



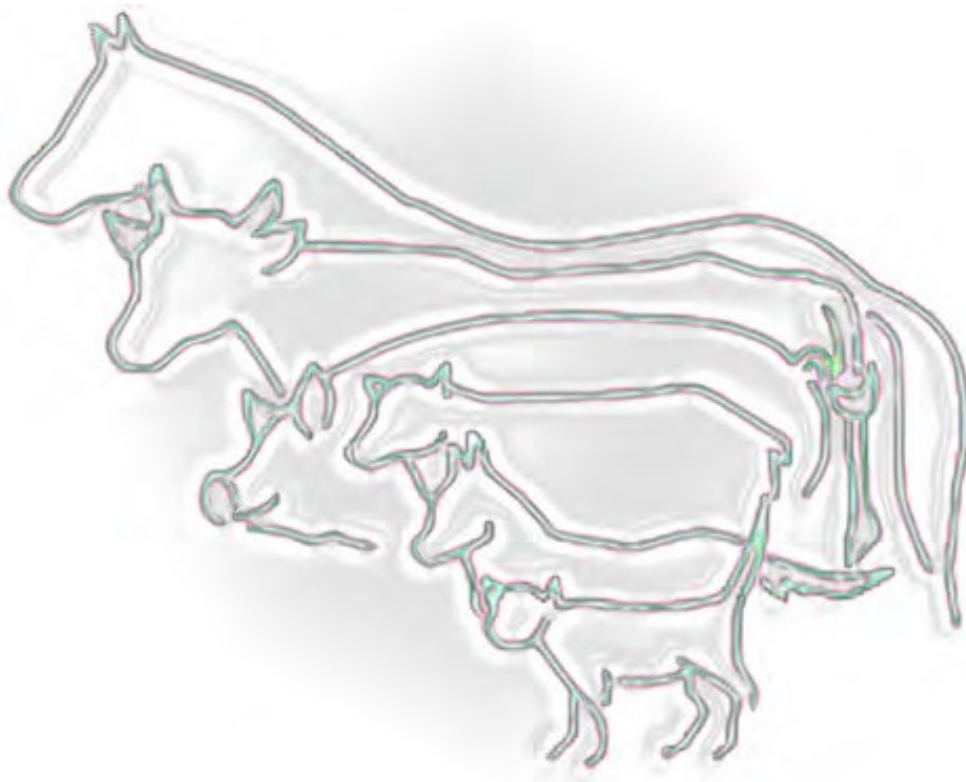
Sveriges lantbruksuniversitet  
Swedish University of Agricultural Sciences

Institutionen för kliniska vetenskaper

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# OPERATIONAL PLAN 2018-2020



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## 2. Mission, vision and values

### For SLU

#### *Our mission*

SLU develops the understanding and sustainable use and management of biological natural resources. This is achieved by research, education and environmental monitoring and assessment, in collaboration with the surrounding community.

#### *Our vision*

SLU is a world-class university in the fields of life and environmental sciences.

#### *SLU's core values*

SLU's values express the common fundamental values for our university. They guide everyday life by describing the operation's starting point, contact with the outside world and how we behave towards each other and others. All SLU employees are bound by these values. The fundamental values are:

- a scientific approach
- creativity
- openness
- taking responsibility
- democracy
- legality
- objectivity, factuality and equal treatment
- free formation of opinions
- respect
- efficiency and service

## For the Department of Clinical Sciences (KV)

### *Our mission*

We are engaged in education and research within the fields of clinical and comparative veterinary medicine, and in veterinary nursing. Hence, we will contribute to the continuous development of knowledge concerning animal health and disease, at both the individual as well as the population levels. The information we disseminate to others must be scientifically based.

The Department of Clinical Sciences is perceived as an attractive workplace with stimulating and challenging work tasks, where everyone takes responsibility for a positive working environment, with everyone being provided good opportunities for personal growth and development, with competitive setting of salaries.

### *Our vision*

Healthier animals – skilled and knowledgeable animal health staff

### 3. Strategic SLU objectives, VH Faculty objectives and activities at Clinical Sciences that contribute to these objectives

#### **Overall strategic objective 1**

***SLU is an attractive and stimulating workplace for our current and future employees.***

#### *Intermediate objective 2020*

1. SLU's combined expertise and competitiveness has been strengthened.
2. The perceived security of funding for individuals has increased.
3. The conditions for a good and effective working environment have been further developed.

#### *Priority measures to achieve the intermediate objectives*

Work for more secure funding for permanently employed junior and senior researchers/teachers. *What will be achieved by 2020:*

- A common funding model will have been introduced.

Increase the importance of good educational skills when recruiting teachers. *What will be achieved by 2020:*

- The academic appointments board will have been trained in educational assessment. All of the faculties will have procedures so as to ensure educational expertise during the assessment of applicants to higher teaching posts.

Develop a broad and active recruitment of doctoral students. *What will be achieved by 2020:*

- Recruitment activities will reach strategically important target groups. The university's recruitment tool will have been developed to make analysis and follow up easier.
- The faculties' models for the allocation of resources to different research subjects will have been adapted so that they respond to internal skills requirements.

Create a good and creative work environment in concrete actions and behaviours with the support of SLU's core values. *What will be achieved by 2020:*

- All departments/divisions will actively pursue core values and work environment efforts based on the results of staff surveys, SLU's guidelines and applicable regulations.

Improve conditions for professional management and leadership. *What will be achieved by 2020:*

- New guidelines for managers' responsibilities and authority will have been drawn up based on a discussion with the broad involvement of managers.
- The recruitment process for the appointment of managers in academia will be harmonised and ensure that both management skills and academic qualifications are taken into account.

### ***Faculty targets linked to overall strategic objective 1***

To increase the number of newly enrolled doctoral students, while continuing to provide high-quality education, resulting in a competitive degree. *This is achieved by doing the following:*

- Develop a policy for high-quality third-cycle education.
- Increase the number of externally employed doctoral students from both industry and public authorities.
- Increase collaboration with industry and public authorities in order to provide a good network for the doctoral students.

Increase the number of students trained at the faculty to pursue doctoral studies. *This is achieved by doing the following:*

- Involve students in ongoing research projects, both during courses and in independent projects at first-cycle and second-cycle, in order to encourage them to continue with third-cycle studies.
- Let doctoral students give lectures on their theses and what it is like to be a doctoral student at SLU in order to attract students to apply for doctoral studentships.
- Create structures in order to offer the brightest students a place on third-cycle courses and programmes at the faculty.

Ensure that the faculty's graduate school Veterinary Medicine and Animal Sciences (VMAS) will be more proactive and visible, as well as provide

more support for doctoral students and supervisors.

- Arrange meetings with all supervisors to exchange ideas on requests and needs they have with the help of VMAS and others within third-cycle education.
- Arrange meetings every semester where doctoral students and supervisors discuss various themes.
- Invite external and international researchers with substantial experience, especially on how to optimise supervision within third-cycle courses and programmes.

Define clearer career paths for doctoral students and postdoctoral researchers. *This is achieved by doing the following:*

- Provide more information on how to shape a research career at and outside of SLU.
- Set up a postdoctoral exchange in collaboration with other higher education institutions in order to increase the possibility of mobility support.

Review the working situation of foreign doctoral students so that all doctoral students have access to the best possible living conditions regardless of how they are financially supported. *This is achieved by doing the following:*

- Centrally review the financial requirements and housing situation for foreign doctoral students in collaboration with SLU as a whole.
- Provide doctoral students with a mentor when they start studying at SLU. This person would help them with social contacts and teach them how things work in Sweden.

Work towards integration of doctoral studies in veterinary medicine and specialisation in residency programmes for veterinarians, to obtain synergies and increase the number of graduates with degrees in both fields. *This is achieved by doing the following:*

- Structure strategies for all residency programmes at the VH Faculty.
- Develop a policy that clarifies how the residency programmes can be a component within existing third-cycle studies.

