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Bachelor Animal Sciences
Master Animal Sciences
Wageningen University

Advisory report of the assessment of the existing programmes
8 November 2024

Colophon

Institution and programmes

Wageningen University
Institutional Audit: yes

Bachelor's programme Animal Sciences (Croho 56849)
Master's programme Animal Sciences (Croho 66849)
Location: Wageningen
Mode: full-time

Assessment panel

Stanley Brul, chair
Marloes van Dort, expert
Michael VandeHaar, expert
Ricarda Engberg, expert
Thomas Westerhuis, student member
Linda van der Grijspaarde, secretary

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Summary

On 8 November 2024, the bachelor's programme Animal Sciences and the master's programme Animal Sciences of Wageningen University were assessed. The panel's overall judgement of the two programmes is **positive**.

Intended learning outcomes The bachelor's programme Animal Sciences is an international academic programme in applied animal biology, directed to all types of domesticated animals such as livestock, fish, companion animals and zoo-animals, in any function for human use and wellbeing. The objective of the programme is to educate academic professionals who are able to explore sustainable development options for complex, society driven problems of a wide range of animal husbandry systems. The programme offers two specialisations: the specialisation Animal Management and Care and the specialisation Biological Functioning of Animals. The profile is translated into ten intended learning outcomes.

The master's programme Animal Sciences is a logical continuation of a bachelor's programme in Animal Sciences or an equivalent bachelor's programme such as Veterinary Sciences or Animal Biology. The focus of the programme is to deliver skilled professional animal scientists, well equipped to tackle problems related to sustainable management of animals that are an integral part of society, economy, and culture. The programme offers six specialisations. All specializations are based on a certain area of study in animal sciences, and all address national and global issues. Also, the programme offers an international specialization: the

European Master in Animal Breeding and Genetics. This is a dual degree programme for students that want to specialize in Animal Breeding and Genetics, developed by a consortium of six European universities. The profile is translated into nine intended learning outcomes.

Both programmes are demonstrably unique within the Netherlands and are clearly distinct from other programmes that deal with captive and domestic animals. The intended learning outcomes of the two programmes fit the level and orientation of the programmes and are aligned with the expectations of the (international) professional field. There is sufficient differentiation between the intended learning outcomes of the bachelor's programme and those of the master's programme.

The panel thus concludes that the bachelor's programme Animal Sciences and the master's programme Animal Sciences meet this standard.

Teaching-learning environment The fulltime English-language bachelors' programme has a duration of three years and comprises a total of 180 EC. The fulltime English-language master's programme has a duration of two years and comprise a total of 120 EC.

The contents of the two programmes enable students to achieve the intended learning outcomes. The bachelor's programme and the master's programme have clearly translated the intended learning outcomes into the educational programmes. The bachelor's programme has a broad basis in the first year with general courses in zoology, mathematics, chemistry and statistics, and specific courses orienting to animal sciences. In the second year these are followed by courses on the disciplinary fields in animal sciences and courses of the two specialisations. In the third year, students finalize their programme with electives, a minor and a thesis. The master's programme is individually tailored. Students follow tailored advanced courses within one of six specialisations in their first year, followed by a thesis and internship (business) or research practice (science) in their second year.

The didactic concept of the programmes supports the learning process of the students. The educational formats are adequate. The study of the programmes consists of lectures, working lectures (making assignments under the guidance of a lecturer), practica (practical assignments in a lab room) and self-study. The programmes have excellent facilities specifically in the field of animal sciences, which are sufficiently available to the bachelor's and master's students.

The programmes have a strong teaching team. The various disciplines are well represented by the input of staff from a variety of research groups, as is practical and scientific experience in the various fields of work.

The admission requirements of both the bachelor's programme and the master's programme adequately match the programmes.

The panel thus concludes that the bachelor's programme Animal Sciences and the master's programme Animal Sciences meet this standard.

Student assessment

The programmes have an adequate, solid assessment system and assessment procedures. The system is adequately based on the university wide policy. Frequently used assessment forms are written tests (open and/or closed questions), assignment (reflection) report, oral presentation, other assignment, and performance. Forms of assessment are written tests (open and closed questions), assignments (for example an essay or a reflection) and for one course an oral assessment.

Quality assurance of assessment is ensured by a proactive Examination Board for the programmes. The board, focusing on a group of programmes, show a sufficient knowledge of the individual programmes and its assessment. In the past years, the capacity of the Board is sufficiently increased.

The panel thus concludes that the bachelor's programme Animal Sciences and the master's programme Animal Sciences meet this standard.

Achieved learning outcomes Bachelor's students complete their specialisation with a thesis (12 EC). The intended learning outcome on working in a team is assessed in several courses. The intended learning outcomes on critically evaluating and making judgments are assessed in several courses.

After the bachelor's programme, students have access to several master's programmes. The bachelor's programme allows direct access to the master's programmes Animal Sciences.

With the master's programme thesis (36 EC), the programmes aim to assess seven of the nine intended learning outcomes. The intended learning outcome on conducting a research plan is assessed in one of the other two courses of a thesis track. The intended learning outcome on analysing the side effects of animal husbandry is assessed in the third course of the thesis track. Depending on their specialisation alumni can find work, for example, as researcher at a university or research department, policy adviser on issues related to animal welfare, health or agricultural land use, animal feed product manager, high school biology teacher, project leader of genetic biodiversity programs or advisor in animal behaviour or ecology.

All standards of the NVAO framework have been positively assessed. On this basis, the panel provides a positive recommendation regarding the accreditation of the bachelor's programme Animal Sciences and the master's programme Animal Sciences.

