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INTRODUCTION

The evaluation of the Faculty of Veterinary Medicine of Lisbon (FVML) took place from 2 - 7 May 2004. During this visit the team 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 second European evaluation of the Lisbon Faculty, the first having taken place in November 1989.

Several months prior to the visit, and well in advance of the minimum of two months required, the experts received a Self-Evaluation Report (SER) and the supporting documentation, which had been prepared by a team led by the Dean, Prof Lucila Ferreira. 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 Faculty of Veterinary Medicine is the oldest school of the Technical University of Lisbon (Universidade Técnica de Lisboa – UTL). FVML was founded in 1830 and joined the UTL at its creation from the merging of four higher education schools:

- Escola Superior de Medicina Veterinária;
- Instituto Superior de Agronomia (ISA);
- Instituto Superior de Ciências Económicas e Financeiras;
- Instituto Superior Técnico (IST).

Other institutes later joined the expanding UTL, which is now one of the four largest Portuguese Universities.

The creation of the University Campus at Ajuda, on the outer part of Lisbon is among the highlights of the recent history of UTL. The FVM relocated to this site from the city centre premises it occupied for many years. The expansion of UTL included a major involvement in the adjacent Science and Technology Park project, Tagus Park, covering about 400 acres in the Lisbon metropolitan area. However, the FVML remarks that this move to the new Campus happened under unfavourable circumstances: the budget for equipment was progressively cut by the government to a point that hindered the planned allocation of the sufficient equipment to make the buildings functional.

Portuguese Veterinary Education has substantially changed in the last decade. From being the only veterinary school in the country, FVM saw the opening, in swift succession, of four veterinary courses in Trás-os-Montes e Alto Douro (UTAD), Porto (ICBAS-UP), Évora (UE) and finally, a private University in Coimbra (Universidade Vasco da Gama).

As well as the five year veterinary course FVML presently offers a degree in Zootechnical Engineering, jointly with the Institute of Agricultural Sciences.

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

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

1. OBJECTIVES

1.1 Findings

Through its Scientific Council, the Faculty of Veterinary Medicine of Lisbon, adopted the general objectives stated in the definition of the ACVT (Advisory Committee on Veterinary Training), in: "*Evaluation of Veterinary Schools, Essential Requirements*":

"*The general objectives of the Veterinary Faculty of Lisbon are to provide adequate, research-based veterinary training which enables veterinary students to examine and treat sick animals, contribute to animal production whilst maintaining the animals' health and welfare, protect humans from zoonoses and ensure high-quality food products of animal origin for human consumption*".

These overall institutional objectives are pursued on several fronts, as follows:

- Promotion of the academic, scientific, technological and ethical development of Veterinary Surgeons, as well as their cultural and humanistic dimension.
- Assurance of a level of Veterinary Education adequate to the demands of modern world, founded in updated scientific research and solid technical basis.
- Development of undergraduate students skills necessary to proficient responses to the issues of: protection, promotion and maintenance of the health and welfare of animals; food technology, hygiene and safety; animal production; stimulating the willingness to pursue solutions for concrete problems of society, by achieving professional performances at the level imposed by globalisation.
- Provision of high-quality continuing education assurance, by the organization of post-graduate courses: academic degrees (Master and Doctorate) and other types of courses (up-dating and specialization courses), especially in the clinical area, following the scientific policy of the Faculty, structured since the Law of University Autonomy, by the directives of FVML's Scientific Council.
- Attainment of satisfactory qualitative and quantitative indicators, required by the entities evaluating Veterinary Education, both at National and European levels.
- Provision of conditions for a permanent improvement in the qualifications and proficiency of FVML's teaching and non-teaching staff.
- Stimulation and provision of conditions for the execution of fundamental and applied research projects within the scope of Veterinary Sciences.
- Provision of the surrounding community with high quality services, in a perspective of mutual benefit and progress.
- Promotion of cultural, scientific and technical exchange with national and foreign peer institutions, in the perspective of globalisation.
- Contribution to international cooperation and the closeness between countries.

Furthermore, after a two-year debate in small groups and general meetings, FVML complemented these general objectives with a list of competencies and aptitudes (or specific objectives), which every student at graduation should master. These competencies were approved by the Scientific Council in May 2000, and later ratified by the Consultative Council. The educational objectives are listed in Appendix I.

The FVML cites as its main strengths:

- the high qualification and experience of the teaching staff;
- the high education level of the students that are accepted for the course;
- a rise in scientific and research activities and the associated financial support;
- the access to outside facilities, such as slaughterhouses, National Animal Production Station, National Horse-Mounted Police and numerous farms around Lisbon, mainly for clinical work.

As its main weaknesses, the FMVL mentions:

- a steadily reduced budget from the state, regardless of the standard of activity;
- an officially imposed teaching staff:student ratio, which is inadequate;

- the high running costs of the new facilities;
- the lack of an experimental farm belonging to the Faculty;
- difficulties in employing technical and administrative personnel;
- the absence of a parallel research career;
- the absence of a parallel clinically-based career structure (internships, residencies and specialisation).

In view of the current situation of Higher Education funding, FVML is also trying to establish programme-contracts with the Ministry, in order to support critical areas of development, namely the Veterinary Hospital and other clinical training activities.

1.2 Comments

The Faculty has a clear statement of objectives in both overall terms and in the detail of student competencies sought. The stated objectives adequately cover education (undergraduate, postgraduate and continuing professional education), research, and service provision, and correctly prioritise undergraduate education. The objectives are focussed on the specific aspects of individual animals. However, the importance of herd health monitoring and preventative veterinary medicine are not mentioned in the objectives.

Some activities and areas of the Faculty are noticeably under-developed and in order to effectively implement the stated objectives, and for the general management of the Faculty, FVML needs to enhance its level of strategic management. The need to have a more strategic approach and a more analytical basis, to some of the activities of the Faculty have been mentioned in other chapters of this report.

The team would agree with many of the strengths and weaknesses stated by the Faculty.

As additional strengths, the team considers that the Faculty should have mentioned the urban location and the functioning of the small animal clinics.

As additional weaknesses, the team considers that the Faculty should have mentioned the lack of caseload in the large animal clinics. It was noted that despite the 4-department structure, the Faculty actually functions as small and separate sections (see chapter 2). This leads to a lack of integration and coordination of departmental activities. The need to structure and develop integrated clinical activities at the Faculty is a particular challenge.

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 role of herd health monitoring and preventative veterinary medicine should be mentioned in the objectives.

1.2 FVML should enhance its strategic management and seek to establish a more analytical basis for its activities.

2. ORGANISATION

2.1 Findings

The Faculty of Veterinary Medicine is part of the Technical University of Lisbon (UTL). This is one of the four largest Portuguese Universities, with 1,900 teaching staff (of which more than 65% have Ph.D. Degrees), 20,000 undergraduates and 3,000 post-graduate students. UTL's overall budget is nearly 180 million Euro and it provides 231 different higher education degrees.

The organisation of public universities and other High Education institutions are governed by a University Autonomy law, which gives a common framework to all university governing boards.

UTL has a decentralised organisational model. All Faculties have full administrative, financial, pedagogical and scientific autonomy and therefore the central bodies of UTL, namely the Rector, the Senate and the University Assembly, have a fundamental, but largely coordinating, role to play in the management of UTL.

The Rector is elected by the University Assembly for a four-year term of office, which can be renewed once. The Rector is assisted by a team of four to six professors; three Vice-Rectors, to whom the Rector can choose to add, two or more Pro-Rectors. The Rector's Office has an administrative and technical staff of around 70 people.

The Senate and the Assembly, chaired by the Rector, are composed of representatives from the different faculties, including teaching staff, students and administrative staff.

The UTL has an Advisory Council composed of former Rectors, Counsellors (proposed by the Faculties and elected by the Senate) and representatives of professional, social and economic organisations related to the fields of activity of the University.

The main executive bodies of the FVML are the Assembly of Representatives, the Directive Council (Dean's Office), the Scientific Council, the Pedagogic Council and the Administrative Council. These boards are elected by and composed of representatives from teaching members, students and staff, apart from the Scientific Council, (which is composed exclusively of Professors), and the Administrative Council, (which is composed of the Dean, the Faculty Secretary and the Financial Director). FVML also has its own Consultative Council, which provides an interface between the public and the Faculty.

The Assembly of Representatives (AR) is an elected body of 39 members, representing students (15), technical and administrative staff (5) and teaching staff (15), along with the Dean, the President of the Scientific Council and two representatives of the Students Association. Representatives are elected every two (students) or three years (teaching and non-teaching staff). The main functions of the AR are the approval of the school statutes, supervision of the activities of the Dean's Office, the evaluation and approval of the annual report of activities and the annual plan of activities for the following year, both prepared by the Dean's Office.

The Dean's Office is comprised of three representatives of the teaching staff, three representatives of the students and one representative of the non-teaching staff and is responsible for:

- The general management of the Faculty;
- The fulfilment of the rules and the regulations concerning the administration of the school;
- The implementation of some directives from the Scientific and Pedagogic Councils;
- The connection with the Rector, the Ministry of Science and Higher Education and all the outside authorities.

Several committees assist the Dean in the execution of FVML's policies, in association with the councils and departments of the institution, such as the Technical Support Team, the External Relations Office, the Bioethics Committee, the Planning Group, the Computing Affairs Committee, and the Self-Evaluation Committee. The Secretary of FMVL assists the Dean in all aspects of administration and is responsible for academic affairs, staff, and financial administration.

The Scientific Council is composed of all the full time lecturers with a Ph.D. or equivalent and currently has 58 members. The President and the Vice-President are elected in a plenary session every three years. The Scientific Council is responsible for the definition and implementation of teaching and scientific research strategies, and plays a leading role in matters such as career development, planning disciplines and courses to be taught, and the approval of master and doctorate candidates. Most of the time, the Scientific Council works through a restricted group called the Coordination Committee.

Several committees report directly to the Coordination Committee, thus to the Scientific Council *viz.*: the Final year curricular Training Committee, the Degree Equivalence Committee, the Socrates-Erasmus Office, the Merit Scholarship Committee and the Post-Graduation Committee. These deal with specific areas of responsibility.

The Pedagogic Council is composed of 6 members, 3 teachers and 3 students, elected by their peers, every 3 years. This is an advisory board that cooperates with the other Councils in the planning and current operation of the teaching duties of the Faculty.

Up until November 2003, the Faculty was divided into 3 Departments:
- Department of Animal Production;
- Department of Food Technology and Animal Health;
- Department of Morphology and Clinics.

However, the FMVL was recently restructured into 4 departments:
- Department of Morphology and Function;
- Department of Animal Production and Food Safety;
- Department of Animal Health;
- Department of Clinics.

Table 10.1 shows the distribution of staff between departments.

The main responsibilities of departments are the organisation of teaching and research, as well as providing services to the community in their respective fields of expertise. Each department is headed by a President, who is elected by the members of that department once every three years.

Students are organised in Student Unions that take a direct but not exclusive part in the representation of students in the governing bodies of UTL. The Students Union is independent from all FVML boards, and organises an annual symposium as well as other activities, such as:
- Workshops and one-day conferences by well-known speakers, sometimes with sponsorship;
- Cultural activities;
- Edition of the Association's own biannual scientific magazine, supported by the national Science and Technology Foundation.

There are regular meetings (3 to 4 per year) between the five veterinary Faculties in Portugal and the OMV (Portuguese Veterinary Chamber) in order to exchange ideas about veterinary teaching and professional needs.

2.2 Comments

The FMVL has a good degree of autonomy in managing its own affairs.

The various structures of the University and Faculty seem to provide for effective representation of groups concerned with and involved in veterinary education.

Whilst there are several committees responsible for Faculty activities, in several areas there seems to be a lack of clear coordination or integration of activities. For example, the Pedagogic Committee seems to have a mainly administrative role of coordinating timetables, examinations, etc. There is not a clear impetus or mandate to bring forward proposals on a new curriculum or teaching content, or to develop or implement new teaching methodologies. The decision-taking process on the curriculum seems to be slow. A proper

authoritative curriculum committee is needed in order to enable FVML to have a flexible and modern curriculum which answers the current needs of the veterinary profession.

Similarly, there is no body that provides a 'strategic' shape or direction to clinical activities, either as a service, or as a teaching activity (see also Section 6.2).

Although the Faculty is in principle structured as four departments, in practice it functions with rather separate small sections, each with its own teaching responsibilities and 'territory' (see also Chapter 6). Cooperation on resources, teaching programme, etc. between these sections, even those working in closely-related areas and in the same department is in several cases less than optimal. This reduces the efficiency with which resources are used. The fragmented organisational structure is reflected in a curriculum that is composed of a large number of distinct and separately-taught disciplines with little evidence of vertical or horizontal integration (see Chapter 4).

The level of interaction between departments and sections needs to be improved to give more effective coverage of teaching service and research areas. This applies particularly to integration of areas such as animal production, epidemiology and food safety where improved integration with the clinical departments will provide an integrated approach towards veterinary education in the latter part of the study period.

2.3 Suggestions

2.1 There needs to be improved coordination and integration of Faculty activities to enable more cohesive activities, and so that equipment and teaching resources can be used to their best capacity.

2.2 There is a need for an authoritative curriculum committee that can constantly review the curriculum and adapt it to current needs.

3. FINANCES

3.1 Findings

The income and expenditure of the FMVL are summarised in Tables 3.1 - 3.2, expressed in Euro, and relate to the 2003 calendar year. The overall budget of UTL is nearly 180 million Euro while that of the FMVL is approximately 7.5 million €.

Table 3.4 Total revenues of FVML in 2003

	€
a. revenue from the State or Public authorities	**5,008,921.00**
b. revenue from private bodies	**0.00**
c. Revenue from research (1+2)	**1,220,744.00**
1. EU Funds	**813,868.32**
ASF Control	238,406.94
Tradisausage	36,108.00
Vet 2020	154,562.96
TSE-SR Network	20,558.00
FAIR (epidemology)	23,839.23
Prodep (Final year training)	252,314.19
Remainder from previous year	88,079.00
2. National Funds	**406,875.68**
FCT (CIISA)	109,070.40
FCT(POCTIS)	83,350.00
FCT(PRAXIS)	864.37
IFADAP (AGROS)	65,806.67
INFARMED (Antibio-resistance)	3,656.00
LNIV(AGRO)	4,339.54
ITQB	897.94
Sócrates/Rectorate	1,366.76
Remainder from previous year	137,524.00
d. revenue earned and retained by the establishment	**1,122,764.00**
d.1 registration fees from students	381,471.00
d.2 revenue from continuing education	45,288.00
d.3 revenue from clinical activities	564,330.00
d.3.1. small animals	536,551.61
d.3.2. large animals	12,734.22
d.3.3. ambulatory clinics(1)	15,044.18
d.4 revenue from diagnostic activities	131,675.00
e. revenue from other sources	**221,744.00**
e.1. Financial applications (interests)	5,676.00
e.2 rentals of space and equipment	42,059.00
e.3 other	174,009.00
f. Total Revenue from all sources	**7,574,173.00**

The main budget element is government funding provided through the Ministry of Science and Higher Education (MCES). This allocation is calculated using a complex formula, based mainly on the standard teacher:student ratio assumed by MCES as appropriate for each type of degree, and the standard costs of training per undergraduate student, also decided for each type of degree. For veterinary medicine in 2004, the teacher/student ratio used is 1:9. This compares with a ratio of 1:6 for medical schools and performing arts, 1:11 for subjects such as engineering and agriculture and 1:20 for political science degrees. The standard cost per graduating student per year is 6,627.00 Euro, which is the highest within UTL, and compares with 5,443

Euro for agricultural studies, 4,091 Euro for Political Sciences and 4,060 Euro for Computer Engineering.

An additional allowance (7,159 €) is provided according to the number of M.Sc. students enrolled (but not for Ph.D. or post-doctoral students) There is also an allocation proportional to the number of teaching staff with a doctorate degree.

The budget for non-teaching staff salaries is based on a standard non-teaching staff/teaching staff ratio, imposed by MCES as appropriate for each type of degree. For veterinary studies, this is 0.85:1, which is the highest for any course, and equivalent to medical studies.

This government funding is allocated in 1/12 fractions every month (mainly for paying staff salaries), and remains in the possession of the government's treasury.

In addition to the funding originating from MCES, FMVL has its own revenues which it retains in full. The minimum and maximum registration fees for undergraduate students are decided annually by MCES. The registration fees for postgraduate degrees (M.Sc. and Ph.D.) are determined by the University Senate. Charges for continuing education are determined by FVML alone.

The Dean's Office fixes the overheads to be charged from research projects carried out in FVML, generally between 10 to 20% of the total amount of the project.

Table 3.2: Expenditure of the establishment

Item	€	%
Salaries		
- teaching staff	3151801	41.78
- support staff	1464723	19.42
- research staff	328249	4.35
Operating costs		
- specific to teaching	385063	5.1
- specific to research	842442	11.17
- general operations	866401	11.48
- of which clinical staff ("non-teaching staff")	465000	
- Utilities	430655	5.71
Equipment		0
- Research	38533	0.51
- teaching & general	20497	0.27
maintenance	15600	0.21
Total	**7543964**	**100**

Although, according to the University Autonomy Law and the statutes of FVML, the institution has full financial autonomy, there are several government-imposed constraints to the exercise of this autonomy.

