

***“In the Best Interest of Animals and Man”***

***Self Evaluation Report  
on the  
Veterinary Education***

**Faculty of Veterinary Medicine and Animal Science  
Swedish University of Agricultural Sciences  
Uppsala 2007**

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## INTRODUCTION

As an important step in the visitation process, a Self Evaluation Report (SER) is prepared by the establishment to be reviewed. It is obvious - also to those not being on the visiting team - that the SER is essential for the visitation, by giving the background material necessary for the team members to be able to identify and focus on the strengths and weaknesses of the Faculty and the Departments scrutinized.

Since the 1998 EAEVE evaluation, a number of important steps have been taken for the further development of the role of the Swedish University of Agricultural Sciences in veterinary education and research. These include

- establishment of the Faculty of Veterinary Medicine and Animal Science in 2004,
- reduction of the number of Departments from sixteen to six,
- reconstruction of the finances of the Faculty,
- introduction of a performance-based budgeting system,
- implementation of the 1997 (“old”) veterinary curriculum,
- adaptation to the “Bologna process”,
- development and introduction of the 2007 (“new”) curriculum,
- increase of veterinary students admitted by more than 50%,
- equal opportunities plan,
- University policy for the use of animals in education,
- establishment of the University Animal Hospital in 2007,
- major investments in up-to-date research and clinical equipment,
- planning of new buildings for the research and teaching farms at Uppsala,
- planning for a new centre at the Ultuna campus for all veterinary and animal science departments at Uppsala,
- announcement and recruitment of a number of new academic positions, including professorships, associate professorships and research associate (postdoctoral fellow) positions in research areas that have been identified as strategic.

Most of these measures will be presented in detail in the different SER Chapters. It is, however, evident that during the almost ten years since the last EAEVE evaluation there has been a dramatic and essentially positive development of veterinary education and research at our University. The main worry is – as always – the gradual decrease in the value of governmental revenues due to increase in salaries and other costs that is not compensated for.

This SER is the result from efforts made by individual Faculty members, by Departments, by Faculty Committees, by the Dean’s Office, and by the Student representatives. The readiness to provide material and views on education, research, hospital services, etc. and the thoroughness with which this has been done is gratefully acknowledged. The assistance given by the University Administration and by the University Library is appreciated. Special thanks are due to Dr Göran Dalin who has been responsible for keeping together this SER.

Finally, it is hoped that this SER will provide an accurate and functioning basis for the important work done by the visitation team.

Arvid Uggla  
Dean



# Chapter 1 - OBJECTIVES

## 1. FACTUAL INFORMATION

### Objectives of the Faculty

Within the Swedish University of Agricultural Sciences, the Faculty of Veterinary Medicine and Animal Science has the following major responsibilities

- first (basic) and second (advanced) level education in
  - o animal science
  - o veterinary medicine
  - o ethology and animal welfare
  - o veterinary nursing
  - o equine studies
- third level (research) education
- research
- environmental monitoring and assessment
- continuing education
- information extension

### Method for assessing the achievement of objectives

The Faculty and the University were subjected to a major international peer review initiated by the Ministry of Agriculture 1989-1990 (Special Report No 1, Ministry of Agriculture SOU 1991:101).

In 1998, the Faculty of Veterinary Medicine and the training of veterinary students were evaluated by EAEVE.

The quality assurance work at the University was evaluated in 1998 by a team appointed by the National Agency for Higher Education.

Due to the then unacceptably bad economy of the Faculty of Veterinary Medicine, a team including international experts made a thorough review of the Faculty in 2001.

Suggestions made in their report about organization, education and research programmes, animal hospital, etc. have been important for the development of the new faculty.

The National Agency for Higher Education has recently carried out evaluations of the animal science, veterinary nursing and equine studies programmes.

With regard to education, external examiners have been invited from the sister faculties in Helsinki, Copenhagen and Oslo, to give their assessment of the contents and results of examinations.

The quantitative results - number of graduated veterinarians, postgraduate degrees, etc. - are reported each year to the Ministry of Agriculture Food and Fisheries. The National Audit Bureau not only scrutinizes the economy, but also education and research performance.

## 2. COMMENTS

The Report following the evaluation by EAEVE in 1998 was important for the further development of the veterinary curriculum and of the Faculty of Veterinary Medicine.

We believe that the now introduced 2007 curriculum will prepare the newly graduated veterinarians for their future professional role, but it also ascertains that she/he realises the necessity of life-long learning that is imperative for any professional activity within the biomedical field.

The reports from the external examiners have provided valuable support, and also initiated improvements.

A most important area for the veterinary students is the clinical training. It is therefore essential that we can provide a well-functioning animal teaching hospital and field services (mobile clinic). The cost of operation of these facilities is high, and we anticipate that the establishment of the integrated University Animal Hospital will be successful and cost-effective in the providing of clinical cases for our students.

The general activity and quality of research varies between subjects. It is clear that there are fields in which the Faculty has an international standing, but also that there are areas that can be improved. An inevitable question is how much one single Faculty in a country can be expected to cover scientifically. There will always be specific subjects where the 'critical mass' is too small and where there is a lack of an individual driving force. Such subjects would gain from international cooperation, e.g. teamwork or shared responsibilities on a Nordic basis.

## Chapter 2 ORGANISATION

### 1. FACTUAL INFORMATION

#### Details of the establishment

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**Dean** professor Arvid Uggla, DVM, PhD

**Competent authority** overseeing the establishment  
The National Agency for Higher Education

#### Higher education and research in Sweden

*(The section on “Higher education and research in Sweden” is based on a fact sheet from the Swedish Institute, FS83a, July 2007)*

In Sweden, the Riksdag (Parliament) and Government have overall responsibility for higher education and research, which means that they make decisions on aims, guidelines and the allocation of resources.

With the exception of SLU (Sveriges lantbruksuniversitet - the Swedish University of Agricultural Sciences), education and research fall under the brief of the Ministry of Education and Research. The National Agency for Higher Education is the central government agency responsible for matters concerning higher education, but universities and other institutes of higher education (university colleges) are separate government authorities and make their own decisions about the content of courses and other matters.

#### Eligibility

To meet general admission requirements for attending a university or university college, students must have a school-leaving certificate from the high school or municipal adult education in Sweden or have completed high school education outside Sweden. Studies at a “*folkhögskola*” (folk high school) can also qualify students for higher education. When there are more applicants than places available, applicants are ranked, based in part on their grades when they leave school. A government bill introduced in March 2007 proposed among other things that passing grades be required in the core subjects of Swedish or Swedish as a second language, English and mathematics.

For many university programs, students also have to meet specific admission requirements. This may entail taking advanced courses in different subjects included in the national programmes for high schools.

### Financing, student loans

Studies at Swedish institutions of higher education are free of charge, as they are financed by the Swedish state. However, a report has been commissioned to determine whether fees should be introduced in the future for students from countries outside the EU.

Since 1965, all Swedish students who study at a university or university college are entitled to financial assistance, regardless of their parents' or spouse's finances. Study assistance consists of a grant component and a loan. Repayment of the loan is income-dependent, and the loan is to be repaid no later than the student's 60th birthday. For citizens of the EU/EEA or Switzerland, EU regulations apply. Other foreigners who have a permanent residence permit in Sweden may be entitled to Swedish financial assistance for studies both in Sweden and abroad.

Students at a university or university college must be members of the student union. Students have representatives in different decision-making bodies involved in their education. However, a proposal has now been submitted to abolish the compulsory student union fee.

Universities and university colleges are obliged to arrange instruction so that students with different types of disabilities have the same opportunities for study as other students.

### Universities and university colleges

There are 14 state universities and 22 state university colleges in Sweden. There are also three independent higher education institutions that are entitled to offer graduate training: Chalmers University of Technology in Gothenburg, the Stockholm School of Economics and Jönköping University.

There are also other independent programme providers who offer first and second level education in a given field, such as healthcare.

#### **Breakdown of Swedish students by field of first and second level studies (2006)**

- Social sciences, including law 30%
- Technology 18%
- Humanities, including theology 13%
- Healthcare (including veterinary medicine) 14%
- Natural sciences 12%
- Teaching 9%
- Arts 2%
- Other 2%

*Source: 2007 Annual Report, the Swedish National Agency for Higher Education*

### Changes in the university system

Major changes in the Swedish university system were made on July 1, 2007, when the new levels of higher education were introduced. Each level requires that students have a degree from the preceding level of study. In the new system, one year of full-time study (40 weeks) will correspond to 60 credits (hp) instead of the earlier 40 credits (p). The new system is compatible with the European Credit Transfer System (ECTS).

### The Bologna Process

These changes are part of what is known as the Bologna Process and also affect the admissions process. Among other changes, starting in 2010, foreign applicants will be considered for admission in a separate group.

The aim of the Bologna Process is to create a coordinated European Higher Education Area (EHEA) by 2010.

#### **The objectives of the Bologna Process:**

- Easily readable and comparable degrees. Greater use is also to be made of the Diploma Supplement, a standardized description of each programme and its position in the university system.
- Two main cycles of studies.
- A uniform system of credits.
- Increased mobility for students, teachers, researchers and administrators.
- Promotion of European co-operation in quality assurance.
- Promotion of the necessary European dimensions in higher education.

The aim of the Swedish state in its work with the Bologna Process is, among other things, to increase Sweden's attractiveness to foreign students as a country for study by offering internationally competitive education. Sweden was the first country to implement the Diploma Supplement.

Many courses and some second level programmes are conducted entirely in English.

### Swedish higher education – history and development

The number of students in first and second level (earlier “undergraduate”) programmes in Sweden increased from about 14,000 in 1945 to about 320,000 in 2006. During the 1990s, the number of students doubled. Third level (“research”) programmes have expanded at a similar rate.

Sweden's investment in technology and the natural sciences has also led to almost a tripling in the number of degrees awarded in the country since the early 1990s. Sweden has thus advanced relative to other countries. In terms of the number of postgraduate degrees, Sweden also ranks at the top, doubling the number of degrees awarded in the 1990s. There were almost 18,000 students in research studies in 2006.

In the 2004/2005 academic year, the total number of students entering a university or university college was equal to 45.6 percent of all young Swedes. One trend that can be discerned is that recruitment to higher education has expanded in terms of class and sex. However, students from a working class background are still underrepresented. This is also true of students from an immigrant background; nonetheless, the differences here are considerable, depending on the nationality involved. Given this situation, the Government took the initiative a year ago to broaden recruitment to universities and university colleges.

Since the mid-1990s, a growing number of students from other countries have applied for studies in Sweden. During the 2005/2006 academic year, almost 26,000 foreign students were registered at Swedish universities and university colleges.

## **The new structure of programmes and qualifications**

These changes came into force on 1 January 2007 and take effect from 1 July 2007.

### A new system of credits

In the new system one year of full-time study for 40 weeks will correspond to 60 higher education credits. The number of higher education credits awarded for each course will be determined on the basis of the work normally required to attain the course objectives.

In recalculating the previous credit system to the new higher education credits every credit awarded in the old system (p) will be equated with 1.5 higher education credits (hp). The outcome in terms of student support will be that 1.5 higher education credits will correspond to one week of full-time study and will entitle students to financial support for one week.

### Three levels introduced

- First level (basic studies)
- Second level (advanced studies)
- Third level (research studies)

Each level requires and is based on completion of a programme at the previous level(s). All qualifications and courses will be incorporated into this structure.

### First level

At first level two general qualifications will be awarded. A new category of qualification will be introduced in artistic disciplines.

- University Diploma 2 years, 120 higher education credits
- Degree of Bachelor, 3 year, 180 higher education credits
- Degree of Bachelor of Arts, 3 years, 180 higher education credits

A completed programme in the upper-secondary school or the equivalent is required for admission to higher education.

### Second level

At second level two general qualifications will also be awarded. In addition to the current degree of Magister a new Master's degree will be introduced. A new category of qualification will be introduced in artistic disciplines.

- Degree of Master (One Year), 60 higher education credits
- Degree of Master (Two Years), 120 higher education credits
- Degree of Master of Arts (One Year), 1 year, 60 higher education credits
- Degree of Master of Arts (Two Years), 2 years, 120 higher education credits

State-run higher education institutions with entitlement to award graduate degrees will be granted general entitlement to award master's degrees (for higher education institutions entitled to award graduate degrees only in specified disciplines this will apply within these disciplines).

Other state-run higher education institutions will apply for entitlement to award master's degrees to the National Agency for Higher Education. Private course providers will apply to the government.

Admission to second level programmes will require degrees from Swedish higher education institutions after completion of at least three years at first level **or** a corresponding degree from another country **or** a corresponding qualification. In order to take single-subject programmes completion of a first level programme will be required - i.e. not the award of a degree.

### Third level

Licentiate degrees and PhD's will continue to be awarded:

- Degree of Licentiate, 2 years, 120 higher education credits
- Degree of Doctor (PhD), 4 years, 240 higher education credits

In future four years of full-time study will continue to be required for the award of a PhD. Credit may be given for some studies at second level. On the other hand it will not be possible to offer students preferential selection to graduate programmes on the grounds that they will be able to obtain credit for previous studies or professional activities and therefore able to complete the programme more rapidly.

The requirements for admission to third level comprise a degree awarded at second level **or** at least 4 years of full-time study of which one has been at second level **or** a corresponding programme abroad **or** the equivalent knowledge.

Those who currently fulfil the requirements for basic entitlement to admission to graduate programmes will be considered to meet the basic requirements for admission to programmes at third level up until 30 July 2015.

### Professional degrees

The reform also involves certain changes concerning professional degrees. Some degrees will be eliminated and others changed.

### Diploma supplements

The diploma supplements for all qualifications awarded at first and second level will include the following information:

- The precise number of higher education credits the qualification comprises.
- A description of the expected learning outcomes for the qualification. These are to state what students are expected to be able to do, understand, relate to or perform in practice for the award of a specific qualification.

A degree paper will be required for all qualifications awarded at first and second level. The titles of general qualifications at first and second level are to consist of the degree as laid down in the Higher Education Ordinance and the Ordinance for the Swedish University of Agricultural Sciences and either a pre-determiner or post-determiner specified by the higher education institution itself to indicate the area of specialisation.

### Courses and learning objectives

The level of each course is to be specified to determine whether it is offered at basic level or advanced level. The objectives of every course are to be defined by the higher education institution. These objectives are to describe the expected learning outcomes for the students. They are to state what students are expected to be able to do, understand, relate to or perform in practice in order to pass the course.

### Transitional regulations

Students who have begun a programme before 1 July 2007 for a qualification according to the earlier provisions of annex 2 (the Degree Ordinance), or who have been admitted to such a programme but given leave to delay commencement until after the above date, are entitled to complete their studies for the award a qualification according to the earlier provisions, however only until the end of June 2015 at the latest.

*Source: the Swedish National Agency for Higher Education*

In the mid-1940s, the percentage of women in first and second level programmes was 20 percent. In recent years, the situation has changed dramatically – the percentage of women is now about 60 percent. But there is considerable variation between the different programs.

#### Swedish investment in research

The aim of Sweden's research policy is to be a leading research country, one of the most R&D-intense countries in the world, and to have research that is both broad and specialized. Sweden allocates almost four percent of its gross national product (GDP) to research and development work, which corresponds to about 820 €per capita.

Environmental technology is one field in which Swedish research is far in the lead. For instance, Sweden is one of the pioneers in the handling of emissions and toxic substances in products and manufacturing processes.

In nanotechnology too, Sweden has a high level of expertise in research. The roughly 30 “pure” nanotechnology companies in the country today are often university spin-offs with operations based on nanotechnology. A number of major Swedish companies – including ABB, Sandvik and Högånäs – have enhanced their competitiveness through nanotechnology.

The major part of Swedish research, 75 percent, is financed by companies. Research funded by the state, which is carried out largely at universities and university colleges, accounts for 22 percent of research. Since 1997, some universities and university colleges have fixed research funding, which means that they can plan their research more over the long term. The development of basic research in Sweden is financed and promoted by the Swedish Research Council. Other research is carried out by different government agencies – for instance, the Swedish Environmental Protection Agency, the Swedish Defense Material Administration and the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning – and in the private notfor-profit sector.

The breakdown by sex of students entering research programmes is basically balanced, with 49 percent women and 51 percent men (2006). But here too, the breakdown varies in the different fields: in the humanities and social sciences, there are slightly more women, while in the natural sciences, there are slightly more men. In 2006, the percentage of women among students entering research programmes was highest in medicine, 60 percent, and lowest in the engineering sciences, 31 percent.

Among teachers and researchers in the academic world, men are still in a clear majority. Surveys have also shown that women with doctoral degrees have become professors at universities and university colleges to a lesser extent than men. In 2006, the number of women professors was 751 (17 percent) out of a total of 4,416 professors, which is nonetheless a clear increase compared to 85 women (5.1 percent) out of a total of 1,679 professors 20 years earlier.

#### **The National Agency for Higher Education**

The National Agency for Higher Education (Högskoleverket) is the central government authority dealing with questions concerning Swedish universities and university colleges. The Agency's duties include follow-up, evaluation and supervision of university and university college operations, the analysis of trends important to higher education and the promotion of innovations and improvements in quality and teaching methods.

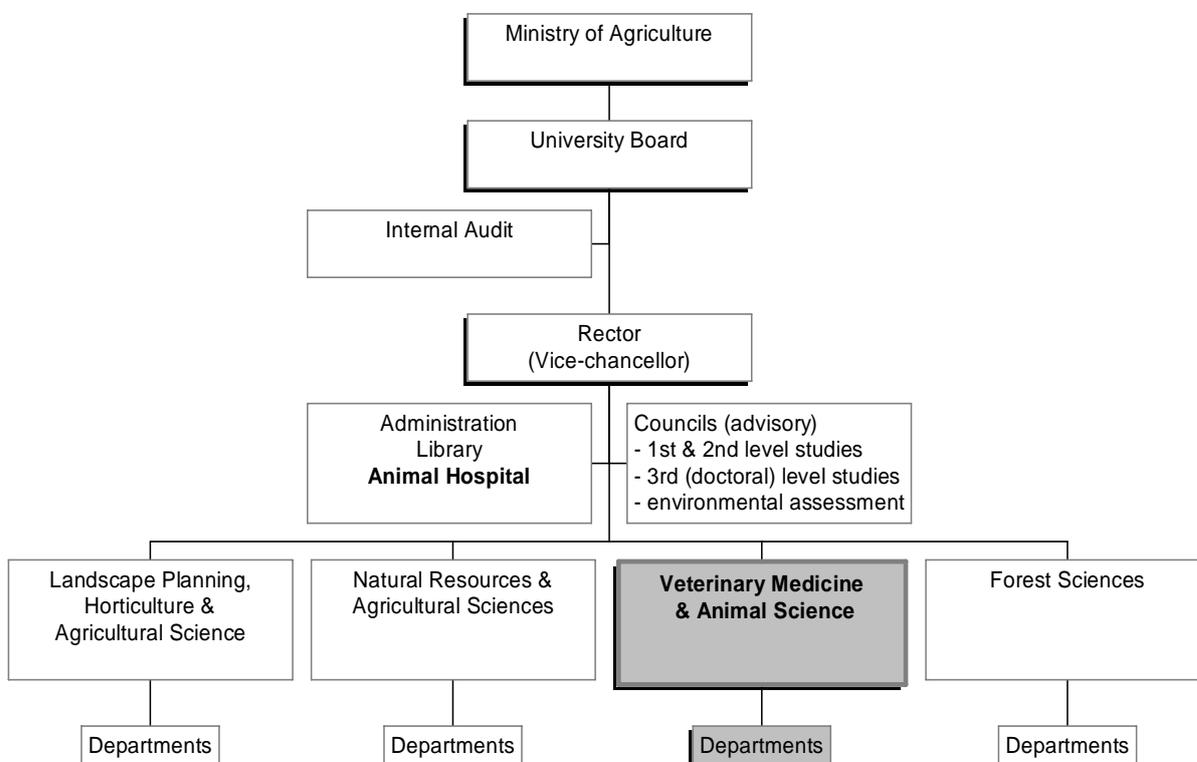
## SLU - the Swedish University of Agricultural Sciences

### Mission Statement

*"SLU develops the understanding and sustainable use of biological natural resources.  
This is achieved through research, teaching and environmental monitoring."*

SLU (Sveriges lantbruksuniversitet – the Swedish University of Agricultural Sciences) is a university with a clearly defined role in society: to take responsibility for the development of learning and expertise in areas concerning biological resources and biological production. This responsibility stretches over the wide-ranging fields of agriculture, forestry and food industry to environmental questions, veterinary medicine and biotechnology. A comprehensive viewpoint, inter-disciplinary approach and applicability are keywords in SLU's research and teaching and in the contacts with industry and society.

SLU was formed in 1977 by a merger of the three former Royal Colleges of Agriculture, Forestry and Veterinary Medicine. Unlike the other Swedish universities, SLU is subordinated not to the Ministry of Education and Research, but to the Ministry of Agriculture.



*Fig 1.* Diagram showing the Faculty of Veterinary Medicine and Animal Science in relation to the University and the Ministry of Agriculture.

University activities are spread between several departments in four faculties: the Faculty of Landscape Planning, Horticulture and Agricultural Science, the Faculty of Natural Resources and Agricultural Sciences, the Faculty of Veterinary Medicine and Animal Science, and the Faculty of Forest Sciences. A total of 2,900 people are employed by the University and about 3,500 first and second level students and 800 third level students are enrolled. Main campuses are located at Alnarp, Skara, Ultuna and Umeå. Research and teaching activities are carried out throughout the country.

The University's educational programme includes advanced (second) level training of agronomists, foresters, landscape architects, horticulturalists, animal scientists and veterinarians, and programmes in biotechnology and natural resources management, as well as basic (first) level programmes and further education schemes.

SLU has a solid basis of research. Close to 70 per cent of the university's turnover is dedicated to research and postgraduate education. One third of all biological research in Sweden is conducted at SLU! Research areas range from environmental monitoring, climate changes, rural development, animal and human health to biotechnology and functional genomics.

#### Governing bodies and administration

The University Board includes the Rector and up to eight members from outside the University (e.g., industry, politics, NGO), three academic staff and three students. The Rector (vice-chancellor) is appointed by the Government after a recruitment procedure, which includes interviews by an electoral college from the faculties. The deputy Rector, or Prorector, is appointed by the University Board.