On behalf of the entire site visit panel,
Utrecht, April 2025

Stanley Brul
Chair

Suggestions

Looking ahead, the panel offers several suggestions for consideration, including the following recommendations:

- Pay attention to the design of assessment forms and their expected completion, to ensure alignment with the intended learning outcomes to be assessed and make the rationale for judgements transparent, especially for the thesis.
- Implement a stronger central policy around the teachers' and students' use of AI.
- For the bachelor's programme, monitor whether sufficient information is offered to students about their future job opportunities and whether sufficient work.

Linda van der Grijspaarde
Secretary

Based on reviewing the recent theses of fifteen alumni from each programme, the panel finds that the students achieve the intended level of the programme in the subject area. The programmes prepare students well for the job market and that students end up in positions that fit the intended exit profiles.

The panel thus concludes that the bachelor's programme Animal Sciences and the master's programme Animal Sciences meet this standard.

attention is paid to the practical side of the study. if necessary, expand the amount of information on this in the programme.

- For the master's programme, make clear where ethics is included in the programme and evaluate whether the focus on ethics is sufficient or should be further expanded.
- For the master's programme, ensure a good fit with the prior knowledge of students entering from outside Wageningen University, both in terms of content and, for example, conducting group work.
- For the master's programme, pay attention to the individual performance in group

Introduction

Profile

Wageningen University & Research is a collaboration between Wageningen University and the Wageningen Research foundation. The domain of Wageningen University & Research consists of three related core areas: Food, feed & biobased production, natural resources & living environment, and society & well-being. The mission of Wageningen University & Research is 'to explore the potential of nature to improve the quality of life.' Wageningen University & Research has 7,600 employees and 13,100 students.

In 2023, Wageningen University & Research consisted of one faculty, 5 departments and 95 chair groups. One of the departments is Animal Sciences with 12 chair groups. By 2023, there were 20 bachelor's programmes, 31 master's programmes and 49 Massive Open Online Courses.

The Department of Animal Sciences participates in research and education related to the function, behaviour, and biology of animals. The department focusses on three main areas:

1. Animal welfare in sustainable food systems.
2. Human and animal health in mutual interaction.
3. Animals in biodiversity and ecosystems.

Two programmes of the domain animal sciences are assessed: the bachelor's programme Animal Sciences and the master's programme Animal Sciences.

The bachelor's and the master's programme Animal Sciences are unique in the Netherlands and prepare students in a consecutive order for a future career as an animal specialist. Upon

master's graduation, the animal science specialist has received a fundamental scientific training combined with a critical attitude towards a few aspects (sub domains of Animal Sciences) determining either the role of animals in circular food systems, health and welfare, and biodiverse animal ecosystems on a global scale.

The programmes are offered in English. Ever since the establishment of the bachelor's and master's programme's system, English has been the language of instruction for all master's programmes at Wageningen University. This has also been chosen for the bachelor's programme Animal Sciences. It is a condition for a basic principle of education at Wageningen University: the 'international classroom.' The language of English is defined in the Code of Conduct of the Wageningen University. With this policy, Wageningen University not only aims to ensure that students from all over the world can participate in the instruction and share its knowledge; it also aims to endow graduates with a basic skill that will help them to launch their (international) careers. The panel considers this an adequate explanation for both programmes. In this respect, the panel finds it logical that the Englishlanguage programmes have also chosen a corresponding English title.

The assessment

Wageningen University has commissioned AeQui to conduct the current assessment. For this purpose, AeQui, in collaboration with the programme, has assembled an independent and knowledgeable panel. A preparatory meeting with representatives of the programme has taken place.

The assessment was conducted based on the Accreditation Framework for Higher Education in the Netherlands, according to the programme outlined in Appendix 2. The

institution has a positive institutional audit decision, and therefore four standards were assessed.

Due to personal circumstances the chair was not able to attend the visitation day. He was present and involved in all other stages of the process, including preliminary consultations and the creation of the report. Another panel member temporarily chaired the panel discussions during the site visit. This arrangement was made to ensure continuity and was agreed upon in consultation with all panel members and the programme management.

Recommendations for further development were made during the previous assessment. The programme has acted in response (see Appendix 3). The panel has integrated this follow-up into its considerations for the current assessment.

The panel conducted the assessment independently; the panel received the necessary information to arrive at a judgement. At the end of the assessment, the programme was informed of the findings and conclusions.

This report was sent in draft to the programme; the programme's responses have been incorporated into this final report.

At the initiative of the programme, a development meeting will take place after the visit. The results of this development meeting will not affect the assessment presented in this report.

Intended learning outcomes

Standard 1: The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

Findings

For the individual programmes, the profile and intended learning outcomes are described. The link with the professional field is then described for the programmes together.

Bachelor's programme Animal Sciences The bachelor's programme Animal Sciences is an international academic programme in applied animal biology. The programme is directed to all types of domesticated animals such as livestock (farm animals, cattle, pigs, and poultry), fish (including fisheries), companion animals (horses, dogs, and cats) and zoo-animals, in any function for human use and wellbeing. Examples of such functions are food production, companionship, sports, processing of waste, nature conservation and educational and recreational purposes. The programme is disciplinary oriented and focuses on aspects such as animal health and welfare, genetics, nutrition, environmental and animal ethics issues. Students are particularly trained to become aware of the need for multidisciplinary approaches in animal sciences.

