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REPORT ON THE VISIT TO
THE VETERINARY FACULTY OF
MURCIA

6- 12 November 2006

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CONTENTS

Introduction	5
1. Objectives	7
2. Organisation	9
3. Finances	13
4. Curriculum	17
4.1 General aspects	17
4.2 Basic subjects and basic sciences	23
4.3 Animal production	25
4.4 Clinical sciences	27
4.5 Food safety	29
5. Teaching: quality and evaluation	31
5.1 Teaching methodology	31
5.2 Examinations	33
6. Physical facilities and equipment	35
6.1 General	35
6.2 Clinical facilities and organisation	39
7. Animals and teaching material of animal origin	43
8. Library and educational resources	45
9. Admission and enrolment	47
10. Academic teaching and support staff	49
11. Continuing education	53
12. Postgraduate education	55
13. Research	59
Conclusions	61
Summary of suggestions	63
Appendix I – Intensification tracks	69

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INTRODUCTION

The Veterinary Faculty of Murcia (VFM) was visited by the team of experts from 6 – 11 November 2006. During this evaluation they visited the facilities, looked at the teaching resources 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.

This was the 2nd European evaluation of the VFM, the first having taken place 10 years ago. After a revisit and further assessment, the Faculty was included on the EAEVE list of visited and approved establishments in 2002.

In July 2006, well in advance of the required date, the team was sent the self-evaluation report (SER), prepared by the Faculty according to the standard operating procedures. 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. Further information relating to each of the chapters was obtained during the visit itself.

The Veterinary Faculty of Murcia is located on the Espinardo Campus, a few kilometres away from the city of Murcia, in a region of 1.35 million inhabitants. The Faculty was founded in 1982. Along with veterinary medicine, the VFM also teaches a degree course in food technology.

The Faculty has made considerable improvements to the infrastructure and facilities for teaching since the last evaluation, in particular opening a Veterinary Teaching Hospital and establishing a Teaching Farm next to the Campus. It has also managed to reduce the student intake and increase the number of teaching staff, which enabled it to reorganise and improve the practical work in the curriculum. Enhanced extracurricular work in clinics, laboratories and at slaughterhouses and processing plants are supported by collaboration agreements with private and governmental organisations.

Further improvement projects are ongoing at the Faculty, in particular at the Veterinary Teaching Hospital and on the Veterinary Teaching Farm.

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 Prof. Ana Bravo and Prof. Laredo, the Liaison Officers, and Pepi Rosique and Aimée Large, the translators for the substantial help that they gave before and during the evaluation visit.

1. OBJECTIVES & STRATEGY

1.1 Findings

The stated general objectives of the University of Murcia are:

- Creation, development, transmission and review of science, technique and culture.
- Preparation for the professional activities that involve the application of scientific knowledge and methodology.
- Dissemination, assessment and transference of knowledge for the purpose of promoting culture, quality of life and economic development.
- Dissemination of culture and knowledge through the continuing professional development and education.

The main objective of the Veterinary Faculty is the training of students to produce veterinarians of recognised quality and prestige. The specific requirements of the veterinary degree are set out in the “White Book” elaborated by the Spanish Conference of Veterinary Faculty Deans. These objectives have the aim of ensuring that students achieve competency in terms of their knowledge, professional expertise, and academic expertise. These general areas are further elaborated in the SER, and the areas of veterinary employment in the private and public sectors are mentioned.

As regards measuring the achievement of the objectives, the different commissions of the Faculty Board (see Chapter 2) evaluate and analyse the problems related to the syllabus, teaching timetables, teaching quality and examination results.

Among its strengths, the Faculty mentions:

- Its location in an important livestock region, close to the capital of the Murcia region;
- Premises and equipment that support instruction of students of good quality;
- The popularity of the FVM among students applicants;
- The qualifications and commitment of its staff most of whom are working on research projects at a national or international level, and some of whom are ECVS Diplomates;
- The clear organisation of studies according to a Study Guide, and measures to improve and assess the organisation and quality of studies.

As weaknesses the Faculty includes:

- Very restricted funds under the current budget allocation mechanism, limiting the Faculty’s ability to implement plans for improvements;
- A severe shortage of support personnel;
- Some subjects that are badly positioned in the timetable, due to the strict framework of the national veterinary curriculum;
- The long time taken by students to finish undergraduate studies;
- Clinical services, particularly out of hours work, that rely upon the goodwill of staff.

1.2 Comments

The VFM has a clear statement of the objectives of undergraduate veterinary training. However, to fulfil these training objectives, the Faculty needs to have authority to direct the teaching as required. The rigid national syllabus (see Section 4.1) and the autonomy of departments (see Chapter 2) severely limit the capacity to shape the course and its teaching. In effect it can only work through encouragement and coordination, and within the constraints of a prescriptive curriculum.

The Faculty objectives make no mention of research and postgraduate training, and it was noted that up until recently these were a departmental responsibilities. As an academic establishment, the Faculty should act as a focal point in these areas, so that they are cohesive, and directed towards veterinary aims, rather than being fragmented into the priorities of ‘knowledge areas’. In this context, the new Faculty role in postgraduate training (see Chapter 12) is a very positive development.

The responsive service activity and good relations the Faculty have with the profession deserves note. These should be maintained and developed, so that the activities and teaching within the Faculty are clearly linked to the needs and obligations of professional activity.

As the VFM notes, clinical services, in particular the 24-hour service, need support (see Section 6.2), as currently they are a heavy and unrecognised burden on staff.

As has been outlined in other sections of this report, the parallel structure of departments and Faculty, and the apportionment of responsibilities between them, raises some concerns. This structure creates a need to ensure there is a clear and overarching veterinary direction and identity to academic activities – i.e. to the core the activities and objectives of training, research and service provision – rather than these being in practice determined on a departmental basis.

The Team would agree that the facilities and the generally good relations and enthusiasm within the Faculty are strengths. It would also note the steps taken to improve teaching, in particular the increase in practical work, incorporation of the pre-graduation practice into the degree and reduction in intake as strengths.

The shortage of support staff is a very obvious and serious weakness that has wide-ranging implications for the functioning of the Faculty. Staff being overloaded, particularly in the clinical areas, was a matter of considerable concern. Maintaining a balance and overview on the teaching as organised under the current national system is also not straightforward, with some important fields left weakly covered.

The strengths and weakness of the establishment are discussed in more depth in subsequent chapters of this report.

The remarks made in subsequent chapters of this report 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 Faculty should have objectives and a central role in research and postgraduate training in the veterinary field (see also Suggestion 2.1 regarding the Faculty having greater authority in veterinary areas).

2. ORGANISATION

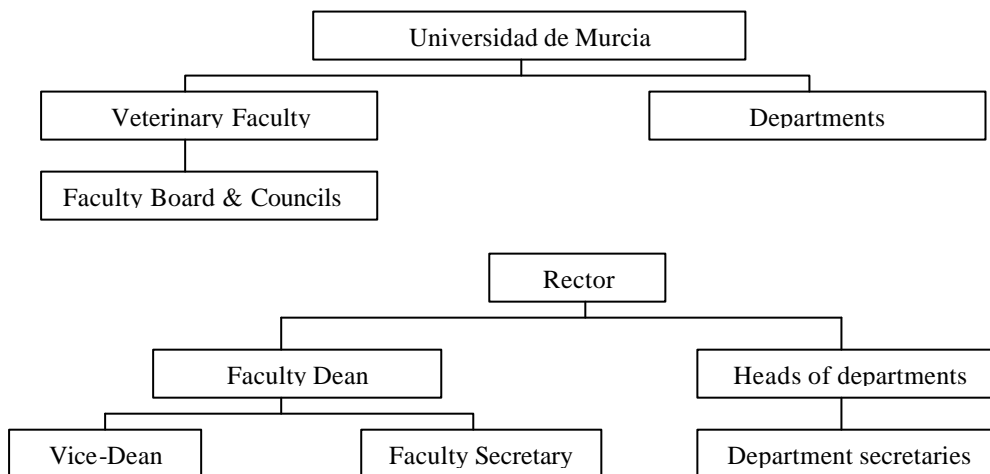
2.1 Findings

The FVM is one of the 15 faculties and 2 colleges of the University of Murcia. It is responsible for a degree course in food technology, as well as that in veterinary medicine.

The University of Murcia is a public institution under the authority of the Spanish Ministry of Education and Science and the Regional Council of Education and Culture in Murcia. The Ministry states the general guidelines for certified degrees in the National Catalogue and determines the general policy for Higher Education in Spain. The Regional Council is responsible for the financing and management of Universities in Murcia.

The Veterinary Faculty is responsible for the educational and managerial organisation of the veterinary degree, in particular coordinating its implementation. It also manages the VFM budget and support and research personnel, and should promote continuing education.

Figure 2.1: Organigrams of VMF bodies and officers



The Faculty is headed by a Dean, elected by the Faculty Board and appointed by the Rector for a 4-year term, renewable once. The Dean is the representative of the Faculty, who implements the agreements of the Faculty Board and oversees the duties of the Faculty members.

From among the lecturers of the Faculty, the Dean nominates three Vice-Deans and a Secretary to assist his/her work. These are formally appointed by the Rector. The Vice-Dean of Academic Affairs is in charge of the co-ordination of the teaching.

The main governing body of the VFM is the Faculty Board, chaired by the Dean. It is comprised of 150 delegates, 55% who are permanent teaching staff, 10% representatives of other teaching and research staff, 30% representatives of the Faculty students, and 5% representatives of the administration and service personnel. The main roles of the Faculty Board include:

- Electing the Dean and Vice-Deans;
- Establishing the committees, including the Government Council;
- Establishing the teaching timetable and examination dates;
- Approving the Study Plan and any similar proposals;
- Dealing with proposals relating to financial or staffing issues;
- Issues of teaching quality and awards.

The FVM remarks that the Veterinary Faculty Board might seem rather large and unwieldy. However, several committees prepare analyses and proposals for the Faculty Board, which often simply ratifies them.

The main committee concerned with the undergraduate course is the Teaching Coordination Commission, composed of the Dean (Chairman), the Secretary or Vice-Dean, 6 permanent teaching staff, 2 members of the teaching and research personnel, 4 students, and one member of the support staff. Its main responsibilities are:

- Propose to the Faculty Board the examination calendar for partial and final exams;
- Co-ordinate different academic departments;
- Propose to the Faculty Board the “Award for the best results at undergraduate level”.

The VFM has several other committees, which are generally chaired by the dean or his representative and composed of 3 permanent staff members, 2 students, and support staff and other staff representatives. One of these, the Study Plan, Teaching Quality and Analysis of Examination Results Commission, is responsible for several issues related to the veterinary course and its teaching. The others include;

- Building and Economic Matters Commission
- Library and Research Commission
- University-Wide Commission
- Professional Issues Commission
- International Relations Commission
- Validation (of studies) Commission

The Faculty and the Official College of Veterinarians established a Mixed Commission College-Faculty in 2001 composed of 2 members of the Dean’s Team, the Director of the Teaching Hospital, the representative of the Faculty Board at the College and two members of the Executive Team of the College. This commission deals with co-operation procedures and issues of common interest.

In the Spanish system of higher education, departments and faculties form a parallel structure, rather than a hierarchical one (see Figure 2.1). Core subjects on any course must be attributed to a specific ‘knowledge area’ that is the responsibility of a particular department.). Departments have a large degree of authority and autonomy on the conduct and delivery of academic work within their knowledge area. Within a university the activities of a department must not be duplicated between faculties (e.g. the teaching of ‘chemistry’, ‘physics’, ‘pharmacology’, etc., must be provided by a single department).

Teaching on the veterinary course is provided by five Faculty departments, based wholly or primarily in the FVM, and eight inter-faculty departments, whose underlying ‘knowledge area’ is not primarily associated with the veterinary sciences.

Faculty departments	Core subjects in national curriculum (year)	
Compared Anatomy & Pathological Anatomy	Anatomy I & Embryology (1°) Anatomy II (2°)	Cytology and Histology (2°) General Pathological Anatomy (3°) Special Pathological Anatomy (4°)
Animal Production	Agronomy (1°) Rural Economics (1°) Genetics (2°) Animal Nutrition (3°)	Etology & Animal Protection & Ethnology (1°) Animal Production & Veterinary Hygiene (4°) Animal Husbandry and Welfare (5°)
Animal Health	Microbiology (2°) Immunology (2°) Parasitology (2°) Epidemiology (2°)	Infectious Diseases (4°) Parasitic Diseases (4°) Preventive Medicine & Sanitary Police (5°)
Food Technology, Nutrition & Food Science	Food Technology (3°)	Hygiene, Inspection and Food Control (5°)
Animal Medicine and Surgery	General Pathology (3°) Radiology (3°) Veterinary Anaesthesia (3°) Medicine and Surgery (4°)	Clinical Examination and Diagnosis and Laboratory Diagnostic Methods (3°) Obstetrics and Reproduction (4°) Medical and Nutrition Pathology (5°)

Inter-faculty departments	Core subjects in national curriculum (year)
Biochemistry & Molecular Biology "A"	Chemistry (1°) Biochemistry (1°)
Zoology and Physical Anthropology	Animal and Vegetable Biology (1°)
Statistics and Operational Research	Mathematics (1°)
Physics	Physics (1°)
Physiology	Animal Physiology (2°)
Biochemistry & Molecular Biology "B" & Immunology	Immunology (2°)
Pharmacology	Pharmacy and Pharmacology (3°) Therapeutics (5°)
Socio-Sanitary Sciences	Toxicology (5°) Deontology, Legal Medicine and Veterinary Legislation (5°)

Departments are responsible for providing the teaching of one or several 'knowledge areas' (in one or several faculties) as well as research activity. The departments are also involved in the design of the overall Study Plan in their field and organise Ph.D. work and specialisation courses.

A department is governed by the Department Council, which is chaired by the Head of Department and composed of full time PhD professors (65%), representatives of the rest of the research and teaching staff (5%), undergraduate and postgraduate students (30%), and support staff (5%). The main responsibilities of the Department Council are overseeing and managing the activities that are a departmental responsibility, and dealing with formal and administrative issues (e.g. election of the Head of Department, proposals about staffing, deciding about the departmental budget).

A new University Law (LOU) in December 2001, led to several changes such as modification of the University structure, new kinds of teaching staff, the creation of the National Agency for Quality Assessment and Accreditation (ANECA). The implementation of the LOU has led to some changes at the FVM, such as the creation of commissions (such as the commissions of Teaching Arrangement and Syllabuses or Teaching Quality and Analysis of Exam Results).

The FVM remarks that the LOU gives a shared responsibility in the University instruction. In particular, departments are responsible for the teaching content, and the Faculty (Dean's Office) is responsible for the organisation of teaching. This gives rise to overlapping responsibilities and some coordination issues.

The Veterinary Teaching Hospital and Teaching Farm are autonomous services of the University, the former being attached to the Veterinary Faculty.

2.2 Comments

In general terms, the University, Faculty and departmental organisations and their interrelationships and respective roles seem to be defined in a quite legalistic and rigid way. Whilst this has the advantage of clarity and avoiding disputes, it does in some cases mean that the decision-taking process does not include some parties that have the greatest interest in, or responsibility for, an effective outcome. For example, departments have little influence on the selection of support staff (see Chapter 10), and the Faculty has only a coordinating and persuasive role in academic activities.

Although the Veterinary Faculty is respected and well-regarded by the University, it has little formal influence on University policy, since it is a very small body in terms of student numbers. This puts it in an unfortunate position, since veterinary training and clinical activity has both some very specific need (e.g. a well-functioning teaching hospital, access to slaughterhouses and farms) and is a very expensive course to provide. The Faculty has difficulty getting support for some of these specificities that are essential to its principal role.

The organisation of the VFM is a difficult one for an outside team to fully understand. There is no central body (what would normally be termed 'the Faculty') with the authority to direct academic work in the veterinary field. Instead, there is a parallel structure of Faculty of departments, with the latter having a great deal of independence in their activities in their 'knowledge area'. Some counterbalance is need, so

that the Faculty is a central focal point, with the role and authority to impart a clear veterinary identity to the activities within the FVM.

A large and complex management bureaucracy has responsibility for veterinary undergraduate teaching. It seems unlikely that the Veterinary Faculty Board, with 150 members, can effectively propose, debate or implement policy, whether originating within the Board, or referred to it from elsewhere. The SER also indicates that at least eight other separate committees, of varying size, are concerned with various aspects of veterinary undergraduate teaching. Some of the committees seem to cover aspects that would be more appropriately dealt with at University level.