Increase communication between co-workers. *This is achieved by doing the following:*

- Make certain that the faculty and heads of department together ensure that there are more interfaculty activities.

The faculty maintains the level of research support provided to lecturers.

During the forthcoming strategy period, offer career support to young researchers to strengthen competitiveness and create regrowth in our operations. *This is achieved by doing the following:*

- Have clear skills supply plans where everyone will be given the opportunity to achieve excellence and to invest especially in the career development of young staff members.

Implement appropriate measures based on the 2016 staff survey during the strategy period. *This is achieved by doing the following:*

- Focus on measures that increase recovery possibilities and coherent time for research.

***Operations within KV (in addition to shared SLU objectives and faculty objectives) for strategic objective 1***

*Work environment in general*

- Important information concerning the entire institution/department is to be available in both Swedish and English.
- Regular information is to be sent to all employees via e-mail (e.g. in monthly newsletters).
- In order to achieve a good working environment, all managers will continuously work on developing their leadership skills.

*Collaboration with the University Animal Hospital (UDS)*

- There is to be a long-term plan in place for staffing and continuing professional development, devised in collaboration with UDS (including a shared employment and residency programme).

*Strategic planning*

- Develop transparent financial models that clarify how the department's funds are to be distributed.
- Each subject area is to have a plan for which costs are to be jointly financed.
- Each employee will have his/her own skills development plan.



## Overall strategic objective 2

***SLU is an attractive educational institution for students, with an educational programme of high quality which additionally is of relevance to the society-at-large.***

### *Intermediate objective 2020*

1. The competition for places will have increased at all levels and students better reflect the breadth of the whole of society.
2. The courses and programmes will be more clearly characterised by educational quality and stimulating learning environments.
3. All degree programmes at undergraduate and Master's level will have a stronger research basis and link to society's needs, both nationally and internationally.

### *Priority measures to achieve the intermediate objectives*

Set aside working hours for teaching staff for regular continuing professional development. *What will be achieved by 2020:*

- All departments will have a plan to ensure employees' opportunities for continuing professional development in accordance with the current collective agreements.
- Active educational academia with excellent teachers will support educational development at SLU.

Strengthen skills training within degree programmes. *What will be achieved by 2020:*

- Professional or vocational elements in courses and degree programmes will have increased in scope and quality.

Develop and follow plans for external collaboration in all degree programmes. *What will be achieved by 2020:*

- All degree programmes at undergraduate and Master's level follow a well-anchored and funded plan for external collaboration.

Increase international mobility for teachers and students. *What will be achieved by 2020:*

- 20 per cent of students who graduate from SLU will have participated in an international exchange. Doctoral students' and teachers' participation level in international exchange programmes will have increased.

*Faculty objectives linked to strategic objective 2*

Offer programmes and courses more clearly characterised by educational quality and stimulating learning environments. *This is achieved by doing the following:*

- Continue to develop VH teachers' teaching skills and strive to give the departments the possibility to participate in educational courses, seminars and workshops.
- Give VH teachers who have been awarded the title "Excellent Teacher" at SLU the possibility to participate in the work with developing learning environments.
- Offer all supervisors, both at and outside SLU, some form of supervisory skills training.

Strengthen the links to research on all degree programmes at first-cycle and second-cycle level, and relate them to the needs of society nationally and globally. *This is achieved by doing the following:*

- Give all teachers the possibility to participate in research and include information on current research in relevant courses.
- Let first-cycle and second-cycle students doing independent projects work in a research-based way and prepare them for this in other course components.
- Dedicate at least one teacher day at VH to research-based teaching.

Set aside work time for the professional development of teaching staff.

*This is achieved by doing the following:*

- Discuss professional development for teaching staff during staff appraisal talks at department level.
- Give all staff the opportunity for professional development within their subject and/or continuing professional development in teaching.
- Prioritise skills supply within courses and programmes for various subjects at the faculty.

Strengthen skills training within degree programmes. *This is achieved by doing the following:*

- Review and, when necessary, improve the progression of skills training (general and practical) and utilise VH's infrastructures in an optimal way.

Elaborate on and execute plans for external collaboration. *This is achieved by doing the following:*

- Ensure that all programmes, especially professional programmes, contain some form of external collaboration (for example external representatives from advisory boards and/or industry councils).
- Arrange seminars and workshops relating to current issues in collaboration with the industry.

Increase international mobility for teachers and students. *This is achieved by doing the following:*

- Review current bilateral agreements with foreign universities regarding student and teacher exchanges.
- Involve degree programmes and individual teachers in the work with developing VH-relevant collaboration partners, i.e. networks that benefit both first-cycle and second-cycle education and specialist training for veterinary surgeons.

***Operations within KV (in addition to shared SLU objectives and faculty objectives) for strategic objective 2***

- Our teaching results in all students achieving Day 1-competence.
- Achieve better collaboration between programmes via reviewing/developing exercises that work for both programmes, with the aim of teaching the students professional teamwork and streamlining the utilisation of resources.
- Deepen the collaboration with UDS via the establishment of a teacher-led student-operated clinic.
- Increase the efforts to raise the teaching skills and interest in teaching among UDS' veterinarians via by having ongoing meetings concerning the teaching in different disciplines/subjects, plus via offering courses and being active in the UDS' recruitment processes.
- Develop IT-supported teaching and assisted learning, and the introduction of computer/web-based examinations.

### Overall strategic objective 3

***SLU's researchers have good access to research infrastructure which gives the opportunity for ground-breaking, excellent research.***

#### *Intermediate objective 2020*

1. SLU has established a well-functioning strategic plan and procedures for funding of research infrastructure, which includes national coordination.
2. The internal joint exploitation of research infrastructure has increased, as well as the number of external users.
3. SLU has secured principal responsibility for national infrastructure in areas where our research has a strong position.

#### *Priority measures to achieve the intermediate objectives*

Implement procedures to deal with the need for basic research infrastructure. *What will be achieved by 2020:*

- All faculties will have procedures for needs analysis and mechanisms for funding basic infrastructure.

Conduct active marketing of SLU's research infrastructure. *What will be achieved by 2020:*

- Revenues from user fees will have increased.

Act proactively for national infrastructures of special interest to SLU. *What will be achieved by 2020:*

- SLU will be managing at least three national infrastructures in areas where SLU's research has a strong position.

#### *Faculty objectives linked to strategic objective 3*

There are strong infrastructures in place at VHC, the research facilities at Lövsta, Götala and Röbbäcksdalen, and the University Animal Hospital (UDS), including the new SLU Animal Locomotion Laboratory. These will be utilised optimally and better marketed to external stakeholders, thereby contributing to, amongst other things, increased funding and better opportunities for research and clinical specialisation. *This is achieved by doing the following:*

- Prioritise marketing of our infrastructures, have uniform pricing at the facilities and ensure that there are resource descriptions in both Swedish and English.
- Establish a Lövsta Council for planning of future research and investments.

***Operations within KV (in addition to shared SLU objectives and faculty objectives) for strategic objective 3***

- Work to achieve a situation where KV-researchers have access to the infrastructure (including clinical materials) required for our areas of research.
- Work to secure access to personal support resources from the KV's Division of Clinical Research and Training Support (KFUS).
- Ensure access to data for research purposes via agreements with commercial parties.

## Overall strategic objective 4

***SLU's collaboration will benefit society and be appreciated by stakeholders while the quality of our education, research and EMA will be raised.***

### *Intermediate objective 2020*

1. SLU employees will see collaboration as an opportunity for the development of both the core business and their own careers and want to contribute to collaboration work.
2. SLU will have organised effective internal support functions for collaboration and structured working methods for different types of interaction, for example, regarding education, business, public authorities, media and civil society.
3. SLU will have chosen a number of stakeholders in our business areas for closer collaboration in the form of strategic partnerships during the 2017–2020 period.

