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**REPORT ON THE VISIT TO
THE FACULTY OF VETERINARY MEDICINE OF
BARCELONA**

17 - 23 January 2005

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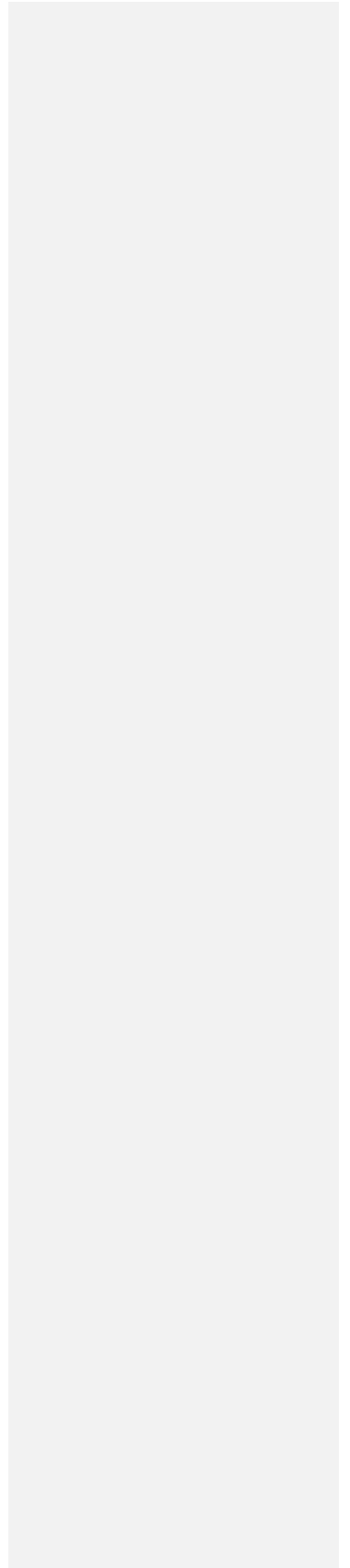
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INTRODUCTION

The Faculty of Veterinary Medicine (FVM) of the Universitat Autònoma de Barcelona (UAB) was visited by the team of experts from 17 – 23 January 2005. During this visit they visited the premises, looked at the teaching resources and facilities that were available to the Faculty, and had discussions with academic and support staff, students, alumni and local practitioners, as well as several meetings with the Dean and other senior staff from the Faculty and University.

Two months prior to the visit the experts had received a high quality Self-Evaluation Report (SER) prepared by the Faculty and departments responsible for teaching at the FVM-UAB. Complementary material was subsequently received before and during the visit. The visit material was well prepared by the Faculty. Prior to the visit, each expert was assigned specific chapters of the SER related to his/her particular area of expertise to study and evaluate in greater detail.

Owing to a change in the examination schedule by the Rector, the visit took place in a 'white week', during which students had no teaching as they were preparing for the examinations. As a consequence the group was not able to see students having classes, or evaluate the premises during utilisation.

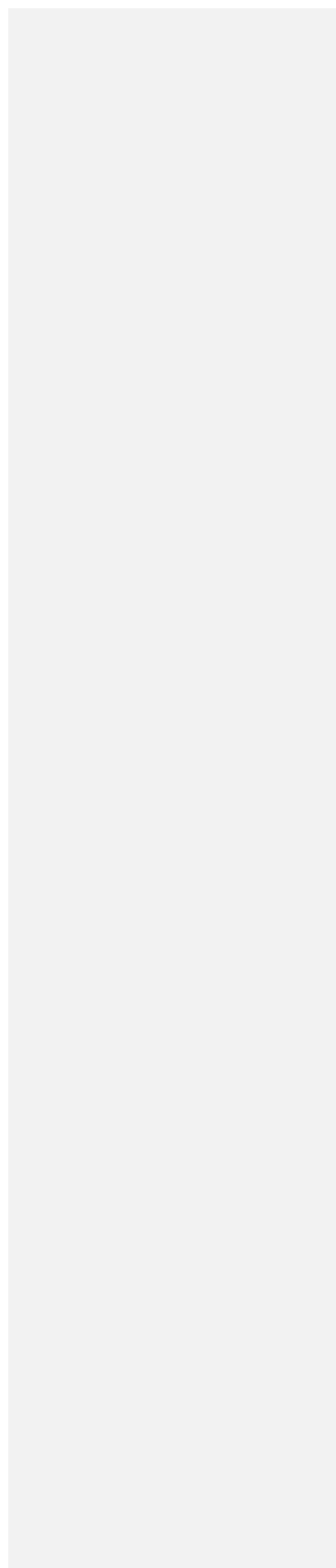
This was the second evaluation of the Barcelona Faculty. The first full evaluation visit took place in 1992, with a follow-up visit in 1998.

During the last four years there have been significant organisation changes at the FVM-UAB. Up until 2000, the Faculty was comprised of a single large department ("Veterinary Medicine and Animal Science"). In 2001, this was split in three departments; "Animal Medicine and Surgery", "Animal Health and Anatomy" and "Animal and Food Sciences". Many of the basic science remain taught by veterinary units that are part of inter-faculty departments.

Regarding new buildings and major items of equipment, the most significant changes in recent years have included enlargement of the Veterinary Library and farm facilities, and remodelling of some teaching facilities, and improvements in the provision of IT facilities.

Evaluation visits represent a 'snapshot' of the situation at the time of the visit. Establishments often respond rapidly and positively to comments and suggestions, even before the report is issued, but any changes made after the visit will not be reflected in this text.

Evaluation visits involve a great deal of work for all concerned - academic staff, support staff, and students. The team of experts is most grateful for the open and friendly way in which it was received throughout the visit. The experts are particularly grateful to the Dean, Prof. Josep Gasa, and his team, and the Liaison Officer, Prof. Manuel Rodriguez, for the substantial help that they gave before and during the evaluation visit.



1. OBJECTIVES

1.1 Findings

The Faculty specifies two different kinds of objectives: General Objectives and Specific Objectives.

General Objectives:

“To provide a high and updated quality of teaching in a learning environment beneficial for student to achieve good veterinary knowledge.”

Students should have the potential to seek out information by themselves, to apply information from basic sciences to professional disciplines and to solve problems concerning the practice of veterinary medicine.

Specific Objectives:

The main stated goals of the Faculty are to provide a high quality veterinary degree programme as well as to offer further professional and scientific post-graduate education. Training must cover the broad requirements for veterinary graduates, and comply with the EU Directives. The Faculty also aims to serve the veterinary profession and the community as a whole.

Within this frame, the outcomes expected to be reached on completion of the degree are:

- sufficient knowledge of the basic subjects forming the foundations of veterinary sciences
- adequate general knowledge and technical expertise in veterinary sciences
- The development of problem-solving skills
- The ability to use the acquired knowledge in accordance with the principles of scientific research
- The development of scientific curiosity
- To be aware of the need of lifelong learning
- The development of skills in written and oral communication
- The development of an ethical compromise with the veterinary profession

Some other specific objectives are listed in Section 4.5.

Every three years the Faculty has to sign an agreement with the Rector’s office, in which it agrees to a series of objectives to improve academic and development standards. Extra funds are allocated if these goals are achieved.

The UAB has a “Commission for Academic Affairs” (see Chapter 2) which analyses the overall extent to which the objectives of the UAB are being met, and the achievement of each faculty. If necessary, this commission specifies corrective measures. Furthermore the “University Commission for Control of Teachers” also evaluates teaching quality, and may order corrective measures, or suggest that a productivity bonus may be given.

For assessing its educational activities, the Faculty has a Commission for Teaching Affairs.

Among its strengths, the Faculty includes:

- The high standard of its students;
- The standard and commitment of its staff;
- The degree of organisation of its activities;
- The University structure and physical layout;
- Its research achievement;
- Its commitment to teaching innovation and quality
- Its physical location, infrastructure and equipment.

As weaknesses, the Faculty mentions:

- Some shortcomings in facilities, in particular the size of the clinical and necropsy areas;
- The difficulty of changing the curriculum;

- Some imbalance in the composition of the student intake ;
- Imbalances in international exchange of students and staff;
- The need to improve continuing education activities, and contact with society;
- Funding shortages for teaching, new equipment and for hiring staff.

1.2 Comments

The statement of aims of the Faculty cover undergraduate and postgraduate training. However, they omit to make detailed mention of research or provision of veterinary services, which should generally be considered as necessary and desirable roles of a veterinary training establishment. In the case of research, this may arise because research is the role of the Departments and University, and not a 'Faculty' function. This may also be the case for clinical and diagnostic services.

In both instances, organisationally separate bodies other than the Faculty (e.g. departments, the Veterinary Teaching Hospital, service/research centres) have been established to carry out such activities. This creates a structure of intersecting organisations, all of which are engaged in activities that are central to veterinary science at the FVM-UAB that is rather confusing. It should be noted that the academic staff that are teaching at the FVM-UAB are also actively engaged in research and service provision (see also Chapters 6.2 and 13), but formally for bodies other than the Faculty. The Faculty needs to have a greater capacity to direct the teaching towards overall and applied veterinary objectives. It should also have some role in research.

As additional strengths, the team considers that the Faculty should have mentioned the level of clinical specialisation training

Some of the weaknesses the Faculty mentions are not major issues. As additional shortcomings, the team considers that the Faculty should have mentioned in more detail some of the weaknesses in the curriculum (see Chapter 4), in particular a low proportion of practical work and a serious weakness due to lack of clinical training

The strengths and weakness of the establishment are discussed in more depth in subsequent chapters of this report and the remarks made will have a strong bearing on the extent to which the Faculty achieves the objectives of a veterinary training establishment.

1.3 Suggestions

- 1.1 The University and Faculty should ensure that in principle and in practice Veterinary Faculty roles and needs take precedence over departmental or 'knowledge area' perspectives, especially as regards educational issues.
- 1.2 As an establishment of higher education with responsibility for an important field, the Veterinary Faculty should have some role and function in academic research.

2. ORGANISATION

2.1 Findings

The FVM is one of 14 Faculties and Schools of the UAB, a public university that depends on the Spanish Ministry of Education and Science (MEC) and the Department for Universities, Research and Society of Information (DURSI) of the Catalan Government.

Like other Spanish universities, the UAB has a structure of parallel faculties and departments. Departments have full responsibility for the academic activities (teaching and research) within the knowledge areas they cover. Faculties have responsibilities for the overall organization and management of the teaching of particular courses.

Under Spanish University regulations, responsibility for teaching a specific subject has to be attributed to a particular 'knowledge area' covered by a department. Within one university it is not permitted to have two departments covering the same field ('knowledge area') i.e. all teaching that field must be attributed to the single department.

There are 12 University Departments are involved in the teaching of the veterinary course with a varied degree of involvement in the Veterinary Faculty:

Main Departments based at the Veterinary Faculty:

- Department of Animal Health and Anatomy, comprised of units for Animal Health and for Animal Anatomy. Until relatively recently there was only one veterinary department, that in 2001 was split into three;
- Department of Animal Science and Food Science comprised of units for Animal Production and for Food Science;
- Department of Animal Medicine and Surgery.

"Inter-Faculty" Departments that have a veterinary unit:

- Department of Animal and Vegetal Biology and Ecology;
- Department of Biochemistry and Molecular Biology;
- Department of Cellular Biology, Physiology and Immunology;
- Department of Pharmacology, Therapeutics and Toxicology.

Departments external to the Veterinary Faculty without a Veterinary Unit:

- Department of Mathematics;
- Department of Physics;
- Department of Chemistry;
- Department of Psychiatry and Legal Medicine;
- Department of Business Economy.

Activities that relate to outside services (e.g. clinical and diagnostic services) are structured as organisationally separate entities. These have separate budgets and (often) separate staff. For the veterinary activities, the most important 'separate' unit is the Veterinary Teaching Hospital (see also section 6.2), which is responsible for providing all clinical services and in which many of the clinical teaching staff of the Faculty work along with some non-academic clinicians and administrators.

The main decision-taking authorities of the Veterinary Faculty are the Dean, the Dean's Team and the Faculty Council.

The Dean is the principal representative of the Faculty, and is elected by the Faculty Council for a 3-year period, renewable once.

The Dean's Team is comprised of three Vice-Deans for 'Teaching and New Technologies', 'Economy and Services', and 'Students and External Practical Work Coordination', the Secretary and the Study Coordinators. The Dean should present his/her team before the election. The current Dean's Team also includes the main Administrator (MAE), who represents the University Manager within the Faculty and is responsible for the management of the budget of the Veterinary Faculty and related services.

The Faculty Council is composed of 60 members of the Faculty and must have representatives of:

- Permanent Academic Staff (51% or 31 appointees. This includes as *ex officio* members the Dean, all members of the Dean's Team, and the Heads of the FVM Departments;
- Students (30% or 18 appointees);
- Administrative Staff; (10% or 6 persons). The MAE is an *ex officio* member;
- Non-permanent teaching staff and postgraduate students (5 votes).

The main functions of the Faculty Council are:

- To prepare, approve and modify the Veterinary Faculty Regulations;
- To elect and revoke the Dean;
- To supervise the management of the Faculty;
- To prepare proposals for modification of the curriculum;
- To approve and supervise the teaching programme;
- To solve teaching conflicts with Departments;
- To participate in the discussion about new degrees;
- To approve the annual budget;
- To supervise general services and facilities;
- To create working commissions;
- To propose nominations for *Doctor honoris causa*.

The Faculty Council and Dean are assisted by various committees, the principal ones being outlined below.

The Commission for Teaching Affairs (CTA) is responsible for the supervision, modification and management of all aspects related to teaching and to the academic curriculum (supervision of the curriculum, proposal of teaching modifications, assessment of the teaching quality, etc). It is composed by the Studies Coordinator, three members of the teaching staff, three students, the Head of the Academic Office, and the Dean (or his/her delegate, usually the Vice-Dean for Teaching Affairs), and meets at least once every semester.

A Study Coordinator implements the decisions of the CTA, is responsible for the organisation of the teaching activities of each semester and is the contact point for students on any issues. In addition, there is a specific coordinator for each year of the curriculum, who assists the Study Coordinator in his/her tasks.

The Commission for Economy and Services is responsible for all the economical aspects and supervision of the facilities and equipment for general use (annual budget, general facilities supervision, proposals for new equipment, etc.). It is composed of the Dean or his/her delegate (usually the Vice-Dean for Economy), the MAE, the Head of the Economy Office, one member of the teaching staff, one student, one member of the administrative and research staff, and a member of the General Services of the Faculty.

The Commission for Students' Affairs is responsible for all issues related to students. It is composed by the Dean or his/her delegate (usually the Vice-Dean for Students), three students from the Council of Students (*Consell d'Estudiants*), three members of the officially recognised student associations, one member of the teaching staff and one member of the administrative staff.

Each Department of the Faculty/University has its own regulations which must comply with the UAB Statutes. The government bodies defined by the Statutes are the Head of the Department and the Department Council ("*Consell de Departament*").

The Head of Department is elected by the Department Council for three years, renewable once.

Department councils are composed of all the members of the academic staff of the department holding a Ph.D. degree, elected representatives of non-Ph.D. teachers, elected representatives of the administrative staff and elected representatives of students.

In addition there is usually an executive commission as a working body of the department. It is composed of several members of the academic staff, representing each knowledge area or Unit. Administrative Staff and postgraduate students are also represented.

The Faculty remarks that there are no formal arrangements enabling the Veterinary Faculty to gain feedback from the veterinary profession. It believes that this could be solved in the near future by creating an “Advisory Council” formed by veterinary professionals that would regularly meet with Faculty representatives.

2.2 Comments

With its parallel structure of Faculty and Departments, the organisation of the FVM-UAB is not an easy one for an outside team to fully understand. Departments have a great deal of independence in their activities, which includes deciding upon and imparting the teaching within their ‘knowledge area’. They are sometimes oriented more to their subject or ‘knowledge area’ than they are to veterinary science. There is a need for a clearer veterinary identity to departments and their activities.

The attribution of units and activities seems quite odd. For instance, the coupling of ‘animal health’ to anatomy rather than to the clinical department, or integrating farm animal health with production is unusual. Likewise, it was sometimes difficult to follow the logic of the attribution of some subjects to particular units.

These attributions arise mainly because of the structure of monopolistic ‘knowledge areas’ and departments specified by Spanish regulations. Besides giving rise to some unusual attributions, this system also means teaching activities are compartmentalised and do not always have a full veterinary orientation or identity. It is unwise to combine a structure of non-veterinary departments (one that provides no possibility of re-allocating subject teaching elsewhere) with a system that gives a Faculty no direct authority over the content and presentation of the teaching being provided to its students. There is a need for the Faculty to have a greater capacity to direct teaching towards clear veterinary needs.

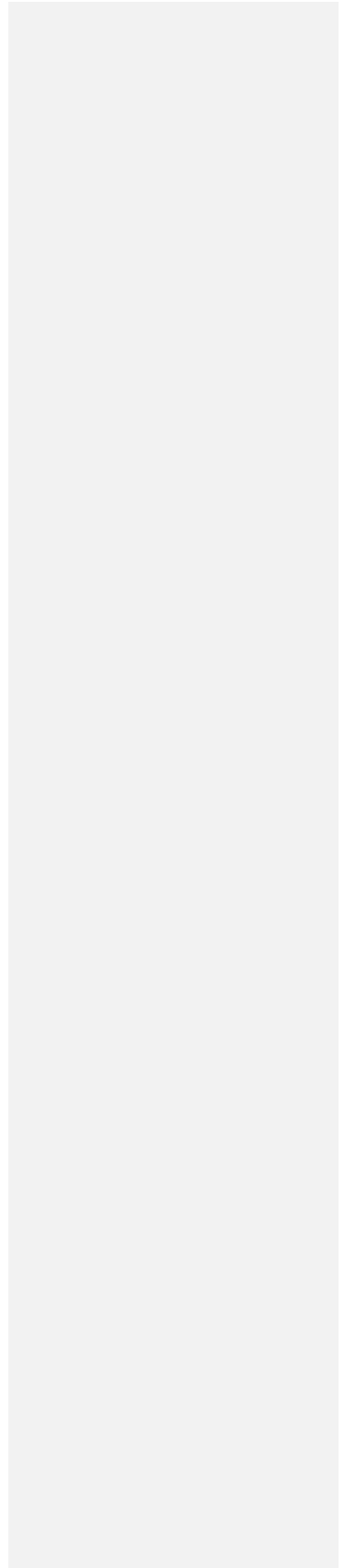
As remarked in the previous chapter the Faculty should also have some role in research, since the activities of a Department, even of its veterinary section, can be completely non-veterinary (see also Chapter 13).

The Faculty structures are generally representative of all participants in the FVM’s work. The idea of setting up an ‘Advisory Council’ to provide outside input and views is a good one.

Having all clinical activities organised under a separate structure is a system that is somewhat unusual. It is presumed that this structure is adopted for good reason. In general, the Hospital seems to be functioning well (see also Section 6.2), although the separation of clinical teaching from clinical activity made by some academic staff is disturbing and abnormal for a very teaching establishment, and must be rectified (see Chapter 10). With clinical work being performed under a separate structure, the Faculty and University need also to take care that clinical teaching is explicitly the main goal of the Hospital, and that other objectives (e.g. clinical excellence, income generation, patient throughput are kept in proportion).

