

2011 Curriculum for the Master's programme in Animal Science at the Faculty of Health and Medical Sciences, University of Copenhagen, School of Veterinary Medicine and Animal Science

This curriculum came into force on 1 September 2011 and shall apply in relation to students admitted on or after that date.

This amended curriculum was approved by the Dean on March 2019.

This subject-specific curriculum, the course or module descriptions in the overall University of Copenhagen course database, and the general curriculum provisions together comprise the curriculum leading to the degree of Master of Science in Animal Science.

Part 1 Objectives and qualification profile

§ 1 Objectives

The objective of the Master's programme in Animal Science is to produce graduates who:

- Are capable of designing strategies for the use of animals in favor of human welfare in its widest perspective (economy, animal derived food, human physical and mental health) whilst considering animal welfare and environmental sustainability.
- Hold solid theoretical knowledge and methodological skills in applied quantitative biology related to animal performance, management, welfare and health; livestock production and sustainability of livestock systems .
- Are capable of analyzing problems from a holistic view and of designing solution models of relevance to the sector, public administration, research and education, in a national as well as international context.
- Possess the academic qualifications required to perform research, development, and disseminate knowledge at various levels based on a broad knowledge of the animal sector and its importance to the national and international society.

1.2. Successful completion of the programme gives the right to use the title of Master of Science (MSc) in Animal Science, the Danish title kandidat i husdyrvidenskab, candidatus / candidata scientiarum in Animal Science and cand.scient. in Animal Science..

1.3. The degree is worth 120 ECTS credits.

1.4. The programme belongs under the Study Board for Veterinary Medicine and Animal Science.

1.5 The programme belongs under the corps of external examiners for Veterinary Medicine (Veterinærmedicin).

§ 2 Admission requirements and qualification profile

A maximum of 60 students may be admitted to the programme. Applicants must have gained a Bachelor's degree in Husdyrvidenskab from the University of Copenhagen or Agrobiologi with specialization in Husdyrbiologi- og produktion from Aarhus University.

Students are admitted in the MSc programme in Animal Science twice a year, with studies starting on 1 September and 1 February.

2.2. Applicants holding a Bachelor's degree from a university abroad may be admitted if the Admission Committee assesses that the scope and content of this degree is equivalent to the Bachelor's degree in Husdyrvidenskab (University of Copenhagen) and Agrobiologi with specialization in Husdyrbiologi- og produktion (Aarhus University).

Applicants with a closely related Bachelor's degree

Applicants with a Bachelor's degree in Biology-Biotechnology (biologi-bioteknologi), Veterinary Medicine (veterinærmedicin) or Biology (biologi) from the University of Copenhagen or other Danish universities may also be admitted if the programme includes:

- Domestic animal nutrition 7.5 ECTS.
- Domestic animal physiology 7.5 ECTS and
- Statistical data analyses 7.5 ECTS.

English language skills

Applicants for whom English is not their first language must submit a document certifying English skills equivalent to Danish high school "Level B" or one of the following language tests: International English Language Testing System (IELTS/Academic) or the Test of English as a Foreign Language (TOEFL). The minimum acceptable score for IELTS is 6.5, and the minimum acceptable score for TOEFL is 560 on the paper test, or 83 on the internet-based test.

Prioritisation of applicants

If the number of qualified applicants to the programme exceeds the number of places available, applicants will be prioritized as follows:

- 1) Applicants with a Bachelor's degree in Animal Science (husdyrvidenskab) from the University of Copenhagen seeking admission by way of direct extension of their completed BSc programme.
- 2) Other applicants with a closely related Bachelor's degree from the University of Copenhagen, other Danish or Nordic universities.

2.3. Motivational Statement and CV. In addition, all applicants must write a motivational statement depicting reasons for applying for admission, how the programme will build on pre-existing knowledge and skills, and describe other relevant experiences. The motivational statement will solely be used for ranking applicants who are qualified for enrolment at the Msc in Animal Science. Applications will be assessed by an admission committee. Selection of the admitted students will be made on the basis of an overall evaluation including bachelor's degree grade average, CV, research experience, any professionally relevant stays abroad and the motivational statement.

2.4. The Bachelor's degree concerned must have been gained within the last five years prior to the start of the first semester of the Master's programme.