The wages of teaching and non-teaching staff are determined annually by the government and can not be modified by the FVML. As a consequence of strong pressure to reduce public expenditure, support staff positions that fall vacant, for example through retirement, are not replaced. Despite the nationally specified ratio of teaching staff:students, academic staff appointments can only be made (e.g. after retirement, or if student numbers rise) if the establishment spends less than 85% of its State funding on salaries. Out of the non-teaching staff (117), only 51.3% are public servants. The FVML is not permitted to open public servant positions (see Chapter 10). Support staff can be contracted out of the revenues of the FMVL, but only for a total period of 3 years. Clinical staff (considered solely for clinical, non-teaching, duties) can also be contracted. In both cases this is done through a University-owned private company.

The FVML remarks that although the physical reality of FVML (whose premises cost nearly 25 million € to build), has changed drastically with the move from Gomes Freire to the premises in Alto da Ajuda at the end of 1999, there was no significant reinforcement of the budget from MCES. In fact, the costs of utilities, equipment, staff etc. have risen considerably in the new facilities, whilst the budget has been cut (e.g. by 15% in 2000). This has meant that savings from revenues generated in previous years have had to be used to buffer the costs of the immediate installation at the new site.

Table 3.3: Costs of training

	€
Annual direct cost of training a student	8963
Total direct cost of training a graduate	61847
The money FVML receives for training a MSc student	7159

3.2 Comments

It should be noted that training a veterinarian is inevitably more expensive than nearly all other professions. Veterinary studies are predominantly practical, and require intensive clinical training in small groups. Hospital and emergency services are required to be staffed around the clock. In addition to the manpower demands, practical-based training is costly in terms of equipment, materials and consumables, and there are transport costs associated with effluent disposal, transport of farm animals to the hospital, and taking students out to facilities such as farms and food handling and processing establishments. The resources needed for veterinary training are thus similar to those required in human medicine, which is often indirectly subsidised through government funding of teaching hospitals. However, the main factors that determine the staffing and government funding of the veterinary course are around 50% less than those applied to the human medicine.

Lack of funding is an evident problem in the functioning of the Faculty. Capital expenditure has in effect stopped. Funding for capital items (e.g. buildings) is no longer available and although the premises are new, several sections of the building (particularly the section of isolation of large animals and the large animal reproduction facilities) are yet to be finished (see Section 6.2). Large items of equipment also cannot be purchased from state funding and, since the funding obtained by revenues is not large enough, funding for essential equipment or renovation of existing apparatus has to be sought from sources with very limited available money, for instance at the FTC, a government-funded foundation.

The moratorium on recruiting staff, (the main cost to a Faculty) means that support and quasi-teaching positions are having to be funded through Faculty resources.

The Faculty also has to support almost all its operational and teaching costs from its own resources. There are therefore many calls on the income generated. This severely restricts the possibility of reinvesting it in the services producing the income, for 'pump-priming' other activities, or for other needs that appear less immediate, such as the library (see Chapter 8).

The level of funding thus appears inadequate, since it does not cover the intrinsic costs for training a veterinarian, such as materials, animals (in particular production animals), effluent disposal, transport of students to facilities, collection of cadavers for necropsy, small group teaching, etc. Moreover, as there is no funding from the State for other postgraduate students, other than those taking an M.Sc. this deficiency is undermining the development of postgraduate training at the School.

The State only funds undergraduate teaching (mainly through teaching personnel costs) but there is no direct support for research. Income for research from public funds comes indirectly through particular projects, via local foundations, or revenues generated by the establishment.

It is commendable that the FVML prioritises teaching in the allocation of its own resources, but it is highly inappropriate that the Faculty has to fund core operations by itself.

At present, all monies derived from the activities at the FVML are collected and administered by the Faculty, with individual sections not having a clearly established budget. There is therefore, no clear linkage at sectional level, between increased generation of income and increased spending power. More generally, there is no transparency about the actual costs of sections and activities. For internal accountancy purposes, it is best to have a clear picture of such costs. In the case of income-generating sections, allowing the section to re-invest the major proportion of net income that it generates (e.g. on staff, equipment, etc.) provides an incentive for the section, firstly as there is a need to know where money is going to and from, both for information and proactive management, and secondly, the money earned, less an overhead, should be at the disposal of the Section.

3.3 Suggestions

3.1 The operational and staff costs of veterinary training should be adequately resourced by the State, and set at the same level as human medicine training.

3.2 The access to state funding for necessary capital expenditure should be improved. Aspects related to staffing are discussed in Chapter 10.

3.3 The FVML should seek to increase income from its research and clinical diagnostic activities.

3.4 Clearer accounting and greater transparency is needed so that the Faculty and its departments and sections know how much is being generated by, and spent on different activities. This will enable the Faculty to make informed decisions.

3.5 Sections generating net income should be able to reinvest a substantial proportion of that income in developing their activities.

4. CURRICULUM

4.1 General Aspects

4.1.1 Findings

Veterinary studies at FVM comprise 5 years of intramural training followed by four to six months of practical work in extramural establishments. The course is structured in 11 semesters of about 14 weeks each. Almost all subjects are taught in theoretical and practical classes. Theoretical classes last for one hour and practical classes for two to four hours, depending on the subject. Some courses have longer practical classes.

The first 3 years are devoted to basic and pre-clinical subjects. The subsequent two years cover the applied and professional areas of clinical sciences, animal health and animal production and veterinary public health.

Before each academic year, the Pedagogic Council establishes the year-calendar, the examination periods, the subject examination dates, and edits a booklet containing the syllabus for each subject and the rules to be followed.

The curriculum is prepared by the Scientific Council in consultation with the Pedagogic Council and the Consultative Council. If less than 10% of the curriculum is modified, then the Scientific Council may approve the changes. However, if more than 10% of the curriculum is modified, the changes have to be approved by the University Senate.

The present curriculum started in 1984. A new curriculum, prepared by the curricular revision committee, is in the final phase of development. The curricular revision committee is waiting for the indications given in this report in order to help them prepare the final version of the curriculum. This final version will be submitted to the scientific council and finally to the Consultative Council of FVML.

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	total
A. BASIC SUBJECTS	870	841	72	3	1786
Anatomy (including histology and embryology)	190	240	28		458
Biochemistry	96	86			182
Biology (incl. cell biology)	3				3
Biophysics	28	18	10		56
Biostatistics	28	29	1		58
Chemistry		1			1
Epidemiology	28	6	9		43
Genetics	74	62	8		144
Immunology	33	15			48
Microbiology	38	40			78
Parasitology	61	89			150
Pathological anatomy (macroscopic and microscopic)	86	148		3	237
Pharmacology	55	26			81
Pharmacy	4	8			12
Physiology	78	44			122
Physiopathology	61	6	1		68
Scientific and technical information and documentation methods		3	1		4
Toxicology (inc. environmental pollution)	7	20	14		41

B.	**Animal production**	219	193	16	0	428
	Agronomy	18	27			45
	Animal behaviour (inc. behaviour disorders)	12	7	2		21
	Animal husbandry (inc. livestock production systems)	44	26			70
	Animal nutrition and feeding	45	52			97
	Animal protection and welfare	11	9	2		22
	Environmental protection	8	1	4		13
	Preventive veterinary medicine (inc. health monitoring programmes)	15	2	8		25
	Reproduction (inc. artificial breeding methods)	33	40			73
	Rural economics	33	29			62
C.	**Clinical subjects**	485	123	54	310	972
	Anaesthesiology	28	4		17	49
	Clinical examination and diagnosis and laboratory diagnostic methods	103	69	19	104	295
	Clinical medicine	92		24	64	180
	Diagnostic imaging	28	5		15	48
	Obstetrics	12	2		16	30
	Reproductive disorders	16	4		14	34
	State vet. medicine, zoonoses, public health and forensic medicine	20	3	11	10	44
	Surgery	106	31		30	167
	Therapeutics	80	5		40	125
D.	**Food hygiene**	118	97	9	0	224
	Certification of food production units	8	14			22
	Food certification	3	4			7
	Food hygiene and food quality (inc. legislation)	13	18	3		34
	Food inspection, particularly food of animal origin	52	31	6		89
	Food science and technology	42	30			72
E.	**Professional knowledge**	22	16	14	0	52
	Practice management	3	6	3		12
	Professional ethics	4	5	4		13
	Veterinary certification and report writing	1	2	2		5
	Veterinary legislation	14	3	5		22

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	total		
Basic subjects	870	841	72	3	1786	51.29	1:1.05
Animal production	219	193	16		428	12.29	1:0.95
Clinical subjects	485	123	54	310	972	27.91	1:1
Food hygiene and technology	118	97	9		224	6.43	1:0.90
Professional knowledge	22	16	14		52	1.49	1:1.36
Other subjects	10		10		9	0.57	1:1
Total	**1724**	**1270**	**175**	**313**	**3482**	**100**	**1:1.02**

Attendance at theoretical lessons is not compulsory. Attendance at 70% of practicals is obligatory, and is monitored by a signature. Students are only allowed to register for final exams if they attend a minimum of two thirds of practical classes, with the exception of employed students, exempted by a specific national law.

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The ratio of theoretical training to practical and clinical training is about 1:0.1.02 (1724:1758), from the figures in Tables 4.1 and 4.2.

The stated ratio of intramural clinical training to theoretical and practical training is about 1:11.23 (313:3517). However, these figures do not seem to adequately account for the 5th year clinical rotations (see Section 4.4). By including these latter hours, the ratio is increased up to at least 1: 7.44 (473:3517).

There are no electives or structured optional teaching in the current veterinary curriculum, although they are being considered for the new curriculum.

Following completion of the structured course, students are required to undertake a 4 to 6 month period (660 hours) of professional training in one or two veterinary areas before they are awarded their diploma. This training can be done in affiliated institutions, such as slaughterhouses, laboratories, food and feed industries, food distribution and catering units, research and experimental stations, farms, and veterinary practices, or within the Faculty.

After selecting their area of work, students must submit their proposal, including the institution, duration, nature of work and the name of the external supervisor, to the Final Year Curricular Training Committee. After the period of training is completed, a report is prepared by the student, detailing the work undertaken, and this is then evaluated by the Committee. This evaluation does not count towards the final mark of the student. However, if the training is considered to be below accepted standards, the training must be repeated before a diploma is issued. The diploma is necessary before students can enter the profession.

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	average weekly hours
	lectures	practical work	supervised work	clinical work	total		
First	246	291	10		547	1: 1.22	18.23
Second	365	360	46		771	1: 1.11	25.7
Third	379	318	6	64	767	1: 1.02	25.57
Fourth	331	156	59	98	644	1: 0.95	21.47
Fifth	403	145	54	151	753	1: 0.87	25.1
Sixth		139		521	660	1: 0	22
Total	1724	1409	175	834	4142	1: 1.4	27.61

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

4.1.1 Comments

The present curriculum covers the required disciplines. The ratio of theoretical training to practical and clinical training is satisfactory. The ratio of clinical training:other types of work is unsatisfactory compared to the recommended ratio of 1:5, and rather too close to the unacceptable level of 1:9. The lack of sanctions for those who do not attend practical work deserves greater attention.

There is too high a proportion of hours allocated to basic sciences, whilst the clinical disciplines are under-represented. Therefore there should be some rebalancing.

The hours of lessons per year are considerable and increase after the first year. This means that students have little time to spend in self-study or to engage in voluntary extramural work. It is positive that students are divided into small groups for practical work; however, this demands a lot of staff time.

It should be possible to have larger shared laboratories in order to use time more effectively.

As noted above, the clinical disciplines and clinical training are under-represented in the overall course. The effectiveness of the clinical training is also reduced by these hours being fragmented. They are spaced out in terms of the students spending intermittent weeks in a particular clinic, interspersed with a 6 week gap. They are also discontinuous on a daily basis, since teaching is interrupted in the afternoons, to allow for lectures. Consideration should be given to relocating some of the current fifth year lectures to an earlier year so that students can concentrate on gaining hands-on experience during this year (see also Section 4.4.2). A good way

of achieving this is to have a lecture-free final year, organised in obligatory clinical rotations in large and small animal clinics, the mobile clinic, food hygiene and preventative medicine.

Most of the clinical training is performed as extramural work. Students are free to choose the type of training and propose the place and the supervisor. The Final Training Committee has to approve the student' proposal and obtain formal acceptance from the nominated supervisor. A staff member is appointed by each Department as a student tutor to act as a link between the student and the Faculty. Extramural clinical work is a useful supplement to, but not a substitute for, structured clinical training provided by an educational establishment. Even if it were an ancillary part of a veterinary course, it is highly advisable that it be governed by a formal structure and validated by some means of quality control.

The present curriculum does not contain electives or optional courses. These courses are considered highly formative and are greatly appreciated by students in helping them to complete their education, particularly with regards to helping them choose a future area of specialisation or interest, particularly as they approach the end of their study. The new curriculum was mentioned several times as providing a solution for shortcomings in the present syllabus and its teaching. However, it was not clear what state of development or acceptance the proposed new curriculum had reached. The current curriculum has been in place for 20 years, which is too long for a dynamic subject like veterinary medicine.

The team would strongly emphasise that a new curriculum, representing a significant overhaul of veterinary teaching rather than incremental changes, should be prepared and introduced without further delay, for example, within the next two years. As noted in Chapter 2, there may well be a need to reinforce the competencies and decision-taking authority of the Curriculum Committee in order to achieve this effectively.

The curriculum should be revised as soon as possible so as to take into account the recent changes in the veterinary profession and in veterinary medicine teaching. The new curriculum should be organised in blocks of disciplines which take place in defined parts of the semester or in integrated courses incorporating different disciplines. This will help coordination and integration among courses. In addition, practical demonstrations should be better organised so as to avoid repetition of exercises which overload the working time required of teachers.

The development of the new curriculum is an excellent opportunity to improve and update the veterinary course at the FVM to the latest requirements and to:

- provide greater and earlier hands-on contact with animals, e.g. basic animal handling and management;
- reduce the hours of theoretical and/or formal lessons to enable students to study and to attend other formative activities;
- increase the amount of hands-on clinical training, a seek to structure this in concentrated, lecture-free periods;
- provide optional and/or elective teaching. These would best be structured as an elective component given towards the end of the course, so as to allow a student to receive more in-depth coverage of a particular field that is of interest to them;
- consider having a 2-part set of rotations in a lecture-free final year: firstly ‘core’ rotations, then an elective track, which could include the option to undertake a scientific project.

The 11th semester does not fit well with the formal course and is not well assessed. The Faculty could consider using some of the material taught in the course, assess students throughout the time and use the marks given as part of the overall course mark. Alternatively, the Faculty could look at using the 11th semester for students to follow differentiated study tracks.

The EMS practical teaching should be an integral part of the coursework, earning credits towards graduation and with professional evaluation. Part of the EMS practical hours could readily be placed in the first years of the course. However, certain work, especially that concerning official functions of veterinarians is best organised as EMS units with those with formal responsibilities, preferably in the fourth or final (fifth) year.

The training in applied fields would be better organised as rotations during a lecture-free final year (LFFY). This could be organised partly to allow a semester of elective and focussed rotations in fields chosen by students and partly as a semester of obligatory 'core' rotations across different stations, such as small animal medicine, large animal medicine, mobile clinic, veterinary public health and food hygiene, animal production,

pathology, epidemiology and perhaps scientific fields where one or two weeks of intensive block teaching serves a useful purpose.

Consideration should also be given to remodelling the examination structure so that valuable teaching time and the possibility of following case studies is not lost (see Section 5.2).

4.1.1 Suggestions

4.1 A new curriculum should be finalised and implemented as soon as possible, both to revise the content and inter-relationship of particular disciplines, and to restructure the teaching into a more appropriate format. The new curriculum should follow the ECTS system and integrate the suggestions made below.

4.2 The weekly hours of formal teaching should be reduced to enable students to engage in self-directed study and other formative activities.

4.3 The repetition of practical work in some pre- and para-clinical disciplines should be reduced by using a larger group size and shared teaching laboratories.

4.4 The hours allocated to basic sciences should be reduced in order to give greater emphasis to the professional disciplines, in particular the clinical subjects.

4.5 The amount of intensive hands-on clinical work (with case responsibility) where the teaching is controlled, structured and balanced, should be substantially increased.

4.6 Integration and coordination between all courses should be improved so as to reduce or eliminate repetition of course material. Consideration should be given to organising teaching into blocks of disciplines which take place in defined parts of the semester, or in integrated courses which incorporate different disciplines.

4.7 A lecture-free final year should be introduced, to enable full-time rotations in the applied fields, (e.g. large and small animal clinics, the mobile clinic, pathology, veterinary public health and food hygiene and preventative medicine.

4.8 Electives and optional courses should be introduced, particularly in the final year of study.

4.9 The extramural work in the 5th year should, as far as possible, be integrated into the formal course and earn credits towards graduation based on a professional evaluation.