2.3 Suggestions

- 2.1 The Faculty should have more authority over the activities of departments and staff, to direct these to meet the establishment’s objectives.
- 2.2 The structure and grouping of disciplines within the Faculty, and the attribution of teaching, should reflect the needs and logic of veterinary science and professional activity.



3. FINANCES

3.1 Findings

The income and expenditure of the FVMB in 2003 are summarised in Tables 3.1 - 3.2.

Table 3.1: Income of the establishment

Source	€	%
Revenue from State or public authorities	8,858,410	64.30
Revenue from private bodies		
Revenue from research	3146463	22.84
Revenue earned and retained by the FVM		
- registration fees from students*		
- from continuing education*		
- from clinical activities	1419730	10.30
- from diagnostic activities	352729	2.56
revenue from other sources		
Total	13777332	100

* included in 'revenue from State or public authorities'

Most of the University budget (78.7%, including student fees) comes from the Catalan Government (DURSI). The model of distribution used by DURSI is based mainly on the number of students and staff in the courses, modified by a coefficient that reflects their operating costs.

The UAB uses a similar formula to distribute the budget to faculties and departments. The budgets for teaching are based on the number of students scaled by a coefficient of between 1 and 2.33, according to the relative cost of the course. The Veterinary Faculty has a coefficient of 2.31.

The Faculty can also receive extra funds from the University if it achieves a series of objectives to improve academic and development standards. These are based on a signed agreement with the Rector's office. No additional funds are received if the Faculty fails to accomplish more than 10% of the objectives.

The 2004 Faculty teaching budget only provided 76% of the calculated practical teaching cost (75% in 2003 and 2002) and it did not take into account all the expenditure on teaching at the VTH and scarcely funded extramural professional training programmes. These are priorities for the Faculty in the near future.

Students pay tuition fees of 12.77 €/credit (10 hours of teaching).

Table 3.2: Expenditure of the establishment

Item	€	%
Salaries		
- teaching staff	4307589	35.08
- support staff	3676130	29.94
- research staff	675285	5.50
Operating costs		
- specific to teaching	291067	2.37
- specific to research	238675	1.94
- general operations	360478	2.94
- utilities	765955	6.24
Equipment		
- research	1605812	13.08
- teaching & general	167416	1.36
maintenance	189267	1.54
Total	12277674	100

The Faculty Council approves the annual budget, which is proposed by the Faculty Commission for Economy. This budget includes funds for the Dean's Office, teaching services and teaching activities. The total amount

allocated to the teaching of each subject has two components; a small element related with the theoretical teaching and a larger portion based on the load and actual cost of practical and clinical work.

The budget for expenditure on teaching equipment is allocated directly by the University (University Commission for Academic Affairs and University Commission for Economy) on a yearly basis. The University requests that each faculty submits a detailed explanation of needs and priorities. This document needs the approval of the Faculty Council.

A proportion of the revenues generated by the Faculty are retained by the UAB:

- *Clinical services*: 10% of the total invoicing of the VTH is given to the UAB management service;
- *Diagnostic services*: 15% of the total invoicing is given to UAB. This amount is later distributed between the UAB management service (12%) and the Departments to which the Diagnostic Service belongs (3%);
- *Research grants*: 15% of the grant is given to UAB as overhead. This overhead is distributed as per diagnostic services. It is anticipated that the overhead is will increase to 30% in 2007;
- *Other revenues (continuous education courses and diplomas)*: 25% of the registration fees go to the UAB. This amount is distributed between the Post-graduate Education School (75%) and the departments involved in the course (25%).

The annual direct cost of training a student is about 8,102 euro, and the total direct cost of training a graduate is roughly 49,827 euro.

3.2 Comments

It should be noted that training a veterinarian is inevitably more expensive than nearly all other disciplines. Veterinary studies are predominantly practical, and require intensive clinical training in small groups. Hospital and emergency services have to be staffed around the clock. In addition to the manpower demands, practically-based training is costly in terms of equipment, materials and consumables, and there are transport costs associated with brining animal material in, and taking students out to facilities such as farms and food handling and processing establishments. The resources needed for veterinary training and thus similar to those required in human medicine, which is often indirectly subsidised through government funding of teaching hospitals.

Although the team was pleased to note that there was some recognition of these unavoidably greater costs, the veterinary degree course having the highest funding coefficient, this is not a sufficiently high level. Veterinary medicine generally requires around three times the total funding per student as courses that are not laboratory-based, or nine times the funding per student excluding staff costs.

The shortfall in funding is most noticeable in the teaching, where public funding only covers about $\frac{3}{4}$ of the actual costs. The departments therefore have to subsidise the costs of teaching. This is problematical with the parallel structure of the Faculty (which has responsibility for teaching) and departments (see Chapter 2) and the predominantly research-based academic career structure, which both act as disincentives for dedicating resources to teaching activities. Fortunately, departments and staff generally are clearly committed to teaching to a high standard.

The level of income generation by the departments of the Faculty is commendably high, in particular from research and clinical activities. There is substantial reinvestment of this income, in particular by funding many staff positions from the income generated. However, none of the income generated with the FVM-AUB goes to reinforcing Faculty funds, giving the Faculty and Dean little financial freedom or influence. The Faculty has a good level of autonomy about how it manages funds, but when the budget is insufficient to cover basic teaching costs, this is a mixed blessing.

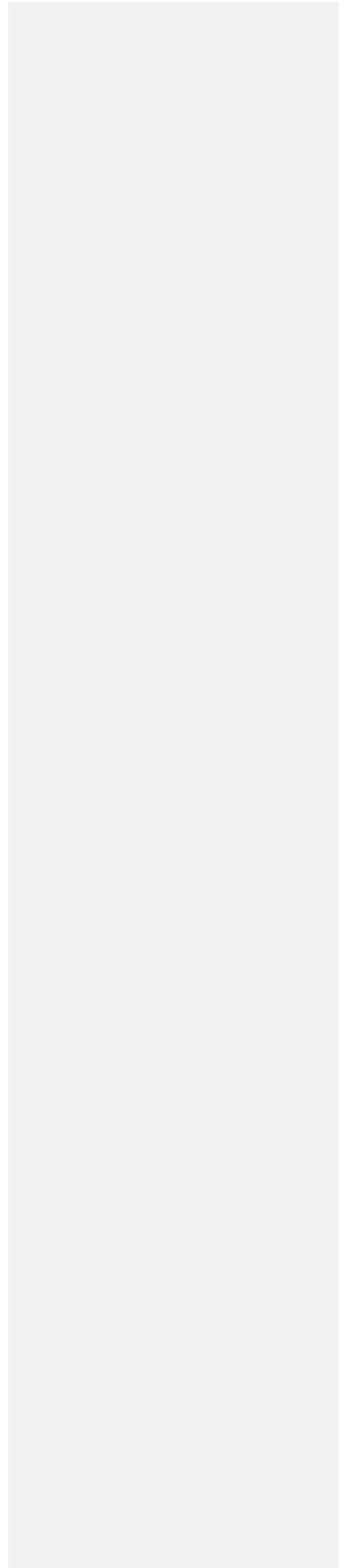
As already remarked, the income generated by clinical activities is high. This is for the most part arranged separately through the Veterinary Teaching Hospital (see Chapter 2 and Section 6.2). The VTH seems to be running well but, as it is an organisationally separate body, care should be taken that teaching remains the clear priority. It also needs to be noted that the strong need to increase the amount of clinical teaching on the course (see Chapter 4) will have an operational and financial impact on the Hospital. Firstly, more staff working within the Hospital are needed, which will increase costs. Secondly, a greater student presence will reduce clinical throughput i.e. income. It should also be noted that increased student involvement in clinical activities is likely

to significantly raise the consumption of consumables per procedure.

The amounts currently retained from Faculty and departmental revenues by the UAB should be looked at. The retention from clinical revenues should be based on the amount remaining after deduction of direct costs (e.g. clinical materials, pharmaceuticals), rather than gross receipts, unless this is explicitly accounted for in the billing for clinical activities. The proposed doubling of overhead on research takes this to a much too high level. It may be very counterproductive since funding bodies could legitimately regard this level of management charge as excessive when considering grant applications.

3.3 Suggestions

- 3.1 The funding per student of the Faculty should be increased, so that it at least covers the actual teaching costs.
- 3.2 The FVM-AUB should continue to deploy the income generated from research and clinical work to support Faculty activities and objectives.
- 3.3 The percentage of FVM-AUB generated funds retained by the University should not be increased, and the use to which the retained overhead is put should be clear identifiable.
- 3.4 The overhead charged on clinical activities should be based on the 'profit' i.e. be made after deduction of the costs attributed to the particular intervention.



4. CURRICULUM

4.1 GENERAL ASPECTS

4.1.1 Findings

Formal studies at the Veterinary Faculty of Barcelona last 5 years. The average duration of attendance is currently around 6.15 years. Extramural work that must be done between the 4th and 5th year is not allocated in any semester, and most students spend the equivalent of an 11th semester to complete this activity. The course is given during semesters of 15 weeks starting at the end of September and mid-February.

Like all nationally-recognised degrees, the veterinary course is specified within a law that sets out the subjects, their credits, when they are taught, and the 'knowledge area' (see also Chapter 2) that must teach them. Thus, the total hours of core and elective subjects must meet a minimum specified number of theoretical and practical hours for each subject. There is no specified maximum number of credits.

The curriculum at the UAB comprises 4,200 hours of which 420 (10%) are "free choice" subjects, 215 (5%) are elective subjects (necessarily belonging to specific veterinary subjects) and the other 3,565 hours must correspond to core subjects.

The Faculty is responsible for implementing the undergraduate curriculum and assigns the teaching of each subject to a department according to the particular 'knowledge area' to which they are attributed. The Faculty also supervises undergraduate teaching and implement the quality assessment programmes. Course contents depend upon the academic staff responsible for the subject, although they have to be approved by the CTA.

To change the curriculum, an intra-establishment proposal has to be formulated and accepted through the Faculty, an independent quality improvement office, University, inter-University and Ministry of Education levels. This process can take two to three years to complete.

The theoretical and practical teaching hours in the 'EEC' subject areas are summarised in Tables 4.1 to 4.8 on the following pages.

Table 4.1: Teaching hours in 'EEC' subjects

	lectures	practical work	supervised work	clinical work	other	total
A. BASIC SUBJECTS						
Anatomy (including histology and embryology)	150	157			8	315
Biochemistry	75	24			21	120
Biology (incl. cell biology)	90	33			12	135
Biophysics	45	8	15		7	75
Biostatistics	45	15			15	75
Chemistry	45	15			15	75
Epidemiology	30	14	14		2	60
Genetics	45	20			25	90
Immunology	30	12.5			2.5	45
Microbiology	150	77.5	1.5	10	1	240
Parasitology	75	45.5	15	7.5	7	150
Pathological anatomy (macro- and microscopic)	75	49	32		8	165
Pharmacology	50	16	8	6	2	82
Pharmacy	25	8	4		1	38
Physiology	90	16	18	6	20	150
Physiopathology	30	4		5	6	45
Scientific and technical information and documentation methods						
Toxicology (inc. environmental pollution)	40	20			10	70

B. Animal production						
Agronomy	45	24	6			75
Animal behaviour (inc. behaviour disorders)	20		15			35
Animal husbandry (inc. livestock production systems)	175	26	19	30	30	280
Animal nutrition and feeding	71	33	4	5	7	120
Animal protection and welfare	20					20
Environmental protection	10					10
Preventive veterinary medicine (inc. health monitoring programmes)	15	4	2		5	26
Reproduction (inc. artificial breeding methods)	30	9	2	10	9	60
Rural economics	30	7	8			45
C. Clinical subjects						
Anaesthesiology	10			15		
Clinical examination and diagnosis and laboratory diagnostic methods	30	30		15	15	132.5
Clinical medicine	60		2	48	10	120
Diagnostic imaging	15	10		5		30
Obstetrics	15			7		29
Reproductive disorders	30	4		7	10	61
State vet. medicine, zoonoses, public health and forensic medicine	15	4				19
Surgery	65	9	2	34.5	14.5	125
Therapeutics	45				15	60
D. Food hygiene						
Certification of food production units						
Food certification						
Food hygiene and food quality (inc. legislation)	75	32	13			120
Food inspection, particularly food of animal origin						
Food science and technology	60		27		23	110
E. Professional knowledge						
Practice management						
Professional ethics	10				7.5	17.5
Veterinary certification and report writing						
Veterinary legislation	10				7.5	17.5

Table 4.2: Distribution of practical and theoretical teaching in 'EEC' subjects

	hours in course						percentage of total course hours	ratio of lectures to other types of work
	lectures	practical work	supervised work	clinical work	other	total		
Basic subjects	1090	534.5	107.5	34.5	163.5	1930	56.46	1: 0.77
Animal production	416	103	56	45	51	671	19.63	1: 0.61
Clinical subjects	285	27	21	146.5	64.5	544	15.92	1: 0.91
Food hygiene & technology	135	59	13		23	230	6.73	1: 0.70
Professional knowledge	20				23	43	1.26	1: 1.15
Total	1946	723.5	197.5	226	325	3418	100	1: 0.76

Table 4.3: Summary of total hours in each year of the present course

year	course hours						ratio of lectures to other types of work
	lectures	practical work	supervised work	clinical work	other work	total	
First	435	200	30	6	64	735	1: 0.69
Second	450	211	47.5	6	80.5	795	1: 0.77
Third	446	147	57	74	76	800	1: 0.79
Fourth	285	96.5	36	90	32.5	540	1: 0.89
Fifth	300	64	32	44	55	495	1: 0.65
Total	1916	718.5	202.5	220	308	3365	1: 0.76

Note: These hours are calculated from the annual tabulations of the courses given, not from Table 4.2.

It is obligatory for students to attend practicals, but not lectures.

Most of the clinical work is provided within 4 to 5 weeks of “modules” comprising 2 weeks spent in the small animal clinic of the VTH and either 2 weeks in the equine clinic or 5 days in the ruminant practice.

The ratio of theoretical training to practical and clinical training is about 1:0.76 (1916:1449).

The ratio of intramural clinical training to theoretical and practical training is about 1:14.3 (220:3145).

Students must take 215 hours of elective courses, predominantly in their 4th and 5th years. There are no defined tracks but, in practice, there are groups of courses aimed at specific areas:

- Small animal and equine medicine;
- Population medicine and livestock production;
- Food science, hygiene and public health;

along with a fourth group of varied subjects.

Students mainly choose to spend all of their elective hours within one of these groups, with nearly half the undergraduates choose the companion animal block.

Table 4.4: Small animal and equine medicine elective courses

subject	enrolled (04/05)	Hours in course				total
		lectures	practical work	supervised work	clinical work	
Ophthalmology	74	15	5		10	30
Clinical anatomy	86	15			15	30
Clinical biochemistry	100	15	12	3		30
Neurology	87	15			15	30
Exotic pets	80	15	4	3	8	30
Feeding & husbandry of pet animals	93	20		10		30
Internal medicine	101	30		6	24	60
Traumatology	71	15	2	9	19	45
Dermatology	106	30	4		11	45
Equine medicine	32	30		10	20	60
Total of group	ave. 83	200	27	41	122	390

Table 4.5: Population medicine & livestock production elective courses

subject	enrolled (04/05)	Hours in course				total
		lectures	practical work	supervised work	clinical work	
Swine medicine	20	30	15		15	60
Swine production	31	45	6	14	10	75
Ruminant medicine	49	45	15			60
Bovine production	39	45	20	8	2	75
Ovine/caprince production	23	30	4	3	8	45
Feedstuffs	25	45	12	3		60
Poultry and rabbit medicine	13	30	1	7	7	45
Poultry production	8	45	3		12	60
Rabbit production	31	30		8	7	45
Fish medicine	14	30	15			45
Fish production	10	30	2	10	3	45
Total of group	ave. 24	405	93	53	64	615

Table 4.6: Food science, hygiene & public health elective courses

subject	enrolled (04/05)	Hours in course					
		lectures	practical work	supervised work	clinical work	other work	total
Food microbiology	36	30	15				45
Meat science	76	45	20	6		4*	75
Fish and seafood	4	30	6	4		5*	45
Milk science	9	45	28	2			75
Zoonoses	19	30	2			13	45
Total of group	ave. 29	180	71	12		22	285

Table 4.7: 'Other' elective courses

subject	enrolled (04/05)	Hours in course					
		lectures	practical work	supervised work	clinical work	other work	total
Biometry	15	30	15				45
Ecology	29	30	9.5	5.5			45
Micology	48	15	15				30
Molecular biochemistry & genetics	4	30	12	3			45
Enterprise management	56	30	2	13			45
Embryo technology	15	15	15				30
Total of group	ave29	150	68.5	21.5			240

Table 4.8: Optional subjects in the veterinary curriculum

subject	Year(s) offered	Hours in course					
		lectures	practical work	supervised work	clinical work	other work	total
Population, food resources & development	All	45				15	60
Food safety	All	45	15				60
Agriculture & sustainability	All	45				15	60
History & documentation of veterinary medicine	All	30	10			10	50
Fisheries & seafood	All	45	10			5	60
Practical work	All		180				180

In addition to the structured course, students have 200 hours (10 weeks) of compulsory extramural work as pre-professional training in the 4th and 5th years, the aim of which is to expose undergraduates to “real” activity in several areas of the veterinary profession. This extramural work can be done in slaughterhouses and Public Health Offices (6 weeks full-time, mostly night work in slaughterhouses), Animal Health Authority Laboratories (10 weeks full-time), equine/small animal clinics/hospitals (10 weeks full-time), livestock production/medicine (10 weeks) or industries (10 weeks). Most students choose clinical activities as extramural work. Students also have the possibility to make a proposal for carrying out this extramural work in other institutions not listed by the Faculty.

The Faculty remarks that the curriculum is quite traditional and has few innovative aspects and that there is an urgent need for a change in the curriculum chiefly in terms of the distribution of those contents and the way that they are taught. It also states that the current (legal) separation between theoretical lectures and practicals within a course is to be changed. More hands-on work is needed and probably some courses may be completely

practical while others may remain mainly theoretical. A positive approach would be to define only a minimum acceptable level of practical workload instead of specifying the number of theoretical and practical hours for each course.

It also remarks that a major difficulty in re-structuring the curriculum is the inflexibility of the legal process involved. Apart from very minor issues, modifying the curriculum is a very long and formal procedure. Hopefully, this situation will change soon since a new draft law is already prepared.

The Faculty remarks that students have a high load of work and little time to study.

4.1.1 Comments

The fact that the main lines of the curriculum are defined in national law makes it difficult to change or adapt. There is flexibility as to the content and orientation of elective subjects, but the mandatory core course is prescriptively set in terms of the course subjects, content, the 'knowledge area(s)' that may present them, and the point in the course when they are taught. This rigid structure makes it difficult for the Faculty to adapt the core course (for example in response to the remarks made later in this Section and Chapter).

Many of the shortcomings of the course are a result of the national curriculum – for example inflexibility in allocation of teaching hours, a heavy curricular load, and significant weaknesses in some fields. This way of defining the veterinary course also compartmentalises the teaching. It is in general not the best way to regulate a dynamic and scientific subject such as veterinary medicine, which can, and should, develop along professional lines. The team would whole-heartedly agree with the Faculty remarks that a more flexible or adaptable way of regulating such studies is needed.