The objective of the programme is to educate academic professionals who can explore sustainable development options for complex, society driven problems of a wide range of animal husbandry systems. The programme offers two specialisations. The specialisation Animal Management and Care has a focus on how to manage the animals humans care for in terms of reproduction, nutrition, housing, and the impact the (human) environment has on animal behaviour, growth, and well-being. The

focus lies on the animal in its environment and society. The specialisation Biological Functioning of Animals has a more physiological focus. In this specialisation students learn sophisticated molecular techniques to unravel the why and how of physiological responses.

The profile is translated into ten intended learning outcomes. There is no specific reference in the intended learning outcomes to the two specialisations.

Master's programme Animal Sciences

The master's programme Animal Sciences is a logical continuation of a bachelor's programme in Animal Sciences or an equivalent bachelor's programme such as Veterinary Sciences or Animal Biology. The focus of the programme is to deliver skilled professional animal scientists, well equipped to tackle problems related to sustainable management of animals that are an integral part of society, economy, and culture. Upon graduation, the animal sciences specialists have received a fundamental scientific training combined with a critical attitude towards all aspects determining sustainable development of animal systems.

The programme offers six specialisations, with each representing a different area of study that address national and global issues. In all specialisations students may focus on an animal species of their interest.

1. Genetics and Biodiversity focuses on the genetic improvement of animals in relation to their environment, by integrating quantitative, biological, and molecular approaches.

Focus can be on genetic management of domestic or wildlife populations to ensure

optimal health and performance, or on the genetic basis of specific behaviours or characteristics in various animal species.

2. Nutrition and Metabolism aims to understand the relation between nutritional demands, diet formulation, digestion and metabolism in animals, and their responses in terms of growth, production, well-being, and waste. The aim is to optimize nutrition to produce safe and healthy foods for human consumption, to safeguard the animal's own health and welfare and to prevent negative effects of nutrition on the emission of waste to the environment.
3. Global and Sustainable Production combines knowledge from different disciplines (such as animal sciences, economics, and social sciences) to study the development of sustainable animal systems across the world. The aim is to guarantee sufficient food supply for humankind in a responsible way, without compromising culture and the environment.
4. Adaptation, Health, and Behaviour studies the effects of the immediate environment on physiological responses of individual or groups of animals, and what these responses mean for animal health and welfare. Immunological status, energy metabolism, thermoregulation, reproduction, and behaviour are major responses of animals being studied in this specialization.
5. Molecule, Cell, and Organ Functioning is a fundamental specialization looking into mechanisms and processes at all levels of physiology: from molecules to organs to whole animals. In this specialization the functioning of animals is studied to acquire animal or computer models for health, disease resistance, growth, and aging.
6. Animal Ecology focuses on the interaction between animal populations and their wider environment, the ecosystem. The

environment can be semi-natural and/or affected by human intervention, i.e. an agro-ecosystem. Mechanisms that underlie the impact of animals on their environment, by food intake behaviour, by interaction with other animals, are studied to understand animal and aquatic ecological systems.

Also, the programme offers an international specialization: the European Master in Animal Breeding and Genetics. This is a dual degree programme for students that want to specialize in Animal Breeding and Genetics, developed by a consortium of six European universities.

The profile is translated into nine intended learning outcomes. There are no intended learning outcomes separately for the specialisations and the European Master, but reference is made to the specific knowledge and skills gained in the specialisation in some learning outcomes, e.g. 3: 'Criticize the sustainable development of animal systems at various integration levels and in an ecological, ethical and socioeconomic context, based on their fundamental and applied knowledge of a chosen specialization.'

The programme is developing a dual master's degree of four years with the Veterinary Faculty in Utrecht, aiming at a start in 2026. Future students can receive joint education leading to two master's degrees, preparing for a career at an academic level in livestock farming with a focus on animal health. Alumni will have a thorough and complete understanding of the functioning of livestock farming from the level of the individual animal, the farm to the sector.

In addition, the programme is considering splitting into three different master's programmes to suit the diverse interests of students around livestock, non-domesticated

animal species (exotic animals), and animals in general (without a specific focus, although horses and pets are of major importance in this group). A working group has been initiated to explore this possibility.

Link with the professional field

To match the demands of the field, the programmes maintain formal and informal contacts with potential employers. In addition to the frequent contacts and meetings of staff with representatives of the professional field, an External Advisory Committee meets biannually to discuss the intended learning outcomes, the content and quality of the programme and the performance of graduates. Recently, the programmes updated membership of the committee. From the documentation, the panel notes that the committee last met in June 2024. Discussions included whether the programme provides sufficient knowledge and skills relevant to the professional field and whether the programme is well aligned with current developments and trends in the professional field.

Considerations

The panel believes that Animal Sciences is a particularly strong and internationally visible discipline at Wageningen University. Both programmes are demonstrably unique within the Netherlands; they are clearly distinct from other programmes that deal with captive and domestic animals. The panel welcomes the broad, integrated profile of the Animal Sciences bachelor's and master's programme.

The panel assesses that the intended learning outcomes of the two programmes fit the level and orientation of the programmes and are aligned with the expectations of the (international) professional field. According to

the panel, there is sufficient differentiation between the intended learning outcomes of the bachelor's programme and those of the master's programme. The latter are clearly formulated at a higher level.

The panel appreciates the programme's good contacts with the professional field. The programmes align their objectives and curricula with the professional field through informal contacts with stakeholders and annual consultations of their External Advisory Committee. The panel notes that the programme's good relations with the professional field enable it to continuously monitor current developments and incorporate them into the programme's profile and programme.