4.2 Basic Subjects and Basic Sciences

4.2.1 Findings

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 4.4: Number of teaching hours in basic subjects

subject	year	hours in course					ratio of lectures to other types of work
		lectures	practical work	supervised work	clinical work	total	
Biophysics	1	28	18	10		56	1: 1
Biomathematics & computing	1	28	28			56	1: 1
Introduction to biochemistry	1	28	28			56	1: 1
Histology	1	56	56			112	1: 1
Anatomy	1,2	112	168	28		308	1: 1.75
Biochemistry	2	56	56			112	1: 1
Physiology	2	84	58			142	1: 0.69
Genetics	2	56	56	8		120	1: 1.14
General Pathology	2	56	56			112	1: 1
Pathological anatomy	3	56	84		3	143	1: 1.55
Pharmacology & therapeutics	3	84	42		14	140	1: 0.67
Microbiology & Immunology	3	51	53			104	1: 1.04
Parasitology	3	56	84			140	1: 1.5
Infectious diseases	4	84	36	20	10	150	1: 0.79
Parasitic diseases	4	56	28		28	112	1: 1
Toxicology	4	23	36	23		82	1: 2.57
Sociology, history vet.med., ethics	5	14		14		14	1: 1
Total		**928**	**87**	**103**	**55**	**1870**	**1: 1.02**

The basic sciences take up about half of the overall hours, according to classification, and are mainly taught within the first three years of the curriculum, with the exception of Toxicology that is taught in the 4th year.

4.2.2 Comments

As mentioned in Section 4.1, the proportion of hours devoted to basic sciences is high and should be reduced to allow more time for other areas of veterinary study, particularly the clinical disciplines.

The basic sciences are generally well taught and well structured, covering the main subjects and being veterinary orientated. However, improved orientation towards veterinary sciences should be made, particularly for biostatistics, chemistry and biophysics.

There is a satisfactory proportion of practical teaching.

The number of hands-on practicals in anatomy is satisfactory.

However, a certain lack of integration and coordination among the courses is leading to repetition of teaching. Integration and coordination among the basic sciences should therefore be increased so as to reduce redundant teaching and also facilitating the reduction of hours given to basic sciences and the number of hours that students have to attend lessons.

The small group number (20-25) of students for practical work is, in itself, commendable and is beneficial for the students. In view of the limited resources and funding currently available, however, the practical work suffers from shortcomings in organisation, leading to repeated lessons, a high workload for teaching staff and defines the need for extra personnel to be involved. Practical lessons therefore need to be organised so as to

reduce the workload for members of staff and also to reduce the number of personnel required, notwithstanding the negative impact on the staff-student interaction.

The lack of a structured organisation for practical work also leads to management problems due to the limited availability of both teaching and non-teaching staff. Therefore, more staff are needed, particularly those who prepare the laboratories and the material necessary for practical work.

The facilities and standard of available for teaching are satisfactory, with the laboratories being of a good quality. Furthermore, many research laboratories are open to students thus enabling them to gain a possible introduction to research provided supervisory staff are made available (see Chapter 13).

4.2.3 Suggestions

4.10 The number of hours spent on the basic sciences should be reduced by approximately 20% (see also suggestion 4.4).

4.11 A major re-orientation towards the veterinary sciences should be made, particularly for biostatistics, chemistry and biophysics.

4.12 The practical teaching should be reorganised to allow for fewer repetitions of lessons, thus reducing staff workload.

4.13 The practical teaching in the basic sciences should be supported by more staff (see also Suggestion 10.3).

4.14 The coordination and integration of basic science teaching should be improved in order to reduce or eliminate repetition of material, and thereby help to reduce both the teaching load and the number of curricular hours needed for teaching.

4.3 Animal Production

4.3.1 Findings

The animal production subjects taught 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 animal production subjects

subject	year	hours in course				ratio of lectures to other types of work
		lectures	practical work	supervised work	total	
General Agriculture	1	22	27		49	1: 1.23
External morphology	1	28	22		50	1: 0.79
Nutrition & feeding	2	28	50	6	84	1: 2
Animal behaviour	2	29	28	4	61	1: 1.1
Reproduction & artificial insemination	2	28	40		68	1: 1.43
Animal husbandry and production	5	96	16		112	1: 0.17
Economics	5	28	28		56	1: 1
Total		**259**	**211**	**10**	**480**	**1: 0.85**

Practical teaching of animal production is performed in FVM facilities using in-house animals to study the condition of cattle and small ruminants. However, most of the practical classes take place at the Estação Zootécnica Nacional (EZN), which has an agreement with FVML, as has the National Horse Stud Farm.

The visits to EZN are as follows:
1st year: Animal Nutrition, 3-4 times a year in 2 groups of 50 students for 3 hours
Animal Production, once a year in 2 groups of 50 students during one day (7 hours)
4th year: Reproduction, three times a year in 8 groups of 12-15 students each, during ½ day (morning, 3 hours)
5th year: Animal production, once a year in 2 groups of 50 students during ½ day (morning, 3 hours)

The groups of 50 students are often subdivided into smaller groups to improve teaching efficiency.

In addition to the visits to EZN, practical classes concerning specific breeds of cattle, horse and small ruminants, are also held at the National Agricultural Animal Shows in Santarém and Beja, so that students can be better acquainted with several different livestock breeds.

While there is an Institute of Agricultural Sciences (ISA) close to the FVML campus, with research facilities and the capability of large animal housing, this potential valuable facility has so far only been used for practical teaching of General Agriculture discipline and for research on poultry and pig nutrition.

Students also attend classes relating to large animal work during their assignment to the mobile clinic (see Section 4.4).

4.3.2 Comments

The EZN provides a good facility for students for both practical training in animal production and clinical experience when attending the mobile clinics for large animals. However, the visits to the EZN consume a lot of travel time for the students (70km, +/- 1 ¼ hours one way). The use of this facility should be optimised by extending the visit to full days and/or overnight stays and by combining visits for classes in these two subject areas.

Hands-on animal teaching needs to be improved in the animal production course. Animal handling involving all the major animal species by each individual student should already be part of the course and should be taught in the first year of the curriculum.

FVML should establish a protocol with the ISA farm so as to provide teaching facilities for animal handling

and animal production work, in order to avoid long travel hours for the students. This protocol should also include the provision of case load for the large animal hospital.

A priority should be to arrange to utilise the resources available at the ISA sat the earliest opportunity.

The practical classes in animal production systems are scheduled in the 5th year. However, they are restricted to demonstrations of housing systems and housing equipment which are presented at a facility some 70 km distant from the Faculty. It is preferable to reschedule this course to the 4th year so as to release valuable teaching time for the clinical subjects in particular in 5th year. The concern should be focussed on the relation between animal health and animal welfare, and the environment of the animal. Meanwhile, training in e.g. the measurement of climatic conditions and climatic control, e.g. ventilation and heating, and effluent management should become part of the course.

The training in the clinical aspects should be concentrated in the 5th year in lecture free blocks (see also Section 4.1). This training should include an integral approach of the herd health monitoring and preventative veterinary medicine using the knowledge of different disciplines, such as animal nutrition, animal production, epidemiology, economics and veterinary public health and food hygiene, as well as the clinical subjects.

4.3.3 Suggestions

4.15 The FVML should make more effective use of the EZN facilities preferentially by having extended (full day, multi-day) visits by students.

4.16 There should be basic teaching on the handling and management of the major production and companion animal species early in the course.

4.17 The practical classes in animal production and production systems should be rescheduled to the 4th year and should focus on the relation between animal health and animal welfare and the environment of the animal.

4.18 Training in measuring climate conditions and climatic control, e.g. ventilation and heating, and effluent management, should be incorporated into the teaching in the animal production field.

4.19 The focus of one of the rotations during a lecture free final year (see Section 4.1) should be an integral approach towards herd health monitoring and preventative veterinary medicine.

4.4 Clinical Sciences

4.4.1 Findings

Currently, clinical science is taught by the sections of the Department of Morphology and Clinics (DEMOC) which include the subjects, Pharmacology and Toxicology, Anatomy, Histology and Pathology, Parasitology, Clinics, Surgery and Reproduction and Obstetrics. A proposed restructuring will rename it as the Department of Clinics (DC), with Anatomy, Histology and Pathology and Parasitology being transferred to a different department.

Clinical teaching is based upon lectures, demonstrations and practicals. Clinical training is based upon direct access to both in- and outpatients, particularly those in the small animal clinic. Large animals are seen via the mobile clinic and visits to the neighbouring GNR (Guarda Nacional Republicana), Horse Mounted Police headquarters or to training farms. In the latter cases, students perform minor samplings and restricted manipulations, under supervision.

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 4.6: Number of teaching hours in 'core' clinical subjects

subject	year	hours in course					ratio of lectures to other types of work
		lectures	practical work	supervised work	clinical work	total	
Medical semiology	3	54	30	6	30	120	1:1.22
Surgical semiology	3	60	21			81	1:0.35
Anaesthesiology & surgical techniques	3	28	4		17	49	1:0.75
Medical pathology	4	56		16		72	1:0.29
Surgical pathology	4	56	10		30	96	1:0.71
Andrology, gynaecology & obstetrics	4	28	6		30	64	1:1.29
Clinical radiology	5	28	5		15	48	1:0.71
Large animal clinics	5	56	9		64	129	1:1.3
Small animal clinics	5	56		8	72	136	1:1.43
Total		**422**	**85**	**30**	**258**	**795**	**1: 0.88**

These hours are those of formal training, and in particular do not seem to include some of the time students have to spend in the clinics in the 5th year (see below). The teaching in pharmacology, infectious diseases and parasitic diseases (see Table 4.4) also have a clinical component.

There is no mandatory holiday work, although students may volunteer to spend some of their free time on extra work with animals. There are no electives or structured optional training within the course. However, students may spend their obligatory 4 to 6-month final semester (6th year) professional training period (see Section 4.1) in a veterinary practice or in a clinical section of the Faculty.

The practical and tutorial activities in the 3d and 4th year (semesters 5 to 8) are aimed at developing the clinical approach, diagnostic and procedure-executing skills of the students. Each week three 3rd year students are assigned to the small animal clinics, and 4th year students are in surgery on Tuesdays, Thursdays and Fridays between 09.00-12.00 in groups of 20 students for a total of three weeks.

For the clinical work in the 5th year, the class is divided in 6 groups of 12 to 18 students for eight separate weeks of rotations. Four of these weeks are spent in the large animal area, and four in the small animal hospital. There are 6 week intervals between attendance in each area. In the small animal hospital, students work for 7 hours a day, subdivided in 4 small subgroups that are distributed between medicine, surgery, diagnostic imaging and in-patient care. Each subgroup stays one day in each area in rotation.

For four hours of this time, students are directly supervised by teaching staff, the remaining time is supervised by non-teaching clinical staff (clinicians).

Each 5th year student therefore has an average of 80 hours of clinical work under the direct supervision of the teaching staff of the small animal clinic, and a further 85 hours engaged in clinical work supervised by the clinicians of the small animal hospital.

Besides the scheduled hours, each 5th year student also performs small animal hospital night duties (two twelve-hour shifts) and 1½ weekend duties. Students are actively involved in emergency care, mainly helping the veterinarian during the first approach to the cases, monitoring the animals, and taking care of medication.

For the large animal work, each group is subdivided into three subgroups (two allocated to food animals and one to horses), each group comprising seven students, who work with a member of the teaching staff for four mornings (4 hours each) for a week, plus emergencies. Students are involved in clinical work on dairy cattle (80 hours), horses (50 hours), beef cattle (10 hours) and small ruminants (10 hours). This covers examination, administration of drugs and interpretation of laboratory results. Students are responsible for taking care of the in-patients of the hospital of the Faculty (feeding, physical examination, administration of drugs).

The mobile clinic is staffed by 3 veterinarians and has an annual caseload of 450 horses, 960 cattle and 107 cases of surgery in cattle. In addition to visiting the Guarda Nacional Republicana State horse stables, students also clinically assess production animals on private farms which have a total herd number of 12,000 animals.

Students who elect to spend their final semester (i.e. 6th year) in the FVM clinics work all day, from 09.00 - 21.00, in the small animal clinics. They spend two months in internal medicine and hospitalisation, two months in surgery and two months in diagnostic imaging. Final semester students are responsible for the correct administration of therapy prescribed by the veterinarians. They also take the initial clinical history of patients, helped by fifth year students.

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

The clinical facilities and organisation are outlined in Section 6.2.

4.4.2 Comments

Clinical Sciences

As remarked in Section 4.1, there is an overall imbalance within the FVML curriculum, with insufficient hours being allocated to the teaching of clinical disciplines. Consideration should be given to reducing the number of hours spent in teaching the basic sciences within the earlier part of the course and relocating some of the current fifth year lectures to an earlier year in order to make space for better structured and increased teaching clinical teaching.

The curriculum of 5th year of the course contains 393 formal hours of lecturing with only 149 hours of practical and 151 hours of clinical training (see Section 4.1). At this stage of the course, lecture time should be considerably reduced to allow students greater time to expand their practical knowledge with case-based training.

This imbalance is also seen in the overall structure of the clinical disciplines, with lectures predominating. Limited case material makes this a particular problem in the large animal area and some sections (e.g. reproduction) are more akin to demonstrations, rather than case-follow ups by the students, and this impairs the amount of clinical exposure ('hands on' work, 24-hour duty, dealing with acute cases, case responsibility, case follow-up, interaction with clients, practice management) obtained by each student.

Although under a single department, there was little evidence of coordination of departmental activities with reproduction and obstetrics failing to function with both the large and small animal departments. Small animal cases seen in the clinic were not followed through by the students to the reproduction department and herd health teaching was not coordinated by the large animal clinicians and the reproduction department.

The group size and caseload within the small animal clinics allows true hands-on experience of 2 - 10 cases daily.

The structure of the teaching as 'one in six' weekly rotations leads to a piecemeal structure with too frequent changes of subject (rotation) to allow students to become familiar with the section. Lecturers also have too little time to devote to the students or to become acquainted with them, thus not enabling them to assist their training other than superficially. The clinical rotations are also broken up within a day, with students having to attend lectures in the early afternoon. This is undesirable from the point of view of the continuity of student participation and case involvement in all areas, but is particularly problematic for the mobile clinic work. It is tiring and inefficient for staff and students to have to leave early to travel to farms, then return after just a few hours to comply with theoretical teaching schedules.

The teaching should be reorganised to give the clinical disciplines a better structure and flow. The best way of resolving all or most of the shortcomings noted above would be to provide much of the clinical teaching as extended (i.e. sequential weeks) full time rotations in the applied areas during a lecture-free final year (see also Section 4.1). This would allow a much more continuous and fruitful engagement by the students.

A variation on this system, which could also be used in earlier years, would be a system of block teaching, rescheduling lectures to one or two hours first thing in the morning (from 09.00) to allow the rest of the day to be devoted to clinics and other facilities, such as those at EZN.

As mentioned in Section 4.1, a system of organising teaching as blocks of related subjects should also reduce or spread the examination load. The current system of teaching and examinations, which takes three months out of the available teaching time, further erodes the time available for practical case study or similar work (see Section 5.2).

Within the clinical teaching, as well as within the clinical facilities, staff and caseload (see also Section 6.2), there is a heavy bias towards small animal clinical work. Teaching of large animal subjects appears to be severely neglected, with lectures concentrating on small animal subjects. There is a need to rebalance the curriculum (as well as the allocation of resources) by taking a strategic overview of species coverage.

The training in the large animal area is not sufficient, with very little hospital-based activity. The mobile clinics provide a useful, but variable, resource as a provider of cases but the staff working in the mobile clinic are working at or beyond capacity, taking into account the need for research, preparation and 'down' time. Despite their best efforts, however, the exposure to large animals they can provide to the students seems to be far too low. As outlined in Section 6.2, the large animal activities and associated resources need to be systematically built upon to become a resource that supports teaching.

It is particularly disappointing to learn that while the equine part of the large animal clinic had a weekly case load of 10 cases some 2 - 3 years ago, this has currently diminished to almost nothing. Equally disappointing is the reported lack of a basic grounding in pig and poultry medicine in what is still a multi-species curriculum leading to a general veterinary degree.

The clinical facilities and organisation are more generally discussed in Section 6.2.

The caseload is outlined in Chapter 7. Although the small animal caseload is satisfactory with adequate exposure to small animal medical and surgical cases, the students only assist during surgery and do not conduct operations themselves, under supervision. The large animal caseload is inadequate for teaching purposes. There is an insufficient caseload of equine and farm animals available for clinical training at the premises of the FVML. It is reported that one large animal case per day and one equine case were seen weekly, but by a group size that is still too large to allow any real participation.

The need for clinical staff, along with ready access to clinical cases, in particular those in the large animal area, and the need to have an improved balance between clinical activities, teaching and research, is mentioned in Chapter 10. This has implications for staffing levels.

Issues of clinical organisation and facilities are mentioned in Section 6.2, with large animal activities and specialisation in particular needing to become a focus.

The need to restructure the curriculum so that more time is spent on clinical subjects, and so that teaching can be organised as blocks, along with a lecture-free final year for full-time rotations is the subject of Suggestions 4.1, 4.5, 4.6, 4.7, 4.8 and 4.19.

4.4.3 Suggestions

4.20 The teaching of the clinical disciplines should prioritise hands-on clinical training in small groups, with less emphasis on lectures.

4.21 The coverage of large animal clinical medicine, surgery and reproduction, and the resources required for this teaching, must be improved (potential Cat 1 suggestion).

4.22 There should be much greater integration between the teaching and clinical activities of the various sections of the clinical departments, along with a more even species balance.