The team was pleased to hear that the curriculum and the associated law are under review. This provides a welcome opportunity to modernise and radically improve on the old curriculum. It would strongly urge the Faculty and the University to press for significant changes. As well as correcting errors and imbalances, such a review should build in more flexibility, to make explicit provision for interdisciplinary teaching, for example.

There are several aspects of the curriculum that should be reformed:

- The present curriculum is overloaded with teaching hours. This means that the 'core' curriculum represents a heavy teaching load for students;
- There are some imbalances in the distribution of subjects in the current curriculum: the proportion of hours spent on basic sciences is too high, in particular the basic subjects, such as mathematics, chemistry, biochemistry, animal and vegetable biology, and physics;
- The curriculum is noticeably overweight in the field of what was labelled 'animal production'. Much of the content in this area seems concerned more with general agro-technical aspects, rather than the health and welfare-related issues that should be the focus of a veterinary course. The opportunities for the students to experience on-farm health related issues are scarce;
- There is little early exposure to general animal management and husbandry;
- a noticeably low proportion of time is spent on clinical subjects, with hands-on clinical work being a particular weakness (see below);
- Some subjects are taught at an inappropriate time in the course.

In the revision of the curriculum, these shortcomings must be corrected, so that training is focussed towards modern concepts of professional veterinary activity. It should be noted that the European veterinary training directives are over 25 years old. They do not provide the most up to date basis for defining a curriculum.

The team was pleased to note that the proportion of practical work in the teaching had increased significantly since the first evaluation of the FVM-UAB in 1992. However, there are still too many lectures in relation to other types of teaching. The latter also includes videos and seminars to large groups, which are rather theoretical in nature. The ratio of theoretical to practical teaching (1:0.76) remains unsatisfactory compared to the recommended ratio of 1:1. There has to be an increase in the amount of practical work, and this should be predominantly hands-on work. Moreover, the ratio of intramural clinical work:other types of work (1:14.4) is unacceptable compared to the minimum ratio of 1:9.

The clinical work being provided has a good structure in terms of student group size and case involvement. However, the amount of intramural clinical work in the VTH must be increased.

It is accepted that the 'core' teaching at the Faculty is supplemented by electives and extramural work. It is also noted that employers in Spain will often examine the electives a graduate has taken. However, there is an obligation to ensure that all students have a minimum level of training in the different fields and across the species.

The efforts of the Commission for Teaching Affairs and the staff to coordinate teaching are appreciated. However, more 'decompartmentalisation' of the teaching is needed. Subjects should have a clear and direct orientation to their application in veterinary activity or subsequent parts of the course. This applies in particular to the basic subjects and animal production disciplines. These need to incorporate material and teaching from the applied fields, presented in an integrated and interdisciplinary way. Some subjects are probably no longer needed as independent disciplines. Instead the elements that are needed by veterinary students should be included within other disciplines. This is explicitly provided for under EU directives on veterinary training. An interdisciplinary approach is often taken in presentation of elective subjects, and such initiatives need to be taken in the core subjects.

The elective subjects and extramural work are sound developments in the curriculum. Many of the electives have a very good orientation and content, and much of the material could legitimately be incorporated within the compulsory teaching. Evidently this is not realistic in terms of the amount of content and the time this would need, but is indicative of a mismatch between the compulsory content and that which is offered as electives. The Faculty might develop the electives into more formal differentiation at the end of the course, so students have to choose all or most of their electives in a particular theme (e.g. small animal, farm animal, food safety).

A more systematic structure to extramural work could be beneficial in terms of the allocation of time between different species, with certification of the work undertaken, and feedback on performance. It would be useful to have a compulsory 2-week period of extramural work on a farm for first students, to give them basic exposure to farm animal handling and management, with a closer definition to what students should do in terms of species exposure and procedures.

4.1.3 Suggestions

- 4.1 The amount of hands-on intramural clinical training in the core course must be increased (*Category 1 suggestion*).
- 4.2 There should be a far less prescriptive and more adaptable mechanism for regulating guiding and developing veterinary curriculum and its teaching.
- 4.3 The proportion of work of a practical or interactive nature should be increased, and Faculty policy and efforts directed at ensuring that students are engaged in structured 'hands-on' (or 'brains-on') work during these learning hours.
- 4.4 The allocation of hours between different fields should be rebalanced, with:
 - Fewer hours spent on pre- and paraclinical disciplines (in particular the basic subjects in the 1st year);
 - A substantial reduction of the hours in the animal production field, in particular removing and/or reorienting animal science teaching;
 - A considerable increase in the coverage of applied veterinary disciplines, especially clinical sciences.
- 4.5 The Faculty should continue its efforts to coordinate and integrate teaching and aim to develop interdisciplinary teaching (e.g. teaching structure and function together).
- 4.6 Over time, the Faculty should consider developing its useful system of electives into more formal and structured differentiation.

4.2 BASIC SUBJECTS AND BASIC SCIENCES

4.2.1 Findings

The basic sciences are taught by the Department of Animal Health & Anatomy, as well as by all the inter-faculty units mentioned in Chapter 2.

The curriculum hours in the basic subjects taught to veterinary students are shown in Table 4.9. The attribution of these hours according to the 'EEC' subjects is shown in Table 4.1.

Table 4.9: Number of teaching hours in 'core' basic subjects

subject	year	hours in course						ratio of lectures to other types of work
		lectures	practical work	supervised work	clinical work	other work	total	
Physics	1	45	8	15			68	1: 0.51
Chemistry	1	45	15				60	1: 0.33
Animal & plant biology	1	45	18				63	1: 0.4
Cell biology	1	45	15				60	1: 0.33
Mathematics	1	45	15				60	1: 0.33
Anatomy I & II	1	105	120				225	1: 1.14
Biochemistry I & II	1,2	75	24			15	114	1: 0.52
Physiology I & II	2	90	16	18	6	20	150	1: 0.67
Genetics	2	45	20			25	90	1: 1
Histology	2	45	37			8	90	1: 1
Epidemiology	2	30	14	14		2	60	1: 1
Microbiology I & II	2	75	42.5	1.5		1	120	1: 0.6
Immunology	2	30	12.5			2.5	45	1: 0.5
Parasitology	2	30	23			7	60	1: 1
Pharmacology I & II	3	75	24	12	6	3	120	1: 0.6
Physiopathology	3	30	4		5	6	45	1: 0.5
General pathology	3	30	24	20		1	75	1: 1.5
Special pathology	4	45	25	12		8	90	1: 1
Parasitic diseases	4	45	22.5	15	7.5		90	1: 1
Infectious diseases I & II	4	75	35		10		120	1: 0.6
Toxicology	5	45	20			10	75	1: 0.67
Ethics & legislation	5	30				15	45	1: 0.5
Total		1,125	534.5	107.5	34.5	123.5	1,925	1: 0.71

4.2.2 Comments

The basic sciences are covered in considerable depth. As mentioned in the preceding section, too great a proportion of curricular hours are allocated to the basic sciences. There is a need to considerably reduce the amount of teaching in these fields, mainly through reductions in the theoretical component. This is necessary in order to reduce the overall curricular load, to leave time for student self-directed study and reflection. It is also required to make space for more teaching in the applied disciplines, especially clinical teaching. The basic science disciplines need to be clearly oriented towards their veterinary use, incorporating more applied material needs in the earlier teaching.

The Faculty receives students with the highest grades, who have followed a scientific track in School (see Chapter 9). It should therefore not be problematical to significantly reduce the teaching in the basic subjects, such as mathematics, physics, animal and plant biology and chemistry. In the latter case, the total hours spent on biochemistry and chemistry should be cut back. In contrast, it would be useful if the currently elective course on clinical biochemistry was provided to all students, taught with a clear orientation towards veterinary application in the Veterinary Teaching Hospital. Cell biology could also be grouped with biology.

The structure of anatomy and histology needs to be reconsidered, so that these subjects are taught in parallel. It would in fact be beneficial to develop interdisciplinary teaching, for example integrating or closely linking

teaching in anatomy, histology, biochemistry and physiology in a 'structure and function' approach. The teaching of anatomy would also benefit from further development of an applied orientation, including clinical and radiological anatomy. This would be an extension of an extension of some of the existing and commendable applied teaching methods, such as teaching about bone structures with the help of radiographs, and taking a surgical approach to soft tissue anatomy work.

The timing and orientation of some other disciplines would benefit from review, with the general aim of improving course flow. The initial course on ethology (see Table 4.9) should not be presented before students have learned the underlying physiology. The teaching of mathematics and epidemiology should be strongly oriented towards its veterinary application in animal health programmes.

The course in genetics was reported to start with some time spent on statistics to refresh the students' capabilities of performing statistical analyses. However, the mathematics course should be oriented towards statistics and the validity and meaning of statistical methods, to provide a foundation for a course on basic epidemiology. This should be followed towards the end of the degree course with teaching on applied epidemiology, integrated into the animal production teaching, demonstrating the use of quantitative epidemiology in treatment and prevention strategies in animal populations.

There should be more emphasis on the practical and applied aspects of pharmacology and toxicology. This should in particular relate to the clinical aspects of these disciplines, for example therapeutics. Similarly, the discipline of parasitic diseases should have more hospital-based work.

4.2.3 Suggestions

The need to reduce the number of curricular hours in the basic subjects and basic sciences has been mentioned in Suggestion 4.4.

- 4.7 The Faculty should seek to develop an interdisciplinary approach to basic sciences, both by linking up this teaching (e.g. a 'structure and function' course) and by incorporating more applied (e.g. clinical) material in the basic science teaching.
- 4.8 There should be more emphasis on the clinical aspects of pharmacology and toxicology, including practical hours in therapeutics.
- 4.9 The timing of some basic subjects in the curriculum should be changed, in particular so that histology is taught at the same time as anatomy, and ethology is taught after physiology. Systematic efforts should be made to integrate the teaching of the pre- and paraclinical disciplines.
- 4.10 The teaching of mathematical disciplines should be closely oriented to applied veterinary epidemiology. The early teaching should focus on statistics and basic epidemiology, to provide a foundation for a later course on applied epidemiology.

4.3 ANIMAL PRODUCTION

4.3.1 Findings

Animal production is taught by the Animal Science Unit at the Department of Animal and Food Science (Agriculture & agro economics, Genetics and Breeding, Nutrition and Feeding, Production) as well as by the Department of Health and Anatomy, Unit of Animal Health (mainly by the section for infectious diseases and epidemiology). The Department of Cell Biology, Physiology and Immunology is responsible for the teaching in ethology

The topics taught in animal production subjects are shown in Table 4.10. The attribution of these hours according to the 'EEC' subjects is shown in Table 4.1.

Table 4.10: Number of teaching hours in 'core' animal production subjects

subject	year	hours in course						ratio of lectures to other types of work
		lectures	practical work	supervised work	clinical work	other work	total	
Ethnology	1	30			6	9	45	1: 0.5
Ethology	1	30		15			45	1: 0.5
Agriculture	2	45	24	6			75	1: 0.67
Agrarian economy	2	30	7	8			45	1: 0.5
Animal Production I & II	3	75	16	4	13	12	120	1: 0.6
Animal Nutrition I & II	3	71	33	4	5	7	120	1: 0.69
Animal Breeding	3	45	10	15	5		75	1: 0.67
Reproduction	3	30	9	2	10	9	60	1: 1
Preventive medicine	5	30	8	2		5	45	1: 0.5
Total		386	107	56	39	42	630	1: 0.63

A substantial part of the time spent in animal production is dedicated to studies on lectures on plant production basis, cropping systems, forage and pasture crops (44 h) and practical sessions on climatology, crops, soil analysis, agricultural machinery, vegetal foods recognition, fertilizer, crop rotation (28 h),

Herd health, population medicine and quantitative epidemiology are taught, but there is a fragmented approach to these subjects rather than them being integrated. The basic course in epidemiology is taught in the second year which does not at present allow an integration with other disciplines within animal production and animal health.

On the Faculty premises there is a farm (see Chapter 6) with stables for a few cows and sheep and goats. Students are assigned to assist on this farm participating in milking, recording and sampling routines.

Third year students must attend three days (15 hours) of activities in a pig farm located some 35 km from the Faculty and 10 h attending to a bovine farm located some 100 km from the Faculty. Although activities in these farms are mainly related to animal production, management and husbandry, some aspects of general clinical examination and biosecurity are included.

The students report that they have one week of mandatory work on the mobile clinic, giving exposure to approximately eight cases per day. However, in contrast to the SER they report that they have not seen any commercial turkey, broiler or egg-producing farm during their whole curriculum.

In the ethology course behavioural disorders are included and there is some coordination with the animal hospital, which receives companion animal behavioural cases as well as medical and surgical cases. The ethology discipline is also contributing to optional subjects such as pig production and small animal management and nutrition. There are plans to also develop such contributions to the optional courses on sheep and goat production as well as poultry production. However, no such plans are yet made on cattle production.

4.3.2 Comments

As remarked in Section 4.1, a substantial number of hours are spent on the animal production disciplines. However, teaching in this field needs to be thoroughly reviewed, since it currently includes a lot of time spent on the classical disciplines of animal science and general aspects related to the agricultural sector. A substantial

proportion of this material is not a priority for a veterinary course, which has to include an ever-increasing amount of content.

Courses are given predominantly through lectures, and much of the teaching in general seems rather remote from applied veterinary work. Little time is devoted to non-infectious diseases and production disorders. At the Department of Animal Health and Anatomy courses are taught on infectious diseases and applied epidemiology, but the responsibility on the teaching of production disorders is not clearly defined

The teaching on welfare is fragmented and not very visible in the current course. Some teaching on regulatory aspects is provided in the course on ethics and legislation (see Table 4.9). However, the applied and on-farm aspects do not seem to be well covered within the teaching dealing with production and husbandry of animals.

Applied ethology is a fast growing discipline with increasing importance both in relation to housing of farm animals and to animal welfare issues. As ethology is partially based on knowledge of physiological systems it is crucial to the understanding of the mechanisms behind animal behaviour that the student has a reasonable knowledge of physiology. This cannot be the case when ethology precedes physiology in the curriculum.

Students did not seem to have seen any poultry farms, and the depth of their exposure to rabbit production (an important food animal in the region) was not clear.

A much closer integration and applied orientation of the animal production disciplines is needed. This should substantially reduce or eliminate the animal science and general agronomics elements and instead explicitly focus on the relationship between production aspects and animal health. The teaching of a herd-health approach, including the relative costs of ill health compared with treatment strategies, should be reinforced. Disciplines such as welfare, ethology, applied nutrition and quantitative epidemiology should be closely integrated with this teaching, with an applied on-farm approach.

European laws are moving towards an integrated approach to monitoring and control of animal health and food safety right through the food chain. This 'stable to table' approach is a very clear veterinary responsibility. It should be reflected in the structure and orientation of veterinary training.

New European laws make integrated approach to monitoring and control of animal health and food safety right through the food chain a very clear veterinary responsibility. This modern 'stable to table' or 'farm to fork' principle has to be embedded within the structure and orientation of veterinary training on the production animal species. The revision of the animal production disciplines to achieve this integration must be done from a veterinary perspective (and not continue the current zootechnical approach), emphasising the scientific veterinary role of enhancing the safety and quality of products of animal origin. There should be particular efforts to make as much as possible of the teaching of animal production 'on farm' and applied, with increased contact with production animals concerning their health management. This would allow the final year choice to be more of a species differentiation added to a core course, as opposed to leaving students with minimal practical experience in certain species.

The Faculty Farm is a very practical and useful facility. Being on site, it could and should be more widely used, in particular in the early teaching on animal production. The rather theoretical approach used at present should be given on-farm wherever possible. This should include basic animal handling and management in the first/second years of the course. It would also be beneficial for students to spend one or two weeks of extramural work on a farm during their first year to get such basic experience with production animals. The proposed addition of a rabbit production unit will be an enhancement.

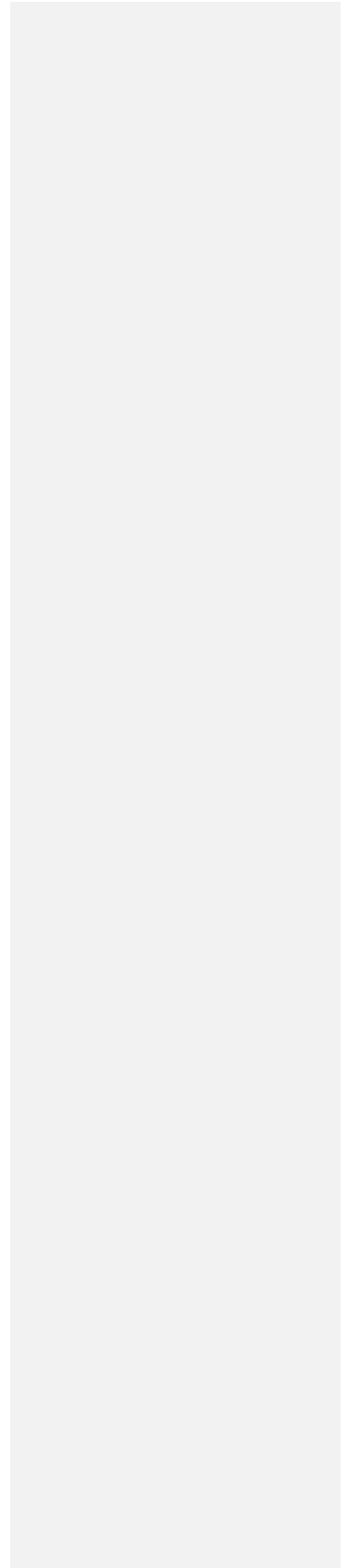
4.3.3 Suggestions

As remarked in Suggestion 4.4, the curricular hours allocated to animal production disciplines should be substantially reduced, in particular by removing and/or reorienting the animal science element.

- 4.11 The teaching in animal production disciplines should be integrated with that on animal health and production diseases, herd health management and veterinary epidemiology and population medicine, and an increased focus given to health and welfare problems of farm animals. Efforts should be made to assure an in depth

understanding by all students of current farm animal production, health and welfare issues.

- 4.12 The teaching in animal production should be clearly oriented towards applied veterinary roles, with practical and supervised work conducted on-farm, dealing with real animal management and health issues and problems to the greatest possible extent.
- 4.13 Students should be exposed to farm animals at an early stage through the arrangement of farm visits, preferably in the first year in the studies, including poultry and rabbit farms. This could be supplemented and reinforced by extramural vacation work on a farm to gain exposure to practical husbandry and management.
- 4.14 The ethology course should be presented after the physiology course, and the focus on this discipline increased, especially on applied ethology, as a key aspect of farm animal production.



4.4 CLINICAL SCIENCES

4.4.1 Findings

The clinical disciplines are predominately taught by the Department of Animal Medicine and Surgery and the Department of Animal Health and Anatomy.

The obligatory courses in clinical subjects and the teaching hours are presented in Table 4.11. The attribution of these hours according to the 'EEC' subjects is shown in Table 4.1.

