
Microscopy		2			2	2			5		
Pathology and Molecular Immunology	1		1	1	2				4		
Aquatic Production				4	1	2			5		
Chemistry		1		2		3			3		

* 40 administratives are shared by the Establishment or the University, not allocated to the Departments

Allocation of teaching staff to the Departments is dependent on the teaching workload for which they are responsible amongst all courses of the Establishment. By law, one FTE must teach 6 to 9 hours per week per year. Ever since Portugal applied for a European financial rescue, admittance of public servants has been heavily impaired, as an effort to significantly reduce state expenses. Furthermore, career progression of budgeted staff has been halted since 2010. This led to no replacement for retired members or staff rejuvenation and substitution. As a consequence, non-budgeted staff must be hired as services providers and paid using the services' income. Such acquisition is decided by the Dean and must comply with the national rules for hiring services in public establishments that, as an example, mandate that all contracts must never surpass one year and cost should be the sole decision factor. Furthermore, should a provider demonstrate interest in renewing, the services cost suffers a mandatory 10 to 12% reduction.

Budgeted staff cannot, by law, work outside the Establishment in the same activities he/she is hired to perform. Some described exceptions are admitted, although they must always be accepted by the Dean or the Rector. This rule is not valid for non-budgeted staff.

Attendance of scientific meetings or other forms of education is often supported by the Departments and/or the Dean's office, if deemed relevant. Proposals for such support may be presented by the Head of Department, Course Director, or directly by the interested person. Sabbatical leaves are only authorized by the Dean after consultation of the ICBAS Scientific Council and the guarantee that the teaching workload of the absent teacher is assured by other teachers with adequate knowledge and competence. Due to financial constraints, sabbatical leaves have not been authorized in the last 5 years.

10.2 COMMENTS AND SUGGESTIONS

As a consequence of the described financial state problems, the distribution of the teachings staff amongst categories is clearly unbalanced, particularly those with a veterinary degree, with a shortage of full professors and an "accumulation" of assistant professors, many of them with curricula that would be sufficient to be, at least, associated professors.

On average, and in spite of the public servants' salary reduction in 2011, the national economic crisis also affected the private sector so it cannot be said that the salary levels are far shorter than those earned in private services.

Although the percentage of non-veterinary FTE is more than those with a veterinary degree, the vast majority of the former is involved in teaching several other ICBAS and U.Porto's degrees, while such distribution is rare amongst veterinary teaching members. Therefore, when the teaching workload is calculated, teachers with a veterinary degree are responsible for nearly 75% of the IMVM teaching load.

Chapter 11: CONTINUING EDUCATION

11.1 FACTUAL INFORMATION

Continuing Education at ICBAS is conducted by the initiative of the Departments, AEICBAS and individual teachers. There are no funds specifically allocated for this purpose (with the exception of AEICBAS). The Establishment provides facilities, training and some equipment, while the remaining expenses must be covered by participation fees and/or partnerships with organizations and private companies.

Some initiatives are devoted to veterinary activities, where the majority of participants are veterinary professionals, while others receive the interest of different professionals, such as “Science in Laboratory Animals” courses where researchers interested in using animals are accepted. A third type involves most of the areas taught at ICBAS, such as the AEICBAS Biomedical Congresses that join all ICBAS’s students with veterinary professionals, medical doctors, researchers, biologists and specialists in environmental sciences. Students are welcome in these initiatives, having the opportunity to meet and discuss new findings and ideas.

Table 11.1. Courses and Conferences organized by the Establishment

Year	Title of the Course
2010	Zoonosis: Diseases transmitted from animals to humans
	Science in Laboratory Animals - IV edition
	Seminar: The use of Assistance Dogs
	II Course in Equine Reproductive Biotechnology
	Diagnostic imaging in Dogs, Cats and Equines
	Assisted Reproduction in Horses – I edition
	Advanced Course on Marine Ecotoxicology
	Advanced Course on Biomarkers of Environmental Contamination
	Advanced Course on Freshwater Ecotoxicology
2011	Science in Laboratory Animals - V edition
	Advanced course on Marine Ecotoxicology and Risk Assessment
	Surgery in Pets, Bovines and Equines
	Assisted Reproduction in Horses – II edition