In addition to the handicap created by its size, the Faculty Board has no direct authority to influence what is taught by the various Departments responsible for the teaching of veterinary undergraduates – whether or not those Departments are regarded as being within the Veterinary Faculty. Each Department is separately funded and has its own, autonomous management structure, which is responsible to the University authorities - not to the Faculty - for the content and quality of its teaching.

Similarly, the Veterinary Teaching Hospital and the Veterinary Teaching Farm are autonomous and funded directly by the University, not through the Veterinary Faculty. And neither of these units appears to have any representation *ex officio* on the Veterinary Faculty Board or any of the other 8 Committees.

All of the staff responsible for teaching the veterinary undergraduate course have a common interest in creating competent veterinary graduates and much can often be achieved by informal agreement and consensus. However, the absence of formal structures which would give the Veterinary Faculty the authority to properly manage and direct the development of the whole of the veterinary undergraduate course - and to coordinate its theoretical and practical teaching - is a cause of serious concern. There is a need for arrangements that ensure more cohesion and integration within the course (see also Section 4.1), with the Faculty having the authority to direct the teaching towards the overall and applied veterinary needs, and thus fulfil the objectives of the training for which it is responsible.

As noted in the preceding chapter, it is unusual and inadvisable for a Faculty to have no role at all in research and postgraduate training. The lack of a central focal point weakens the sense of veterinary identity.

2.3 Suggestions

- 2.1 The Faculty should have more authority to direct academic activities towards overall veterinary goals, most importantly particular to direct the content and delivery of teaching towards the stated objective of training a professional veterinarian.
- 2.2 Within the constraints of relevant legislation, the size of the Faculty Board should be reduced, to make it a more effective governing body, with the Directors of the Veterinary Teaching Hospital and the Veterinary Teaching Farm being members of the Faculty Board *ex officio*. It must be clear that the 8 committees are sub-committees of the Faculty Board and their duties are to propose policies and procedures to the Board intended to improve the quality of undergraduate veterinary teaching.
- 2.3 Every attempt should be made to improve cooperation and coordination between the departments responsible for teaching the veterinary undergraduate course, the Veterinary Teaching Hospital and the Veterinary Teaching Farm – if necessary by establishing an informal discussion group consisting of the Heads of Departments, the Directors of the hospital and the farm and the Dean's team (as per Suggestion 2.2 and 10.2, for example).
- 2.4 The University has to take more account of the specificity and needs of the veterinary degree in the decision-taking process (see also Suggestions 3.1, 3.2 and 10.3).

Suggestion 1.1 refers to the need for the Faculty to have a role in research and postgraduate training, to give these a clear veterinary identity.

3. FINANCES

3.1 Findings

The main source of funding of the University of Murcia (around 80%) is the Murcia Regional Government, via a grant based predominantly on a multi-annual agreement. Other sources of University funding are student registration fees (15 – 20%) and European and central government financing.

The financing of the University of Murcia and its component faculties and departments is managed in a centralised and global way. Several major areas of expenditure (such as staff costs, utilities, services and work contracted out to external companies, maintenance services, waste collection, telecommunications and others) are provided and/or paid directly by the University.

A committee of the Rectorate decides upon the details of how the funds for teaching are to be distributed between the departments and faculties. Around 30% of the funding related to the veterinary course is allocated to the Faculty and 70% is allocated directly to the departments. The number of students is the most important criteria for the distribution of the funds between the different units (accounting for approximately 70% of the funds). Other factors that effect the allocation of departmental budgets are the number of credits the department teaches, the extent to which the subject is experimentally based (a multiplier from 1 to 4), and the number of teaching staff. Departmental budgets range from around 8,000 € to 30,000 € to cover expenditure on teaching costs, library books, minor equipment and consumables.

For the Faculty, the size and number of the premises and facilities (e.g. laboratories) are factors that effect the allocation, although secondary to student numbers. The Faculty budget is for expenditure on the secretariat, official travel and meetings, and general maintenance and equipment for common areas.

The Veterinary Teaching Hospital (HCV) and the Farm are financially separate units, although all income and expenditure pass through the University Central Account. They are run on the principle that revenue and expenditure should balance, with operational budgets being based on the revenue from the previous year. The HCV has considerable flexibility in how it uses revenue (e.g. for consumables, salaries, etc.) up to the level agreed in the budget. It can also use any surplus at the end of the year, if revenue exceeds that of the preceding year.

The enrolment fees students pay to the University are decided upon by the regional authorities, and are currently about 13 € per teaching credit (10 teaching hours).

The University retains 15% of research grants and contracts as overhead. It also retains 10% of the income from the Toxicology and Forensic Veterinary Service, the only diagnostic service which is not included within the administrative framework of the Hospital. Specialist, CPE and masters courses have to offer 10% of their income as grants, and the University retains 10% of the income from courses and 4% of that from meetings. 15% of income from advisory services is retained by the University.

The income and expenditure of the VFM for 2004 are summarised in Tables 3.1 - 3.3.

Table 3.1: Income of the VFM (2004)

Source	€	%
Revenue from State or public authorities	5,821,682	66.56
Revenue from private bodies	32,455	0.37
Revenue from research	1,311,743	15.00
Revenue earned and retained by the FVM	1,574,252	
- registration fees from students	634,779	7.26
- from continuing education	648,371	7.41
- from clinical activities	253,228	2.90
- from diagnostic activities	37,874	0.43
revenue from other sources	5,836	0.07
Total	8,745,968	100

Table 3.2: Expenditure of the VFM (2004)

Item		€	%
Salaries	- teaching staff	4,400,081	56.22
	- support staff	2,043,615	26.11
	- research staff	350,527	4.48
Operating costs	- specific to teaching	240,284	3.07
	- specific to research	227,050	2.90
	- general operations	11,937	0.15
	- utilities	272,597	3.48
Equipment	- research	121,211	1.55
	- teaching & general	107,252	1.37
maintenance		51,727	0.16
Total		7,826,283	100

€
Annual direct cost of training a student 9658
Total direct cost of training a graduate 67410

The FVM remarks that one of the main problems in the financing is the lack of funds to replace equipments that can be out of date in few years

3.2 Comments

Veterinary training is inevitably one of the most expensive forms of education. 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. In general terms, veterinary training costs around 9 times the amount per student as a humanities course (without including staff costs in the calculation).

There is very little funding allocated to teaching under the current University model. Furthermore the differentiation relative to non-experimental disciplines only plays a minor role. The total funding available for teaching (i.e. considering both the Faculty and departmental budgets) is far too low, in particular to support an appropriate practical programme . The expenditure on teaching is currently far higher than the budget actually allocated to the Faculty and departments for such purposes. Teaching activities are having to be paid for out of other departmental revenue, probably from research work. Besides the principle that such crossover is better avoided, this gives rise to several concerns that relate directly to the teaching:

- Since departments decide what form their teaching takes, and must fund it, the nature of such work will vary hugely according to the ability and willingness of departments to deploy funds on training;
- Departmental funding of teaching reinforces a sense of departmental ‘ownership’ of that subject;
- Even if the Faculty were to produce a teaching programme or ethos, it has no funds to implement it. Departments could justifiably refuse on financial grounds.

It must also be noted that it is neither easy nor desirable for the Faculty to try to get higher funding under the current system, by increasing the student intake. Faculties that have a lower and less expensive practical component to their teaching (or none at all) can readily raise student numbers, and thus their budget allocation. However, the intensity of training that makes veterinary education so expensive also means that increased undergraduate numbers would undo the improvements in quality that the Faculty and University have achieved in recent years (see also Chapter 9). In effect, it would be very counterproductive for the Faculty to ‘compete’ for funding.

In more general terms, the VFM has very little financial means at its disposal, and minimal income streams other than the University grant. This limits its ability to influence or be proactive as regards

academic activities in which a veterinary faculty would normally have a leadership role, such as curricular development and research.

There does not seem to be a regular budget line for replacing or maintaining equipment. Funds again have to be found from other departmental sources, or through specific grants, which is not appropriate for routine renovation. Funding is also a difficulty in relation to the equipment in the Hospital. At present, this is not an acute problem, as the clinics were built and equipped relatively recently. However, as apparatus ages, costs of maintaining and upgrading it to a good professional level are going to rise significantly.

The HCV has considerable autonomy as regards the use of its budget, which is commendable. There do seem to be some administrative difficulties about the way this is put into practice, in particular as regards employing additional staff (see Section 6.2). Full flexibility on issues related to self-financed activities would be beneficial.

As noted in Chapter 10, the low number of support staff is a serious concern that has to be addressed. This has financial implications, although not directly upon the FVM operational budget.

3.3 Suggestions

- 3.1 The University funding system has to take account of the extent to which a degree is experimentally-based, with a realistic accounting of the actual costs of a training programme.
- 3.2 Teaching activities, in particular the provision of a well-structured programme of practical work, must be adequately funded.
- 3.3 The Faculty has to have more financial means and influence, in particular to direct and support interdisciplinary curricular development.
- 3.4 The Faculty must have a budget line for the maintenance and replacement of equipment for teaching use, in particular for practical and laboratory teaching and in the Veterinary Teaching Hospital.

Remarks on student numbers, which strongly influence departmental and Faculty budgets, are made in Chapter 9.

Suggestions relating to the autonomy and flexibility of the HCV and its budget are made in Section 6.2.

4. CURRICULUM

4.1 GENERAL ASPECTS

4.1.1 Findings

The veterinary degree at the VFM comprises 5 years of coursework plus 12 weeks of ‘pre-professional practice’ that must be completed before graduation. The average duration of attendance is currently around 7 years. The coursework is divided in two cycles of 2 years and 3 years, and given during 2 semesters of 4 months followed by 2 – 3 weeks of examinations after each term. The teaching load is 30 contact-hour weeks per course, with subject lengths calculated in credits (1 credit = 10 hours). Theoretical classes are scheduled 08:30 - 10:30 and 15:30 - 16:30, with practical and clinical activities organised from 10:30 to 14:30.

In common with other 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. The Faculty is responsible for managing the undergraduate curriculum and assigns the teaching of each subject to a department according to its particular ‘knowledge area’. Within the national outline of a subject, course content and delivery depend upon the academic staff responsible for the subject.

Teaching is organised according to a “Guide of Studies” coordinated by the Vice-Dean for Academic Affairs, and approved by the Faculty Board, that aims to avoid overlapping between the theoretical, practical and/or clinical activities in subjects given in the same year/term.

A new curriculum was established in 2001, in which the number of hours of practical training was increased considerably, and re-organised into a system of rotations. The FVM also decided that ‘pre-professional practice’ should be a part of the core course.

The time allocated to theoretical and practical teaching is summarised in Tables 4.1 to 4.3 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)	122	82	45			249
Biochemistry	50	40	5			95
Biology (incl. cell biology)	49	42	20			111
Biophysics	21	12	12			45
Biostatistics	30	20	8		10	68
Chemistry	25	20				45
Epidemiology	25	16		4		45
Genetics	45	30	15			90
Immunology	30	14			1	45
Microbiology	60	40				100
Parasitology	30	30				60
Pathological anatomy (macroscopic and microscopic)	69	59	14			142
Pharmacology	30	4		4		38
Pharmacy	30	7		1		38
Physiology	75	40	10	20		145
Physiopathology	45		15	20		80
Scientific and technical information and documentation methods						
Toxicology (inc. environmental pollution)	45	10		25		80

B. Animal production						
Agronomy	30	15				45
Animal behaviour (inc. behaviour disorders)	8	6	5	10		29
Animal husbandry (inc. livestock production systems)	105			78		183
Animal nutrition and feeding	60	20		25		105
Animal protection and welfare	7	6				13
Environmental protection						
Preventive veterinary medicine (inc. health monitoring programmes)	75	42		23		140
Reproduction (inc. artificial breeding methods)	40	14		19		73
Rural economics	15	15	15			45
C. Clinical subjects						
Anaesthesiology	25			20		45
Clinical examination and diagnosis and laboratory diagnostic methods	10			50		60
Clinical medicine	75	8	4	65		152
Diagnostic imaging	25	10	3	10		48
Obstetrics	15	14				29
Reproductive disorders	20			18		38
State vet. medicine, zoonoses, public health and forensic medicine	9	6				15
Surgery & therapeutics	75			65		140
D. Food hygiene						
Certification of food production units						
Food certification	75	65				140
Food hygiene and food quality (inc. legislation)						
Food inspection, particularly food of animal origin						
Food science and technology	60	65	5			130
E. Professional knowledge						
Practice management		35			210	245
Professional ethics	7	3				10
Veterinary certification and report writing	7	3				10
Veterinary legislation	7	3				10

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	781	466	144	74	11	1476	46.40	1:0.89
Animal production	340	118	20	155		633	19.9	1:0.86
Clinical subjects	254	38	7	228		527	16.57	1:1.07
Food hygiene and technology	135	130	5			270	8.49	1:1
Professional knowledge	21	44		210†		275	8.65	1:12.1
Total	1531	796	176	667	11	3181	100	1:1.08

† Pre-professional practice (see below), 70 hours of which are spent in the HCV

Students must attend all practical work, but lectures are not obligatory. For practical teaching, the intake is divided into 5 groups of 25 – 30 students. During the 1st cycle (years 1 and 2) each group rotates through practical sessions in 5 subjects during a week. From the 3rd year onwards, the groups are further subdivided and rotate through subjects on a weekly basis.

The “pre-professional practice” prior to graduation comprises intramural and extramural rotations:

- 4 weeks (70 hours) at the Veterinary Teaching Hospital
- 4 weeks (70 hours) in an external company (normally a veterinary clinic)

- 2 weeks (35 hours) in a slaughterhouse
- 2 weeks (35 hours) of veterinary work on a farm

These practices, and other summer practices, are based on agreements with private companies and public bodies on a collective or individual basis. Extramural work is supervised by one person from the external establishment and one person from the Faculty. The student and the supervisors produce a report on the work undertaken, which may lead to credits and/or money for the student.

The ratio of theoretical training to practical and clinical training is about 1:1.1 (1531:1650)

The ratio of clinical training to theoretical and practical training is about 1:4.5 (527:2374).

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	290	190	85	33	10	608	1: 1.1
Second	362	238	55	24	1	680	1: 0.88
Third	309	120	37	130		596	1: 0.93
Fourth	390	119		183		692	1: 0.77
Fifth	315	140	4	143		602	1: 0.91
Sixth		35		210		245	1: -
Total	1666	842	181	723	11	3423	1: 1.05

In addition to the core course, students have to take 4 subjects of 4.5 credits each of ‘optional’ subjects¹ (2 in the 3^d year, 2 in the 5th year). The optional subjects are grouped in pre-specialisation tracks (see Annex I):

- Medicine and Surgery
- Animal Production and Economics
- Hygiene and Food Technology
- Animal Health

A particular subject might belong to one or more tracks, depending on its contents. Every optional subject must have at least 10 students enrolled, or it will be cancelled that year. Students taking all the optional subjects in a track receive a pre-specialisation note in the degree.

University undergraduates must also obtain at least 10% of their total course credits from elective subjects (40.5 credits in total). This is a free choice from any subject offered as an elective by a faculty or department of the University, and not necessarily veterinary-related (e.g. students can choose to study subjects from the arts or humanities).

4.1.1 Comments

The veterinary course of the FVM is heavily dependent upon the prescriptive national curriculum. The composition of this core course needs to be revised, as currently rather too many hours are spent on basic and agronomical sciences. In consequence, too few ‘core’ hours are available for clinical disciplines. The team was very pleased to see that the Faculty has worked hard to compensate for this shortcoming in the national curriculum by orienting animal health teaching towards clinical aspects, and by requiring part of the pre-professional training to be undertaken in the teaching hospital. These measures have undoubtedly improved the training. However, the root imbalance in the national curriculum needs to be addressed.

The course workload is high, and a reduction in the didactic component (i.e. lectures and other uni-directional teaching) would ease this situation. This should be linked to the development and encouragement of self-directed study by students using bibliographic resources (see also Chapters 5 and

¹ These ‘optional subject’ are in fact equivalent to the ‘elective subjects’ of many European faculties.

8), rather than trying to cover and memorise a large volume of content through lectures and course scripts. In some areas the amount and level of detail covered within the teaching could be considerably reduced.

The national curriculum and Spanish university structure (see also Chapter 2) formally compartmentalises the teaching through the attribution of full responsibility for the content of each subject to specific departments. This is a very restrictive framework for a dynamic subject such as veterinary medicine, and leads to weaknesses in fields or disciplines that are less traditional and/or not a specific subject of the national curriculum. For example, the team was concerned about the apparent absence of coherent teaching in animal welfare and applied veterinary epidemiology.