2.5. In exceptional circumstances the admissions committee may waive the requirement stipulated above.

§ 3 Description of objectives

Students following the MSc Programme acquire the knowledge, skills and competencies listed below. Students will also acquire other qualifications through elective courses and other study activities.

The MSc programme in Animal Science allows the following profiles:

- General profile in Animal Science.

3.1 Knowledge

- Demonstrate insight into the biological and management determinants of and constraints to animal production and performance (quantitatively and qualitatively) in animal husbandry systems.
- Account for knowledge into the factors influencing animal performance, welfare and longevity as well as maintenance of animal health.
- Demonstrate knowledge on the impact of animal husbandry systems on environmental sustainability in a national and international context.
- Demonstrate knowledge on the socioeconomic importance and impact of the animal sector and principles for regulation of the sector.
- Critically reflect on animal production theory, including performance factors, performance goals, performance functions, criteria of optimality, utility theory and the impact of external environmental and legislative constraints and limitations.
- Account for understanding of the interaction of animal husbandry systems with the surrounding environment and of factors influencing sustainability (economical, environmental and social) of the animal sector in a national and international context.
- Critically reflect on scientific methods, including animal experimentation techniques, used within the subject areas of the program.
- Account for knowledge about the interaction between production of animal derived foods, legislation and society both nationally and internationally.
- Critically reflect on optimal management strategies in animal units for sustenance of animal health, welfare and performance as well as socio-economic and environmental sustainability.
- Legislation rules and constraints related to animal husbandry and animal experimentation.

3.2 Skills

- Handle complex issues in domestic animal science, interpreting information in a systematic and competent way to make informed judgments and design programmes and solutions to problems that may arise, bearing in mind the limitations of existing theories.
- Apply animal performance/production theory, e.g. for monitoring, analysis and planning of actual animal units across different animal species under a utility function with attributes like monetary income, working conditions, animal welfare, performance criteria, product quality and interaction with environment and society.
- Apply biological models and animal experimental techniques to quantify complex life processes underlying animal performance, from cellular to whole body level, considering the impact of genetic, physiological and nutritional factors and interaction with the surrounding close environment.
- Summarize and explain the management basis for optimizing animal husbandry/ production units from an animal welfare, economic and environmental perspective.

- Evaluate and discuss sustainability of and technology use in animal based food production and other systems from different perspectives and make informed judgments and design programmes and solutions to problems that may arise.
- Use relevant scientific principles to develop new solutions for optimization and improvement of performance, health and welfare status of animals, and the quality of their physical/technical environment.
- Participate in informed judgment based policy making to regulate the use of animals and their interaction with environment and society in a national and international context.
- Communicate domestic animal science clearly and effectively to specialist and non-specialist audiences, at a variety of levels, using modern and appropriate information and communication tools in the work process.

3.3 Competencies

- Capacity for independent thought, creativity and rigour in the application of knowledge and skills in work situations or in research.
- Participate in public discussions of the impact of animals and animal production on society (including human physical and mental health) and environment, both from an international and a national perspective.
- Manage complex and unpredictable work and development scenarios within the professional scope of the programme.
- Work independently and effectively on an individual basis, as well as in project teams and interdisciplinary environments, cooperate with relevant partners, discuss solutions and reach consensus.
- Reformulate existing theories, principles and research findings to independently generate new hypotheses and theories.
- Use lifelong learning as a principle to independently evaluate and structure learning processes and assume responsibility for continuous professional development.

Part 2 Modules, instruction, maximum duration of study

§ 4 Modules, instruction

The programme consists of modules in the frame of the block structure of the University of Copenhagen.

4.2. Instruction primarily consists of dialogue-based classroom sessions and exercises augmented by lectures.

§ 5 Maximum duration of study

5.1. Students must complete the programme no more than three years following commencement.

5.2. In exceptional circumstances the study board may waive the deadlines in 5.1 above.

Part 3 Study and exam activities

§ 6

The Master's programme in Animal Science comprises the following courses and exams:

Year 1	1. semester	Block 1	Animals and Sustainability	Restricted electives/Electives
		Block 2	Restricted electives/Electives	Restricted electives/Electives
	2. semester	Block 3	Livestock and Equine Production Science	
		Block 4	Restricted electives/Electives	Restricted electives/Electives