### *Priority measures to achieve the intermediate objectives*

Support skills development in collaboration. *What will be achieved by 2020:*

- A course in successful collaboration management will be available to all employees at SLU.

Strengthen the merit rating of collaboration. *What will be achieved by 2020:*

- A template for employees to document collaboration will have been developed. Guidelines will have been introduced to show how the quality of collaboration should be assessed and valued in employment recruitment and salary reviews.

Organise effective internal coordination of the collaboration function. *What will be achieved by 2020:*

- There will be an effective organisation to coordinate collaboration.

Structure and organise work with 'strategic partnerships'. *What will be achieved by 2020:*

- SLU will have signed agreements on strategic partnerships, where programmes for staff mobility are included, with five chosen stakeholders.

*Faculty objectives linked to strategic objective 4*

The faculty should be the obvious academic collaborative partner within the faculty's areas of expertise. *This is achieved by doing the following:*

- Develop U-Share and support collaboration between veterinary medicine and translational medicine.
- Get the faculty's researchers to participate in activities arranged by external parties.
- Primarily nurture the existing networks at SLU and prioritise participation in activities arranged by various centres and networks.
- Develop the faculty's strategic partnership, review prospective collaboration partners and create contacts where there are none.
- Continue to review collaborative centres and networks.
- Invite external partners to research projects early on in the process, at the application stage.
- Publish in SLU's various newsletters.

Ensure that the faculty's employees gain a better understanding of the benefits of and need for collaboration within SLU and externally. *This is achieved by doing the following:*

- Show the benefit of collaboration and instil its importance and weight in doctoral students.
- Present researchers who have successfully collaborated in research projects, as well as those who have had success in the media and who dare to take up space.
- Arrange media training courses.
- Encourage researchers to establish personal contacts with journalists and themselves suggest ideas on what media can report.
- Mention collaboration as a merit in job advertisements and force/remind researchers to log/describe collaboration activities.

Ensure that the faculty encourages increased mobility between academia, industry and government agencies. *This is achieved by doing the following:*

- Ensure that all departments develop proposals on appropriate external-ly employed doctoral student projects which can be proposed to the companies with which SLU will cultivate a relationship for strategic partnerships (see above).

***Operations within KV (in addition to shared SLU objectives and faculty objectives) for strategic objective 4***

- Stimulate participation in the debate in the community-at-large via spreading research-based knowledge.
- Offer more opportunities for continuing professional development and courses for practicing professional veterinarians and veterinary nurses, within KV's subjects.
- Further develop in-service training for academic supervisors organising clinical placements for veterinary nurses.
- Encourage the establishment of, and participation in, joint meeting points and forums in order to achieve increased collaboration between industry and academia for the development of research and education.
- Continuously participate in national and international research applications and research consortia.



## **Overall strategic objective 5**

***Employees and students will have knowledge of and feel commitment to SLU's activities, and take joint responsibility for developing activities.***

### *Intermediate objective 2020*

1. The perception of a shared SLU will have increased among staff and students.
2. Collaboration between different sites and organisational sectors within SLU will have increased.
3. More employees, students and alumni will help to convey a unified and attractive image of SLU.

### *Priority measures to achieve the intermediate objectives*

Increase commitment to SLU. *What will be achieved by 2020:*

- All departments/divisions will conduct ongoing, broad discussions on the manner in which they contribute to SLU's profile and objectives.

Make it easier for staff and students to convey a unified and attractive image of SLU. *What will be achieved by 2020:*

- Ready-to-use presentation materials will be used extensively by our employees and students. Procedures will be in place to give all new employees and students wide knowledge of SLU's activities and relevance.

Further develop harmonisation. *What will be achieved by 2020:*

- Administrative procedures and processes will have been harmonised between the faculties.

### ***Operations within KV (in addition to shared SLU objectives and faculty objectives) for strategic objective 5***

- KV takes an active part in SLU and faculty arrangements.
- KV actively works to ensure that its employees will have a proper knowledge of the activities throughout the institution.

## 4. SLU's research objectives

SLU works continuously to develop conditions for innovative, excellent research. The focus should be on areas of strategic importance to SLU's mission and education, with the goal that SLU will be internationally renowned in these areas and provide society with the relevant knowledge. The strength that lies in our research, combining production, the environment, health and quality of life must be safeguarded. To develop the knowledge needed in both the short and long term, SLU needs to have a full range of research, from specialised and subject-oriented to system-oriented and application-oriented research.

During the period 2017–2020, SLU intends to focus on the following university-wide domains:

### **Area 1: Bio-based materials**

This area is becoming increasingly important in the context of society's transition from a fossil-based to a bio-based economy. SLU has an important niche in the value chain from the primary production of agriculture and forestry to the properties of biomaterials.

SLU intends to coordinate and reinforce research in the area and be an attractive partner for the technical universities.

#### *Faculty objectives for research area 1*

- Stimulate research on the manufacturing of new products from domestic and imported raw materials such as feed, biofuel, and synthetic materials based on animal by-products and materials from forest, seas and lakes.
- Stimulate research on synthetic proteins and stem cells, which are also included in this domain.

### **Area 2: Sustainable and secure food supply**

SLU intends to contribute actively to the national food strategy through research, ranging from primary production conditions to food quality, safety and health aspects. In collaboration with the sector, SLU intends to develop application-oriented research and to take a leading role in a new research and innovation programme, characterised by a holistic approach to the food system and where the skills of

various Swedish actors are combined.

#### *Faculty objectives for research area 2*

- Develop and increase the demand for research on sustainable animal husbandry, secure food supply and food safety;
- Help strengthen, through basic and applied research, the competitiveness of national animal husbandry; sustainability perspectives are also central to the faculty's commitment in developing countries.
- Continue to contribute, by using the faculty's unique competencies in preventive animal health care, animal welfare, housing and general care, as well as bioinformatics and technology, to the development of modern decision-making tools for animal husbandry – *Precision Livestock Farming* (PLF).
- Continue to actively contribute to the upcoming national food strategy by increasing focus on applied research that contributes to Swedish livestock management's good animal health, animal welfare and low antibiotic consumption has an impact on Swedish and international markets, thus giving Swedish agricultural enterprises the economic prerequisites to survive.
- Contribute to raising the nutritional value of food derived from animal raw materials through increased cooperation within SLU and with other centres of learning.

### **Area 3: Economics**

In the surrounding world there is a clear wish for SLU to conduct strong research in the area, e.g. concerning market and business analysis and entrepreneurship in agriculture and forestry, animals for sports and companionship, etc. SLU needs good teacher competence in the subject that corresponds to the courses and programmes' needs. A strengthening of the subject is also an important step towards greater multidisciplinary and interdisciplinary science.

*Faculty objectives for research area 3*

The VH Faculty will not establish any staff positions in the field of economics/business administration; however, within our operations as well as our courses and programmes, we wish to enhance knowledge about business, profitability and the long-term significance of the subject economics/business administration from a sustainability perspective. The faculty's objective for the strategy period is:

- to include financial expertise in platforms, boards, centres and courses.

**Area 4: The importance of nature and companion animals for human health and well-being**

For many people in today's urbanised society, contact with animals, growing their own plants, visiting nature or green spaces in urban environments, etc., is of crucial importance to their quality of life. Research in this area is in line with SLU's concept of mission and requires multidisciplinary and interdisciplinary approaches.

*Faculty objectives for research area 4*

- Use the new platform Future Animal Health and Welfare, which has its organisational headquarters at the faculty. This is to highlight and develop SLU activities relevant to the individual, and also includes values other than those contained in our mission statement.
- Ensure that the well-being of animals is constantly in focus to achieve the objectives of this focus area.