On central university level there are a number of advisory bodies to the Rector, including Education Council, Research Education Council, and Student Welfare Council. These include representatives from the four faculties and the students. Furthermore, an Advisory Committee to the Rector, which includes the Prorector, the Deans, the Director of University Administration, and the president of the student's union SLUSS, meets regularly every second week.

The University Administration under the Director includes support functions to the faculties, e.g. for economy and personnel administration, building and IT resources, and pedagogical, technical and library services. After a reorganisation in January 2007, the University Administration at SLU consists of six divisions;

- Division of Student Affairs and Learning Development
- Division of Legal Affairs, Finances and Human Resources
- Division of Facility Management
- Division of Communication
- Estate Office
- Division of Strategy and Planning

The Faculty Offices are formally parts of the University Administration.

## **The Faculty of Veterinary Medicine and Animal Science**

With roots back in 1775, the Faculty of Veterinary Medicine and Animal Science is the principal actor in veterinary and animal science research and higher education in Sweden and the only educational establishment for veterinarians in the country.

The Faculty has two campuses; one is in Uppsala where the veterinary education is located, and one is in Skara. In Uppsala, it is located at four scientific centres: Uppsala Biomedical Centre (BMC), Animal Science Centre (HVC), Kungsängen Research Centre, and the Clinical Centre (KC). In the Clinical Centre, the University Animal Hospital is housed, in order to provide opportunities for practical training during the education, for clinical research, and for post-graduate specialist training. A research farm with pigs and poultry is located at Lövsta, about eight km east of Ultuna Campus.

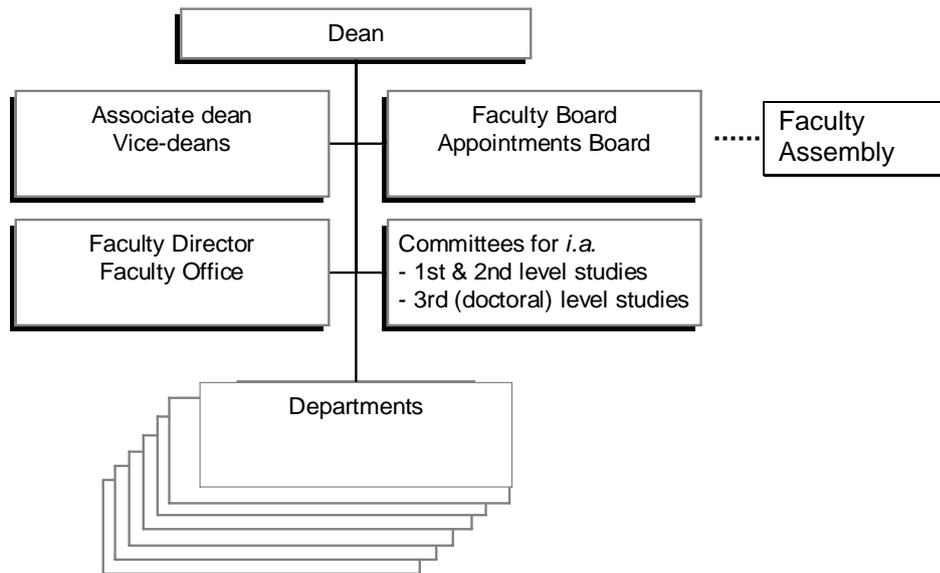
### Faculty Administration

Under the Rector, the Dean (“dekanus”) is the person responsible for the planning and administration of scientific and educational activities at the Faculty. This is a full-time position. The Dean is appointed by the Rector, following a nomination by the Faculty Assembly. Under the Rector, the Dean is the Chief Executive of the Faculty. The Dean chairs the Faculty Board, with seven more representatives from the academic staff and three from the students (incl. PhD students). There are also two substitute members from the academic staff, and an additional (maximum) three representatives from outside the university (e.g. from profession, industry, public agencies). The staff associations (“unions”) have the right to attend the Faculty Board meetings. The Faculty Director and the Faculty Secretary are also present at the Board meetings.

One of the academic members of the Faculty Board is appointed Associate Dean (“prodekanus”). Additional Vice Deans, normally two, one responsible for first and second level studies and one responsible for research and third level studies, are appointed by the Dean. The Dean, his Associate and Vice Deans, and a student representative, form the Faculty Board Executive Committee, which is an advisory function to the Dean and meets every second week.

Within the Faculty, there is also an Appointments Board and a number of additional boards, committees and sub-committees, e.g. a research fellowship award board, one committee for first and second level education, and one for third level studies. The Faculty Office gives administrative and secretarial support to the Dean and the Committees.

The Higher Education’s Act states that students have the right to be represented in the bodies that takes decisions affecting their studies. This means that students (basic, advanced and/or research) are represented in most Faculty organs. The veterinary profession, the industry, governmental and non-governmental organisations are represented in some of the Faculty organs, i.e. in the Faculty Board and in the Committees for research and extension.



*Fig 2.* Diagram showing the organisation of the Faculty of Veterinary Medicine and Animal Science.

#### **List of Boards, Committees and Subcommittees in the Faculty**

- Faculty Board
- Nominations committee
- Appointments Board
- Research Fellowship Awards Board
- Committee for third level (doctoral) studies
- Committee for first and second level studies
- Subcommittees for study programmes
  - veterinary
  - animal science
  - veterinary nursing
  - ethology and animal welfare
  - equine studies
- Scholarships committee
- Committee for continuous environmental assessment
- International committee
- Committees for research and extension
  - livestock production
  - equine
  - animals in research
  - companion animals
- Committee on equality

**Departments at the Faculty of Veterinary Medicine in 1998 and at the Faculty of Veterinary Medicine and Animal Science in 2007**

Departments in 1998	Departments in 2007
Anatomy and Histology (HVC) Animal Physiology** (HVC) Equine Studies* (HVC) Veterinary Medical Chemistry (BMC)	Anatomy, Physiology and Biochemistry (HVC, BMC)
Animal Breeding and Genetics** (HVC, BMC)	Animal Breeding and Genetics (HVC, BMC)
Animal Environment and Health (Skara)	Animal Environment and Health (Skara)
	Animal Nutrition and Management** (HVC, Kä)
Food Hygiene (SVA) Pathology (SVA) Pharmacology and Toxicology (BMC) Veterinary Microbiology*** (BMC, SVA)	Biomedical Sciences and Veterinary Public Health*** (KC, SVA)
Clinical Chemistry (KC) Clinical Radiology (KC) Large Animal Clinical Sciences (KC) Obstetrics and Gynaecology (KC) Ruminant Medicine and Vet Epidemiology (KC) Small Animal Clinical Sciences (KC)	Clinical Sciences (KC)
	Reindeer Husbandry Unit
	University Animal Hospital**** (KC)
Clinical Nutrition (HVC)	Closed
Animal Hospital in Skara*	Sold to private companies

BMC – Biomedical Centre  
HVC - Animal Science Centre  
KC - Clinical Centre

Kä – Kungsängen Research Centre  
KC - Clinical Centre  
SVA - Building of National Veterinary Institute

\* not engaged in veterinary education

\*\* part of former Faculty of Agriculture, Horticulture and Landscape Planning

\*\*\* partly in collaboration with the National Veterinary Institute (SVA)

\*\*\*\* from clinical departments (primarily Clinical Chemistry, Clinical Radiology, Large Animal Clinical Sciences, and Small Animal Clinical Sciences)

### **The Departments**

The scientific Departments vary in size, from 51 up to 110 persons. One section of the Department of Biomedical Sciences and Veterinary Public Health (Parasitology and Virology) is run and administrated in collaboration with the National Veterinary Institute (SVA). The University Animal Hospital, which is organisationally not part of the Faculty, has 135 employees.

The Head of Department is the person responsible for the planning and administration of the scientific and educational activities at the departmental level. The Head of Department is appointed by the Dean. Normally, associate Heads of Department are appointed with responsibility first and second ('director of studies') and third level education.

## **2. COMMENTS**

The present organisation was established in 2004 and is still under development. The most prominent changes during the last decade include the establishment of a Faculty of Veterinary Medicine and Animal Science, formed in 2004 by Departments from the former Faculties of Veterinary Medicine and of Agriculture, Landscape Planning and Horticulture, and a dramatic reduction in the number of Departments (from eighteen to

six!). The new Faculty and the bigger Departments have all also been strengthened with regard to administrative competence and capacity.

In 2007 the clinics, which up till then had been operated by the respective academic Departments, were restructured and organisationally moved from the Faculty to form a joint University Animal Hospital direct under the Rector. This reorganisation was made, on the one hand to enable the clinics to be managed and coordinated economically more efficiently, and on the other to enable the Departments to focus on their academic functions such as teaching, training, research and post-graduate education. This new structure is still under development, and includes a number of challenges with regard to fine-tuning of the organisational and economic separation between the Faculty and the Animal Hospital. As the creation of the coordinated University Animal Hospital was the initiative of the Faculty, it fully supports its establishment. The organisational separation between the Animal Hospital and the academic Departments will give the University the possibility to be progressive clinically as well as in teaching and research.

Even if the administrative structure of the University and Faculty may seem complicated on paper, it has proven to be well functioning and appropriate for everyday work. In this context it should be stressed that the responsibility for the coordination and development of veterinary training is with the Veterinary Programme Subcommittee, which includes teachers, students and a representative from the industry.

The new Faculty organisation opens for a further development of the cooperation between veterinary medicine and animal science. This will improve the quality of education programmes as well as research programmes. New opportunities for interdisciplinary collaboration between teachers and supervisors have been identified and/or are under development between (and within) Departments. And more remain to be discovered!

## **Education programmes at the Faculty of Veterinary Medicine and Animal Science**

### **University diploma in Veterinary nursing**

Location: Skara. 2 years.

The programme combines courses in animal health care and animal disease with supervised clinical training in animal nursing at animal hospitals.

### **University diploma in Equine studies - Racing, Trotting, Riding instruction and Stable management**

Location: Flyinge, Strömsholm and Wången. 2 years.

This is a unique higher education programme in that it solely specialises in horse biology and management and horse professions. The programme integrates theoretical studies, practical exercises and training.

### **BSc in Animal science**

Location: Uppsala. 3 years.

The programme starts with an introduction to animal science, followed by courses in ethology, physiology, breeding, nutrition and management. It also includes basic courses in e.g. biochemistry and statistics. Farm animals as well as animals for sports and companion are studied.

### **BSc in Ethology and animal welfare**

Location: Skara. 3 years.

The programme aims to provide the students with a sound knowledge in animal behaviour and welfare that can be applied in practice. It also gives a scientific and practical approach to the relationship and communication between animals and man.

### **Agriculture programme - Animal science**

Location: Uppsala. 4.5 years.

The programme combines basic biosciences with anatomy, physiology, breeding, nutrition, behaviour and management domestic animals. Some courses, like Agro system, are studied together with students from other specialisations in agriculture, e.g. economy. Much emphasis is given on problem solving and communication.

### **Veterinary medicine programme**

Location: Uppsala. 5.5 years.

The programme gives training towards a veterinary degree, provides knowledge in basic biosciences relating to domestic animals as well as training in how to detect, treat and prevent disease in animals. Food safety is another important part of the curriculum. It is the only education in Sweden resulting in a license to practice as a veterinarian.

### **Master programme in Animal science, in English**

Location: Uppsala. 2 years.

This programme offers knowledge about the biology, function and wellbeing of domestic animals. The studies focus on four profile areas: Farm animals, Animals for sports and companion, Ethology, welfare and animal housing, Biomedicine and animal health. The students may also choose to concentrate on, for instance, animal genetics or nutrition.

### **European Master in Animal Breeding and Genetics (EM-ABG)**

The programme aims at building capacities in the fields of Animal Breeding and Genetics to meet challenges in developed and developing countries concerning food security, food quality, animal health, welfare and biodiversity. The focus is on the development of sustainable breeding programmes for farm animals, fish and companion animals. The programme is run by a consortium of six European universities, one being SLU. Students conduct the major part of their training at two of the universities.



## Chapter 3 FINANCES

### 1. FACTUAL INFORMATION

The operations of higher education institutions in Sweden are funded to a great extent by governmental allocations, direct or indirect (via research councils). They receive funding for first and second level education based on the number of enrolments and student performance. They also receive funding to be used for third level studies and research. The main funding for basic functions at the SLU is a grant from the Ministry of Agriculture, Food and Fisheries, which in 2006 amounted to 1,340 MSEK (146 M€). The total income of SLU, including research grants, animal hospital fees, etc. was higher, 2,357 MSEK (256 M€).

<b>Key figures of the economy of the University in 2006</b>		
	<b>MSEK</b>	<b>M €</b>
<b>Expenditure</b>		
Staff	1,306	142
Premises	266	30
Other operative expenses	540	59
Depreciation	64	7
<b>Income</b>		
Government grants	1,340	146
Operating income	415	45
External grants	602	65
<b>Expenditure in fields of activities</b>		
Research and third level education	1,494	162
First and second level education	499	54
Environmental monitoring and assessment	184	20

#### **Student numbers and performance determine funding**

Higher education institutions are allocated governmental funds for first and second level education. The amount per student varies between disciplines. The allocation is based on the number of full-time equivalent students (FTE) and annual performance equivalents (APE). The number of full-time equivalent students is calculated by taking the total number of (ECTS) credit points for which students are enrolled and dividing by 60, which is what a full-time student is expected to attain in two semesters (one academic year) of full-time study. Annual performance equivalents are calculated by dividing the total number of credit points finally attained by 60.

For the period 2006-2008, SLU has been assigned 10,700 FTE, ie. an average of 3,567 FTE per year. The annual directives issued by the University Board to the four faculties stipulate how governmental funding is to be distributed to the various first and second level programmes. In 2006, the Faculty of Veterinary Medicine and Animal Science received an educational assignment of 922 FTE, of which 409 FTE were for the veterinary education. The corresponding figures for 2007 are 902 and 436.5, respectively.

In 2006, the governmental funding for the University's first and second level education was 339 MSEK (36.9 M€). From this, 146 MSEK (15.9 M€) was allocated for the education programmes (incl. "free courses") at the Faculty of Veterinary Medicine and Animal Science.

**SLU allocations to course expenditures according to discipline, 2006**

<b>Discipline(s)</b>	<b>FTE, SEK</b>	<b>APE, SEK</b>	<b>Total SEK</b>	<b>Total €</b>
Humanities, Social sciences	23,230	9,955	33,185	3,607
Natural Sciences, Technology	54,955	23,550	78,505	17,075
Design	140,650	60,275	200,925	21,840
Veterinary Nursing	61,190	26,225	87,415	9,502
Veterinary Medicine	148,160	63,500	211,660	23,007
"Unspecified"	44,890	19,240	64,130	6,970

**Financing research and third level (doctoral) education**

The governmental funding allocated for third level education and research is laid down in the annual directives issued to each higher education institution. In 2006, direct governmental funds for SLU research amounted to 757 MSEK (82 M€). The Board of SLU stipulates how this funding is divided between the faculties and the different disciplines, including a faculty target for the number of doctoral (PhD) degrees. The allocations are based on historical data (structure), extension effects and performance, including no of degrees, competitive grants and international peer-reviewed publications.

The Faculty of Veterinary Medicine and Animal Science was allocated 178 MSEK (19.3 M€) for research and third level (doctoral) education in 2006. For the period 2005-2008, SLU has an assignment in third level (PhD) training of 105 PhD degrees per year. For 2006, the goal for the Faculty of Veterinary Medicine and Animal Science was set to 22 doctoral degrees. The actual result was 34.5.

Of course, the faculties and departments also receive additional external ("competitive") funding from research councils, foundations, local authorities, county councils and commercial companies.

**Capital Expenditure**

The funding of capital expenditure (e.g. building work, major items of equipment) is regulated in detail. Depending on the amount, decisions are to be made at departmental, faculty or university levels. The National Debt Office provides governmental guarantees and loans to Universities for major investments.

**Faculties allocate funding**

The further allocation of funds, from faculty to departments, is decided by the Faculty Board. As is the case from university to faculty, the allocation of funds for first and second level education is based on the number of FTE and APE the respective department is expected to produce during the coming year. There are different "price-tags" for different subjects, e.g. veterinary medicine, natural science, animal care. For veterinary courses, the allocation also depends on the type of activity (see below).

For research and third level education, the allocation within the Faculty is the result from strategic decisions, and historical and performance data. After setting some (minor) funds off for special projects and 5% for strategic projects sanctioned by the University Board, the remaining research funds are distributed to the departments according to 65% basic revenues (historical data), 35% performance. Performance is based on external research grants, on numbers of PhD, Licentiate and Docent (see chapter 5.3) degrees, and on international peer-reviewed publications.

<b>Faculty allocations for veterinary courses according to type of activity</b>		
<b>Activity</b>	<b>FTE+APE</b>	
	<b>Total SEK</b>	<b>Total €</b>
“Dry” – lectures, computer labs, etc.	63,312	6,882
Wet labs – anatomy, microbiol., etc.	126,625	13,764
Clinical	253,250	27,527

### 3.1 EXPENDITURE

The expenditure of the Faculty in 2006 is summarized in Table 3.1.1. Through an “overhead” calculated as 15% of the personnel costs, the four faculties cover the costs for the university administration, administrative, IT and infrastructure services, teaching and pedagogy development, etc. The cost for the Faculty of Veterinary Medicine and Animal Science was about 38 MSEK (4.1 M€) in 2006, which is included in “general operations” in Table 3.1.1. On the basis of personnel costs, each Department also sets off 2.5% for central Faculty costs.

In the table, the costs for support staff have been distributed between teaching and research in accordance with the budgeting system of the University.

Table 3.1.1: **Annual expenditure of the Faculty, calendar year 2006**

	<b>1,000 SEK</b>	<b>1,000 €</b>
<b>a. Personnel</b>		
a.1 teaching staff	108,284	11,770
a.2 support staff	na	na
a.3 research staff	145,870	15,855
Total for a	254,154	27,625
<b>b. Operating costs</b>		
b.1 utilities	Included in d	
b.2 expenditure relating to teaching	66,017	7,176
b.3 expenditure relating to research	50,911	5,534
b.4 general operations (excluding the above)	39,440	4,287
Total for b	156,368	16,997
<b>c. Equipment</b>		
c.1 teaching	1,369	149
c.2 research	4,760	517
c.3 general operations (excl. the above)	972	106
Total for c	7,101	772
<b>d. Rent and maintenance of buildings</b>		
d.1 teaching	26,130	2,840
d.2 research	36,637	3,984
Total for d	61,767	6,824
<b>e. Total expenditure</b>	<b>479,390</b>	<b>52,218</b>

na = not available in University's budget system

### Cost per student

The cost of education can be estimated in different ways. From the budgets and economic results provided by the Departments, the direct yearly cost for training a veterinary student has been estimated to approximately 212,000 SEK (23,000 €). Thus, the total direct cost of training a graduate would be 1,166,000 SEK (127,000 €). On top of this, there are additional indirect costs, which cannot be easily identified and estimated.

Table 3.1.2: **Cost of veterinary training**

	SEK	€
1. Annual direct cost of training a student	212,000	23,000
2. Direct cost of training for a diploma	1,166,000	127,000

### 3.2 REVENUES

Table 3.2.1: **Annual revenues of the Faculty, calendar year 2006**

	1,000 SEK	1,000 €
a. revenue from the State/University	324,156	35,234
b. revenue from private bodies, research	19,827	2,155
c. revenue from public authorities, research	46,486	5,053
d. revenue earned and retained		
d.1. registration fees from students	0	0
d.2. revenue from continuing education	5,573	606
d.3. revenue from clinical activities	67,716	7,360
d.4. revenue from analyses	10,324	1,122
e. revenue from other sources	40,268	4,377
f. Total revenue from all sources	514,350	55,907

It should be noted, that the departments are allowed to retain income from outside services for their own use. In Sweden, there are no tuition or registration fees for students. This is irrespective of citizenship (Swedish, Nordic, European or elsewhere). “Over-head” costs at university and faculty levels are covered indirectly on the basis on the personnel costs at the respective department. Revenues from non-governmental sources are subject of a governmental 8% “university VAT”.

Table 3.2.2: **Changes in public funding**

Year	2007 <i>(budgeted)</i>	2006	2005	2004
Revenue MSEK (M€)	331 (36.0)	324 (35.2)	310 (33.7)	336 (36.5)

## 2. COMMENTS

The degree of autonomy and flexibility that the Faculty is given by the University is relatively high and the Faculty can allocate governmental funds for teaching according to the needs of the Departments, based on the cost for different types of courses and number of students.

We do agree that “teaching establishments never have enough finance”. What is particularly difficult to fulfil at a Faculty of Veterinary Medicine and Animal Science is the keeping of high standard animal facilities with sufficient numbers of normal healthy animals of the species required. The training of veterinary students must not be an exercise of theory. Today, many students have little or no experience of handling animals, particularly livestock. This in combination with the practical/clinical training makes it necessary to have close access to animals. Some of the clinical training (gynaecology, rectal examination, palpation, heart and lung auscultation, etc.) is first done using teaching animals.

The cost for maintaining stables, animals and clinics is very high – and obviously hard to comprehend for bureaucrats and politicians. Our number one priority for the use of any increased funding would be stables and animals for teaching.



## Chapter 4 CURRICULUM

### 1. FACTUAL INFORMATION

In the Ordinance for the Swedish University of Agricultural Sciences, the Government has laid down which degrees may be awarded by the University and the objectives for these degrees. At University level, the University Board approves the study programme, while the Faculty is responsible for the detailed course syllabus. At present, there are two curricula for the veterinary programme running at the same time. One was approved in 1997 by the Board of SLU and will now be gradually replaced by a new curriculum, which was approved in 2007. The new curriculum started in the academic year 2007/2008.

There are several reasons for this revision, one being the continuous increase in knowledge in the area of veterinary medicine causing a problem with curriculum overload. In addition, the academic year has recently been reduced by a couple of weeks, which now leaves 37 out of 40 weeks open for timetabled activities. At the same time, economic restrictions are to be observed. The demand for more veterinarians trained in Sweden is met by the University by increasing the admission from 82 to 100 students per year from 2007/2008. In eight years, the number of students admitted has step by step increased from 65 to 100. Finally, all higher education in Sweden will be revised to harmonize with the so-called Bologna process. A working party with teachers representing different competences as well as students is now leading the introduction and implementation of the new curriculum from 2007.