4.23 Teaching in the clinical disciplines should be coordinated with that in other areas, in particular as regards cooperation with pre- and para-clinical disciplines (e.g. for block courses) and in adopting an integrated approach to teaching on the health, productivity and well-being of the production animal species (i.e. the stable-to-table approach).

4.5 Food Hygiene and Technology and Veterinary Public Health

4.5.1 Findings

Table 4.7: 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 inspection	5	55	30	5	90	1: 0.64
Technology of animal products	5	56	56		112	1: 1
Veterinary public health	5	14	10	18	42	1: 2
Total		**125**	**96**	**23**	**244**	**1: 0.95**

Teaching covering slaughter and meat inspection (*ante*- and *post*- *mortem* examination, critical control points in the processing activity, transport and handling of animals), is carried out in a range of slaughtering and processing establishments in and around Lisbon. These are visited in sessions of 2 hours in groups of 16 students, although sometimes these groups are subdivided into two subgroups, with 1 or 2 members of staff. For slaughter, meat inspection and food technology teaching the FVML has:

- one visit to a pig slaughterhouse (40km from Lisbon), with a line speed of 300 pigs/hour. This slaughterhouse has a cutting and deboning room plus a freezer installation with the capacity of 1,500 tons of storage, a meat cutting room working with 250 pigs/hour and a unit for treatment of effluent with the capacity of 5000 m^3;
- one visit to a poultry slaughterhouse (located 90km from Lisbon), with a line speed of 6,000 broilers/hour and laying hens and broilers at a rate of 3-4,000/h;
- one visit to a rabbit slaughterhouse (90km from Lisbon), with a line speed of 1000 rabbits/hour;
- visits to three multi-species slaughterhouses (the furthest is 70km from Lisbon), with a line speed for cattle of 35-40 per hour, for sheep/goats, 110-120/h and for pigs; 120/h;
- a visit to a ham and sausage factory (slaughterhouse visit), a meat industry, a milk industry and a fishery (1 visit each), where students observe the work carried out.
- 5 sessions at a fishery port.

Regarding the teaching of the subject 'Veterinary Public Health' (VPH), there are 2 practical classes in a catering unit on the University Campus and in a Lisbon market of fresh products. Each student has one visit, in a group of 5-6 students and one teacher. The visit to the catering unit starts with an explanation concerning the basis and conduct of this type of evaluation, and students then collect data, swabs etc., testing samples at the Faculty before preparing a group report.

The visit to the market is also preceded by an introductory session, given by the veterinarian responsible. Students observe and collect data on the conditions and environment in which a wide range of food products are kept and sold, and have to present a final group report.

All students take part in the production of different canned foods, the production and packaging of traditional and international meat products, the processing of milk and production of milk products, and the production of fish products. After the production of the different products, the students undertake an application exercise of an HACCP plan and carry out a final quality control procedure which includes microbiological, chemical and sensorial analysis of the product. Sanitary inspection classes on egg and shellfish inspection and identification of animal species of meat cuts also take place at the Faculty, as well as in VPH classes on food borne outbreaks and the epidemiological investigation of outbreaks of food-related diseases, intoxications and infections.

These subjects are presented in the context of the food chain, by a newly defined group within the Department of Animal Production and Food Safety. Accordingly, the continuum of the food chain is emphasised and relevant aspects of the Animal Production course are presented in a manner that is complementary in terms of

food quality and safety.

Regarding food inspection and specifically meat inspection, the primary responsibilities of the veterinary officer are demonstrated during the above visits in the context of current legislative requirements. In the case of meat and poultrymeat inspection, the nature of dispositions regarding disease conditions and food borne residues, in terms of causation and significance regarding animal health and/or human health, is illustrated during the course of each visit. Hygiene monitoring and control are also addressed. These in-plant inspections comprise the major component of the food inspection programme. These visits are conducted with the approval of the regulatory authority.

4.5.2 Comments

The epidemiological approach to veterinary public health is emphasised to good effect.

The courses are well integrated and provide a basis for an epidemiological approach to food safety at both the production and processing levels

It is appropriate that for the most part, these courses are presented in the fifth year and in parallel with the clinical subjects. However, some aspects of the course in food technology could usefully be presented in an earlier part of the course where the physical, chemical and microbiological qualities of processed foods could be presented in parallel with courses in biochemistry and microbiology.

While supervised visits to food plants for the purposes of exposing students to aspects of e.g. food processing and the preparation of dairy and fish products are appropriate, this is not the case in relation to inspection of meat and poultrymeat slaughterhouses premises and related products where there is a sole reliance on short visits to meat and poultrymeat plants. This latter arrangement does not provide the necessary training in this aspect of the subject and is inappropriate to future needs. Furthermore, visits to external establishments are too short and are conducted as 'guided tours', rather than as hands-on training for the students. The inspection training is therefore unsatisfactory as it does not meet current requirements and will be even more inappropriate in a few years time when requirements change.

There is an inordinate amount of time devoted to off-campus visits with small groups of students. This detracts from the opportunities to conduct in-house classes devoted to e.g. problem-solving, risk assessment and the formulation of e.g. HACCP-based proposals for a variety of scenarios, coordinated classes with biochemistry, microbiology (including parasitology)/ population medicine and clinics including companion animal personnel, in order to explore the VPH aspects of animal ownership. This would also address issues relating to opportunities to conduct research, both basic and applied.

The Faculty should consider structured EMS as being a more valid way of providing inspection training.

4.5.3 Suggestions

4.24 There is much to be gained from greater collaboration between the staff working in the food safety areas, and those providing the animal production teaching and those involved in population medicine and food animal medicine, so as to establish a fully integrated approach to food safety throughout the food chain as the core objective of the respective courses.

4.25 The relevant components of the food technology course should be relocated to Year 3 or 4.

4.2 The programme of short visits for food inspection practical classes should be replaced with a formal EMS programme requiring the participation of students (preferably during the 5th year) at cooperating food plants for a period of two weeks.

5. TEACHING: QUALITY AND EVALUATION

5.1 Teaching Methodology

5.1.1 Findings

The objectives and contents of disciplines are organised by professors in charge of teaching the specific course. These individual programmes include, among other details, teaching objectives, theoretical and practical contents and a recommended bibliography. They are submitted to the Pedagogic Council on a yearly basis and published in the Student's Guide and on the FVML website.

The Pedagogic Council's involvement in teaching is largely a coordinating role, dealing with timetables and the organisation of examination schedules and other evaluations. The coordination of teaching has not been implemented by statutory structures within or between departments and services. Teaching at discipline level is offered through lectures, practical and laboratory sessions and applied seminars.

In most disciplines, theoretical teaching is mainly provided in a classic way, although case-based teaching and interactive computer assisted learning are reported in 16 and 6 out of 38 disciplines, respectively.

The majority of disciplines (> 90 %) use text books (available in the library and/or provided by the teachers) as basic study material. However, this is supplemented with text books prepared in-house, notes elaborated by teachers (± 30%), copies of material presented during classes (± 20%), and scientific papers generally provided by teachers (± 15%).

Traditional audiovisual equipment (slides and overhead projectors) are available in all classrooms and laboratories. Data-show and video equipment are permanently available in three classrooms (out of five). Mobile equipment is also available. Internet connections are available in all classrooms.

Computer facilities are used for teaching purposes in 28 disciplines, with specific teaching software for several disciplines namely, Anatomy, Biophysics, Biomathematics and Informatics, Genetics, Physiology, Biochemistry, Nutrition, Pharmacology, Microbiology, Infectious Diseases, Toxicology, Animal Husbandry, Public Health and Large Animal Clinics.

Quality Assessment of the teaching/learning process is carried out by the Pedagogic Council, through questionnaires filled in by students at the end of each semester. These address global aspects of each subject, such as coordination of contents of both practicals and lectures, contribution of the discipline to the whole learning, adequacy of evaluation and work-load, development of critical reasoning, facilities, etc. After collation and analysis the results for each subject are made available to all the teaching staff of that discipline. Results of teaching/learning performance for particular staff members are only communicated to the individual concerned, the staff member responsible for the discipline and the Dean and Presidents of the Scientific and Pedagogic Councils.

5.1.2 Comments

Teaching is conducted in a fairly traditional manner, comprising formal lectures, complemented with laboratory-based practical work. Each subject is taught as a distinct entity. Problem based learning does not appear to be used, although some staff apply case-based material.

The audio-visual support within lecture theatres is of a good standard. However, the facilities that the students have for self-directed learning, notably the library and computer based materials, are limited (see Chapter 8). It is encouraging that the Faculty has started to direct more attention to the need for such facilities in its consideration of the new curriculum.

The learning materials used seem to be primarily comprised of in-house produced texts or scripts. Bibliographic resources are used as a supplement to this but do not seem to be core to the teaching process. The examination process also seems to focus on learning a large volume of material that is contained within

the 'scripts' (see section 5.2). This style of teaching tends to emphasise rote-learning of a large volume of factual information, which is often forgotten shortly afterwards, rather than the acquisition, assimilation and application of knowledge. With the ever-expanding amount of material in the field of veterinary medicine, students need to be encouraged or required to seek out and use new information for themselves. There is little evidence of the Library being promoted by staff as a major resource for learning.

As noted in chapter 13, student involvement in research and the preparation of a thesis is very much dependant on the initiative of individuals.

The courses and the quality of teaching is evaluated but there are doubts regarding the transparency of the outcome. This raises questions about how responsive members of staff would be to suggestions that curriculum, lecture content or didactic/pedagogical approaches should be changed. As noted in Section 4.1, an overhaul of the curriculum is overdue.

5.1.3 Suggestions

5.1 The Faculty should look at creating a more transparent system of teaching evaluation in order to continuously re-evaluate teaching and to facilitate improvements to the whole curriculum.

5.2 The teaching should move towards problem based learning in the basic subject training and towards case based learning in the clinical subjects.

5.3 Time should be made available for self-directed learning by students, possibly by the coordination of lecture subjects, by the reduction of lecture hours and by making some subjects non-compulsory (see also Suggestion 4.2).

Suggestions on the library and computing resources accessible to students have been made in Chapter 8.

5.2 Examinations

5.2.1 Findings

Examinations are scheduled during two defined teaching-free periods. The "normal period" has two phases - 1 month at the end of the first semester (dedicated to final exams of semester-based disciplines and to partial evaluations of annual disciplines) and 2 months at the end of the second semester (dedicated to final examinations of semester-based and annual disciplines).

The "second opportunity period" comprises 1 month, in September before the beginning of the academic year (dedicated to final exams of annual and semester-based disciplines) in which students may take a maximum of four examinations at one sitting.

Table 5.1 Proportion of disciplines using different examination types

Usage of examination types	
Written examination (descriptive short answers)	78.9%
Written examination (descriptive long answers)	39.5%
Multiple-choice questions	60.5%
Oral examination	26.3%
Practical examination	73.7%
Clinical examination	7.9 %
Continuous assessment	15.8%
Others* (report evaluations)	10.0%

Evaluation is based upon a point marking scale which is adaptable to ECTS. The examinations comprise both written and oral exams, either theoretical or practical. Evaluations are prepared by panels of teachers from the disciplines, and in many instances include 1 or 2 teachers of different disciplines. In one instance, an external examiner has been included in the jury. There are no limits to the number of times students may take an examination. In principle, after three attempts to pass a given subject in consecutive years, a student should leave the course. This has not been applied so far and students only loose their registration at the FVML if they do not pay their fees, or do not register for two consecutive years.

Students are allowed to register for the following year if they pass all but two annual disciplines from the previous years, and do not have any discipline outstanding for more than two years. They must succeed in all the formal curricular examinations before they are allowed to register for the final semester training period in the 6^{th} year**.**

5.3.2 Comments

As mentioned in section 4.1, the current system of examinations takes three months out of the available teaching time and erodes the time available for practical case study. Serious consideration should be given to rescheduling or, preferably, reducing considerably, this period.

The lack of any sanction on students for failing examinations leads to a loss of academic rigour in the course, both in terms of logical and prompt progression, and in the attitude towards learning. It is a major weakness in the teaching of the veterinary course/

The examinations focus on rote-learning of a large amount of information. This encourages short-term retention of facts, rather than the acquisition, assimilation and use of information in an applied context. Since the examinations are grouped in particular periods, the current format and organisation places a heavy load on students. It also means a substantial portion of the year has to be attributed to the preparation and scheduling of examinations. This blocks or limits the possibility for organising practical case study or extramural placements, for example, during the vacations.

The Library is not utilised by students in a manner that ensures that their knowledge of the examination subjects is not as up to date as might be reasonably expected.

5.2.3 Suggestions

5.4 The Faculty should restructure the current teaching/examination system so that the time allocated for examinations as a whole, does not compromise the amount of time available for the teaching of the subjects.

5.5 There should be a firm limit to the number of times students can attempt an examination and remain on the course, with a 'no-show' constituting a failure.

5.6 Consideration should be given to continuous assessment and problem-based learning as integral part of the examination/evaluation process.

6. PHYSICAL FACILITIES AND EQUIPMENT

6.1 General

6.1.1 Findings

The facilities at the Póló Universitário do Alto da Ajuda, were built in the nineties, overlooking the Tagus estuary and bounded by the Tapada da Ajuda wall, a road and the Monsanto Park. The FVML moved there in September/October 1999.

The new premises are located near the Institute of Agricultural Sciences, the Faculty of Architecture and the Institute for Social and Political Sciences, forming a new University campus of Lisbon with shared canteens and sports centres. The total functional area of the new facility is around 28,000 square meters and is divided into several buildings or blocks:

A – Administrative, management and maintenance services, main editorial centre, lecture theatres and general library. This block provides support services for the entire Faculty, namely concerning the secretariats and Dean's and other Faculty management offices, two lectures halls and library services.
B – Main hall and auditorium for academic sessions, university events and congresses, with associated multimedia room. It is located between buildings A and C.
C – This building has a vertical functional arrangement: floor C-1, the basement, is the main parking lot. Floors C0 and C1 are dedicated mainly to teaching activities. C2 is only partially occupied and may be used for future expansion. Floors C3 and C4 are mainly for departmental office administration and secretariats and some research laboratories.
D – This is mainly for clinic and hospital support units: bioterium, laboratories, operating theatres and related rooms, diagnostic imaging, pharmacy and offices etc.
E – Small animal clinics: waiting room and reception area, consultation rooms, sample collection room, radiology, intensive and intermediate care units.
F – Kennel and cattery, and 1 lecture theatre.
G – Rooms for clinical practical teaching with animals, anatomy and pathology premises, isolation unit and general store.
H – Animal housing for all species and two practical classrooms.

There are 5 lecture halls: 3 that seat 120 students each and 2 that seat 80 students. There are 7 rooms for group work and these provide a total of 170 places. There are 46 practical rooms/laboratories that in total provide 900 spaces. Most of the teaching laboratories are arranged to seat 20 to 40 students but some are designed for 10 to 20 students and a few seat less than 10 students.

Generally the teaching laboratories are well equipped, e.g. with microscopes, hplc, centrifuge, disposables etc, with a sufficient number of instruments in relation to the number of students. The dissection room is about 180 m^2 with 12 tables. The necropsy room is about 120m^2 with 4 tables.

The new premises were planned for an annual intake of around 80 per year. The Faculty remarks that the move to the new FVML premises took place at a time when the budget for equipment was progressively and significantly cut by the government. This hindered the planned allocation of equipment to make the buildings functional. The FVML also had difficulties funding necessary adaptations and repairs of the new Ajuda facilities, since several building problems arose due to the nature of the construction.

The clinical facilities and organisation are outlined in the next section. The provision of library and computing facilities is outlined in Chapter 8.

Farm facilities

FVML has a protocol with the Estaçao Zootecnica Nacional (EZN) at Santarém (70 km away) to use 300 m^2 of covered open space as a large animal clinical unit. The same protocol also allows for the performance of practical classes and clinical training using the various production animal species housed at EZN

(approximately 50 dairy cattle, 100 beef cattle, 250 ewes, 30 goats, 80 sows, 500 laying hens, 40 mares, 70 stallions and 100 foals). EZN also owns a small feed mill and an abattoir. Each student visits the establishment several times, during practical training of animal production subjects (see also Section 4.3).

The FVML also has close links with the adjacent ISA, where it was planned to have production animal facilities. These have not yet been realised.

A few years ago, FVM invested in new vehicles to transport groups of students to practical training facilities (e.g. slaughterhouses, meat industry units, fish inspection units, farms) and for the ambulatory clinic. The Faculty has two trailers available, one for horses and one for ruminants.

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

6.1.2 Comments

The Faculty is located on a pleasant site, which is reasonably accessible to both small animal and large animal caseload; the topography and pattern of building in the area does not facilitate transport links.

The facilities are new and built specifically for the veterinary Faculty. However, some design or construction flaws are evident, notably in the layout, scaling and implementation of the clinical facilities. Some areas, such as the isolation unit and some large animal areas, have not been completed.

In overall terms, the Faculty has sufficient space in its new premises. However, with the fragmented organisational structure, this space has been 'colonised', leading to distribution or use of space that is sometimes inappropriate, or does not reflect priority needs. Thus, sometimes space (offices, animal facilities) is unused or severely underused, whilst there is a pressing need for identical facilities by another user.