Year 2	3. semester	Block 1	Thesis 45 ECTS Restricted electives/Electives
		Block 2	Thesis 45 ECTS Restricted electives/Electives
	4. semester	Block 3	Thesis 45 ECTS Restricted electives/Electives
		Block 4	Thesis 45 ECTS Restricted electives/Electives

§ 7

The programme is set at a total of 120 ECTS. The programme must include the following elements:

- Compulsory courses of 22,5ECTS (§8)
- Restricted elective courses of minimum 30 ECTS (§11)
- Elective courses of maximum 22,5ECTS (§11)
- A thesis of 45 ECTS (§12)
- Compulsory courses, restricted elective courses and the thesis must sum to at least 97,5 ECTS

§ 8

The programme includes the following courses and exams:

1st semester Block 1

Course unit title: Animals and Sustainability

STADS code: SASA10153U

ECTS: 0 ECTS

Name of exam: Animals and Sustainability

STADS code: SASA10153E

ECTS: 7.5 ECTS

1st semester Block 2

Restricted electives/Electives 15 ECTS

2nd semester Block 3

Course unit title: Livestock and Equine Production Science

STADS code: SASK16002U

ECTS: 0 ECTS

Name of exam: Livestock and Equine Production Science

STADS code: SASK16002E

ECTS: 15 ECTS

2nd semester Block 4

Restricted electives/Electives 15 ECTS

3rd semester Block 1

Thesis 45 ECTS SASK14301U

Restricted electives/Electives

3rd semester Block 2

Thesis 45 ECTS SASK14301U

Restricted electives/Electives

4th semester Block 3 and 4

Thesis 45 ECTS SASK14301 U/E

Restricted electives/Electives

§ 9 Group exams

Written papers can be undertaken in groups with other students if stipulated in the course descriptions at www.kurser.ku.dk

9.2 Group examinations can be done for groups of no more than three students, when stipulated in the course descriptions at www.kurser.ku.dk

9.3 Jointly written papers are permitted provided the contributions made by each member of the group can be identified. A separate and individual grade will be given to each student.

9.4 Oral examination on the basis of jointly written papers should be individual if not otherwise stipulated in the course description at www.kurser.ku.dk, and a student may attend the examination of other students in the group only if his or her examination has been held.

§ 10 Instruction and exam languages

The MSc programme is conducted in English.

§ 11 Elective element

The master's programme includes a compulsory element of elective courses.

The master's programme includes 22,5 ECTS electives. These electives must be in subjects relevant to Animal Science. Approval of the study board is necessary.

Electives can include Projects outside the course scope and Projects in Practice. Approval from the study board is not necessary.

Projects outside the course scope: Projects outside the course scope may be included in the elective sections of the programme. The regulations are described in course description [SASK14201](#) (7.5 ECTS) and [SASK14202](#) (15 ECTS)

Projects in Practice: Projects in Practice may be included in the elective section of the programme. The regulation is described in the course description [SASK14200](#) (15 ECTS)

Restricted elective courses

A minimum of 30 ECTS credits are to be covered by courses from the following list:

SASK19001U/E [Experimental Animal Nutrition and Physiology](#) 7,5 ECTS (block 1)

SASK16001U/E [Parasitic Zoonoses and One health approaches](#) 7.5 ECTS (block 1)

SASK17003U/E [Ethology](#) 7.5 ECTS (block 1)

SASK10137U/E [Nutrition and Management of Companion and Exotic Animals](#) 15 ECTS (block 2)

SASA10156 U/E [Advanced Quantitative Methods in Herd Management](#) 7.5 ECTS (block 2)

SASK16004U/E [Advanced Livestock and Equine Production Science](#) 15 ECTS (block 4)

SASK16003U/E [Quantitative Genomics and Breeding](#) 15 ECTS (block 4)

SASK16007U/E [Domestic Animal Parasitology](#) 7,5 ECTS (block 4)

§ 12 Master's thesis

During the last 4 blocks of the programme students must complete a master's thesis. The thesis must demonstrate the student's ability to formulate, analyse and process issues within a relevant, limited subject in the health sciences in a qualified way.

The MSc programme in Animal Science includes a thesis corresponding to 45 ECTS - see course descriptions for details.