## 5. The VH Faculty's prioritised areas of research

In addition to SLU's four priority research areas at university level, the faculty has also established the following objectives:

- Prioritise research on animals for their own sake, but also where animals can serve as models for human diseases. These two goals need not conflict with each other, as research can lead to significant improvements in health and quality of life of the animals being studied.
- Reduce the use of antimicrobial substances through strengthening One Health as a field of study – locally, nationally and globally, and to widen the field of study from the core of infectious diseases and antimicrobial resistance which has thus far been the focus. Increased research efforts to be placed on the prevention of infectious diseases for example through increased understanding of mechanisms that impact the spread of infection, the development of effective and safe vaccines, appropriate feeding, housing and care. SLU is already successfully collaborating with Uppsala University, Linnaeus University and the Swedish National Veterinary Institute within One Health and this collaboration will be strengthened and developed.
- Conduct research on complex diseases and diagnostics in collaboration with researchers in human medicine, where we can find treatments for sport and companion animals that can later be transferred to humans. The trend toward more individualised treatment and diagnosis (referred to as personalised medicine) can be developed with this type of research.
- Safeguard SLU's strong position in wildlife research where veterinary medicine research today is primarily focused on infectious diseases, disease dynamics, food safety and reproduction in various wildlife populations. A key for continued knowledge development in the field, however, is to increase collaboration across disciplines and faculties.
- Develop systems biology, an interdisciplinary field where information from different levels of detail and approaches are integrated to build understanding of how biological systems work. The topic has emerged as a result of technological developments in biotechnology that have contributed to the ability to extract large amounts of data from biological material (big data management). This is expected to contribute to more interdisciplinary collaboration and can also contribute to a decline in the use of laboratory animals (in accordance with 3R).
- Continue, but also expand, international cooperation in research and teaching, with a focus on low-income countries where capacity development is already well-integrated at the faculty.
- Create sustainable systems in animal husbandry that benefit biodiversity and ecosystems and which do not have negative effects on climate and the environment.

- Develop animal feed and its raw materials for farmed and companion animals, such that they do not compete with, but rather complement, our production of food from cultivation and fishing. The focus should be on feed that is not suitable for humans, but that animals in food production can transform into food with high levels of the desired quality.

## 6. For the Department of Clinical Sciences, SLU Descriptions and objectives

### **Anaesthesiology**

Head of Subject: Professor Görel Nyman

#### **Subject description**

Anaesthesiology is the specialty concerned with methods and pharmaceuticals used to induce total or partial loss of sensation with or without the loss of consciousness. Anaesthesia and intensive care is a relatively young specialty and "The Association of Veterinary Anaesthetists" is an international organisation for education and development of the discipline. After obtaining a veterinary degree and a minimum of 3 years of specialist training, it is possible to pursue a diploma from the European College of Veterinary Anaesthesia and Analgesia (ECVAA), The subject encompasses the main areas: anaesthesia, analgesia and perioperative intensive care plus anaesthesia and intensive care in veterinary nursing.

#### **Current research**

- Improved oxygenation in horses under general anaesthesia, with sub-projects: a) matching of ventilation/perfusion in the lungs when under anaesthesia, b) effect of pulsed NO, and c) the effect on the quality of awakening.
- Refinement of anaesthesia and analgesia for pigs. Interdisciplinary projects and inter-university research projects in the field of veterinary medicine, where the pig is used as an animal model in medical research.
- Development of appropriate analgesia and anaesthesia for caesarean sections on dogs and cats.

#### **The future for doctoral graduates/residents**

There is a great demand for both those with a doctorate and veterinarians and veterinary nurses with specialist training in anaesthesia, analgesia and veterinary nursing for sports and companion animals. The demand for expert support within experimental research on animals, especially in the development of diagnostics and surgery, is increasing.

SLU and UU are currently investing in building a common platform within U-Share for large animal research. If that comes to fruition, KV will most likely have an extensive role, which requires expertise.

## **Objectives for Anaesthesiology 2018-2020**

### **Staffing**

- To have, by 2019, three veterinarians employed, two of which have specialist degrees plus two veterinary nurses (specialised/holding doctorates in veterinary anaesthesia) in order to cover the needs of education, research and veterinary care.
- That there will be, by 2023, a minimum of one veterinary nurse holding a doctorate and, additionally, at least one veterinary nurses who has a special training in anaesthesia and intensive care.

### **First-cycle and second-cycle courses and programmes**

- To increase the duration of the educational programme in the field of anaesthesiology within the veterinary curriculum to 6 credits in VP17. Anaesthesiology becomes a separate course in the curriculum.
- To plan and commence two independent courses in Anaesthesiology for veterinarians and veterinary nurses (15 credits) during the 2018/2019 academic year, of which one is given as distance education.

### **Third-cycle courses and programmes and research**

- That two doctoral students defend their doctoral theses by 2021.
- To apply for research funds and publish a minimum of 5 scientific articles per year in the field.
- To establish research and collaboration for improved veterinary nursing and more secure monitoring of anaesthesia in large animals in animal research (within the 3R principles, in particular refinement and reduction).

### **Clinical practice specialist education at UDS**

- UDS is accepted as an educational centre for residencies in anaesthesiology by the ECVA and that a minimum of two veterinarians complete a residency programme in 2018-2021.



## **Diagnostic Imaging**

Head of Subject: Docent Kerstin Hansson

### **Subject description**

The core of the subject of veterinary imaging diagnostics is knowledge and understanding of the various imaging diagnostics methods (x-ray, computer tomography (CT scan), ultrasound, magnetic resonance tomography (MRT) and scintigraphy) that are used in research and clinical activities, and which forms the basis for the teaching in the veterinary and veterinary nursing programmes.

### **Current research**

- The musculoskeletal system of horses, cattle and felines, focusing on cartilage and bones, both the normal appearance and the development of pathological changes.
- Previously, however now to a lesser extent, research has a strong foundation in circulatory system physiology, including the renal glomerulus function.
- Imaging diagnostic expertise is a vital part of the research conducted by researchers in several other disciplines, both within and outside of SLU, for example research on degradable bio-based surgical implants where ultrasound is used to monitor the resorption. In summary, the research can be described as being directed at both method validation of methods and collection of data/information.

### **The future for doctoral graduates/residents**

There is a shortage of veterinary diagnostic imaging professionals (diagnosticians) with a doctoral degree, both nationally and internationally. Along with a doctoral degree, one must also be good at working in a clinic.

## **Objectives for the Diagnostic Imaging 2018-2020**

### **Staffing**

- To work for the expansion of personnel to add one professor and one assistant university lecturer.
- To recruit a doctoral student with a research focus in the field of osteoarthritis with a focus on horses and/or felines.

### **First-cycle and second-cycle courses and programmes**

- To produce short instructional videos showing working methods for various X-ray projections that can be used in both the veterinary nursing and the veterinary programme.
- To complete the current digital image archive for the veterinary programme so that the material harmonises with what is listed as Day 1 competence in future documents.
- To develop an exercise that focuses on diagnostic ultrasound within the veterinary programme.

### **Research and doctoral studies**

- To scale up the project concerning osteochondrosis in the knee joint of beef cattle bulls from a pilot project to that it becomes a national criterion/tool for genetic evaluation of bulls in various breeds of beef cattle, plus to become a clinical tool for use in individual herds out in the field.
- To start up a pilot project involving the use of the MaxIV platform.