The teaching equipment (e.g. audio-visual support) is of a high standard and teaching laboratories are generally well-equipped. In the basic sciences areas and those of food hygiene, the provision of laboratory equipment is mainly good.

However, there is a noticeable duplication of facilities and equipment, for example, multiple microscopy laboratories, since each section has its own facilities for its teaching and laboratory work.

A more rational system for allocation, or reallocation of space is needed, based on functional requirements, not on 'territory'. This has to include a body having the authority to re-assign space that is not optimally used, and is needed for other purposes. There should also be systematic moves to develop larger, shared teaching facilities, to make more rational use of resources.

The EZN provides a good facility for student training. The distance from the Faculty is an obstacle to making full use of it. As remarked in Sections 4.4 and 4.1, the current teaching pattern means that sessions at the EZN have to be terminated in time to return to the Faculty for afternoon lectures. It would be far better to reorganise teaching so that students can spend the full day or, preferably, consecutive days, at the EZN site. As EZN has accommodation facilities, teaching could also be organised so that students stay overnight, either for routine coursework, or for specific interventions, e.g. parturitions.

The provision of facilities and equipment in the clinical areas, is outlined in the following section.

Although the Faculty has a range of vehicles at its disposal, the demands for transport relating to outside work puts pressure on their availability.

6.1.3 Suggestions

6.1 The organisational structure needs to be amended so that space can be distributed more appropriately to meet priority needs. A formal body should be created to reassign space that is not optimally used.

6.2 The Faculty should make provision for more facilities for shared use, such as larger teaching laboratories.

6.3 The EZN facilities should be used more intensively, in particular through full-day sessions, and overnight stays by students.

6.2 Clinical Facilities and Equipment

6.2.1 Findings

The clinical premises are situated on the northerly side of the FVML buildings, which due to the topography is at the roof level of the main blocks. They comprise distinct areas, though these are often linked, the main ones being:

- the Veterinary Hospital (outpatient clinic for small animals)
- surgery areas for large and small animals (downstairs from the outpatient clinic);
- the Reproduction Clinic (adjacent to the surgery area);
- separate ancillary premises (such as kennels, cattery, isolation, large animal housing/examinations area, the large animal facilities of the Reproduction Clinic.

In addition, there are various offices and other administrative spaces elsewhere in the FVML buildings.

The small animal clinic is coordinated by a clinical director. There are eight veterinarians who are academic staff members working in consultations and surgery. These work with five veterinarians for internal medicine, two for surgery and two for diagnostic imaging, who are not part of the academic staff. The small animal clinic also has two receptionists and seven veterinary practitioners (two in surgery, five in internal medicine including the hospitalisation rooms).

The Small Animal Hospital (SAH) has ultrasonography, endoscopy (unavailable since the equipment was broken approximately two years ago), CAT and radiology services for diagnostic imaging. There is also a large animal radiology service, and ultrasonography for large animal species is provided either by the Reproduction Clinics or by mobile equipment of the mobile clinics service, which is also the case for large animal endoscopy.

There is central gas distribution for anaesthesia (oxygen, nitrous oxide and compressed air) with outlets in each of the operating theatres, and centralised preparation and sterilisation for clinical materials.

For hospitalisation, the FVML has in total 2 places for cattle, 5 for horses, 20 for small ruminants, 37 for dogs and 15 for cats.

The FVML has planned a multipurpose isolation section to accommodate animals suspected of having a contagious disease. This comprises four separated animal rooms, a small laboratory and a preparation room, feed and other material stores, changing rooms and WC's, with adapted air and waste management. The facility will be able accommodate up to ten small animals and/or up to 6 to 10 large or medium size animals. At the time of the visit it was under construction.

The Small Animal Hospital outpatient clinic is open 50 weeks per year. Consultation hours are from 09:00-21:00 on weekdays. Outside these hours, a veterinarian stays on duty until midnight, after which he/she is on call. Student participation is only for hospitalised animals and no incoming emergencies are seen.

Consultation hours – small animal clinics

Morning				
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
General consultation + Neurology + Diagnostic Imaging	General consultation + Cardiology + Diagnostic Imaging	General consultation + Neurology + Diagnostic Imaging + Orthopaedics	General consultation + Gastroenterology + Diagnostic Imaging	General consultation +
Afternoon				
General consultation	General consultation + Dermatology	General consultation	General consultation + Dermatology	General consultation + Dermatology

The large animal clinics work all year round. In August, there is one staff member available for emergency calls.

The mobile clinic unit works an average of 60 hours per week, with a staff of three veterinarians. These veterinarians work on call through mobile phone. The mobile clinic has two vehicles available, one jeep and a van with a capacity to transport 7 to 8 students each. These, sortie four days a week.

All administration of clinical activity carried out is centralised within the administration of the Veterinary Faculty, as is the purchase of the materials needed by the hospital. The fees of the FVML hospital are based on the average prices that the OMV establishes for the Lisbon area.

The Veterinary Teaching Hospital is supported by a clinical pathology laboratory which also accepts external samples (around 20,000 tests in 2002). The diagnostic laboratories associated with the different disciplines of the Faculty (histopathology and cytology, parasitology, mycology, virology, retro-virology and immunology, bacteriology, reproduction) also provide additional analyses for the VTH and outside clinicians.

Case records are paper-based.

6.2.2 Comments

The premises available for the clinical examination, treatment and accommodation of animals are extensive, spacious and modern. However, some facilities, in particular those for large animal work, have not been completed since the move by the Faculty a few years ago.

Notwithstanding this point, there is sufficient space overall for clinical activities. However, this space is physically dispersed between different areas. This applies particularly to the facilities for keeping and examining farm animals. However, the small animal area of the Reproduction Clinic is also located some distance from the main small animal hospital, with this physical separation being increased by organisational separation/isolation (see below). Some of the space is unused or under-used; for example the large animal surgery is not used, and some parts of it have either fallen into disrepair, or have never been functional. Likewise, a useful building with large animal facilities provided for the reproduction department has stood idle since construction.

The small animal clinic appears to function well, receiving a caseload similar to that of a 2 - 3 veterinarian small animal practice. Although this clinic is large enough for its current caseload and functioning, facilities currently require some further thought and reorganisation. If the extent (i.e. caseload) or depth (i.e. specialisation) of clinical services are expanded, such reconsideration will be vital.

The large animal clinical activities are noticeably underdeveloped. There are extensive physical facilities, which are equipped fully or in part, but which are noticeably underused, if used at all. There is no large animal surgery, and practically no hospital based activity for such species. This particularly limits the ability to provide meaningful teaching, or build up any competency or reputation in the equine area. There is a clear problem due primarily to a lack of clinical staff, as there are only three positions to cover the farm animal species and horses. The efforts of these staff seem almost entirely devoted to teaching, principally using extramural facilities and the mobile clinic. The efforts of the few staff cannot make up for the lack of resources, or adequately support the basic teaching (see also Section 4.4) and service activity in the large animal field that is expected of a veterinary teaching establishment. It should also be noted that it is very difficult to see how these staff find any time at all for research activity with their current teaching workload.

The team were informed that, although no longer in existence, there was once a viable equine clinic and hospital at FVML but that it was allowed to decline due to lack of finances and resources. There seems to be a similar situation occurring with the mobile clinic, which has a very limited number of staff who are currently working beyond capacity. Both of these issues need to be redressed so that FVML can have a fully functioning and viable mobile clinic and equine hospital.

A lack of strategic management of the clinics as a whole seems to be at the root of the under-emphasis of large animal activities. The difficulties with financing are also a problem, since production animal teaching activities are unlikely to bring in any significant revenue, unlike companion animal work. However, reinforcement of the large animal activity is an essential component of a more general need to strengthen and direct clinical activities within the FVML. It was particularly disappointing to learn that equine caseload and facilities had been built up, and then been allowed to fall into complete neglect.

The clinical areas appear to have been designed with insufficient consideration of clinical needs. It would be appropriate to consider using money, already designated for further expansion, to redesign and amend these areas in consultation with the clinicians currently using the facility, and with a strategic view of current and future clinical function.

The improvised isolation facilities within the hospital are not adequate. The purpose-built large isolation unit built at some distance from the hospital has remained incomplete and unused since construction. The lack of a functioning isolation unit is a serious deficiency.

The FVML clinics function predominantly as first opinion clinics in terms of the equipment available and the level of expertise. The staff working within the clinics are enthusiastic and dedicated. However they are too occupied with clinical work to develop their own interests or research projects. This means that there is a shortfall in specialised knowledge in most areas of the clinical curriculum compared to the European norm and consequently less incentive for general practitioners to refer cases. There are no specialists with European College Diplomas working within the clinics, and this lack will constrain further development of a valuable service for general practitioners, access to animals, "hands on" experience for students of more interesting cases and will have an adverse effect on the staff who have to retain their motivation.

Specialisation, in terms of personnel and equipment is quite limited; for instance although CAT and ultrasonography are available, the endoscope is broken and there is no ophthalmological equipment other than a basic ophthalmoscope (which must seriously limit the teaching and demonstration of this subject). A veterinary training centre would normally be expected to have the role of a centre of excellence, offering services and infrastructure that is outside the capacity of a private practice. The Faculty needs to develop in this direction, both to enhance its level of services and caseload, and to support and advance clinical services in the Lisbon area and Portugal as a whole. The lack of positions that emphasise or require long-term commitment to developing clinical services in general and specialisation in particular, is a considerable problem in this respect.

There is a continuity of service within the large and small animal clinics, though there are some gaps in the complete provision of a 24 hour, 365 day service. The FVML provides hospitalisation although it does not have an emergency service, which a veterinary training establishment must offer. Students need to be exposed to emergency work, both to see the conditions that present, and so they are fully aware of the ethical obligations of veterinarians. The formation of an emergency service requires an appropriate number, availability and commitment of personnel. In principle this is an issue of expanding the 24 hour cover with an on-call system, so that senior clinicians are available when needed.

Service is emphasised not for its own sake, but because it is a prerequisite for having viable clinical teaching and research activities. As well as having far more coordination and integration of activities within the Faculty clinics, the FVM must develop relations with practitioners outside, so that the services it offers aim as much as possible to complement and support those offered by private practice.

The Clinical Pathology Department is now providing an increasingly valuable resource for the hospital and general practitioners, both in terms of finance and service. However, the general practitioners reported that it could still be improved further in terms of providing the wider service that they require. Once again this appears to be an example where thoughtful investment could provide an increasingly financially profitable service, and the specialist knowledge gained would provide a further incentive for staff, students and practitioners.

As noted in Chapter 2, the FVML in practice functions as a substantial number of separate sections, rather than as departments. The lack of integration or coordination of activities this implies is evident in the clinics. Reproduction is noticeably separated from other aspects of teaching. In more general terms, there is no ethos of running a clinical service with continuity and dependability of service. In this respect, there are particular problems with some academic staff seeming to have no commitment to supporting clinical work outside their teaching obligations, an approach that seriously affects the ability to maintain a viable and high standard clinic. Support services (e.g. diagnostic analysis, pharmacy) also need to be geared up to the functional needs of the clinics, rather than having a purely 'local' view of their role.

The current fragmentation leads to a less than optimal use of buildings, equipment and caseload. It also

impairs the development of clinical services.

There are noticeable imbalances in terms of species coverage and staff loading, and thus the effectiveness of clinical services and teaching. This points towards a clear need for overall strategic management of clinical activities within the FVML. This firstly needs to clearly identify the roles and functions of a clinical department in terms of the clinical services, teaching and research that this should be providing, and the appropriate level (i.e. specialisation) and species balance in the medium and short term. Strategic planning also needs to have a clear view of resources (e.g. buildings, staff time, equipment, expertise, caseload, etc.) in terms of what it has available, and what is necessary to fulfil the objectives of the clinics.

The resources need to be matched with the roles and functions of the clinics in terms of:

- identifying where there are deficiencies in terms of the current coverage of activities;
- identifying where resources are insufficient to fulfil the necessary tasks;
- identifying where resources are not being used to optimum effect;
- making systematic, coordinated and integrated use of resources to fulfil the service, teaching and research requirements of the clinics;

To function and develop properly, the clinics of the Faculty must be able to maintain and reinvest a large proportion of the revenue they generate so as to provide an incentive to both staff and students, in addition to funding and servicing of equipment and facilities. This will require an appropriate and authoritative administrative structure that can be firm about the requirements and use of resources (see Chapter 3).

Paper-based records are no longer appropriate for a modern veterinary practice, far less a veterinary teaching establishment. They do not permit adequate follow-up of cases on an individual or population basis, and are unsuited to research work. The Faculty should work with an integrated records/administrative management system, into which all cases, and clients, are logged.

There is a major problem in that some members of the clinical staff who hold academic appointments may not be fully engaged on a whole-time basis in the activities of the hospital. They go there, teach, and then leave. Clinical duties are not a distinct element of a clinical academic position. Advancement within the faculty has no relation to clinical teaching ability. As remarked in Chapter 10, despite outside work being officially discouraged or closely controlled, it seems that a significant number of staff engage in outside work, such as private practice. This has an adverse affect on the quality of the clinical service provided, both in terms of competition and absenteeism. The habit of staff having second "jobs", such as running clinics of their own, must detract from their commitment to FVML activities, and represents a conflict of interest which is to the detriment of the FVML.

6.2.3 Suggestions

6.4 There needs to be strategic and authoritative management of the clinical activities and resources so that the clinics meet the objectives and expectations of a modern veterinary training establishment, and to ensure that the limited resources available are used to optimal effect.

6.5 The large animal area needs to be systematically built up, particularly regarding staff numbers and expertise, in order to support a functioning mobile and hospital-based activity that provides an acceptable level of training in equine and in farm animal work and also to provide staff with the opportunity for professional development (see also Suggestion 4.21).

6.6 The clinical department and clinical activities (including support activities) need to be run as a cohesive and coordinated effort aimed at effective shared use and full engagement in all clinical activities by all personnel.

6.7 The material deficiencies in terms of incomplete facilities, non-functional equipment and missing basic items should be rectified.

6.8 The FVML must have functioning isolation facilities for small and large animals (potential category 1 suggestion).

6.9 The FVML clinics should aim to build up specialisation in terms of services, training capacity and staff expertise (see also Suggestion 10.6).

6.10 All academic and clinical staff should have a full-time commitment to supporting clinical services and teaching. The rules forbidding outside employment should be rigorously enforced.

6.11 The attribution of space within the clinical areas should be kept under review in the context of:
- the space needed if the clinics develop;
- whether space (e.g. stabling) is being used.

Note that the large animal radiology and surgery areas, that are currently almost unused, should not be reassigned but should be equipped and developed so as to form part of a thriving clinical activity (mainly involving equine cases) and be fully used as an income generating resource.

6.12 The tasking of staff working in the clinics should strike a balance between their clinical service, teaching and research. All these activities should be recognised as an important component of a professioinal appointment in a prestigious veterinary teaching establishment such as the FVML.

6.13 The Faculty has to have a fully functional emergency service for small and large animals in which all academic clinical staff and students participate.

6.14 Case records should be computerised, with a central system which all FVML clinics can access.

6.15 Consideration should be given to the direct involvement of local practitioners in the use of the large animal facilities of FVML by encouraging them to bring cases to the hospital, where they themselves can carry out investigations and treatments with the collaboration of their academic colleagues and to the benefit of the students.

7. ANIMALS AND TEACHING MATERIAL OF ANIMAL ORIGIN

7.1 Findings

Anatomy teaching is based primarily on sheep, which are bought from farms around Lisbon. About 100 per year are used for practical classes (dissection of muscles and joints and splanchnology) and around 40 more animals are used for practical exams. Some dog and cat cadavers for anatomy work are obtained from a Lisbon animal shelter, whilst others are euthanised patients from the FVML hospital. At least 10 dogs are used each year.

Equine, bovine and rabbit material comes from animals submitted for pathology analysis and the quality is variable. Pigeons are available through a particular surveillance research sampling in Lisbon.

For the teaching of physiology and physiopathology FVML experimental animals are used. Video films and CDs are used to demonstrate the physiological functions and pathological processes in animals. For the teaching of pharmacology, animals are used in a restricted manner.

Part of the training in general pathology uses around 40 case specimens per student, consisting mainly of lungs, livers, kidneys and spleens of farm animals obtained from slaughterhouses. Cadavers for necropsy are also obtained from veterinary clinics in Lisbon. Students assist in several field necropsies performed during their rotations in infectious diseases and large animal clinics in the 4th and 5th years,

The FVML has access to the Horse Mounted Police (Guarda Nacional Republicana) facilities near FVM (approximately 2 Km) through a protocol of collaboration between the two institutions. Students attend this facility in ethology classes and during the 5th year as part of the equine rotation. Guarda Nacional Republicana has its own radiological apparatus and operating facility. Students will on occasions attend operations there. This unit has 250 individual boxes which house over 200 horses, a surgery room and an equine hospital.