The current organisation of teaching also means that the course is a mosaic of the different component subjects. Active coordination of content depends upon interpersonal contacts, and an integrated approach to teaching is almost entirely missing in the core subjects. Explicit provision for interdisciplinary teaching is required to provide better linkage and flow between different disciplines, so that each has a direct orientation to its application in professional veterinary work or in subsequent parts of the course. As noted in Chapter 2, there also needs to be an overview and coordination of the content and coverage of the core course as an entity, to prevent gaps and overlaps and ensure balance and clear veterinary context to the material taught. The material included in the teaching should be that which prospective veterinarians need to learn, not simply that which a unit feels it should teach.

The need for a coordinated and integrated approach to teaching is most apparent in production animal work. The 'feed to food' approach to monitoring and control of animal health and food safety right through the food chain is a very clear veterinary responsibility. Applied animal production, production systems and management, health management, legislative and ethical responsibilities, and the safety and quality of food of animal origin therefore need to be explicitly interlinked and focussed on the primary veterinary roles and obligations.

The team was pleased to note that the proportion of practical work in the teaching had increased significantly since the first evaluation of the VFM in 1996. The Faculty deserves praise for requiring that the pre-professional practice be completed before graduation, and for giving this a good structure. However, as remarked in Chapters 3 and 10, the team was concerned to note that the commendable and important effort that is put into providing practical teaching seems to not be sufficiently supported at University level. In particular, practical teaching activities need to be adequately funded by the University, and there needs to be recognition that for intensive work in applied areas (especially clinical work) an 'official' (i.e. funded) group size of 10 is far too large for effective training.

The organisation of practical work during a fixed period of the day and in fixed groups provides a clear structure to such work. Nonetheless, it could be considered whether for some activities and parts of the study, in particular off-site work or intensive clinical work in the 5th year, the daily duration of the rotation could be extended (e.g. by removing one of the lecture periods) to improve the continuity of exposure.

The amount of hospital-based clinical work in the 'core' course is low compared with the general European level, mainly because few curricular hours are attributed to medicine and surgery disciplines.

The grouped 'optional' subjects is a good innovation in the curriculum. It would be beneficial to develop this further, for instance so that each student systematically focuses on a particular area of veterinary work in their choice of optional subjects.

The 'elective' subjects permit students to follow very wide choice of topics, veterinary or otherwise. Veterinary medicine is a demanding vocational course, in which the content and methods are expanding rapidly, and where the syllabus and teaching programme is already overloaded. Spending 10% of curricular time on non-essential material is not appropriate or sensible. To put this in context, the 405 hours that the curriculum allows for 'hobby' subjects is over 4 times the core hours allotted to medicine and surgery, or far in excess of the time students must spend on the whole field of food safety, technology and veterinary public health.

4.1.3 Suggestions

Suggestion 2.1 is important to the general structure and organisation of teaching.

- 4.1 The current system of compartmentalised subjects attributed to specific departments should be changed to explicitly permit and encourage interdisciplinary teaching, with the aim of:
 - giving the Faculty more control and flexibility over the attribution of core teaching to the most appropriate teacher(s) or unit(s);
 - providing external control and feedback on the teaching programmes to ensure these are well oriented towards other veterinary disciplines and professional activity.
- 4.2 The philosophy and structure of the veterinary course should be changed to that it explicitly encourages interdisciplinary teaching, and promotes active horizontal and vertical interlinking of content.
- 4.3 The curricular hours spent on basic and agronomical sciences should be reduced, and the time dedicated to clinical subjects increased.
- 4.4 The overall curricular load should be reduced, in particular through continuing to reduce the number of lectures. Students should be encouraged or required to cover relevant issues of detail through self-directed learning (see also Suggestion 5.1)
- 4.5 The Faculty and curricular authorities should aim to increase the amount of intramural hands-on clinical training in the core course, and extend the duration and continuity of such hands-on work.
- 4.6 The VFM should consider developing the 'optional' subjects into more structured differentiated tracks.
- 4.7 The time spent on 'elective' subjects should be transformed into hours spent on something of clear and direct veterinary relevance.

4.2 BASIC SUBJECTS AND BASIC SCIENCES

4.2.1 Findings

The majority of the basic subjects and sciences are taught by inter-faculty departments (see Chapter 2 for the subjects covered by these), along with the Departments of Compared Anatomy and Pathological Anatomy and of Animal Health.

The curriculum hours in the basic subjects taught to veterinary students are shown in Table 4.5. The attribution of these hours according to the 'EEC' subjects is shown in Table 4.1.

Table 4.5: 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 / other work	clinical work	total	
Mathematics	1	30	20	18		68	1: 1.27
Chemistry	1	25	20			45	1: 0.8
Physics	1	21	12	12		45	1: 1.14
Animal & vegetable biology	1	30	30	5		65	1: 1.17
Biochemistry	1	50	40	5		95	1: 0.9
Anatomy & embryology	1	44	26	35		105	1: 1.39
Anatomy II	2	60	45			105	1: 0.75
Cytology & histology	2	37	23	30		90	1: 1.43
Genetics	2	45	30	15		90	1: 1
Epidemiology	2	25	16		4	45	1: 0.8
Physiology	2	75	40	10	20	145	1: 0.93
Immunology	2	30	14	1		45	1: 0.5
Microbiology	2	60	40			100	1: 0.67
Parasitology	2	30	30			60	1: 1
Pharmacology, pharmacy	3	60	11		5	76	1: 0.27
General pathological anatomy	3	24	14	14		52	1: 1.17
General pathology	3	45		15	20	80	1: 0.78
Special pathological anatomy	4	45	45			90	1: 1
Infectious diseases	4	75	16		46	137	1: 0.83
Parasitic diseases	4	60	30		20	110	1: 0.83
Toxicology	5	45	10		25	80	1: 0.78
Deontology, legal med. & veterinary legislation	5	30	15			45	1: 0.5
Total		946	527	160	140	1773	1: 0.87

Biophysics is included in 'physics', 'mathematics' includes biostatistics and biometrics. Physiopathology is taught within the course 'general pathology' (which in Spain is oriented towards clinical pathology and physiopathology, rather than pathological anatomy *per se*).

For teaching anatomy, the VFM has a dissection room of about 200 m² with 8 medium-sized dissection tables, as well as an annex of a similar size with 5 small and 1 medium table. On the level below, there is a practical room of approximately 300 m², including an anatomy museum.

The necropsy facility is about 300 m² including a section room with 8 medium-sized stainless steel tables and 2 large low tables. Students each have to prepare 5 necropsy reports during their studies. The Pathological Anatomy section, which is run by Diplomate in Pig Health Management, has good links to both the farm and the clinics, including participating in case presentations.

4.2.2 Comments

The basic sciences are covered to a considerable depth and are allotted a high proportion of the overall curricular hours. It would be beneficial to reduce the academic detail in the topics, and put more emphasis on self-directed learning and use of knowledge by students.

The overall ratio of theoretical to practical work is slightly below the recommended level of 1:1, although subjects which need most to be based on practical work, such as anatomy and pathology, have a higher proportion of practical work. Practical work is given in appropriately-sized groups, which are subdivided where necessary. The curricular structure does require staff to repeat each session 5 times, which is quite a heavy workload, especially since there are very few support staff to assist.

As noted in the previous section, subjects are taught as independent entities. Greater coordination between subjects given at the same time would be beneficial (e.g. teaching the structure and function of organs or systems together). The course would also be improved by a clearer linkage of the pre-clinical disciplines to applied veterinary aspects.

Under the national curriculum, some subjects, such as immunology, are not placed at the appropriate point in the course for students to benefit from the teaching. Epidemiology is also taught far too early, as basic epidemiology, without following through to the actual use of epidemiology in an veterinary context as a tool for analysis and preventative and treatment strategies.

4.2.3 Suggestions

- 4.8 The teaching in the basic sciences should incorporate more material from, and links to, their role and application in subsequent disciplines and professional activity, preferably through joint or integrated teaching.

The need to reduce the hours of teaching in the basic sciences has been mentioned in Suggestion 4.3. Suggestion 4.5 concerns the desirability of replacing lectures with sessions that require more active engagement by the students.

- 4.9 The timing of some of the basic sciences within the curriculum should be reviewed, considering what the aim of the discipline is within the veterinary course.

4.3 ANIMAL PRODUCTION

4.3.1 Findings

The animal production subjects are taught by the Departments of Animal Production and of Animal Health. The topics taught are shown in Table 4.6, with the attribution of these hours according to the 'EEC' subjects being shown in Table 4.1.

Table 4.6: Number of teaching hours in 'core' animal production subjects

	year	hours in course						ratio of lectures to other types of work
		lectures	practical work	supervised work	clinical work	other work	total	
Ethology, animal protection & ethnology	1	45	12	5	33		95	1: 1.11
Agriculture & forage conservation	1	30	15				45	1: 0.5
Agrarian economics	1	15	15	15			45	1: 2
Animal nutrition	3	60	20		25		105	1: 0.75
Animal production & vet. hygiene	4	75			45		120	1: 0.6
Breeding & animal health	5	45	30		15		90	1: 1
Preventive medicine & sanitary policy	5	30	12		8		50	1: 0.67
Total		300	104	20	126		550	1: 0.83

Undergraduates have their first contact with animals in the 1st year, learning the handling, feeding and care of horses, along with their appraisal and morphology. The practicals on animal behaviour are given on the Teaching Farm, paying special attention to behavioural disorders. This work is done using a group size of 10.

From the third year onwards, practical training is organised in blocks of 10 consecutive days of 3-4 hours each, typically in groups of 10. In the animal production disciplines students have such rotations in the subjects:

- Animal nutrition (two rotations in the 3rd year)
- Obstetrics and reproduction (two rotations in the 4th year)
- Animal production and veterinary hygiene (two rotations in the 4th year)
- Breeding and Animal Health (5th year)
- Preventive Medicine and Sanitary Police (5th year)

The University has a multi-species teaching farm adjacent to the Campus (see Section 6.1) that is managed and used by the VFM.

4.3.2 Comments

In the context of the curriculum as a whole a far higher number of curricular hours are allocated to the agronomical sciences and animal production subjects than in other parts of Europe. The content of the teaching in this field should be carefully reviewed with the aim reducing the number of hours. The teaching in the animal production area is in parts oriented towards general agronomical aspects, and often includes a level of detail that is not needed in a modern veterinary course (e.g. the specifics of nutrient and soil analysis). Rather than this classical academic approach to animal production, the teaching needs to be clearly oriented towards veterinary activity and its principles.

The compartmentalisation of the course (see Section 4.1) adds to the difficulties in getting a comprehensive veterinary focus in the teaching. Animal production and animal health are treated as separate fields composed of specific subjects, when in reality they are very closely interlinked. An important part of veterinary work in the farm animal field is to be able to take an overview of all the factors in a production environment, and produce a cohesive plan for managing the health and profitability of a population. The training should reflect and introduce this approach by developing systematic programmes of multi-disciplinary visits and analysis of working farms in the region. The

teaching of a herd-health approach, including the relative costs of ill-health compared with treatment strategies, should be a priority.

The teaching on animal production and health also needs to be closely linked to that on the safety and quality of food of animal origin. This should reflect the integrated approach to monitoring and control of animal health and food safety right through the food chain that is now a clear veterinary responsibility.

As a less traditional discipline, animal welfare is not adequately addressed in the teaching. The first year course, which seems to focus more on the ethnology and ethology fields, and applied aspects of the subject do not seem to sufficiently covered. Epidemiology suffers from similar problems, as the early course on basic epidemiology is not followed up with teaching that covers applied quantitative epidemiology, which is an important tool for production animal work.

The Teaching Farm is a potentially valuable educational asset, and should be developed and used to the maximum extent in the teaching on farm animals (see Chapter 6). However, it needs to be made clear to students that it is not at present a 'model' farm, and should not be considered as such, as some serious animal welfare issues need to be addressed.

4.3.3 Suggestions

- 4.10 The content of the animal production teaching should be comprehensively reviewed, with the aims of:
 - significantly reducing the number of teaching hours in this field (see also Suggestion 4.3);
 - eliminating detail that is not of primary importance to mainstream veterinary activity; and
 - clearly orienting all subjects to their applied use in professional activity with production animals.
- 4.11 The teaching relating to production animals area should be closely integrated, merging animal production aspects with the teaching on animal health and care, and linking this to issues of safety and quality of food of animal origin.
- 4.12 The teaching on animal welfare should be reinforced, and given an applied approach.
- 4.13 The teaching on general epidemiology should be reduced in favour of training in applied quantitative epidemiological methods much later in the course.
- 4.14 Teaching at the Farm needs to be genuinely "hands on" and should be reinforced by visits to commercial farms in the region, followed up by discussion - led by teaching staff - about the good and bad aspects of the premises visited.

Suggestion 6.3 concerns establishing a dairy herd on the University Teaching Farm to help compensate for the current lack of access to this species.

4.4 CLINICAL SCIENCES

4.4.1 Findings

The clinical sciences are primarily taught by the Department of Animal Medicine and Surgery and the Department of Animal Health, with therapeutics being taught by the inter-faculty Department of Pharmacology.

The obligatory courses in clinical subjects and the teaching hours are presented in Table 4.7. The attribution of these hours according to the 'EEC' subjects is shown in Table 4.1.

Table 4.7: Number of teaching hours in 'core' clinical subjects

subject	year	hours in course					ratio of lectures to other types of work
		lectures	practical work	other work	clinical work	total	
Propaedeutics	3	10			50	60	1:5
Radiology	3	25	10	3	10	48	1:0.92
Anaesthesia	3	25			20	45	1:0.8
Medicine & surgery	4	60			35	95	1:0.58
Obstetrics & reproduction	4	75	28		37	140	1:0.87
Infectious diseases	4	75	16		46	137	1:0.83
Parasitic diseases	4	60	30		20	110	1:0.83
Therapeutics	5	15			30	45	1:2
Medical & nutritional pathology	5	75	8	4	65	152	1:1.03
Pre-professional practice (intramural)	6				70	70	1:-
Total		410	92	7	383	902	1:1.76

Clinical teaching on small animals is given in the Veterinary Teaching Hospital (HCV – see Section 6.2). Equine clinical work is also predominantly undertaken at the HCV, although some propaedeutics and handling is taught at the Teaching Farm (see Section 4.3), and the Mobile Clinic does some equine work. For production animals, students participate in groups of 6 – 10 in the Mobile Clinic run by the Infectious Disease and Parasitic Disease units during the teaching of these disciplines in the 4th year.

Clinical training at the Veterinary Teaching Hospital starts in the 3rd year, when students rotate through different disciplines (propaedeutics, radiology, pharmacy and pharmacology) for 10 days each, for 3 – 4 h./day, typically in groups of 10. For anaesthesia, students have 20 hours of practical work in groups of 7 with 2 - 3 students per anaesthetic procedure. Part of the propaedeutics teaching takes place on the Teaching Farm.

In the 4th year and 5th year, students continue this pattern, with 2 rotations of 10-day rotations in each of the clinical disciplines, including farm visits with the Mobile Clinic. The 'official' group size is 10, but this is generally subdivided into at least two groups of five.

Students also have to complete their pre-professional practice before graduation, which includes 4 weeks (at least 70 hours) working in the different services of the Veterinary Hospital.

One associated lecturer, whose main task is the Mobile Clinic in cattle, conducts two weekly visits of 2 hours to farms with groups of three students. Eight exploitations holding 2,300 animals are visited on a regular basis. Students work with 20 cows in each practice, extracting blood, practising the tuberculin test, vaccines, sampling to detect encephalopathies and clinical case solving.

The animal material sent to the Faculty, treated on the Farm and seen by the mobile clinic is detailed in Chapter 7.

4.4.2 Comments

As noted in Section 4.1, too few hours of the core national curriculum are allocated to clinical subjects. A high percentage of graduates will be working as clinicians, and equipping students with the knowledge and skills required for such work should be a primary objective of a veterinary course. The welcome

inclusion by the VFM of the pre-professional practice into the degree course, and the clinical orientation of the parasitic disease and infectious disease course are therefore key elements of the clinical training.

The provision of training on small animals and equines is generally satisfactory for supporting training, and with the new Hospital the Faculty can look forward to the caseload developing.

Active and comprehensive clinical services are essential to a veterinary teaching programme. The team was pleased to note the new Veterinary Hospital, which is of major benefit to the Faculty's teaching capacity. It would commend the 24-hour service, which is vital for professional undergraduate training.