	Veterinary Emergency Medicine
2012	Paediatrics in small and large animals
	Science in Laboratory Animals - VI Edition
	Workshop on Cancer Research – biological and molecular basis
	Veterinary Emergency Medicine
	Advanced course on Marine Ecotoxicology and Risk Assessment
2013	II Meeting of the Portuguese Society of Veterinary Cardiology
	I AEICBAS Biomedical Congress
	Workshop on Cancer Research – biological and molecular basis
	Science in Laboratory Animals - VII Edition
	Occupational Safety and Health in Laboratories
	Seminar: Oncology in Companion Animals
	Advanced course on Marine Ecotoxicology and Risk Assessment
2014	II AEICBAS Biomedical Congress
	Science in Laboratory Animals - VIII Edition
	Meeting of the European College of Veterinary Clinical Pathology
	Workshop on Cancer Research – biological and molecular basis
	Workshop on Brucellosis in small ruminants
	Veterinary Traumatology
2015	III AEICBAS Biomedical Congress
	Science in Laboratory Animals - IX Edition
	Assisted reproduction in horses: how to breed the problem mare and how to collect the problem stallion
	Reproductive ultrasonography in cattle
	Workshop on Cancer Research – biological and molecular basis
	Neurology and Reproductive Medicine

11.2 COMMENTS AND SUGGESTIONS

Continuing education initiatives of ICBAS cover multiple topics and are the result of distinct initiatives. Some (e.g. practical courses in animal reproduction) are implemented as a response to the demand of practitioners in the field, others (e.g. workshops in cancer research) are aimed at the diffusion of scientific and research activities in which ICBAS's staff is involved. As stated, Biomedical Congresses promote the dialog amongst the

several formations of ICBAS and external field and research professionals. Finally, the Courses in Animal Research provide adequate training for researchers using laboratory animals, mandatory in the country.

All initiatives are provided with the maximum quality that the Establishment possesses, some counting with the best professionals in the field, and several are subjected to final evaluation and official accreditation.

Veterinary participation is obviously variable, from 100% in technical programs to a lower percentage in multiple discipline-integrated initiatives. Although continuing education programmes are not mandatory for veterinarians in Portugal, attendance is high and participants recognize the value of the Establishment's initiatives.

Chapter 12: POSTGRADUATE EDUCATION

12.1 FACTUAL INFORMATION

12.1.1 CLINICAL SPECIALTY TRAINING (INTERNS AND RESIDENTS)

Table 12.1.1: Clinical specialty training

Clinical discipline	No residents	Diploma anticipated
Theriogenology	2	Dipl ECAR
Pathology	2	Dipl ECVP

Three of the 14 Portuguese specialists certified by the European Board of Veterinary Specialization (EBVS) working in Portugal are professors of ICBAS' IMVM (ECVP; ECAR; ECVPH). ICBAS is the only certified training institution for ECAR residents in Portugal. None of the residents receive a program-specific salary as they already work as professor and clinician at ICBAS.

12.1.2 RESEARCH EDUCATION PROGRAMMES

ICBAS has several Masters and Doctoral programs where students with a veterinary degree are accepted, some in cooperation with other U.Porto Faculties. They are:

- Master degree in Biochemistry
- Master degree in Marine Sciences – Marine Resources
- Master degree in Forensic Sciences
- Master degree in Oncology
- Master degree in Public Health
- Master degree in Environmental Contamination and Toxicology
- Master degree in Forensic Medicine
- Master degree in Chinese Traditional Medicine
- Doctoral Program in Veterinary Sciences
- Doctoral Program in Animal Sciences
- Doctoral Program in Forensic Sciences
- Doctoral Program in Biomedical Sciences
- Doctoral Program in Applied Mathematics
- Doctoral Program in Sustainable Chemistry
- Doctoral Program in Experimental and clinical Pharmacology and Toxicology
- Doctoral Program in Neurosciences
- Doctoral Program in Basic and Applied Biology