The panel highly appreciates plans for future variants of the programmes, such as a dual degree with a professional bachelor's programme. At the same time, the panel recommends not losing sight of the fact that the current bachelor's programme would also benefit from a more practical focus, in addition to its excellent academic signature.

Regarding the bachelor's programme, the panel notes the following. The programme has a strong, broad knowledge base that introduces students to the different components of the Animal Sciences domain. The intended learning outcomes are in line with the broad, integrated profile of the bachelor's programme. There is sufficient attention to research skills, underlining the research-based nature of the programme. The focus on building teamwork skills is good. The panel appreciates the attention to skills in the intended learning outcomes and involving the socioeconomic and ethical context in decision making. The panel thus concludes that the programme has

followed the previous panel's recommendation from 2018, which indicated to include research integrity as a topic in the intended learning outcomes. The panel suggests that the intended learning outcomes should give more meaning to the specific profiles of the two specialisations, as there are clear differences between the two in addition to the general broad base that bachelor's students receive.

Regarding the master's programme, the panel notes the following. The profile of the programme is relevant and the specialisations cover important aspects of the domain. As with the bachelor's programme, following the advice of the previous review panel, the programme has addressed ethics in the intended learning outcomes. Like the comment on the intended learning outcomes of the bachelor's programme, the panel suggests that the profiling and specific skills of the specialisations and the European Master could be more explicitly reflected in the intended learning outcomes.

Taking these considerations into account, the panel assesses that the bachelor's programme Animal Sciences and the master's programme Animal Sciences meet this standard.

Teaching-learning environment

Standard 2: The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

Findings

The academic year consists of six periods. Period 1,2,5 and 6 comprise eight weeks of classes, time for self-study and the exam week. In these periods students of all programmes often follow two courses worth 6 EC each. Periods 3 and 4 entail of four weeks in which both the lectures and the exams take place. In these periods students usually follow one course worth 6 EC.

The curricula and teaching-learning environment of the bachelor's programme and the master's programme is discussed separately. General information is then given for the two programmes on admission criteria and staffing.

Bachelor's programme Animal Sciences The English-language fulltime bachelors' programme has a duration of three years and comprises a total of 180 EC. The programme has a broad basis in the first year with general courses in zoology, mathematics, chemistry and statistics, and specific courses orienting to animal sciences. In the second year these are followed by so called 'pre-Master' courses (the 'toolbox' of all disciplinary fields in animal sciences) and two specialisations: Animal Management & Care and Biological Functioning of Animals. In the third year, students finalize their programme with electives, a minor, go abroad ('Broaden your Horizon') and a thesis.

It is clear from the student chapter and interviews that students appreciate the broad programme, especially from the second year onwards. Internship options in the first year are also greatly valued. The student chapter shows that students perceive some courses as

intensive or advanced, while others are more basic. Sometimes many different topics are covered in one course; the students perceive this as overwhelming.

The programme consists of lectures, working lectures (making assignments under the guidance of a lecturer), practica (practical assignments in a lab room) and self-study. Students value the opportunities to get practical lab experience. Practicals are usually hands-on and give students opportunities to develop their skills. Students would like to be offered a variety of excursions to possible future employers (not only farms) to be well prepared for their future.

Some changes have been made to the programme in recent years. Since 2019, the Skills Academy is part of the programme. Students reflect on their skills throughout the programme. From September 2024, this component has been strengthened. Based on findings that students are deficient in quantitative skills, a new third-year course was launched in this academic year.

Master's programme Animal Sciences The English-language fulltime master's programme has a duration of two years and comprises a total of 120 EC. The study programme is an individual tailor-made thesis-oriented programme. Students follow two or three tailored advanced courses within a thesis track within one of six specialisations in their first year, followed by a thesis and internship (business) or research practice (science) in their second year. Electives can be chosen from a broad variety of courses to complement the programme.

Additionally, students work in groups on research skills or professional skills. Thesis,

internship, and research practice is supervised by research staff from a chair group, where the research profile of the supervisor aligns with chosen thesis track.

6 to 9 students per year choose for the European Master in Animal Breeding and Genetics. They follow their first year at Wageningen University, and the second year at one out of three partner universities (Saint Louis University, Norwegian University of Life Sciences or BOKU University of Natural Resources and Life Sciences). They are registered to the relevant master's programmes at both universities and receive two master's degrees after successful completion of the programme. At Wageningen University, students are registered to the master's programme Animal Sciences.

It is clear from the student chapter and interviews that students appreciate being able to follow their own interests; they experience great freedom to plan and shape their own master's programme. International students in particular experience a lack of guidance and information about future opportunities. According to students, there is a lack of projects for future orientation involving companies. Students would also like more practical experience during their studies. Another related issue is that it is not clear to many students whether they can do a practical instead of a research internship in their masters. Students prefer to gain practical knowledge in their internship also for future orientation.

Admission requirements

Students are admissible to the bachelor's programme with a vwo diploma with the profile Nature and Technology with Biology, the profile Nature and Health or Economy, the profile Society with Chemistry and Biology or the profile Culture and Society with Chemistry,

Biology, and Mathematics A or B. There are opportunities for admission based on other diplomas. For example, there is the possibility for admission of students aged twenty-one or older through the so-called Colloquium Doctum.

For the master's programme Animal Sciences, the entry requirement is a bachelor's degree in animal sciences, a bachelor's degree in biology (with CROHO 56860 or 59325), or equivalent. The norm for this equivalence is an assessment of the student's expertise in a list of topics. The expertise will be weighed by the Admission Board per individual application.

Every year, about 130 to 140 students enter both the bachelor's programme and the master's programme.