Other processes at the Faculty will also affect the veterinary education the coming years. The buildings in Ultuna campus in Uppsala are now 30-35 years old and as the needs from education, research and animal hospital have changed over the years there is an imminent need for up-to-date buildings. Therefore, plans for construction of new buildings and thorough restoration of some of the present buildings in campus are under way. The research herds, also used for veterinary training, will get new buildings at Lövsta within the next few years. Another change is the new organization of the University Animal Hospital, making it a separate administrative and economic unit within the University. The overall aim of all on-going processes is to improve quality and efficiency of education and research at the Faculty of Veterinary Medicine and Animal Science.

#### **“Old” Curriculum – Master of Science in Veterinary Medicine**

The 1997 veterinary curriculum covers eleven terms of full time education (5.5 years) and constitutes a medical, academic education as well as a professional education at university level. The curriculum is the same for all students during the first 5 years, comprising pre- and paraclinical studies (approx. 6 terms), and clinical studies (approx. 4 terms).

The last term consists of elective studies with a period of courses and activities as well as a scientific degree project work, together covering 20 weeks. The degree project, in a subject chosen by the student, is required to pass the veterinary exam. The aim is that the student, under supervision by a faculty member, shall identify, characterise and analyse a veterinary medical topic. Projects are presented orally as well as in a written report. All six departments of the Faculty support degree projects during the last year of studies,

which means that the projects may be of anything from basic (experimental) to practical (clinical) character. They may also include work outside University.

#### **Higher Education Act (SFS 1992:1434)**

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##### Section 9

Undergraduate education shall essentially build on the knowledge that students acquire in national or specially designed programmes at upper secondary school or corresponding knowledge. The Government may, however, allow exceptions where education in the field of arts is concerned. First level education shall develop the students'

- ability to make independent and critical assessments,
- ability to independently perceive, formulate and solve problems, and
- preparedness to deal with change in working life.

In the educational field concerned, in addition to knowledge and skills, students shall develop an ability to

- seek and evaluate knowledge at a scholarly level,
- follow the development of knowledge, and
- exchange knowledge with other people, including people without specialist knowledge of the field.

#### **Degree of Master of Science in Veterinary Medicine (approved by the Board of SLU 17 June, 1997)**

##### *Scope*

A degree of Master of Science in Veterinary Medicine may be awarded on completion of courses totalling 220 credit points.

##### **Objectives (in addition to the general goals laid down in Chapter 9 Section 1 of the Higher Education Act [1992:1434]).**

To qualify for the award of the degree of Master of Science in Veterinary Medicine students shall

- have acquired the knowledge required to enable them to undertake the professional duties of a veterinary surgeon in accordance with scientific principles and tried and tested experience,
- have acquired the principles of clinical diagnosis and treatment, preventive health care and the methods used to investigate and deal with population problems so that after some professional experience they can themselves take responsibility for these measures,
- possess the clinical skills needed to be able to provide emergency treatment to animals,
- have acquired the knowledge required to uphold community demands concerning food of animal origin,
- have acquired knowledge of the statutes on which the activities of veterinary surgeons are based,
- have acquired the knowledge and skills to required as preparation for further education and for research and development activities, and
- have acquired insight into the role of the veterinary surgeon with regard to the prevention of cruelty to animals and the ethical values in which the professional activities of veterinary surgeons are grounded.

## Summary of the “old” curriculum (1997)

- “p” denotes one credit (“poäng”), approx corresponding to one week of full-time studies

### First year:

- Introduction to Academic Studies and Scientific Methodology (6 p)
- Introduction to Veterinary Anatomy (4 p)
- Basic Medical Biology (14 p)
- Structure and Function of Body Systems (15 p)
- Practice in Animal Husbandry (1 p)

### Second year:

- Structure and Function of Body Systems, continued (10 p)
- General Mechanisms of Disease (18 p)
- Herd and Population Medicine (12 p)

### Third year:

- Specific Mechanisms of Disease (9 p)
- Pharmacology and Toxicology (11 p)
- Laboratory Animal Science (2 p)
- Clinical Anatomy and Introduction to Clinical Studies (7 p)
- Food Hygiene (11 p)

### Fourth year:

- Clinical Chemistry and General Medicine (2 p)
- Anaesthesiology (1 p)
- General Surgery (1 p)
- Introduction to Clinical Studies (2 p)
- Horse Surgery and Hoof Diseases (7 p)\*
- Horse Medicine (4 p)\*
- Small Animal Surgery and Medicine (17 p)\*
- Diagnostic Pathology (3 p)\*
- Clinical Radiology (Diagnostic Imaging) (2 p)\*
- Introduction to the Veterinary Profession (1 p)

### Fifth year:

- Epizootiology (1 p)
- Mobile Clinic (7 p)\*
- Ruminant Medicine (10 p)\*
- Food Hygiene (3 p)\*
- Comparative Reproduction, Obstetrics and Udder Health (11 p)\*
- Pig and Poultry Diseases (4 p)\*
- Elective Studies with Degree Project, planning (3 p)\*
- Animal Welfare and Veterinary Legislation (1 p)

### Sixth year:

- Epizootiology (1 p)
- Elective Studies with Degree Project (17 p)
- Veterinary Public Health (2 p)

\* included in the Clinical Rotation

Extramural work is not required with the exception of a compulsory one week practice period in food-animal production during the summer holidays between years 1-2 or 2-3, and two weeks of meat inspection practice in year 5.

Within the curriculum in an establishment, a distinction can be made between:

- "core" subjects taken by every student (Tables 4.1.1, 4.1.2 and 4.1.3);
- "electives" which each student must select from a list of permissible subjects (Table 4.2);
- "optional" subjects available over and above the obligatory curriculum;
- obligatory extramural work.

The details of the curriculum will be described in this section of the report. Please note that the details were collected in a most ambitious in-depth survey made two years ago for the development of the "new" (2007) curriculum. Some major changes that have been made since then have been adjusted for (e.g., food hygiene).

The following terms are used in the tables - some overlap, however, is inevitable.

- **Lectures** convey theoretical knowledge. Lectures (or presentations) of teaching are given to an entire or partial annual intake of students. Teaching may be with or without the use of teaching aids or of demonstration animals or specimens. The essential characteristic is that the active involvement of the students is restricted to questions and brief discussions.
- **Supervised work** (sometimes called tutorials) is teaching sessions directed towards a small group of students during which they work on their own, or as a team, on part of the theory, prepared from manuscript notes, photocopied documents, articles and bibliographic references. Information is illustrated and knowledge extended by the presentation of audio-visual material, exercises, discussions, problem-based learning in groups, and case work.
- **Practical work** means teaching sessions where students themselves actively perform laboratory experiments, carry out dissection or necropsy, use microscopes for examination of histological or pathological specimens, or handle normal healthy animals.
- **Clinical work** means hands-on procedures by students on live animals - examination, diagnosis, treatment. Surgery on cadavers to practice clinical techniques is also classified as clinical work. Simply observing the teacher doing these tasks is not clinical work.
- **Other work** includes all time assigned to degree project and examinations that are scheduled as part of course indicating their value for learning and understanding.

**Table 4.1.1: General table of curriculum hours taken by all students, "old" curriculum (1997). Based on an analysis performed for the development of the "new" (2007) curriculum.**

	Hours of training according to schedule					Total
	Lec- tures	Pract. work	Super- vised work	Clinical work	Other work	
First year	246	193	147.5	9	30	625.5
Second year	423	318.5	188	24	50	1,003.5
Third year	367	149.5	112	-	22.5	651
Fourth year	220	180	80.5	809	34	1,323.5
Fifth year	292	183	72	461	179	1,187
Sixth year	44	8	37	-	597	686
<b>TOTAL</b>	<b>1,592</b>	<b>1,032</b>	<b>637</b>	<b>1,303</b>	<b>912.5</b>	<b>5,476.5</b>

Table 4.1.2: **Yearly curriculum studies, “old” curriculum (1997). Based on an analysis performed for the development of the “new” (2007) curriculum.**

1 p (credit point) per week

Subject	Hours of training					Total
	Lectures	Pract. work	Supervised work	Clinical work	Other	
<b>FIRST YEAR</b>						
Introd Acad Stud & Scient Meth, 6 p	6	-	45	-	2.5	53.5
Introduction to Veterinary Anatomy, 4 p	18	11	17	-	5	51
Basic Medical Biology, 14 p	88	57.5	68	-	11	224.5
Structure & Function of Body Systems, 15 p	134	94.5	17.5	9	11.5	266.5
Practice in Animal Husbandry, 1 p	-	30	-	-	-	30
<i>Total first year, 40 p</i>	<i>246</i>	<i>193</i>	<i>147.5</i>	<i>9</i>	<i>30</i>	<i>625.5</i>
<b>SECOND YEAR</b>						
Structure & Function of Body Systems, 10 p	87	84.5	20	20	8	219.5
General Disease Mechanisms, 18 p	181	204	107	4	21	517
Herd & Population Medicine, 12 p	155	30	61	-	21	267
<i>Total second year, 40 p</i>	<i>423</i>	<i>318.5</i>	<i>188</i>	<i>24</i>	<i>50</i>	<i>1,003.5</i>
<b>THIRD YEAR</b>						
Specific Disease Mechanisms, 9 p	74	25	2	-	5	106
Pharmacology & Toxicology, 11 p	125	17	39	-	3	184
Laboratory Animal Science, 2 p	29	8	7	-	-	44
Clin Anatomy & Introd to Clin Studies, 7 p	35	36.5	46	-	11.5	129
Food Hygiene, 11 p	104	63	18	-	3	188
<i>Total third year, 40 p</i>	<i>367</i>	<i>149.5</i>	<i>112</i>	<i>-</i>	<i>22.5</i>	<i>651</i>
<b>FOURTH YEAR</b>						
Clinical Chemistry & General Medicine, 2 p	21	-	14	-	3	38
Anaesthesiology, 1 p	20	10	10	40	-	80
General Surgery, 1 p	18	-	4	-	4	26
Introduction to Clinical Studies, 2 p	15	22	1	-	3	41
Horse Surgery & Hoof Diseases, 7 p	25	33.5	3	195	10	266.5
Horse Medicine, 4 p	19	3	1.5	120	3	146.5
Small Animal Surgery and Medicine, 17 p	100	83.5	7	341	9	540.5
Diagnostic Pathology, 3 p	-	-	21	90	-	111
Clinical Radiology, Diagnostic Imaging, 2 p	-	18	19	23	2	62
Introd to the Veterinary Profession, 1 p	2	10	-	-	-	12
<i>Total fourth year</i>	<i>220</i>	<i>180</i>	<i>80.5</i>	<i>809</i>	<i>34</i>	<i>1,323.5</i>
<b>FIFTH YEAR</b>						
Epizootiology, 1 p	18	6	4	-	2	30
Mobile Clinic, 7 p	-	-	-	274	-	274
Ruminant Medicine, 10 p	93	48.5	56	45	10	252.5
Food Hygiene, 3 p	15	62	-	-	2	79
Comp Reprod, Obst & Udder Health, 11 p	123	53	39	91	10	316
Pig & Poultry Diseases, 4 p	26	6.5	8	76	4	120.5
Elective Studies with Degree Project, 3 p	-	-	-	-	105	105
Animal Welfare & Vet Legislation, 1 p	19	3	5	-	3	30
<i>Total fifth year</i>	<i>292</i>	<i>183</i>	<i>72</i>	<i>461</i>	<i>179</i>	<i>1,187</i>

Table 4.1.2 cont'd: **Yearly curriculum studies, “old” curriculum (1997). Based on an analysis performed for the development of the “new” (2007) curriculum.**

1 p (credit point) per week

Subject	Hours of training					Total
	Lectures	Pract. work	Super-vised work	Clinical work	Other	
<b>SIXTH YEAR</b>						
Epizootiology, 1 p	17	6	5	-	2	30
Elective Studies with Degree Project, 17 p	-	-	-	-	595	595
Veterinary Public Health, 2 p	27	2	32	-	-	61
<i>Total sixth year</i>	<i>44</i>	<i>8</i>	<i>37</i>	<i>-</i>	<i>597</i>	<i>686</i>
<b>TOTAL WHOLE CURRICULUM, 220 p</b>	<b>1,592</b>	<b>1,032</b>	<b>637</b>	<b>1,303</b>	<b>912.5</b>	<b>5,476.5</b>

In Table 4.1.3 the curriculum hours have been distributed, as required from the SER instructions, according to the subjects listed in the (now out-dated) EEC Directives from 1978. The subject titles listed in the SER instructions do often not correspond to the name of the course in which the subject content is covered at the Faculty. The hours spent on the various subjects, as listed in Tables 4.1.2, have been allocated to the most appropriate subject title in Table 4.1.3. Subjects that do not correspond to any particular subject title have been listed in Table 4.1.4 as "other subjects".

Pharmacy is not given as a separate subject. To some small extent it is dealt with during the course in pharmacology, but under Swedish legislation veterinarians are not, with few exceptions, permitted to mix or sell pharmaceutical preparations. This rather precludes the need for a course in pharmacy.

Table 4.1.3: **Curriculum hours in EU-listed subjects taken by every student, “old” curriculum (1997)**

Subject	Hours in course					Total
	Lectures	Practical work	Super-vised work	Clinical work	Other	
<b>A. Basic subjects</b>						
Anatomy (incl. histology and embryology)	138.5	157	74.5	-	20.5	390.5
Biochemistry and molecular biology	61	32	38	-	8	139
Biology (incl. cell biology)	Included in Biochemistry/molecular biology and Anatomy					
Biophysics	Included in <i>ia</i> Anat, Biochem, Physiol, Pharm, Tox, Diagn Imag					
Biostatistics	16	-	8	-	-	24
Chemistry	Prerequisite for entering programme					
Epidemiology	28	18	32	-	4	82
Genetics	27	6	12	-	2	47
Immunology	48	6	-	-	7	61
Microbiology	83	142	37	-	12	274
Parasitology	32	16	24	-	6	78
Pathological anat (macro- & microscopic)	106	65	69	94	21	355
Pharmacy	Included in Pharmacology & Toxicology					
Pharmacology	116	17	39	-	3	175
Physiology	86.5	25	23.5	-	8	143
Physiopathology	Included in Pathological Anatomy, Physiology and Clinical courses					
Toxicology (incl. environmental pollution)	Included in Pharmacology & Toxicology					

Table 4.1.3 cont'd: **Curriculum hours in EU-listed subjects taken by every student, “old” curriculum (1997)**

<b>B. Animal Production</b>						
Agronomy*	4	-	3	8	4	19
Animal behaviour (incl. behavioural disorders)	22	4	-	-	1	27
Animal husbandry (incl. livestock production systems)	36	24	17	-	1	78
Animal nutrition and feeding	21.5	4	2	-	1	28.5
Animal protection and welfare	20	3	12	-	-	35
Environmental protection*	10	-	1	6	1	18
Preventive veterinary medicine (incl. health monitoring programmes)	17	2	2	-	2	23
Reproduction (incl. artificial breeding methods)	42	20	6	43	3	114
Rural economics*	3	-	6	8	2	19
<b>C. Clinical subjects</b>						
Anaesthetics	20	10	10	40	-	80
Clinical examination and diagnosis and laboratory diagnostic methods	57	57	18	-	11	143
Clinical medicine	152.5	29	79.5	559.5	13	833.5
Diagnostic imaging	7	4	33	23	2	69
Obstetrics	12	18	16	50	2	98
Reproductive disorders	69	6	26	48	5	154
State veterinary medicine, zoonoses, public health and forensic medicine	62	14	45	-	4	125
Surgery	86	111	6	441.5	18	662.5
Therapeutics	15	-	11	-	-	26
<b>D. Food Hygiene</b>						
Certification of food production units	12	-	-	-	-	12
Food certification	8	-	2	-	-	10
Food hygiene and food quality (incl. legislation)	45	63	13	-	3	124
Food inspection, particularly food of animal origin	30	62	3	-	2	97
Food science and technology	24	-	-	-	-	24
<b>E. Professional knowledge</b>						
Practice management, professional ethics and vet certification and report writing	12	9	30	35	21	107.5
Veterinary legislation	6	-	-	-	-	6

\* These topics are not given as separate subjects but integrated in other courses. Agronomy is mainly included in Population Medicine, Pig & Poultry Diseases, Ruminant Medicine, and Mobile Clinic. Environmental protection is included in Pathology, Pharmacology and Toxicology, Population Medicine, Small Animal Surgery and Medicine, Pig & Poultry Diseases, Ruminant Medicine, Comparative Reproduction, Obstetrics & Udder Health, and Veterinary Public Health. Rural Economics is included in Population Medicine, Pig & Poultry Diseases, Ruminant Medicine, Comparative Reproduction, Obstetrics & Udder Health

Table 4.1.4: **Curriculum hours in other subjects taken by every student, “old” curriculum (1997)**

	Hours in course					Total
	Lectures	Pract. work	Super-vised work	Clinical work	Other	
Introduction to university studies	6	-	45	-	36	87
Laboratory animal science	29	15	-	-	-	44
Electives and Degree Project	-	-	-	-	700	700

### **Elective subjects**

The overall objective of the one-term long course “Elective Studies with Degree Project” is to give the individual student opportunity to elective in-depth studies, through independent search of scientific knowledge and individual development of the ability to critically pursue analysis and synthesis of this knowledge in an area of the student’s choice. As well, acceptable oral and written deliverance of the gained knowledge should be shown.

A total of 20 credit points include elective in-depth studies (courses, departmental activities etc) within and outside SLU, and a degree project of at least 10 credit points. The individual student is responsible for planning and implementation of the course activities while involved academic staff (tutors and supervisors) act as facilitators and organisers rather than as a direct source of facts. Each student selects an area of in-depth studies and contacts a suitable supervisor or if needed several co-supervisors. The individual student is responsible for the implementation of the work. A specific teacher is elected as examiner of the degree project.

Planning and implementation of the in-depth studies and the degree project is performed during the 5th (3 p) and the 6th (17 p) year of study. Administrative responsibility lies within the department where the project is performed. In addition to the elective courses offered by the University, courses and other activities can also be found through NOVA (other Nordic faculties), Erasmus/SOKRATES (other European universities) or through other international contacts, pharmaceutical companies, animal hospitals, other Swedish universities, etc.

### *Optional subjects*

There are no optional subjects or courses available for the veterinary students.

### **Obligatory extramural work**

In the 1997 curriculum, there is a one-week period, “Practice in Animal Husbandry”, when the students shall follow and take part in the work at a farm with milk or piglet production. During the fifth-year course “Food Hygiene”, groups of three students attend the life animal and meat inspection at two slaughterhouses, one in Uppsala and one in Skara, one week at each site.

On a voluntary basis, students can attend one week of the mobile clinic practice outside the University.

### **Ratios**

In the ratios below, the hours for elective studies and degree projects, introduction to University studies and some other “non-veterinary” have not been included. The elective courses and degree project often include a substantial part of clinical and practical training.

$\frac{\text{Theoretical Training}}{\text{Pract \& Clin Training}} = \frac{1,592}{2,972} = \frac{1}{1.87}$
--

$\frac{\text{Clinical Training}}{\text{Theor \& Pract Training}} = \frac{1,303}{3,261} = \frac{1}{2.50}$
--

Table 4.2: **Elective courses organised at the Faculty in 2007**

How to write and present a scientific paper, 1 p
<b>Department of Anatomy, Physiology and Biochemistry</b>
The locomotor apparatus of the horse, 2-5 p
The morphology of the reproductive system, 2-5 p
Tumor biology and diseases, 2-5 p
<b>Department of Clinical Sciences</b>
Clinical chemistry, 2 p
Haematology and cytology, 1 p
Diagnostic ultrasound in horses and small animals, 1 p
Diagnostic imaging, 1-8 p
Anaesthesiology and intensive care (SA), 1-8 p
Dermatology (SA), 1-8 p
Internal medicine (SA), 1-8 p
Cardiology (SA), 1-8 p
Odontology (SA), 1-8 p
Ophthalmology (SA), 1-8 p
Orthopaedics and neurology (SA), 1-8 p
Exotic pets (SA), 1-8 p
Tooth extraction (SA), 1 p
The horse's mouth, 1 p
Ophthalmology (LA), 1 p
Laboratory Animal Science, 1 p
Abomasal displacement surgery, 1 p
Herd health in milk production, 1 p
Bovine reproduction with emphasis on gynaecology, 2 p
Equine reproduction with emphasis on gynaecology, 1 p
Mobile clinic, 4 p
Canine and feline reproduction, 1 p
<b>Department of Animal Environment and Health</b>
Applied ethology, 3 p
Animal management, welfare, and meat quality, 1 p
Stable building control and approval in practice, 1 p
Herd health, environmental disturbances and their prevention, 1 p
Post mortem examination, 2 p
Production diseases in practice – ruminants, 3 p
<b>Department of Animal Breeding and Genetics and Department of Animal Nutrition and Management</b>
The biology and use of the horse, 10 p
Dog and cat nutrition, 3.3 p
Dog and cat – genetics, health and reproduction, 6.7 p
Pig production, 6.7 p
Poultry production, 3.3 p
Cattle production, 10 p
Genome analysis, 6.7 p
Bioinformatics, 6.7 p
Biology of lactation, 5 p
Basic nutrition, 6.7 p
Automatic animal management systems – cattle, 5 p
Animal management in organic farming, 5 p
Individual course on nutrition, 3 or 5 p

LA = Large Animal, SA = Small Animal

### **Specific information on the practical clinical training**

A most important area for the veterinary students is the clinical training. In Uppsala, the whole training is given at the University. It is therefore essential that we can provide a well-functioning animal hospital and field services (mobile clinic). The University Animal Hospital is located in the Clinical Centre together with the Department of Clinical Sciences. The courses in clinical subjects are given during the spring of the third year of studies and during the fourth and fifth years. The practical clinical training is predominantly through 23 weeks of introductory courses and 45 weeks of rotations in the different clinics. Most practical and supervised work is obligatory. All clinical work is obligatory.

<b>The time students spend in the different Clinics</b>	<b>weeks</b>
- small animal medicine and surgery	13
- horse medicine and surgery	7
- swine medicine	3
- ruminant medicine	6
- reproduction, obstetrics and udder diseases	5
- mobile clinic	7
- diagnostic imaging	3
- clinical chemistry	1

The small animal clinic is open around the clock, all year round. The horse clinic also runs an emergency service. The University Animal Hospital has an active mobile clinic, which provides emergency and night services all year round. Students participate in the emergency and night duties at the clinics as part of their coursework.