- Doctoral Program in Molecular and Cellular Biology
- Doctoral Program in Molecular and Cellular Biotechnology Applied to Health Sciences
- Doctoral Program in Marine and Environmental Sciences
- Doctoral Program in Environmental Contamination and Toxicology
- Doctoral Program in Pathology and Molecular Genetics
- Doctoral Program in Occupational Safety and Health
- Doctoral Program in Gerontology and Geriatrics
- Doctoral Program in Molecular and Oncology Medicine

Masters Degrees have a duration of two years, while Doctoral programs last for four years. Both post-graduation programs have specific tuition fees. All Master and many Doctoral programs include curricular units in their first year, while the other years are devoted to research activities. To enrol in a PhD program, the students apply to the Course Scientific Council for registration by presenting his/her curriculum vitae, a summary of the research project and a declaration of acceptance from the supervisor(s). Upon acceptance, the Scientific Council nominates an advisory committee to follow the student's progress. Definitive registration occurs only after approval of the probation period (1st year). The PhD title is awarded after a public defence and approval by a jury of at least 5 professors, the majority of them from other Faculties or Universities. None of the research students receive a program-specific salary during the training periods. Several apply and receive grants from European programs, the Portuguese Foundation for Science and Technology, or research partners.

Table 12.2: Number of research students enrolled in different programs in 2014/15

Type of Degree	Fulltime	Duration
ICBAS:		
M.Sc.*	170	2 years
PhD	542	4 years
Veterinary Sciences:		
PhD	29	4 years
Animal Sciences:		
PhD	20	4 years

* Integrated Masters not included

12.2 COMMENTS AND SUGGESTIONS

Speciality residence programs have been recently created so there are still no diplomates trained in the Establishment.

Overall, ICBAS is one of the leading research institutions of U.Porto. Postgraduate training in more veterinary-oriented themes has been framed in two PhD Programs (Veterinary Sciences and Animal Sciences). As stated, veterinary graduates are accepted in the majority of the other Master and PhD programs, the Doctoral Program in Biomedical Sciences being the most popular.

Chapter 13: RESEARCH

13.1 FACTUAL INFORMATION

IMVM's teachers work in ICBAS' research laboratories and/or are integrated in research units funded by the Foundation for Science and Technology (FCT). Research activities have attracted participation of IMVM's and other degrees' students. During internship (6th year) students are allowed to choose between professional practice or scientific research work, under the guidance of teachers of the corresponding area, at ICBAS or at any national (e.g. IBMC, IPATIMUP, CECA-ICETA, CIMAR, CIBIO/ICETA) or international University or research centre. Furthermore, U.Porto has a program of research initiation (IJUP) aiming to involve undergraduate students in R&D activities. Additionally, the University funds multidisciplinary projects that incorporate students from complementary areas of knowledge, different R&D groups and companies, promoting the contact between students, R&D groups and potential employers.

Many students opted for research activities in the 6th year (internship). Examples of their thesis titles in the last 3 years are presented below:

- Biologic hitchhikers: changes in the parasitic lagomorphs community of north-western Italy by the introduction of *Sylvilagus floridanus*
- Electrocardiographic characteristics of the Castro Laboreiro dog breed
- Immunohistochemical study of proliferative and apoptotic activity of canine mammary carcinomas
- Unravelling the role of methylprednisolone on neuromuscular transmission in myasthenia gravis
- Evaluation of risk factors for salmonella infection in Danish pig breeding herds
- Prevalence of *Mycoplasma synoviae* in broilers. A comparative study of diagnostic methods
- Use of avian recombinant gonadotropin in the gonadal stimulation of common turtle (*Caretta caretta*)
- The effects of the inclusion of *Gracilaria vermiculophylla* in “bordaleira” and “churra galega” lambs production and immunity
- Exposure assessment of extended-spectrum beta-lactamases/ampc beta-lactamases-producing *Escherichia coli* in meat in Denmark
- Dashboard for simplified monitoring of productive parameters in dairy cows

- Calcium and propilenoglycol administration in the post-partum of Holstein frisian cows for the prevention of puerperal pathologies
- Immunohistochemical expression of phospho-mTOR in canine mammary carcinomas
- Animal model for evaluation of biomaterials and cell therapies in peripheral nerve regeneration
- MRI in the understanding of navicular syndrome
- Antimicrobial resistance in salmonella spp. isolated from chicken farms in central Thailand
- Characterization of β -lactam resistance in *Escherichia coli* isolates from bovine mastitis: an approach on PCR optimization

Some of the theses originated research papers published in indexed international scientific journals. The percentage of students that choose research as a subject for their final semester over the last 3 years was 9.3%.