Staff

The programmes present a list of one hundred lecturers teaching in one or both programmes. The lecturers come from the various chair groups of the Department of Animal Sciences. Most lecturers hold at least the UTQ or are in the process of obtaining the UTQ.

It is clear from the student chapter and interviews that students are positive about the staff. According to the bachelor and master students, teachers are knowledgeable and have much practical experience in the field. They, as well as study advisors, are easily approachable and have close contact with students. Staff puts effort in remembering students' names. There is a flat hierarchy. Teachers support students with learning disabilities.

Considerations

The panel has established that the contents of the two programmes enable students to achieve the intended learning outcomes. The bachelor's

programme and the master's programme have clearly translated the intended learning outcomes into the educational programmes. Innovations in Animal Sciences are included in the programme. The panel notes that the curricula are sufficiently coherent, while at the same time giving students a lot of freedom in designing their individual study paths. The scope of both the bachelor's and master's programme are clearly international, matching the profiles of the programmes. In the eyes of the panel, the admission requirements adequately match the programmes.

In the eyes of the panel the didactic concept of the programmes structures the programme and supports the learning process of the students. The educational formats are adequate. The panel notes a particularly good atmosphere. Students and alumni indicate that they find the lecturers approachable and helpful. According to the students, there is no unreasonable hierarchy, and the teachers and staff have genuine interest in students.

The previous panel in 2018 encouraged the programmes to further explore the use of innovative digital teaching methods, which stimulate more meaningful interaction in class, and to also make use of group work, which allows students to learn with and from one another. The past years the number of interactive (digital) teaching methods has increased. The programmes note that this nowadays gives the challenge to promote student willingness to participate in classroom settings. The panel appreciated the programmes' efforts to allow students to collaborate and learn in small groups, in addition to the digital innovations, for example in small scale tutorials.

The panel understands that the university has opted for a format of six periods per year, with

a short third period, so that minors, for example, fit well with teaching elsewhere. However, the panel notes that for some courses, the third period is on the short side to fully grasp the material. The panel suggests that the programmes carefully evaluate whether courses are suitable for such a brief period and, if necessary, spread courses over two periods.

The panel observed that the programmes have a strong teaching team. The various disciplines are well represented by the input of staff from a variety of research groups, as is practical and scientific experience in the various fields of work. The panel observes that the staff is also qualified for the execution of the programme in terms of educational expertise. The panel notes that all staff members have adequate English language skills for teaching, which is partly ensured by appropriate policies on teachers' English-speaking skills. The panel appreciates the opportunity to get an appointment with an emphasis on teaching, which increases the number of lecturers with a focus on developing and delivering teaching.

The previous panel in 2018 noted that the increasing workload of staff members required monitoring. The panel strongly recommended that staff numbers reflect the growing student numbers to maintain quality of the programmes. The programme replies that when course evaluations and discussions with students indicate that workload pressure affects quality standards of a course, measures are taken to reduce workload that might affect the richness of a course (e.g., a demonstration practical being deleted). The present panel discussed the perceived workload with teachers. Some indicated that they sometimes still experience a high workload, for example when teaching on early evenings or in administrative tasks. Improvements have been made in

supporting administrative tasks, teachers indicated. As the perceived workload can still occasionally be on the high side for some, the panel recommends continuing to monitor whether the workload for teachers is acceptable and adjusting where necessary.

The tutoring and provision of information to students are conducive to study progress and tie in with the needs of the (international) students and students with functional disabilities.

The panel was impressed by the specific facilities available for the Animal Sciences domain. The panel visited some of the Animal Research Facilities CARUS during the visitation visit. The panel learned from the interviews that students also have the opportunity to learn about these facilities and conduct work here in the education programme. There is also scope for bachelor students to learn about the facilities, the panel noted. The high quality of facilities is valued by the students.

The panel has some specific considerations regarding the bachelor's programme. The committee is positive about the impact of the dedicated focus on bachelor skills and the expansion of statistics and research integrity education in preparation for doing academic research. The panel is positive about the offered group work, for which students are well prepared.

Students indicate that they would like to receive more information about job opportunities. Senior students in particular mention that they have limited insight into what positions they are being trained for. Younger-year students already receive this information better. The panel recommends monitoring whether

sufficient information is offered to students about their future.

As mentioned in standard one, the panel welcomes the programme's aim to teach students to make judgements based on knowledge of socio-economic and ethical aspects, among others. The panel notes that the programme's focus on this learning objective could be increased and recommends that the programme look at where this could be built in.

The previous panel in 2018 stated that improvements for the bachelor's programme include adopting a more proactive role in giving students early exposure to the practical aspects of animal husbandry. The panel also recommended that - where possible - the programme creates opportunities for bachelor's students to do experimental work as part of their thesis, which is currently not always the case. The current panel notes that the programme has made progress on the 2018 recommendations but recommends that the programme continue to make improvements on including practical training, in addition to the academic training.

The panel also has some specific considerations regarding the master's programme. The panel appreciates the opportunity for students to put together a programme to suit individual interests, with the examination board ensuring that the individually composed programmes are coherent and that the intended learning outcomes are achieved.

Students receive good guidance from the study advisor in putting together their individual programme. However, for some internationals, the help is on the late side; they are overwhelmed at the start of the programme. The panel notes that study advisors proactively

contact students to offer help well before the start of the programme, but this does not always seem to be taken up. The panel suggests looking at whether guidance for internationals (in particular) could be tightened so that they start the programme well prepared. Of course, the panel understands that the responsibility also lies with the student themselves to take it up properly.