During the fourth year of studies the students are divided into two groups. One of these first attends the small animal clinics, the other attends the horse clinic rotation. "Half-time" they do their examinations and then change clinics.

The layout of the fifth year 30 weeks of rotation is more complicated. Students are divided into a large number of small groups that is necessary for the period at the mobile clinic. In summary, each student spends

- 6 weeks in Ruminant Medicine,
- 6 weeks in Comparative Reproduction and Udder Health,
- 3 weeks in Swine Medicine,
- 1 week Epizootiology and Degree Project,
- 7 weeks in the Mobile Clinic,
- 2 weeks at slaughterhouse practice,
- 3 weeks Degree Projects and Electives,
- 2 weeks for own studies.

### Clinical Rotations during the fourth year of studies

Weeks 46 – 07	Week 8	Weeks 9 - 21	Week 22
<p><b>Small Animal Clinic</b> (6 groups of 6-7 students)</p> <p>Acute/Operation 2 w            “Special group” 2 w*            In-patient Medicine 2 w            Day patients Medicine 2 w            In-patient Surgery, Pol Op 2 w            Day patients Surgery 2 w</p>	<p><u>Exams</u></p> <p>Small            Animal            Surgery            and            Medicine</p>	<p><u>Horse Clinic</u> (group sizes 3, 6 or 9)</p> <p>Operation 1 w            In-patient Clinics 2 w            Day patients 2 w            On Duty 1 w            “Special group” 3 w**            (Diagnostic Pathology 3 w)</p>	<p><b>Exams</b></p> <p>Diagn            Imaging</p> <p>Horse            Surgery            and            Medicine</p>
<p><u>Horse Clinic</u> (group sizes 3, 6 or 9)</p> <p>Operation 1 w            In-patient Clinics 2 w            Day patients 2 w            On Duty 1 w            “Special group” 3 w**            (Diagnostic Pathology 3 w)</p>	<p><u>Exams</u></p> <p>Horse            Surgery            and            Medicine</p>	<p><b>Small Animal Clinic</b> (6 groups of 6-7 students)</p> <p>Acute/Operation 2 w            “Special group” 2 w*            In-patient Medicine 2 w            Day patients Medicine 2 w            In-patient Surgery, Pol Op 2 w            Day patients Surgery 2 w</p>	<p><u>Exams</u></p> <p>Diagn            Imaging</p> <p>Small            Animal            Surgery            and            Medicine</p>
<p>* Small animal “special group” includes cardiology, dermatology, oncology and orthopaedics            ** Horse “special group” includes surgical exercises, farriery, hoof diseases and diagnostic imaging</p>			

**CLINICAL ROTATIONS FIFTH YEAR, 2007/2008**

	W	41	42	43	44	45	46	47	48	49	50	51	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21																
Group																																															
1a	3			U				E	SU	M	ST				SM		M	M	DP	M	M			M	ST	SS	DP			M	DP																
1b	3			U				E	M	SS	M						M	SU	ST	M	DP			M	M	ST	DP			M	DP																
1c	2		RM 1	U			Rep 1	E	M	M	ST			RM 2	M	DP	SU		SM		M	M			RM 3	M	M	ST	DP		Rep 2	SS	DP														
2a	3			U				E	M	M	SU				SM		ST	M	M	DP	ST				SS	DP	M	M			DP	M															
2b	3			U				E	M	M	ST				M	SU	M		SM		DP	ST			DP	M	M	DP			M	SS															
2c	2			U				E	M	M	M				M	SS	ST		SM		SU	M			M	ST	DP	DP			M	DP															
3a	3	E	U			SU	M								SM		ST	M	M	DP	M	M	SS	ST	DP	M					DP	M															
3b	3	E	U			M	M										M	DP	M	M		SM	SS	ST	DP							DP	M														
3c	2	E	U			M	SU			Rep 1				RM 2	M		SM		M	SS	ST	M	M	DP				Rep 2	RM 3				DP	M													
4a	3	E	U			M	M								ST	M	DP	M		SM		M	M	SS									DP	M													
4b	3	E	U			SS	M								DP	ST	M	M		SM		DP	M	SU										DP	M												
4c	2	E	U			M	SS								DP	ST	DP	SU	M	M	M		SM											M	DP												
5a	3	E	SU	M	U										ST	M			SS	M				DP	M	M	M					ST	DP	DP	M												
5b	3	E	M	M	U										SU	ST			M	DP				M	M	ST	M					M	SS	DP	DP												
5c	2	SU	M	E	U					RM 1					SS	M	M			SM														ST	DP	M	DP										
6a	3	M	M	E	U														DP	SS				M	M	SU	M							M	ST	DP	DP										
6b	3	M	DP	SU	U										E	M	ST																		SS	M	DP	DP									
6c	2	SS	M	E	U										M	ST	M																			M	ST	DP	DP								
7a	3	U	SS	E	M	M	M	M	ST						DP	ST																				M	DP	DP									
7b	3	U	DP	E	SU	M	M	M	ST						M	M																					M	DP	DP								
7c	2	U	M	SS																																		M	ST	DP	DP	M	DP				
8a	3	U	M	E																																			M	M	DP	DP	M	SU			
8b	3	U	M	E																																				M	M	DP	M	SU	DP		
8c	2	U	M	E																																						DP	M	ST	M	DP	DP
9a	3	M	DP	M	M	U	E								ST	M	SS	ST	DP	M	M																										
9b	3	M	ST	M	M	U	E								SU																																
9c	3	M	ST	M	SS	U	E								DP																																
10a	3					M	U	E							M	SS	M	M	ST	DP	M																										
10b	3					M	U	E							ST	M	DP	M	SS	ST	M																										
10c	3					M	U	E							ST	M	DP	ST	M	M	SS																										

RM = Ruminant Medicine  
 Rep = Comparative Reproduction  
 SM = Swine Medicine  
 SS = Slaughterhouse Skara  
 SU = Slaughterhouse Uppsala  
 U = Udder Diseases  
 E = Epizootics and DP  
 M = Mobile Clinic  
 ST = Study Time  
 DP = Degree Project and electives

## **Specific information on the practical training of food hygiene**

There are two courses on Food Hygiene.

The first 11-weeks (11 p) course is given during the third year of studies. The objectives of the course are to provide the ability to independently carry out meat inspection according to the legislation. In addition, it will lead to the ability to carry out bacteriological examination, carry out and judge uncomplicated microbiological food analyses and to identify infectious agents causing food-borne infections and intoxications. The course also provides knowledge of the main outlines in Swedish food legislation, the chemical composition of different food products, principals of uncomplicated food chemical analyses and the basis for processing, distribution and treatment of different food products.

The course contents include:

- Veterinary ante-mortem inspection, meat inspection and meat control
- Systems control in food production
- General food hygiene comprising, e.g., the composition and production of different food products as well as the changes, especially of biological nature that occur in foods during treatment and storage
- Quality assurance
- Risk management
- Food-borne infections and intoxications comprising aetiology, epidemiology and diagnostics of the diseases they cause
- Legislation concerning food, food hygiene and food control

Experts from outside the University who lecture during the Food Hygiene course come from the National Veterinary Institute, the National Food Administration, the Swedish Institute for Infectious Disease Control, the County and Municipality Veterinary Offices, and the Karolinska Institute.

The second course, which is three weeks (3 p), is given during the fifth year of studies. It is a continuation of the food hygiene course during the third year. The course is, above all, devoted to practical training of part of the theoretical sections taught during the third year. Together the both courses shall give ability to independently carry out meat inspection according to the legislation.

The course contents include:

- Veterinary ante-mortem inspection, meat inspection and meat control
- Legislation concerning the area

The education is integrated in the clinical rotations. The practical training at slaughterhouses is located to KS 058 in Uppsala and to KS 081 in Skara, where groups of three students stay one week at each place. The training is under the supervision and guidance of the National Food Administration veterinary officers responsible for meat inspection and hygiene control at the two plants. The turnover in Skara (Uppsala) in 2006 was: cattle 70,637 (19,304), calves 3,672 (1,738), sheep 35,587 (11,775) and pigs 656,990 (101,432).

## The Development of the New Curriculum

The study programme in veterinary medicine approved by the Board of SLU in 1997 included a number of changes towards an education based on a better co-ordination between courses (and departments) and integration between subjects. New subjects were included and some of the previously existing subjects were expanded. The introduction of degree projects allowed individual in-depth studies by the students. New pedagogic methods, including problem-based learning, were introduced. Nevertheless, ten years later time has come for the introduction of a new curriculum.

In 2003, decisions were taken by the University and Faculty Boards to develop a veterinary curriculum more adapted to the present (and coming) needs of society and industry. Two experienced teachers were assigned to produce a first “blue-print” for a new curriculum. After interviews and hearings with faculty, students, profession and industry they produced a draft curriculum for a yearly intake of 100 students and including a two-term “differentiation” in three directions and a one-term degree project.

Comparisons with the development of veterinary curricula in other European countries (*Quo Vaditis, Veterinariii?* Report SLU 2005) gave support for a further integration of subjects within the teaching programme and for the possibility to establish a period of “differentiation” with maintained accreditation of veterinary licences.

In December 2005, the Faculty Board appointed a working party (AgVet) to continue the development work on the contents and design of the veterinary education aiming at an adaptation to assumed future demands. The goal of AgVet was to present a more detailed curriculum to handle the needs of the labour market, the “Bologna process”, and the increasing problem of “curriculum overload”.

During 2006, discussions were held with employers and customers, heads of departments, teachers and students. Questionnaires were sent to potential employers of veterinarians as well as to veterinarians who had graduated after following the study programme established in 1997. In October 2006, AgVet summarized their findings and suggestions in a report including details of a new curriculum. The proposal can be summarised as follows;

- A Bachelor’s degree is introduced after the third year of studies.
- A “core” during the first nine terms will be attended by all students.
- The tenth term will offer elective courses and three elective species-oriented clinical course “packages”.
- The students shall perform two degree projects during their studies, one for the Bachelor degree (10 hp, approx. 7 weeks) and one for the Master degree (30 hp, approx. 20 weeks).
- The generic competences (written and oral communication, leadership, group interaction, study technique, etc) will be stressed in the training and examination.
- The “species- and discipline-borders” must be abolished, which means more integration between subject areas and more cooperation between departments.

The contents of the proposal were accepted by the Faculty Board in October 2006. Since then, the work has continued with the help of a coordinator and an implementation group. The objectives and contents of the new veterinary programme were approved in May 2007.

As the study programme is still under development, a complete version of the curriculum is not yet available.

### A simplified diagram of the "old" curriculum

First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Y
Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn
Pre- and paraclinical courses Food hygiene						Intr clin stud	Clinical studies - Small Animal - Horse	Intr clin stud	Clinical studies - Rumin - Pig & poultry - Reprod	Degree project Elective courses
-----Core Curriculum-----										Electives

### A simplified diagram of the "new" curriculum

First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Y
Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn
Pre- and paraclinical courses Food safety				DP BSc	Introd to clinical studies	Clinical Courses Clinical Rotation Vet Publ Health		Elect SA Horse Prod	DP Master	
-----Core Curriculum-----									-----Electives-----	

DP – Degree Project

The new veterinary curriculum is of the same total length in time as the old one. The old credit point *p* (*p* = poäng = approx. 1 week of full-time studies) has now been replaced by the ECTS-based credit point *hp* (*hp* = högskolepoäng = 1.5 hp per week of full-time studies). In short, 1 *p* = 1.5 *hp*.

With the exception of the BSc degree project, the new curriculum is the same for all students during the first nine terms, comprising pre- and paraclinical studies, including food safety. The first six terms lead to a degree of Bachelor with a major in Veterinary Medicine. The second level studies include clinical studies, clinical rotations and veterinary public health, in all 97 hp. The tenth term consists of a choice between three different 17- hp electives: small animals, horse, or production animals. The two later include food safety. The last term is assigned to the production and presentation of a degree project.

The elective part of the new curriculum is divided into three parts:

- Elective courses / Extramural practice, 6 hp
- Alternative elective sets of courses, "differentiation", 17 hp
  - o Small Animals
  - o Horse, incl. Food Safety
  - o Production Animals, incl Food Safety
- Degree Project, 30 hp

There will be 40 students places assigned to the small animal and 40 to the production animal "differentiations", and 20 students to the horse "differentiation". The allocation of places will be primarily based on first and second choices. If needed, there will be a "lottery".

**Higher Education Act (SFS 1992:1434) with amendments up to 21 March 2006.**

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**Section 8**

First level education shall essentially build on the knowledge that students acquire in national or specially designed programmes at upper secondary school or corresponding knowledge.

The Government may, however, allow exceptions where education in the field of arts is concerned. First level education shall develop the students'

- ability to make independent and critical assessments,
- ability to independently perceive, formulate and solve problems, and
- preparedness to deal with change in working life.

In the educational field concerned, in addition to knowledge and skills, students shall develop an ability to

- seek and evaluate knowledge at a scholarly level,
- follow the development of knowledge, and
- exchange knowledge with other people, including people without specialist knowledge of the field.

**Section 9**

Second level education shall essentially build on the knowledge that students acquire in first level education or corresponding knowledge.

Second level education shall involve a deepening of knowledge, skills and abilities relative to first level education and, in addition to what applies to first level education, shall

- further develop the students' ability to independently integrate and use knowledge,
- develop the students' ability to deal with complex phenomena, issues and situations, and
- develop the students' potential for professional activities that demand considerable independence or for research and development work.

***Since the production of the original SER, a draft translation has been made of the Study Programme Syllabus for the New Curriculum, see Appendix 1.***

## **Master of Science in Veterinary Medicine, 330 hp (2007)**

(Unauthorized translation from the Ordinance of the Swedish University of Agricultural Sciences)

### Scope

A degree of Master of Science in Veterinary Medicine is obtained after the student has completed course requirements of 330 hp (higher education credits).

### Objectives

For a degree of Master of Science in Veterinary Medicine, students must demonstrate the knowledge and skills required for them to work independently as a veterinary surgeon.

### Knowledge and understanding

For a degree of Master of Science in Veterinary Medicine, students must

- demonstrate knowledge of the scientific basis of the field and insight into current research and development work, together with knowledge of the connection between science and proven experience and the significance of this connection for professional practice;
- demonstrate both broad and in-depth knowledge in the field of veterinary medicine, including in-depth knowledge of animal diseases and injuries;
- demonstrate insight into the conditions for and functioning of animal husbandry, and of its interaction with the environment and society, both nationally and internationally; and
- demonstrate knowledge of economic, organisational and legislative matters that are relevant to the veterinary field.

### Skills and abilities

For a degree of Master of Science in Veterinary Medicine, students must

- demonstrate an ability to independently diagnose diseases and injuries in animals and to decide on and carry out appropriate medical and surgical treatment in the field of basic veterinary care;
- demonstrate an ability to initiate and implement measures in the field of preventive veterinary care;
- demonstrate an ability to identify problems and take necessary measures concerning public requirements regarding animal welfare, communicable disease control and food safety;
- demonstrate an ability to present measures and treatment results to the parties concerned, orally and in writing, and to document these measures and results in accordance with relevant legislation;
- demonstrate a deeper ability to discuss new facts, phenomena and issues in the veterinary field with different groups, on a scientific basis, and to critically examine, assess and use relevant information;
- demonstrate an ability to engage in teamwork and cooperation with other professional groups; and
- demonstrate the skills required to participate in research, development and evaluation work or to work independently with other advanced tasks in the veterinary field, so as to contribute to the development of the profession and professional activities.

### Judgement and approach

For a degree of Master of Science in Veterinary Medicine, students must

- demonstrate an ability to take a holistic approach in the practice of their profession and to make assessments based on a scientific approach, taking account of human and animal health, economic, environmental and ethical aspects;
- demonstrate an ability to take a professional approach to animals and animal owners;
- demonstrate an ability to assess their own limits in the practice of their profession; and
- demonstrate an ability to independently identify their need of further knowledge and to continuously upgrade their capabilities.

### Independent project (degree project)

For a degree of Master of Science in Veterinary Medicine, students must have completed an independent project (degree project) worth at least 30 higher education credits, within the framework of the course requirements.

### Other

For a degree of Master of Science in Veterinary Medicine, more precise requirements are also to apply, as determined by the Swedish University of Agricultural Sciences within the framework of the requirements in this qualification description.

## Summary of the “new” curriculum (2007)

**NB** “hp” denotes one credit (“högskolepoäng”) according to the ECTS, in which 1.5 hp correspond to one week of full-time studies

First year:

- Introduction to Academic Studies (1 hp)
- Introduction to Veterinary Anatomy (6 hp)
- Basic Medical Biology (20 hp)
- Structure and Function of Body Systems (33 hp)

Second year:

- General Mechanisms of Disease (incl. microbiol. food safety) (30 hp)
- Specific Mechanisms of Disease (14 hp)
- Herd and Population Medicine (15 hp)
- Practice in Animal Husbandry (1 hp)

Third year:

- Bachelor degree project (planning and statistics course) (5 hp)
- Pharmacology and Toxicology (15 hp)
- Laboratory Animal Science (3 hp)
- Veterinary Legislation (3 hp)
- Animal Welfare, introduction (2 hp)
- Food Safety (10 hp)
- Clinical Anatomy and Introduction to Clinical Studies (incl. general nutrition) (12 hp)
- Bachelor degree project (10 hp)

Fourth year autumn, Introduction to Clinical Studies:

- Clinical Chemistry and General Medicine (3 hp)
- General Surgery (1 hp)
- Anaesthesiology (2 hp)
- Ruminant Medicine, incl. Udder and Hoof Diseases (5 hp)
- Comparative Reproduction (4 hp)
- Pig and Poultry Diseases (2.5 hp)
- Horse Surgery and Medicine, incl. Hoof Diseases (5 hp)
- Small Animal Surgery and Medicine (7.5 hp)

Fourth year spring - Fifth year autumn, Clinical Rotations:

- Ruminant Medicine, incl. Udder and Hoof Diseases (9 hp)
- Comparative Reproduction (6 hp)
- Mobile Clinic (7.5 hp)
- Ruminant Medicine (10 hp)
- Food Hygiene – Slaughter House (3 hp)
- Pig and Poultry Diseases (3 hp)
- Horse Surgery and Medicine, incl. Hoof Diseases (9 hp)
- Small Animal Surgery and Medicine (15 hp)
- Diagnostic Pathology (4.5 hp)
- Clinical Radiology (Diagnostic Imaging) (3 hp)

Fifth year spring:

- Veterinary Public Health with Applied Epidemiology and Epizootiology (7 hp)
- Elective Courses / Extramural Practice (6 hp)
- Alternative Elective Sets (“Packages”) of Courses (17 hp)
  - a. Small Animals
  - b. Horse, incl. Food Safety
  - c. Production Animals, incl. Food Safety

Sixth year:

- Degree Project (30 hp)

## 2. COMMENTS

With the new curriculum, the students achieve a BSc in veterinary medicine after three years. This exam makes it possible for them to apply for master courses at different universities in Sweden and in other countries.

The dominating course language is Swedish also in the new curriculum. With the exception of the clinical training periods, this limits international student exchange to students from the Scandinavian countries and Swedish speaking students from Finland. To learn veterinary professional English is, however, a goal in the education programme. Thus, international teacher exchange is both possible and desirable. The Faculty is actively engaged in Erasmus teacher exchange programmes and has a number of bilateral agreements with Universities all over the world.

It is important for our students to meet students from other countries. Therefore, efforts should be made to recruit international exchange (e.g. Nordic and Erasmus) students to the few elective courses that are given in English. At the same time, the Swedish students should be encouraged to go abroad for a period.

The ability for students in veterinary medicine and animal science to study together has increased with the new Faculty structure. There is, however, still not room for much cooperation between these groups in the new curriculum. The possibility to integrate courses in veterinary medicine and animal science, so that the two groups of students can work together in problem solving exercises or make Degree projects together can be further developed. A challenge for the future!

We do not yet know how the student preferences concerning the alternative elective sets of courses (horses, production or companion animals) match with the number of seats (20, 40 and 40). As long as differentiated grades are not given, it can be necessary to use lottery. This can, of course, be questioned from many different perspectives. Mentors or personal study advisors could be a way to help students make an informed choice, in accordance with both own interest and labour market.



## **Chapter 5 TEACHING: QUALITY AND EVALUATION**

### **1. FACTUAL INFORMATION**

The Swedish National Agency for Higher Education (HSV) evaluates the higher education institutions. This takes the form of the evaluations of subjects and programmes conducted once every six years, and of occasional evaluations of specific matters (eg. internationalisation).

The forthcoming evaluation of the veterinary education will be the last one in the “round” of evaluations 2001-2007 which have focus on the evaluation of subjects and programmes and assessments of entitlement to award degrees, supplemented by thematic evaluations. The evaluations are aimed to assure fundamental quality, while the thematic evaluations focus on describing various quality aspects and highlighting good examples of successful quality procedures.

In 2007, a new “round” of evaluations will begin with the following “points of departure”:

- Greater emphasis on the quality procedures of the higher education institutions themselves.
- External quality appraisal based on risk assessment.
- Greater degree of international participation in the evaluations.
- Distinction of centre of educational excellence.
- Reasonable work loads for the higher education institutions and for HSV.
- Support for and acceptance of the entire system.

The veterinary education is also evaluated by EAEVE/FVE (European Association of Establishments for Veterinary Education/Federation of Veterinarians of Europe). The first evaluation was performed in 1997. The EAEVE/FVE evaluation will this time be co-ordinated with an evaluation by the HSV.

#### **Education framework at SLU**

The education at SLU is governed by the detailed “Regulatory Framework for first and second level education” issued by the Rector in 2002, and by the Educational Policy from 2005.

### **5.1 THE TEACHING PROGRAMME**

#### **Co-ordination within the veterinary programme**

The introduction in 1997 of a new, more integrated curriculum resulted in an increased inter-departmental collaboration in the teaching programme. The collaboration already existing between some departments deepened and new teaching teams were formed by teachers from different departments, especially around ‘themes’ as structure and function, infectious diseases, herd and population medicine, etc. The co-ordination in the teaching between different departments and sections is achieved through the course directors’ work, by the “departments’ directors of studies” meetings and through the work in the Veterinary Programme Subcommittee. The success of (especially) the integrated courses very much lies in the hands of the individual teachers. The new departmental organization, with fewer departments, has contributed to a better co-operation and understanding between teachers representing different subjects. In the new curriculum, this has been developed even further.