The clinical teaching programme and its delivery would be improved by a clearer structure and objectives, both for this stage of the training as a whole, and for each session or rotation. This would help ensure systematic and evaluated development of clinical skills and habits. It could, for example, take the form of a list or logbook of clinical procedures that each student should have undertaken and/or the levels of competency or involvement in different work that a student should certifiably reach at graduation (day 1 skills).

The teaching on production animals suffers particularly from the compartmentalisation of the course (see Section 4.1), with teaching on 'production' being quite separate from that concerning 'health'. The production disciplines (e.g. nutrition, environment, breeding, housing, etc.) and health/clinical teaching need to be integrated, with all farm animal activity being based around systematic programmes of multi-disciplinary visits and holistic analysis of working farms in the region. Furthermore, the teaching on the safety and quality of food of animal origin needs to be explicitly linked with that on production animal health so there is a clear 'farm to fork' approach.

The animal health work undertaken by the Infectious Disease and Parasitic Disease units takes a good applied approach, based on visits to the VTF and external farms. However, the team had significant concerns about bovine work, which seems to fall between the activities of the Animal Health department, and those of the Medicine and Surgery department, and is only covered only by an associate professor working 12 hours a week. This does not provide students with adequate exposure to routine interventions and procedures in obstetrics, minor surgery, production-related illness (such as mastitis and lameness), metabolic disorders, etc.

4.4.3 Suggestions

The need to allocate more hours of the core national curriculum to the clinical disciplines has been mentioned in Suggestion 4.3.

- 4.14 A clear structure and set of applied learning aims should be developed and introduced for the clinical training programme of the VFM.

Suggestion 4.11 refers to the need to integrate the teaching on animal production with the training on health and disease of farm animal species, as well as ensure close coordination with food safety issues.

- 4.15 The teaching on farm animals and production needs to be clearly focussed on the applied veterinary role in ensuring the health and productivity of farm animal populations, and adopt an integrated and proactive approach to the management of herd health.
- 4.16 The clinical training on cattle must be improved so that each student has exposure to routine obstetrical, medical, surgical and production-related disorders (*Category 1 suggestion*).

4.5 FOOD HYGIENE AND TECHNOLOGY AND VETERINARY PUBLIC HEALTH

4.5.1 Findings

The teaching in the field of food hygiene and technology is provided by the Department of Food Technology, Human Nutrition and Food Science and covers meat, milk, fish, egg and honey starting by the production of these products of animal origin.

Table 4.8: Subjects and of teaching hours in 'core' food hygiene subjects

subject	year	hours in course				ratio of lectures to practical work
		lectures	practical work	supervised work	total	
Food technology	3	60	65	5	130	1: 1.17
Food hygiene inspection & control	5	75	65		150	1: 0.87
Total		135	130	5	270	1: 1

The core subjects tabulated above are taught by a staff of responsibility of 2 full professors, 6 associated professors, 2 lecturers, 7 associate professors (similar to 3 FTE) and 2.5 technical teaching staff.

In addition to the lectures and practical work in the core subjects, students can also elect to take 'optional' subjects from the group 'Hygiene and Food Technology' (see Section 4.1 and Annex I), which are also structured in a lecture and a practical part. One (free-choice) elective subject in the food safety field is also offered in cooperation with the Department of animal health.

The practical work in food technology is provided in the Faculty's Pilot Plant, which is located under the area of Food Technology. It is equipped with the suitable means to process and produce:

- Meat products: mincing machine, cutter, mixer, boiler, cooker, stuffer.
- Milk transformation: plate heat exchanger, homogenization equipment, skimming machine, cheese vats, whey drainage table, equipment for salting, equipment to produce butter, yogurt and ice-cream.
- Canned vegetables, vegetable juices and their derivatives: rotatory autoclave, pasteurising and homogenising machines, dosimeter, colloidal mill, tin fastening systems, boilers and filtration equipment.

The practical work in food hygiene is focussed on laboratory work (36 hours), slaughterhouse work (24 hours), and visits to canteens and a fish market. Practical work is done in groups of 10 students per teacher, split in slaughterhouses into 2 groups of 5 students per teacher. Since 1993, the Veterinary Faculty has a collaboration agreement with the regional health service to perform practical work on the hygiene, inspection and control of food at slaughterhouses, at the fish market and at laboratories for inspecting foodstuffs.

The slaughterhouse practicals are organised in the main slaughterhouse in the southeast of Spain, which is 15 km from the VFM. Cattle, swine, sheep and goats are slaughtered there, producing a total of about 20,000 tons of meat per year.

4.5.2 Comments

The Department presents detailed information on the different topics. However, there is too much emphasis on technological aspects, rather than a main focus on the principles of food chain control. Moreover, post mortem meat inspection was primarily established to fight brucellosis and tuberculosis and is no longer the only and adequate tool to detect actual zoonoses. Meat inspection should always include the whole process: Information about animal feeding, status of health and transport, along with ante-mortem inspection and good slaughter hygiene. As process control corresponds to control of latent zoonoses, including monitoring of hygiene of slaughtering and milk production, as well as zoonoses at farm level, there should be more investment in this field in the future.

The stable to table approach is needed, so that teaching on food and process inspection and safety is clearly set in the context of the health and production of animals. The main knowledge requirements of an official veterinarian are listed in chapter IV of the directive EG 854/2004. They have to be integrated in the curriculum.

In the slaughterhouse, where practical training in meat inspection for students is organized, the position of the responsible veterinarian is open. Until now, this position was an associated lecturer in the area of nutrition and bromatology, and was in charge of supervising the students' practices. This vacancy must be filled as soon as possible.

4.5.3 Suggestions

- 4.17 The integrated ("feed to food") approach of monitoring and controlling of animal health and food safety right through the food chain approach, which is becoming a very clear veterinary responsibility under European laws, should be reflected in the structure and orientation of the veterinary training.
- 4.18 In the field of meat inspection, as well as veterinary public health, there should much greater interaction with other disciplines, such as pathology - pathological condition of organs; epidemiology, epizootic disease control, animal welfare, etc..
- 4.19 In the slaughterhouse where practical training in meat inspection for students is organised, the vacancy of the position of the responsible veterinarian should be filled as soon as possible.

5. TEACHING: QUALITY AND EVALUATION

5.1 TEACHING METHODOLOGY

5.1.1 Findings

Within the guidelines of the national curriculum, the content and delivery of teaching is decided upon by the department and staff with responsibility for that 'knowledge area' (see also Section 4.1). The Faculty or University cannot insist on any change to the teaching programme of the department. The Vice-Dean of Academic Affairs is responsible for the co-ordination of the teaching in the Veterinary Faculty.

Teaching comprises lectures during morning and afternoon sessions, with a 4-hour period between for practical work in rotating groups. Lectures make extensive use of modern audio-visual aid, and teaching areas are well-equipped for this.

Many subjects are based on Spanish-language course manuals and textbooks written and published by staff as the primary reference material. Course material is also often placed on the intranet using an Intranet tool (SUMA) to provide access to learning materials, such as power point presentations, interactive atlas, pictures or movies as well as demonstrations, references or papers. Textbooks written in foreign languages are rarely used in the undergraduate teaching. Up to date versions of several key international textbooks are not readily available (e.g. no copy is evident from searching the library database).

The Faculty remarks that the conventional teaching methodology means students are rather passive in the teaching-learning processes, with a tendency to acquire knowledge by memory. However, in 2005/06, the Faculty initiated a pilot project in the context of the adaptation of their teaching methods to the European Higher Education Area, with 10 core and 15 optional subjects participating in the project. Its main aim is to establish a more interactive approach to teaching, such as tutorial work and problem-oriented learning, and to gradually reduce the role of lectures. The main target of this action for the 2006/07 academic year is to include all the 1st cycle subject into the project.

In terms of teaching evaluation, the new University Law required a University-level unit for assessing quality, which evaluates the teaching processes through questionnaires on lecturer every two years. The anonymous student responses and their analysis are sent in confidence to the lecturer concerned, and overall statistics are sent to each Department and Establishment.

There is a Faculty Committee for the Study Plan, Teaching Quality and Analysis of Examination Results, which is responsible for:

- Analysing the result of the final examinations, to take actions to reduce students' failure;
- Analysing the Study Plan to raise proposals for correcting potential deficiencies;
- Making proposals to promote teaching quality and the assessment of the quality of the courses.

The UM also assesses the performance of the contracted lecturers in periods of 5 years. If the result of the evaluation is considered positive, which is usual, the lecturer receives additional payment. There is a similar system to evaluate research activity.

The Faculty of Veterinary Science, carried out a project known as "teaching audit" three years ago to look at the quality of teaching and academic failure. This resulted in changes to the weighting of different examination components and to the overall pass-mark.

5.1.2 Comments

The teaching at the VFM currently follows the traditional format of lectures and practical work of different kinds, although a more case-based approach is adopted in some applied areas. The use of audio-visual and information technology to support the delivery of teaching is well-developed.

As remarked elsewhere, the increase in the component of practical work in the new curriculum is a very positive development, as are the Faculty's own efforts to increase the practical and clinical components.

Remarks on the structure of the curriculum and the organisation of teaching were made in section 4.1. These aspects, especially the compartmentalisation and independence of the subjects, have considerable consequences for teaching methodologies, in particular impeding the development of integrated teaching. For both method and content, the Faculty does not have the authority to insist on changes to teaching and is also very limited in the extent to which teaching responsibility can be transferred to another unit. Such factors constrain the adaptation of course material and assessment, and therefore the extent and rate of change away from a content-based approach to teaching and learning in each discipline.

The team was pleased to learn of the initiative to adapt teaching methods and encourage students to take a more active role in learning. As mentioned in Section 4.1, this is necessary to reduce the didactic teaching load on both staff and students. It points to increasing the amount of work of a tutorial nature. The team would urge the Faculty to aim to be a University 'leader' in the project to adapt teaching.

Rather than staff putting a lot of effort into producing Spanish course texts as the reference material for their subjects, it would be better to develop the systematic use of international titles. Using locally-produced texts often tends to make content rather insular and 'closed', with pre-existing material being retained through habit or inertia. The fact that the course is partitioned between formal 'knowledge areas', with little or no interdisciplinary teaching of core disciplines, and examinations being conducted by the same staff who teach the subject, adds to the risk of each discipline being a rather closed and independent entity. Teaching, along with the associated learning material, needs to be outward-looking and continuously adapting and evolving to new incorporate new concepts.

Depending on an all-encompassing course text may also foster a 'learn this and pass' mentality, and reduce the amount of interaction and active student engagement in teaching. Requiring students to locate, assimilate and apply appropriate material from different sources, rather than giving them a coursebook to learn, is a key element of developing self-directed learning ability. To support this, the bibliographic resources that are available need to be reinforced, so that the Faculty and/or University Library has a sound collection of modern textbooks covering veterinary medicine.

The procedures for the evaluation of teaching would benefit from development, more specificity and firmer outcomes and consequences. They should be a tool by which the Faculty can direct the content and delivery of teaching.

5.1.3 Suggestions

- 5.1 The Faculty and departments should continue to develop the teaching methodology towards one where self-directed learning and problem-oriented teaching plays and increasingly important role.
- 5.2 The Faculty and its component departments and staff should base its teaching around international textbooks and similar material from external sources, not around internally-generated and self-validated content.

The need for more international bibliographic material has been mentioned in Suggestion 8.2.

5.2 EXAMINATIONS

5.2.1 Findings

There is not a centralised policy of examination for the establishment as a whole. Under Spanish regulations, the teachers and the department responsible for a particular subject have the autonomy to decide upon the length and nature of the examination. Multiple choice, practical, written, continuous assessment, and oral examinations are used. No external examiners are used in the Spanish Universities at undergraduate level.

There are three teaching-free periods for examinations, in February, June and September. The Faculty Board decides upon the timetabling of examinations, avoiding scheduling more than one examination of subjects from the same term or course on a particular day. It also tries to avoid scheduling examinations of subjects from consecutive courses on the same day.

Each examination can be taken twice during the first year a student is enrolled for that subject and up to three times per year on re-enrolment. Each examination can be attempted 7 times, with a 'no-show' not counting as a failure. After this, if the student has only one examination to pass in order to graduate, a student may ask the Rector for a further opportunity, but must otherwise leave.

There are no specific prerequisites for enrolling in later subjects. However, a student cannot start the 2nd cycle of studies unless they have passed at least 75% of the core subjects credits of the 1st cycle. Students are also not allowed to enrol on the pre-professional practices if they have more than one annual (or two four-month) core subjects outstanding.

5.2.2 Comments

There are a lot of separate examinations that can be passed in an unstructured way. Students can (and frequently do) continue with later subjects in the course without having demonstrably achieved a satisfactory level of understanding or competence in the preceding foundation disciplines. Allowing students to elect when they take an examination, and to repeat each examination up to seven times, is also lenient (although seemingly a legal entitlement) .

This lack of a clear structure to the learning process as an entity (see also remarks in Section 4.1), with the course being a collection of subjects rather than a cohesive whole, presents evident challenges and compromises for both the students' learning and for the academic staffs' teaching. An examination system that has more structure and prerequisites, so that each student has progresses logically through the course, would provide more academic rigour.

The impression sometimes given was that the teaching and learning focussed on memorising the detail of knowledge in a particular area, rather than its utility and application in a veterinary context. The team was pleased to hear that the Faculty was trying to move away from rote-learning and towards teaching that required students to be more active. The scope of examinations should be widened in line with this concept, to test reasoning and the use of knowledge and assess problem-solving skill.

External examiners provide an outside level of quality control, both in terms of the examining process and the level that should be achieved, and in terms of helping to ensure there is balance and the correct focus of the material covered. As noted in the previous section, the teaching is currently a rather 'closed' cycle, since each subject is taught and examined by the same staff that examine the outcome.

5.2.3 Suggestions

- 5.3 Students should have to pass the examinations in appropriate foundation subjects before being permitted to enrol for more advanced subjects.
- 5.4 The Faculty and departments should develop examinations, so that they test skills in the acquisition and application of knowledge, not primarily the ability to memorise.

- 5.5 Individuals who will be subsequent ‘users’ of students (e.g. in later disciplines, or as employers), or who can otherwise bring a valid external perspective, should participate in the examination process (see also Suggestion 4.1).

6. PHYSICAL FACILITIES AND EQUIPMENT

6.1 GENERAL ASPECTS

6.1.1 Findings

The Veterinary Faculty of Murcia is located on the Espinardo Campus, one of three of the University of Murcia, on which most of the science faculties of the UM are located. The Campus, started in the 1980's, is at the junction of the motorways to Andalusia, Madrid, Alicante and Cartagena, and about 7 km from the city of Murcia. There are regular buses into the city centre, and a tramway system to the city centre University Campus will be built in 2007.

The Faculty of Veterinary Science of Murcia has three premises: the main building, the Teaching Hospital (HCV) and the Teaching Farm.

The main building provides about 15,000 m², and is divided into a central area and western and eastern wings. On the ground floor of the Central Area are the Dean's office and administration, the Faculty Library, 2 conference rooms, 3 lecture theatres, a meeting room, the canteen, a computer room, student premises and the dissection and necropsy rooms and anatomic museum. On the 4 upper floors of this area are located staff offices, a lecture hall and the research and teaching laboratories of most of the Faculty departments (not those of Food Technology, Nutrition and Bromatology, and Clinical Sciences).

The ground floor of the eastern wing houses the Department of Food Technology, Nutrition and Bromatology and the Pilot Plant facilities along with a lecture theatre and the photocopying room. The Departments of Pharmacology (Veterinary Section) and Biochemistry and Molecular Biology "A" are located on the 1st, 2nd and 3rd floors of this wing.