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

Table 7.1: Number of animals seen at FVML (2000/01 - 2002/03)

		consultations			hospitalisations			autopsies		
		03/02	02/01	01/00	03/02	02/01	01/00	03/02	02/01	01/00
Farm animals	Cattle	27	10	2	27	10	2	49(28)	48(19)	40(14)
	Horses	73	13	2	73	13	2	9(3)	8(1)	3(1)
	Small ruminants	6	5	5	6	5	5	12 (4)	18 (4)	32(14)
	Pigs	4						2	5	2
	Other farm animals							133	71	29
Pets	Dogs	4291	3099	1942	352	223		234	277	223
	Cats	805	612	445	114	98		117	134	80
	Other pets	321	324	243				39	52	41

*figures in brackets are field necropsies

Approximately 80% of the small animal cases are 1st opinion cases. In addition, the FVML has an agreement with a charity kennel, under which five spays/month are performed for the training students.

As already mentioned, there is a protocol with the national police for students to have access to police horses for training. Also under this protocol, students have access to 100 police dogs in premises located close to the school.

For the mobile clinic, an annual caseload of 450 horses, 960 cases of cattle and 107 cases of surgery in cattle is cited in the SER.

The availability of companion animals for practical teaching of students is as follows:

- there are sufficient small animal cases being admitted to the Faculty's clinic. However, there are very few equine cases being presented at the large animal clinic. The limited number of large animals is considered to be insufficient for the training of students;

- on other sites, the Faculty has access to both dogs (only for ethological studies) and horses (ethology and variable surgical and medical cases) at the GNR.

The availability of production animals for the practical teaching of students is as follows:

- there are very few cows on the Faculty site and this limited number of large animals for the training of students is considered to be insufficient;
- the Faculty also has access to farms.

The ratio of students graduating:clinical caseload in pets is about 1:54 (98:5417).

The ratio of students graduating:clinical caseload in livestock is 1: 15 (98:1520).*
*This is very dependent on the mobile clinic

The ratio of students graduating:necropsies is about 1:4.5 (98:450). For reasons of comparability between reports, necropsies on 'other' farm or pet animals (such as poultry, pigeons, rats and rabbits) are not included when calculating the ratios.

Dairy and beef herds are regularly visited by teams of students, with a total number of around 12,000 cattle in these herds. Four cattle are kept on site for practical classes (e.g. physiology, animal behaviour, pharmacology, medical semiotics).

Rapid changes in the last decade of animal production activities around Lisbon area have resulted in a significant reduction in the number of livestock units and the corresponding animal activities.

7.2 Comments

The Faculty goes to some effort to obtain fresh material for anatomy. It would however be desirable to put more emphasis on the use of dogs as the animal model, since students are more likely to be working with the species in later training.

The amount of material available for pathology work is satisfactory. Conducting necropsies in the field is not a practice to be encouraged.

The amount of small animal material available for teaching is generally satisfactory. It comprises primarily of out-patient cases, which provides students with exposure to routine cases. As noted in section 6.2, the level and extent of specialisation at the FVML is low, and therefore the exposure of students to referral work is very limited.

The access to equine material is far too low to provide an acceptable level of training. A concerted effort is needed to build up both the hospital-based activity in this field, along with a mobile service. The FVML has facilities (see section 6.2) that probably offer better possibilities than are available to private practice, but it lacks an individual or academic group to consistently use these facilities, or to build up and sustain an equine clinical service.

As noted in section 4.4, the exposure that the students have to large animals is too low. Although there is a mobile clinic, there is little or no hospital-based activity.

As noted in Section 6.2, it would appear that a viable equine activity has been built up, and then allowed to dissipate. In a similar vein, the maintenance of the mobile clinic places a disproportionate load on the very limited number of staff working in the large animal areas. For an adequate caseload and teaching activity in the large animal area, there needs to be, at a strategic level, more balanced support for equine and production animal health/clinical activities (see also Section 6.2).

7.3 Suggestions

7.1. The amount of hospital-based large animal caseload, in particular equine work, must be increased and the Faculty should look at ways of encouraging practitioners to bring their own patients to the large animal clinic and to treat them there in collaboration with academic staff and for the benefit of students. In addition, the Faculty should negotiate access to large animals at the neighbouring farm, Instituto de Agronomia as a matter of priority.

8. LIBRARY AND EDUCATIONAL RESOURCES

8.1 Findings

The library is located on the 3rd and 4th floor of Building A, with an intermediate mezzanine providing an area of about 1000m^2 and 110 reading places. The 3rd floor comprises the Reception and Service Desk, shelves for periodicals, offices, an archive and two depositories. The reading room is also on this floor, with about 210 m^2 and 70 reading spaces, all wired for laptop use and containing books (reference books and theses). There is also a room with 6 places, that is equipped with TV and video, and is frequently used for study groups.

On the mezzanine, there are additional reference books, along with two photocopiers and manual catalogues.

The 4th floor comprises a reading room (180m^2) with 12 reading places, containing the recommended course textbooks. There are also two rooms on this floor, each with 8 reading places for study groups.

The library is open from 09:00 to 18:30 on weekdays during term time and from 09:00 to 17:00 during vacations. It is supervised by a coordinating professor and staffed by 4 full-time employees, including a professional librarian.

Book loans are restricted from closing time to opening time on the following day, since multiple copies of recommended textbooks are generally not available.

There are two library computers giving access to electronic documents, CD-ROM material and the Internet.

The library subscribes to 48 journal titles. A further 80 titles are received either free of charge or through exchanges with other institutions.

The library collection on veterinary sciences comprises some 41,712 books, 1,665 periodicals and 97 manuscripts. The library also owns a collection of more than 8,000 reserved books, many related to the history of the veterinary profession in Portugal. However, the stock of current veterinary textbooks is rather limited in terms of the overall quality, the age/edition of texts and the availability of specialised textbooks. Some specialised texts are available in departments but these are not always accessible to students. A major problem regarding the bibliographic resources of the library is that it does not have an allocated budget.

The library-based audiovisual materials consist of a collection of about six CD's and 26 videotapes, of which only about half a dozen are related directly to the courses taught at the Veterinary Faculty.

The computer service of the Faculty comprises one full-time employee plus 0.5 full-time equivalent of part-time employee. The full-time employee's main task is to manage and provide the maintenance of the technical audio-visual equipment installed throughout the Veterinary Faculty.

There is one computer room, which is for self-use by students, and is equipped with 18 PCs. This room is sponsored by a banking institution. It is open from 11:00 to 19:00 on weekdays and closed during August. There is also a class room, equipped with 15 PCs and with 27 places equipped for computer-based teaching.

8.2 Comments

While the stock held by the library is numerically extensive, there have been relatively few additions to the collection in recent years, due to lack of finance. Access to electronic issues and abstracts has improved in recent months but the library is short of textbooks in general, and lacks some of the specialised books that a veterinary training establishment would be expected to have, and use. Some of these are kept in particular departments, but these collections are not readily accessible to students. This over-reliance on departmental collections has led to a degree of complacency in regard to the extension of library stock.

In addition, due to the restricted opening hours and stock of the Faculty library, undergraduate and postgraduate students regularly use other libraries or rely upon internet access. This is particularly the case for students in the clinical years. There is serious under-utilisation of this facility for these reasons.

The library is largely unrecognised as a major resource for the Faculty and for the staff. There is no formal

instruction on the utilisation of library resources for students. There is a limited amount of directed reading by staff, and the numbers of assigned projects requiring input from current literature is sadly lacking. This has added to the difficulties in making a case for funding for library development to parallel that of other veterinary institutes. This is exacerbated by the pattern of examinations, whereby many students absent themselves from the University precincts in the weeks leading up to examinations. The Library is thus largely ignored as a source of learning at a critical time in the University calendar year.

The consequences of the present arrangements are alarming in the context of the need for curriculum development in a Faculty that is lacking in human resources at the teaching and clinical levels. There is no evidence of forward planning, despite the fact that the library should play a major role in learning.

With the recent development of a new computer room, the level of access the students have to computers for their own work, as well as for structured teaching, is currently satisfactory.

The role of the library has to be reviewed and reinforced as a matter of urgency, in view of its key role in learning. This applies particularly since the new curriculum should place a greater emphasis on self-directed learning, which is increasingly necessary in order to adapt the training and the thinking of graduates to the ever-expanding quantity of information they are required to access and assimilate.

8.3 Suggestions

8.1 There has to be an accessible stock of up-to-date international textbooks covering the veterinary disciplines.

8.2 The role of the library in the learning process has to be recognised and promoted by the teaching staff so that thoughtful and effective utilisation of the library gives it a central role in student learning.

8.3 The hours of opening should be extended to meet student and staff needs, now and in the future, with the staffing of the library extended in order to facilitate such access.

9. ADMISSION AND ENROLMENT

9.1 Findings

Year	2002/03	2001/02	2000/01	1999/00	1998/99
Number applying	575	570	660	835	799
Number admitted - standard	109	88	92	91	85
Number admitted - other	26	25	21	19	19
Number graduated	98	87	88	83	92

A total of 735 undergraduates are enrolled on the veterinary course, about 60% of whom are female.

Access to the FVML is based on access grades calculated from the marks in the final years in school and, with a higher weight, the grades obtained in national exams in biology and chemistry. The minimum access grades in the last few years have been 12 out of 20 for each subject. Beyond having the minimum grades, entry is competitive, with applicants with the highest grades being accepted.

The cut-off grades of the students admitted to the FVM have ranged from 17.38 to 17.75 out of 20 in the last five years, which is high by national standards.

The FVML, through its Scientific Council, determines the minimum access grades and the *numerus clausus* for each year. The *numerus clausus* has varied, depending on the dropout rate in the last ten years, from 85 to 105.

Furthermore, other criteria for admission are allowed. The Dean's Office, on recommendations from the Scientific Council, fixes an annual number of vacancies for each of the following situations:

- re-admission of former FVM students who have dropped out;
- transfer of students studying degrees other than veterinary medicine;
- transfer or exchange of students of veterinary medicine from other Universities;
- students already holding degrees other than veterinary medicine;
- foreign students holding degrees other than veterinary medicine;
- Ad hoc (for candidates over 25 years old who pass the *ad hoc* special examination to enter University).

Students transferring from other degrees, apply to the Scientific Council for equivalence of the disciplines already approved in their course of origin.

The Faculty remarks that this system of admission to higher education leads to the situation where students enrol for degrees with the same specific subjects, just to enter the University system. For the FVML, this means that students, whose first choice has been a medical school, often apply for veterinary medicine as a second choice, and are admitted. A sizeable number of these students then manage to get transferred to a medical school, increasing the dropout rate from FVML.

Students can also access FVM through several government-determined situations. These students have to obtain the minimum access grades, but do not compete for admission with the students of the standard entry regime. This quota includes high-standard athletes, sons/daughters of Portuguese emigrants, diplomats and Portuguese public servants located abroad, nationals of former Portuguese colonies and a contingency for Madeira and Azores residents. Both the standard admission and the special entry regimes are centrally controlled and applied by the Ministry of Education and Science.

Any reduction in the total student population has a direct influence on finances (see Chapter 3), which is a major factor when deciding the *numerus clausus.*

The new premises were planned for an average of 80 students per year. This relates directly to the actual number of seats in the 3rd and 4th year classrooms. However, FVM could not maintain this limit to the *numerus clausus* due to current financial constraints.

Meanwhile, in the past two decades, the number of courses in Veterinary Medicine in Portugal has increased from 1 to 5.

9.2 Comments

The student intake is primarily based on the need to have high undergraduate numbers so as to maintain the Government's contribution to the overall budget (see also Chapter 3). As a result the current student numbers are too high for the facilities and in relation to staff. The imbalance in relation to staff is structural, in that the budgetary link means that a reduction in student numbers will necessitate a reduction in staff.

As there are a significantly number of applicants for each veterinary study place available, only students with high grades are able to enter the course.

The number of different possible entry modes and conditions is confusing. The practice of switching into and out of the veterinary course is disruptive, and is wasteful of teaching resources. Although it may be a national tradition or entitlement, there is perhaps too much flexibility in the current system. The emphasis should be on accepting from the outset, students who have the commitment to veterinary studies as their first degree choice.

The team notes that in Portugal as a whole, admissions to and graduations from the five Veterinary Medicine courses appear to be too high. While this is an issue that must be addressed by the national authorities, this fact has a considerable negative impact on the financing of the Lisbon course, and eventually upon the employment outlook for its graduates.

9.3 Suggestions

The need to have more realistic criteria for relating student numbers to staffing levels and funding has been mentioned in Suggestion 3.1, 10.1 and 10.3.

9.1 The extent to which students can transfer between different courses should be very strictly limited.

9.2 The Faculty should seek to accept only those students who have a clear motivation and preference for veterinary studies, and in all cases allow entry to the first year only.

10. ACADEMIC AND SUPPORT STAFF

10.1 Findings

Table 10.1: Academic and support posts in Departments

	Academic staff				clinicians	Support staff								Total
						Budgeted				From own resources				
	Prof	Assoc. Prof	Assist. Prof	Assist.		Lab tech	Animal care	Admin	Other	Lab tech	Animal care	Admin	Other	
DMF	**1**	**2**	**10**	**2**	**0**	**3**	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**22**
Administ. staff												1		**1**
Anatomy			3	2		1								**6**
Histology		1	2											**3**
Biochemistry			3			1				1				**5**
Physiology		1	2			1				1				**5**
Genetics	1									1				**2**
DSA	**4**	**3**	**7**	**1**	**0**	**12**	**0**	**0**	**0**	**2**	**1**	**1**	**0**	**31**
Administ. staff												1		**1**
Biostatistics			1											**1**
Microbiology	1	1	1			3								**6**
Parasitology	1		3			3				1				**8**
Pathology	2		1	1		2				1	1			**8**
Infectious Diseases		2	1			4								**7**
DC	**5**	**5**	**7**	**7**	**0**	**6**	**0**	**0**	**0**	**3**	**1**	**1**	**0**	**35**
Administ. staff												1		**1**
Pharm. & Tox.	2		1	1		3					1			**8**
Clinics		2	4	3		2				2				**13**
Surgery	2	2	1	3										**8**
Reproduction	1	1	1			1				1				**5**
DPASA	**3**	**3**	**9**	**2**	**0**	**7**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**27**
Administ. staff												1		**1**
Sanitary insp.		1	1	1		2								**5**
Technology of animal products		1	1	1		4								**7**
Vet. Pub. Health	1		1						2					**4**
Agriculture, etc.			2											**2**
Nutrition	2		1			1								**4**
Zootechnics		1	1											**2**
Economics			1											**1**
Animal behaviour			1											**1**
Dept. Staff	**13**	**13**	**33**	**12**	**0**	**28**	**0**	**0**	**2**	**8**	**2**	**4**	**0**	**115**
Small Animal Hospital					13	2	2	1		1	4	2	1	**26**
Large Animal Hospital					1		2				2			**5**
General administrat. staff								18	10			9	3	**40**
Total	**13**	**13**	**33**	**12**	**14**	**30**	**4**	**19**	**12**	**9**	**8**	**15**	**4**	**186**

Most academic staff occupy budgeted posts, with both teaching and research requirements. Some research staff, mainly non-budgeted posts, are also occasionally involved in classes. On the other hand, clinicians are

veterinarians employed from FVML resources (as is also the case for support staff), to provide clinical services and student supervision.

The ratio of teaching staff:students is 1: 10.4 (71:735) or 1:8.65 (85:735) if non-budgeted clinicians are included as supervisors of undergraduates.

The ratio of teaching staff:support staff is 1: 1.42 (71:101) or 1:1.62 (71:115) if clinicians are considered as support staff.

The ratio of teaching staff: budgeted support staff is about 1:0.91 (71:65).

Only 65 of the support staff positions are budgeted.

For veterinary medicine, staff numbers are governed by pre-established ratios and funding (see also Chapter 3), whereby a teaching staff:student ratio of 1:9 and a teaching staff:support staff ratio of 1:0.85 is imposed.

At the current time, academic staff posts cannot be opened if expenditure on staff is more than 85% of the funding allocated by the government, which is currently the case at FVML.

Besides the constraints on support staff numbers that arise due to the statutory ratio applied by MCES, there has in recent years been a moratorium on opening new positions because of the government policy of blocking access to civil service careers. Technical and administrative staff who retire have not been replaced in recent years. This has led to the hiring of services and contracting personnel through the private budget of FVM, with salaries being entirely supported by revenue earned by FVM. Of the 117 non-teaching staff, only 51.3% are civil servants. Such support staff (including clinicians) can only be employed on contracts for a maximum of 3 years.

Only support staff, and not teaching staff, may be hired and paid from resources generated by the Faculty.

Teaching staff are allocated according to the needs of each subject or Department as adjudged by the Scientific Council in plenary session. The needs are identified and brought to the Council by professors or by any of the management boards of the Faculty (e.g. Departments, Dean's Office, Pedagogic or the Scientific Council itself).

Administrative and other non-teaching staff are hired and allocated by the Dean's Office, sometimes after input from the Presidents of the Departments or the professors responsible for each discipline or unit.

Veterinarians form the large majority of the academic staff, with only three academic staff members having a different degree. Most of the teaching staff commenced their career at the FVML as assistants whilst pursuing their Ph.D. or M.Sc. degrees, while they were teaching and doing other tasks.

There is no structured staff development programme or activities, although the FVML recently has organised courses in pedagogic matters and a seminar on teaching issues.

Teaching excellence is not the most relevant criteria for the promotion of teaching staff. Assessment of teaching quality is limited to inquiries to students carried out annually by the Pedagogical Council.

The FVML suggests that teaching quality of staff should be recognised and formally used as assessment criteria for promotion.