A hallmark of the SLU veterinary programme is the close connection to research. Most teachers are active in research and senior research staff in teaching. The pedagogic approach is adapted to the different circumstances during the pre- and paraclinical years and the clinical years, respectively. Newer approaches have been introduced for the early phase of studies, including problem-based learning. The periods of clinical rotation are characterized by “hands-on” training, when the students actively take part either in the examination and treatment of patients or train on the animals kept for teaching purposes.

The work with the “new” curriculum – and the “Bologna process” – includes reviewing and formulating learning objectives with regard to “knowledge, ability and attitude”, an important and, hopefully, rewarding approach in curriculum development. In the new curriculum, students’ total workload (incl. an estimate of “own studies”) is specified for each course. This will decrease the risk of “overload”.

### **Literature**

The course literature mainly consists of standard veterinary textbooks in English. These are often very expensive which is a problem. All recommended textbooks are available in several copies at the libraries. When needed, compendia that present the Swedish situation with regard to diseases, animal husbandry, legislation, etc supplement textbooks. Lecture notes are often distributed. In the “course homepage”, the students will find links to electronic documents (e-journals, compendia, PM, “hand-outs”, etc.).

### **Arrangements between Faculty and outside bodies**

There are contractual arrangements to support veterinary education between the Faculty and a number of outside bodies, including:

- the National Veterinary Institute
- the National Food Administration
- the Swedish Board of Agriculture
- the Swedish Armed Forces
- the Uppsala County Administration
- the Uppsala Municipality
- the Swedish Dairy Association
- the Swedish Animal Health Service
- “Svenska Husdjur”, the regional dairy farmers’ organisation
- Astra Zeneca
- Animal hospitals

The co-operation with our nearest neighbour, the National Veterinary Institute is of special importance with a number of adjunct and associate professors, PhD students, and as host for several degree project students each year. The Faculty and Institute also “share” a couple of full professors (bacteriology, virology, parasitology). The governmental, county and municipality agencies all supply experts who lecture at courses (eg., Veterinary public health, Epizootiology, Food hygiene, Animal welfare and legislation). The National Food Administration is hosting the students during their slaughterhouse practice. The private bodies are engaged in some teaching and as hosts for study and herd health visits.

## 5.2 THE TEACHING ENVIRONMENT

The non-academic (support) staff is offered courses on biomedical subjects, laboratory animal science, pedagogics, administration, language, etc. Staff at all levels supervising students and others are given 'leadership training'. Workshops and seminars on pedagogic issues are organised by the University and the Faculty several times each term.

For the academic staff, development of scientific and pedagogic skills are essential for promotion and for the development of the quality of research and education. All staff involved in teaching or supervising students must attend a two-weeks basic course in education within two years after employment. All teachers shall attend an additional four-weeks course within the same time span, ie. a total of six weeks within two years.

To function as main supervisor of PhD students, one has to be assessed by the Research Fellowship Award Board as associate professor (in Swedish 'docent'). In order to be assessed one has to present scientific papers showing continued post-doctoral research progress, attend two plus four weeks of basic pedagogic courses and a four-week supplementary pedagogic course focused on the supervision of postgraduate students. Some experience of supervision, eg. of Degree Projects, is also necessary. The title 'Docent' is accompanied by increased salary.

For a position as *professor* you have to show documented evidence of scientific and pedagogic skills. As *senior lecturer* a PhD degree is demanded and moreover documented evidence of pedagogic skills. As *research assistant* a PhD degree is required. As *lecturer* you must have a MSc in Veterinary Medicine (or other relevant field) and documented evidence of pedagogic skills. Apart from seeking a new position, a teacher/researcher can also apply for promotion (lecturer to senior lecturer, senior lecturer to professor).

When judging applications for a position as professor or senior lecturer, the Faculty Appointments Board is assisted by three or two external experts, respectively. A pedagogics expert is also attending.

The Heads of departments are responsible for the continuous assessment and development of the academic and support staff. The Heads of sections within the department regularly have interviews with members of the staff. The interview is a discussion about the work, progress and performance, development possibilities, etc. Salary increases are based on performance and the result from negotiations between the personnel unions and SLU.

There are yearly prizes for "outstanding teachers", one awarded by the University, one by the Royal Swedish Academy of Agriculture and Forestry, and one by the veterinary students.

## 5.3 THE EXAMINATION SYSTEM

In combination with some additional rules for written and practical/clinical examinations, the "Regulatory Framework for first and second level education" issued by the Rector in 2002 provides a detailed guidance for teachers and students.

Examinations are held at the end of each course and in some cases for several courses together (eg., after the courses "Basic Medical Biology" and "Structure and Function of Body Systems"). The tests are written, oral and/or practical/clinical, depending on the course. In clinical sciences, the students' performance is also continuously assessed during clinical

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**Memorandum for Guidance in Connection with Applications for Appointment/Promotion to Professor and Senior Lecturer at SLU**

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**Pedagogic Qualifications**

Equally great attention shall be devoted to the consideration of the pedagogic skills as the consideration of scientific skills (Chapter 4, Section 5, Higher Education Ordinance). Pedagogic skills shall be considered both qualitatively and quantitatively.

- 4.1 Overall description** of the teaching undertaken by the applicant (max. 2 pages). State level, responsibility, kind of teaching, type of examination, etc.
- 4.2 Pedagogic personal reflections.** Describe your personal view on teaching, pedagogy, the role of the teacher, fundamental attitude to pedagogics, pedagogic visions, etc. State how the future of the subject may manifest itself from a pedagogic perspective and what pedagogic motives lie behind these future visions.
- 4.3 Short description of planned teaching activities**
- 4.4 Teaching planning, teaching administration and pedagogic leadership** (max. 2 p). State contributions as director of studies, course manager, course organiser, etc.
- 4.5 Pedagogic activities, basic education**
- 4.5.1 Teaching in basic education (state period of time and scope)
- 4.5.2 Production of teaching materials and teaching aids (textbooks, laboratory instructions, electronic aids/teaching aids, etc.)
- 4.5.3 Pedagogic development work. Report various kinds of didactic development projects and pedagogic activities that are vitalising (for example, how the results of course evaluations have been utilised)
- 4.5.4 Tutor experience (state number of degree papers and points)
- 4.6 Pedagogic activities, research education**
- 4.6.1 Teaching in research education (state period of time and scope)
- 4.6.2 Tutor experience
- 4.6.2.1 Ph.D. students being tutored (state person, date of acceptance, level of responsibility – formally and real respectively – together with methodology for tutorship)
- 4.6.2.2 Licentiate and Doctoral Degrees (state person, date of acceptance and award of degree, level of responsibility – formally and real respectively – in the tutoring together with the methodology for the tutoring)
- 4.7 Other pedagogic assignments**
- 4.8 Popular scientific presentations**
- 4.9 Other pedagogic qualifications** (pedagogic prizes, etc.)

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practice. Occasionally, external examiners are present. Some courses have small oral or written tests at various intervals along, in particular, long courses. The grades are pass or fail.

Examination dates must be fixed in the course schedule. Results from examinations must be available within ten days. A first retake shall be scheduled already at the start of the course. There are also “general” re-examinations offered three times per year, after the Easter brake, late in the summer vacation and after the Christmas brake. If a student fails an examination of a course three times, the student-guidance officer is informed for support. As a rule, the examination has to be done within four years after the year when the course in question was ended (the first time).

To begin a course, the students have to attend and, in some cases, pass the examinations of earlier courses. For each course, a list of “musts” for previous attendance is available. All courses and activities must be attended and most examinations passed before the student is allowed to proceed with the curriculum the next year. Certain possibilities exist for dispensation. Dispensation is valid for one year and is not granted in those cases where a subject pass is deemed indispensable for the comprehension of the following year’s course. In those cases where a student is not granted admittance to the next year he/she is forced to interrupt the studies until the deficiencies are corrected and a vacancy is present.

#### 5.4 EVALUATION OF TEACHING

In addition to the evaluations made by external bodies, evaluations of a greater part or of the whole study programme have also been initiated by the University and the Faculty, and especially so during the now ongoing development and introduction of a new curriculum. These evaluations have been done by or included external experts from academia, profession, industry and students. Future plans include expanded programme evaluations made by the Faculty at regular intervals.

Course evaluations as a means for quality assurance of the veterinary programme were introduced in the late 1960’s. The design and extent of the evaluations have varied with time and between departments (courses). There is now a central policy, including regulations and format for course evaluations, decided by the Rector of SLU.

<p><b>Course Evaluation Format</b></p> <p><u>Obligatory questions</u></p> <ol style="list-style-type: none"> <li>1. Age</li> <li>2. Gender</li> <li>3. To what percentage have you participated in scheduled course events?</li> <li>4. How many hours per week have you on average spent on the course, including scheduled time?</li> <li>5. How do you estimate your background knowledge before the course? <i>1 too low &lt;&gt; 5 too high</i></li> <li>6. How has the administration of the course worked? <i>1 poor &lt;&gt; 5 very good/well</i></li> <li>7. The overall impression of the course is very good. <i>1 completely disagree &lt;&gt; 5 completely agree</i></li> <li>8. The level of difficulty for this course has been <i>1 too easy &lt;&gt; 5 too difficult</i></li> <li>9. I have achieved the goals described in the course plan <i>1 completely disagree &lt;&gt; 5 completely agree</i></li> <li>10. To what extent has the course contributed to the development of your ability of independent critical thinking? <i>1 to a very low degree &lt;&gt; 5 to a very high degree</i></li> <li>11. Assessment of this course has provided me with opportunities to demonstrate my knowledge and proficiency. <i>1 completely disagree &lt;&gt; 5 completely agree</i></li> </ol> <p><u>Course-specific questions</u></p> <p><u>Comments</u></p>
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Today, students evaluate all courses in the programme in e-based, anonymous course evaluations. Oral evaluations are also performed in many courses. The whole programme is evaluated by the last-year students when they graduate. The results of the evaluations (statistics, comments from students and teachers) are made available to students and teachers within three months. The results and suggested improvements are reported to and discussed in the Veterinary Programme Subcommittee consisting of representatives from the departments, students, student-guidance officer and industry. The Subcommittee then reports its findings and views back to course director and department(s). When appropriate, suggestions from the evaluations are used to alter the courses and results of the evaluations have also been of great value in the development of the new curriculum.

## **5.5 STUDENT WELFARE**

The Rector of SLU has appointed a Students' Welfare Council chaired by the Prorector with one teacher from each of the four faculties and student representatives. The Council has a central role to support, initiate and supervise questions concerning student welfare.

For research students, there is a University PhD Ombudsman to support them during their doctoral studies.

At the Division of Student Affairs and Learning Development, there is a student-guidance officer assigned especially to the veterinary students. The person is a not too long ago graduated veterinarian.

Through the University, all students have insurance covering costs following accidents (and some contagious diseases) during their studies at the University and while travelling between their home and the University.

Like all students at any Swedish university, students at SLU have to be members of a students' union. The compulsory membership applies for students in basic educational programmes as well as for postgraduate students. At SLU there are eight different students' unions, one representing the veterinary students ("Veterinärmedicinska Föreningen", VMF). There is also a cooperative body for the eight unions, "SLUSS", which in most cases represents the students at University level. To be able to work full-time for a year with student questions, the president of SLUSS receives a salary from the University.

The students' unions are organisations driven by students for students. One of the most important responsibilities of the students' union is to represent the members towards the university and the departments and to work in the best interest of the students. Student representatives take part in preparing and deciding organs at different levels at the university. When decisions are made at level that affect the education, students have the right to be a part of the decision making.

The students' unions also arrange many social activities, among these are traditional dinners, student plays, all kinds of sport activities, international activities and choirs.

The Health Care provided by the Student Health Centre, is a complement to the public health care system in Sweden. The Centre has a staff of doctors, nurses, psychologists and counsellors and is mainly devoted to the treatment of health problems originating in, or aggravated by the conditions related to studying. The Student Health Centre also offers a variety of exercise and sports activities.

## 2. COMMENTS

### **Quality improvement**

A part-time position as Faculty Educationalist is held by an associate professor, who has a longstanding and active engagement in the quality of education. She is also working in the same field for the Uppsala University Faculty of Medicine. The position includes being a member of the SLU's central committee for education quality. The mission is to strengthen, systematize and visualize the quality work at the Faculty. This is to a great extent achieved by pedagogic training and thematic seminars. For the period until 2010, priority has been given to

- student's active participation and engagement in course evaluations, and the use of results from these to further develop the course syllabus and pedagogic methods,
- further development of curriculum evaluations from newly graduated,
- the introduction of self-evaluations of courses every third year by teachers involved, including syllabus, scientific and pedagogic competence, examinations, and student participation,
- alumni evaluations 3-5 years after graduation,
- contact with employers, industry and profession

The results will be collected and analysed to form the basis for future quality work.

### **Students and stress**

The University's Student Welfare Council made an investigation in 2006, where the students from all programmes at SLU were invited to fill in an e-based inquiry form. There were 35 questions about health, wellbeing and social life, and study circumstances. From the results it was evident that the veterinary students more often had stress-related symptoms than the average student. They also spent more time studying and felt that the intensity of studies was high. At the same time, they felt very motivated and were of the opinion that the time schedule was acceptable. The vast majority (83%) felt that they had made the right choice of education.

The Swedish National Board of Student Aid (CSN) is the national authority that handles the Swedish financial aid for students; i.e. loan and grant for studies. The maximum number of weeks that this financial support may be given is 240. In the latter part of the veterinary studies, which are 220 weeks, too many students who have studied at university earlier surpass this limit. This may lead to economic problems.

From the results of the inquiry and from the experiences reported by the Student Health Centre, it is evident that too many veterinary students feel stressed in spite of loving their choice of studies. Several seminars have been organised, where these questions have been discussed among students and teachers. One of the aims with the new curriculum was to minimize the risk of curriculum overload.



## **Chapter 6 FACILITIES AND EQUIPMENT**

### **1. FACTUAL INFORMATION**

The Royal Veterinary College (now part of the Faculty of Veterinary Medicine and Animal Science, SLU) moved from Stockholm to Uppsala during 1973-76. In Uppsala, the College moved into newly built premises.

In addition to the Uppsala location, the Department of Animal Environment and Health is situated in Skara. This is about 350 km southwest of Uppsala and is the very place where the first veterinary school in Sweden was established by the Linnean pupil Peter Hernqvist in 1775.

#### **6.1 PREMISES IN GENERAL**

In Uppsala, the Departments are spread to four different centra (Animal Science Centre - HVC, Clinical Centre - KC, Biomedical Centre - BMC, and Kungsängen Research Farm). Furthermore, one department is located in the same building as the National Veterinary Institute (SVA). The departments all have access to the University's jointly operated teaching facilities (libraries, assembly hall, lecture halls, seminar rooms, computer laboratories, etc.).

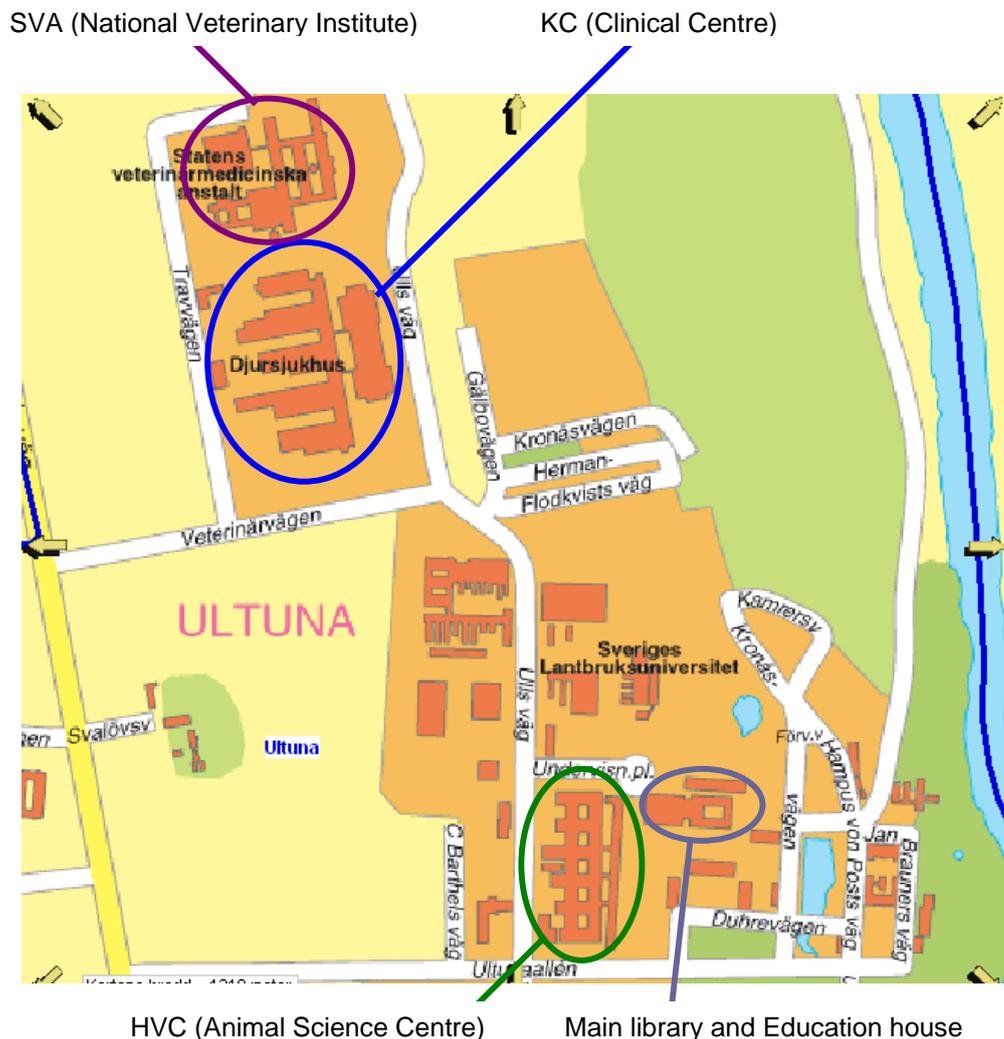
As a result of changing demands from education and research, continuous smaller alterations and renovations have been made, but most buildings stand as they were 30-35 years ago. In some buildings (parts of HVC and KC), there have been severe problems with the Sick Building Syndrome. These buildings have been partly repaired, but especially KC is still a source of worry with its leaking roofs. The Swedish Work Environment Authority is constantly supervising this problem. At the same time, there are new demands on housing of animals for teaching and research purposes separated from incoming patients.

In short, many buildings that were new 30-35 years ago are now outdated, especially laboratories and parts of the clinics. The layout too often mirrors the departmental structure when there were close to twenty separate units. The Faculty is spread over too many centra, which counteracts cooperation and interdisciplinary teaching and research. The buildings cost too much in relation to their standard, and among some of the employees at KC there is a worry for negative impact on their health due to the 'sick building'.

There is now an ongoing process to establish a Centre for Veterinary Medicine and Animal Science at Ultuna Campus, to which the Uppsala Departments will move in 2012. The Centre will also house the University Animal Hospital.

In Skara, the Department of Animal Environment and Health have a new office building and access to lecture halls, seminar rooms, library and laboratories in a close-by renovated former training-college for teachers. The Department also runs a research facility for beef production at Götala just outside Skara.

## Map of Ultuna campus indicating the sites and buildings used in veterinary education



- The Biomedical Centre (BMC) is situated 3 km north of Ultuna campus, close to the Uppsala University Hospital.
- The research farms Kungsängen, Lövsta and Jälla are all situated on the east side of the river.

Centre	Type of premises	Departments
BMC - Biomedical Centre	Labs, offices, teaching	Anatomy, Physiology, Biochemistry (bioch) Biomed Sci & VPH (immunology)
HVC - Animal Science Centre	Labs, offices, teaching, anatomy building	Anatomy, Physiology, Biochemistry Animal Breeding & Genetics Animal Nutrition & Management
KC – Clinical Centre	Labs, offices, teaching, stables, clinics	Clinical Sciences University Animal Hospital
“SVA” building	Labs, offices, teaching, autopsy hall	Biomedical Sciences & Veterinary Public Health

## 6.2 PREMISES USED FOR CLINICS AND HOSPITALISATION

The operations of the University Animal Hospital is presented in some detail in Sections 7.4 to 7.8.

Table 6.2.1: **Places available for clinics and hospitalisation**

- number of hospitalisation places for cattle	6
- number of hospitalisation places for horses	30
- number of hospitalisation places for small ruminants	na
- number of hospitalisation places for pigs	na
- number of hospitalisation places for dogs	42
- number of hospitalisation places for cats	8
Number of animals that can be accommodated in isolation facilities;	
- small animals	20
- horses	4

na =not applicable

## 6.3 PREMISES FOR ANIMALS

The Swedish Animal Welfare Act aims at keeping the number of animals used for teaching purposes at a minimum. The number of animals kept by the Faculty for teaching purposes is deemed adequate. Cattle, pigs and poultry at the University research farms (in Uppsala: Kungsängen, Jälla and Lövsta, in Skara: Götala) are used for teaching and training purposes.

At the Biomedical Centre, there is a central laboratory facility for small lab animals. In the Animal Science Centre, the Department of Anatomy, Physiology and Biochemistry has stables for goats, poultry and rodents. In the Clinical Centre, the Department of Clinical Sciences maintains a group of eighteen healthy experimental dogs, twelve cows and a group of eleven horses (esp. mares) for teaching purposes. During term, healthy cattle, sheep and pigs are brought in for teaching and training.

The research stables at Kungsängen and Lövsta were built in the early 1970-s and were already fifteen years ago considered too costly to renovate. The herds at Kungsängen (90 dairy cows, 90 heifers, and 10-30 calves), Jälla (100 dairy cows and 40 heifers) and Lövsta (110 sows and 350 fattening pigs, up to 4,000 laying hens and up to 5,000 broilers) are used for teaching.

A new research station with stables for 520 dairy cows, 160 sows in integrated pig production, and for laying hens and broilers will be built at Lövsta eight km east of the Ultuna campus.