The interviews reveal that while there is a focus on ethics in the master's programme, it is too limited for some students. There also seems to be a lack of overview of where ethics is part of teaching. The panel recommends evaluating whether the focus is sufficient and giving students a clearer picture of where ethics is embedded in the programme, both in the bachelor and master programme.

Students in the master's programme have a lot of flexibility in shaping their programme to their own interests, which students appreciate. The panel finds this a positive point, but at the same time notes that interaction between specialisations is limited. Students would appreciate more time to learn from each other and keep abreast of activities in other specialisations. The panel suggests having students, for example, present to each other at an end-of-year symposium, possibly as part of Academic Skills, for example by giving a presentation to a wide audience of non-specialist scientists.

Group formation (both between specialisations and within a specialisation) could also be better. The panel challenges the programme to look for ways to strengthen both group formation and collaborative learning. Expanding the collaboration between different disciplines could increase the focus on intended learning

outcome 8, on working together in multidisciplinary teams.

For students who also took the bachelor's programme at Wageningen, the connection to the master's programme is excellent. For students coming from elsewhere, the connection is sometimes not very good. The panel recommends close monitoring of whether the assumed prior knowledge is present. This concerns not only the content, but also the didactic approaches, for example around group work. As in the bachelor's programme, the master's programme includes a lot of group work. The panel appreciates this; it fits well with the goals to be achieved. In the master's programme, however, not all students are well prepared to do group work optimally. International students in particular need more preparation and guidance. The panel asks the programme to pay attention to this.

The panel appreciates the European Master in Animal Breeding and Genetics. This programme offers students a rich learning environment. While the content of this programme is accurate, the panel does call attention to monitoring carefully whether students were eventually offered all intended learning outcomes and whether these were assessed at the right level. Because of the offerings at different universities, the panel thinks that it is extra important.

In summary, according to the panel, the curriculum, faculty, and facilities for all two programmes form a cohesive, inspiring learning environment. Taking these considerations into account, the panel assesses that the bachelor's programme Animal Sciences and the master's programme Animal Sciences meet this standard.

Student assessment

Standard 3: The programme has an adequate system of student assessment in place.

Findings

The bachelor's programme and the master's programme present an overview of the forms of assessment per course. The intended learning outcomes to be assessed are indicated for each assessment. This overview shows that frequently used assessment forms are written exams (open and/or closed questions), reports or other written (group) assignments, presentations, lab practicals and contribution/participation.

To properly assure the quality of interim examinations and final examinations, there are institution-wide guidelines and instructions for assessment. These guidelines and instructions include the following: the method of testing whether the student has met the learning outcomes; the procedures for testing in individual teaching methods; the role of assessment strategies and assessment criteria in the examination per course; and the supervision on these aspects by the Examiners and the Examining Boards.

Wageningen University & Research has four Examining Boards: Life Sciences, Social Sciences, Environment and Landscape, and Technology and Nutrition. Each of the boards is responsible for the examination arrangements for one of the four groups of study programmes. Joint degrees have their own specific Examining Boards. The two programmes in the Animal Sciences domain fall under the examination board Life Sciences.

This board consists of a chair, a secretary, a second secretary, six members employed by the University and one external member (employed by Utrecht University).

The Examining Board evaluates the sets of study components, approves exemptions, and determines the results of the final evaluations of the study programmes. The Examining Board is also responsible for assuring the quality of interim examinations and final evaluations. The secretary is the contact person for all Examining Boards. The Examining board periodically consults with the programme directors.

Considerations

The panel judges that the programmes have an adequate, solid assessment system and assessment procedures. The system is adequately based on the university wide policy, the panel notes. Multiple adequate assessment types are implemented in the programmes: from written exams to (individual and group) assessments. The panel believes that the variety of assessment formats allows students to develop the necessary knowledge and skills.

The panel understands that the programme is considering not only assessing attendance at practicals, but also actual student performance at these practicals will be assessed. The programme is looking to employ appropriate examiners for this purpose. The panel appreciates this expansion of assessment, with a greater focus on students' practical work.

According to the panel, the procedures for assessing the final product of the programmes, the thesis, are clear and the assessment itself is sound. However, the panel notes that the feedback on assessment forms of these is not always of the same level. In several cases, for example, the feedback is limited or only mentions points for improvement, so that the grounds for the judgment are not in line with the outcome from the completed Rubric. The panel observes that the programmes pay attention to the justification on the forms and recommends that the programmes continue this attention, for example in calibration sessions with each other to assess whether the justification for a judgement can also be followed by outsiders.

Achieved learning outcomes

Standard 4: The programme demonstrates that the intended learning outcomes are achieved.

As mentioned, the panel appreciates the frequent use of group work, which is an appropriate assessment of the intended learning outcomes. Bachelor students are well equipped in the skills courses to participate in group work as an assessment form. This could be done better for master students. Attention to individual performance in group work is needed.

There is a lot of focus on the use of AI in student products within the university. Guidelines are in use, but programmes would benefit from a stronger central policy, according to the panel.

The programme uses assessment forms prepared centrally in the university, for example when assessing the internship. Based on the documentation, the panel finds that these general forms might not always fit well with the objectives to be assessed. The panel

recommends allowing the possibility of adaptation when this is necessary for alignment with the learning outcomes.

According to the panel, quality assurance of assessment is ensured by a proactive Examination Board for the programmes. The board, focusing on a group of programmes, show a sufficient knowledge of the individual programmes and its assessment. Since the previous accreditation, the capacity of the Board is sufficiently increased, and its agency in relation to the rather autonomous Chair Groups is improved. For ensuring the quality and uniformity of assessment in general, the panel appreciates the increased use of calibration sessions in which assessors participate.