13.2 COMMENTS AND SUGGESTIONS

The heavy workload of students during the first 5 years hampers their participation in many time-consuming research projects. However, as stated, whenever possible and feasible, students are welcome by the Establishment's researchers (that are also their teachers).

APPENDIX 1

Veterinary Medicine Master's Degree

Day-One Skills

Professional general attributes and capacities

The newly-graduated veterinarian must:

- 1- Know the national and European ethic and professional regulations of the veterinary activity.
- 2- Be able to perform the professional acts in a responsible manner, complying with the regulations and being aware of the veterinary professional ethic responsibilities with regard to clients and their animals, authorities, the general public as well as their potential impact on the environment.
- 3- Use one's professional capabilities to contribute, as far as possible, to the advancement of veterinary knowledge, in order to benefit veterinary practice and further improve the quality of the services to the general public, the animal welfare and the protection of public health.
- 4- Know the veterinary institutions, organisms and services of Portugal and the European Union.
- 5- Have an elementary knowledge of the organization and management of veterinary services, including:
 - a) Awareness of own and employer's responsibilities in relation to employment, health and safety;
 - b) Awareness of the legal principles and good practices of clinical records and records of veterinary drugs use.
 - c) Awareness of how fees are calculated and invoices drawn up, and the importance of following the practice's systems for record keeping and book-keeping, including case reports, production records in both hard and computer format.
- 6- Hear and communicate in a cordial way. Communicate effectively with clients, professional colleagues, authorities, organisms, and the lay public, using language in a form appropriate to the audience and the context.
- 7- Efficiently use the new technologies in the communication, share, collection and analysis of information.
- 8- Prepare clear reports and maintain records in all areas of veterinary services in a rigorous and understandable form both for colleagues and the public.
- 9- Develop self-evaluation abilities and be able to interpret and adapt to peer-evaluation.

10- Understand the need for a commitment to continuing education and training, both in basic sciences and specialization areas of the veterinary profession, throughout one's professional life.

11- Be aware of personal limitations and demonstrate awareness of when and where to seek advice, assistance and support, refraining to execute procedures to which one has no skills.

12- Work effectively as a member of a multi-disciplinary team.

13- Be able to cope with uncertainty and adapt to change.

14- Be aware of the socio-economic and emotional climate in which the veterinary surgeon operates, and respond appropriately to the influence of such pressures.

Knowledge and understanding

The newly-graduated veterinarian will need to have acquired a thorough knowledge and understanding of the following:

1- The sciences and technologies on which the veterinary activities are based.

2- The research methods and the contribution of basic and applied research to all aspects of veterinary science.

3- The methods of data collection, treatment and biostatistics application.

4- The structure and functions of healthy animals and their husbandry.

5- The legislation regarding animal welfare, including production, transport and slaughter for human consumption.

6- The aetiology, pathogenesis, clinical signs, lesions, diagnosis and treatment of the common diseases and disorders that occur in the common domestic species in the EU.

7- The medicines legislation and guidelines on responsible use of medications as applied in the EU.

8- The principles of disease prevention, including zoonoses, and promotion of animal health and welfare.

9- The legislation regarding animal health requirements, including disease eradication and control programmes.

10- The essentials of the Common Agricultural Policy, market measures, restrictions to exportation and fraud detection.

11- The essentials of food processing and food technology.

12- The essentials of food quality evaluation in regard to food hygiene and safety, nutritional value, sensory aspects, storage stability, convenience, economical value and social perceptiveness.

13- The national and European legislation regarding veterinary conduct for the prevention and control of food-derived hazards in human health.

14- The principles and methods of microbiological, parasitic, chemical, physical and biotechnological risk-analysis of animal food products, and the application of the control tools and promotion of food safety.

15- The objectives, nature and frequency of inspection procedures during the slaughter of domestic ungulates, poultry, lagomorphs, farm and wild game, and the corresponding decisions in the case of non-compliance.