Table 4.11: Number of teaching hours in 'core' clinical subjects

subject	year	hours in course					total	ratio of lectures to other types of work
		lectures	practical work	supervised work	clinical work	other work		
Propaedeutics	3	30			30	15	75	1:1.5
Reproduction	3	30	9	2	10	9	60	1:1
General surgery	4	45	4	2	9.5	14.5	75	1:0.67
Radiology	4	15	10		5		30	1:1
Clinical surgery	4	30	5		40		75	1:1.5
Clinical medicine I & II	4, 5	60		2	48	10	120	1:1
Obstetrics & theriogenology	5	45	4	17	14	10	90	1
Therapeutics	5	45				15	60	1:0.33
Total		270	23	21	146.5	64.5	525	1:0.94

All undergraduate students must participate in clinical training activities in different areas for 4 or 5 full weeks during 4th and 5th year clinical rotations. These are done in the Veterinary Teaching Hospital (VTH) for small animal and equine medicine, with training in farm animal medicine mainly being done as work in the mobile clinic. The clinical activities are organised as “modules”, one- or two week- periods of clinical training in groups of 4-6 students. These groups are generally subdivided, so that 2-4 students are working with a clinician, and a case. For small animals these “modules” comprise one full week for clinical medicine (including one nightshift and a 12h week-end shift attending emergencies) and 1 full week participating in the surgery service of the VTH (plus one night and one week-end shift). For equine medicine, students must work in the Equine Unit of the VTH for 2 weeks (including two nightshifts and a 12h shift during weekends). During these rotations all students must participate also in the activities of the Intensive Care Unit.

Each morning, teachers and students have a meeting to present, review and discuss the clinical records of the animals admitted to the VTH. This meeting serves to plan the treatments or additional examinations needed for a given patient. Students then participate in the daily-programmed activities (outpatient appointments or scheduled surgeries). For consultations, students are distributed in two or three different exploration rooms where they participate in the examination of patients. At the end of each day the students discuss with their supervisor the different cases seen all over the day.

Besides these general activities, students are expected to undertake the following tasks: to write down accurately clinical histories, to explore patients, to perform additional examinations (inspection, palpation, auscultation, X-ray, ultrasound diagnosis, etc.), to administer treatments and to follow-up treatment. The students also participate in all pre-surgery preparation of the patients, anaesthesia, monitoring during surgery, and surgery procedures. Also, they must perform the post-surgical follow-up.

Mobile clinic activities cover livestock medicine. In these 4th/5th year clinical practices, students are integrated in the normal clinical activity of a bovine veterinary practitioner who also is a part-time or full-time teacher. Students can choose to participate in the activities of two different veterinary groups (*Cooperativa Plana de Vic* or *Centre Veterinari de Tona*). In the Osona area (about 80 km away), one of the main livestock producing areas of Catalonia. These activities correspond to five days of work in a row or split into two weeks. They spend one week in bovine mobile clinic (10-15 farms/week; approx. 100 animals/farm, approx. 7-8 cases/day) and 2 days in swine and poultry (1-2 farms each, approx. 250 sows, 500 weaners and fatteners, and more than 5,000 poultry). Transport to these mobile clinic activities is the responsibility of the students.

Pre-rotational clinical activities include restraining and clinical examination procedures, which are given during propedeutics and reproduction courses (3rd year), plus some activities in physiology such as electrocardiography (2nd year) and administration of drugs (Pharmacology, 3rd year). In the 3rd year students also have 25 h. of work on two farms (cattle and pig) during which some clinical aspects are covered, although these sessions are mostly intended for animal production teaching.

Students have to spend 200 h. on extramural work as pre-professional practice (see also Section 4.1). Although the nature and place where this work is done is not rigidly specified, the majority of students (more than three-quarters) elect to spend this extramural training on clinical activities. This can be in one of several practices or clinics dealing with small animals or farm animals.

The animal material sent to the University and seen by the mobile clinic is detailed in Chapter 7.

The clinical facilities and organisation are outlined in Section 6.2.

4.4.2 Comments

As noted in Section 4.1, the major problem in the clinical disciplines is that not enough hours are spent on these subjects. In almost all areas and species there is not enough curricular time for staff to provide adequate coverage. There is clearly not enough clinical training in the core course. The clinical disciplines need to be considerably reinforced in a new curriculum.

Within the limited number of hours, the structure and standard of clinical training is very good, with a small group size, case involvement and continuity. Students can examine the case and discuss their findings firstly with the resident/intern, and subsequently with the teacher. There are also relatively good opportunities for students to follow the surgery without entering the aseptic area, since there is a CCTV camera over the operating table and a large viewing window. Students assisting with the operation are allowed to participate, for instance suturing skin after the intervention.

The clinical organisation, equipment (see section 6.2) and general and emergency caseload (see Chapter 7) is at a good level for supporting clinical training, both at undergraduate level and for true specialisation training (see Chapter 12). Teachers are motivated, with good research performance. The small animal section of the VTH is rather small and crowded for the clinical activities and teaching that it needs to support. This problem should be solved with the construction of a new hospital.

The main obstacle to providing satisfactory clinical training at the FVMB is therefore increasing the amount of 'hands-on' practical work in the course. This should preferably be done by considerably increasing the time spent on clinical rotations in the VTH. This necessitates both a change in the curricular hours (see Section 4.1) and an extra effort by the clinical staff. In view of the heavy demands intensive clinical training places on manpower, the apparent refusal by a minority of academic (i.e. teaching) staff in clinical departments to participate in clinical work is incomprehensible, and must change (see also Chapter 10). Teaching of clinical disciplines can only be credibly provided by individuals actively involved in clinical work.

With too few hours allocated to clinical disciplines in general, it is inevitable that there will be noticeable weaknesses in particular areas. For example, equine practical work (and even theoretical teaching) of 60 h. in total is insufficient as this means orthopaedics, internal medicine (colic, respiratory system, heart, skin), reproduction, anaesthesia and surgery have to be covered in very few hours. The teaching is largely insufficient to provide a base for specific equine medicine. Some practicals are given on slaughterhouse legs, but, for instance, rectal examinations are not performed by the students. Training in routine manipulations, such as IV catheterisation, stomach tube placement, intubations, etc., are not given on a regular basis. Greater use in practicals of specimens from slaughterhouse (nerve blocks, minor surgical interventions, hoof care, teeth care, technical aspects of radiology, etc.) and more use of the ponies kept on the premises (e.g. rectal and tooth examination) could supplement the equine caseload, but the limited hours remain a major obstacle.

Furthermore, students take either the ruminant medicine rotation or the equine one. This can easily lead to their not having had structured clinical training in one of these important species groups.

Diagnostic imaging provides another example of where the hours are inadequate to provide appropriate coverage. 30h in total is not enough to cover radioprotection issues, technique (exposure, positioning..), normal anatomy of small and exotic animals, horses, abnormal findings in radiology, ultrasound. This field should also include a short overview of other techniques, such as MRI and scintigraphy. To put this in context, radiology/diagnostic imaging, a subject of direct and considerable importance to applied veterinary medicine, is allocated less than half the curricular hours of physics.

Anaesthesia is under-developed, both within the curriculum and as a clinical service (see Section 6.2). A structured approach to teaching in anaesthesia should be built up, both expanding the teaching in this field and to incorporate the necessary components of physiology and pharmacology.

Both diagnostic imaging and anaesthesiology should be included as 'stations' in an extended system of clinical rotations. This would necessarily imply the development of these activities as a distinct professionalised service within the VTH (the equine diagnostic imaging activity is already well-organised). Practicals should specifically cover taking X-rays (training, technical issues such as exposure factors, positioning, etc., which can be done on specimens), radioprotective issues, anaesthetic procedures (use of in-house beagles, ponies). For example, anaesthesia of dogs to perform ultrasound investigations for teaching purposes, or sedation of ponies to perform rectal examination, would provide training in more than one clinical aspect.

There is currently little on-site work with farm animals that could prepare students for participation in the mobile clinic activities. With its adjacent farm, the Faculty could make greater use of healthy animals for propaedeutic training, for example by using the animals on the Faculty Farm for teaching topographical anatomy. Since a variety of species are kept, this would give the students the opportunity to apply basic anatomy to a clinical context. Palpation is a primary step in the evaluation of sick or lame animals, and a sound knowledge of the 'normal' is a basic prerequisite.

Although most poultry medicine is dealt with by a few (industrially organised) companies, this subject, along with rabbit health management, might need more attention in the course. A rabbit farm is being set up on the campus, and may be a good resource for education on this species.

A considerable number of hours are allocated to paraclinical disciplines, in particular parasitic and infectious diseases (see Table 4.9). It would be beneficial to base as many hours as possible of these practical hours in the hospital, both to give these subjects a clearly applied veterinary orientation, and to contribute to the reinforcement of clinical teaching. The applied approach taken in anatomy teaching, where the anatomy of the skeleton is taught with the aid of radiological material, and soft tissue anatomy takes the perspective of surgical approaches, is commendable.

It would be beneficial to provide an applied course in practice management close to the end of the degree studies. This should focus on practical and professional aspects of veterinary work that graduates will face when starting employment. It would be normal for practitioners to contribute strongly to such teaching.

The teaching in the clinical fields is in most cases backed up by a very good level of specialisation among the staff (See Section 6.2). However, there is no specialist of overall allocation of responsibility for diagnostic imaging, which will inevitably have repercussions on the teaching on diagnostic imaging to the students. Bearing in mind the importance of the subject in teaching (most veterinarians in small animal, equine and bovine practice make use of ultrasound and/or radiographic examinations) and to clinical work, this lack of a specialist should be addressed.

Although a high percentage of undergraduates elect to perform their extramural work in a clinical environment, the choice of field, place and type of work is largely left to the students. It would be beneficial to have more structure to this work, in particular since the intramural relations do not cover all species. Thus, the extramural work could include a 'core' of clinical work in different types of practice (e.g. at least 2 weeks in small animal, equine and farm animal practices), along with other non-clinical placements and a 'free-choice' component. It would also be useful to progressively introduce a more systematic definition or evaluation of what students undertake during their extramural work.

4.4.3 Suggestions

The need to increase within the curriculum the number of hours allocated to clinical disciplines, and in particular to increase the amount of 'hands-on' clinical training as been mentioned in Section 4.1. This is by far the most important point that the Faculty must address, as it must both raise the number of weeks students spend in the hospital and increase the diversity of the subjects (surgery, internal medicine, anaesthesia, diagnostic imaging).

- 4.15 Within the context of generally insufficient hours allocated to clinical discipline, the time spent on theoretical and practical teaching on equine medicine and surgery and on diagnostic imaging needs to be increased.
- 4.16 The Faculty should systematically incorporate more clinical and applied material into the pre- and para-clinical teaching (e.g. use the animals on the Faculty farm for topographical anatomy, covering the principles of diagnostic imaging in physics), and orient the work in such disciplines towards applied clinical aspects.
- 4.17 The teaching of cross-species clinical disciplines, such as diagnostic imaging and anaesthesiology, should be reinforced, and these fields included as a rotation station in an expanded system of clinical rotations.
- 4.18 The Faculty should incorporate teaching on practice management into the final year of the course.
- 4.19 The extramural work should progressively be given more structure, in terms of specifying minimum periods working in particular fields, and a more systematic definition and evaluation of student activities during extramural work.

The Suggestions made on clinical facilities and organisation (Section 6.2) will have a considerable bearing on the FVMB's capacity to support clinical training.

Suggestions 10.4 and 10.3 relate to the need for all academic staff in the clinical departments to be fully engaged in practical clinical activities, and for the number of staff providing hands-on clinical training in the Hospital to be increased.

4.5 FOOD HYGIENE AND TECHNOLOGY AND VETERINARY PUBLIC HEALTH

4.5.1 Findings

Table 4.12: Subjects and of teaching hours in 'core' food hygiene subjects

subject	year	hours in course			total	ratio of lectures to practical work
		lectures	practical work	other work		
Food technology	3	60	27	23	110	1: 0.83
Hygiene I & II	5	75	32	13	120	1: 0.6
Total		135	59	36	230	1: 0.7

The specific objectives of the Faculty include training graduates in order to;

- contribute to the economically feasible production of healthy and safe food products of animal origin, with the lowest environmental impact and safeguarding animal welfare;
- secure human health by means of sanitary inspection, certification and quality control of all the food production chain;
- develop the legislative and administrative principles related to the veterinary profession and public health.

The lectures in core subjects cover most of the field of food hygiene and technology. To the core food hygiene subjects about half of the 5th year students add 75 hours of meat science, as an elective, although few opt for the whole elective group of food science (see Section 4.1 and Table 4.8).

Practical teaching in the food area is divided among practice in the Food Processing Plant owned by the University, inspection activities in slaughterhouse and laboratory practices and case-based teaching in food science, food microbiology, inspection and certification. Practical activities in external food industries are only possible during elective or optional periods

For slaughterhouse activities, the Faculty has an agreement with Mercarbarna, the main slaughterhouse of Barcelona (some 30 km from the AUB). This slaughterhouse handles cattle, sheep, goats and horses. The agreement with this slaughterhouse includes attendance at all the slaughter and inspection processes. Visits to the slaughterhouse are supervised by a part time teacher who is also an official food inspector. Every 5th year student must do two 5-hours visits in groups of 10 - 12. During these student carries out inspection of carcasses and meat, and visits a neighbouring cutting plant. The procedures of food hygiene control are demonstrated. This is a mandatory practice linked to the Food Hygiene and Inspection course.

The slaughterhouse is a large commercial one, with no by-passed slow line for examination of carcasses or offal by students so that most of the on chain work is simple observation with commentaries from the teacher. A new laboratory and examination room is available on site permitting detailed demonstrations and hands on activity with organs in good conditions. Arrangements are being made to also ensure visits to a pig slaughterhouse, and it is intended to also link up with a poultry abattoir.

The Faculty also has an agreement with the Health Department of the Catalanian Government allowing veterinary students to spend one month and a half in one of the regional slaughterhouses as part of their extramural work (see Section 4.1). The establishments used may change from year to year depending on the availability of veterinary inspectors and the geographical preferences of the students. Once the location of the slaughterhouses is agreed (every May), a list is displayed in the Faculty notice board. The Faculty generally offers places at about 15 slaughterhouses each year. 23 students chose this type of extramural work last year.

The Food Processing Plant (FPP) of the Faculty is situated between the hospital and the farm complex in a 500 m² building and started to operate in 1987. Nowadays the FPP is considered as the Research Centre in Food Technology (CERPTA) of the UAB. It is equipped with a complete machinery of dairy industry (pasturiser, facilities to produce cheese, a tetra-brik packaging machinery, etc.) at pilot size, and equipment to demonstrate or experiment in meat technology. Practical activities taught in the processing plant are: Food Technology (core subject, 3rd year), Meat Science and Technology (elective) and Milk Science and Technology (elective). For the core subject, students spend 11 hours in groups of 8, with hands on activity in cheese making.

In laboratory practical teaching in food hygiene, meat products and fishes are used. In food technology, milk, meat, fishes and eggs are used for teaching. All these products are bought from commercial sources.

4.5.2 Comments

The theoretical part of the teaching generally covers the required elements of food safety. However, the practical exposure of students in this field, such as on ante- and post-mortem slaughter inspection, is rather limited. Although all students have the opportunity to take an overview on slaughtering and meat inspection at Mercarbarna, the two periods of 5 hours are too short a time to teach a significant part of the useful professional knowledge available on such a site. Moreover the teaching conditions are difficult with a constant and loud noise. Adapted audio materials could significantly enhance teaching conditions in these noisy surroundings. The team welcomes the new agreement with a swine slaughterhouse. This provides a means to extend and diversify the current training on food safety and inspection.

The FPP provides a very valuable teaching resource for students and increased use would be beneficial. However, this is currently restricted by the limited time available for students, as well as space and equipment. Use and maintenance of FPP need to fit strictly to EU regulation standards.

As well as greater use of the FPP, it would be beneficial to include in the core course, visits to commercial food processing plants, along with critical analysis of control and certification procedures.

The teaching in the field of food safety should be closely linked to that of farm animal health and productivity in the 'stable to table' or 'farm to fork' approach. The production chain should be covered in an integrated way.

The current approach is rather fragmented, particularly with regard to milk and its production.

Teachers of Food Hygiene complain on the impossibility to cover properly the core subjects in the time allocated, a complaint that seems justified. Important items, for example the zoonoses course, have to be given as optional subjects.

As mentioned in Section 4.1, it would be sensible to develop the system of electives into a form of pre-graduation differentiation, rather than an *ad hoc*. Equally, the electives should not be used to compensate for an insufficient core programme in food safety.

4.5.3 Suggestions

- 4.20 To give a more effective view on food safety and control, the practical component of teaching should be reinforced by:
- Additional core training in a slaughterhouse (e.g. more mandatory visits to a swine abattoir, as anticipated in the new agreement);
 - Visits to conduct an analysis of food processing plants;
 - Greater use of the demonstration of the food processing plant on site.
- 4.21 An early introductory visit to a slaughterhouse should be considered, to help the students get an overview with which to choose their electives.
- 4.22 The teaching on the safety and quality of food should be integrated or closely coordinated with that on farm animal health and productivity.
- 4.23 After its rebuilding and extension, the Food Processing Plant should be used more intensively for undergraduate training, in particular changing laboratory-based food technology work to the FPP to make these more effective.

As mentioned in Suggestion 4.6, the FVM should seek to develop its elective course into a system of pre-graduate differentiation, including a food safety track oriented towards professional activity.

5. TEACHING: QUALITY AND EVALUATION

5.1 TEACHING METHODOLOGY

5.1.1 Findings

The Faculty and University policy is to reduce classical magisterial lectures and increase hands-on activity, either in computer rooms, laboratories, and farms or in clinical practice. However, these goals are difficult to attain due to current legal framework for veterinary studies that specifies the number of theoretical lectures (see Section 4.1).

Most staff and courses of the Faculty conduct their teaching using multimedia resources. The Faculty has developed a virtual library of resources where students can find notes, lectures, multimedia materials and web- links to help them developing autonomous work. In addition, the University Press Service has also published several course notes that are used in teaching (e.g. epidemiology problems, neuroanatomy, population genetics, etc.), which are sold at low cost (about 10 € each).

Computer-based teaching (e.g. ration formulation, simulations) is used in mathematics, epidemiology, preventive veterinary medicine, biochemistry, genetics, physiology, pharmacology, toxicology, agrarian economy, nutrition, animal breeding, animal production, as well as in several elective subjects.

There are internal and external quality assurance strategies. External assessment of quality is done at a national level through a programme called National Plan for Quality of Universities. In this plan, a three-phase process is established for the evaluation of quality: self-assessment, external evaluation and drawing up of a final report. The Catalan Governments assumes that passing an EAEVE evaluation is enough to get the accreditation. Internal strategies are developed by the University or the Faculty. The University level programme (Office for Promotion of Quality) includes a series of surveys by the students, a verification of the teaching duties and the accomplishment of the teachers and, experimentally, a survey by teachers about the students.

At a Faculty level there are several mechanisms in quality assurance including the work of the CTA (see Chapter 2). Each semester there are meetings with the students to discuss the development of the courses, including a detailed and structured evaluation of weaknesses and strengths of each course.

The Veterinary Studies Coordinator also has periodical meetings with the students to assess the development of the course and to ask about possible problems. Any substantial change in teaching methodologies or examination systems has to be presented and accepted by the CTA (see Chapter 2). Sessions of this Commission are open to the attendance of all members (faculty, students and administrative staff) of the Faculty.

The development of staff teaching skills is outlined in Chapter 10. The Faculty considers that more courses and incentives should be provided to help improve the quality of teaching. It is also hopeful that a forthcoming change in the law will allow it to base teaching less on lectures and more on practical and self-directed work.