## **Veterinary Nursing**

Head of Subject: Docent Anna Bergh

### **Subject description**

The field of veterinary nursing for animals can be seen as a comprehensive, all-embracing area of knowledge, similar to veterinary medicine. The field veterinary nursing encompasses subjects such as the veterinary nursing science, rehabilitation and prevention and control of infections. Veterinary nursing science is defined as the science that creates knowledge concerning relationships and measures to promote the patient's development towards good physical and mental health. By doing so, good health is seen as something more than the absence of illness and can be related to the feeling of well-being. Veterinary nursing aims to promote the patient's health and well-being, measures to prevent poor health and to alleviate suffering, along with promoting a dignified conclusion of life. The veterinary nursing science is central for/within the exercise of veterinary nurse's professional activities.

### **Current research**

The research focuses on rehabilitation, prevention and control of infections and veterinary nursing aspects for various fields, such as clinical nutrition/pharmacology/odontology/anaesthesiology.

We conduct research largely for the benefit of the animals themselves:

- Rehabilitation (validation of diagnostic methods and evaluation of treatment methods, generally oriented towards diagnostics and treatment of musculoskeletal problems and pain).
- Perioperative/perianesthetic veterinary nursing.
- Veterinary nursing in clinical pharmacology.

The research conducted in the field of One Health is:

- Prevention and control of infections (reduced spread of infections and reduced antibiotics usage).
- Clinical pharmacology (reduced use of antibiotics).
- Epidemiology in veterinary nursing (life expectancy in animals as a comparative model for humans).

### **The future for doctoral graduates/residents**

There is a strong demand for doctoral graduates. Residency programs are not yet available.

## **Objectives for the Veterinary Nursing 2018-2020**

### **Staffing**

- To hire two licentiates from April 2018, plus reinstate a lecturer position and seek one additional lecturer position.
- Work to free up time for the initiation of research, via that staff with pilot projects will obtain 20% research time.

### **First-cycle and second-cycle courses and programmes**

Stimulate publishable degree projects, from spring semester 2018.

Start up a cooperation with the industry regarding specialist education and master's degree courses.

Further develop and conduct evidence-based teaching in the nursing programme, harmonised with the requirements imposed by the professional role, in consultation with the industry, by means of:

- Initiate an industry council in spring term 2018.
- Make an annual evaluation and possible revision of the programme.
- Annual academic supervisor in-service training.
- Internationalisation, via a clinical placement or other workplace training abroad, and cooperation with other educational programme/training organisers.

Ensure the long-term availability of clinical placement slots by:

- The industry organises and provides clinical placement slots as well as advisors/supervisors, in cooperation with KV-DOV.
- Redo the framework schedule, so as to obtain a third clinical placement period from autumn term 2018.

Protect practical skills in the programme via making the clinical training resources more efficient and effective with regard to materials as well as staff, via working to achieve:

- Better adapted facilities for practical workplace training. Increased number of research technicians with a specialist education.
- Correct number of research animals for propaedeutic and clinical training.
- Surveillance cameras in more training rooms, to enable more efficient use of premises.
- Increased cooperation with UDS and the veterinary programme.
- Equipment especially for the purpose of simulation exercises (cameras and control room).

### **Research and doctoral studies**

To establish research and research groups with regular meetings in veterinary nursing science, rehabilitation and care hygiene, with the intention to publish a minimum of 3 original articles per year in each subject.

That all staff receives annual theoretical and practical skills development focusing on veterinary nursing via participation in external courses, conferences, and clinical work.

## Porcine and Poultry Medicine

Head of Subject: Professor Magdalena Jacobson

### Subject description

The field includes propaedeutics, medicine and surgery in porcines. Knowledge about medical diseases and conditions such as metabolic disorders, infectious diseases, hereditary diseases, zoonotic diseases and poisonings are included. Preventive health care for animals is an integral part.

The subject has a responsibility for teaching propedeutics and medicine in poultry, where expertise is currently purchased from the National Veterinary Institute (SVA).

### Current research

- Infectious diseases focusing on gastrointestinal tract infections.

Other research conducted in recent years concerns:

- pain physiology and analgesia,
- infectious, reproductive diseases,
- respiratory diseases,
- antibiotics and the use of antibiotics,
- bacteriology and virology,
- aetiology and pathogens in chronic wounds,
- occurrence and spread of zoonotic bacteria in rodents and wild boars.

Research is also conducted in cooperation with other European countries. In addition, research is conducted in the form of development assistance projects within the fields infectious diseases and food science. Collaboration with other experts within and outside SLU is a prerequisite for all this research.

The research is based on **Sustainable and Secure Food Supply**, and responds to the Faculty's objective of **actively contributing to the National Food Strategy**. Good animal health is essential in order to strengthen the competitiveness of domestic livestock production and to ensure a sustainable food supply; and knowledge of animal diseases, as well as foodborne bacteria, is essential to ensure safe food. We have strong expertise within disease diagnostics and preventive animal health care, which is part of *Precision Livestock Farming*.

The research focuses on **applied research** as well as **research for the benefit of the animal itself**, which contributes to good animal health, animal welfare and minimal usage of antibiotics.

The research contributes to One Health via actively working to prevent infections and the spread of infection, improve diagnostics and to identify mechanisms that impact the onset of disease.

### The future for doctoral graduates/residents

There is strong demand for both those with a doctoral degree and residents.

## **Objectives for the Porcine and Poultry Medicine 2018-2020**

### **First-cycle and second-cycle courses and programmes**

- Engage a minimum of two students per year in thesis work.
- Have a minimum of two newly graduated international specialists (diplomates) by 2020.

### **Research and doctoral studies**

- Publish a minimum of 5 scientific and 5 popular science articles per year.
- Have a minimum of one new docent/associate professor by 2020.
- Strengthen the joint cooperation with Gård & Djurhälsan (Farm & Animal Health), SVA and other strategically important partners.

## Domestic Animal Reproduction

Head of Subject: Professor Patrice Humblot

### Subject description

Domestic animal reproduction encompasses various aspects of the reproduction of domestic animals and contains several sub-subjects that we research and/or teach in, such as andrology, gynaecology (including infections and metabolic disorders), obstetrics, udder diseases, reproductive endocrinology and reproductive toxicology.

### Current research

In terms of research, the most central is andrology, gynaecology (including infections and metabolic disorders), reproductive toxicology and reproductive endocrinology. We are researching both in vitro and in vivo reproduction, and on the herd level and population level. Successful research focuses primarily on gynaecological problems in farm animals associated with to nutrition and infections, as well as the causes of osteoporosis. All of the above-mentioned focuses are aimed at preventing rather than curing, thus reducing the need for the usage of antibiotics. Another successful focus is wildlife and environmental research related to reproduction. In many ways, the research is closely related to the field of veterinary reproductive biotechnology. We have a very broad international/global approach in our research issues, as well as in our staffing. Similarly, the involvement in research and residency courses and programmes is strong (four of our academic personnel hold European diplomas).

Research concerning agricultural animals is strongly linked to SLU's priority research area "1. Sustainability and secure food supply." Furthermore, the research directly focuses on several of the faculty's priority areas for research: "Reduced usage of antimicrobial agents via strengthening One Health; Upholding and protecting SLU's position in the field of wildlife research; Continued and expanded international cooperation in research and education focusing on low-wage countries; Creation of long-term sustainable systems for livestock production." Naturally, the research in the subject also relates to the very generalised "priorities" - Research for the benefit of animals themselves (Animal Welfare), Research concerning complex diseases and the development of system biology, due to that animal reproduction is a clinical subject.

### The future for doctoral graduates/residents

Assessed as good, doctors in this field are attractive within several sectors: senior positions at other universities, livestock extension services, various governmental authorities, Government Offices, research councils, international organisations (UN, World Bank), etc.



## **Objectives for the Domestic Animal Reproduction 2018-2020**

### **Staffing**

- Two permanent positions in the fields of mammary/udder diseases and reproductive endocrinology, respectively.

### **First-cycle and second-cycle courses and programmes**

- Average of over 4 points (on a 5-point scale) on all course evaluations from students.