16- The environmental issues of the veterinary profession, including solid and liquid waste management.

Practical competences

The newly-graduated veterinarian should be able to undertake the following:

1- Evaluate and implement health and welfare records, as well as production records, when relevant.

2- Obtain an accurate and detailed history of the individual animal or animal group, and evaluate its/their husbandry and environment.

3- Handle and restrain an animal safely and humanely, and instruct others in performing these techniques.

4- Perform a complete clinical examination of the most common domestic species.

5- Attend all common domestic animals in an emergency and perform basic first aid and life-support procedures, including haemorrhage, wounds, breathing difficulties, ear and eye injuries, unconsciousness, clinical deterioration, burns, tissue damage, internal organ damage and cardiac arrest.

6- Assess correctly the health status of an animal and be able to advise its owner on the principles and practice of husbandry, according to the species needs and status at the moment.

7- Apply the reproductive biotechnology techniques according to specific situations and needs, in an ethical and safe way.

8- Plan, implement and execute preventive, prophylactic and bio-safety programs for the most common domestic species, according to the standards of health, welfare and public health protection.

9- Select the appropriate ancillary diagnostic tests according to the list of differential diagnosis, its utility, cost and benefit in the pursue of the diagnostic and treatment, being able to adapt to the specificities of the animal status, as well as economical, emotional and practical owner constraints.

10- Collect, preserve and transport samples, perform standard laboratory tests and interpret the results of the most common diagnostic tests in domestic animal's clinical practice.

11- Use technical equipment (radiographic, ultrasonic, magnetic) safely and accordingly to legal regulations.

12- Follow the appropriate actions upon diagnosis of infectious diseases, diseases under specific schemes for eradication or control, and zoonoses.

13- Access the appropriate sources of data on licensed medicines; prescribe and administer medicines correctly and responsibly in accordance with relevant legislation and ensure that medicines and waste are safely stored and/or disposed of.

14- Correctly apply principles of disinfection of infrastructures, surgical equipment sterilization and asepsis.

15- Safely and correctly apply sedation; general, regional and local anaesthesia; and chemical methods of restrain. Correctly evaluate and control pain.

16- Correctly perform the commonest surgical procedures in domestic animals.

17- Recognise when euthanasia is necessary and perform it humanely, using appropriate methods with due regard to its safety, execution conditions and other relevant aspects.

18- Perform a basic gross post mortem examination, record details, sample tissues, store and transport them accordingly to its hazard potential.

19- Promote the appropriate processing of animal carcasses and other biological waste, according to the environment protection regulations.

20- Perform the appropriate inspection acts during domestic ungulates, poultry, lagomorphs, farm and wild game slaughter, including:

- a) Assess and interpret relevant information from the records of the holding of provenance of animals intended for slaughter, using them properly when carrying out ante- and post-mortem inspection;
- b) Perform an ante-mortem inspection of all animals before slaughter;

- c) Assess, accordingly to the previous procedures, the nature and degree of the necessary actions for the protection of intervening persons and prevention of facilities contamination;
- d) Verify continuous compliance with hygiene requirements during slaughtering;
- e) Inspect, during and after slaughter, the carcasses and related offal;
- f) Determine complementary laboratory tests, when needed;
- g) Supervise health marking and the marks used;
- h) Document and classify the rejection motives, according to its cause or origin;
- i) Evaluate the need and utility of inspection results to the food business operator and competent authorities.

21- Verify and implement sanitary procedures and hygienic requirements for the safety of food products of animal origin.

22- Implement the official plans for passive and active surveillance and eradication of enzootic and epizootic diseases.

23- Plan and perform auditoria to food companies, according to the type and throughput of the processes carried out as well as the estimated human and animal health risk, including:

- a) Systematically verify legal compliance of its operating conditions;
- b) Assess the collection of samples obtained for the evaluation of the hygiene and food safety procedures;
- c) Interpretation of laboratory assays and verification of legal compliance;
- d) Document collected data and propose correction actions.