The topic of the thesis is to fall within the academic scope of the programme. The following specific rules apply to the MSc programme in Animal Science:

The main supervisor must be employed at either the Faculty of Science or the Faculty of Health and Medical Sciences at the University of Copenhagen. For students who want to write in Genetics and breeding, please refer to the cooperation agreement with Aarhus University (*" Samarbejdsaftale om undervisning af bachelor studerende på Husdyrvidenskab og masterstuderende på Animal Science, samt forskningssamarbejde. gældende 1. januar 2018"*)

12.2. The Master's thesis may be prepared individually or by groups of minimum 2 and maximum 3 students. The student can choose to prepare the assignment individually.

12.3. When assessing master's (candidatus) theses, emphasis must, in addition to the academic content, also be placed on the student's spelling and writing skills. The scientific content will carry most weight.

12.4 If the thesis is written by a group, the written thesis is assessed in its entirety as a joint scientific product. The written thesis forms the basis of an individual assessment of each students at the oral presentation and subsequent examination. Whether the final assignment is written as group work the student may, where there is an oral defense, choose individual oral defense.

12.5. The Master's thesis is worth 45 ECTS credits.

Part 4 Concluding remarks

§ 13 Transitional arrangements

For students admitted 1. September 2018 and previous:

• Passed the exam in SASK16005E or SASA170004E -7.5 ECTS equivalent to a passed examination in course SASK19001E 3.75 ECTS and SASK19002E 3.75 ECTS.

For students admitted 1. September 2016 and 2017:

SASA170004U/E Experimental Animal Nutrition and Physiology 7,5 ECTS

If students don't want to take the compulsory course SASA170004U/E Experimental Animal Nutrition and Physiology 7,5 ECTS the student have to send an exemption to the Study Board.

SBIK10198U/E Animal Parasitology. The course is offered for the last time in the year 2017/2018.

For students admitted before 1. September 2016:

The programme is (set at a total of) 120 ECTS and must include the following elements:

Compulsory courses, restricted elective courses and the thesis must sum to at least 105 ECTS.

Compulsory courses of 22.5 ECTS (§8)

SASA10152U/E Animal Production Science 15 ECTS or SASK16002U/E Livestock and Equine Production Science 15 ECTS

SASA10153 U/E Animals and Sustainability 7,5 ECTS

Restricted elective courses of minimum 22.5 ECTS from list 1 (§11)

SASA10154 U/E Advanced Animal Production Science 15 ECTS or SASK16004U/E Advanced Livestock and Equine Production Science 15 ECTS

SASA10155U/E Equine Nutrition and Management of Horses 15 ECTS or SASK16004U/E Advanced Livestock and Equine Production Science 15 ECTS

SASK10137U/E Nutrition and Management of Companion and Exotic Animals 15 ECTS

SBIK10212 U/E Aquaculture and Fish Diseases (Not offered)

SASA10156 U/E Advanced Quantitative Methods in Herd Management 7,5 ECTS

LOJK10281 U/E Animals in Society 7,5 ECTS

SASA14001U/E Quantitative Genomics, Breeding and Systems Biology 15 ECTS or SASK16003U/E Quantitative Genomics and Breeding 15 ECTS

Restricted elective courses of minimum 15 ECTS from list 1 or list 2 (§11)

If the course is offered in the previous curricula (list 1 or 2) before 1st September 2016 the student can take the course.

If the course is not offered in the programme the student must apply for pre- approval from the Study Board.

Elective courses of maximum 15 ECTS (§11)

No change according to the previous Curriculum (before 1. September 2016).

A thesis of 30 or 45 ECTS (§12)

If students want to write a thesis corresponding to 30 ECTS the student have to send an exemption to the Study Board.

Students admitted before 1. September 2011 to the MSc programme in Agriculture, with specialization in Domestic Animal Science are transferred to the MSc programme in Animal Science. Transferred students do not have to follow the compulsory course in Animals and Sustainability.

For students admitted in 2013/14 and earlier, the following course may be included in the restricted elective section:

SASA10149 U/E Quantitative Genetics, Genomics and Breeding has from 2014 been replaced by: SASA10157 U/E Quantitative Genomics, Breeding and Systems Biology 15 ECTS.

§ 14 Exemptions from these provisions

In exceptional circumstances, the study board may grant exemptions from any curriculum provisions within the sole remit of the study board.

§ 15 Date of commencement

This curriculum takes effect from 1. September 2019 (the study year 2019/2020).