5.1.2 Comments

The development and availability of teaching material at the Faculty was very good. Most, if not all, course material was presented through modern media, and made available on the web, including the development of a 'virtual veterinary' resource. Many staff made use of problem-oriented teaching, seminars, and computer-based learning as part of their teaching strategy. All these efforts are very positive.

The more traditional learning resources were also of a good standard, such as an anatomy-surgery book produced in-house.

With the teaching being explicitly divided into nationally-specified subjects, students seem to learn each discipline separately with the aim, understandably, of passing the examination. It would be beneficial to develop teaching so that it encourages the retention and application of knowledge in a more holistic way. This implies much greater integration of teaching and disciplines, as mentioned in Chapter 4.

As also mentioned in Chapter 4, teaching needs to be connected to its application. Although this is done in many disciplines, in others (particularly some of the animal production subjects) it is rather theoretical, and

insufficiently linked to modern professional activity. Teaching needs to be made as ‘hands-on’ or ‘brains-on’ as possible.

Students seem to be satisfied with the evaluation and feedback they have on the teaching.

Some comments on the curriculum on particular subjects and fields have been made in Chapter 4.

5.1.3 Suggestions

Various suggestions on the curriculum are made in Chapter 4. Some of these, in particular the need to increase practical work and give this an applied orientation, will influence teaching methodology.

5.2 EXAMINATIONS

5.2.1 Findings

The periods for examinations are determined by the University Council. Usually, there are three 3-week sessions; in January-February for courses imparted during the first semester; in June for second semester subjects and in September for re-examination of students that did not pass their examinations in February or June. A "white week" without teaching precedes the January-February and June examination periods.

Each examination is prepared and implemented by the department or member of staff responsible for the teaching of a specific subject. External examiners are not used, and so there is no examiners' report.

The frequency of the different types of examination are outlined below.

Assessment Methods	1. Year	2. Year	3. Year	4. Year	5. Year
Written and multiple choice test examination	72%	75%	60%	73%	66.7%
Assessed coursework	7%	15%	25%	14%	25%
Laboratory experiment write-ups	7%		5%		
Essays					8.3%
Oral examination	14%	10%	10%	6.5%	
Presentations				6.5%	

Under Spanish law, a student is allowed a maximum of six retakes. A 'no show' is not considered as a failure. Students failing to pass a course after the sixth examination are dismissed from the University. Under special circumstances a student can ask permission to the Social Council for a further retake

There are no requirements for progression to a subsequent year of the course, but the maximum number of credits students are allowed to take yearly is 105.

The Faculty remarks that the number of written examinations, particularly test or multiple-choice exams, is excessive compared to continuous evaluation or other types of examination. The accumulation of examinations in three periods is a heavy workload for the students, and leads to the perception that examinations are an end, instead of a means. The current system rewards memory, which is just one component of learning, at the expense of other skills. The Faculty also remarks that the number of retakes is too high, and unjustifiable except in exceptional cases, but that this cannot be changed without modifying the regulatory arrangements.

The Faculty considers that a series of actions are needed to improve the examination system. Briefly:

- To increase the number of oral examinations, presentations and hands-on examinations.
- To implement continuous evaluation activities. This is already being done and the fixed periods of examination will probably disappear in the next few years.

5.2.2 Comments

The team would echo and support the Faculty's remarks on the examination system.

Since each subject is examined separately, there are a large number of examinations, giving students a heavy workload.

The absence of prerequisites, and allowing students to retake each examination many times, means that there is a lack of structure and academic rigour to the students' passage through the study programme. A staff member cannot know whether a student has acquired a satisfactory level of competency in a related discipline, upon which they can base their own teaching programme.

The examinations are predominantly based on learning a large volume of factual information for short answer questions. This type of learning is often superficial and short-term. The teaching and examination process needs to be far more oriented towards the understanding, synthesis and application of veterinary knowledge. The team would support and encourage the efforts by the Faculty to move away from an examination system that emphasises or rewards rote-learning.

It is recommended that these issues be looked at carefully, and the regulations governing examinations modified.

5.2.3 Suggestions

- 5.1 The scope of examinations should be widened to test reasoning and the use of knowledge (with notes and documents) and assess problem-solving skill, making use of written papers with essay or composite questions.
- 5.2 Students should have to pass the examinations in appropriate foundation subjects before being permitted to enrol for more advanced subjects. Students should also not be permitted to start courses in a particular year of the curriculum unless they have successfully completed at least 80%-90% of all the subjects and the examinations of the preceding years.
- 5.3 There should be a system of external examiners to objectively assess whether the content of a subject is relevant and comprehensive, and whether it has been taught and learnt in a way that enables its effective use in subsequent studies or professional activity. For the applied subjects (clinical, animal production and veterinary public health), practitioners should be included in this process.

The suggestions made above most likely require changes to the regulatory background to the examination system.

6. PHYSICAL FACILITIES AND EQUIPMENT

6.1 GENERAL ASPECTS

6.1.1 Findings

The facilities of the Veterinary Faculty dating from the 1970's, are mainly located on the UAB campus in a semi-rural area about 20 km outside Barcelona. The Campus is connected with the city by trains and buses that run every 10-20 minutes. It is also close to a sizeable 'satellite' town of Barcelona.

The Veterinary Faculty is composed of the main building and several adjacent buildings and facilities (Veterinary Teaching Hospital (VTH), farms, food processing plant, etc.)

The main building, of about 7,000 m², is divided in three different blocks connected by several indoor corridors through the courtyard. Block "A" is a four-storey building that accommodates most of the offices for teachers, the research and teaching laboratories (including the dissection, microscope and food hygiene laboratories), the Faculty administration, the Dean's office, two meeting rooms and the four computer rooms. The block "B" has two floors and houses the lecture rooms, the restaurant and other facilities (photocopy service, students' associations room, staff common room and student multi-purpose rooms). Block "C" accommodates the library and two lecture halls (the larger one for 300 people and the smaller one for 75 people).

Close to the main building, additional buildings and facilities are grouped in three different areas: VTH, farm animal facilities and food-processing plant and kennels. The VTH and diagnostic laboratory service are outlined in the following section.

The farm complex consists of 4 barns of about 480 m² each along with two smaller ones. One barn houses cattle, goats, hens, broilers, piglets and a digestibility room. A second contains offices and is the storehouse for feedstuff and forages. Barn 3 accommodates ewes and sheep, and the 4th barn has the examination rooms, one small laboratory, experimental pens for pigs, and stables for horses, donkeys and pigs. The two smaller barns are dedicated exclusively to lambs. Several outdoor housing fenced areas complete the farm facilities.

The Food Processing Plant (FPP) is a well-equipped building of about 500 m² distributed in two levels. (See also Section 4.5)

Two more facilities are being constructed: the Research Centre for Animal Health (CReSA), on which building is almost finished, and the Rabbit Production and Research Unit, which has now been started. These are joint ventures between the University and the Catalan Government, through IRTA.

The Faculty has agreed plans for several major changes in the near future. A new necropsy building with new and updated equipment and resources will be placed close to CReSA and will be finished about September 2005. The Veterinary Teaching Hospital will be greatly expanded with new adjacent construction. The increase in the number and size of the examination rooms and surgical theatres will allow a decrease in the number of students per clinical case and will facilitate the proper management of the increase number of clinical cases. Work on this building will start on September 2005. New kennels and an extension to the food processing plant are also being planned.

The Faculty considers it has enough lecture facilities, in terms of number and capacity, and sufficient laboratories for practical work. It notes as a weakness the inadequacy of the available space in the VTH (crowded consultation rooms, accumulation of students working on different clinical cases in the same facilities, waiting time for using some equipment, e.g. x-rays, etc.).

The need to modernise the necropsy facilities, remodel some laboratories, and increase the rooms available for student self-directed work are also mentioned as a weakness, along with some more general aspects of space (restaurant, parking) and technical equipment.

The Faculty has access by contract to two external farms where all students do practical work with dairy cows (SEMEGA-IRTA, Monells) and pigs ("Sus scrofa", La Garriga). The first farm has 80 milking cows and 40 heifers and the second 220 sows and 800 piglets of different ages.

The provision of library and computing facilities is outlined in Chapter 8.

The facilities used for training in the food hygiene disciplines have been outlined in Section 4.5.

6.1.2 Comments

The Faculty is located within a University Campus on a pleasant and extensive site. Its proximity to Barcelona and other towns, with good transport links, gives it easy access to small animal caseload, and facilitates national and international contact.

The Faculty occupies a sizeable and attractive building, within which facilities are well arranged. This provides it with enough space for all its activities, with the exception of the clinics, which (in particular in the small animal area) are very cramped and urgently need expansion (see following section). The compartmentalisation of activities and space along departmental lines means that some sections are a little crowded, whilst other seems to have facilities that are not heavily used, and/or which could be shared with other units without loss of functionality. Some reorganisation of the space within the buildings to reflect activities and level of utilisation would be beneficial to optimise the use of these good buildings. In this context, the team was pleased to hear of the plan to develop shared teaching laboratories.

The lecture theatres are undersized relative to the number of students in each year, and lectures are repeated as a consequence. However, Spanish university law decrees that if student numbers exceed 100 in the first two years of a course, or 75 in the subsequent years, the group must be split. With 75 still being a large group, there is not any enhancement of learning to justify this measure, which doubles the lecture hours of staff.

In general the provision of equipment was satisfactory, with apparatus being at a standard 'state of the art' level, or better. Some improvements in teaching equipment would be beneficial.

The team would remark that there seem to be good opportunities for shared access to research equipment. There are also many service-oriented diagnostic facilities. This collective approach is commendable.

The Faculty Farm is a very practical and useful facility. Being next to the Faculty, it could and should be more widely used, in particular in the early teaching on animal production (see also Section 4.3 and 4.4). It would be useful to increase contact with rabbits and poultry, and the planned developments are welcome.

The necropsy premises are suited to perform large animal necropsies although this can be improved. As it provides a good service, cases are attracted from both the Hospital and the surrounding area. The team was nonetheless pleased to of the plans for the new necropsy room.

As remarked in Section 4.5, the food processing plant (FPP) needs expansion and upgrading to fully comply with EU standards.

6.1.3 Suggestions

- 6.1 The Faculty and University should continue the planned programme of expansion and upgrading of facilities (VTH, FPP, necropsy building, rabbit unit, etc.).
- 6.2 The Faculty should aim to improve and re-equip its teaching laboratories as facilities for shared use by different departments and sections.

6.2 CLINICAL FACILITIES AND ORGANISATION

6.2.1 Findings

Clinical services are provided through the Veterinary Teaching Hospital (VTH). This is an organisationally separate entity, which has the FVM and the UAB as 'parents'. The VTH is managed by a Director and a governing board (Directive Council) that is chaired by the Dean of the Faculty, and has teaching and veterinary service functions.

The VTH (about 1,500 m²) is divided into a small animal hospital and an equine hospital, which are both connected to the reception. The morphology of the area means that the VTH, although having ground-floor access, is an extension of the third floor of the main FVMB building.

The small animal hospital (about 750 m²) is arranged along a corridor, one end of which leads into the main FVM building, the other end of which is a client reception and waiting room. On one side of the main corridor there is the radiology room, with a digital X-ray, and a small animal operating suite, comprising a primary operating theatre with a CCTV transmission system and large viewing window, three medium-equipped additional surgical theatres, a preparation area and washing/changing facilities, and a surgical store, all connected by an internal service corridor. On the other side of the main corridor are an intensive care room, five examination/treatment rooms, an emergency laboratory and a staff office.

There is a separate small building that contains the pharmacy and laundry, as well as the equine isolation facilities.

The treatment area of the equine hospital comprises a large animal radiology and scintigraphy facility, two examination areas, and a surgical unit comprising a large animal operating theatre, two induction/recovery boxes (with a rail hoist in and out) and cleaning facilities. In addition, a CAT-scanner (for small animals) and the ultrasound unit (for all species) are housed here. On the far side of an access lane there is a stable with boxes for 8 animals and feed, bedding and tack rooms.

The small animal part of the VTH covers internal medicine, anaesthesia, soft tissue surgery, ophthalmology, neurology, dermatology, diagnostic imaging (X-ray, CAT, ultrasound), behavioural disorders and exotic pet medicine. The equine unit has sections for internal medicine, surgery and anaesthesia.

A total of 61 people work in the VTH; 36 veterinarians (22 teachers, 8 residents and 6 full-time hired veterinarians), 6 veterinary technicians and 5 administrative staff. The director and vice-director are veterinarians. In addition, there are 14 graduate students employed as interns (9 in the small animal unit and 5 in the equine unit - see also Chapter 12), who support regular and emergency clinical activities.

The VTH is open all the year round. The timetable for general consultations is from 10:00 – 20:00 on weekdays. The rest of the day and on weekends there is emergency attendance (24 h/day covering internal medicine, surgery, anaesthesia, orthopaedics, neurology and ophthalmology).

Small animals	
Internal Medicine	Mon. to Fri. 10:00 to 14:00 and 16:00 to 20:00
Exotic pets	Tues. & Thurs. 4 PM to 7 PM
Behav. disorders	Mon. 3 PM to 5 PM, Wed. 10 AM to 12 AM, Fri. 5 PM to 7 PM
Odontology	Tues. 9 AM to 10 AM
Neurology	Tues. & Thurs. 10 AM to 1 PM, Wed. 4 PM to 7.30 PM
Dermatology	Mon. & Fri. 3 PM to 7 PM, Tues. 9 AM to 1 PM
Orthopaedics	Mon. & Wed. 3 PM to 6 PM
Ophthalmology	Mon. 10 AM to 1 PM, Tues. & Thurs. 4 PM to 7.30 PM
Reproduction	Mon. 9 AM to 11 AM, Wed. 3 PM to 5 PM, Fri. 9 AM to 11 AM
Surgery	Mon. to Fri. from 9 AM until needed.
Anaesthesia	Mon. to Fri. from 9 AM until needed.
Equines	Equine unit receives referral cases on a 24 h a day basis.

There is a horse trailer to bring cases to the VTH, which is loaned to the animal owner if necessary.

Within the VTH as a foundation, only the behavioural disorders service has mobile clinic activities (mainly for small animals). The external large animal mobile clinic in which students participate is run by practitioners who are associate teachers.

The variety of services and quality of equipment is considered as well above that of the average Spanish veterinary hospital. The opening hours and the emergency service are also much extended compared to other private or public clinics.

Most VTH clinicians hold European and/or American diplomas of specialisation and belong to the respective European or American colleges. Also, the VTH offers postgraduate clinical training meeting European requirements such as internships and residencies in several areas (see Chapter 12).

Clinical fees are decided by the Directive Council of the VTH. As a general policy they are at least equal or higher than those of the average private hospital.

Client and patient information and economic data are kept in a purpose-built networked customised database. This software also allows the introduction of clinical information, but clinicians do not use this part of the programme. There is a computer in every consultation room and several at the reception desk. Patient records are kept on paper and clinical information is hand-written.

The Veterinary Faculty has several specialized diagnostic services (clinical biochemistry, haematology, infectious diseases, bacteriology and mycology, parasitic diseases, pathology, equine reproduction, genetics and fish diseases) that provide service to the Faculty, the VTH other University faculties and to external veterinarians and private companies.

6.2.2 Comments

The Veterinary Teaching Hospital occupies an area originally designed for other purposes. It is noticeably short of space. However, the Hospital is making the most effective use of the available premises: The small animal area is well equipped and the layout and utilisation of the space is good. There are certain limitations imposed by the building; many areas are cramped, particularly for teaching, and cats and dogs are hospitalised in the same ward. The equine area is similarly satisfactorily equipped, but very limited in terms of the space available. There is a particular problem of scintigraphy patients blocking access to the examination room and radiology area due to the layout and radioprotection requirements. The hospital undoubtedly needs new and substantially larger facilities – for its teaching, its clinical service activities, and for clinical research. The team was very pleased to hear that funds have been committed for a new Hospital, and that plans are well advanced. It would note that Faculty, University and regional support will be needed for fitting out and equipping the new clinical premises.

The organisation of clinical activities under a separate structure is not straightforward for the team to understand. As remarked in Chapter 2, it is assumed that this structure is adopted for good reason, as within Spain it is apparently not unique to Barcelona.

In general terms and given its physical constraints, the VTH is functioning extremely well. It has extended opening hours, offers good specialisation, and has a good companion animal caseload.

The efforts of the clinical and academic staff working in the VTH deserve note and praise for the level of achievement, which extend to the (unrecognised) organisation of postgraduate clinical training programmes conforming to European Board requirements (see also Chapter 12). The efforts and achievements of the personnel working in the VTH are made all the more noteworthy by the apparent refusal of some academic colleagues to work or teach in the VTH. As remarked in Chapter 10, this attitude is totally contrary to the generally accepted concept of a 'clinical teacher' or 'academic in a clinical discipline'. In terms of the functioning of the VTH, it means that the workload of providing hands-on clinical training and maintaining dependable clinical service of a high standard have to be borne by fewer staff, undermines the arguments for allocating more personnel to meet clinical obligations and must have a negative effect on morale in the VTH.

Although the general level of clinical services is high, with recognised European specialists in several areas, no diplomate or other specialist is present in diagnostic imaging. There is a lack of a centralised medial imaging

unit with a clearly attributed responsibility for small animal radiology, registration of radiology patients and outcomes. As an important area in both general and referral practice, diagnostic imaging should have an appropriate focal point and expertise. It would be advisable to create such a diagnostic imaging unit, with supervision of the different imaging modalities, from a clinical as well as a teaching point of view. Similarly, anaesthesiology needs to be developed as a distinct service and to provide a foundation for teaching in this discipline (see also Section 4.4).

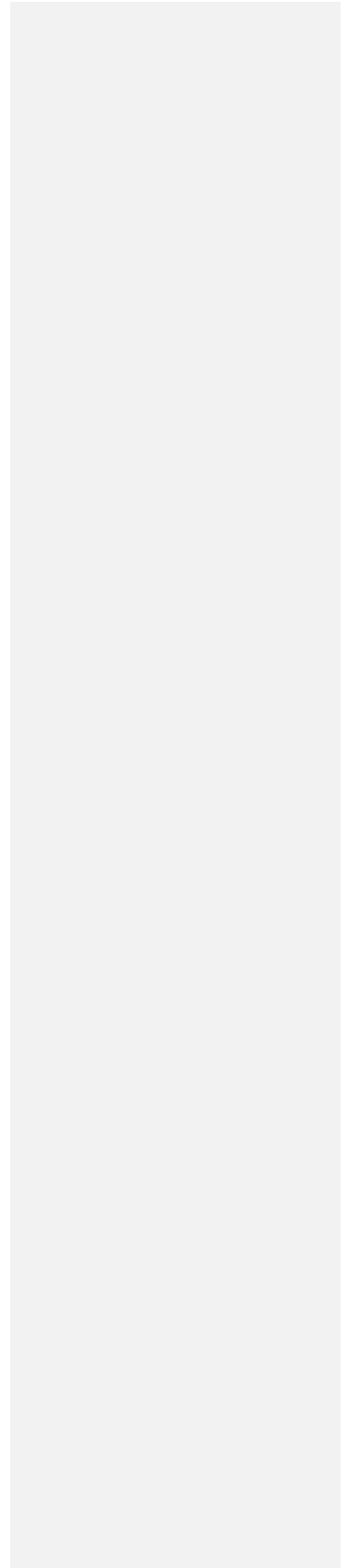
Administratively, the VTH seems to function satisfactorily. In view of its planned (and necessary) expansion, the fact it is somewhat separate from the academic structure, and has to generate enough income for it functioning, care should be taken that undergraduate teaching remains a clear priority. It would be imagined that circumstances or a need to maintain its staff and functioning could make it more oriented towards income-generation and/or clinical excellence. Both are desirable, but should not be allowed to outweigh the educational role of the VTH. This is certainly not a problem at present, but should be kept in mind as the VTH and its caseload is developed.