10.2 Comments

The number of academic positions is below the level of 80 that is regarded as the minimum 'critical mass' needed to cover the veterinary curriculum.

The government-imposed ratio of teaching staff:students of 1:9 is unsatisfactory compared to the recommended ratio of 1:7.5.

The current restrictions on appointing academic staff mean that positions that fall vacant cannot be refilled. Unless there is an increase in its government grant, the faculty would have to cut its staff expenditure by 14% (i.e. reduce its budgeted staff by this amount, an estimated 10 positions) before it was below the threshold

where replacement of staff was permissible.

Along with this shortfall in staff, and at least in part because of it, there is a need to develop specific activities at the Faculty. In terms of this evaluation; this is particularly a case of reinforcing certain parts of the teaching and related service work, especially in the clinical areas (see also Section 4.4 and 6.2). However, research activities also need reinforcing. Staff levels need to be increased so that they are adequate relative to obligations and workload of a veterinary training establishment and the intensive nature of its teaching.

In fact, with current government budgetary and staffing policy, it appears inevitable that the staffing situation will deteriorate. The loss of 10 academic posts before the number of teaching personnel stabilises implies a prospective staff:student ration of 1:11.9 (62:735). The staff:student ratio is already considerably outside that indicated in national legislation and this gap will widen.

For these reasons, clinical research and postgraduate education are chronically jeopardised at FVML, as well as the progression of the academic career of teaching staff in clinical areas, which is conditioned not by clinical performances, but by the number of publications of high scientific quality.

Currently, academic staff advancement is based almost entirely on research. Teaching performance is not evaluated in any depth or with any consequences, and there is no training or support as regards pedagogical issues.

The ratio of teaching staff:support staff is satisfactory when compared with the recommended ratio of 1:1. Due to financial and recruitment restrictions, an unusually high proportion of these positions are funded from own resources. There is the obvious point that it is highly inappropriate that the FVML has to devote a major proportion of the resources it generates to supporting core positions which should be funded by the government. Furthermore, these positions are limited to three years in duration. This means that the Faculty steadily loses its experienced support staff and clinicians and has to train up new ones. This is highly wasteful of the resources already invested in the development of these individuals, particularly since many of these staff are highly qualified at the end of their appointment and would otherwise be a considerable asset to the Faculty. It is an extremely destructive policy to not only prohibit the creation or replacement of support staff posts, but to also prevent, by order, effective and continuous substitution for the lost posts, even when these are paid for from the Faculty's own funds.

In principle, full-time staff can only engage in outside work if they have express permission from the Faculty. It would seem that in practice, this requirement is not respected and that a significant number of staff have outside work, such as private practice.

This is a major conflict of interest (see also Section 6.2), both in terms of the individuals concerned being in direct and unethical competition with the FVML clinics, and in terms of the direct impact on the standard and continuity of clinical service. Not only are clinical services and training at a stage where they need development and reinforcing (see Section 6.2) but the Faculty is also using its own resources to pay for a significant number of clinical posts that must, at least in part, be necessary to compensate for the non-attendance of salaried, full-time academic clinical positions. It might also be remarked that clinical research also needs to be significantly enhanced.

Since it needs to improve research and service provision, it is essential that the Faculty staff are available and actively involved in these activities on its behalf. Clearly, a position that is one of full-time employment must mean exactly that and the terms of such employment within the University must be rigorously enforced.

There needs to be recognition that hours spent providing clinical services are part of the academic activities of the clinical teaching staff. A move towards full-time rotations, with students working alongside staff, will both increase the number of clinical hours of attendance by students and make clear the distinction between clinical service and formal teaching.

10.3 Suggestions

10.1 FVML must have strategic planning concerning the allocation of staff resources to develop solutions for the current shortfall in staff and to correct noticeable imbalances and weaknesses in some areas of teaching and service.

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10.2 The Veterinary Faculty staffing, and the government funding for this, should be equivalent to that of human medicine to reflect the unavoidably intensive nature of veterinary medical training.

10.3 The number of full-time academic staff positions should be increased to at least 80, to give the FVML the critical mass necessary to cover the full veterinary curriculum.

10.4 There has to be provision for the retention of individuals recruited for clinical, laboratory and administrative staff positions funded through the faculty's own resources. In the longer term, the steady decline in budgeted positions, and the associated drain on the FVML's own resources by having to pay for such posts, must be halted by re-employing permanent support staff.

10.5 The attribution of staff time to different activities, and the encouragement and recognition that is given to different activities needs to be reviewed in the context of meeting Faculty objectives. In particular:

- there should be systematic appraisal and development of teaching performance, which should be an important factor in academic career development and promotion.
- clinical duties, both during normal working hours and as on-call 'back-ups' in evenings, nights and weekends should be a recognised component of academic appointments in the clinical fields.
- achievement of a higher level of clinical skills (i.e. specialisation) should also be recognised and promoted among staff, and/or made a mandatory component of an academic career (see also Suggestion 6.9).
- time and facilities should be specifically earmarked to allow both academic and clinical staff in the clinical departments to engage in research. This is an issue of a balanced workload, hence there should be sufficient clinical positions to cover teaching; service and research obligations.

11. CONTINUING EDUCATION

11.1 Findings

The team notes that there is an increased number of courses for postgraduate education (see Chapter 12). However, these are not actually continuing professional education (CPE) in the normal sense. The team also notes that a high proportion of these courses are in the domain of Veterinary Public Health.

There is no continuing education for teachers or practitioners.

11.2 Comments

The Faculty should provide CPE courses in a variety of veterinary subjects as this will not only aid career development for Faculty staff, but also of members of the veterinary profession in the surrounding area.

As mentioned in Section 4.2, the large animal operating and x-ray facility within the hospital is underused. By encouraging local practitioners to bring cases to the hospital, and to be involved in their treatment, this would help practitioners to develop their CPE, whilst the hospital and students would benefit from an increasing caseload.

11.3 Suggestions

11.1 There is a need to organise and prepare CPE for staff, students and practitioners in all fields i.e. clinics and basic sciences. Income can also be generated from running CPE courses.

12. POSTGRADUATE EDUCATION

12.1 Findings

There are no formal internships or residency positions. The contracted clinicians take on the role of interns, although they usually have 3 year contracts.

Table 12.1: Taught postgraduate courses

Course	Duration of training	Number enrolled
(a) Diploma level		
1. Veterinary Public Health	1 year (31 CU)	20
2. Tropical Vet. Medicine and Livestock Production	1 sem (24 CU)	0*
3. Animal Production	2 sem (27 CU)	17
4. Food Science and Engineering	2 sem (26 CU)	20
5. Food Quality	1 sem (14 CU)	20
(b) Masters level		
1. Veterinary Public Health	1 year	11 (6)
2. Tropical Vet. Medicine and Livestock Production	1 year	9**
3. Animal Production (n° underway)	1 year	17 (12)
4. Food Science and Engineering	1 year	20

* This was not run in 2002/2003
** Theses from the previous edition; Figures in brackets are n° underway

Five postgraduate courses (four MSc. and one Diploma) take place at or have the co-operation of FVML, as shown in Table 12.1. One of the M.Sc. courses (Veterinary Public Health) is organised and run by the Faculty.

All M.Sc. courses have an identical structure, consisting of a year of formal lectures (24 to 31 credit units), followed by a year for research and writing a thesis. Most M.Sc. training programmes relate to students who developed the research work at FVM. All of them have a grant or salary and 15 of them are Veterinary Medicine graduates.

Postgraduate research training, both for M.Sc. and Ph.D., is generally linked to research projects financed by the Centre for Interdisciplinary Research in Animal Health (CIISA) or by outside sources.

Ph.D. courses are based on research training followed by the submission of a thesis. The course runs for 3-5 years but generally students take 4-6 years before submitting a thesis. Members of FVM teaching staff are allowed a maximum of six years to submit their thesis in order to take due account of their teaching duties.

Ph.D. degrees are offered in Veterinary Sciences (reserved for students graduated in Veterinary Medicine, i.e. 28 of the 43 Ph.D. students) and in Animal Science and Technology. Most students develop their research training at FVM, but sometimes part, or all, of the research work is developed outside of the Faculty under the supervision of a Faculty Professor or under the supervision of an outside Professor. In the latter case the supervisor has to be previously approved by the Scientific Council. Sixteen of the Ph.D. students are supported by grants, while 28 are employed and receive salaries. Ten of the current Ph.D. students are members of the Faculty teaching staff.

There is no overall educational programme for Ph.D. students provided by the University that is approved by the Faculty, although Ph.D. students in theory should have the opportunity to follow general oriented courses outside their specialised subjects.

12.2 Comments

There is a need for a structured element to the Ph.D. programme. Ph.D. students should have a foundation in generic skills such as experiment design, statistical relevance, pedagogics and scientific writing.

There are no postgraduate clinical postgraduate positions. This is an area, along with clinical specialisation,

that would be beneficial for the Faculty to develop.

12.3 Suggestions

12.1 The Faculty and/or University should develop a taught element within its Ph.D. programme, with modules covering generic skills, such as experiment design, statistical relevance, pedagogics and scientific writing.

12.2 The Faculty should consider creating postgraduate clinical positions that offer the possibility of postgraduate degrees and /or European College recognition.

13. RESEARCH

13.1 Findings

There is little or no opportunity for undergraduate research at FVML. Research is conducted through the Centre for Interdisciplinary Research in Animal Health (CIISA). The centre was established by the FVM in 1991/1992, to develop, integrate and articulate research activities, framed within the following main areas:

A – Animal Health and Prevention	B – Food Safety and Technology	C – Pathology and Medicine	D – Biotechnology and Animal Production
- Epidemiology and Veterinary Public Health	- Food Inspection	- Anatomy	- Physiology and developmental biology
- Infectious Diseases	- Food Biochemistry	- Pathology and Histology	- Reproduction
- Virology and Immunology	- Pharmacology and Toxicology	- Teaching Hospital and specialty clinics:	- Nutrition and Biotechnology
- Bacteriology and Mucosal Immunology	- Technology of Products of Animal Origin.	- Surgery, Medicine, Imagiology	- Animal Production
- Parasitology, and Wild, Feral and Zoo Animals		- Large Animal Medicine	- Tropical Animal Science

This forms a parallel structure to the FVM in which all staff can participate. This structure for research was adopted for administrative and funding reasons.

Undergraduates may elect to participate in research activities in their own time. In addition, students may opt to spend part of the 6th year practical training period in a research or diagnostic laboratory. The dissertation or report on their activities during the extramural period may contain some elements concerned with research activity.

13.2 Comments

Research performance at the FVM is very dependent on the resources locally available in each particular unit. Although some of the research conducted is of a good quality, some individuals appear to be engaged in 'old' research rather than taking a progressive approach and looking to the future.

Undergraduate involvement in research depends strongly upon the initiative and motivation of the individual student in seeking to participate in research activities. In addition, the section or unit has to be both willing and able to introduce an undergraduate to research work.

The research laboratories of several sections are reasonably open to students, thus enabling them to gain an introduction to research. This is particularly the case in regard to pharmacology and toxicology as well as microbiology and parasitology.

Research is of questionable quality in the clinical sciences while the basic sciences are overloaded with teaching and therefore staff do not have the opportunity to be so engaged. Young staff in particular, should be allowed time to undertake research in their field of interest.

13.3 Suggestions

13.1 Undergraduates and staff should be encouraged to undertake progressive research.

13.2 The teaching load in the basic sciences needs to be reduced so that staff can engage in research.

13.3 The Faculty needs to look at ways for enabling all staff, particularly young staff, to have time to undertake research in their field of interest.

CONCLUSIONS

Since the last European evaluation in 1989, the situation of the Lisbon Faculty of Veterinary Medicine has changed greatly. The most apparent change is its relocation from a limited urban site to spacious new facilities on the edge of the city. Furthermore, the Faculty is no longer the only Portuguese establishment providing veterinary education, since four new veterinary medicine courses have been started in the past decade and a half.

Although the Faculty has undergone major changes, some aspects remain traditional. The plans of the FVML need to be fully implemented, and the mechanisms by which the Faculty is managed need to be brought up to date, for it to function in the most effective fashion. For example, although the Faculty clearly intends to improve coordination in its academic activities, and has adopted a good structure of four departments, it currently functions in practice as a much larger number of independent sections. More integration, cooperation and sharing of knowledge, facilities and equipment would be beneficial. It is also important that the Faculty has rational, effective and objective decision-taking processes, rather than using a historical basis, in particular as regards to the allocation of resources – staff positions, building space, finance, curricular time – to different areas. Some imbalances in these respects need to be corrected.

There are some difficulties as regards the financing of the Faculty and veterinary training. In common with the public sector as a whole, the Faculty has been adversely affected by austerity measures in Portugal. These have had an impact on both capital projects, such as lack of funds to complete the Ajuda premises, and on operational aspects, a block on recruiting being the most serious problem. In the case of the FVML, the challenging budgetary situation has been compounded by the fact that veterinary training is inadequately resourced, with its funding being based on a teaching staff: student ratio that is inferior to the one used for medical training and to the level recommended by European bodies.

Current government restrictions mean that staff who leave, for instance through retirement, are not being replaced. This means there is a shortfall in teaching staff to fulfil the academic duties properly (i.e. teaching, research and services). The most problematical area is in the clinics. Here, rooms and animal facilities are not used due to lack of personnel and expertise. There are similar but more pronounced problems with the provision of support staff. Since it is not permitted to replace government-funded positions that fall vacant, the Faculty is using its own income to pay for around half its support staff. However, the Faculty can only employ individuals in non-budgeted posts for at most three years, leading to systematic loss of staff with essential expertise.

The generation of useful amounts of revenue by the FVML is a very positive feature. However, such money should be used to fund additional activities, not to support 'core' activities, such as established staff positions or basic teaching costs. Income generation should not continue to be regarded as a substitute for inadequate government funding.

The team was pleased to learn that the FVM planned to introduce a new curriculum in the near future, since the curriculum has remained largely unchanged since 1984. Although the new curriculum was mentioned several times as the solution to existing problems, the team felt that the actual alterations proposed were rather limited. Although the teaching within each specific subject of the course is generally of a good standard, some quite substantial shortcomings in the overall training and structure of academic activities need to be addressed. A more ambitious and pragmatic approach to curriculum revision is therefore required. The main features that should be implemented in a new curriculum are:

- a reduction in the number of teaching hours in the basic sciences. The pre- and paraclinical disciplines are well-taught, with good practical facilities and much small group work, but basic subjects occupy a high proportion of the curricular hours.
- far more integration in the teaching and its content. This applies both in general terms, such as reducing overlap in the teaching, and in adopting an integrated approach. for example the 'stable to table' concept of farm animal health and productivity, and safety and quality of food of animal origin, require to be further developed and promoted in order to meet future demands made of the veterinary profession

The Faculty is strongly encouraged to adopt a integrated block system of teaching.

- a reduction in the number of lectures, in particular in later years of the course.

- a revision of the examination periods and structure, so that these occupy significantly less time during the academic year
- provision of greater and earlier hands-on contact with animals, especially basic animal handling and management.
- a substantial increase in the amount of hands-on clinical training, and other applied training. This should be structured as full-time rotations within a fully intergrated, lecture-free final year. The current daily and weekly pattern of the courses does not facilitate coherent training.
- provision of optional and/or elective teaching. This would best be structured as an elective component given towards the end of the course.

Several curricula with these characteristics have been developed in different European countries, and could serve as a model. Decisions on the curriculum need to be taken far more swiftly and effectively, and the team would emphasise strongly that a revised new curriculum should be constructed and implemented rapidly. Staff must adapt their working arrangements to the needs of an effective modern curriculum.

In terms of the clinical functioning and teaching, the Faculty should systematically build up a higher level of specialisation within its small animal clinical activities in the first instance, as well as a full emergency service. The large animal area is relatively undeveloped in both the theoretical and practical teaching programme. The staff of the large animal clinic are putting in a lot of effort, but this section has altogether too few resources. Qualitatively and quantitatively, students do not receive sufficient training on large animal species and their examination, diagnosis and treatment. There needs to be strategic and rigorous management and organisation of clinical activities and resources to develop the clinics in a balanced and effective way, to correcting such serious weaknesses.

With its new premises, the Faculty has good new buildings that in most areas are well equipped. However, the financial stringency meant a shortfall in government funding to complete and equip all areas. In most cases, the Faculty has either made strenuous efforts to find the necessary funds itself, or can get by whilst waiting for these facilities to be completed, albeit in a somewhat impaired fashion. However, in some instances, facilities that must be available in a veterinary teaching establishment, such as isolation, are not functioning properly.

To make better use of its facilities, the FVML should develop a more strategic system for allocating space within premises, based on functional requirements, not on ‘territory’. At present, some space is under-used but other sections are short of premises. The Faculty should also promote the sharing of facilities, to make more rational use of resources.

With its new premises and established staff and status, the FVML has a good basis for further development. It now needs to complete the organisational and curricular reform that will allow it to most effectively adapt to its changed circumstances, and extend and deepen its role as the leading centre of education in veterinary medicine in Portugal.

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).

4.21 The coverage of large animal clinical medicine, surgery and reproduction, and the resources required for this teaching, must be improved (potential Cat 1 suggestion).