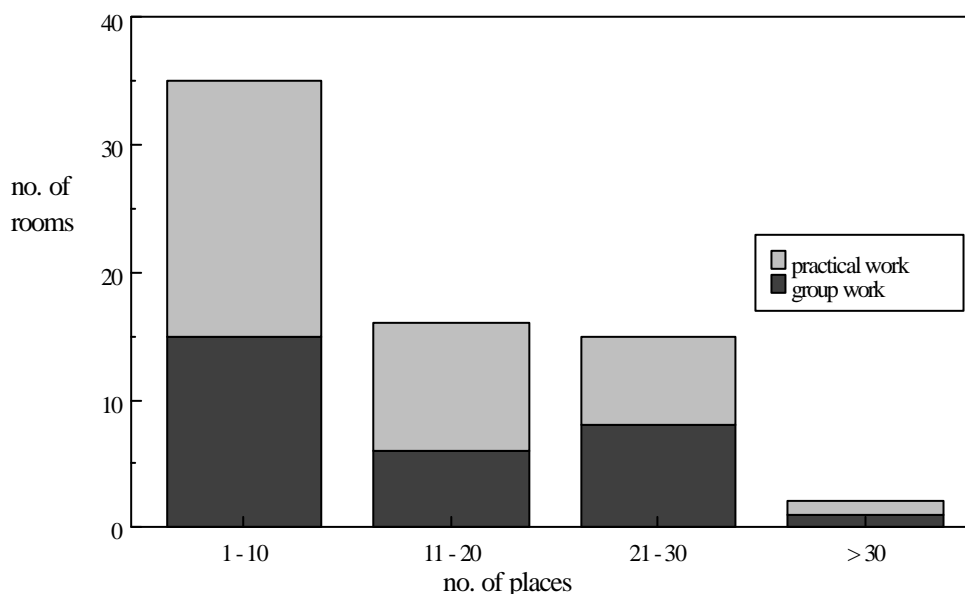
The western wing houses the Sections of Toxicology and of Mathematics, isolation facilities, food technology laboratories, a computer room and a lecture theatre.

The Veterinary Teaching Hospital, which is adjacent to the main building, is described in Section 6.2.

The FVM has 10 lecture theatres (40 – 390 seats), providing a total of 1,522 places. Seven of these can seat 100 or more persons (i.e. an entire annual intake). There are 3 further lecture rooms at the Farm.

The Faculty has 29 rooms for group work and 38 premises for practical work (see Figure 6.1).

Figure 6.1: Number of rooms for practical and group work at VFM



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

Teaching Farm

A 16-hectare Veterinary Teaching Farm (VTF) was opened in May 2001, apparently the only such facility run by a veterinary faculty in Spain. It is located next to the Campus, about 1.5 Km. from the Faculty buildings, easily accessible by car or bus.

The VTF has a teaching facility of about 2,900 m², which includes a 164-place conference room, two 32-seat lecture theatres, a computer room with 20 PCs, a library, 4 laboratories, a canteen, 2 dormitories and administration offices. A separate service building houses changing rooms, storerooms and a display and auction area.

The VTF production area has 15 buildings (about 8,200 m²) for different species and purposes:

- A swine unit running on a weekly cycle with 240-250 sows, comprising a farrowing unit (689 m²), gestation unit (975 m²), nursery unit (625 m²), gilt unit (490 m²) and growing/finishing unit (two buildings of 1,000 m² each);
- An avian unit of 589 m², comprising a laying unit for holding 500 chickens and a broiler unit, as well as an incubator for 2000 eggs;
- A rabbit unit (383 m²) for 150 does in a closed-cycle system;
- Ovine unit (573 m²) for 100-125 ewes;
- A calf finishing unit (621 m²) for 100 animals;
- A unit (1,208 m²) for 150 goats of “Murciano-granadino” breed;
- An equine unit (369 m²) with 7 animals of different breeds;
- A primate unit 120 m² divided into 2 cages with 28 baboons for testing;
- A facility for bees and their reproduction.

The Farm also has a fodder plant, 1.6 hectares for fodder production, and a manure treatment plant.

The VTF is an administratively and financially separate unit of Murcia University that the Veterinary Faculty is responsible for and uses. Apart from the equine unit, teaching premises and common services, the Farm premises and activities are rented out to and run by commercial producers, who allow student access.

6.1.2 Comments

The Espinardo Campus is a modern site that provides enough space and easy access to both the town and the surrounding agricultural area. The premises of the Faculty are generally modern, spacious and well-equipped, and suited to purpose. The new Veterinary Teaching Hospital (see next section) is a particularly valuable addition to the Faculty.

Apart from the central facilities, such as lecture halls, almost all the premises were departmental ‘territory’. There is enough space in the Faculty for this not to be currently a major issue, but rather than each section making separate provision, it would be beneficial to have rationalised shared use of larger teaching laboratories with associated support staff. In this context, it was noted that some teaching areas were in need of more equipment, and that in general the financial support for practical teaching activities was insufficient (see also Chapter 3). It was noted that the current organisation of practical teaching (see Section 4.1) may require teaching laboratories for each subject.

As was also noted in Chapter 3, provision for maintaining, replacing or upgrading equipment as it ages is also needed, especially in the clinical areas.

The Faculty should take care to ensure that it has consistently high standards of Good Laboratory Practice (GLP) in terms of the provision of protective equipment, chemical and gas storage, etc.

Teaching Farm

The teaching farm is very conveniently located and has a good range of species and facilities of teaching. The way it is funded and run is innovative and seem to be overcoming some of the major difficulties veterinary faculties can have with such facilities, namely that they can be very expensive in operational and upgrading costs, and easily become unrepresentative of ‘real’ farm activity.

The highly useful Farm facilities need to be used to the maximum extent:

- Students should sleep overnight, and be ready and available for interesting training experiences (e.g. normal and assisted/complicated births);
- The teaching on farm animal species on the Farm (and elsewhere) should be integrated, so that students see clearly how production, health, quality and safety of food and economic factors have to be considered together (i.e. using an interdisciplinary 'farm to fork' approach)
- An applied approach should be taken (e.g. applied nutrition, applied economics, critical appraisal, full diagnosis and herd-book keeping, a case-based approach to teaching).

The team would encourage the Faculty to continue the development of full and interdisciplinary use of this excellent resource. As noted elsewhere, there is a gap in the teaching of medicine and surgery in production species, particularly as regards dairy cattle. Although this is primarily an issue relating to the practical teaching programme, the establishment of a dairy herd on the Farm could be considered as one possible means of providing access to such material for clinical training.

Some welfare issues need to be dealt with as regards animal housing. The team was pleased to hear that staff are aware of this, and that upgrading of pens to meet modern welfare and legal norms is planned.

6.1.3 Suggestions

Suggestions 3.4 refer to the need to have adequate funding for the maintenance and replacement of equipment for teaching and clinical use.

- 6.1 The Faculty should consider establishing shared teaching laboratories, with the associated support staff for running them.
- 6.2 Maximum use should be made of the Teaching Farm for integrated and applied training on the production and health of farm species.
- 6.3 To compensate for the relative lack of dairy farms in the region, the Faculty and University should seriously consider the addition of a dairy cattle herd to the Teaching Farm.

6.2 CLINICAL FACILITIES AND ORGANISATION

6.2.1 Findings

Clinical teaching and veterinary services are provided through the Veterinary Teaching Hospital (HCV), which was opened in October 1999. This is an organisationally and financially separate service of the University of Murcia, attached to and run by the Faculty. Administrative management, such as budgeting and support staff allocation, is made through the University. It is planned to set up an independent foundation in the near future to manage the HCV in a more professional and efficient way.

The HCV is predominantly staffed by academic personnel from the Department of Animal Medicine and Surgery, with the addition (see Table 10.1) of some HCV clinical and support staff posts, and some associate teachers (practitioners working part-time). Residents and scholarship holders (see Chapter 12) also work in the Hospital.

The teaching hospital is subdivided into three sections covering small and exotic animals, large animals, and common clinical and diagnostic services (e.g. diagnostic imaging, anaesthesiology, clinical pathology, pathological anatomy and infectious/contagious diseases), and comprises the following facilities:

- Main hall and waiting room for small animals, along with two reception/administration rooms;
- Consulting rooms for the clinical services (internal medicine (2), small animal reproduction, cardio-respiratory, dermatology, ophthalmology (including ophthalmological surgery) and exotic animals (equipped with cages, terrarium and aquaria for different species);
- Anaesthesia service, adjacent to the surgical area, which also houses recovery cages and a neonatal incubator;
- Small animal surgery service, including two consulting rooms, a surgical preparation room, and three fully equipped small animal operating theatres. One of the theatres has a C-arm X-ray machine;
- Small animal hospitalisation service with 2 intensive care rooms (for dogs and for cats), a long-term hospitalisation room, and a room for potentially infectious cases;
- Large animal service, including two examination rooms, X-ray facilities (standing and portable), a pre-surgical room, and two induction/recovery boxes linked by rail hoist to two fully equipped operating theatres. The HCV is the only establishment in the Murcia region that has such extensive facilities and equipment for large animal surgery. This service also has a riding-ring, 11 boxes for horses, a large room for bovine patients, and another used for swine and small ruminants;
- Diagnostic imaging service for radiography and echography;
- Clinical Pathology service staffed by a laboratory technician and four vets. The clinical pathology laboratory is one of only five such facilities in Europe accredited by the European College of Clinical Pathology;
- Pharmacy service;
- Infectious/contagious disease service, with analytical laboratories and animal housing;
- Pathological anatomy service;
- Sterilising, laundry;
- A four-bedroom apartment for veterinarians and students on 24-hour duty;
- An administration room and small conference room with video and PC display used for meetings and clinical sessions;

Table 6.1: Hospitalisation and isolation places

	Dogs	Cats	Horses	Cattle	Small ruminants	Swine
Hospitalisation	13	4	11	8	20	8
Isolation†	3		2		20	10

† The Teaching Farm (see Section 6.1) also has a quarantine area (located outside the farm fence) with six pens: 2 for pigs, 1 for horses, 2 for small ruminants and 1 for cattle.

The HCV is open all year round. There are general and specialist consultations (internal medicine, surgery, exotics, ophthalmology, reproduction, diagnostic imaging, cardiology) from 09:30 to 13:30 and 17:00 to 20:00 every weekday, plus dermatology on Wednesdays. There is a permanently staffed 24-hour emergency service for small animals (only two other establishments in the region offer this) and horses (the only one in the region).

The HCV covers a range of specialities, with eight Diplomates of European Colleges on the staff, as well as a holder of a Certificate in Veterinary Anaesthesia from the Royal College of Veterinary Surgeons. About 60% of cases are referrals, rising to 80 - 90% in specialised services such as cardiology, ophthalmology, dermatology or pathological anatomy.

Clinical fees are decided by the Rector's Hospital Council, subject to the approval of the University Governing Council and Social Council. Essentially, prices are set equal to or higher than those charged by private hospitals, and are usually higher than the fees recommended by the Veterinary Chamber, to avoid unfair competition.

Clients' and patients' data are kept on a database. Clinical records are written by hand and kept in folders along with the reports of clinical pathology, echographies and echocardiographies. Radiographies are kept separately.

A mobile clinic is run by the infectious and parasitic disease teaching units of the Animal Health Department. Farm visits with students are routinely carried out from 10:30 - 14:30, using two 11-seat minibuses and one 5-seat jeep.

6.2.2 Comments

The new Veterinary Teaching Hospital provides good premises for carrying out clinical work and training. Likewise the equipment is in general satisfactory, since much of it was installed relatively recently. However, in some areas the equipment is starting to show its age, and staff are very aware that it is not up to the standard of some private hospitals in the region. As there is no clearly associated budget line (see Chapter 3), replacing or upgrading apparatus is a problem, and this will become progressively more difficult in the next few years. It is important to find a long-term solution to this problem, since a veterinary faculty should aim to provide the highest level of service in the locality in terms of facilities, expertise and care.

In terms of organisation, the Hospital seems to have adopted an administrative and financial structure that is not unusual in Spain (although less common elsewhere) to enable it to function within an academic structure. This is still not entirely satisfactory, since, for example, support staff appointments are made by the University from a common list (i.e. the HCV is unable to select staff with the specific skills needed for its work). It is for such reasons that the HCV is considering adopting a different administrative status, although it does not yet know if this will be a complete solution. The team would urge the University to help the Faculty and clinicians in reaching whatever structure is most effective for the Hospital.

The HCV is recognised and appreciated by practitioners in the Murcia region for the services and expertise it provides, and is responsive to their needs and concerns. The Hospital and the personnel working there deserve a lot of praise for the way they have built up this activity and caseload. The day to day running of the Hospital is being successfully provided by the Department of Medicine and Surgery, but at the cost of a lot of effort by the staff, and a particularly heavy and unrecognised load on the Hospital Manager. A lot of personal effort is also put into ensuring a 24 h. hospital service and cover is maintained, which is essential as a clinical service and teaching resource. Such extra effort by staff urgently needs recognition and support by the University, or there is a danger it will be withdrawn. Such a reversal of the momentum and enthusiasm that has built the HCV up would have extremely adverse consequences for the Hospital and its services.

The Infectious Disease and Parasitic Disease units have commendably taken a very applied and practical approach to their activity, based around their mobile clinics. This is a good hands-on way of exposing students to the reality of production animal work, and provides a substantial contribution to clinical teaching and services. In effect, clinical work has been reasonably neatly partitioned between hospital-

based companion animal work, undertaken in the HCV by the Department of Medicine and Surgery, and on-farm production animal work, undertaken by these two sections of the Department of Animal Health.

However, as remarked in Section 4.4, the current organisation of clinical activities does leave a gap in the teaching. The problem arises principally with work on cattle, since veterinary aspects are often multi-factorial (i.e. may not be purely and solely an infectious, parasitic nutritional, management, physical, etc., issue). In other words, the unit dealing with farm animal care (for cattle) has to cover both production/management issues, disease issues and medicine and surgery. This does not fit with the prescriptive Spanish departmental structure and attribution of teaching responsibilities (see Chapter 2). Some way needs to be found to achieve comprehensive species-based clinical work.

The Faculty and clinical sections should be vigilant about maintaining high standards of clinical management (e.g. Good Veterinary Practice), in terms of standardised procedures, pharmaceutical storage, record-keeping systems, etc.

6.2.3 Suggestions

Suggestion 3.4 concerns the need to establish a funding line to maintain, replace or upgrade equipment in the HCV as this ages.

- 6.4 The University and Faculty should give maximum support and help to establish comprehensive species-based clinical services under the constraints of the Spanish academic regulations, and, specifically to integrate cattle medicine, surgery and production-related health issues with the current infectious and parasitic disease activity.
- 6.5 The Veterinary Teaching Hospital, with the support of the University and Faculty, should have an organisational structure, status and *modus operandi* that maximises its flexibility and effectiveness to deliver clinical training and services of a high standard and continuity.
- 6.9 The importance and workload of the role of the Hospital Manager should be formally recognised and supported

Suggestion 10.1 relating to the need for more support staff is of considerable significance to the Teaching Hospital. The Hospital also needs to have the freedom or responsibility to select and appoint the most appropriately-skilled individuals for the required task (see Suggestion 10.2).

7. ANIMALS AND TEACHING MATERIAL OF ANIMAL ORIGIN

7.1 Findings

Cadavers of euthenised dogs are used for anatomical dissection, with around 30 and 25 animals used annually in 1st year and 2nd year courses respectively. Most of the cadavers are embalmed and used for up to two years for particular practicals, with fresh cadavers used in some teaching. Organs and body parts from farm animals (ruminants, equines and swine) are also used in this teaching, acquired from the slaughterhouse, the FVM necropsy room, the Laboratory Animal Unit of Murcia University and other sources.

The Faculty has a collection of over 20 complete skeletons and 2,450 skulls, bones, osseous and articular assemblies, etc. It also has a total of about 1000 other anatomical items, such as dried plastinated dog cadavers, body parts of farm animals, organs (some with vascular injections), fetuses, body sections, etc.

The animal material available for necropsy is detailed in Table 7.1 below, along with the cases received in the FVM clinics.

Table 7.1: Number of animals seen at VFM (2003 - 2005)

		consultations			hospitalisations			autopsies		
		2005	2004	2003	2005	2004	2003	2005	2004	2003
Farm animals	Cattle							1		
	Horses	798	605	593	718	544	533	12	9	9
	Small ruminants							115	58	91
	Pigs							302	32	66
	Other farm animals							55	45	132
Pets	Dogs	5196	3972	3933	230			75	71	35
	Cats	399	323	453	45			10	5	4
	Other pets	283	277	261	30			25	16	8

The Infectious Disease and Parasitic Disease teaching units of the Department of Animal Health run a mobile clinic (see Section 6.2), with a caseload indicated below.

Table 7.2: Number of farm visit and animals examined by the mobile clinic of FVM (2005/06)

	Parasitic unit		Infectious unit	
	farms	animals examined	farms	animals examined
Pigs	11	2750	2	500
Sheep	2	1000	2	1000
Goats	5	2000	3	1200
Cattle	2	1000	3	3000

The species and numbers of animal available at the Farm are outlined in Section 6.1. The interventions carried out by students are indicated below.