## 6.4 PREMISES USED FOR THEORETICAL, PRACTICAL AND SUPERVISED TEACHING

Table to show the number of seats (halls) available in the parts of Ultuna campus where veterinary students are taught (2006) and at BMC					
	Central campus	Clin Ctr(KC) & NVI (SVA)	Anim Sci Ctr (HVC)	Ultuna Total	Biomed Ctr (BMC)
<b>No of seats</b>	<b>1,860</b>	<b>523</b>	<b>443</b>	<b>2,826</b>	
Of which					
Hall >150	952 (3)			<b>952</b>	300 (1)
Hall 81-150	390 (3)	192 (2)	150 (1)	<b>732</b>	660 (6)
Hall 61-80	150 (2)	230 (3)	80 (1)	<b>460</b>	584 (8)
Hall 41-60	110 (2)	58 (1)		<b>168</b>	224 (4)
Hall 20-40	188 (6)		54 (2)	<b>242</b>	392 (12)
Rooms <20	30 (5)	16 (1)	60 (5)	<b>106</b>	205 (20)
Computer labs	32 (3)	27 (2)	99 (3)	<b>158</b>	na
Video conference	8 (1)			<b>8</b>	na

\*BMC figures are approximate, facilities are shared with Uppsala University research and teaching in medicine, pharmacy, chemistry, etc

The Biomedical Centre is shared with Uppsala University and includes a number of well-equipped laboratories for biochemistry education. In the Animal Science Centre, there is an anatomy teaching building with one lecture hall, two demonstration halls, eight dissection rooms, cold and freezing storage rooms, etc. Microscopy labs are available in the Animal Science Centre and in the pathology lecture area. A large (100 seats) laboratory used for microbiology and food safety courses is found in the "SVA building". The Department of Clinical Sciences has a room equipped for training of obstetrics ("the phantome hall").

Spread throughout the Clinical Centre, there are a number of group rooms close to the clinical and stable areas, which are used for seminars, case discussions, rounds and self-studies.

## 6.5 DIAGNOSTIC LABORATORIES AND CLINICAL SUPPORT SERVICES

The Faculty's pathology laboratories are situated in the same building as the National Veterinary Institute's (SVA) pathology department. There is a large autopsy room with cold storage rooms, etc. close to an incinerator. See also Section 7.1.

The unit of clinical chemistry is a modern clinical pathology laboratory that yearly performs some 90,000 analyses from 15,000 cases. About 5,000 cases are from the University Animal Hospital and the Faculty departments. Material is from clinical cases and from research. A high number of cases (approx. 10,000) come from customers outside the university, including veterinary clinics and animal hospitals, biotechnical and pharmacology companies, etc.

The clinics include a state-of-the-art unit for diagnostic imaging, including digitized radiography, ultrasonography, scintigraphy and MRT equipment. In addition, there is also access to advanced CT and MRT resources at nearby hospital clinics. The number of cases seen by the diagnostic imaging unit is about 8,000 a year (2/3 small animals and 1/3 horses). The unit also has a referral service, giving second opinion on submitted radiographs.

## **6.6 SLAUGHTERHOUSE FACILITIES**

The practical training at slaughterhouses is located to KS 058 in Uppsala and to KS 081 in Skara. The training is under the supervision and guidance of the National Food Administration veterinary officers responsible for meat inspection and hygiene control at the two plants. The turnover in Skara (Uppsala) in 2006 was: cattle 70,637 (19,304), calves 3,672 (1,738), sheep 35,587 (11,775) and pigs 656,990 (101,432).

## **6.7 FOODSTUFF PROCESSING UNIT**

There is no foodstuff processing unit at the Faculty.

## **6.8 WASTE MANAGEMENT**

The waste management is supervised and supported by the University Building Service Office and the units for Physical working environment and Environmental management and systems.

There are strict law regulations for the handling and disposing of biological and chemical waste material. There is an incinerator at the National Veterinary Institute in which hazardous material is disposed of. Some biological waste is also used for biogas production.

## **6.9 FUTURE CHANGES**

The common lecture halls and group rooms in the centre of Ultuna campus is right now under renovation and up-grading.

A totally new Centre for Veterinary Medicine and Animal Science will be built at Ultuna campus, south of the present location of the Clinical Centre. It will house the Faculty Departments and the University Animal Hospital. This means that the Departments will leave the present locations at BMC and the different centres at Ultuna. This is a major undertaking with a total budget close to 1,000 MSEK (100 M€).

New research stables for dairy cows, pig production and poultry will be built at Lövsta and the present stables at Kungsängen and Lövsta will be closed.

The timetables for these projects are aiming at 2010 (stables) and 2012 (Centre).

## **2. COMMENTS**

The SLU campuses at Ultuna and Skara are green and open oases close to cities. In Skara it is actually very close to the medieval city centre and the Ultuna campus is at convenient bike or bus distance from the city centre and the students' residential areas. The students' union houses in the campus offer places for meetings and parties. At Ultuna, there are also two restaurants and a couple of gymnasiums.

Modern scientific and clinical work is heavily dependent on the establishment of new methods, which require investment in expensive equipment. In some areas, there is a strong need for renewal. The Faculty is presently making an inventory of its needs in terms of new equipment and is planning to make necessary investments. This will be made possible both

from utilising own economic resources and from application of funding from external grant bodies.

The present buildings at Ultuna are not very well suited to their purpose, which has negative effects for staff and students, and for education and research. The Faculty is now looking forward to the new Centre for Veterinary Medicine and Animal Science, which will enable us to further develop a modern approach to theoretical and practical/clinical education.

# Chapter 7 ANIMALS AND TEACHING MATERIAL OF ANIMAL ORIGIN

## 1. FACTUAL INFORMATION

The Animal Welfare Act sets the rules for the use of animals in education.

Ethical review of animal experimentation has been obligatory in Sweden since 1979; there are seven ethical committees across the country. According to the Animal Welfare Act the ethical committee shall weigh the importance of the experiment against the suffering inflicted to the animal. The examination is to be carried out only from an ethical perspective, thus rendering things such as economic aspects irrelevant. The committees' decisions are binding but may be appealed.

In January 2007, the Rector of SLU issued a policy document on the use of animals and material of animal origin for teaching purposes. The policy stresses the importance of a constant ambition to keep numbers of animals used low, to look for alternatives to the use of animals, and to reduce the stress and strain (“suffering”) as much as possible. Information and ethical discussions shall always precede courses and exercises that include the use of animals and/or material of animal origin.

### 7.1 BASIC SUBJECTS

#### **Anatomy**

The Department of Anatomy, Physiology and Biochemistry teaches anatomy under the initial part of the veterinary programme. The Department is also responsible for other courses, e.g. for animal science and biotechnology students. Dissection and demonstration material of animal origin is acquired in several different ways:

- whole body material from horses used for surgical training (terminal operations),
- one slaughter horse per year,
- organs from cattle, pigs and horses from slaughterhouses in Uppsala and Heby,
- whole body material from fur farms (mink, fox),
- laboratory rats that are bought for the purpose,
- small number of dogs and cats donated by owners following euthanasia on humane grounds.

Bodies and organs that are not used immediately are frozen at  $-18^{\circ}\text{C}$ . Formaldehyde is not used. For live anatomy (palpation etc.), the department has access to animals at the Department of Clinical Studies, at the Kungsängen Research Station and Jälla Education Farm, and at the Cavalry Stables in Stockholm. Students may use their own dogs also.

#### **Physiology**

For the teaching of physiology the Department uses its own goat herd, private (teacher's) dogs, and animals at the Department of Clinical Studies. During Degree Projects, patient dogs are also used.

## Pathology

During the course, the Department of Biomedical Sciences and Veterinary Public Health runs an autopsy service which essentially depends on material from the clinical services. The active periods normally are late October – Christmas and January – June.

The pathology staff and laboratories are located in the same building as their counterparts in pathology at the National Veterinary Institute. This means additional access to interesting material for education purposes, and cooperation in teaching and research.

Table 7.1: Number of necropsies over the past 3 years

Species		Number of necropsies		
		2006	2005	2004
Farm/large animals;	cattle	35	44	40
	equines	75	51	52
	small ruminants	20	15	10
	pigs	21	21	13
	other farm animals	-	-	-
Small/pets;	dogs	125	86	105
	cats	59	59	53
	other pets	7	4	5

## 7.2 ANIMAL PRODUCTION

The Department of Clinical Sciences keeps animals (horses, cattle, dogs) for teaching purposes at the Clinical Centre. When needed for course work, pregnant sows, a boar, and some sheep are brought to the stables. The research herds at Kungsängen (90 dairy cows, 90 heifers, and 10-30 calves), Jälla (100 dairy cows and 40 heifers) and Lövsta (110 sows and 350 fattening pigs, up to 4,000 laying hens and up to 5,000 broilers) are also used for teaching.

The second year Herd and Population Medicine course is partly held in Skara, where it includes study visits to broiler, sheep, sow, and dairy cow herds and to a slaughterhouse. To train cattle hoof care, the students go to the dairy cow herds at Kungsängen and Jälla.

## 7.3 FOOD HYGEINE

Practical training in the slaughterhouses in Uppsala and Skara is included in courses in food hygiene.

## 7.4 CONSULTATIONS

The University Animal Hospital includes a small animal, a large animal (horse), and a mobile clinic. The clinics have 24-hour service all year and seven days a week. All clinics accept primary and referral cases. Between 10 and 20% of the small animal and horse patients are referral cases.

The national programmes for the eradication of infectious diseases require careful control of animal movements, so that only few production animals come to the clinics; the vast majority of the production animals are treated on farms.

**Table 7.4: Number of animals received for consultation in the past three years**

Species		Number of patients		
		2006	2005	2004
Farm/large animals	cattle	-	-	-
	equines	3,134	2,651	2,290
	small ruminants	-	-	-
	pigs	-	-	-
	other farm animals	-	-	-
Small/pets;	dogs	11,213	9,574	9,726
	cats	4,473	3,987	3,762
	other pets	466	420	429

## 7.5 HOSPITALISATION

**Table 7.5: Patients hospitalised in the clinics in the past three years (approximate figures)**

Species		Number of hospitalisations		
		2006	2005	2004
Farm/large animals	cattle*	82	96	81
	equines	1,000	800	700
	small ruminants*	32	25	33
	pigs	-	-	-
	other farm animals*	-	-	-
Small/pets;	dogs	2,100	1,600	1,650
	cats	670	650	570
	other pets	-	-	-

\* clinic accepts cases 5 months per year (course period)

## 7.6 VEHICLES FOR ANIMAL TRANSPORT

With the exception of most of the incoming cattle, the clinics do not provide any transport services for sick animals. Most horse owners have their own animal transport vehicles. There is also a well-equipped “large animal ambulance” with trained staff available day and night in the greater Stockholm area

## 7.7 EMERGENCY SERVICE

The clinics have a 24-hour service in-patient emergency service with specialists in surgery and medicine available. Technical staff and students are also on duty.

## 7.8 MOBILE CLINIC

The mobile clinic serves the Uppsala and Knivsta municipalities, with an area of 2,542 km<sup>2</sup> and a population of about 200,000 people. The practice area is about 60 km from north to south and 80 km from east to west. This is an area in which traditional farming has partly been replaced by studs and horse stables, a shift from 'rural' to 'urban animal husbandry'. There is a decrease in the number of dairy farms, at the same time the average herd size increases. The number of pig herds has gone down dramatically while there is a small rise in the size of sheep herds.

The clinic is responsible for teaching veterinary students and for the animal health care of mainly farm animals and horses in the Uppsala region. This involves a 24-hour duty all year round. The clinic also has the function as official veterinarians according to EU standards and serves as border veterinarians at the major Swedish international airport Arlanda.

The mobile clinic has three 5-seat Peugeots, one 5-seat Volvo, and one VW 7-seat bus at its disposal. Two additional buses and a Volvo are used for herd health visits.

Monday to Friday - four veterinarians go out on calls during the daytime together with the students (4 students/vet). One veterinarian is on call during weekday nights, on Saturday and Sunday two veterinarians share these duties. Students also participate on the on-call services.

The number of farm/stable visits in 2006 was 3,200. This includes regular visits to the University's dairy cattle (more than twice a week) and pig (every two or three weeks) herds. Approximately 60% of the visits are to dairy and beef cattle herds, 35% are to horse stables, the remaining are to pig, sheep and poultry herds. About 25% of the visits are during duty hours (17.00-08.00 and Saturday-Sunday).

Table 7.8: **Number of animals seen by the mobile clinic in 2006**

<b>Species</b>	<b>Number of patients 2006</b>
cattle	5,824
equines	1,726
small ruminants	478
pigs	6,661
other farm animals	101 (poultry herds)

## 7.9 OTHER INFORMATION

As of January 1, 2007, the small animal, large animal and mobile clinics have been reorganized into a University Animal Hospital. This is not part of the Faculty, but lies under the central University Administration. Staff from the Department of Clinical Sciences are active in the clinical work as part of their teacher's role.

The veterinary staff at the University Animal Hospital and the departments includes a number of Diplomates of European (and American) Colleges, e.g. equine and companion animal internal medicine, porcine health management, comparative nutrition, clinical pathology,

neurology, ophthalmology, dermatology, diagnostic imaging, reproduction, pharmacology and toxicology, pathology, parasitology, and veterinary public health. There is also a high percentage of veterinarians holding a national specialisation, in most cases a species-oriented one.

The clinics include state-of-the-art units for diagnostic imaging and clinical chemistry. The number of cases seen by the diagnostic imaging unit is about 8,000 a year and clinical chemistry laboratory yearly performs some 90,000 analyses from 15,000 cases. See also Section 6.5.

At the horse clinic, there is a farriery facility, including a forge and place for 3-4 horses.

The Department of Clinical Sciences maintains eighteen dogs and eleven horses for teaching purposes. There are also 12 cows during the teaching period. Sheep and pigs are brought in during periods when needed. The Department has contracted a stud farm to assist with additional stallions during AI courses.

The regional dairy farmer's organization, Svenska Husdjur, provides herd health services to their members. In cooperation with the organization, teachers and students perform herd health visits during the fifth year of veterinary studies. The Swedish Animal Health Service provides animal health service to breeders of pigs, beef and sheep in Sweden. Following an agreement with the organization, herd health visits are made to pig producers during the swine medicine and comparative reproduction courses. The animals seen at the herd health visits are not included in the above statistics.

For surgical training (terminal), horses, cows and pigs intended for slaughter are bought. For the courses in pharmacology and toxicology and in laboratory animal science, animals are bought from a firm specialised in supplying laboratory animals for research and teaching purposes.

For the introductory training in gynaecological and andrological examination, organs from different species are bought from the near-by slaughterhouse. From the same source calves (unborn) are acquired for the obstetrics course. Feet from horses and cattle and skulls from horses are used for farriery and hoof trimming exercises and for dentistry training, respectively.

The fees for clinical services are decided by the University Administration and the Head of the University Animal Hospital. On the whole, the fees are the same as those charged by private animal hospitals.

There are two administrative systems in use for the patients, one for the large and small animal clinics and another for the mobile clinic. Both are centralized case record systems well integrated into and accessible throughout the patient-flow.

## 7.10 RATIOS

### 7.10.1: Animals available for clinical work

<b>Ratio: students/production animals</b>			
number of students <u>graduated in the last year</u>	=	$\frac{64}{17,823}$	= $\frac{1}{278}$
number of production animals			
<b>Ratio: students/companion animals</b>			
number of students <u>graduated in the last year</u>	=	$\frac{64}{16,152}$	= $\frac{1}{252}$
number of companion animals			

### 7.10.2: Animals available for necropsy

<b>Ratio: students/post-mortem examinations</b>			
number of students <u>graduated in the last year</u>	=	$\frac{64}{342}$	= $\frac{1}{5.3}$
number of cadavers necropsied			

## 2. COMMENTS

The access to normal healthy animals for practical and clinical training and studies is a prerequisite for veterinary studies. In the Clinical Centre and at the Kungsängen, Jälla and Lövsta stables, there is good availability to animals of all species. Stable managers supervise the use of animals by students. In the new facilities at Ultuna and Lövsta, the stables will be organised to allow good access for students.

As a result of the decreasing number of dairy farms and pig herds in the area, the mobile clinic has to seek contacts with new customers at a distance from Uppsala.

The ethical aspects of using animals for research, food production, competition and pleasure is discussed throughout the veterinary studies. Training and education in laboratory animal science is included in the curriculum. The aim is to get the veterinary programme at SLU accredited according to the standards of The Federation of European Laboratory Animal Science Associations. An application for FELASA accreditation (category C) is under preparation.

## Chapter 8 LIBRARY AND LEARNING RESOURCES

### 1. FACTUAL INFORMATION

#### 6.1 LIBRARY

The SLU Libraries have been commissioned to act as a national resource library in the subject fields agriculture, forestry, veterinary medicine and environmental protection. The organisation comprises nine units of varying size located in the SLU campuses in different parts of the country. The total SLU libraries budget is 53 MSEK (5.8 M€).

The SLU libraries provide SLU staff and students access up-to-date information retrieval systems, to 5,200 e-journals and 28,000 e-books. The total number of printed journals is 3,150 and the book collections include virtually all publications needed in veterinary and animal science research and education.

The SLU libraries offer courses for students, PhD students, researchers and staff at SLU. In Uppsala, one thousand students per year attend library courses to improve their ability to identify information needs, locate information efficiently, evaluate information, use information creatively, and to find back to the information.

The libraries are responsible for the University's electronic publishing service, which includes degree and doctoral theses.

The libraries serving the Faculty of Veterinary Medicine and Animal Science and the veterinary students are the ones in Uppsala and Skara. Departmental libraries are small and as a rule not open to students.

*Ultuna Library* is the biggest library and is located in the centre of Ultuna campus. It contains literature and information skills in the fields of agriculture, forestry, veterinary medicine, plant and forest protection, ecology and environmental care, landscape planning, genetics etc. The library holds close to 2,000 journals in print. More than 100,000 visitors ("entrances") are registered per year. Opening hours are Mon-Thu 09.00-18.00, Fri 09.00-16.30.

The *Veterinary Library at the Clinical Centre* has collections of veterinary medicine textbooks and handbooks, focusing on the examination, diagnosis and treatment of sick animals. The library holds 200 journals in print. In 2006, there were 12,400 loans of which 80% were to students. About 40,000 visitors per year. Opening hours are Mon – Thu 10.00-16.30, Fri 10.00-16.00.

The *Veterinary Library at the National Veterinary Institute* has collections on veterinary and human medicine, principally dealing with microbiology, parasitology, pathology and veterinary public health. The library holds 530 journals in print. In 2006, there were 11,000 loans and copies dispatched. About 25,000 visitors per year. Opening hours are Mon – Fri 09.00-15.00.

The *Hernquist library* in Skara provides literature on veterinary medicine and related areas. Of special historical interest is the Hernquist Collection, a specialised collection of literature from the past. There are two librarians and the opening hours are Mon-Thu 08.00-17.00, Fri 08.00-16.00.

The two Veterinary Libraries in Uppsala share 3 librarians, 1.4 position is allocated to the Clinical Centre and 1.6 position to the National Veterinary Institute library.

The total number of study places in or close to the three libraries in Uppsala is more than 1,100 and there are 100 public computers available. The corresponding figures in Skara is 70 and 7, respectively.

## **6.2 AUDIO-VISUAL SERVICE**

SLU has a unit – “Educational Media” – specialised in media production. They produce media for both CD-ROM/DVD and web-based delivery. The services include on-site and studio video production, web applications, interactive multimedia design and learning modules, 2- and 3-D animation and illustration, etc. Among media produced for veterinary training there are interactive media on ethology, dog and cat reproduction, videos on rectal palpation, clinical examination, hoof bandaging, shoeing a horse, muscles on horse and dog anaesthesia. They can all be studied at <http://sus.slu.se/utbildningsmedia/>.

## **6.3 COMPUTER SERVICE**

SLU’s student IT service is a part of the IT-support unit responsible for the University’s public computer labs, student accounts, e-mail, computer education and other computer-related services for students.

Computer labs open for veterinary students are located in the Ultuna library building (34 computers in two labs), Animal Science Centre (HVC, 47 computers in two labs), Clinical Centre (KC, 25 computers in two labs).

Most computer labs are open 24/7 for SLU's students. A pass-card or pass-code is necessary to enter the labs outside of standard opening hours. Student's usage of computer resources is regulated by the contract they sign when they receive their account.

An open wireless network (NOMAD) is available throughout the Ultuna and Skara campus areas (will soon be installed at the Clinical Centre).

A user-ID and password is required for using the computers or the wireless network. They are obtained when the contract is signed. This is usually done during introduction education at the beginning of the first term.

Instructors who book a computer lab for teaching have the right to ask that student not participating in the course leave the lab. However, if they do not disturb the course in progress, they should normally be allowed to remain, at the discretion of the instructor.

Student computer labs, as the name implies, are primarily for student use. Other potential uses, such as graduate courses, personnel education or external education are welcome to book the labs, but are charged for the time they use the labs.

If there are no computers free in the computer lab but there are computers which have been locked by other users, these can be restarted if they are left unattended for more than 15 minutes (if it is not being used during a course for which the lab is booked).

The number of pages one is allowed to print out free per term is limited to 500/term.

## 2. COMMENTS

The Course Home Pages are important as a tool for information about course schedule, syllabus, for acute messages, and for “hand-outs”, videos and other learning resources.

From the students’ point of view, the availability of books and journals, and opening hours are good in the Main University Library as well as in the Clinical Centre Library. Although the provision of reading spaces could be better in the Clinical Centre library, the students feel that the librarian assistance in this library is extraordinarily good!

The Clinical Centre librarian is an adjunct member of the Veterinary Programme Subcommittee. At all levels of education, the library takes part in teaching and supervision. The subject of “Information literacy” has been introduced, which includes ability to recognize need for information, to formulate questions and to identify sources of information, to develop and evaluate information search, to organize and integrate new information into one’s knowledge base, communicate, consider research ethics, etc.

A programme for electronic control of plagiarism will be introduced for all student projects (reports) of 15 hp or more.

The new Centre for Veterinary Medicine and Animal Science will include a “learning landscape” with individual and group study places, PCs and information retrieval desk, reference and course books, etc.