6.8 The FVML must have functioning isolation facilities for small and large animals (potential category 1 suggestion).

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 role of herd health monitoring and preventative veterinary medicine should be mentioned in the objectives.

1.2 FVML should enhance its strategic management and seek to establish a more analytical basis for its activities.

2. ORGANISATION

2.1 There needs to be improved coordination and integration of Faculty activities to enable more cohesive activities, and so that equipment and teaching resources can be used to their best capacity.

2.2 There is a need for an authoritative curriculum committee that can constantly review the curriculum and adapt it to current needs.

3. FINANCES

3.1 The operational and staff costs of veterinary training should be adequately resourced by the State, and set at the same level as human medicine training.

3.2 The access to state funding for necessary capital expenditure should be improved. Aspects related to staffing are discussed in Chapter 10.

3.3 The FVML should seek to increase income from its research and clinical diagnostic activities.

3.4 Clearer accounting and greater transparency is needed so that the Faculty and its departments and sections know how much is being generated by, and spent on different activities. This will enable the Faculty to make informed decisions.

3.5 Sections generating net income should be able to reinvest a substantial proportion of that income in developing their activities

4. CURRICULUM AND TEACHING

4.1 GENERAL

4.1 A new curriculum should be finalised and implemented as soon as possible, both to revise the content and inter-relationship of particular disciplines, and to restructure the teaching into a more appropriate format. The new curriculum should follow the ECTS system and integrate the suggestions made below.

4.2 The weekly hours of formal teaching should be reduced to enable students to engage in self-directed study and other formative activities.

4.3 The repetition of practical work in some pre and paraclinical disciplines should be reduced by using a larger group size and shared teaching laboratories.

4.4 The hours allocated to basic sciences should be reduced in order to give greater emphasis to the professional disciplines, in particular the clinical subjects.

4.5 The amount of intensive hands-on clinical work (with case responsibility) where the teaching is controlled, structured and balanced should be substantially increased.

4.6 Integration and coordination between all courses should be improved so as to reduce or eliminate repetition of course material. Consideration should be given to organising teaching into blocks of disciplines which take place in defined parts of the semester, or in integrated courses which incorporate different disciplines.

4.7 A lecture-free final year should be introduced, to enable full-time rotations in the applied fields, (e.g. large and small animal clinics, the mobile clinic, pathology, veterinary public health and food hygiene and preventative medicine.

4.8 Electives and optional courses should be introduced, particularly in the final year of study.

4.9 The extramural work in the 5th year should, as far as possible, be integrated into the formal course and earn credits towards graduation based on a professional evaluation..

4.2 BASIC SUBJECTS AND BASIC SCIENCES

4.10 The number of hours spent on the basic sciences should be reduced by approximately 20% (see also suggestion 4.4).

4.11 A major re-orientation towards the veterinary sciences should be made, particularly for biostatistics, chemistry and biophysics.

4.12 The practical teaching should be reorganised to allow for fewer repetitions of lessons, thus reducing staff workload.

4.13 The practical teaching in the basic sciences should be supported by more staff (see also Suggestion 10.3).

4.14 The coordination and integration of basic science teaching should be improved in order to reduce or eliminate repetition of material, and thereby help to reduce both the teaching load and the number of curricular hours needed for teaching.

4.3 ANIMAL PRODUCTION

4.15 The FVML should make more effective use of the EZN facilities preferentially by having extended (full day, multi-day) visits by students.

4.16 There should be basic teaching on the handling and management of the major production and companion animal species early in the course.

4.17 The practical classes in animal production and production systems should be rescheduled to the 4th year and should focus on the relation between animal health and animal welfare and the environment of the animal.

4.18 Training in measuring climate conditions and climatic control, e.g. ventilation and heating, and effluent management should be incorporated into the teaching in the animal production field.

4.19 The focus of one of the rotations during a lecture free final year (see Section 4.1) should be an integral approach towards herd health monitoring and preventative veterinary medicine.

4.4 CLINICAL SCIENCES

4.20 The teaching of the clinical disciplines should prioritise hands-on clinical training in small groups, with less emphasis on lectures.

4.21 The coverage of large animal clinical medicine, surgery and reproduction, and the resources required for this teaching, must be improved (potential Cat 1 suggestion).

4.22 There should be much greater integration between the teaching and clinical activities of the various sections of the clinical departments, along with a more even species balance.

4.23 Teaching in the clinical disciplines should be coordinated with that in other areas, in particular as regards cooperation with pre- and para-clinical disciplines (e.g. for block courses) and in adopting an integrated approach to teaching on the health, productivity and well-being of the production animal species (i.e. the stable-to-table approach).

4.5 FOOD HYGIENE

4.24 There is much to be gained from greater collaboration between the staff working in the food safety areas, and those providing the animal production teaching and those involved in population medicine and food animal medicine, so as to establish a fully integrated approach to food safety throughout the food chain as the core objective of the respective courses.

4.25 The relevant components of the food technology course should be relocated to Year 3 or 4.

4.26 The programme of short visits for food inspection practical classes should be replaced with a formal EMS programme requiring the participation of students (preferably during the 5th year) at cooperating food plants for a period of two weeks.

5. TEACHING: QUALITY AND EVALUATION

5.1 The Faculty should look at creating a more transparent system of teaching evaluation in order to continuously re-evaluate teaching and to facilitate improvements to the whole curriculum.

5.2 The teaching should move towards problem based learning in the basic subject training and towards case based learning in the clinical subjects.

5.3 Time should be made available for self-directed learning by students, possibly by the coordination of lecture subjects, by the reduction of lecture hours and by making some subjects non-compulsory (see also Suggestion 4.2).

5.4 The Faculty should restructure the current teaching/examination system so that the time allocated for examinations as a whole, does not compromise the amount of time available for the teaching of the subjects.

5.5 Consideration should be given to continuous assessment and problem-based learning as integral part of the examination/evaluation process

6. PHYSICAL FACILITIES AND EQUIPMENT

6.1 The organisational structure needs to be amended so that space can be distributed more appropriately to meet priority needs. A formal body should be created to reassign space that is not optimally used.

6.2 The Faculty should make provision for more facilities for shared use, such as larger teaching laboratories.

6.3 The EZN facilities should be used more intensively, in particular through full-day sessions, and overnight stays by students.

6.4 There needs to be strategic and authoritative management of the clinical activities and resources so that the clinics meet the objectives and expectations of a modern veterinary training establishment, and to ensure that the limited resources available are used to optimal effect.

6.5 The large animal area needs to be systematically built up, particularly regarding staff numbers and expertise, in order to support a functioning mobile and hospital-based activity that provides an acceptable level of training in equine and in farm animal work and also to provide staff with the opportunity for professional development (see also Suggestion 4.21).

6.6 The clinical department and clinical activities (including support activities) need to be run as a cohesive and coordinated effort aimed at effective shared use and full engagement in all clinical activities by all personnel.

6.7 The material deficiencies in terms of incomplete facilities, non-functional equipment and missing basic items should be rectified.

6.8 The FVML must have functioning isolation facilities for small and large animals (potential category 1 suggestion).

6.9 The FVML clinics should aim to build up specialisation in terms of services, training capacity and staff expertise (see also Suggestion 10.6).

6.10 All academic and clinical staff should have a full-time commitment to supporting clinical services and teaching. The rules forbidding outside employment should be rigorously enforced.

6.11 The attribution of space within the clinical areas should be kept under review in the context of:
- the space needed if the clinics develop;
- whether space (e.g. stabling) is being used.

Note that the large animal radiology and surgery areas, that are currently almost unused, should not be reassigned but should be equipped and developed so as to form part of a thriving clinical activity (mainly involving equine cases) and be fully used as an income generating resource.

6.12 The tasking of staff working in the clinics should strike a balance between their clinical service, teaching

and research. All these activities should be recognised as an important component of a professioinal appointment in a prestigious veterinary teaching establishment such as the FVML.

6.13 The Faculty has to have a fully functional emergency service for small and large animals in which all academic clinical staff and students participate.

6.14 Case records should be computerised, with a central system which all FVML clinics can access.

6.15 Consideration should be given to the direct involvement of local practitioners in the use of the large animal facilities of FVML by encouraging them to bring cases to the hospital, where they themselves can carry out investigations and treatments with the collaboration of their academic colleagues and to the benefit of the students.

7. ANIMALS AND TEACHING MATERIAL OF ANIMAL ORIGIN

7.1. The amount of hospital-based large animal caseload, in particular equine work, must be increased and the Faculty should look at ways of encouraging practitioners to bring their own patients to the large animal clinic and to treat them there in collaboration with academic staff and for the benefit of students. In addition, the Faculty should negotiate access to large animals at the neighbouring farm, Instituto de Agronomia as a matter of priority. .

8. LIBRARY AND EDUCATIONAL RESOURCES

8.1 There has to be an accessible stock of up-to-date international textbooks covering the veterinary disciplines.

8.2 The role of the library in the learning process has to be recognised and promoted by the teaching staff so that thoughtful and effective utilisation of the library can play its central role in student learning.

8.3 The hours of opening should be extended to meet student and staff needs, now and in the future, with the staffing of the library extended in order to facilitate same.

9. ENROLMENT AND ADMISSION REQUIREMENTS

9.1 The extent to which students can transfer between different courses should be very strictly limited.

9.2 The Faculty should seek to accept only those students who have a clear motivation and preference for veterinary studies, and in all cases allow entry to the first year only.

10. ACADEMIC AND SUPPORT STAFF

10.1 FVML must have strategic planning concerning the allocation of staff resources to develop solutions for the current shortfall in staff and to correct noticeable imbalances and weaknesses in some areas of teaching and service.

10.2 The Veterinary Faculty staffing, and the government funding for this, should be equivalent to that of human medicine to reflect the unavoidably intensive nature of veterinary medical training.

10.3 The number of full-time academic staff positions should be increased to at least 80, to give the FVML the critical mass necessary to cover the full veterinary curriculum.

10.4 There has to be provision for the retention of individuals recruited for clinical, laboratory and administrative staff positions funded through the faculty's own resources. In the longer term, the steady decline in budgeted positions, and the associated drain on the FVML's own resources by having to pay for such posts, must be halted by re-employing permanent support staff.

10.5 The attribution of staff time to different activities, and the encouragement and recognition that is given to different activities needs to be reviewed in the context of meeting Faculty objectives. In particular:

- there should be systematic appraisal and development of teaching performance, which should be an important factor in academic career development and promotion.
- clinical duties, both during normal working hours and as on-call 'back-ups' in evenings, nights and weekends should be a recognised component of academic appointments in the clinical fields.
- achievement of a higher level of clinical skills (i.e. specialisation) should also be recognised and promoted among staff, and/or made a mandatory component of an academic career (see also Suggestion 6.9).

- time and facilities should be specifically earmarked to allow both academic and clinical staff in the clinical departments to engage in research. This is an issue of a balanced workload, hence there should be sufficient clinical positions to cover teaching; service and research obligations.

11. CONTINUING EDUCATION

11.1 There is a need to organise and prepare CPE for staff, students and practitioners in all fields i.e. clinics and basic sciences. Income can also be generated from running CPE courses.

12. POSTGRADUATE EDUCATION

12.1 The Faculty and/or University should develop a taught element to its Ph.D. programme with modules covering generic skills, such as statistical relevance, experiment design, pedagogics and scientific writing.

12.2 The Faculty should consider creating postgraduate clinical positions that offer the possibility of postgraduate degrees and /or European College recognition.

13. RESEARCH

13.1 Undergraduates and staff should be encouraged to undertake progressive research.

13.2 The teaching load in the basic sciences needs to be reduced so that staff can engage in research.

13.3 The Faculty needs to look at ways for enabling all staff, particularly young staff, to have time to undertake research in their field of interest.

Appendix I

1. Basic training and competencies

1.1.1. To have the general knowledge to understand applied biomedical sciences.

1.1.2. To recognize topics related with biomedical sciences.

1.1.3. To be able to access bibliographic data and to use updated information technologies to obtain scientific information.

1.1.4. To be able to critically evaluate a scientific article.

1.1.5. To be able to write a technical/scientific report.

1.1.6. To understand the social, economic, environmental and ethical implications and responsibilities that result from the use of new technologies.

1.2. Social background

1.2.1. To understand the ethical issues to the exercise of the veterinary profession.

1.2.2. To acknowledge communication skills as a key instrument for social relationship.

1.2.3. To maintain and to promote an adequate relationship with other interface professionals.

1.2.4. To develop and practice the principles of working in multidisciplinary teams.

2. Technical and clinical competencies

The following technical competencies intend to make sure that the training given to the students covers all areas of intervention of veterinarians, namely in clinics, herd health, inspection, technology and animal production, including competencies of multidisciplinary spectrum.

2.1. To be proficient in the evaluation of animal health status, especially of farm and companion animals.

2.2. To be proficient in the evaluation of abnormal behaviour, in the recognition of the indicators of animal stress and in the application of ethical and legal principles of animal welfare.

2.3. To master the techniques for identification, handling, restraining and transporting of animals.

2.4. To be able to plan and execute a clinical exam including:

2.4.1. To have practice in obtaining relevant information related to the health and environmental conditions of animals.

2.4.2. To be proficient in the methods of clinical examination and sample collection such as :

2.4.2.1. Implementation of the most common and essential methods;

2.4.2.2. Collection, preparation and preservation of samples for laboratory analysis;

2.4.2.3. Interpretation of diagnostic tests.

2.4.3. To perform the appropriate necropsy techniques of different animal species.

2.5. To be able to recognize the OIE List A and national notifiable diseases and other most common animal health problems of Portugal and the European Union (EU).

2.6. To identify and evaluate animal and herd reproductive parameters.

2.7. To understand the potential of reproduction technologies and applying the most common.

2.8. To be able to prevent and treat the most frequent diseases and other animal health problems in the country, including:

2.8.1. To master and apply the principles of medical prophylaxis;

2.8.2. To prescribe drugs and other medication, considering its side effects and public health constraints;

2.8.3. To be able to perform the most common surgical interventions including field preparation, anaesthetic protocols, individual asepsis and equipment sterilisation, surgical approaches and technical procedures, as well as post surgical follow-up;

2.8.4. To be able to identify and evaluate diagnostic failures, through clinical observations and/or necropsy findings.

2.9. To be able to formulate prognosis, taking in consideration the evolution of clinical cases.

2.10. To be familiar with the application of euthanasia techniques, based on ethical principles of animal welfare.

2.11. To master and apply the basic principles of descriptive and analytical epidemiology.

2.12. To be able to perform epidemiological data collection, processing and analysis related to follow up and surveillance activities for the prevention, control or eradication of transmissible diseases.

2.13. To be aware and to be able to identify, evaluate and prevent the risks related to the import of animals and animal products.

2.14. To be familiar with methodological planning and execution of animal health programmes.

2.15. To be able to apply the Portuguese and EU animal health legislation, in particular the notification of OIE and national listed diseases.

2.16. To be able to analyse and execute EU and national legislation concerning:

2.16.1. Identification of animals and products of animal origin for human consumption;

2.16.2. Movement and transport of live farm animals, especially to slaughter;

2.16.3. Inspection of live animals, of animals during the slaughter process and of carcasses, based on the current national and European legislation;

2.16.4. To evaluate infrastructures, equipment, personal and hygiene conditions involved in the slaughtering process and to recommend procedures to correct detected deficiencies;

2.16.5. To apply the basic principles of preservation and distribution of food products of animal origin, both fresh and transformed.

2.17. To be familiar with the most common methods of processing and preservation of food animal products.

2.18. To know and to apply the fundamentals of pro-active systems of food safety assurance such as the HACCP methodology.

2.19. To be familiar with the basics of state veterinary services interventions.

2.20. To know the nutritional and dietetics quality parameters and relative economic value of products of animal origin.

2.21. To be identified with general official process of certification of food animal products.

2.22. To recognize the morphological and productive characteristics of native and main introduced breeds of different species.

2.23. To know how to generate, collect and evaluate the main productivity indexes and use them to assess production systems efficiency.

2.24. To know the principles and applications of animal genetics and selection.

2.25. To know how to collect feed samples, choose the appropriate analytical methods and interpret the results of the analysis, in order to evaluate the nutritional value and sanitary conditions of animal feed.

2.26. To comprehend the main animal feeding techniques and how to formulate and prepare rations.

2.27. To plan proper feeding protocols, for the different species, and prevailing production systems.

2.28. To understand the most common agricultural practices utilized in forage crops production and preservation.

2.29. To plan and establish adequate management systems, including infrastructure requirements, reproductive and nutritional management as well as animal health programmes.

2.30. To know the ecological implications of animal production systems, with emphasis on the relationship between animal waste and environmental contamination.

2.31. To know the basic principles of production, maintenance and use of animals for experimentation and other scientific purposes and to apply the animal welfare legislation.

2.32. To know the methods and techniques of environmental protection related to the proper disposal of animals and other by-products of the animal industry.

2.33. To know the quality parameters and the economic value of animal products.

2.34. To master the concepts for the design of animal installations.

2.35. To have knowledge of the legal requirements for animal production activity.

2.36. To know how to act in public emergency situations caused by natural or man- made disasters.

2.37. To be aware and to be able to act in sanitary emergencies in accordance with EU and national contingency plans.

2.38. To have basic concepts of economic management of a veterinary practice.