Concerning the information management, efforts are made to compile all information (clinical, diagnostic imaging, surgery, etc.) in one file. Currently, a lot of information (e.g. radiological images, equine ultrasound) is not kept electronically, but on paper only.

6.2.3 Suggestions

- 6.3 The necessary planned expansion of the Veterinary Teaching Hospital should go ahead as soon as possible, to allow for better working and teaching conditions, enhance capacity, allow separation of dog and cat wards, etc.
- 6.4 The FVMB and VTH should seek to develop expertise and a focal point for diagnostic imaging and anaesthesia, preferably with European Board certified personnel in place.
- 6.5 The Faculty and VTM should try to predict and take account of the financial and operational consequences of considering expanding student teaching activities with the VTH.
- 6.6 The Faculty, University and Hospital should check there are safeguards that ensure teaching is explicitly the priority function of the Veterinary Teaching Hospital.
- 6.7 Patient information (anamnesis, laboratory results, diagnostic imaging, surgery, treatments, etc.) should be completely available in electronic format.

See also Suggestion 10.4 regarding the need for all academic staff of the clinical department to be fully engaged in the clinical activities of the VTH.



7. ANIMALS AND TEACHING MATERIAL OF ANIMAL ORIGIN

7.1 Findings

In practical teaching of anatomy, bones, viscera (from slaughterhouses) and cadavers are used. Increasingly the FVMB is using plastination to preserve viscera and other anatomical preparations. The Anatomy Unit has a complete collection of bones and skeletons of the different domestic species.

In practical training, dissection of euthanised dogs (30 every semester) and some cadavers of sheep (from the Faculty farm) are used. A refrigerated room is available in the necropsy building to store viscera and cadavers. Freezers are available for the interim storage of carcasses and viscera.

The animal material seen in the establishment clinics and necropsied is detailed in Table 7.1.

Table 7.1: Number of animals seen at FVMB (2001 - 2003)

		Consultations			Hospitalisations			necropsies			mobile clinic ¹
		2003	2002	2001	2003	2002	2001	2003	2002	2001	2003
Farm animals	Cattle							12	6	6	1200
	Horses	498	425	408	498	425	408	62	26	23	
	Small ruminants							21	21	50	
	Pigs							191	213	186	
	Other farm animals							80	99	45	
Pets	Dogs	7515	7212	6721				251	231	267	
	Cats	4372	4203	3918	874	838	784	64	62	62	
	Other pets	625	597	561	125	118	112	44	52	46	

¹ Very rough estimate; - daily cases x 5 x 30. The Faculty states that the annual large animal caseload is 1,982

The necropsy caseload includes animals sent by owners, veterinarians and farmers.

About 40% of the total small animal cases are referrals, although this proportion rises to 70 – 80% for specialised services. The equine work is almost entirely referral, with are around 130 equine surgery cases per year (mainly colic surgery, followed by urogenital surgical interventions and arthroscopy).

There are approximately 2-5 emergency cases per day in small animals depending on the season (more during holidays, when local veterinarians are unavailable people come directly to the Faculty. For horses, there are a lot of colic cases and foals during foaling season, mainly in the evenings and at night.

For diagnostic imaging in small animals there are about 1200 ultrasonography and 1200 radiology cases are year. For equines, there are about 30 ultrasound, 100 radiographic and 30 scintigraphic cases annually.

The Veterinary Faculty owns a kennel of about 175 m² placed with 16 5m² boxes. Six beagle dogs are available for teaching several non-invasive clinical methods (physical exploration, ophthalmology, etc.).

Under an agreement with an animal charity, cats abandoned in the area are cared for and neutered before being adopted or returned to the charity. Students are involved in these activities, although at the time of the visit, no cats seemed to be available.

Two mares and 15 donkeys are full-time available at the VTH and farm complex for teaching purposes in reproduction and propedeutics. As regards the farm animals, the FVMB has 4 cows and 220 sheep used for teaching.

Several species (goats, sheep, 4 cows, horses, beagles) are regularly kept on the Faculty Farm (see Section 6.1) and used for propaedeutic teaching. In addition, swine and poultry are often available. One 'house cat' is also amenable to propaedeutics work, if it is present. The sheep are also used providing final year students with lambing experience and for Ph.D. experimental work. The Farm is always accessible for students at any time, and students commented on the helpfulness of those staffing and running the Farm.

In addition to the on-site animals, the Veterinary Faculty has agreements with two outdoor farms and companies, whose practitioners are in fact part-time teachers (associate teachers), to provide *in situ* clinical and production training.

The ratio of students graduating:clinical caseload in pets is about 1:80 (163:12,998)

The ratio of students graduating:clinical caseload in livestock is 1:12.2 (163:1982)

The ratio of students graduating:necropsies is about 1:4 (163:645). For reasons of comparability between reports, necropsies on 'other' farm or pet animals (such as poultry, rats and rabbits) are not included when calculating the ratios.

The access the Faculty provides to slaughter and inspection activities is outlined in Section 4.5.

7.2 Comments

The availability of fresh, chilled and prepared material for teaching anatomy is adequate in quantity and diversity (small animals, horses, calves and sheep), and students are able to perform dissection in small groups. The plastination of organs provides very impressive teaching material and is a good alternative to fresh organs. The incorporation of radiographs in teaching osteology is positive. The preserved whole animals for teaching anatomy are educative (and safe, as chemical evaporation is removed by a new ventilation system). These specimens are carefully dissected and structures are exposed beforehand so that students can readily identify structures.

There is adequate animal material for necropsy training, although an increase in the number of cattle necropsies would be welcome. The planned reconstruction of the necropsy facility, and the increase in teaching capacity this should provide, are welcome. The Pathology section provides a good service to clinicians.

The companion animal caseload (small animal and equine) is adequate for undergraduate teaching purposes, and should be improved when the Veterinary Teaching Hospital is expanded (see Section 6.2). The specialised staff involved in both small and large animals attract referral cases. A rise in the equine caseload would be useful, in particular in view of the VTH's resident and intern training activity. However care needs to be taken when increasing the referral caseload (already the case in equine, and being sought in the small animal field), since undergraduate training needs firstly to cover the most routine conditions seen and treated in a general practice. If the clinical work becomes predominantly referral, a means has to be found to expose students to routine conditions, such as work in 'front-line' clinics certified (or run) by the Faculty. It would also be useful to increase the cases from animal charities that are seen and dealt with by the VTH, as these would provide good training opportunities (general examination, parasitic work, spays, castrations, etc.), within the limits of regulations on such work.

An identifiable unit for diagnostic imaging (see Section 6.2) might increase the referral work from surrounding veterinarians. This applies not only to CT, but also to the radiological and ultrasound examinations. The presence of one person in charge (a clinician working in the hospital) would give referring veterinarians a contact point concerning referrals, case discussions, etc.

As no rectal examination is allowed on equine patients for training purposes, and since this is a major aspect of equine medicine, it might be appropriate to use the ponies and donkeys available on site for this, as well as for practicing ultrasound examinations.

There are no cattle patients in the hospital. This is not a negative point, since due to the risk of transmissible diseases, cattle are best treated on-farm. Also, individual medical care is becoming less and less significant, whilst management of the health of the herd is becoming more important.

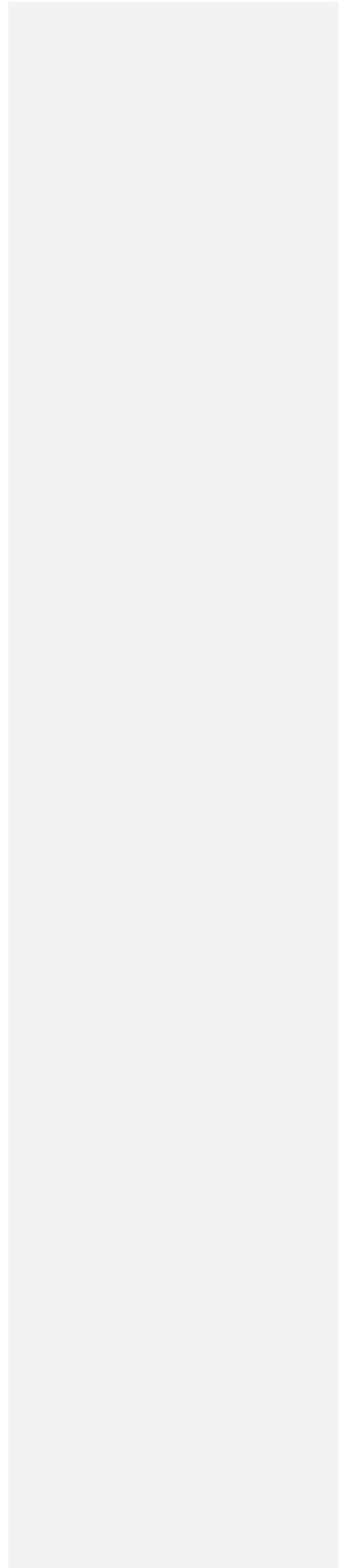
Student contact with farm animals is mainly provided through work with the mobile clinics (see Section 4.4), and through use of the Faculty farm. As mentioned in Chapter 4, it would be useful to more closely link with rearing in animal production with applied issues of health. It would also be useful to increase the amount of 'showcase' work on non-viable farm animals (e.g. abomasal displacements) as an on-site teaching activity to complement the work on the mobile clinic.

7.3 Suggestions

The need to more closely link teaching the animal production disciplines to applied issues of health, and to make greater use of the Faculty farm has been mentioned in Suggestion 4.11.

- 7.1 When increasing the number of referral cases the Faculty should ensure that undergraduate exposure to routine companion animal cases and procedures is maintained, for instance through maintaining a 'front-line' clinic, greater use and more structure/control of extramural work in general practices and/or more (routine) work on non-paying cases.
- 7.2 The Faculty should seek to increase the amount of Faculty-based 'showcase' work on farm animals for teaching purposes.
- 7.3 The FVMB should consider using the equines kept on site for teaching rectal examinations and ultrasonography.
- 7.4 The Faculty should try to increase the animals received from animal charities and shelters to provide teaching material for routine procedures.

Establishing a clear focal point and service for diagnostic imaging (see Suggestion 6.4) should increase the referral work in this field.



8. LIBRARY AND EDUCATIONAL RESOURCES

8.1 Findings

The principal library is the Veterinary Faculty Library (VFL) of about 1,300 m², separated into three main areas: 540 m² of reading rooms (211 reading places), 400 m² for journals and 360 m² for the technical area and personnel allocation. There is 1575 m of shelving for books and journals.

The Library is open from 08:30-20:30 during weekdays (08:30-13:30 during vacations) and closed on weekends. There are 7 staff working in the Library (3 librarians, 3 administrative staff and one clerk). The Library offers a wide range of scientific journals, most of them in electronic form. Library stocks correspond to the bibliographies of each course. The Library is subscribing to 12 international databases.

Journal title holdings increase by 3-4% annually. Monographs increase by approx. 5% annually through donations, mainly of older literature and through purchases. Students are given introductory courses on how to use the Library and access publications. Nine such training sessions for beginners and 10 advanced sessions were performed 2003, with 117 and 20 users attending respectively.

In terms of organisation, the VFL has a dual dependence: organically on the MAE (see Chapter 2) and functionally on the General UAB Library Service Network, formed by 8 campus libraries and 4 branch libraries in UAB hospitals located in Barcelona. Each library has a Faculty Library Commission with representatives from teachers, students and administrative staff, a Library Coordinator - acting as advisor - and a General UAB Library Commission (reporting to the UAB Research Vice-Rector). The VFL has a Director who manages the Library and acts as secretary of the Library Commission.

Funding mainly comes from the general UAB Library, but this is insufficient (see also Chapter 3), and has to be supplemented from the general budget of the Faculty, the budget of the Departments, or even research projects, or clinical and diagnostic services. In the case of journals, preference of subscriptions is given to titles in digital format. Many titles have subscription in digital format for Catalonia University Bibliographic Consortia (CBUC) or UAB finance: <http://www.bib.uab.es/project/remjour1.htm> but again this is clearly insufficient for teaching and research necessities

The Library offers eight computers in a separate room and also three booths with computers. In total, there are 32 Ethernet connections with 23 publicly accessible computers. The journals can be accessed from all computers in the library and many of them also from computers in the informatics unit.

The Faculty have 4 computer rooms which together with the computers in the FVL provide some 60 computers in total. Faculty policy is to increase the number of public computers to reach a ratio of 1 computer per 10 students, and to fully equip the building with wireless connections to the Internet and the Faculty intranet (this is foreseen for years 2005-2006).

Besides the computers available in the Computer Service and the Library, all the classrooms have a computer and a projector for teaching. The microscopy teaching laboratories also have a computer and projector to help image discussion.

8.2 Comments

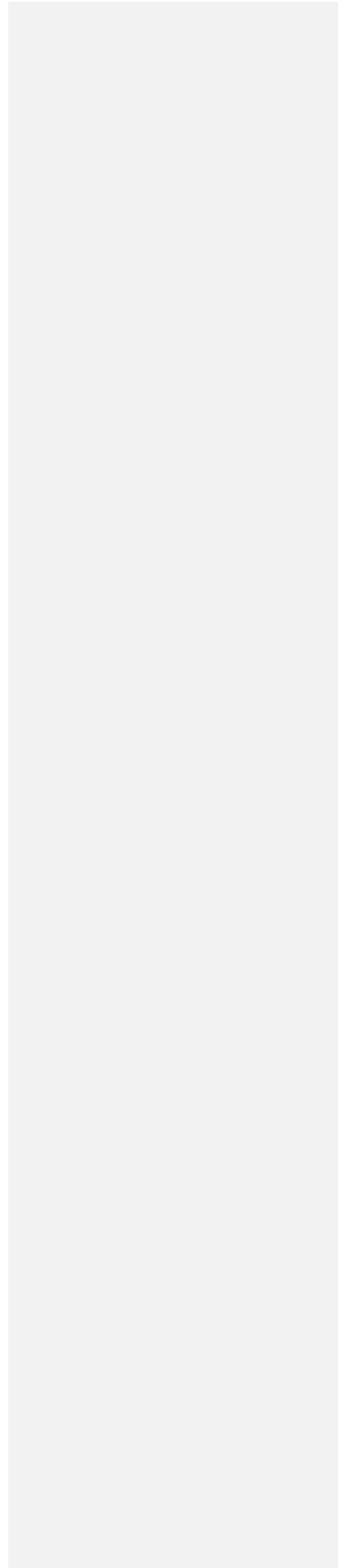
The Library is well staffed and open to the students all work days. There is sufficient access for the students offered to the library facilities. Students seem to be familiar with library resources and to use them well.

There is a large and increasing number of scientific journals available in the Library. More emphasis is put on electronically accessible journals.

The staff at the library seem to be well aware of the needs of the Faculty. The Library has recently been certificated according to ISO 9001.

8.3 Suggestions

None



9. ADMISSION AND ENROLMENT

9.1 Findings

Year	2004/05	2003/04	2002/03	2001/02	2000/01	1999/00
Number applying (as 1 st choice)	387	418	545	470	504	
Number admitted – standard	142	152	156	156	162	164
Number admitted - other	8	7	9	4	8	9
Number graduating		133	163	137	162	183

A total of 958 undergraduates are enrolled on the veterinary course, about 75 % of whom are female.

The total number of offered places is agreed between the University and the Catalan Government (DURSI). The intake has been steadily decreased from the level of about 195 admissions a decade ago. The ambition is to reduce the number further to 125. However, the Faculty does not have the ultimate authority to establish the admittance quota.

The average duration of studies is about 6.15 years. The drop-out rate is approximately 8%.

High school studies have four different branches each one of them permitting access to a set of university-level studies. A student who wishes to enrol on a veterinary course should have followed the 'Health and Natural Sciences' branch. Students must apply in advance for a given number of university studies indicating their preferences (e.g. 1st veterinary medicine, 2nd medicine, 3rd chemistry, etc.).

The main mechanism of admission to university level studies is through a general examination (PAAU) at the end of high school studies. With a *numerus clausus* at the Faculty, admittance is competitive. The total mark of a student is based 60% of the average grades from high school, and 40% on their performance in the PAAU. The qualification needed to attend the Veterinary Faculty is amongst the highest in Catalan Universities.

There are specialised admittance procedures for handicapped students and top athletes, who may account for a maximum 2% of the intake.

Students wishing to transfer to UAB from other universities of Spain have to provide evidence of their PAAU grades and their academic performance at the previous university, along with a detailed memorandum explaining their reasons for asking to transfer. Applicants are ranked, and the limited quota of places (3% of the total enrolment) assigned accordingly.

Students transferring to the UAB from other universities abroad have to be able to demonstrate that they have passed examinations corresponding to courses that account for 60 credits of the veterinary curriculum in the university.

9.2 Comments

The student intake is high in relation to the size of some of the facilities such as the lecture halls, since no lecture hall has the capacity of more than 130 students. The student intake is divided into two groups. However, under Spanish law lectures have in any case to be repeated above a certain class size. As mentioned in Section 6.2, the Teaching Hospital is noticeably crowded, but this problem should be solved with the new building that is about to get underway. The reduction in student intake over the past decade deserves praise. Nonetheless, there still seem to be a certain overproduction of veterinarians, and the goal of the Faculty to reduce the intake to 125 is appropriate.

Not all students have the background in mathematics, physics and chemistry needed to successfully follow the veterinary medicine course. A substantial amount of time in the first year of the veterinary curriculum is therefore spent on these subjects. Many students complain that they already have taken these disciplines, and that for them it is not useful to go through a lot of repetition on these subjects. However, such knowledge must be held by all veterinary students, although this should be done prior to their admission.

The drop-out rate of students is consistently low.

9.3 Suggestions

- 9.1 The Faculty and University should seek to continue the trend of further reducing the number of students admitted annually.
- 9.2 There should be an improved evaluation or requirement for basic skills in mathematics, physics and chemistry for the students who are admitted to the veterinary medicine course.

10. ACADEMIC AND SUPPORT STAFF

10.1 Findings

Table 10.1: Academic and support posts in departments

Department	Academic staff				res.	Support staff			Total
	Prof.	Assoc. Prof.	Assist. Prof.	Assoc. teach.		tech./anim. carers		admin./general	
						teaching	res.		
Animal Biology	1	1	1	0	0	1	1	0	5
Physiology, Cell Biology & Immunology	2	7	1	2	0	1	1	1	15
Biochemistry & Molecular Biology	2	3	0	4	1	1	8	2	21
Animal & Food Science	5	24	4	12	2	5.5	11	5	68.5
Economics	0	0	0	1	0	0	0	0	1
Pharmacology & Toxicology	1	4	1	4	0	1	7	1	19
Mathematics	0	1	0	3	0	0	0	0	4
Animal Medicine & Surgery	2	20	4	13	0	5.5	2	2.5	49
Legal Medicine	0	0	0	2	0	0	0	0	2
Chemistry	1	0	1	0	0	0	0	0	2
Animal Health & Anatomy	3	19	5	11	0	5	7	2.5	52.5
HCV/Farms/Food Tech. Plant	0	0	0	0	0	12	12	7	31
TOTAL	17	79	17	52	3	32	49	21	270

Table 10.1 does not include support staff from Faculty administration, library and computer services.