Table 7.3: Interventions on the Veterinary Teaching Farm (2004/05)

	Porcine	Rabbits	Cattle	Poultry	Horses	Goats
Vaccinations	2,196	945			15	
Iron injections/teeth liming/caudectomies	671 of each					
Deworming		452			20	
Therapeutic acts			214	563		
Feet treatments					20	
Artificial insemination						2,300
Other disease preventions		171				

The Veterinary Teaching Hospital has agreements with various organisations that provide off-site access to different animals, and/or a flow of animal material to the clinics, in particular:

- Society for the Prevention of Cruelty to Animals
- Centre for the Recovery of Wild Fauna

- Mundomar (a marine park, primarily for dolphins and other sea mammals)
- MAPFRE (an insurance company), where the HCV is the reference centre for all insured animals;
- the local horse racing club.

The ratio of students graduating:clinical caseload in pets is about 1:59 (100:5878).

The ratio of students graduating:clinical caseload in large animals depends upon which activity is considered as a 'case', but seems in excess of 1:50.

The ratio of students graduating:necropsies is about 1:5.2 (100:515). 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 to animal material of different types for training purposes in slaughtering and food inspection is outlined in Section 4.5.

7.2 Comments

The access to material for anatomy teaching is satisfactory. The use of dogs as the reference species is sensible.

The supply of material for necropsy work, and the organisation of this activity (see Section 4.2) is good (considerably better than the raw figures imply), with regular linkage to clinical and farm aspects.

The small animal caseload is satisfactory, and steadily rising.

The access to large animal material is generally satisfactory, but note should be taken of the remark in Section 4.3 and 4.4 about the organisation of teaching involving this material. The access to cattle for obstetrics, reproduction, orthopaedics, metabolic disorders, etc. is a particular concern. Whilst a paucity of cattle farms in the area does limit availability, the current shortcoming in coverage of bovine work appear to more directly an issue of the course organisation and staff resources. It would nonetheless be a considerable advantage to have a dairy herd on the adjacent Teaching Farm.

Access to material for teaching in the area of food safety seem good, although the current (hopefully temporary) lack of an associate professor covering meat hygiene is of concern (see Section 4.5).

7.3 Suggestions

(Suggestions relating to the issues in the comments above have been made elsewhere, notably in Sections 4.3, 4.4 and 6.1).

8. LIBRARY AND EDUCATIONAL RESOURCES

8.1 Findings

Veterinary students can use the Veterinary Faculty library, located in the main building of the FVM, and the main University General Library of the Espinardo Campus, situated 100 m from the Veterinary Faculty.

The Veterinary Faculty library is around 500 m², with two floors. On the ground floor, there is a study room (160 m²) for 96 students. The first floor is mainly used for a 250 m² study room, with seating for 128 people. There is also an area with two computers (with an on-line catalogue and a database), 80 m² of book storage, and administrative areas.

The Veterinary Faculty library has one full-time employee and 0.5 full-time equivalent (FTE) of part-time workers. The study room is open 12½ hours on weekdays during term time (5½ hours during vacation), with library services available during 7½ hours per day. The library receives 70 journals, and has an annual budget of around 20,000 Euro (2/3 of which comes from Departmental budget lines).

The University General Library of the Espinardo Campus (UGLEC) includes a 420 m² section for Health Sciences (Veterinary Science, Medicine and Nursing Studies) and 2,500 monographs and seating for 40 students. There is also a scientific journal library of 420 m² with capacity for 26 students, and a general study room that can seat 268 people. Journals are available in both paper and electronic formats. Of the total University Library staff of 102, 54 work in UGLEC. The General library is open 12½ hours on weekdays during term time (5½ hours during vacation).

The computer service, which is not specific to the FVM, has two full-time employees. There are three computer rooms (with 34, 20 and 20 PC's) for students at the Veterinary Faculty, which are accessible for 7½ hours per day on weekdays during term-time, and 5½ hours per day during vacations.

The University has about 400 k€ for library purchases, of which approximately 180 k€ is for purchase of textbooks for curriculum support. This is divided between the different courses, based primarily on the number of students.

8.2 Comments

Library facilities and bibliographic resources in the veterinary field are currently being provided by the University, Faculty and various departments without a clear and structured coordination and professionalisation of such activities. It would be preferable to regroup title in a clearly identifiable, accessible and professionally-managed veterinary collection, rather than continue with the current dispersal of resources. The exception to concentrating material in this was is to have a near-clinic library within the Hospital for ease of reference by clinic ians and students, and as a study resource during quiet periods of clinical work.

As noted in Section 5.1, many subject use locally-produced textbooks and course manuals as the primary reference material. Furthermore, the learning strategy used by students often does not seem to be based around locating and assimilating independent bibliographic material. It would be healthier to develop the systematic use of international titles, especially since the teaching is a 'closed cycle', with the content of each subject decided upon, imparted and examined by the same individuals. At present, up-to-date editions of international textbooks are not readily available to students. The bibliographic resources that are available need to be reinforced, so that the Faculty Library has a sound collection of modern textbooks covering veterinary medicine.

The veterinary course is currently at a disadvantage in terms of purchasing bibliographic resources, firstly because the library purchasing budget is based mainly on student numbers, and secondly because international veterinary textbooks are very expensive. Since veterinary medicine is a very dynamic subject, textbooks in many fields are revised and re-published every few years. A much larger budget is required for maintaining a good veterinary bibliographic resource than for many other disciplines.

8.3 Suggestions

- 8.1 A systematic effort should be made by the FVM staff and the Study Plan, Teaching Quality and Analysis of Examination Results Commission to base the veterinary course on the active use of international bibliographic material.
- 8.2 The contents and availability of up-to-date and international textbooks on veterinary science in the Faculty and University Libraries should be reinforced (see also Suggestion 5.2).
- 8.3 Bibliographic resources in the veterinary field should be structured as a single coherent and professionally-managed collection, preferably within a single main library along with a subsidiary Hospital library for ease of consultation and study during clinical work.

9. ADMISSION AND ENROLMENT

9.1 Findings

Admission requirements for starting University Studies are determined by the Ministry of Education and Science and the regional government.

High school studies have four different branches, each permitting access to a set of university-level studies. A student who wishes to enrol on a veterinary course should have followed the '*Life and Health Sciences*' branch. Compulsory subjects in this option are biology and chemistry, but mathematics and physics are electives. In addition, there is a general examination (PAAU) for admission to university level studies. The total mark of a student is based 60% of the average grades from high school, and 40% on their performance in the PAAU. Admittance is competitive, and the grades needed to enrol at the Veterinary Faculty are amongst the highest.

A *numerus clausus* is proposed by the Faculty Council, then passes through the University Governing Council to the regional government for approval. It has recently been agreed to reduce the standard intake to 95, although the great demand for veterinary studies makes the regional government reluctant to decrease markedly the student intake. The number of students is the main factor determining the University and FVM budget (see Chapter 3).

By law, priority for 10% of places must be given to students with special circumstances: 2% of the places are reserved for students older than 25, 2% to students who already have a University degree, 3% to disabled students, 1% to those with high achievements in sports, and a 2% to students from non-European Union countries.

Students can also transfer in from veterinary studies started in another national or international establishment.

Year	2005/06	2004/05	2003/04	2002/03	2001/02
Number applying - standard	428	402	482	457	490
Number applying - transfer	24	30	23	14	5
Number admitted – standard	100	100	100	100	100
- transfer	12	9	10	6	2
Number graduated	103	111	96	97	75

A total of 681 undergraduates are enrolled on the veterinary course, about 70 % of whom are female. The Faculty also offers a degree in Food Technology, on which 100 students in total were enrolled in 2004-2005.

Around 96% of the students enrolling eventually graduate.

9.2 Comments

Since there is a lot of demand for veterinary studies, students with the highest grades are selected. The ranking is based on the overall grades obtained in a broad subject area, but they do not really allow to assess the student's suitability for the veterinary course. Therefore, some of the students are not well prepared by their baccalaureates for the following teaching in basic sciences in the first year.

The Faculty and University are commended for reducing the student intake. With the popularity of veterinary studies and the 'more is better' approach often adopted, this is never easy. However, more manageable student numbers are essential to improving the quality of teaching.

The student intake is in general compatible with the facilities, caseload and academic staff resources available for teaching them (the remarks in Chapter 10 on the clinical staff should be noted, however). The teaching budget and support staff numbers need improvement, although the issues needing resolution do not correlate directly to student intake.

In a more general context, there appears to be overproduction of veterinary graduates within Spain. Local opportunities now seem to be becoming limited, with graduate pay rates said to be low, indicating the employment market in the area is starting to saturate.

Although most graduates from the VFM find employment, this is sometimes in low-paid work in the area, or by moving elsewhere.

The drop-out rate is commendably low.

9.3 Suggestions

Suggestion 3.1 relates to adequately funding the veterinary course, which entails a modification of the current system based on student numbers.

10. ACADEMIC AND SUPPORT STAFF

10.1 Findings

Table 10.1: Academic and support posts in Departments

Department	Academic staff					Support staff			total
	Prof.		TEU	Assoc. teacher	researchers	teaching	research*	admin./ general	
	CU	TU							
<i>Faculty departments</i>									
Anatomy & Pathological Anatomy	4	8	2	3		2	1	1	21
Animal Production	2	11	3	1		1	3	1	22
Animal Health	3	9	5	1		3	1	1	23
Food Science & Technology	2	6	2	7		2	10	1	30
Animal Medicine & Surgery	3	14	8	5		4	14	2	51
<i>Inter-Faculty department sections</i>									
Biochemistry & Molecular Biology	4	1			1	1	5	1	13
Animal Biology	1	1			1	0.5	5	0.5	3.5
Statistics & Operational Research	1	1					1	0.5	3.5
Physics		1							1
Veterinary Physiology		4	1			0.5	6	0.5	12
Pharmacology		2	1	2			1	0.5	6.5
Toxicology		2	2	3		0.5	4	0.5	12
<i>Separate services</i>									
HCV (Hospital)				5			18	3	14
Teaching Farm				8			13	1	10.5
Food Technology Pilot Plant							0.5		0.5
General VFM services								13	13
University services (library, sports, cleaning, cafeteria, security, etc.)								22	22
TOTAL	20	60	24	35	2	14.5+15.8	51+15.7	48.5	217

* Aside from two posts, research support staff comprise non-budgeted young graduates (termed 'becarios') paid from research funds, who may be able to follow doctoral studies if they hold a university degree.

† University lecturer with full teaching load.

Associate teachers are individuals working outside the Faculty (e.g. as private practitioners, in the food industry, etc.) who provide some teaching part-time, generally off-site. They work an average of 6 hours a week on behalf of the Faculty, and are considered as ½ FTE.

The ratio of FTE teaching staff:students is around 1:5.5 (123.5:681).

The ratio of FTE teaching staff:budgeted support staff is around 1:0.67 (123.5:83) and about 1:1.2 if non-budgeted support staff are included.

The University Governing Council decides upon proposals for new academic positions. Decisions are based on the Department Teaching Management Plan (POD), which specifies the teaching burden (this will depend upon the number of credits taught, number of students, group size of practicals, etc.) and the so-called 'teaching capacity' of the Department (calculated in terms of number, kind and dedication of the teaching personnel). The UGC makes a proposal to the Ministry of Education and Science about the number of positions needed and the appropriate profile.

Academic staff appointments follow a formal process, whereby applicants with a doctorate sit an examination to become nationally accredited, a requirement for a professorial post. The University decides upon which candidate is the most appropriate. New academic staff are usually either accredited professors or personnel trained at Murcia University, or former students with a Ph.D. and/or other experience necessary for a permanent position.

Staff are first and foremost attributed to, and part of, a department rather than a faculty. As remarked in Chapter 2, under the Spanish system of higher education departments cover particular and defined 'knowledge areas' within the University. Once appointed in a specific 'knowledge area', academic staff cannot transfer to a different one, except by restarting at the entry level in the other domain.

The University decides upon, appoints and assigns support staff, establishing 'pools' or lists of actual or potential staff of different categories. The Financial Management Office and Trade Union representatives specify the criteria for new administration and service personnel. Candidates must also sit a competitive examination.

The Faculty remarks that there is little difficulty in hiring or retaining personnel, but that it is not easy to increase the permanent staff. A fundamental criterion to engage more teaching staff is the number of students, which at the FVM is quite low compared to other faculties.

Academic and support staff in permanent posts are civil servants, with standardised conditions of service. Academic salaries are considered as low compared to the liberal professions (e.g. lawyers, doctors, etc), as well as to their counterparts elsewhere in Europe, but higher than those earned by most local private practitioners and veterinarians working in industry.

The Faculty remarks that in common with many Spanish universities there is a chronic shortage of support staff. This means that the teaching staff have to undertake such work. It is also remarked that in the HCV scholarship holders and residents are used to overcome this problem, noting this is not a satisfactory solution.

The Faculty also notes that academic promotion in the Spanish University system is based primarily on research, and that teaching and other essential activity needs to be adequately recognised. This is particularly important in the case of the clinical teaching staff.

10.2 Comments

The ratio of teaching staff to undergraduates is satisfactory. The number of academic staff is also comfortably over the level of 80, considered as the minimum 'critical mass' for a veterinary faculty. The team was pleased to note the increase in academic staff over the past few years, which contributes significantly to improving teaching quality.

The VFM makes use of private practitioners as 'associate professors'. These individuals make a valuable contribution, in particular in the farm animal field. However, the Faculty should take care to ensure that there is close coordination and linkage between the training given by the academic staff and that imparted by the associate professors. The Faculty needs also to take care that it retains the competency and coverage necessary for academic leadership in the full range of disciplines and species. For instance, the current lack of teacher covering practical meat hygiene (see Section 4.5) will be a serious weakness if it were to continue.

There were serious concerns about the very low number of support staff. There are clearly not enough technical and administrative personnel working to support teaching, research and service activities at the Faculty. Support staff roles are having to be undertaken by academic staff, which is not appropriate or efficient, and a major obstacle to improvements in teaching, research and service provision. It was also disturbing to find that doctoral students were also being counted as support staff; this is totally inappropriate, both numerically and educationally.

The lack of support staff is a major contributory factor to a heavy teaching workload for the academic staff. This was particularly evident with clinical and veterinary teaching hospital personnel, where staff also have to maintain a high standard of clinical services. A significant further problem is that the 'official' group size for clinical teaching is 10. This is far too large, since clinical sessions in groups of more than 2 – 5 (depending upon the species and procedure) lose their effectiveness, becoming demonstrations rather than hands-on training. The staff are aware of this, and subdivide the groups to avoid this weakness, an extra workload that is not recognised at University level.

The selection and allocation of support staff at University level, with minimal Faculty or departmental involvement, contributes to the weakness of academic support. Firstly, the individuals attributed may not be the most appropriate ones for the task or the unit, but simply top of a particular University 'list'. Being able to select support staff with specific skills or motivation would be beneficial. Secondly, the allocation of support positions may be weighted towards a 'universal' format for all the faculties and departments, in terms of both numbers and fields of work, rather than prioritising primary academic needs. The imbalance in the number of 'general' support staff compared to departmental posts suggests this.

As already remarked (e.g. Section 4.1), the departmental focus and compartmentalisation of staff and their activities causes some concerns, especially as regards interlinking teaching. From a perspective of career and personal development, constraining an individual to a specific field for their working life also seems rather inflexible, and contrary to the interdisciplinary character of veterinary science. From a practical point of view, this system means that a particular subject (particularly those in the basic science fields) has to be assigned to an individual from the 'right' knowledge area, rather than someone who may have a more appropriate applied perspective.

Since the Faculty as a whole is relatively young, staff have been trained at wide range of faculties. However, there were concerns that the selection process, despite being based on open competition, were now tending to result in graduates or postgraduates from Murcia being appointed. In the longer term, such an outcome from recruitment will lead to 'inbreeding' and a narrowing of knowledge/experience. This is particularly troubling since academic progression, even initially from undergraduate level (e.g. as *alumnos internes*), seems geared to being an 'internal' candidate, Ph.D. work (see Chapter 12) is intra-departmental, there is little or no interdepartmental mobility, and departments have a virtual monopoly on 'their' area (see Section 4.1) and teach using primarily self-generated material (see Section 5.1).

Academic advancement at the VFM is based primarily on research work, which has to be a largely self-started activity (i.e. an individual or unit has to find funding for research) undertaken in addition to the teaching load. The difficulty this gave rise to in terms of potential tenure or promotion was an obvious a common concern of many junior and intermediate personnel.