APPENDIX 2 - Statutory competences of the ICBAS management bodies

Council of Representatives

- 1) To elect the Dean;
- 2) To organize the election process of the selected candidate to fulfil the Dean's position according to the law, the present statutes and all applicable regulations;
- 3) To formally notify to the University's Rector on the results of the electoral process and corresponding management program;
- 4) To approve its own operational Regulations;
- 5) To approve amendments to the statutes of ICBAS;
- 6) To assess the acts of the Dean and of the Executive Council;
- 7) To propose any initiative deemed necessary for the proper functioning of the institution;
- 8) To perform any other duties prescribed by the law or the statutes of ICBAS;
- 9) The Council of Representatives, under the Dean's proposal, should:
 - a) Approve the proposed strategic plans of ICBAS and action plan for the Dean's four-year term and send them to the University General Council;
 - b) Approve the general guidelines of ICBAS in the scientific, pedagogical and financial plan;
 - c) Create, modify or abolish departments within ICBAS;
 - d) Approve the proposed annual plan of activities and budget of ICBAS and send them to the Rector's office;
 - e) Approve the annual report and the annual accounting report and send them to the Rector;
 - f) Pronounce on the remaining issues submitted to the Council of Representatives by the Dean.
- 10) To decide on the creation, merger and dissolution of research units within ICBAS, after hearing the Scientific Council.
- 11) To approve the organic regulation of ICBAS proposed by the Dean and its amendments, when required
- 12) To decide on the affiliation of academic groups to ICBAS.
- 13) To decide on the person to be nominated as Department Council's director, in the case of a repeated divergence of opinion on that matter, between the Dean and any Department Council.

The Dean (ICBAS' Director):

- 1) To represent ICBAS at the University's Senate and the Director's Council, before the other organs of the institution and before outside institutions;
- 2) To chair the Executive Council and direct the services of ICBAS.

- 3) To respond to the requests of the University's Rector and General Council requests, within the defined timeframes, in matters related to the University management needs, namely regarding the strategic plans, budgets and activity and accounting reports.
- 4) To approve the teaching timetables and schedules, after hearing the Scientific and the Pedagogical Councils;
- 5) To execute the deliberations of the Scientific and the Pedagogical Councils when mandatory;
- 6) To exercise the disciplinary authority delegated by the Rector;
- 6) To submit the strategic plans of ICBAS and the action plan for the four-year term to the Council of Representatives, after hearing the Scientific Council;
- 7) To elaborate the ICBAS strategic and action plan for its mandate, after consulting with the Scientific and Pedagogical Councils, and in articulation with the University strategic plan;
- 8) To elaborate the general scientific, pedagogical and budgetary orientation guidelines for ICBAS, in articulation with the University plans approved by the General Council and other University management bodies;
- 9) To elaborate the budgetary and activity proposals, as well as the activities and accounting reports in conformity with the corresponding plans approved by the University General Council;
- 10) To propose to the Council of Representatives the creation, modification or extinction of ICBAS Departments, after hearing the Scientific Council;
- 11) To draw conclusions on the evaluation reports of research units from ICBAS and other research units in which its professors and researchers have a significant participation;
- 12) To propose to the University's Rector the creation or alteration of courses, after hearing the Scientific and Pedagogical Councils;
- 13) To administer the mechanisms of students' social assistance in articulation with the Social Services of the University, and to elaborate plans for tuition payments that facilitate student's attendance and academic progression;
- 14) To propose to the Rector the maximum values for new admissions and registrations according to the law;
- 15) To issue the regulations necessary for the proper functioning of ICBAS;
- 16) To approve the distribution of teaching services taken in account its financial and operational feasibility;
- 17) To decide on the appointment and hiring of staff, in any capacity;
- 18) To collect and manage revenue and authorize expenditures and payments;
- 19) To decide about accepting donations of any kind;
- 20) To appoint and dismiss, according to the law and the statutes, ICBAS officers and personnel;
- 21) To appoint the Department Directors, under the proposal of the Department Councils;

- 22) To propose organic regulation and its modifications to the Representatives council the ICBAS;
- 23) To perform any other functions delegated by the University Rector;
- 24) To perform other legal or statutory duties.

The Executive Council:

- 1) To assist the Dean in the exercise of its powers;
- 2) To exercise the powers delegated by the University's Management Council.