The ratio of teaching staff:students is 1:5.8 (165:958) or 1:8.5 (113:958) if Associate Teachers (who are not working full time for the FVMB) are not included.

The ratio of teaching staff:support staff is 1:0.62 (165:102) or 1:0.90 if Associate Teachers are not included in the calculation.

The Department is the body that has the right to request new academic positions and hires teaching staff. There are two types of academic staff: tenured and contracted, each recruited in a different way. Both are budgeted permanent positions financed by the University.

The University has been historically based on tenured (civil service) positions, whereas the contracted positions were mainly for young teachers and part-time staff. Spanish Universities are currently in a process of change that will probably favour employing teaching and research staff on a contact basis.

Departments make requests for staff to the University, usually based on teaching duties. Each university makes a proposal to the Ministry of Education about the number and characteristics ('knowledge area') of the tenured positions needed. Once the proposals are approved and open to applicants (the requirements are to have a Ph.D. and to have a recognised research activity of 6 or 12 years depending on the type of tenure), there is a competitive selection based on the suitability of candidates, who have to present and defend, orally and in writing, a project about the courses that he/she shall impart. Applicants also have to present and defend their scientific achievement. A jury, composed of tenured professors, randomly selected from those in the given knowledge area, decides whether or not a given candidate is able to fulfil the requirements of that tenured position.

For hired teachers the process must be decided by the parliament of each autonomous region.

The number and allocation of support staff financed by the University is directly negotiated with the Rectorate depending on the actual needs of the establishment (administrative, general services, etc). There are two types of support staff: tenured and contracted.

It is very difficult to increase the number of tenured positions. New positions are allocated based mainly on the ratios between the number of students and teachers. As the number of students in the establishment has been decreasing during the last years, the number of tenured positions has not substantially changed. When available, vacancies are usually filled with few difficulties.

It is not difficult to employ additional staff from service income or research projects. However, the different Services (e.g. HCV, Diagnostic Services, and Research Support Services) are not funded by the University and are not allowed to have a deficit. About one third (43/140) of the Faculty support staff still is completely paid by departmental research projects.

Staff (as civil servants) have a high job stability, although salaries for teachers are generally lower than those of similarly trained professionals working in the private sectors

The University has several activities to increase teaching skills, both to prepare new teaching staff, and development courses to improve teaching skills of senior teachers. For newly hired teachers, courses are organised by the Unit for Innovative Teaching in Higher Education (IDES) (see <http://magno.uab.es/ides/form1.htm>) The courses directed towards senior teachers are done twice per year (February and June). The scope of these activities is to gain a deeper insight in specific areas of teaching. (see <http://oaidm.uab.es:8181/ides/cursos/index.jsp>.) The Faculty also organises specific courses for teachers, mainly focused on new technologies applied to teaching.

Full time teachers are not allowed to have an outside work (consultation or private practice), except through institutional agreements between the UAB and third parties.

10.2 Comments

There are sufficient academic staff to cover all the main fields of veterinary medicine, i.e. the required 'critical mass'.

It would be beneficial to have more integration of activities since the effectiveness with which the staff can be used is reduced by the compartmentalisation of the Faculty and the curriculum into defined 'knowledge areas' (see also Chapter 2 and Section 4.1). This system means that academic staff cannot move into or work in different fields within veterinary medicine, except by formally re-qualifying in another area. The Faculty also seems to have little influence on the selection of academic staff members, which is decided internally within a 'knowledge area'. This will not foster an integrated approach, neither in the sense of having the perspective (or the will) to take an inter-disciplinary approach, nor in the sense of staff belonging to a faculty that has a collective responsibility.

The current structure also gives rise to the situation where some of the research carried out by sections within the Veterinary Faculty is not in a veterinary field. This evident and institutionalised separation between educational activities and research work is inappropriate for a veterinary educational establishment.

The tenured academic staff are supplemented by a large number of positions that the Faculty and its departments and services fund through the income they generate. Although this is a commendable sign of the health and success of these services, care should be taken by the Faculty, University and funding authorities that such posts are a supplement to, not a replacement for, proper funding of core veterinary staff. This includes sufficient staff to support intensive training, which needs urgently to be increased. In particular, the significant increase in teaching that is essential in the clinical field will require a reinforcement of the clinical teaching staff to provide teaching in the VTH.

In this context the team was surprised and disappointed to find not all the staff of the Department of Surgery and Medicine are working in the clinic. Some are providing theoretical and 'theoretical practical' work only. In the huge majority of veterinary training establishments, such an attitude would be unacceptable. Besides the very negative effect such refusal has on the overall morale and cohesiveness in the clinics, it is not possible to either conduct meaningful clinical research or maintain an appropriate level of clinical competency if opting out from clinical work. In other words, the academic as well as the professional credibility of teaching staff from clinical departments who have no clinical involvement is highly questionable. It needs to be made clear and contractual that an academic position in a clinical department entails full and structured participation in the provision of service and teaching, as well as for research and the maintenance and development of professional skills.

Although in overall terms the Faculty seems to have a good complement of support staff, many of these are funded from income generated by research and service activities. The number of government-funded support staff positions is low. In some departments, the number of administrative staff appears to be very low (e.g. Animal Health and Anatomy and Animal Medicine and Surgery have in total only 5 administrative staff for 80

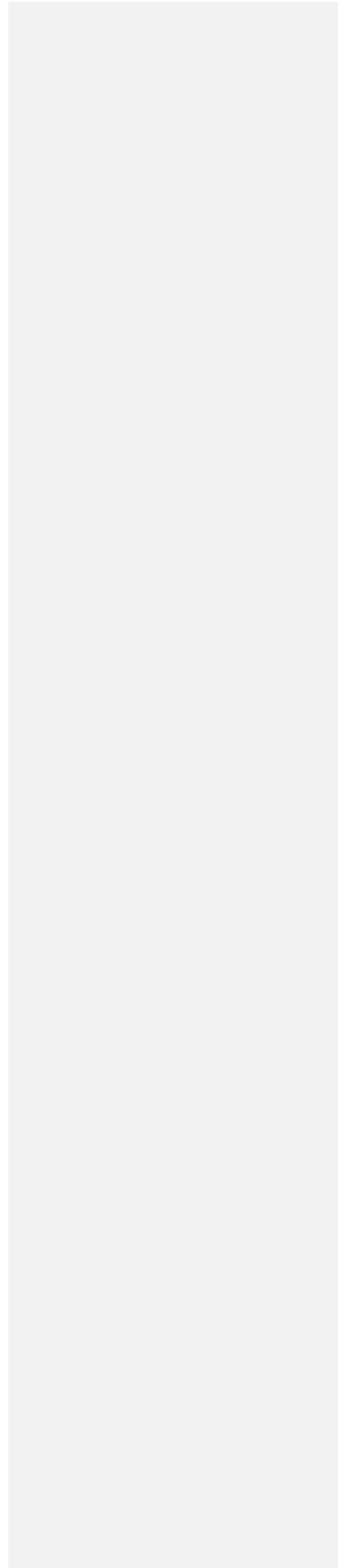
teachers)

It is noticeable that the staff of the Faculty are all relatively young, although well-qualified and enthusiastic. This is of considerable benefit to the Faculty and its development.

These are good opportunities for staff to receive training in relation to their activities. There is a good take-up rate for these activities among the veterinary faculty personnel.

10.3 Suggestions

- 10.1 There should be greater influence at Faculty level over the selection, deployment and activities of the staff whose primary function and source of funding is veterinary education. This should aim in particular to promote integration in teaching and research, and a clear veterinary faculty identity and orientation.
- 10.2 The Faculty and authorities should ensure that positions funded from self-generated income are a supplement to the budgeted positions, and that 'core' activities (especially intensive hands-on training) are being adequately funded from state sources.
- 10.3 The number of academic staff working in the Veterinary Teaching Hospital to support hands-on training and ensure dependable clinical services of a high level should be increased to meet the needs of greater clinical exposure for students.
- 10.4 Full and active involvement in clinical work in the Veterinary Teaching Hospital (i.e. teaching, ensuring clinical service and research) has to be considered as an integral and obligatory element of an academic position in a clinical department.
- 10.5 There should be an increase in the number of state-funded support staff working in the departments, in particular to support a higher level of practical teaching on the veterinary course.



11. CONTINUING EDUCATION

11.1 Findings

The departments and teaching units of the Faculty organised around 30 courses, seminars and congresses last year, around half of which were in the clinical field. There was a wide range in their duration (2 – 136 hours) and in the number of participants (4 – 700).

Continuing professional education in Spain is organised primarily by practitioners' organisations. Faculty staff participate extensively in these initiatives.

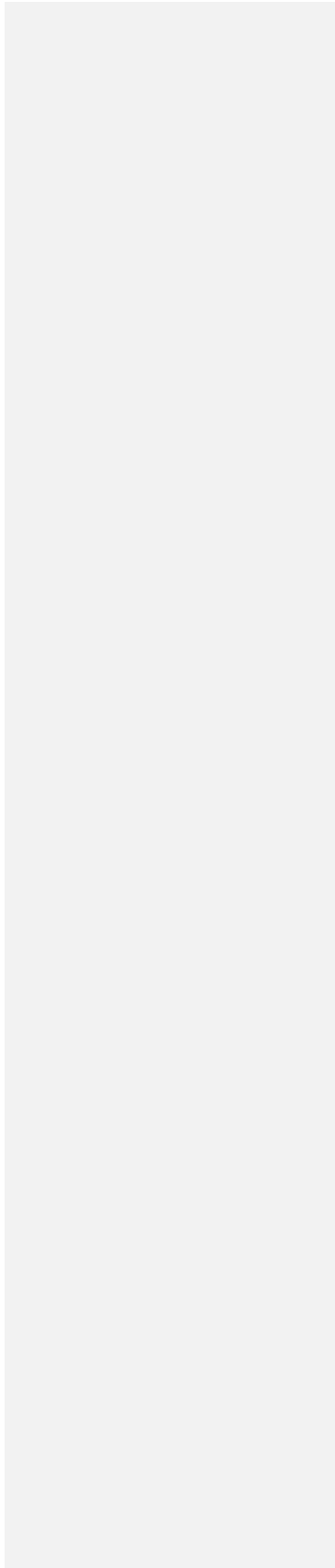
11.2 Comments

Traditionally, the Faculty has not been deeply engaged in continuing professional education. This, and the fact that provision of continuing professional education (CPE) is not considered an academic priority, means that the FVMB involvement in CPE is not as high as it could potentially be.

With the notable standard of clinical services and expertise, the Faculty is in a good position to contribute CPE to practitioners. This would build up relations between the two groups, although these already seem good. In the pre- and paraclinical fields, and in particular in the animal production field, more contact with professional veterinary activity would provide useful stimulus to the undergraduate course.

11.3 Suggestions

- 11.1 The FVMB should seek to increase its involvement in CPE, and such activities should be recognised and rewarded as valid academic activity.



12. POSTGRADUATE EDUCATION

12.1 Findings

Postgraduate Research Training

The Faculty teaches on three Masters' courses – 'Companion Animal Clinical Ethology', 'Laboratory Animal Science' and 'Consulting and Management of Dairy Cattle Farms' - with 20, 18 and 27 part time students enrolled respectively. Each course comprises 320 h of teaching and project work, and involves the participation of 15-18 teachers from UAB and elsewhere.

Ph.D. studies are a departmental responsibility, and are mostly imparted by the staff of each department. Within the Faculty there are three Ph.D. programmes under the responsibility of FVMB departments. The sections belonging to inter-faculty departments generally participate in the Ph.D. programmes of their own departments.

The Ph.D. programme is organised into two phases:

- Proficiency in Research ("*Suficiència Investigadora*"); divided into a 200h intra-departmental taught component and an experimental research project ("Master"), concluded by a dissertation summarising the results and conclusions. The student must defend his/her work in a public session before of a Committee of academic staff. This stage usually takes around two years for a full-time student.
- Ph.D. stage: The student must develop a research project under the supervision and direction of one of the academic staff of the Department. This period usually takes at least two years for full time students already holding a masters degree. A Ph.D. requires either a monograph, or a collection of four reviewed publications in international scientific journals. The thesis and the student are evaluated by an international expert within the subject.

Table 12.1 : Number of full-time students enrolled on Ph.D. programmes

Ph.D. programme	Number enrolled full time	
	Proficiency in research	research project
Within FVM departments		
Veterinary Medicine and Animal Health (Dept. Animal Medicine and Surgery + Dept. Animal Health and Anatomy)	31	22
Animal Production (Dept. Animal and Food Science)	19	18
Food Science (Dept. Animal and Food Science)	16	6
Within section of inter-faculty departments		
Biochemistry and Molecular Biology * (Dept. Biochemistry and Molecular Biology)	5 (total: 52)*	5 (total: 30)
Biology (Dept. Biology)	4 (total: 25)*	4 (total: 26)
Biotechnology (Dept. Biochemistry and Molecular Biology)	3 (total: 19)*	3 (total: 8)
Cell Biology (Dept. Cell Biology, Physiology and Immunology)	0 (total: 15)*	0 (total: 17)
Pharmacology (Dept. Pharmacology)	2 (total: 25)*	0 (total: 6)
Neurosciences (Dept. Cell Biology, Physiology and Immunology)	4 (total: 40)*	3 (total: 18)

* totals refer to number of postgraduates in the department and programme as a whole

Students do not necessarily receive a salary, although the most usual situation for postgraduates to have a fellowship (from institutions, or from a research grant/project).

Table 12.2 : Number of graduations from each department

Department or section	Research Masters				Ph.D. Program			
	2001	2002	2003	2004	2001	2002	2003	2004
Animal Medicine and Surgery	1	11	2	4	2	5	4	5
Animal Health and Anatomy	2	7	3	10	1	4	4	4
Animal Production	6	13	3	10	7	6	4	4
Food Science	4	9	4	6	2	4	6	3
Physiology Unit	-	1	4	-	1	3	4	-
Biochemistry Unit	5	4	4	2	1	0	3	2
Biology Unit	-	1	-	2	-	1	-	-
Total	18	46	20	34	14	23	25	18

The Faculty remarks that an important problem with the postgraduate programs is that there is no clear policy about their organisation and structure. This means that on many occasions the repertoire of courses depends on the willingness of individuals and, in consequence, some crucial aspects may be missing from the programme. This situation is made worse by the lack of financial support and academic recognition for academic staff. In addition, constant changes in the laws defining postgraduate education have been a burden. A new law will probably be dictated in 2005.

Postgraduate Clinical Training

The Faculty currently has 14 veterinary graduates on its 18-month internship programme; 9 in the small animal unit and 5 in the equine unit. Interns rotate through different clinical areas (anaesthesia, surgery, dermatology, exotic animals, ophthalmology, neurology, orthopaedics and intensive care for small animals, and internal medicine, surgery, diagnostic imaging and anaesthesia for equine) and collaborate in all the clinical procedures. They are also an important part of the emergency service. Their salaries are paid out of the VTH budget.

The Faculty currently has 8 residents on 3-year programmes, working towards European board-level specialist diplomas in; small animal internal medicine, equine internal medicine, equine surgery (2), dermatology, ophthalmology, neurology (2). All residents receive a salary, which is paid by a veterinary or pharmaceutical company.

A Diploma in Laboratory Animal Medicine is organized by the Department of Physiology and is certified by the European College of Laboratory Animal Medicine. These residents also receive a salary.

12.2 Comments

Postgraduate Research Training

The Faculty has a commendably active postgraduate training programme. This reinforces the impression that it is a dynamic, research-led establishment. The quality of the postgraduate research programmes has recently been given positive remarks in an evaluation by the Ministry of Science and Education.

As the Faculty has noted, it would be beneficial to have more systematic organisation of postgraduate research training. In particular having such a substantial intra-departmental taught component and short research element can be questioned. In contrast, the initial part of Ph.D. studies does not include teaching on generic academic skills such as experiment design, planning and validation, statistical methodology, pedagogies, communication and scientific/technical writing. These could usefully be provided at Faculty or University level as part of the taught component of a structured Ph.D. programme.

The preparation and submission of a paper to a peer-reviewed journal is an important part of a scientist's work and a quality assurance procedure which is not an element of writing a thesis. Scientific papers are generally more readily accessible to an international audience than a monograph and therefore publications in scientific journals better display the research activities of a Faculty and an individual researcher.

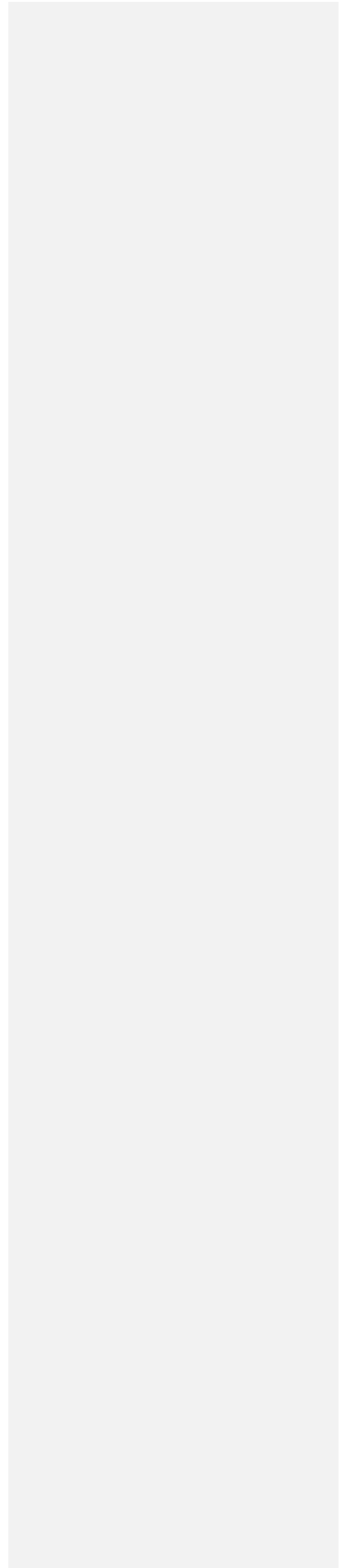
Postgraduate Clinical Training

European specialists in a variety of fields are working at the hospital, which attracts other postgraduate students interested in achieving a high level of specialisation in their qualifications and work. The number and level of the residency training programmes is highly commendable. The internship programme is also a very positive action on the part of the VTH and/or the Veterinary Faculty. They are valuable postgraduate training programmes that contribute substantially to the development of professional veterinary activity, not only at the Faculty, but at the regional, national and European level. They also provide good support to clinical training and service work.

The internship and residency training programmes both deserve support from the University and the governing authorities, in terms of recognition of the staff effort, and contribution to the high costs (not least the salaries that the Faculty and VTH are having to support through self-generated funds and sponsorship).