### **Research and doctoral studies**

- Award two doctoral degrees per year.
- Have more than 25 peer-reviewed articles accepted per year.
- Doubling the cooperation with UDS concerning clinical cases (including the Ambulatory Clinic).

## **Equine Medicine**

Head of Subject: Professor John Pringle

### **Subject description**

Equine medicine, encompasses the wide range of problems horse owners observe or perceive in their animals as not functioning normally, or exhibiting signs of illness. This includes even those apparently clinically normal but that failure to perform expected work or show behavioural changes. Sub areas are not officially recognized. However, equine cardiology, dermatology neurology and ophthalmology are clearly identified activities demanded of European specialists (ECEIM).

The discipline of equine internal medicine at SLU is aimed at providing the strongest evidence based clinical expertise in equine medicine for this country. As well, it provides mentorship and guidance for postgraduate training and research in relevant to equine medicine.

### **Current research**

Our hypothesis based clinical research activities include infectious diseases such low virulence equine respiratory viruses and relationship to athletic performance as well as pathobiology of bacterial infections by *Streptococcus equi* versus *S. zooepidemicus*, and silent carriers of *S. equi*. Other activities include metabolic and cardiac diseases in the horse, as well as equine asthma.

### **The future for doctoral graduates/residents**

There is a strong demand for residents. Those with a doctoral degree must also be skilled clinicians.

## **Objectives for Equine Medicine 2018-2020**

### **First-cycle and second-cycle courses and programmes**

Each medicine faculty member will have the majority of time devoted to clinical activities for mentoring younger veterinarians and veterinarians in training and overseeing veterinary student training in the art and science of current evidence based equine medicine.

### **Research and doctoral studies**

Working for reduced use of antimicrobial substances by strengthening efforts within One Health. Improved understanding of infectious diseases in the horse can lead to reduced antibiotic usage through improved application of evidence based medicine in equine practice. Reducing use of antibiotics, with improved diagnostic acumen needed to reduce prophylactic or polypharmacy therapy.

Each equine medicine faculty member will have their primary research activities involved in advancing evidence based medicine on clinical case accessions to UDS equine clinic.

Each faculty member will present on average at least once per year clinical research findings at leading national and international forums (ECEIM, ACVIM) and publish the same in peer-reviewed journal.

The entire equine group, including representation from UDS veterinarians, will have yearly meetings to review the discipline of equine internal medicine current state and new developments regarding teaching/clinical research.

## **Ruminant Medicine**

Head of Subject: Professor Jean-Francois Valarcher

### **Subject description**

Ruminant medicine is a species-based discipline that focuses on teaching and research in the identification, treatment and prophylaxis of diseases of ruminants at individual and herd level, as well as the optimisation of ruminant production.

The discipline generates and disseminates evidence-based knowledge about the etiology, pathogenesis, diagnostics techniques, treatment, prophylaxis, and epidemiology of ruminant diseases, as well as animal husbandry and ruminant clinical practice.

### **Current research**

- Development of control methods (prophylaxis and treatment) for diseases in ruminants and fundamental parts of control programmes, especially for infectious diseases (primarily in Sweden and Europe, but also in developing countries), based on research in epidemiology, pathogenesis, animal husbandry, genetics, microbiota, molecular epidemiology, antibiotic resistance, treatment and vaccinations, as well as methodology in herd medicine.
- Comparative research is also performed with ruminants as a model for humans.

The intention is to increase the society's financial health and promote animal welfare, as well as to reduce antibiotic consumption in a One-Health perspective.

### **The future for doctoral graduates/residents**

There is a demand for a residency programme.

## **Objectives for the Ruminant Medicine 2018-2020**

### **Staffing**

Working for the integration of doctoral education in veterinary medicine and the relevant residency programmes for veterinarians, in order to obtain synergies and increase the number of examinees with double degrees:

- Ruminant medicine recruits one intern or resident per year (4-year cycle).

Work in closer cooperation with the ambulatory clinic via sharing staff and financial resources:

- Ruminant medicine increases its cooperation with animal owners' organisations and DVO. For example, by sharing job positions between these organisations and SLU.

Increasing the number of newly enrolled doctoral students, who continue to receive a high-quality education resulting in a competitive degree:

- On average, ruminant medicine admits one new doctoral student per year, or two new doctoral students in ruminant medicine 2018-2020 with funding for the 4th doctoral student year.

### **First-cycle and second-cycle courses and programmes**

That all educational programmes at the undergraduate and graduate level are given a stronger research connection and link to the society's needs, both nationally and globally:

- Ruminant medicine adjusts its teaching by offering more lectures online, combined with more seminars and discussions.

The courses and educational programme in general is more clearly characterised by educational quality and developing learning environments:

- Ruminant medicine further develops student activities in the field of ruminant medicine, at clinics and in herds (target objective: 150 patients at the clinic and 10 visits to herds per year).

### **Research and doctoral studies**

- To conduct outstanding research and thereby publish a minimum of six articles in prominent international journals with peer review (impact factor > 2) in the period 2018-20.
- Ruminant medicine has increased its number of projects with three.

## **Clinical Pathology**

Head of Subject: Professor Inger Lilliehöök

### **Subject description**

Clinical Pathology is used to diagnose diseases and increase the knowledge of pathogenesis in various diseases. The sub-areas include haematology, endocrinology, clinical chemistry and cytology, as well as quality assurance/method development/validation of diagnostics used in clinical pathology.

### **Current research**

Our current research focuses on diagnostic methods that are clinically relevant to animal health care. Current research areas include:

- Interference in antibody-based assays
- Circulating biomarkers for heart disease in cats
- IGF-I and diabetes in cats
- Inflammatory markers in dogs
- Biomarkers in reproductive endocrinology
- Improved diagnostic methods for haematology and urinalysis
- Effect of glucocorticoids and endotoxin on clinical pathological variables.

Clinical Pathology SLU also has an important function with the development/evaluation of new methods and examining the methods used in clinical pathological diagnostics.

### **The future for doctoral graduates/residents**

There is a good demand for doctoral graduates and licensed clinical pathologists.

### **Objectives for Clinical Pathology 2018-2020**

#### **Staffing**

Ensure that there is subject expertise in the particular field, by appointing an associate senior lecturer.

#### **First-cycle and second-cycle courses and programmes**

Clarify the role of clinical pathology in the veterinary nursing programme, so it will become a sub-course in the veterinary nursing curriculum.

#### **Research and doctoral studies**

Expand the collaboration with clinical pathology at Uppsala University/Academic Hospital, to provide and receive access to additional analytical methods and to create a larger and wider network of contacts for successful research.

Offer combined residency and doctoral student positions in order to optimise the time spent in the educational programme.

## **Comparative Medicine**

Head of Subject: Professor Marianne Jensen Waern

### **Subject description**

Comparative medicine encompasses experimental medicine using animal models for translational and biomedical research, for increased biological and medical knowledge. The objective is to better understand and treat, or prevent, diseases that occur in humans and animals. Laboratory animal medicine encompasses the knowledge concerning animals used for experimental purposes and their use in research, their biology, care, management, diseases and the weighing of ethical issues with their use, as well as the legislation and regulations that governs this.

### **Current research**

- Animal welfare,
- Anaesthesia,
- Analgesia,
- Technological developments,
- Transplantation and coagulation research, material development in orthopaedics in collaboration with Uppsala University and Karolinska Institutet, SVA, UU, LU, KI/CS and EU cooperation (many participating countries): research in transplantation medication, coagulation, regenerative orthopedic medicine.

### **The future for doctoral graduates/residents**

The demand is strong.

### **Objectives for Comparative Medicine 2018-2020**

#### **Staffing**

- Two veterinarians are employed as residents.
- Two doctoral students are recruited.

#### **First-cycle and second-cycle courses and programmes**

Give undergraduate courses where the students assign a minimum of 3.5 points in the overall assessment in the course evaluations.