Staff often have to spend a large amount of their time preparing and imparting teaching, which leaves them less time for research than is ideal. This should absolutely not be considered as a criticism of the teaching staff, as the effort they put into providing practically-based training is commendable and should be maintained. However, the academic staff do need better support to help achieve an appropriate teaching/research balance, in particular recognition of all their duties and the allocation of more auxiliary personnel directly assisting with teaching, research and clinical and laboratory services. Account also needs to be taken of other efforts and achievements, such as achieving European diplomate status, and management work.

There are particular problems with research-based career progress in the clinical field:

- Firstly, the Department of Medicine and Surgery is a relatively 'young' department, and therefore does not have a well-established research base and infrastructure that granting agencies look for. This compounds the more general difficulty of clinical research receiving less recognition than basic research in terms of publications and support.
- Secondly, the workload is particularly high, due to the need to provide intensive clinical training and maintain a high standard and continuity of clinical services. This precludes research in its classical form. Furthermore, clinical staff will often be aiming to establish or maintain higher clinical qualifications, such as European diplomate status, which is an additional workload.

The team was impressed by the dedication of the staff to making the veterinary teaching hospital into a very effective teaching and clinical resource. The University should be proud of what they have achieved. We did however get the strong impression that clinical duties, excellence in clinical level, and administration were not recognised. This is clearly straining the staff. They are working at maximum capacity, a situation that is unsustainable in the longer term. More support staff, as mentioned previously, would help ease their burden. Greater recognition of clinical teaching and service duties and help in developing clinical research lines, would also help considerably. Such measures would provide a boost to morale that would help maintain the very positive momentum and energy that has built the Hospital up to its current standard.

10.3 Suggestions

- 10.1 The number of budgeted support staff directly assisting academic personnel with teaching, research and service work must be substantially increased.
- 10.2 The selection or attribution of support staff should take much more account of the needs and wishes of the department and section concerned, and the specificity of the duties and profile required.
- 10.3 The University should fully and fairly recognise the duties and efforts of staff, in particular clinical obligations and specialist skills, extra teaching efforts and management work.
- 10.4 The Faculty and University should ensure that breadth and diversity of staff positions and competencies are systematically maintained in all areas of veterinary science and teaching, paying particular attention to areas not explicitly covered under the current departmental structure and/or that have been assigned to associate teachers (e.g. welfare, applied meat hygiene, applied epidemiology, farm animal clinical work).
- 10.5 There should be more interchange of academic staff between both subject and geographical areas, in particular by offsetting the tendency to fill any post with VFM graduates and by trying to have more flow and interaction between different 'knowledge areas'.
- 10.6 Staff should be support in their efforts to gain more time and resources for research work and publication (see also Suggestion 13.3).

11. CONTINUING EDUCATION

11.1 Findings

The Faculty has organised around 15 continuing professional education (CPE) events annually for the past few years, typically lasting about 10 – 50 hours (an overall total of 1123 hours), and with 15 – 60 participants (a total of 3575 participants). The range of fields and topics is broad.

Academic personnel are also frequently involved in continuing education courses organised by external organisations, contributing to courses that totalled 730 hours attended by 2621 participants in total.

CPE is currently voluntary in Spain, and not linked to the right to practice. Participants receive a certificate rather than this being noted in a professional register. There is currently not a national CPD committee to oversee, recognise and accredit such activities.

The Faculty remarks that continuing education has historically not been a major activity, since traditionally this has not been a responsibility of Spanish faculties, and this attitude changes only slowly. There is also no administrative, economic and organisational back-up to support continuing education projects. Such activities are therefore mainly undertaken as personal initiatives by the academic staff, with no aid or academic recognition from the University.

11.2 Comments

Academic staff, graduated students and veterinary practitioners all agree that continuing education is required to guarantee good veterinary services.

The provision of CPE programmes is a useful way of strengthening relations with practitioners, to keep them aware of the competencies and support available at the Faculty, and also to get feedback on their needs and concerns.

11.3 Suggestions

- 11.1 In collaboration with the local veterinary chamber, the Veterinary Faculty should seek to develop its continuing professional education activities.

12. POSTGRADUATE EDUCATION

12.1 Findings

As postgraduate work, the Faculty and departments support or provide;

- a graduate thesis;
- taught courses (Masters, specialist, training courses);
- Ph.D. programmes
- clinical training positions

Up until 2006, postgraduate education was a departmentalised activity. To adopt to the Bologna Declaration, postgraduate studies are now the responsibility of the Faculty, with a Vice-Dean in charge of their co-ordination and implementation.

Graduate Thesis

Graduate students can prepare a dissertation as an initiation to research activity. This is supervised research work carried out within, and assessed by, a department. The grade obtained is included in the student's record. The number of dissertations carried out every year is low, as graduates students prefer to start work. Most of the students who prepare dissertations do so as a prelude to Ph.D. work.

Taught courses

The Veterinary Faculty organises courses for graduate students wishing to expand their knowledge or to increase their specialisation in a particular veterinary field:

- University Master, with a minimum duration of 50 credits (500 hours), normally taking two years. It comprises theoretical and practical teaching, and may also include external practices. Masters are currently running in Biology and Reproduction Technology (15 + 12 students), Porcines (13 students), and Food Technology, Nutrition and Health (4 students);
- University Specialist, with a minimum duration of 25 credits (250 hours), and a minimum duration of one academic year. It includes theoretical and practical work. Specialist courses on Food Quality and Safety (2 students) and Food and Health (1 student) are currently running;
- Training courses with a minimum duration of 3 credits (30 hours), including theoretical and practical activities. These courses are usually given in a week.

The Veterinary Faculty also participates in Master's courses run by other academic bodies, such as in Classic Homeopathic Medicine. The students enrolled in these courses do not get a salary, but may be eligible for some complimentary funding.

Ph.D. programmes

Ph.D. studies have to be approved by the Doctorate Commission of the University of Murcia. Up until recently the implementation of the proposed programme is a departmental responsibility, mostly fulfilled by the staff of the particular department, but this is now changing (see above).

Ph.D. programmes are organised into two phases:

- Proficiency in Research ("*Suficiència Investigadora*"), divided into a 20-credit 200 h taught component during the 1st year, and a 12-credit (120 hours) experimental research project, concluded by a dissertation summarising the results and conclusions. 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 a minimum of two years for full-time students who have completed the *Suficiència Investigador*, and a longer period is often required.

In addition to the classical thesis-based format, a Ph.D. can also be awarded upon presentation of a compilation of scientific papers, including (by University regulation) a minimum of 3 published or accepted papers in journals of listed impact factor.

Ph.D. programmes are currently offered in:

- Medicine and animal reproduction (16 students participating)
- Food Technology, Nutrition and Bromatology (10 students participating)
- Biology of Mammals Reproduction (10 students participating)
- Fish Biology: Basic and Applied Aspects (10 students participating)

A programme 'Production and Health in Swine and Small Ruminants' is also mentioned, but no students are currently enrolled. Staff working in the FVM also participate in several other Ph.D. programmes run by other faculties.

Clinical training positions

With the Veterinary Teaching Hospital, the Department of Animal Medicine and Surgery awards grants to train graduate students in the different clinical services of the Hospital. In most services (there were in total 10 graduates on grants at the time of the visit) these are one-year positions. Although the Veterinary Faculty is included in the training programmes of various European Veterinary Specialisation Colleges (ECVDI, ECVCP, ECRDA, ECVIM-CA Cardiology), financial constraints have largely precluded the FVM offering residency programmes. A three-year residency in diagnostic imaging has recently been started, supported with the help of an external sponsor.

During the clinical training interns and residents conduct clinical activities, learning diagnosis and treatment methods. Clinical sessions are conducted twice a week to help improving their clinical education. The interns and residents receive a salary from Murcia University and are considered as postgraduate scholarship holders.

12.2 Comments

A reasonable number of postgraduate courses are offered within the Faculty. As noted earlier, the Veterinary Faculty should act as a focal point for veterinary science, and the team was pleased to note that it now has an academic role in postgraduate education. In this context, the current system of intradepartmental Ph.D.'s with a very substantial but internalised taught component and a correspondingly shortened research project is not the most appropriate structure for what should be the 'gold standard' of postgraduate work:

- Intradepartmental work depends far too heavily on the knowledge base of the existing staff, in a system that tends to appoint and promote internally (i.e. has no influx of 'new blood', or at least 'fresh new blood').
- There is in contrast no platform of generic academic skills, such as statistical analysis and significance, experimental planning, technical writing, pedagogics, etc. This could be efficiently imparted at a University level as a foundation for all those starting science doctorates;
- The two years for Ph.D. research *per se* is short relative to most countries

It would be better to have Ph.D. programmes with a relatively short taught part covering generic research skills, organised on a Faculty-wide or University-wide basis, followed by an extended period for Ph.D. research and publication.

Having a route for the award of a Ph.D. based on a compilation of published papers is a good development. A minimum publication requirement (in terms of both their number and impact factor) should be encouraged as a means of providing a defined and externalised standard for doctoral work.

The team was concerned to find doctoral students being counted among the 'support staff'. It seems to be particularly difficult for clinical Ph.D. students to fulfil their programmes, as they have to spend a lot of their time dealing with work which would normally be done by support staff. Whilst there is undoubtedly a very strong need for more support positions, it is inappropriate that Ph.D. students should fill this role.

It seems that in some Ph.D. programmes financial support for attending meetings and conferences is missing.

The clinical positions for graduate students are a highly useful innovation. They provide clinical

experience for the participants, underpin clinical services, and can support teaching activities.

The residency training programme in Diagnostic Imaging is a very positive development on the part of the HCV and the Veterinary Faculty. Such programmes provide good support to clinical training and service work, and contribute substantially to the development of professional veterinary activity. Clinical training programmes 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 further promote the need for a minimum number of publications of a certain impact factor as a requirement for the award of a Ph.D.
- 12.1 The Ph.D. degree should be more clearly oriented towards research, with a much shorter taught component that is a Faculty- or University-wide programme covering generic research skills, and a considerably extended research element.
- 12.2 More funding should be provided for offering training programmes in various European Veterinary Specialisation Colleges and for supporting participation of postgraduate students in scientific meetings.

The need to increase the support staff, so that this work does not have to be dealt with by staff or postgraduate students, is outlined in Chapter 10.

13. RESEARCH

13.1 Findings

Research is a departmental responsibility, conducted in the knowledge area and field of interest of the unit and the academic staff, with international connections in some departments. The Faculty has no role. Most of the departments have sufficient infrastructure to perform the research. The University has established some central research facilities, where expensive and/or complex research methods (e.g. electron microscopy) or support services (e.g. experimental animal unit) are available for the different departments on the Campus to use.

Papers of the Faculty are published in national and international journals, and by national statistics for 2006 the VFM is ranked the second highest veterinary faculty in terms of the number of scientific papers and contributions.

Students can participate in the research activities at the Faculty as undergraduate ‘intern’ students (*alumnos internes*) or through collaboration grants. They can also work on research activities on a voluntary basis, or as part of a scheme of research prizes.

Around 21% of students participate in research activities as *alumnos internes* with a particular department. Each department offers places for intern students, awarded after an open competition and interview. An intern student receives no payment, but the work will go on their record.

Department	No. of intern students
Compared Anatomy and Pathological Anatomy	19
Animal Medicine and Surgery	58
Animal Production	28
Animal Health	25
Food Technology, Nutrition and Bromatology	6
Other Departmental Units	13
TOTAL	146

The Ministry of Education and Science offers awards called ‘Collaboration Grants’ (€2,854 in 2005/06) with the aim of allowing students to start research tasks through their collaboration at the Departments. Only final year students with good grades can apply for such grants, and submit their CV and a collaboration project approved and graded by the Department Council. Successful students receive around 2,300€ and are exempt from fees for an year. Last year, the Veterinary Faculty had 5 grants available (out of 70 grants at Murcia University), although only 2 students applied successfully.

13.2 Comments

As already remarked, as an academic establishment, the Faculty should be a focal point for veterinary science to provide a clear overall strategy and a main research focus. Direction of research at Faculty level could create particular Faculty-wide themes or strong points, to make more cohesive and effective use of human and physical resources.

Research activities are currently fragmented into departmental or individual fields of interest, which in some cases means they are outside mainstream veterinary work. In some departments a more interdisciplinary research interaction should be established, as this is currently a matter of personal relationships.

As remarked in Chapter 10, the team had concerns about the balance between teaching and research work due to the difficulty in finding the time and money to research and prepare publications. Staff need to have more support and time to increase their research activities and output. Clinical research is a particular challenge.

Undergraduates are provided with adequate opportunity for involvement in research activities in a department.

13.3 Suggestions

- 13.1 The Faculty *per se* should have a coordinating and focussing role in the research activities conducted within the Faculty, and establish a strategy for developing research and its funding.
- 13.2 There should be more interdisciplinary coordination and integration of research activities, which should be directed towards mainstream veterinary activity.
- 13.3 A special effort should be put into increasing the involvement of the clinical staff in research, perhaps through more joint projects with the pre- and para-clinical sciences.

Suggestion 10.1 refers to the need for more support staff, which is essential to increasing the research capacity of the academic personnel.

CONCLUSIONS

The Veterinary Faculty of Murcia has made many changes and huge progress since the last evaluation visit in 1996. The Faculty has the advantage of having a good campus location that provides easy access to both the town and the surrounding agricultural area. Its facilities are generally modern, spacious and well-equipped, and have been markedly improved by the addition of a new teaching hospital and farm. A welcome reduction in student intake, a new curriculum that significantly increases the proportion practical work in the teaching, and the Faculty's own efforts to increase clinical training are also worth noting as very positive developments.

Nonetheless, the Faculty still faces challenges. It is noticeably constrained in its activities by a regulatory framework that is often not easy or effective work with. The hours and timing of all obligatory undergraduate subjects are specified by a national curriculum, which is an overly prescriptive way of regulating a dynamic subject such as veterinary medicine. A noticeable weakness of this mandatory current curriculum is that too much time is spent on basic and agronomical sciences, leaving too few hours for clinical disciplines. The team was pleased to see that the Faculty has gone to considerable effort to compensate for this shortcoming by clearly orienting animal health teaching towards clinical aspects, and providing part of the pre-professional training in the teaching hospital.

The way teaching is organised is a further issue that needs to be addressed. Under the Spanish university structure, faculties and departments are parallel bodies. There is no central body with the authority to direct academic activities in the veterinary field. A 'faculty' only facilitates, encourages and provides administrative coordination of teaching, and it is the departments that are responsible for academic activities in each defined 'knowledge area'. This includes autonomy over the content, delivery and examination of teaching, with each core subject having to be assigned to a University department that is permitted to cover the 'knowledge area' of that discipline. Since many subjects are taught using locally-produced textbooks and course manuals as the reference material rather than international titles, the teaching can be very internalised.

Defining and teaching a veterinary curriculum in such a way means the core course is formally compartmentalised into a set of self-contained subjects. This leads to gaps and other weakness, along with a substantial weakening of the interdisciplinary linkage essential in a veterinary course. Particular difficulties arise with topics that are less traditional, and not in themselves a defined 'knowledge area' or national curriculum subject, such as an absence of coherent teaching in animal welfare and veterinary epidemiology. There is a clear need for an authoritative Faculty-level body that provides more cohesion and overall direction to the veterinary course. This should ensure that subjects have a clear and direct orientation to their application in veterinary activity or in subsequent parts of the course. There also needs to be explicit provision for interdisciplinary teaching, including integrated coverage of subjects that span more than one classical discipline.

The need for closer linkage of subjects is most evident in the production animal field where an integrated approach to monitoring and control of animal health and food safety right through the food chain is becoming a very clear veterinary responsibility under European law. The current subdivision of teaching does not reflect this, and one serious concern was that, even within the clinical field, bovine medicine, surgery and obstetrics seems in practice to fall between departments and not be adequately covered. More generally, the teaching on animal production, food safety and farm animal clinical work need to be merged, so that there is not a formal separation of the teaching on the 'healthy', 'sick' and 'eaten' animal. This teaching should focus strongly on the modern farm animal veterinary roles and obligations, using a multi-factorial case-based approach to the analysis and management of health, productivity, safety and economics of production animal populations.

University regulations oblige students to spend 10% of course hours on free choice subjects that can be irrelevant to veterinary studies. This is inappropriate for an already overloaded course with structural imbalances.