12.3 Suggestions

- 12.1 The Faculty and University should establish a more systematic structure to the early part of Ph.D. studies, and in particular including courses on generic academic skills, such as pedagogics, communication, experimental design, statistics and scientific writing.
- 12.2 The option of completing a Ph.D. project by several international scientific publications should be clearly favoured over a monograph.
- 12.3 The University and higher authorities should recognise and support the important contribution to veterinary sciences and services provided by the internship and residency postgraduate training programmes.



13. RESEARCH

13.1 Findings

Research is a departmental function, carried out on a departmental basis.

The University provides very little seed money for research projects. Most of the research funding comes from competitively awarded grants from European, Spanish or Catalan government sources, or from private companies.

There are three main pathways for undergraduate students to get involved in the research topics developed in the Faculty:

- “Practical work” (*Treball pràctic*): As an optional subject, students may join University Departments, Scientific Services or external institutions to improve their practical expertise. At the end of an internship, students must present a report with a description of the project.

	Students involved	Teachers involved
1st semester 2002-03	18	12
2 nd semester 2002-03	31	22
1st semester 2003-04	45	22
2nd semester 2003-04	48	29

- Fellowships: Students in the last year of their curriculum may apply for a fellowship program, sponsored by the Spanish Ministry of Education. The goal is to collaborate with a research project in a University Department. Twenty of these fellowships were awarded in the academic year 2002/03 and eleven in 2003/04.

- Voluntary work: Students may apply for a voluntary collaboration with a research project at a department, with no recognised credits.

13.2 Comments

As remarked elsewhere in the report (e.g. Chapter 2), Spanish universities are currently organised as parallel structures of faculties and departments, with responsibilities partitioned between. The Faculty of Veterinary Medicine at Barcelona *per se* therefore has no involvement in research activity.

Being organised on a departmental basis, and with the Faculty having no role in its direction or coordination, the research associated with the staff and activities of the FVM-UAB is quite fragmented. It would be desirable, and probably more productive, for there to be a coordinating action to focus research and the associated use of human, financial and infrastructure resources, onto particular themes. The University already regroups the most costly analytical equipment in inter-departmental centres that can be used by different research groups. This is an admirable way of avoiding duplication and maintaining quality of service.

As also remarked earlier, departments and sections are structured as, and oriented to, ‘knowledge areas’ rather than to veterinary medicine and science. It was evident that in several sections, the research being carried out within the Faculty has little or no direct connection to veterinary fields. In an establishment that should be providing research-led higher education, this decoupling of teaching and research activity is most regrettable. The loss of a clear veterinary flavour to research within the Faculty, and lack of linkage and support of basic sciences and applied veterinary fields is also not a positive feature.

In terms of publications, most departments and units had a steady publication of a good number of papers in international peer-reviewed journals. This was complemented by sizeable numbers of postgraduate students and courses (see Chapters 12 and 13), and good provision of facilities and equipment. A significant number of personnel, mainly support staff, but also quite a number of research staff, are funded from outside income, of which research funds are the largest component.

Undergraduate students have the opportunity, although not the compulsion, to become involved in research activities.

13.3 Suggestions

As outlined in Suggestion 1.2, the FVMB should have some involvement in research.

- 13.1 The Faculty, and University and departments should seek to give the research conducted within the FVMB a clearer and more cohesive veterinary identity.

CONCLUSIONS

The Veterinary Faculty of Barcelona has many strengths: It is well located, with notably good facilities for most activities. It has a solid academic base in terms of the number of staff, who are relatively young, enthusiastic, and have good relations with students and colleagues. The Faculty has many postgraduate positions, including a very impressive postgraduate clinical training, and provides clinical services of a high level and continuity. It is evident that research within the FVM-UAB is being published at a good level. However an evaluation needs to focus on areas where change or improvement would be beneficial to increase the quality of the teaching and training of veterinary students

Although the organisation of the FVM-UAB is typical of Spanish universities, it is a difficult one for an outside team to fully understand. One of its main features is a parallel structure of faculties and departments. Departments have a great deal of independence in their activities, and are sometimes oriented more to their subject or 'knowledge area' than they are to veterinary science. With such a structure, the Faculty needs to have a greater capacity to direct the teaching towards overall and applied veterinary needs, and should also have some role in research.

The curriculum at the Faculty is for the most part that defined in Spanish law, which sets out the subjects, their credits, when they are taught, and the 'knowledge area' that must teach them. Such a very restrictive and compartmentalised way of defining the curriculum is not appropriate for a dynamic subject such as veterinary medicine. Many of the shortcomings of the course are a result of the national curriculum – for example inflexibility in allocation of teaching hours, a heavy curricular load, and significant weaknesses in some fields. The team was pleased to hear that the curriculum and the associated law is under review. This provides a welcome opportunity to modernise and radically improve on the old curriculum. It would strongly urge the Faculty and the University to press for significant changes.

The current curriculum is imbalanced. Far too many hours are spent on basic sciences and on animal science aspects of farm animal production. Some of these subjects are probably no longer needed as independent disciplines, as the elements that are needed by veterinary students could be included within other teaching. In contrast far too few 'core' hours are allocated to clinical disciplines, and the coverage of almost all species and disciplines needs to be considerably reinforced in a new curriculum.

There is a general need to increase the amount of practical work, and ensure that this is predominantly hands-on work by the students. In particular, the amount of clinical work in the 'core' course is currently unacceptably low, although it has a good structure in terms of student group size and case involvement. The practical teaching on ante- and post-mortem slaughter inspection is another activity that needs to be increased.

The current division of the Faculty and the curriculum into 'knowledge areas' means the teaching is compartmentalised. More coordination and integration of the various disciplines is needed, so that the course can be structured as a cohesive whole. Subjects need to have a clear and direct orientation to their application in veterinary activity or subsequent parts of the course. This applies in particular to the basic subjects and animal production disciplines. For example, the 'stable to table' approach is a clear veterinary responsibility, and needs to be reflected in the structure and orientation of veterinary training. A closer integration and applied orientation of the animal production disciplines is needed, focussing on the relationship between production aspects and animal health through of a herd-health approach.

The Faculty Farm could and should be more widely used, in particular adopting an on-farm approach in the early teaching on animal production. Basic animal handling and management should be covered in the first two years of the course through both intramural and extramural farm work.

Although the Faculty generally has good facilities, the team was pleased to hear of the plan to develop shared teaching laboratories. This will be a more cost-effective way to achieve desirable improvements in teaching equipment. The plans for new necropsy facilities were also welcome

The Veterinary Teaching Hospital is making the most effective use of the available premises with extended opening hours and a good companion animal caseload. There is clinical specialisation at the Faculty of a high standard in terms of the number of European board-certified specialists working in the Hospital, and the

residency programmes offered. However, the VTH is noticeably very short of space and undoubtedly needs new and substantially larger facilities - for its teaching, its clinical service activities, and for clinical research. The team was very pleased to hear that funds have been committed for a new Hospital, and that plans are well advanced. Some care should be taken to ensure that an increased throughput of clinical cases does not compromise teaching quality, since the VTH is run as a separate organisation.

The development and availability of teaching material at the Faculty was very good. Most, if not all, course material was presented through modern media, and made available on the web, including the development of a 'virtual veterinary' resource. Many staff made use of problem-oriented teaching, seminars, and computer-based learning as part of their teaching strategy. Learning is supported by a good and well-stocked library and well-organised computing facilities. However, a more integrated examinations system with prerequisites and greater academic rigour would be beneficial.

The Faculty has a substantial number of tenured academic staff. These are supplemented by a large number of positions that the Faculty and its departments and services fund through the income they generate. Most staff are relatively young, but well-qualified and enthusiastic, and relations with students seem to be good. The significant increase in teaching that is essential in the clinical field will require a reinforcement of the staff providing hospital-based training. In this context it needs to be made clear that active and full participation in clinical activities, through work in the VTH, is an integral and indispensable element of an academic position in a clinical department.

Although in overall terms the Faculty seems to have a good complement of support staff, many of these are funded from income generated by research and service activities. More government-funded support staff positions are needed, in particular to support a higher level of practical teaching on the veterinary course.

The departments and units working in the Faculty are generally actively engaged in research, and publishing at a good level. The team would note, however, that not all this work is in a veterinary field. It is desirable that the research of all units within the FVM-UAB had such a veterinary orientation.

To summarise, the team found the Veterinary Faculty of Barcelona to be a dynamic and well-organised establishment, performing well at a European level, and with good prospects for further development in the future. The main concerns are caused by an over-restrictive and rather outdated national curriculum. The forthcoming curricular review in Spain provides the first opportunity in many years for substantial and essential changes. We strongly urge the Veterinary Faculty and University to ensure that this opportunity to modernise veterinary teaching is not missed.

SUMMARY OF SUGGESTIONS

1/ Suggestions which, if not implemented, mean that the establishment does not reach the minimum level specified in the EU veterinary training directives (Directive 78/1027/EC and its appendix) as interpreted in the 'Guidelines, requirements and main indicators' (contained within document XV/E/8488/2/98).

- 4.1 The amount of hands-on intramural clinical training in the core course must be increased.

2/ Suggestions whose implementation does not effect the conformity of the teaching at the University with EU veterinary training directives as interpreted in the 'Guidelines, requirements and main indicators'.

1. OBJECTIVES

- 1.1 The University and Faculty should ensure that in principle and in practice Veterinary Faculty roles and needs take precedence over departmental or 'knowledge area' perspectives, especially as regards educational issues.
- 1.2 As an establishment of higher education with responsibility for an important field, the Veterinary Faculty should have some role and function in academic research.

2. ORGANISATION

- 2.1 The Faculty should have more authority over the activities of departments and staff, to direct these to meet the establishment's objectives.
- 2.2 The structure and grouping of disciplines within the Faculty, and the attribution of teaching, should reflect the needs and logic of veterinary science and professional activity.

3. FINANCES

- 3.1 The funding per student of the Faculty should be increased, so that it at least covers the actual teaching costs.
- 3.2 The FVM-AUB should continue to deploy the income generated from research and clinical work to support Faculty activities and objectives.
- 3.3 The percentage of FVM-AUB generated funds retained by the University should not be increased, and the use to which the retained overhead is put should be clear identifiable.
- 3.4 The overhead charged on clinical activities should be based on the 'profit' i.e. be made after deduction of the costs attributed to the particular intervention.

4. CURRICULUM AND TEACHING

4.1 GENERAL

- 4.1 The amount of hands-on intramural clinical training in the core course must be increased (*Category 1 suggestion*).
- 4.2 There should be a far less prescriptive and more adaptable mechanism for regulating guiding and developing veterinary curriculum and its teaching.
- 4.3 The proportion of work of a practical or interactive nature should be increased, and Faculty policy and efforts directed at ensuring that students are engaged in structured 'hands-on' (or 'brains-on') work during these learning hours.
- 4.4 The allocation of hours between different fields should be rebalanced, with:
- Fewer hours spent on pre- and paraclinical disciplines (in particular the basic subjects in the 1st year);
 - A substantial reduction of the hours in the animal production field, in particular removing and/or reorienting animal science teaching;
 - A considerable increase in the coverage of applied veterinary disciplines, especially clinical sciences.

- 4.5 The Faculty should continue its efforts to coordinate and integrate teaching and aim to develop interdisciplinary teaching (e.g. teaching structure and function together).
- 4.6 Over time, the Faculty should consider developing its useful system of electives into more formal and structured differentiation.

4.2 BASIC SUBJECTS AND BASIC SCIENCES

- 4.7 The Faculty should seek to develop an interdisciplinary approach to basic sciences, both by linking up this teaching (e.g. a 'structure and function' course) and by incorporating more applied (e.g. clinical) material in the basic science teaching.
- 4.8 There should be more emphasis on the clinical aspects of pharmacology and toxicology, including practical hours in therapeutics.
- 4.9 The timing of some basic subjects in the curriculum should be changed, in particular so that histology is taught at the same time as anatomy, and ethology is taught after physiology. Systematic efforts should be made to integrate the teaching of the pre- and paraclinical disciplines.
- 4.10 The teaching of mathematical disciplines should be closely oriented to applied veterinary epidemiology. The early teaching should focus on statistics and basic epidemiology, to provide a foundation for a later course on applied epidemiology.

4.3 ANIMAL PRODUCTION

- 4.11 The teaching in animal production disciplines should be integrated with that on animal health and production diseases, herd health management and veterinary epidemiology and population medicine, and an increased focus given to health and welfare problems of farm animals. Efforts should be made to assure an in depth understanding by all students of current farm animal production, health and welfare issues.
- 4.12 The teaching in animal production should be clearly oriented towards applied veterinary roles, with practical and supervised work conducted on-farm, dealing with real animal management and health issues and problems to the greatest possible extent.
- 4.13 Students should be exposed to farm animals at an early stage through the arrangement of farm visits, preferably in the first year in the studies, including poultry and rabbit farms. This could be supplemented and reinforced by extramural vacation work on a farm to gain exposure to practical husbandry and management.
- 4.14 The ethology course should be presented after the physiology course, and the focus on this discipline increased, especially on applied ethology, as a key aspect of farm animal production.

4.4 CLINICAL SCIENCES

- 4.15 Within the context of generally insufficient hours allocated to clinical discipline, the time spent on theoretical and practical teaching on equine medicine and surgery and on diagnostic imaging needs to be increased.
- 4.16 The Faculty should systematically incorporate more clinical and applied material into the pre- and para-clinical teaching (e.g. use the animals on the Faculty farm for topographical anatomy, covering the principles of diagnostic imaging in physics), and orient the work in such disciplines towards applied clinical aspects.
- 4.17 The teaching of cross-species clinical disciplines, such as diagnostic imaging and anaesthesiology, should be reinforced, and these fields included as a rotation station in an expanded system of clinical rotations.
- 4.18 The Faculty should incorporate teaching on practice management into the final year of the course.
- 4.19 The extramural work should progressively be given more structure, in terms of specifying minimum periods working in particular fields, and a more systematic definition and evaluation of student activities during extramural work.

4.5 FOOD HYGIENE

- 4.20 To have a more effective view on food safety and control, the practical component of teaching should be reinforced by:
- Additional core training in a slaughterhouse (e.g. more mandatory visits to a swine abattoir, as anticipated in the new agreement);
 - Visits to conduct an analysis of food processing plants;
 - Greater use of the demonstration of the food processing plant on site.
- 4.21 An early introductory visit to a slaughterhouse should be considered, to help the students get an overview with which to choose their electives.
- 4.22 The teaching on the safety and quality of food should be integrated or closely coordinated with that on farm animal health and productivity.
- 4.23 After its rebuilding and extension, the Food Processing Plant should be used more intensively for undergraduate training, in particular changing laboratory-based food technology work to the FPP to make these more effective.

5. TEACHING: QUALITY AND EVALUATION

- 5.1 The scope of examinations should be widened to test reasoning and the use of knowledge (with notes and documents) and assess problem-solving skill, making use of written papers with essay or composite questions.
- 5.2 Students should have to pass the examinations in appropriate foundation subjects before being permitted to enrol for more advanced subjects. Students should also not be permitted to start courses in a particular year of the curriculum unless they have successfully completed at least 80%-90% of all the subjects and the examinations of the preceding years.
- 5.3 There should be a system of external examiners to objectively assess whether the content of a subject is relevant and comprehensive, and whether it has been taught and learnt in a way that enables its effective use in subsequent studies or professional activity. For the applied subjects (clinical, animal production and veterinary public health), practitioners should be included in this process.

6. PHYSICAL FACILITIES AND EQUIPMENT

- 6.1 The Faculty and University should continue the planned programme of expansion and upgrading of facilities (VTH, FPP, necropsy building, rabbit unit, etc.).
- 6.2 The Faculty should aim to improve and re-equip its teaching laboratories as facilities for shared use by different departments and sections.
- 6.3 The necessary planned expansion of the Veterinary Teaching Hospital should go ahead as soon as possible, to allow for better working and teaching conditions, enhance capacity, allow separation of dog and cat wards, etc.
- 6.4 The FVMB and VTH should seek to develop expertise and a focal point for diagnostic imaging and anaesthesia, preferably with European Board certified personnel in place.
- 6.5 The Faculty and VTM should try to predict and take account of the financial and operational consequences of considering expanding student teaching activities with the VTH.
- 6.6 The Faculty, University and Hospital should check there are safeguards that ensure teaching is explicitly the priority function of the Veterinary Teaching Hospital.
- 6.7 Patient information (anamnesis, laboratory results, diagnostic imaging, surgery, treatments, etc.) should be completely available in electronic format.

7. ANIMALS AND TEACHING MATERIAL OF ANIMAL ORIGIN

- 7.1 When increasing the number of referral cases the Faculty should ensure that undergraduate exposure to routine companion animal cases and procedures is maintained, for instance through maintaining a 'front-line' clinic, greater use and more structure/control of extramural work in general practices and/or more (routine) work on non-paying cases.
- 7.2 The Faculty should seek to increase the amount of Faculty-based 'showcase' work on farm animals for teaching purposes.
- 7.3 The FVMB should consider using the equines kept on site for teaching rectal examinations and ultrasonography.
- 7.4 The Faculty should try to increase the animals received from animal charities and shelters to provide teaching material for routine procedures.

8. LIBRARY AND EDUCATIONAL RESOURCES

No suggestions.

9. ENROLMENT AND ADMISSION REQUIREMENTS

- 9.1 The Faculty and University should seek to continue the trend of further reducing the number of students admitted annually.
- 9.2 There should be an improved evaluation or requirement for basic skills in mathematics, physics and chemistry for the students who are admitted to the veterinary medicine course.

10. ACADEMIC AND SUPPORT STAFF

- 10.1 There should be greater influence at Faculty level over the selection, deployment and activities of the staff whose primary function and source of funding is veterinary education. This should aim in particular to promote integration in teaching and research, and a clear veterinary faculty identity and orientation.
- 10.2 The Faculty and authorities should ensure that positions funded from self-generated income are a supplement to the budgeted positions, and that 'core' activities (especially intensive hands-on training) are being adequately funded from state sources.
- 10.3 The number of academic staff working in the Veterinary Teaching Hospital to support hands-on training and ensure dependable clinical services of a high level should be increased to meet the needs of greater clinical exposure for students.
- 10.4 Full and active involvement in clinical work in the Veterinary Teaching Hospital (i.e. teaching, ensuring clinical service and research) has to be considered as an integral and obligatory element of an academic position in a clinical department.
- 10.5 There should be an increase in the number of state-funded support staff working in the departments, in particular to support a higher level of practical teaching on the veterinary course.

11. CONTINUING EDUCATION

- 11.1 The FVMB should seek to increase its involvement in CPE, and such activities should be recognised and rewarded as valid academic activity.

12. POSTGRADUATE EDUCATION

- 12.1 The Faculty and University should establish a more systematic structure to the early part of Ph.D. studies, and in particular including courses on generic academic skills, such as pedagogics, communication, experimental design, statistics and scientific writing.

- 12.2 The option of completing a Ph.D. project by several international scientific publications should be clearly favoured over a monograph.
- 12.3 The University and higher authorities should recognise and support the important contribution to veterinary sciences and services provided by the internship and residency postgraduate training programmes.

13. RESEARCH

- 13.1 The Faculty, and University and departments should seek to give the research conducted within the FVMB a clearer and more cohesive veterinary identity.