Taking these considerations into account, the panel assesses that the bachelor's programme Animal Sciences and the master's programme Animal Sciences meet this standard.

Findings

Bachelor's programme Animal Sciences Students complete their specialisation with a thesis (12 EC), a short research project that aims to integrate all (disciplinary) knowledge and skills of the previous years. The bachelor thesis is an individual project. The intended learning outcome on working in a team is assessed in several courses, for example the course Skills Academy and Personal Assessment. The intended learning outcomes on critically evaluating and making judgments are assessed in several courses, for example Systems Approach in Animal Science.

The thesis consists of an individual assignment report (60%), performance (30%) on the research competence and an individual assignment (10%) on the oral presentation and defence of the thesis.

After the bachelor's programme, students have access to several master's programmes. The bachelor's programme leads directly to the master's programmes Animal Sciences. Besides the programmes to which students have direct access, there are some opportunities to move on to other master's programmes, such as veterinary medicine.

Master's programme Animal Sciences With the master's programme thesis (36 EC), the programmes aim to assess seven of the nine intended learning outcomes. The intended learning outcome on conducting a research plan is assessed in one of the other three courses of a thesis track. The intended learning outcome on analysing the side effects of animal husbandry is assessed in the third course of the thesis track.

The thesis consists of a performance (40%), a research report (50%), an oral presentation and an oral defence (both 5%). All components must be assessed with a 5.50 for a satisfactory final grade.

Depending on their specialisation alumni can find work, for example, as researcher at a university or research department, policy adviser on issues related to animal welfare, health or agricultural land use, animal feed product manager, high school biology teacher, project leader of genetic biodiversity programs or advisor in animal behaviour or ecology. Almost 40% start a job abroad after graduation,

in the context of development cooperation, as a researcher or from the industry.

The second year of the European Master in Animal Breeding and Genetics consists of 30 EC in depth courses and a 30 EC thesis, both at a partner university.

Considerations

To form an opinion about the final level of the students, the panel read recent theses of fifteen graduates per programme and viewed the assessments of these works. The selection included theses with a variety of topics and a distribution between lower and higher grades. Theses from all specialisations were considered, including theses from the European Master in Animal Breeding and Genetics. The panel found that all the theses attested to the bachelor's or master's level and the content matches the profiles of the programmes. The quality of the works varies, with the grade given corresponding to the panel's assessment of quality. In general, the panel was pleased with the quality of the work and the accuracy of their assessments. Adequate research ability is evident in all theses. This finding is in line with the strong research profiling of the bachelor's programme and the master's programmes.

The panel notes that all bachelor's theses are of the right level, but some theses show that it is not easy for students to distribute information across the different sections in the thesis. Also, in some cases, the hypothesis is not clear enough. The panel advises the programme to strengthen preparation and guidance on these points.

From surveys and conversations with alumni, the panel concludes that the master's programme prepares students well for the job market and

that students end up in positions that fit the intended exit profiles.

Taking these considerations into account, the panel assesses that the bachelor's programme Animal Sciences and the master's programme Animal Sciences meet this standard.

Attachment 1: assessment panel

Prof.dr. Stanley Brul chair
Chair Molecular Biology and Microbial Food Safety, UvA

Marloes van Dort
Policy advisor Erasmus School of Health Policy & Management, EUR

Ricarda Engberg
Associate professor, Aarhus University

Michael VandeHaar
Professor Animal Sciences at Michigan State University

Thomas Westerhuis Student-member
Student MSc Biomoleculair Sciences RUG

Linda van der Grijspaarde supported the panel as a certified secretary.

All panel members have completed and signed a statement of impartiality, and these have been submitted to NVAO.

Attachment 2: site visit program

Friday 8 November 2024

Time	What	Who
8.30	Arrival panel	
9.00-09.45	Management of programmes	Programme Director Dean of Education member Board of Education chair PC Animal Sciences secretary PC Animal Sciences student member PC Animal Sciences
	Break	
10.00-10.45	Students BAS	student cohort 2021 student cohort 2022 student cohort 2022 student cohort 2022 student cohort 2024 student cohort 2024

10.45-11.30	Students MAS + alumni	student cohort 2024 D student cohort 2022 C student cohort 2023 B student cohort 2023 B alumnus, NVWA alumnus, PhD Adaptation Physiology (ADP)
	Break	
11.45-12.30	Teaching staff BAS and MAS	staff member Human and Animal Physiology staff member Animal Nutrition staff member Animal Production Systems staff member Cell Biology and Immunology staff member Human and Animal Physiology staff member Wildlife Ecology and Conservation staff member Adaptation Physiology staff member Animal Breeding and Genomics
12.30-13.30	Lunch and deliberation	
13.30-14.00	Examining Board (EB) + Study advisors	chair EB Life Sciences secretary EB Life Sciences second Secretary EB Life Sciences MAS study advisor BAS study advisor
	Break	
14.00-15.00	Guided tour – Animal Research Facilities CARUS	MAS student
15.00-17.00	Deliberation	
17.00-17.30	Preliminary feedback	All welcome
17.30	Closure of the day - drinks	All welcome

The open consultation took place online prior to the visitation. Nobody had signed up for this.