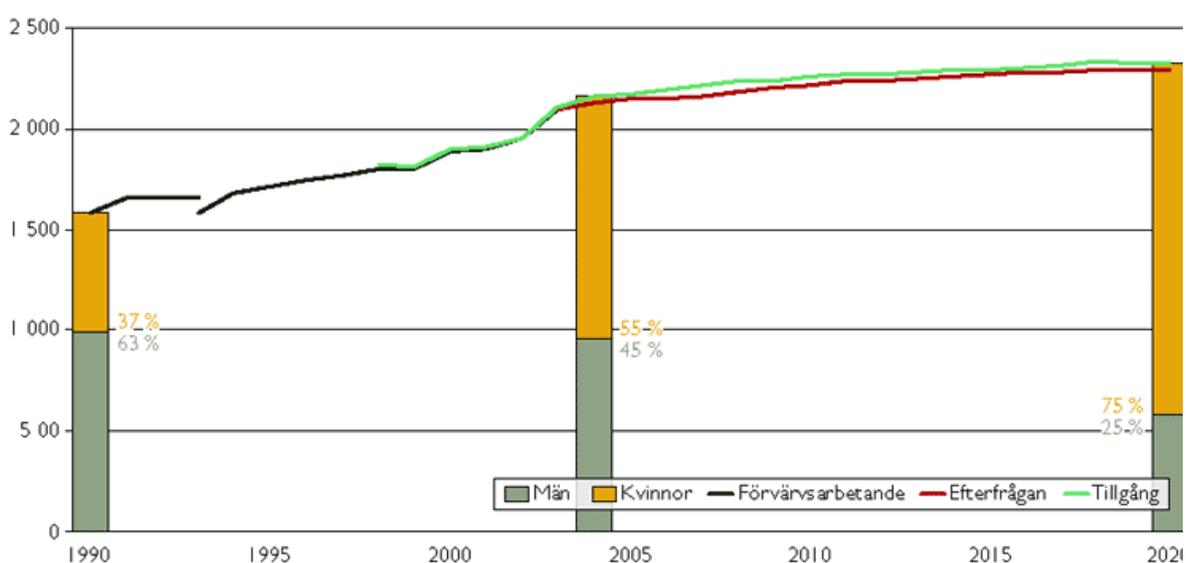


## Chapter 9 ADMISSION AND ENROLMENT

### 1. FACTUAL INFORMATION

In 2006 the National Board of Agriculture granted license to practice to 147 veterinarians. For the first time ever there were more who had graduated outside Sweden than in Sweden. 64 had received their education in Sweden, 48 in the other Nordic countries, 23 in other EU countries and 2 in North America. Nine had participated in the special postgraduate training for veterinarians from outside EU and North America.

There is a high number of Swedish veterinary students abroad, especially in Copenhagen and Budapest.



The figure shows a prognosis of the veterinary work-force until 2020 which indicates that there will be a balance or slight “over-production” and 75% women veterinarians by 2020 (Source: the National Board of Higher Education).

### 9.1 STUDENT NUMBERS

Table 9.1.1: First and second level student composition autumn 2006

a.	Total number of undergraduate students	452
b.	Male students	76
c.	Female students	376
d.	Nationals	na
e.	Foreign students	na
f.	1st year students	84
g.	2nd year students	77
h.	3rd year students	81
i.	4th year students	74
j.	5th year students	69
k.	6th year students	66
l.	7th, or subsequent year students	22
m.	students not in any specific year	32

na = not available for personal integrity reasons

Table 9.1.2: **Third level student composition**

n.	Registered postgraduate students (Active)	191 (170)
o.	Male students	56
p.	Female students	135
q.	Nationals	143
r.	Foreign students	48
s.	1st year students	20
t.	2nd year students	39
u.	3rd year students	17
v.	4th year students	31
w.	5th year students	39
x.	6th year students	19
y.	7th, or subsequent, year students	26

## 9.2 STUDENT ADMISSION

Specific entry requirements have been laid down for admission to higher education - known as admission or entry requirements. These are divided into general admission requirements and specific admission requirements. The general admission requirements apply for all higher education. In addition to the general admission requirements, most programmes specify further requirements, the specific entry requirements. For the veterinary programme, the specific requirements include the subjects biology, physics, chemistry, mathematics, Swedish and English from the science programme in upper-secondary school or the equivalent.

### **Students are ranked on the basis of their qualifications**

When the number of applicants exceeds the number of places on offer some form of selection has to take place. Applicants are first grouped in various categories (see below). Within each category they are then ranked on the basis of their qualifications, such as school-leaving grades. Applicants who have been ranked highest are admitted to the programme.

### **Places are divided between different groups of applicants**

At least one third of the places offered in a programme must be allocated on the basis of school-leaving grades and at least one-third according to scores in the Swedish Scholastic Aptitude Test. In addition, SLU may lay down selection criteria consisting of some specific proficiency or other objective grounds for no more than 20 per cent of beginner places offered.

### **Swedish Scholastic Aptitude Test (SweSAT)**

The Swedish Scholastic Aptitude Test tests study skills. It measures the knowledge and skills that are important in higher education. The score attained on the Swedish Scholastic Aptitude Test provides an indication of the ability to succeed in higher education. The scores on the Scholastic Aptitude Test are used in selecting applicants. At least one-third of the places in a programme are filled on the basis of these scores.

## Selection

There are four selection categories for first-time applicants for higher education. Of the available places, 60% are distributed between the BG and BF groups according to the number of applicants in the respective group. The remaining 40% are distributed equally (20%) to the HP and HA groups.

*BG* - Applicants with school-leaving grades from the upper-secondary school or adult education programmes in which grades are expressed alphabetically and applicants with school-leaving grades from the upper-secondary school or adult education programmes in which grades are expressed on a numerical scale and applicants with foreign certificates or mixed certificates.

*BF* - Applicants with certificates of general eligibility from a folk high school (study assessment).

*HP* - Applicants with scores from the Swedish Scholastic Aptitude Test.

*HA* - Applicants with scores from the Swedish Scholastic Aptitude Test (extra points are allocated in this group on the basis of work experience).

Table 9.2: Intake of veterinary students 1998 – 2007

Year	Number applying Total (1 <sup>st</sup> priority)	Number admitted		
		'standard' intake	other entry mode	total
2007	1,350 (839)	100	-	100
2006	1,351 (894)	85	-	85
2005	1,385 (939)	82	-	82
2004	1,357 (968)	82	-	82
2003	1,322 (974)	34	48	81
2002	1,217 (882)	22	50	72
2001	1,219 (832)	24	48	72
2000	1,370 (941)	23	48	71
1999	1,533 (971)	66	-	66
1998	1,526 (919)	65	-	65

In the period 2000-2003, a trial was made to admit 2/3 of the applicants from an alternative combined test-and interview procedure, which is now being evaluated.

### 9.3 STUDENT FLOW

Table 9.3.1: **Student flow** - Of the 71 students admitted in 2000, how many were in the autumn of 2006 (six years later) in the:

b.	1st year	0
c.	2nd year	0
d.	3rd year	0
e.	4th year	0
f.	5th year	1
g.	6th year	7
h.	how many have graduated	60
i.	how many have dropped out or been asked to leave.	2
j.	how many are not in any identifiable year*	1

\* Not finished degree project yet

Table 9.3.2: **Number of students graduating annually and number admitted 5.5 years earlier**

Year	Number graduating (admitted)
2006	64 (71)
2005	60 (66)
2004	52 (65)
2003	57 (65)
2002*	24 (65)

\* shift of graduation from before to after Christmas brake from 2002

Table 9.3.3: **Average duration of studies** - In the case of students graduating in year 2006, how many students have attended the veterinary training course for 6, 7, 8, 9, 10 years or more?

Duration of attendance	number
6 years (5.5)	55
7 years	6
8 years	2
9 years	0
10 - 13 years	1
more than 13 years	0
Average duration of studies of the students who graduated in 2006	5.72

The requirements (in terms of completing subjects and examinations) for progressing to a subsequent year of the course are described in Section 5.3.

## **2. COMMENTS**

### **Admission**

There is an imbalance of gender in the veterinary education in Sweden. Since 1973 there has been predominance of women admitted and for many years there have been 15-20% men with a recent slight increase of the proportion. In short, the veterinary programme is dominated by women and there are few second-generation immigrants.

The Faculty is proud to be responsible for several of the most popular education programmes of SLU. The number of applicants for veterinary education is in the Swedish top league. There are many more applicants with highest possible grades from upper secondary school than there are seats. The selection has to be done by lottery. Many feel that this is an unjust method of selection.

According to the Ordinance for the Swedish University of Agricultural Sciences, special tests other than the Swedish Scholastic Aptitude Test may only be used as selection criteria for education programmes that provide preparation for professional fields that require personal characteristics or special skills. The University decides on permission to use these tests and on the conditions that shall apply to their use.

At the National Board of Higher Education, work is in progress to develop and evaluate an e-based aptitude test for health care professions. The test is divided into three parts, one knowledge test, one test of communicative skills, and one test of the individuals' ability to interplay with others. The Faculty Board has proposed that we should participate in the evaluation of the test. In 2008 and 2009, the test will be used to separate applicants with identical grade marks in the selection categories BG (upper secondary school) and BF (folk high school). Today, the many high-performing applicants are separated by a lottery. After the evaluation period, the Faculty will decide whether the test will be introduced on a permanent basis or not.

### **Student performance**

The veterinary students perform extremely well. The education programme is 5.5 years and in 2006 the average duration of studies was 5.7 years (table 9.3.3).



## Chapter 10 ACADEMIC AND SUPPORT STAFF

### 1. FACTUAL INFORMATION

The Swedish Ordinance of Higher Education states that University education shall rest on a solid foundation of active research. This also means that teachers are expected to be active scientists. The fact that Sweden has no research institutes in veterinary medicine and animal science implies that the majority of the teaching staff at the Faculty of Veterinary Medicine and Animal Science is actively involved in research. In total, there is 200 academic staff that has a PhD degree and more than a hundred have a 'docent-ship' (associate professor, see below). At the University Animal Hospital, there are some 35 clinical instructors who are mainly involved in clinical work and supervision of students. Some of them have European Diplomate status, a significant number have a national specialist degree, seven are PhDs and two are docents (assoc. prof.).

#### Teaching and research staff

With few exceptions, academic staff is engaged in both research and teaching. This means that it is almost impossible to divide the staff into individuals who teach and those who do research. As a rule of thumb one can say that among teachers:-

- Professors at the Faculty do a higher proportion than usual (comp. to other Universities) first and second level education, and are much involved as supervisors of degree projects and of PhD students.
- Senior lecturers (*universitetslektor*) are expected do approximately half-time education and half-time research.
- Research Associate (*forskarassistent*) is a four-year appointment and normally a "senior post-doc" position. Mainly research.
- Lecturers (*universitetsadjunkt*) are mainly engaged in first and second level education.
- Doctoral studentships (*doktorandtjänst*) is a position for third (doctorate) level students, who have a four-year appointment for research training.
- Clinical instructors (*klinikkveterinär*) are employed by the University Animal Hospital for clinical work and to instruct and supervise students.

Research staff includes academic personnel whose main task is to do research work, even though they may from time to time participate in teaching. There is a rather big group of almost 100 employees who belong to this group.

Technical and administrative staff includes all posts, regardless of the work undertaken; - administrators, laboratory technicians, veterinary nurses, animal caretakers, etc.

#### Requirements for academic positions

For a position as *professor* you have to show documented evidence of scientific and pedagogic skills. As *senior lecturer* you have to have a PhD degree and moreover documented evidence of pedagogic skills. As *research associate* as well as *researcher* a PhD degree is required. As *lecturer* you must have a MSc in Veterinary Medicine (or other relevant field) and documented evidence of pedagogic skills. As *clinical instructor* a MSc in Veterinary Medicine is needed.

For nomination of a professor or a senior lecturer, the Faculty has a standing committee, the Appointments Board, assisted by three (professorship) or two (senior lecturers) external expert advisers. Members of the Appointments Board are four teachers/researchers and one representative for the students.

For promotion, a teacher/researcher can either apply for another position, eg. professorship, or apply for promotion. As of 1 January 1999, a senior lecturer can be promoted to professor and a lecturer to senior lecturer. Promotions includes an assessment by external experts and the Appointments Board.

Another way is to be assessed by the Research Fellowship Award Board as associate professor (in Swedish “docent”). In order to be assessed one has to present scientific papers showing continued post-doctoral research progress, attend six weeks of general pedagogic courses and a four-week pedagogic course focused on the supervision of third level (doctorate) students. Experience as assistant supervisor is expected. The title ‘docent’ is accompanied by increased salary.

Salary increases are the result from yearly negotiations with the representatives of the personnel unions and SLU.

When holding a position at SLU, consultation or outside work including private practice is restricted and regulated by a specific law and by rules set up by the University. The latter mainly deal with ‘private practice’ in the Uppsala area, which may be in conflict with the interest of the University’s clinics. Academic staff is obliged to report outside work to their Heads of department.

### Ratios

To describe the teacher/student ratio is an almost impossible task, considering that the Faculty has several professional, university diploma and BSc and MSc programmes running at the same time. A rough estimate of the teaching done for the veterinary programme is presented below.

<b>Ratio: teaching staff/undergraduate students</b>			
$\frac{\text{number of teaching staff (FTE)}}{\text{number of active vet students}}$	=	$\frac{72}{398}$	= $\frac{1}{5.53}$
<b>Ratio: academic staff/technical and administrative staff</b>			
$\frac{\text{number of academic staff (excl. res stud)}}{\text{number of techn & adm staff}}$	=	$\frac{226.2}{103.8}$	= $\frac{1}{0.46}$

The latter ratio is of less value because the University Animal Hospital is not a part of the Faculty. The “satisfactory” ratio of over 1/1 is a historical artefact. One shall also bear in mind that students do a lot of hands-on work that in old times used to be done by caretakers. Nevertheless, the low ratio is also the result from effect economies when the choice has stood between keeping scientific or support staff.

Table 10.1 – 10.2: Staff at the various Departments (FTE)

Department	Academic staff (FTE)					
	Profes- sor	Senior lectur	Res. Assoc	Lectu- rer	Other Res	Doct stud ship*
Anatomy, Physiology & Biochemistry	8	6	1	9	6	10
Animal Breeding & Genetics	3.2	2	3	1	26	17
Animal Environment & Health	5	-	-	11.5	17	10
Animal Nutrition & Management	6	4.5	3	0.5	18	8
Biomedical Sciences & Vet Public Health	10	5	5	4	14	20
Clinical Sciences	17	8	6	19.5	6	18
<u>Total</u>	<b>49.2</b>	<b>26.5</b>	<b>18</b>	<b>45.5</b>	<b>87</b>	<b>83</b>

\* doctoral studentship - a significant proportion of third level students are employed by the University

Department	Techn & Admin staff		
	Animal care	Labora tory	Admin.
Anatomy, Physiology & Biochemistry	1	6.5	3.7
Animal Breeding & Genetics	4	8.8	8.5
Animal Environment & Health	1.8	8.8	6.6
Animal Nutrition & Management	8	11	4
Biomedical Sciences & Vet Public Health	-	6.8	5
Clinical Sciences	9.5	4	5.8
<b>Total</b>	<b>24.3</b>	<b>45.9</b>	<b>33.6</b>

**The total of  
463 Faculty employees  
correspond to  
414.3 FTE  
(Full Time Equivalents).**

**There are 306 women  
and 157 men.**

Table 10.1 – 10.2: **Staff at the University Animal Hospital (FTE)**

University Animal Hospital	Staff (FTE)				
	Heads of clinics	Vet staff	Animal care	Laboratory	Admin
	4	30	52	19	6

### **Diplomates and Specialists**

There are 39 veterinarians among the academic staff who have Diplomate status in one or several of the European Colleges of Veterinary Specialisation. Some are also members of American Colleges. The European Colleges represented are:

- European College of Animal Reproduction – 9 Diplomates
- European College of Equine Internal Medicine – 1 Diplomate
- European College of Porcine Health Management – 3 Diplomates
- European College of Veterinary Comparative Nutrition – 1 Diplomate
- European College of Veterinary Clinical Pathology – 3 Diplomates
- European College of Veterinary Dermatology – 1 Diplomate
- European College of Veterinary Diagnostic Imaging – 5 Diplomates
- European College of Veterinary Internal Medicine CA – 5 Diplomates
- European College of Veterinary Neurology – 1 Diplomate
- European College of Veterinary Ophthalmologists – 1 Diplomate
- European College of Veterinary Pathology – 3 Diplomates
- European College of Veterinary Public Health – 3 Diplomates
- European College of Veterinary Pharmacology and Toxicology – 1 Diplomate
- European Veterinary Parasitology College – 2 Diplomates

A number of young veterinarians are now attending training for diplomateship. Five of them attend a postgraduate special track – Veterinary Specialisation Track (VST).

A majority of the senior clinicians are “national” species specialists. Most of the newly recruited junior clinicians follow a training programme to become “national” specialists.

### **Attendance at scientific meetings**

There is no specific restriction of the number of scientific meetings one can attend.

Attendance requires the approval by the Head of department. Generally, staff is encouraged to participate but are expected to participate with a presentation. The department normally covers the travel costs from research or travel grants.

### **Study/educational leave**

Professors have the possibility to get some ‘sabbatical leave’ for research. There are no rules, but about 6 months every 6 years seems to be an unofficial policy.

## 2. COMMENTS

The close relation between teaching and research is a strength for all academic staff at the Faculty. The students meet active and engaged scientist teachers, the scientists meet young people eager to learn. Degree projects bring young people into labs and clinics, and some of them stay for life.

The Faculty has the only veterinary school in Sweden. With the exception of the National Veterinary Institute (SVA) there are no veterinary research institutes in the country. The double role and responsibility of education and research makes it necessary to recruit and to keep academic staff of high standards.

The salaries must be competitive with those paid in industry and in practice, and in other EU countries - both in order to be able to keep the most promising scientists and to recruit people from abroad. In relation to other Swedish actors, the salaries paid for veterinary teaching and research staffs at SLU are more competitive now than ten years ago.

The number of staff paid from core funding (for teaching and research) has been gradually reduced during many years. At the same time an increasing number are paid from external short-term grants for research.

**During the evaluation, plans for recruitment of senior staff following retirement were asked for. These plans were provided and are found as Appendix 2.**



## Chapter 11 CONTINUING EDUCATION

### 1. FACTUAL INFORMATION

#### Continuing education activities

Continuing education is one of the objectives set up for the Swedish Universities. Several departments give shorter and longer continuing education courses, which are held at the Faculty. Some courses are held in cooperation with the National Veterinary Institute (SVA).

#### 11.1 CONTINUING EDUCATION COURSES HELD AT THE ESTABLISHMENT

Table 11.1.1: Courses for veterinarians organised by the Faculty itself in 2006

Title of course	Number of participants	Total number of hours of the course
Abomasal surgery in cows	14	5 days
Dentistry horse	81	3+2 days
Laboratory Animal Science	20	5 days
AI in horses	18	5 days
Fertility in dogs and cats	18	3 days
AI in dog and cat	21	1 day
Ultrasound exam of stifle and hock, horse	15	2 days
Introduction to ultrasound, SA	20	2 days
Small animal endocrinology	40	2 days
Dealing with animal welfare cases	11	2 days
Neurology II, SA	24	2 days
Bone and joints – health and disease, SA	177	1 day

SA – small animal

Table 11.1.2: Courses for veterinarians organised by the Faculty itself in 2005

Title of course	Number of participants	Total number of hours of the course
Abomasal surgery in cows	12	5 days
Anaesthesiology I	30	3 days
Anaesthesiology II	30	3 days
Dentistry horse	54	3+2 days
Laboratory Animal Science	20	5 days
AI in horses	18	5 days
AI in cattle	12	2 weeks
AI in swine	9	5 days
Introduction to ultrasound, SA	20	2 days
Haematology, SA	40	2 days
Neurology I, SA	39	2 days
Soft tissue surgery, SA	18	2 days
Ongoing small animal research	43	1 day

SA – small animal

### **Participation of staff in extra-mural continuing education programmes**

By tradition, the Faculty has close cooperation with the Swedish Veterinary Association and its special branch for continuing education, the Swedish Society for Veterinary Medicine. This means that many short ('week-end type') of continuing education courses that Faculty staff are engaged in as teachers are administered and run by that organisation, or by other organisations and the industry.

**Table 11.1.3: Courses for veterinarians organised at the Faculty by outside bodies in 2006**

<b>Title of course</b>	<b>Total number of hours of the course</b>
Ultrasound in gynaecology	1 day
Ultrasound in gynaecology	3 days
Ultrasound in gynaecology	3 days
Digital radiography	2 days
Clinical chemistry	4 hours
Anaesthesiology	

### **Supplementary training for foreign veterinarians**

Veterinarians who have graduated outside the EEA (the European Economic Area), North America, Australia and New Zealand, are required to attend supplementary training before they get a licence to practice. This postgraduate training is 1.5 years and includes a 28 week period including six thematic courses given by the Department of Animal Environment and Health in Skara and 20 weeks of practice. Remaining course time is for self-studies at home and for practical and theoretical examinations.

### **11.2 DISTANCE LEARNING (INCLUDING VIA INTERNET)**

One distance learning course in Clinical Chemistry is run by the Department of Clinical Studies. Continuing education courses are offered to veterinary nurses.

## **2. COMMENTS**

The Faculty aims at increasing the Continuing Education activities for veterinarians. One way that will be further developed is to open some of the elective courses for external participants. This will be of special interest when the "differentiations" of the new curriculum are introduced. Already today there are practitioners attending the elective course "Abomasal surgery in the cow" along with fifth year programme students.

## Chapter 12 POSTGRADUATE (THIRD LEVEL) EDUCATION

### 1. FACTUAL INFORMATION

#### **Third level education activities**

Third level (research) education is regulated by the Ordinance for Higher Education and bylaws. These set the framework within which the university has developed rules and policies concerning third level education. The regulations stress that, in addition to helping students to develop knowledge and skills, the education should encourage independent and critical thinking among students and enhance their ability to solve problems in a scientific way.

At SLU, the University Board has appointed an 'Advisory Committee for third level (research) education' with representatives from all faculties as well as third level students. Even if each faculty has the final responsibility for the education, this board formulates general university policies. At Faculty level, there is a "Committee for third level (research) education".