The Scientific Council:

- 1) To pronounce on the proposed strategic plans of ICBAS;
- 2) To appreciate the scientific plan of activities of ICBAS, proposing actions on its scope and collaborating on its implementation;
- 3) To pronounce on the creation, modification or extinction of Departments;
- 4) To pronounce on the creation, merger and dissolution of research units of ICBAS;
- 5) To pronounce on the conclusions drawn by the Dean on the evaluation reports of research units that comprise the organic unit and of those in which its professors and researchers have a significant participation;
- 6) To deliberate on the distribution of teaching service, verifying its compatibility with the study plans and teaching calendars and subjecting it to homologation of the Dean;
- 7) To pronounce on the creation of courses involving ICBAS and to approve their curricula;
- 8) To appreciate the annual reports of the study cycles and other courses, issuing recommendations for continuous improvement;
- 9) To promote high quality institutional culture and scientific ethics;
- 10) To supervise and seek to ensure the scientific and pedagogical quality of the courses provided;
- 11) To promote and support the development, strategic coordination and internationalization of advanced training courses, especially of the 2nd and 3rd study cycles;
- 12) To propose the bestowing of titles or honours;
- 13) To propose or decide on the grant of awards;
- 14) To propose or comment on international agreements and partnerships;
- 15) To propose the composition of academic evaluating committees;
- 16) To perform other acts required by law regarding the academic career, research and teaching staff recruitment;
- 17) To elaborate and adopt its operational rules;
- 18) To perform other duties assigned by law.

The Pedagogical Council:

- 1) To pronounce on the pedagogic approaches, teaching and evaluation methods;
- 2) To promote regular surveys on the ICBAS teaching performance and their analysis and dissemination;
- 3) To promote the evaluation of the teachers performance by themselves and by students, as well as to analyse and disseminate the results;
- 4) To appreciate complaints on pedagogical flaws and propose measures deemed necessary;
- 5) To approve students pedagogical and evaluation regulations;
- 6) To pronounce on the prescription and subjects precedence regimens;
- 7) To pronounce on the creation of study cycles involving the ICBAS and on their plans;
- 8) To pronounce on the creation of scholar awards;
- 9) To pronounce on the ICBAS academic calendar and exam schedules;
- 10) To approve its bylaws;
- 11) To propose academic timetables to the Dean;
- 12) To appreciate the annual reports of the study cycles and other courses;
- 13) To advise students on pedagogical matters;
- 14) To promote continuous pedagogical training of teachers;
- 15) To promote an institutional culture of high quality and high pedagogical ethics;
- 16) To perform other duties assigned by law.

The Department Director:

- 1) To nominate the Department assistant Director;
- 2) To nominate the members of the executive commission, if existent;
- 3) To schedule and direct the Department Council meetings and executive commission;
- 4) To represent the Department;
- 5) To disclose and promote the department activities and zeal for their quality;
- 6) To permanently execute, within his/her competences, the tasks committed by the Department Council;
- 7) To pronounce on the course directors nominations;
- 8) To manage the Department according to the law, the general regulations of ICBAS and the decisions and orientations of the Department Council;
- 9) To manage the human and material resources of the Department, in accordance with the budgets attributed by the management bodies of ICBAS;
- 10) To ensure the coordination between the Department laboratories and research units;
- 11) To nominate the Department representatives in any other management bodies or commissions;

- 12) To coordinate the teaching service in articulation with the course Directors, and elaborate the corresponding distribution maps;
- 13) To present proposals for the constitution of academic juries, recruitment or promotion of Department professors, researchers, technicians, administrative personnel, assistant technicians or work persons;
- 14) To elaborate and propose arrangements, agreements and services contracts to the Executive Council;
- 15) To zeal for the preservation of facilities and equipment of the Department, using the means made available by the ICBAS management bodies;
- 16) To elaborate and present, to the Department Council, the exercise activities and accounting report, and the budgetary and activity plan for the next exercise.