The team was pleased to note the increase in the proportion of practical work on the course to a satisfactory level. However, this practical work is not being adequately funded, with the expenditure on

teaching being currently far higher than the budget for this activity. The formula used for the allocation between the faculties and departments of the University does not take account of the fact that veterinary training is inevitably one of the most expensive forms of education. There is a need for more teaching equipment in several laboratories, and more general problems with funding for the purchase, maintenance or replacement of equipment that is not funded through research.

The new Veterinary Teaching Hospital and University Teaching Farm should be highlighted as very 'visible' additions that make a major contribution to improving the extent and quality of teaching. The teaching farm should be used to the maximum extent in student training, and a dairy herd could be added to give access to more material in this species. The Hospital provides active and comprehensive clinical services, including a 24-hour service, which are essential for professional undergraduate training. Managing and administering these two new facilities is a heavy burden of particular individuals on the academic staff, and this work needs to be recognised and assisted.

The team was pleased to note the increase in the academic staff over the past few years. The improvements made in veterinary training owe a great deal to the dedication and enthusiasm of the staff. It was therefore of concern to note that staff had a heavy teaching load, limiting time for research, and that in some cases they felt that this was not recognised in terms of career progression. This is a particular problem in the clinical field, where staff have to provide intensive hands-on training in smaller groups than officially recognised, as well as ensuring the standard and continuity of clinical care.

A serious concern of the team was the very low number of auxiliary staff which is clearly insufficient to support teaching, research and service activities at the Faculty. Support staff roles are having to be undertaken by academic staff, which is not appropriate or efficient, and add further to their workload. This issue needs to be addressed by the University and Faculty as a matter of urgency.

The Spanish university organisational structure means that the Faculty has virtually no role in research. As the focal point for veterinary science in the region, the VFM should have responsibility for guiding, coordinating and overseeing such activities, rather than them being fragmented into the priorities of 'knowledge areas'. In this context, the recent changes in respect to the Faculty involvement in postgraduate training are very encouraging.

The Faculty has been very successful in building up its activities and credibility, and overcoming material and administrative challenges. With modern facilities, dynamic and effective staff and motivated students, it can look forward to developing further, but needs the support of the University and national authorities to address some remaining shortcomings. The team is confident that with the support of the University and the local agro-veterinary sector it will do so.

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).

- 4.16 The clinical training on cattle must be improved so that each student has exposure to routine obstetrical, medical, surgical and production-related disorders.

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 Faculty should have objectives and a central role in research and postgraduate training in the veterinary field.

2. ORGANISATION

- 2.1 The Faculty should have more authority to direct academic activities towards overall veterinary goals, most importantly particular to direct the content and delivery of teaching towards the stated objective of training a professional veterinarian.
- 2.2 Within the constraints of relevant legislation, the size of the Faculty Board should be reduced, to make it a more effective governing body, with the Directors of the Veterinary Teaching Hospital and the Veterinary Teaching Farm being members of the Faculty Board *ex officio*. It must be clear that the 8 committees are sub-committees of the Faculty Board and their duties are to propose policies and procedures to the Board intended to improve the quality of undergraduate veterinary teaching.
- 2.3 Every attempt should be made to improve cooperation and coordination between the departments responsible for teaching the veterinary undergraduate course, the Veterinary Teaching Hospital and the Veterinary Teaching Farm – if necessary by establishing an informal discussion group consisting of the Heads of Departments, the Directors of the hospital and the farm and the Dean's team (as per Suggestion 2.2 and 10.2, for example).
- 2.4 The University has to take more account of the specificity and needs of the veterinary degree in the decision-taking process.

3. FINANCES

- 3.1 The University funding system has to take account of the extent to which a degree is experimentally-based, with a realistic accounting of the actual costs of a training programme.
- 3.2 Teaching activities, in particular the provision of a well-structured programme of practical work, must be adequately funded.
- 3.3 The Faculty has to have more financial means and influence, in particular to direct and support interdisciplinary curricular development.
- 3.4 The Faculty must have a budget line for the maintenance and replacement of equipment for teaching use, in particular for practical and laboratory teaching and in the Veterinary Teaching Hospital.

4. CURRICULUM AND TEACHING

4.1 GENERAL

- 4.1 The current system of compartmentalised subjects attributed to specific departments should be changed to explicitly permit and encourage interdisciplinary teaching, with the aim of:
- giving the Faculty more control and flexibility over the attribution of core teaching to the most appropriate teacher(s) or unit(s);

- providing external control and feedback on the teaching programmes to ensure these are well oriented towards other veterinary disciplines and professional activity.

- 4.2 The philosophy and structure of the veterinary course should be changed to that it explicitly encourages interdisciplinary teaching, and promotes active horizontal and vertical interlinking of content.
- 4.3 The curricular hours spent on basic and agronomical sciences should be reduced, and the time dedicated to clinical subjects increased.
- 4.4 The overall curricular load should be reduced, in particular through continuing to reduce the number of lectures. Students should be encouraged or required to cover relevant issues of detail through self-directed learning.
- 4.5 The Faculty and curricular authorities should aim to increase the amount of intramural hands-on clinical training in the core course, and extend the duration and continuity of such hands-on work.
- 4.6 The VFM should consider developing the 'optional' subjects into more structured differentiated tracks.
- 4.7 The time spent on 'elective' subjects should be transformed into hours spent on something of clear and direct veterinary relevance.

4.2 BASIC SUBJECTS AND BASIC SCIENCES

- 4.8 The teaching in the basic sciences should incorporate more material from, and links to, their role and application in subsequent disciplines and professional activity, preferably through joint or integrated teaching.
- 4.9 The timing of some of the basic sciences within the curriculum should be reviewed, considering what the aim of the discipline is within the veterinary course.

4.3 ANIMAL PRODUCTION

- 4.10 The content of the animal production teaching should be comprehensively reviewed, with the aims of:
- significantly reducing the number of teaching hours in this field (see also Suggestion 4.3);
 - eliminating detail that is not of primary importance to mainstream veterinary activity; and
 - clearly orienting all subjects to their applied use in professional activity with production animals.
- 4.11 The teaching relating to production animals area should be closely integrated, merging animal production aspects with the teaching on animal health and care, and linking this to issues of safety and quality of food of animal origin.
- 4.12 The teaching on animal welfare should be reinforced, and given an applied approach.
- 4.13 The teaching on general epidemiology should be reduced in favour of training in applied quantitative epidemiological methods much later in the course.
- 4.14 Teaching at the Farm needs to be genuinely "hands on" and should be reinforced by visits to commercial farms in the region, followed up by discussion - led by teaching staff - about the good and bad aspects of the premises visited.

4.4 CLINICAL SCIENCES

- 4.14 A clear structure and set of applied learning aims should be developed and introduced for the clinical training programme of the VFM.
- 4.15 The teaching on farm animals and production needs to be clearly focussed on the applied veterinary role in ensuring the health and productivity of farm animal populations, and adopt an integrated and proactive approach to the management of herd health.
- 4.16 (*Category 1 suggestion*).

4.5 FOOD HYGIENE

- 4.17 The integrated ("feed to food") approach of monitoring and controlling of animal health and food safety right through the food chain approach, which is becoming a very clear veterinary responsibility under European laws, should be reflected in the structure and orientation of the veterinary training.
- 4.18 In the field of meat inspection, as well as veterinary public health, there should be much greater interaction with other disciplines, such as pathology - pathological condition of organs; epidemiology, epizootic disease control, animal welfare, etc..
- 4.19 In the slaughterhouse where practical training in meat inspection for students is organised, the vacancy of the position of the responsible veterinarian should be filled as soon as possible.

5. TEACHING: QUALITY AND EVALUATION

- 5.1 The Faculty and departments should continue to develop the teaching methodology towards one where self-directed learning and problem-oriented teaching plays an increasingly important role.
- 5.2 The Faculty and its component departments and staff should base its teaching around international textbooks and similar material from external sources, not around internally-generated and self-validated content.
- 5.3 Students should have to pass the examinations in appropriate foundation subjects before being permitted to enrol for more advanced subjects.
- 5.4 The Faculty and departments should develop examinations, so that they test skills in the acquisition and application of knowledge, not primarily the ability to memorise.
- 5.5 Individuals who will be subsequent 'users' of students (e.g. in later disciplines, or as employers), or who can otherwise bring a valid external perspective, should participate in the examination process.

6. PHYSICAL FACILITIES AND EQUIPMENT

- 6.1 The Faculty should consider establishing shared teaching laboratories, with the associated support staff for running them.
- 6.2 Maximum use should be made of the Teaching Farm for integrated and applied training on the production and health of farm species.
- 6.3 To compensate for the relative lack of dairy farms in the region, the Faculty and University should seriously consider the addition of a dairy cattle herd to the Teaching Farm.
- 6.4 The University and Faculty should give maximum support and help to establish comprehensive species-based clinical services under the constraints of the Spanish academic regulations, and, specifically to integrate cattle medicine, surgery and production-related health issues with the current infectious and parasitic disease activity.
- 6.5 The Veterinary Teaching Hospital, with the support of the University and Faculty, should have an organisational structure, status and *modus operandi* that maximises its flexibility and effectiveness to deliver clinical training and services of a high standard and continuity.
- 6.9 The importance and workload of the role of the Hospital Manager should be formally recognised and supported

7. ANIMALS AND TEACHING MATERIAL OF ANIMAL ORIGIN

(Suggestions relating to the issues in this section have been made elsewhere, notably in Sections 4.3, 4.4 and 6.1).

8. LIBRARY AND EDUCATIONAL RESOURCES

- 8.1 A systematic effort should be made by the FVM staff and the Study Plan, Teaching Quality and Analysis of Examination Results Commission to base the veterinary course on the active use of international bibliographic material.
- 8.2 The contents and availability of up-to-date and international textbooks on veterinary science in the Faculty and University Libraries should be reinforced.
- 8.3 Bibliographic resources in the veterinary field should be structured as a single coherent and professionally-managed collection, preferably within a single main library along with a subsidiary Hospital library for ease of consultation and study during clinical work.

9. ENROLMENT AND ADMISSION REQUIREMENTS

Suggestion 3.1 relates to adequately funding the veterinary course, which entails a modification of the current system based on student numbers.

10. ACADEMIC AND SUPPORT STAFF

- 10.1 The number of budgeted support staff directly assisting academic personnel with teaching, research and service work must be substantially increased.
- 10.2 The selection or attribution of support staff should take much more account of the needs and wishes of the department and section concerned, and the specificity of the duties and profile required.
- 10.3 The University should fully and fairly recognise the duties and efforts of staff, in particular clinical obligations and specialist skills, extra teaching efforts and management work.
- 10.4 The Faculty and University should ensure that breadth and diversity of staff positions and competencies are systematically maintained in all areas of veterinary science and teaching, paying particular attention to areas not explicitly covered under the current departmental structure and/or that have been assigned to associate teachers (e.g. welfare, applied meat hygiene, applied epidemiology, farm animal clinical work).
- 10.5 There should be more interchange of academic staff between both subject and geographical areas, in particular by offsetting the tendency to fill any post with VFM graduates and by trying to have more flow and interaction between different 'knowledge areas'.
- 10.6 Staff should be supported in their efforts to gain more time and resources for research work and publication.

11. CONTINUING EDUCATION

- 11.1 In collaboration with the local veterinary chamber, the Veterinary Faculty should seek to develop its continuing professional education activities.

12. POSTGRADUATE EDUCATION

- 12.1 The Faculty and University should further promote the need for a minimum number of publications of a certain impact factor as a requirement for the award of a Ph.D.
- 12.1 The Ph.D. degree should be more clearly oriented towards research, with a much shorter taught component that is a Faculty- or University-wide programme covering generic research skills, and a considerably extended research element.
- 12.2 More funding should be provided for offering training programmes in various European Veterinary Specialisation Colleges and for supporting participation of postgraduate students in scientific meetings.

13. RESEARCH

- 13.1 The Faculty *per se* should have a coordinating and focussing role in the research activities conducted within the Faculty, and establish a strategy for developing research and its funding.
- 13.2 There should be more interdisciplinary coordination and integration of research activities, which should be directed towards mainstream veterinary activity.
- 13.3 A special effort should be put into increasing the involvement of the clinical staff in research, perhaps through more joint projects with the pre- and para-clinical sciences.

Annex I: Intensification Tracks

Track 1: Medicine and Surgery.

Subjects	Hours of training							Total
	Course	Other tracks where the same subject is also offered	Theoretical hours	Practical work	Supervised work	Clinical work	Others	
Biology of Exotic Animals	3	2	25	20				45
History of Spanish Veterinary	3	2, 3 and 4	45					45
Alternative Methods to Animal Experimentation	3	4	15	30				45
Advanced Statistical Methods in Life Sciences	3	2, 3 and 4	20	25				45
Mathematical Models in Life Sciences	3	2, 3 and 4	20	25				45
Biotechnology in Porcine Reproduction	5	2	20			25		45
Veterinary and Clinical Cardiology	5	None	20			25		45
Equine Surgery	5	None	20			25		45
Dermatology in Small Animals	5	None	15		15	15		45
General Medicine and Examination of Experimentation Animals	5	None	20			25		45
General Immunogenetics Applied to Xenotransplantation	5	2 and 4	30	15				45
Ophthalmology	5	None	25			20		45
Exotic Animals Pathology	5	None	25			20		45
Diagnosis and Therapeutic Protocols in Internal Veterinary Medicine	5	None	20			25		45
Traumatology	5	None	20			25		45

gy and Orthopaedics in Small Animal								
Tumours in Domestic Animals	5	None	15	30				45

Table 4.3.2. Optional Subjects in Veterinary Curriculum. Track 2: Animal Production and Economy.

Hours of training								
Subjects	Course	Other tracks where the same subject is also offered	Theoretical hours	Practical work	Supervised work	Clinical work	Others	Total
Economic and Financial Analysis. Management of farms	3	None	15	15	15			45
Laboratory Animals	3	4	20	15	10			45
Apiculture	3	None	15	15			15**	45
Biology of Exotic Animals	3	1	25	20				45
Molecular Biology Applied to Veterinary	3	4	25	20				45
History of Spanish Veterinary	3	1, 3 and 4	45					45
Advanced Statistic Methods Applied to Life and Health Sciences	3	1, 3 and 4	20	25				45
Mathematical Models of Life and Health Sciences	3	1,3 and 4	20	25				45
Alternative Nutritional Resources. Environment and Farm Activity	3	None	30	15				45
Breeding of Pets and other Species	5	None	28	4		8	5**	45
Biotechnology of Porcine Reproduction	5	1	20			25		45
General Immunogenetics Applied to Xenotransplantation	5	1 and 4	30	15				45

Table 4.3.3. Optional Subjects in Veterinary Curriculum. Track 3: Hygiene and Food Technology.

Hours of training								
Subject	Course	Other tracks where the same subject is also offered	Theoretical hours	Practical hours	Supervised work	Clinical work	Others	Total
History of Spanish Veterinary	3	1, 2 and 4	45					45
Ingredients, Technological Innovations and Development of New Products	3	None	25	20				45
Advanced Statistical Methods in Life Sciences	3	1, 2 and 4	20	25				45
Food Microbiology	3	None	25	20				45
Advanced Mathematical Models in Life Science	3	1, 2 and 4	20	25				45
Commercial Life and Food Stuff and Elaborates	3	None	25	20				45
Hygiene, Inspection and Technology of Non-Animal Food	5	None	25	20				45
Food Technology of Animal Origin: Meat, Milk, Fish, Egg and Honey	5	None	25	20				45

Table 4.3.4 Optional Subjects in Veterinary Curriculum. Track 4: Animal Health.

Hours of training								
Subject	Course	Other tracks where the same subject is also offered	Theoretical hours	Practical work	Supervised work	Clinical work	Others	Total
Laboratory Animals	3	2	20	15	10			45
Molecular Biology Applied to Veterinary	3	2	25	20				45
Ecopathology of Wild Animals	3	None	30	15				45
Ecotoxicology	3	None	30	15				45
History of Spanish Veterinary	3	1, 2 and 3	45					45
Alternative Methods to Animal Experimentation	3	1	15	30				45
Advanced Statistic Method Applied to Life & Health Sciences	3	1, 2 and 3	20	25				45
Sanitary Environmental Microbiology & Parasitology:	3	None	15	15	15			45

Importance in Livestock Exploitation								
Mathematical Models in Life Science	3	1, 2 and 3	20	25				45
Extension in Clinical and Forensic Toxicology	5	None	15	7		23		45
Infectious Diseases in Bees	5	None	30			15		45
General Immunogenetics Applied to Xenotransplantation	5	1 and 2	30	15				45
Welfare and Breeding of Goats	5	None	30	8	5	2		45