#### Licentiate degree

The licentiate degree requires two years of full-time studies. It is intended to guarantee, by means of course work and the completion of a dissertation, that the recipient

- has demonstrated an ability to investigate and to solve problems scientifically;
- is conversant with general scientific methodology and is familiar with the more important research methods within his or her subject area;
- is knowledgeable within his or her area of expertise and has contributed to the development of this area through his or her own research;
- is able to utilise the scientific literature within the subject area and relate it to his or her result;
- has in the planning and execution of research, as well as in the analysis of results, worked both independently and in co-operation with others;
- has experience in presenting and discussing research results, both orally and in writing, e.g., before a board of examiners at a final public seminar.

#### Doctoral degree

The doctoral degree requires four years of full-time studies. It is intended to guarantee, by means of course work and the completion of a dissertation, that the recipient

- is capable of formulating, investigating and solving problems in accordance with scientific principles;
- is familiar with both general scientific methodology and specific methods within his or her area of expertise;
- has in-depth knowledge within this area and has made an original contribution to it;
- has attained a sufficient command of the subject matter to be able to place his or her research within a wider scientific context;
- is capable of working independently as well as in co-operation with others within a research project, and has some experience of work supervision;
- has teaching experience, and can present research results orally and in writing to various types of audience, both nationally and internationally.

The thesis consists of 3 to 5 scientific papers and an extensive discussion based upon these papers. At least 2 of the papers should be published or accepted in international journals with a referee-system before the defence of the thesis. The defence is public, often with an audience of 50 to 100 persons, and there is an external examiner ('opponent') and an Evaluation Committee (3 or 5 members) appointed by the Faculty.

### **Activities**

The Faculty has about 190 registered PhD-students of which 170 are "active" today. Almost half of these have positions/financing devoted mainly to their own education. The others are either teachers, clinicians or are employed outside the University and thus part time students.

The close cooperation with the National Veterinary Institute (SVA) is of great value for the postgraduate education. A number of their employees are enrolled in third level education, other are active as advisors to the students.

The Faculty has a Vice-dean for research and third level education, a "Committee for third level (research) education" and a part time director of third level education to assist the Dean in questions on third level education. Also at each department, there is a liaison person for research education.

One-day meetings on important issues within postgraduate education are organized at the Faculty on a yearly basis for all supervisors and students. These are often well attended. Both the Faculty and the departments organize seminars specifically for the third level students. The Faculty supports and the departments arrange subject courses dealing with methods or themes within a certain scientific field. The university supports more general scientific courses.

The Faculty and the University put emphasis on improving supervision of the students. For instance, to become a principal supervisor one has to be at least an associate professor ("docent").

### **12.1 POSTGRADUATE CLINICAL TRAINING (INTERNS AND RESIDENTS)**

The Swedish university system does not include internship and residency programmes. From the Faculty's point of view, such programmes would be of value mainly as a means of recruiting research students, but also to strengthen the clinical services. They would also - from the newly graduates' point of view - be valuable as parts of the training for specialist competence. Positions for four year Veterinary Specialisation Tracks are, however, available since 2003 (see Chapter 10).

The table summarizes the activities in third level education in the period of 2004-2006.

	2004	2005	2006
<b>Third level students, no</b>			
Registered			190
Active	181	172	170
age, mean	35	35	35
Newly admitted	21	29	24
age, mean	32	35	30
Active third level stud/professor	3.8	3.7	3.7

<b>Academic background, %</b>			
Degree from SLU	54	60	60
Other Swedish degree	11	11	14
Foreign degree	17	12	9
Not given	18	17	17

<b>Financing, no</b>			
Doctoral studentship	98	102	98
Special education assistance	1	1	5
SLU employee (other)	38	41	44
Other (outside SLU)	55	41	39

<b>Degrees awarded</b>			
Doctoral, no	22	25	32
age, mean, years	37	38	35
net study time, mean	3.4	4.4	4.1
Women, no		17	17
Licentiate, no	1	6	5
age, mean, years	29	32	33
net study time, mean		2.5	3.0
Women, no		5	4

## 2. COMMENTS

The Faculty has recently made a thorough revision of the “Faculty Guidelines for Third Level Education”. When the Faculty of Veterinary Medicine and Animal Science was created in 2004 the Faculty Board initiated a “best practice- process” for developing a policy document with the best from the old veterinary faculty and the two animal science departments. This document has now been revised and adjusted to the Swedish Bologna-format and terminology. The overarching aim of the policy document is to ensure the quality of the postgraduate training at the faculty and to be transparent regarding the means for this aim. This document is available at our website, though the last version not translated into English yet. It points out certain forms for admission to studies as well as application for dissertation to ensure a transparent judgement.

Some key elements in the policy are:

- Emphasis on the individual Study plan
- The training is focused to five subjects in order to create critical masses of both students and supervisors
- The financial situation for the student, with special attention to foreign students
- The format of supervision and the qualifications of the supervisors
- The requirement regarding courses, participation in seminars etc.
- The requirement regarding papers in the thesis

- Half time seminar and revision of the individual study plan in order to monitor progress
- The format of the dissertation including the required qualifications for the examination committee and external examiner

In 2006, the Faculty was commissioned from the University to perform 22 doctoral degrees annually. In 2006 the number produced was 34.5. We believe that the Faculty has the capacity to produce more than the 2007 commission of 24 doctoral degrees but that the number during recent years will be hard to keep up to on a long-term basis.

There is concern that the number of courses offered by the Faculty to third level students is somewhat low.

## Chapter 13 RESEARCH

The details requested under this heading relate only to research experience offered to students during their undergraduate training, for example through project work.

### 1. FACTUAL INFORMATION

The Ordinance of Higher Education states that University education should rest on a solid foundation of active research. This also means that teachers are expected to be active scientists. The fact that Sweden has no research institutes in veterinary science implies that the majority of the teaching staff at the Faculty of Veterinary Medicine at SLU is actively involved in research. The majority of the academic staff has a PhD degree and more than 50% have a 'docent-ship' (associate professor).

#### Research areas

Central research areas for the Faculty are:

- Animal husbandry
- Animal health
- Animal welfare
- Food safety and quality
- The role of domestic animals in public health

The Faculty Research Strategy (Faculty Board December 2006) identified a number of strategic research areas which are currently receiving additional support from core funds:

- Infection biology and prevention
- Molecular genetics in domestic animals
- Reproduction
- Food safety and quality
- Systems for sustainable livestock production
- Environmental research related to animal husbandry
- The locomotor system in health and disease
- Animal models of human disease

#### Postgraduate training

The Faculty of Veterinary Medicine and Animal Science has an extensive third level education with 170 active students, of which 60% hold a degree from SLU. More than 10 per cent of the newly graduated veterinary students continue into postgraduate research training, i.e. six to eight each year. During 2006, 32 students graduated with a doctoral degree and 5 with licentiate degree. More than half of the Faculty's research students are employed through Doctoral Studentships..

#### Research funding

The resources available for research through core funding have been gradually reduced as little compensation is given for higher salaries and costs. The Departments have become more and more dependent on competitive grants. Still, the salaries to academic staff from core funding are a key factor in the support to the Faculty's research. This is so because research is an integral part in the majority of the academic "teacher" positions.

In 2006, the total turnover for research at the Faculty amounted to approximately 260 MSEK (28 M€). Two thirds were from University allocations ("core") and one third from external

competitive grants. From external research grants, over-head costs are drawn for administrative, infrastructural support and building costs. See also Chapter 3.

Formas (the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning), the Swedish Research Council, the National Board of Agriculture, the Swedish Farmer's Foundation for Agricultural Research, the Swedish Foundation for Horse Research, and insurance companies, are examples of significant external funding bodies.

## 2. COMMENTS

The quality of research varies between fields. It is clear that there are fields in which the Faculty has an international standing, but also that there fields which could be improved. The important question is how much one single Faculty in a country can be expected to cover scientifically. There will inevitably be subjects where the 2critical mass2 is too small and where there is lack of a prime mover. Such areas gain from international support, e.g. Nordic co-operation.

The Faculty safeguards the possibility for research work to be undertaken by teachers and has pointed out that all teachers must also be involved in research. Likewise, all researchers should also participate in teaching.

The Degree Project during the last year of studies is often linked to ongoing research projects at the respective Department. Under the guidance of one or two teachers/supervisors, the veterinary student identifies a problem, carries out laboratory, clinical or epidemiological work, summarizes the findings, presents and publishes the results in a Degree thesis. There are many positive effects from the Degree Projects, especially as a tool for recruitment of third level (research) students and next generation teachers/researchers.

<p><b>See also <u>Appendix 2</u>, where the Faculty's Research Strategy is commented.</b></p>
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This is a draft translation for the EAEVE/HSV evaluation of the Swedish Veterinary Education 2007-10-21

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*See SER Chapter 4, pp. 42-46 about “New Curriculum”.*

## **Study Programme Syllabus for Veterinary Medicine Programme, 330 ECTS**

*Veterinary Medicine Programme, 330 ECTS*

### **1. Decision**

The SLU board decided September 11, 1984 to establish a study programme syllabus for the veterinary medicine study programme. Thereafter, the study program syllabus has been altered December 18, 1989, June 3, 1991, June 22, 1993, July 1, 1993, June 17, 1997, and June 5, 2007. The last change goes into effect from the academic year, 2007/08.

The Veterinary Medicine Programme aims to prepare for a degree of Master of Science in Veterinary Medicine on a second level education and encompasses 330 ECTS credits. The programme has the following programme code: VY002

### **2. Prerequisites and other admission requirements**

#### **2.1 Previous studies**

In order to be accepted to the Veterinary Medicine Programme, in addition to meeting basic requirements, the following special requirements are also necessary:

- Mathematics D
- Physics B
- Chemistry B
- Biology B
- Swedish B / Sv 2 B
- English A

Grade requirements: In each of the above courses, a minimum grade of Pass is required.

The eligibility requirements for course admission according to the above can even be fulfilled if you have a corresponding education from current or earlier Swedish schooling. The requirements are also met if the corresponding education has been attained in another way.

For admission to the different courses that are included in the program, the eligibility requirements for course admission are prescribed for each, individual course.

### **3. Goals**

#### **3.1 General goals**

In accordance with the Higher Education Act (chapter 1, § 8) the first level education shall “develop the students’

– ability to make independent and critical assessments,

- ability to independently perceive, formulate and solve problems, and
- preparedness to deal with change in working life.

Within the area that the education concerns, the student shall in addition to knowledge and skills develop the ability to:

- seek and evaluate knowledge at a scholarly level,
- follow the development of knowledge, and
- exchange knowledge with other people, including people without specialist knowledge of the field.”

In accordance with the Higher Education Act (chapter 1, § 9) the second level education shall “involve a deepening of knowledge, skills and abilities relative to first level education and, in addition to what applies to first level education, shall

- further develop students’ ability to independently integrate and use knowledge,
- develop students’ ability to deal with complex phenomena, issues and situations, and
- develop the students’ potential for professional activities that demand considerable independence or for research and development work.”

### **3.2 Special requirements for a degree of Master of Science in Veterinary Medicine**

In accordance with the appendix to the Ordinance of the Swedish University of Agricultural Sciences the student shall meet the following goals for a degree of Master of Science in Veterinary Medicine:

For the degree of Master of Science in Veterinary Medicine the student must demonstrate the knowledge and skills required for them to work independently as a veterinary surgeon.

#### *Knowledge and understanding*

For a degree of Master of Science in Veterinary Medicine the students must:

- demonstrate knowledge of the scientific basis of the field and insight into current research and development work, together with knowledge of the connection between science and proven experience and the significance of this connection for professional practice,
- demonstrate both broad and in-depth knowledge in the field of veterinary medicine, including in-depth knowledge of animal diseases and injuries,
- demonstrate insight into the conditions for and functioning of animal husbandry, and of its interaction with the environment and society, both nationally and internationally and,
- demonstrate knowledge of economic, organisational and legislative matters that are relevant to the veterinary field.

#### *Skills and abilities*

For a degree of Master of Science in Veterinary Medicine the students must:

- demonstrate an ability to independently diagnose diseases and injuries in animals and to decide on and carry out appropriate medical and surgical treatment in the field of basic veterinary care,
- demonstrate an ability to initiate and implement measures in the field of preventive veterinary care,

- demonstrate an ability to identify problems and take necessary measures concerning public requirements regarding animal welfare, communicable disease control and food safety,
- demonstrate an ability to present measures and treatment results to the parties concerned, orally and in writing, and to document these measures and results in accordance with relevant legislation,
- demonstrate a deeper ability to discuss new facts, phenomena and issues in the veterinary field with different groups, on a scientific basis, and to critically examine, assess and use relevant information,
- demonstrate an ability to engage in teamwork and cooperation with other professional groups, and
- demonstrate the skills required to participate in research, development and evaluation work or to work independently with other advanced tasks in the veterinary field, so as to contribute to the development of the profession and professional activities.

#### *Judgement and approach*

For a degree of Master of Science in Veterinary Medicine the students must:

- demonstrate an ability to take a holistic approach in the practice of their profession and to make assessments based on a scientific approach, taking account of human and animal health, economic, environmental and ethical aspects;
- demonstrate an ability to take a professional approach to animals and animal owners;
- demonstrate an ability to assess their own limits in the practice of their profession; and
- demonstrate an ability to independently identify their need of further knowledge and to continuously upgrade their capabilities.

### **3.3 Specific goals for the Veterinary Medicine Programme**

Within the framework for the goals in the degree description, SLU has specified the following goals for the Veterinary Medicine Program:

#### *Knowledge and understanding*

For a degree of Master of Science in Veterinary Medicine the students must:

- demonstrate such knowledge that is necessary to understand the structure and function of the healthy animal in order to be able to evaluate which symptoms indicate disease in the individual animal and animal groups,
- demonstrate knowledge of how different factors in animals and their surroundings give rise to health disorders, as well as of the disease-producing organisms' structure, classification, biology and dispersion abilities, as well as of those methods that are used to investigate, take care of and prevent disease in individual animals as well as in populations, and
- demonstrate knowledge and familiarity with the fundamentals of production of different foods, their distribution and handling.

#### *Skills and ability*

For the degree of Master of Science in Veterinary Medicine the students must:

- demonstrate both theoretical and practical skills and abilities which are necessary to practice fundamental animal health care including animal health and investigations which shall be applied even in field-related conditions,
- demonstrate the ability to collect and critically interpret relevant data that pertains to diagnostics, treatment as well as preventive care in animals in order to preserve both animal health and food safety,

- demonstrate the ability to explain the connection between animal husbandry, feeding, care, environment and their well-being or disease,
- demonstrate the ability to independently search for knowledge and the ability to analyze and synthesize that information which shall be shown in both oral and written presentations, and
- demonstrate the ability to think independently and take measures which are necessary for further studies as well as for contacts with trade and industry and society in general.

### *Judgement and approach*

For a degree of Master of Science in Veterinary Medicine the students must:

- demonstrate the ability to assess problems that relate veterinary medicine to human medicine, biology as well as knowledge of domestic animals and food science,
- demonstrate the ability to evaluate the economic and ethical consequences of therapy as well as the ability to take a holistic view of the problems that pertain to animal protection, disease control and legislation,
- demonstrate the ability to maintain a professional and scientific approach in the practice of the profession as well as an awareness of the responsibility for communication and relations with both animal owners and colleagues that the veterinary professional role involves.

## **4. Possibility for further studies**

The student who has completed the education in the Veterinary Medicine Programme with a degree of Master of Science in Veterinary Medicine fulfils the requirements for eligibility for course admission to be accepted for further studies at, among others, the following type of education at SLU:

- research education

## **5. Contents and design**

### **5.1 Courses**

The courses that are included in the Veterinary Medicine programme are stipulated by the Committee for Undergraduate Education at the Faculty for Veterinary Medicine and Animal Science and are presented in appendix 1 of the study programme syllabus. The courses' goals and contents appear in the syllabus for each respective course.

### **5.2 Design**

The entire veterinary education contains theoretical and practical sections that aim towards a successively in-depth understanding of the veterinarian's professional role. Instruction of the generic qualifications is integrated with instruction within the different course modules throughout the whole education. Dispersed throughout the entire education are vocationally oriented stages such as observation visits to an animal hospital and training in animal owner communication, group dynamics and leadership.

The education is comprised of compulsory courses during the first contiguous nine terms. The integration between fundamental knowledge and clinical subject knowledge are aimed for,

which increases understanding of knowledge and contributes to a holistic view in the education.

#### First level

The first level in the veterinary programme, the pre-clinical period, is characterized by teaching of the structure and function of primarily healthy but even sick animals together with teaching about factors that can affect animals' health. In addition legislation and animal protection are taught as well as the basics of food safety. The design of the instruction during the pre-clinical period is carried out primarily by lectures, seminars and practical modules, individually or in groups. Base group work according to the principles of problem-based learning is used as a pedagogical teaching method in some of the courses. The education in the first level ends with an independent project work (bachelor's thesis) where the student can apply his/her knowledge, ability and approach on a pre-clinical problem.

#### Second level

The second level of the program focuses primarily on the sick animal's diagnostics, treatment and prophylaxis. During a clinical preparatory term and a clinical year, fundamental theory and practical education about animal diseases and care are given. During the clinical education the student is trained to take responsibility for the patients, in fundamental examination techniques and treatment as well as in independent thinking and a critical approach. Term ten offers three electives, animal-type focused course modules.

#### Independent project

The second level ends with a one term independent project (degree project) where the student can apply his/her knowledge, abilities and approach in order to deepen their knowledge into an actual problem within the education's field.

## 6. Examination

Each course includes one or several exams. The course grade is either pass or fail. The grade pass indicates that the student has passed all requirements including exams in the course and fulfils the requirements for satisfactory participation in the compulsory course modules.

The grade is determined by an examiner designated by SLU. The final grade cannot be appealed. More detailed information about the right to be granted a new exam exists.

## 7. Degree

### 7.1 Degree that the program aims for

The degree of Master of Science of Veterinary Medicine, according to the study programme syllabus for the Veterinary Medicine Program, is obtained after completion of course requirements (passed courses) for 330 higher education credits with the following requirements:

- 262 higher education points compulsory program courses according to appendix 1
- 17 higher education points elective program courses according to appendix 1
- 6 higher education points elective courses according to appendix 1
- 15 higher education points independent project work at the first level according to appendix 1
- 30 higher education points independent project work at the second level according to appendix 1

Students who fulfil the requirements for the veterinary medicine degree receive upon request a degree certificate. In the degree certificate the term Degree of Master of Science in Veterinary Medicine is used.

### **7.2 Other degrees that the program makes possible**

The courses that are included in the Veterinary Medicine Programme even make it possible for the following degrees with the expectation that SLU's requirements for a general degree are met:

- General degrees according to the Higher Education Ordinance

## **8. General**

### **8.1 Transfer courses**

Approved courses from another higher education program, within or outside of Sweden, can be transferred to the Veterinary Medicine Program. This is only possible if there is no discernable difference between the educations. Assessment of course transfer takes place on a case by case basis. After assessment even corresponding knowledge and skills that have been acquired in professional practice can be transferred.

### **8.2 Provisional regulations**

Students accepted to the Veterinary Medicine Program before July 1, 2007 can receive a Veterinary Medicine degree according to the this study programme syllabus if the requirements according to point 7. Degree are met.

**ADDENDUM - SER of the Veterinary Education at SLU**

During the EAEVE/HSV evaluation of the Veterinary Education at SLU, plans for recruitment of senior staff following retirement were asked for. Such plans are in place, but are not to be included in the SER (according to the 2000 SOP). This is a short presentation of the present state with regard to the age distribution and plans for recruitment.

*Table showing the age distribution among senior staff at the Faculty*

	Age intervals			Total no.
	< 55	55 - 59	60 <	
<b>Professors, recruited</b>	14	11	13	38
<b>Professors, promoted</b>	8	3	5	16
<b>Senior Lecturers</b>	14	10	6	30
<b>Total no.</b>	36	24	24	84

The age at retirement is 65-67, which means that one third of the “recruited” professors (“chairs”) will retire during the next 5 – 7 years. The “promoted” professors of which a third is also 60 or older, all held a position as senior lecturer prior to promotion.

**The Faculty Research Strategy**

The Faculty’s research strategy for 2006-2009 was adopted in 2006 after an 18-month long internal process involving several working groups and seminars with research stakeholders including representatives from the most prominent national organisations and industries in veterinary medicine and animal science.

The research strategy naturally elaborates on the key issue of how the Faculty shall meet the forthcoming generation shift in higher scientific positions (p. 9). A thorough analysis was made of when retirements will occur for senior positions during the coming 5-10 years. It is clearly stated that the need not only for research and postgraduate training but also for undergraduate teaching must be taken into account when establishing the replacement positions. Also certain specific recruitment positions such as post-docs and residencies are highlighted in this part of the strategy document.

Scientific positions within the Faculty’s core subjects (p. 11)

Following the internal research strategy process the Faculty’s core subjects were identified and it is stated that in each of these there should be at least one senior scientist/teacher and in the larger subjects there could be several professors or senior lecturers. Based on the Faculty’s analysis including the requirements from the new teaching programmes a number of higher positions to which personnel should be recruited during the period 2007-2009 is defined and listed (see Table below).

Research lines deemed as being particularly perfectible (p.13)

Eight such research lines were identified and, during the last year, to each of them one research associate has been recruited to promote its development. The research lines are presented in the table below.

**Table showing the Recruitment of Senior Staff and Research Associates 2006-2009 according to the Faculty's Research Strategy**

<b>Professors</b>	<b>Senior Lecturers</b>	<b>Research Associates</b>	<b>Status</b>
Ethology			Appointed in 2007
Poultry Production			- " -
Integrative Physiology of Domestic Animals			- " -
	Anatomy and Physiology of Domestic Animals		- " -
	Animal Breeding and Genetics		- " -
	Anaesthesiology		- " -
		Sustainable Systems for Animal Production	- " -
		The Locomotor System in Health and Disease	- " -
		Molecular Animal Genetics	- " -
		Reproduction	- " -
		Food Safety	- " -
		Domestic Animals as Models for Human Disease	- " -
		Infection Biology and Control	- " -
		Environment Research in Relation to Animals and Animal Husbandry	Under Preparation
Anatomy of Domestic Animals			- " -
Veterinary Immunology			- " -
Molecular Animal Genetics			- " -
Animal Management and Housing			- " -
	Veterinary Diagnostic Imaging		- " -
	Animal Welfare		- " -
	Animal Care		- " -
Animal Breeding and Genetics			- " -
Veterinary Toxicology			Planned
"Within the area of interaction between domestic animals, environment and wildlife"			Planned