Organise one course per year in advanced techniques for doctoral students and researchers (e.g. anaesthesia, asepsis, pig and rabbit models).

#### **Research and doctoral studies**

Provide academic supervision to researchers with the development of models on rabbits and pigs.

## Reproductive Biotechnology

Head of Subject: Professor Jane Morrell

### Subject description

Veterinary Reproductive Biotechnologies are used to obtain offspring from animals as an alternative to natural mating. The most common reproductive biotechnology in animals is artificial insemination (AI), in conjunction with sperm preservation/ cryopreservation. Embryo production (ET) is employed mostly in cattle at present. There are many other reproductive biotechnologies, ranging from cloning to transplantation of spermatogonia from donor animals to recipients' testes. Hormonal control of reproduction is also increasingly important, especially in species whose populations are increasing rapidly. Thus, reproductive biotechnologies are central to a number of other reproductive disciplines. The subject Veterinary Reproductive Biotechnologies is wide-ranging and runs parallel to Domestic Animal Reproduction, with which we interact.

### Current research

- Improving reproductive efficiency in a wide range of species e.g. by selecting fertile sperm sub-populations from the rest of the ejaculate for use in various reproductive biotechnologies; devising new markers of fertility; improving cryopreservation protocols; researching the roles of seminal plasma in modulating sperm function and also its effects on the female reproductive tract; and understanding how external factors such as season or the age of the animal can affect both sperm quality and seminal plasma; epigenetics. In addition, a major interest is in removal of pathogens from semen and in finding alternatives to antibiotics for controlling bacteria that contaminate the ejaculate during semen collection. We have collaborative research projects to develop reproductive biotechnologies in exotic animal species e.g. camelids.
- Developing or optimizing flow cytometric analyses of sperm quality.
- Methods to improve sperm cryopreservation in dogs and cats, and in optimizing insemination protocols in these species.
- The role of melatonin in the reproductive cycle of the bitch.
- Wildlife conservation.
- Embryo vitrification. In vitro bovine or porcine embryo production is currently used as a model for human early embryonic development (impact of pollutants) and as a 3R (replace, reduce, refine) method for toxicological testing. In one project, we are studying the effect of environment on female fertility.
- Establishment of embryo methods in Sweden for research and for commercial embryo production.
- Gamete interactions, particularly the effect of zona pellucida proteins on sperm binding.

In addition, together with KV-Lab, we offer a service for animal breeders in sperm morphology evaluation. Collectively we offer an advisory service to animal owners on all aspects of fertility and herd health which can serve as a springboard for research projects.

These areas are strongly in line with the University's and Faculty's research strategy, especially to provide a sustainable and secure food supply, to reduce the use of antimicrobials, to continue research on wildlife, and to conduct research of benefit to animals.



### **The future for doctoral graduates/residents**

Our PhD students and residents are very much in demand in academia, field work and clinics, as well as in various regulatory authorities, and as government policy makers. Many alumni from other countries have returned to high ranking positions in their native countries.

### **Objectives for Veterinary Reproductive Biotechnology 2018-2020**

#### **Staffing**

To plan for succession within teaching and clinical work, e.g. personnel to participate actively in clinical courses arranged by KV.

#### **First-cycle and second-cycle courses and programmes**

To reach day-1 competence in undergraduate teaching.

#### **Research and doctoral education**

Within veterinary reproductive biotechnology and domestic animal reproduction:

- i) To attract at least one visiting post doc, new research student or new resident per year.
- ii) To establish integration with UDS for clinical work (one shared position).
- iii) To add 2-3 new external collaborations (collaborations with stakeholders/society).
- iv) We will extend the sperm morphology evaluation service to other aspects of sperm quality evaluation in the future.

## **Small Animal Surgery**

Head of Subject: Professor Franck Forterre / Docent Odd Höglund

### **Subject description**

Surgery is a specialty that involves preventing, diagnosing, curing or alleviating the impact of diseases via an operation on a patient. The field of small animal surgery encompasses dogs and cats and other small animals such as rabbits, guinea pigs, birds and other smaller species.

In addition to the primary subject surgery, the sub-specialities at SLU include orthopaedics (including sports medicine and rehabilitation), dentistry, ophthalmology and neurology. Within the field of surgery, education in emergency and intensive care, traumatology, and clinical-practical applications of adjacent areas e.g. obstetrics and neonatology is also provided.

There is an international specialist educational programme in surgery within the framework of the European College of Veterinary Surgery (Small Animal Surgery major). There are also international specialist programmes in the fields of dentistry, ophthalmology and neurology.

### **Current research**

In the department, research is conducted in both small animal surgery and sub-specialities in the broad sense with focus on prevention, diagnostics including development of diagnostic techniques, and treatments

Key research focuses today:

- Development and evaluation of surgical techniques, as well as aftercare.
- Development of surgical implants.
- Dental health and oral cavity diseases.
- Pain and pain assessment, surgical stress.
- Biomarkers e.g. for adrenal tumours and surgical sepsis.
- Etiology/genetics of diseases treated surgically.

### **The future for doctoral graduates/residents**

The demand for doctoral graduates is mainly within academia. There is a demand in the market for clinical expertise within the field, also in the form of residents & diplomates (from animal hospitals).

## **Objectives for Small Animal Surgery 2018-2020**

### **Staffing**

That appointments will be made for all senior teaching positions.

### **First-cycle and second-cycle courses and programmes**

Conduct high-quality practical/clinical education and animal health care in the various fields of small animal surgery, and thereby ensure that SLU's students achieve Day 1-competence.

Increase international mobility via that one teacher per year participates in an exchange programme taking them outside of Sweden.

### **Research and doctoral studies**

- Continue the development of surgical implants and bio-based materials, as well as initiate further interdisciplinary projects in the field.
- Increase the number of presentations at congresses so that each teacher/researcher attends and presents a minimum of one international academic convention per year.
- Further develop expertise in the field by allocating time and resources for one week of continuing education per year.
- Two graduate research students reach the level (at a minimum) of licentiate during the period.
- Two veterinarians reach specialist level, or the equivalent, in the field of small animal scale surgery during the period.

## **Small Animal Medicine**

Head of Subject: Professor Jens Häggström

### **Subject description**

The field of small animal medicine focuses primarily on clinical questions concerning companion animals, which includes several animal species, however mostly dogs and cats. Small animal medicine includes physiological and pathophysiological events related to prevention, diagnostics and medical treatment in the event of disease/illness. Small animal medicine includes various subdisciplines, such as dermatology, endocrinology, gastroenterology, immunology, infectious diseases, cardiology, oncology, neurology, pulmonology, urology/nephrology, clinical nutrition and clinical toxicology.

### **Current research**

- Etiopathogenesis, prevention, diagnosis and treatment of medical diseases linked to clinical issues in companion animals, primarily dogs and cats, with improved animal health for the individual animal as the objective.
- Increased animal welfare and well-being that contributes to increased well-being in humans.
- Comparative aspects with focus on One Health.

Specifically, today, research is conducted concerning epidemiology, etiopathology, pathophysiology, prevention, biomarkers, prognosis, diagnostics and treatment for the following diseases in dogs and cats:

- Chronic kidney disease
- Heart disease
- Tumours/neoplastic diseases
- Autoimmune diseases
- Endocrine diseases/disorders
- Neurological diseases
- Skin diseases/skin ailments

The future for doctoral graduates/residents

There is a strong demand for those with a doctoral degree and subject-specific specialists in the subject field.

## **Objectives for Small Animal Medicine 2018-2020**

### **Staffing**

Ensure a continuous flow of residents in specialist educational programmes and to achieve this cooperation with UDS regarding new shared employment.

Maintain expertise in the field via providing opportunities for those who have recently received their doctorate in the field of internal medicine to participate in a specialist education or vice versa.