Attachment 3: Recommendations from previous assessment

The programmes were last visited for accreditation in 2018. The following overview of recommendations from the previous visitation and follow-up by the programme is taken verbatim from the documentation of the programmes. The panel states that the programmes have incorporated the recommendations well. Some recommendations, although already well addressed, could be further developed. Under the various standards, the panel addresses this.

Recommendation previous panel	Actions taken by programmes
<p>An opportunity for further improvement is to specifically address ethical issues in the bachelor's ILOs and to include research integrity as a topic in the bachelor's and master's ILOs that deal with academic and research skills.</p>	<p>These advices have been taken into account in a further development and optimization of the 'Skills Academy' (BAS) and the introduction of a 'quantitative skills' course (BAS; see below), as well as a new course 'Sensor Data in Animal Sciences' (MAS) and some elective courses on Data sciences (MAS, but not exclusively our programme). Next to that we just re-designed the 'Introduction to Animal Sciences' course, to give it a more direct connection to the research areas in Animal Sciences.</p>
<p>Possible improvements for the bachelor's programme include adopting a more proactive role in giving students early exposure to the practical aspects of animal husbandry. The panel would also recommend that - where possible - the programme creates opportunities for bachelor's students to do experimental work as part of their thesis, which is currently not always the case. A recommendation for the master's programme is to pay more attention to labour market orientation and possibly also to a broader range of statistical methods and big data in general.</p>	
<p>The increasing workload of staff members requires monitoring. The panel strongly recommends that staff numbers reflect the growing student numbers in order to maintain quality of the programmes.</p>	<p>The programme agrees on this observation but that this is in fact the responsibility of the chair holders within ASG; whenever course evaluations and discussions with students indicate that workload pressure affects quality standards of a course, the PD discusses potential measures with the chairholder, in order to prevent that measures are taken to reduce workload that might affect the richness of a course (e.g., a demonstration practical being deleted).</p>

<p>There is an adequate number of contact hours and teaching methods are relatively small-scale, but not always as interactive as students would like. The panel encourages the programmes to further explore the use of innovative digital teaching methods, which stimulate more meaningful interaction in class, and to also make use of group work, which allows students to learn with and from one another.</p>	<p>Since COVID (but also before), the number of interactive (digital) teaching methods has increased. This nowadays gives the challenge to promote student willingness to participate in classroom settings. Small scale tutorials, where students feel peer responsibility and work in groups of 4 mostly, are a great tool to exercise case studies, and other components of applying theoretical principles. This has been a topic in our PC and lecturers were invited to share their 'best practices'.</p>
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Attachment 4: reviewed documents

Practical information visit

- 1a. Programme overview and list of participants 08-11-2024
- 1b. Map of the WU campus

General information WU and Programmes:

- 2. Administrative information about the programme(s)
 - 2a. Governance structure and the organization of WU degree programmes
 - 2b. WU Vision for Education 2017
 - 2c. WU Education and Exam Regulation 2024-2025
 - 2d. Assessment Policy WU 2023
 - 2e. Framework for Education Wageningen University 2024-2025
 - 2f. Study Advice Service level commitment 2023
 - 2g. Final Report Animal Sciences accreditation 2018
 - 2h. Student Chapter BAS SWOT
 - 2i. Student Chapter MAS SWOT
 - 2j. Admission criteria BAS
 - 2k. Admission criteria MAS
 - 2l. EMABG Consortium Agreement
 - 2m. Questions to the panel

Documents per standard

Standard 1 Learning Outcomes:

- 3a. Content and learning outcomes BAS
- 3b. Content and learning outcomes MAS
- 3c. Skills profile BAS
- 3d. EAC BAS-MAS
- 3e. Report EAC meeting

Standard 2 Teaching and Learning environment

- 3f. Structure BAS 2023-2024
- 3g. Study Handbook BAS
- 3h. Structure MAS 2023-2024
- 3i. Study Handbook MAS
- 3j. Language of instruction BAS and MAS
- 3k. Teaching staff overview

Standard 3 Assessment:

- 3l. BAS assessment matrix 2023-2024
- 3m. MAS assessment matrix 2023-2024

Standard 4 Achieved Learning Outcomes:

- 3n. Education monitor
- 3o. Dreaming about your Future booklets
- 3p. Alumni MAS factsheet

Selection of courses

- 4a. YAS10306 Introduction to Animal Sciences
- 4b. YAS11803 Dilemma's in Animal Management and Care
- 4c. WEC21306 Introduction to Animal Ecology
- 4d. ADP31306 Sensor Data in Animal Sciences
- 4e. ANU30806 Animal Nutrition and Physiology
- 4f. QVE30806 Modelling Infectious Diseases in Animal Populations

Thesis (selected samples)

- 5a. BSc Thesis Course Guide BAS (YAS80312)
- 5b. Final Assessment form BSc thesis YAS80312
- 5c. MSc Thesis course guide WU
- 5d. Rubric MSc thesis 2023-2024
- 5e. BAS thesis sample
- 5f. MAS thesis sample

Examining Board

- 6a - 6c FBE (Facultair Beleidsoverleg Examencommissies) Annual Reports 20/21, 21/22 en 22/23
- 6d. Report thesis review BAS of the Examining Board EBLs
- 6e. Appendix IV Findings EBLs thesis review BAS
- 6f. Report thesis review MAS of the Examining Board EBLs
- 6g. Appendix IV Findings EBLs thesis review MAS

Programme Committee

- 7a - 7c PC annual reports and plans 20/21, 21/22 en 22/23
- 7d. Final report animal ethics committee
- 7e. Final report working group quantitative skills

7f. Proposal structure MAS programme working group

7g. Proposal structure ASPHP working group