The Department Council:

- 1) To elaborate and submit to the Executive Council the Department regulation and modification proposals;
- 2) To elect the Department Director and propose his/her name to the Dean;
- 3) To decide on the constitution, functioning and dissolution of Department sub-units;
- 4) To deliberate on matters that are its responsibility and to pronounce on those that were submitted for appreciation;
- 5) To appreciate and approve the activity and accounting reports, activity plans and budgets as well as the Department's strategic plans;

The course director:

- 1) To ensure the normal functioning of the course and to zeal for its quality;
- 2) To manage the funding that is attributed by the management bodies of ICBAS;
- 3) To ensure the liaisons between the course, the departments and other entities involved in the teaching of curricular units of the course;
- 4) To disclose and promote the course;
- 5) To elaborate and submit organization proposals or curricular changes of the course to the Dean, upon consultation of its Scientific Committee;
- 6) To request lecturing of curricular units to the involved entities, submitting the teaching workload, in articulation with the former, to the deliberation of the corresponding bodies, upon consultation of its Scientific Committee;
- 7) To elaborate and submit proposals for admittance and *numerus clausus* to the Dean, upon consultation of its Scientific Committee;
- 8) To elaborate an annual report on the course functioning, with curricular units reports in appendix, written by the corresponding regents;
- 9) To organize the curricular units equivalence processes and individual study plans;
- 10) To preside the Scientific Committee and Monitoring committee meetings.

APPENDIX 3 - LIST OF INDICATORS

Staff and students

I1: n° of FTE academic staff involved in veterinary training / n° of undergraduate students

$$85.6 / 398 = \mathbf{0.215}$$

I2: n° of FTE veterinarians involved in veterinary training / n° of students graduating annually

$$41.2 / 60.33 = \mathbf{0.683}$$

I3: n° of FTE support staff involved in veterinary training / n° of students graduating annually

$$95 / 60.33 = \mathbf{1.575}$$

Types of training

I4: n° of hours of practical (non-clinical) training - **1317**

I5: n° of hours of clinical training - **707**

I6: n° of hours of FSQ and VPH training - **332**

I7: n° of hours of extra-mural practical training in FSQ and VPH - **42**

Patients available for intra-mural clinical training

I8: n° of companion animal patients seen intra-murally / n° of students graduating annually

$$4603 / 60.33 = \mathbf{76.293}$$

I9: n° of ruminant and pig patients seen intra-murally / n° of students graduating annually

$$80.66 / 60.33 = \mathbf{1.337}$$

I10: n° of equine patients seen intra-murally / n° of students graduating annually

$$92.33 / 60.33 = \mathbf{1.530}$$

I11: n° of rabbit, rodent, bird and exotic patients seen intra-murally / n° of students graduating annually

$$152 / 60.33 = \mathbf{2.519}$$

Animals/herds/units available for extra-mural clinical training

I12: n° of companion animal patients seen extra-murally / n° of students graduating annually

$$0 / 60.33 = \mathbf{0}$$

I13: n° of individual ruminants and pig patients seen extra-murally / n° of students graduating annually

$$3875.7 / 60.33 = \mathbf{64.238}$$

I14: n° of equine patients seen extra-murally / n° of students graduating annually

$$27.3 / 60.33 = \mathbf{0.453}$$

I15: n° of visits to ruminant and pig herds / n° of students graduating annually

$$791 / 60.33 = \mathbf{13.11}$$

I16: n° of visits to poultry and farmed rabbit units / n° of students graduating annually

$$19.7 / 60.33 = \mathbf{0.326}$$

Necropsies available for clinical training

I17: n° of companion animal necropsies / n° of students graduating annually

$$147 / 60.33 = \mathbf{2.436}$$

I18: n° of ruminant and pig necropsies / n° of students graduating annually

$$55 / 60.33 = \mathbf{0.912}$$

I19: n° of equine necropsies / n° of students graduating annually

$$0.7 / 60.33 = \mathbf{0.011}$$

I20: n° of rabbit, rodent, bird and exotic pet necropsies / n° of students graduating annually

$$337 / 60.33 = \mathbf{5.586}$$

Indicators used only for statistical purposes

I21: n° of FTE specialised veterinarians involved in veterinary training / n° of students graduating annually

$$3 / 60.33 = \mathbf{0.05}$$

I22: n° of PhD-students graduating annually / n° of students graduating annually

$$56.7 / 60.33 = \mathbf{0.939}$$