### **First-cycle and second-cycle courses and programmes**

The objective of the foundation education is that the students can manage medical issues with dog and cat patients in daily veterinary activities in a clinical setting. This entails communication with the animal's owner, conducting clinical examinations, suggesting adequate examination and evaluation times, diagnostics, differential diagnostics and medical treatment options for common and important diseases in dogs and cats, as well as the care of acutely ill animals. The students will be offered theoretical knowledge and practical clinical application concerning medical problems and how the documentation is conducted. The students should also be able to perform basic examinations and taking samples, treatment with drugs/administration of medications and preventive treatments. All practical clinical work is permeated by proper management and procedures regarding i.a. hygiene, protection against infections, ethics, workplace health and safety, environmental impacts and animal welfare.

### **Research and doctoral studies**

- To increase the number of doctoral students in addition to industrial doctoral students.
- To increase the scope of the Small Animal Medicine activities within "One health"
- That Small Animal Medicine is represented in the new platform "SLU Future Animals, Nature and Health" in order to contribute to improving animal health and animal welfare in companion animals, and thus also increase human well-being.
- Work in a manner to prevent harm and ensure that the aspects of protection of animals and animal welfare are ensured (concerning stress-related diseases) for therapy dogs/cats, which has taken on an increasingly important role in the treatment and rehabilitation of humans.

Improve and enhance the interactions with:

- Leading insurance companies
- Pharmaceutical companies
- Other animal health companies

## **Large Animal Surgery**

Head of Subject: Professor Pia Haubro Andersen / Docent Ove Wattle

### **Subject description**

Large Animal Surgery includes indicated and relevant surgical treatments of horses and pigs, as well as large and small ruminants commonly kept in Sweden, in clinical practice, education, as well as research and development of methods.

The objective of surgical treatment is to restore or to optimise biological function and to minimise any suffering. Alternatively, the objective may be to modify behaviour and/or normal function, such as castration and dehorning.

Subspecialties such as ophthalmology, dentistry and neurology exist, however traditionally the field is primarily divided into soft tissue surgery and orthopedic surgery. Intensive care, infections that require surgical intervention and pain control are also important areas that are included. There is an international specialist programme in the field of surgery within the framework of the European College of Veterinary Surgery (Small Animal Surgery specialty). There are also international specialist programmes in the ophthalmology, neurology and veterinary dentistry.

### **Current research**

- Dental and hoof diseases
- Ocular diseases
- Lameness diagnostics using biomechanical methods
- Assessment of various types of pain caused by surgery, including neuroma
- Pain assessment methodology, including automated methods
- Wound healing
- Evaluation of new drugs for the treatment of aseptic arthritis
- Rapid detection of septic arthritis

### **The future for doctoral graduates/residents**

The career path for PhDs depends primarily on the specific focus of the doctoral studies conducted. For those who obtain a PhD combined with practical clinical or pathophysiological expertise, the career opportunities are considered to be very good. A combination of surgery training and doctoral studies in surgery with more focus on basic science aspects may provide a basis for a career as a university teacher. In the private market, there is low demand for PhDs, but the demand for veterinarians with specialist training, "diplomates," is high.

## **Objectives for Large Animal Surgery 2018-2020**

### **Staffing**

- Establish doctoral student positions where clinical skills training and research are combined.
- Offer, in cooperation with UDS, more doctoral students the opportunity for residency education and vice versa.

### **First-cycle and second-cycle courses and programmes**

- Conduct high-quality practical education and animal healthcare within the specialist areas included in large animal surgery, and via this ensure that SLU students' achieve Day 1-competence.

### **Research and doctoral studies**

- Continue the work in the fields of dentistry, ophthalmology, orthopaedics, pain and wound healing, and continue our ongoing collaborations in these projects, as well as seek new collaborators among researchers in human medicine.
- Continuously present our research within Sweden and abroad, as well as keep up-to-date with the development of the field in the world in general.
- Further develop research on equine oral health, which includes issues related to bridle-related injuries and how bacteria contained in the oral cavity's normal flora can change and become pathogenic.
- Develop orthopedic research concerning objective diagnosis of lameness with improved diagnosis of motion disorders.
- Use the horse as a model animal in comparative research about the impact of exercise on both performance and occurrence of injuries.
- Research concerning how signs of pain is best detected and interpreted, something which is important for animal welfare.

## Veterinary Epidemiology

Head of Subject: Professor Ulf Emanuelson

### Subject description

Teaching and research within the cross-disciplinary subject in the field of veterinary epidemiology focuses on how veterinary medicine can be utilised to prevent disease and other disorders, thereby promoting animal health and human health, welfare and well-being.

### Current research

The focus of our research is to apply epidemiological methods in order to identify factors in the environment, in the care, and in the animal that affects health, well-being and performance capability in populations of animals. The possibilities for preventive measures and to promote good animal health and welfare therefore benefit from our research. We have a strong interdisciplinary way of working and our ambition is to merge social sciences, including qualitative methods and animal health economics, with population medicine and other medical specialties.

The research is based primarily on available secondary databases, many of which are unique to Sweden, but also on large-scale field studies, which are designed and implemented for specific research projects. Improving the quality and usability of data is a critical part of the research. Therefore, evaluation of existing databases and the work to achieve a correct design of field studies are important components of our research. Research is conducted with several animal species such as dairy cows, horses, pigs, dogs and cats, and is conducted in close collaboration with other departments and teams/groups at Clinical Sciences. Many projects are being carried out in collaboration with external stakeholders such as Gård & Djurhälsan, Växa, DeLaval and SVA.

Examples of research approaches, each with several sub-projects, include:

- Infectious diseases
- Organic production
- Use of antibiotics
- Biomechanics
- Sustainability
- Animal welfare
- Canine health.

Several of these are connected to SLU's first priority research area (**sustainable and safe food production**), and also to the fourth which concern **economy**. This means that they also relate to the Faculty's target areas: **research for the animals' benefit, reduced use of antimicrobial substances**, and the **creation of long-term sustainable systems for animal production**.

### The future for doctoral graduates/residents

There is a strong demand for doctoral degree graduates and a residence programme is in demand.



## **Objectives for Veterinary Epidemiology 2018-2020**

### **Staffing**

To achieve the situation where the department receives faculty funds for two senior teaching positions in the field of epidemiology.

To work for SLU/VH establishing a statistician position associated with the subject.

### **First-cycle and second-cycle courses and programmes**

Give undergraduate courses where the students assign a minimum of 3.5 points in an overall assessment in the course evaluations.

Actively promote Nordic research education courses in the field of epidemiology, for example by applying for courses from NOVA.

Carry out a minimum of one educational development project by 2020.

### **Research and doctoral studies**

Conduct outstanding research and thereby publish a minimum of 30 articles in prominent international journals with peer review during 2018-20.

Ensure access to relevant data for research into long-term sustainable milk production systems, and the ability to manage BigData via participation in:

- Establishing an infrastructure for the collection of automatically registered data from a number of commercial milk producers.
- The recruitment of a postdoc with a focus on machine learning or other methodology suitable for managing BigData

Strengthening the expertise and research in small animal epidemiology, which can be measured by a minimum of four articles published by 2020.

Developing and enhancing expertise in the field of animal health economics with a population and animal welfare focus.

- Give ourselves continuing education in sustainable animal production and economics, and include these perspectives in our forthcoming research applications.
- A minimum of one research project will have been started by 2020.

Apply for additional funding to study (the horse's) sustainability with multiple continuous systems, and other data as a complement, in order to enhance the knowledge of the determinants and widen experience/develop analytical methods for longitudinal data analysis (with sensor/measurable/BigData technology).

Studying attitudes to and use of veterinary care, including financial considerations, in animal owners. The objective is to submit a minimum of one research application in the field by 2020.