Norwegian University of Life Sciences
Faculty of Veterinary Medicine

2024

Self-evaluation report
for periodic PhD programme evaluation

Veterinary Science

VET PhD Day 2024. Photo: Camilla Wiik Gjerdrum – NMBU

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1 Introduction

1.1 Aim

NMBU's Faculty of Veterinary Medicine is Norway's only veterinary educational institution and educates veterinarians, veterinary nurses and doctoral students in Veterinary Science. Our research encompasses a broad range of topics within veterinary medicine and related biomedical disciplines, from basic sciences to applied and clinical projects. PhD candidates form an integral part of these research activities and the reason why we have a PhD programme is two-fold: Equally important outputs are both *research* of high quality, as documented by scientific publications and academic theses, and new *researchers* capable of taking on scientific careers to fill societal needs within Academia and the public and private sectors. The PhD programme at the Faculty of Veterinary Medicine (VET) aims to produce high-quality research and high-quality doctors for the future.

The purpose of this periodic evaluation is to evaluate the quality of the PhD programme at VET with a special focus on recruitment, education and scientific research performed in PhD projects. The evaluation will consist of a self-evaluation report and a site-visit by a panel of external experts.

1.2 National importance

The Norwegian School of Veterinary Science (NVH) was established in 1935 as a specialized university institution after more than a hundred years of deliberations [1] and given the task to provide scientifically grounded education of veterinarians and to advance and promote research within the areas of veterinary science. This continues to be our core mission and we remain the only institution in Norway that offers education in veterinary science at the master's and PhD level.

From the start we have been co-located with the Norwegian Veterinary Institute (NVI). NVI is the Norwegian national research institute for veterinary medicine, and they provide diagnostics, monitoring, risk assessments and research in mammals and fish. We have extensive collaboration with NVI, and together we conduct the significant portion of national research focused on veterinary issues. Farmed fish, especially salmon, is more broadly researched in Norway, and although we have a significant presence, we do not hold a monopoly on aqua medicine.

1.3 Programme history

The Norwegian School of Veterinary Science (NVH) was granted the authority to award doctoral degrees within veterinary science (*doctor medicinae veterinariae*, *dr.med.vet.*) with the act *lov 29. mai 1953 nr. 7 om Norges veterinærhøgskole* (Act Concerning the Norwegian School of Veterinary Science) and the first degree was awarded in 1959. When licentiate degrees were introduced in Norway in 1973, NVH was given the authority to award a licentiate degree in veterinary science (*licentiatus medicinae veterinariae*, *lic.med.vet.*), but this degree was replaced by a doctoral degree, *dr.scient.*, when the system for academic degrees was reformed in Norway in 1981 [10]. With the 2003 Quality Reform all doctoral degrees resulting from organized doctoral programmes in Norway were to award the degree *philosophiae doctor* or PhD, which has been the only degree awarded since 2008.

Where the *dr.med.vet.* degree initially was a traditional doctoral degree representing a large independent work from the candidate, the licentiate and later *dr.scient.* degree was part of a more organized research education. This is the degree which has evolved into our current PhD programme, although eventually *dr.med.vet.* degrees were also awarded from this programme to candidates with a *cand.med.vet.* degree.

NVH and later VET has since 1990 also had the authority to grant the *doctor philosophiae*, *dr.philos.*, doctoral degree, however since this degree is only awarded for scientific work done outside of an organized doctoral programme it is not included in this self-evaluation and our few *dr.philos.* are not counted in tables and figures.

In 2014 The Norwegian School of Veterinary Science and the University of Life Sciences (UMB) merged to form The Norwegian University of Life Sciences (NMBU). The PhD Programme in veterinary science was continued as part of the new university's PhD portfolio and has since the merger been adapted to fit in with the other PhD programmes the new university offers. This is an ongoing process, especially as the Faculty of Veterinary Medicine (VET) relocated to the university's campus at Ås only in spring 2021.

1.4 About the periodic PhD programme evaluation

NMBU's quality assurance system for PhD programmes includes both an annual and a periodic evaluation of each of the PhD Programmes. The procedure is defined in NMBU's *Routine for annual and periodic PhD Programme evaluation* [2]. Prorector for Research and Innovation has the overall responsibility for the periodic evaluation, but the faculties each administer the process. The purpose of the periodic evaluation is to have an external evaluation committee assess the quality of and the quality assurance framework for the PhD programme to ensure that the PhD programme meets national and international standards as well as to give feedback on potential areas for improvement.

This evaluation is part of the quality assurance Norwegian universities are required to maintain as part of their institutional accreditation with NOKUT (Norwegian Agency for Quality Assurance in Education). In addition, the Faculty Board of the Faculty of Veterinary Medicine has identified the quality of the following areas as being of particular interest for this evaluation [3]:

- Research
- Education
- Recruitment

Most of the data collection and writing for this report was done by the PhD administration. Data on funding sources, completion rates and time-to-completion were accessed from "Innsikt" – NMBU's operational data visualisation tool. Data from our faculty was bench-marked against national data from Statistics Norway (ssb.no) for completion rates only, as other parameters were not available at the national level. The sources of data are indicated for all tables and figures except for those compiled manually for this report.

After completing the descriptive parts of the self-evaluation report, a group of employees and PhD candidates at VET participated in a SWOT-analysis of the PhD programme, with special emphasis on the quality of the recruitment process, coursework, and the scientific research performed in PhD projects. Twelve participants were appointed by the department heads, including five academic staff and seven PhD candidates. In addition to these twelve participants, there were three representatives from the PhD administration. The gender distribution was 50/50. Prior to the meeting, an agenda, and relevant materials such as the self-evaluation report, current course portfolios, and recruitment strategies were distributed to participants. The meeting started with an introduction to the SWOT analysis method, emphasizing its role as a strategic planning tool to evaluate internal and external factors affecting whether goals are achieved. The fifteen participants were divided into four groups and asked to identify strengths in PhD research, coursework, and recruitment. They then identified weaknesses, before focusing on potential internal and external threats to the PhD programme. The main conclusions are presented under relevant sections of the self-evaluation report, together with an evaluation from the faculty.

The final stage of the periodic evaluation is an independent evaluation by an external committee based on the self-evaluation report and a site-visit to be performed in the fall of 2024.

1.5 Organization and responsibilities at NMBU

The Norwegian University of Life Sciences (NMBU) is a public university. The Ministry of Education and Research is responsible for the universities of Norway. While the Chair and three members of the University Board are appointed by the ministry, the five employee-representatives and two student representatives are democratically elected. Figure 1 shows a simplified organizational chart for NMBU.

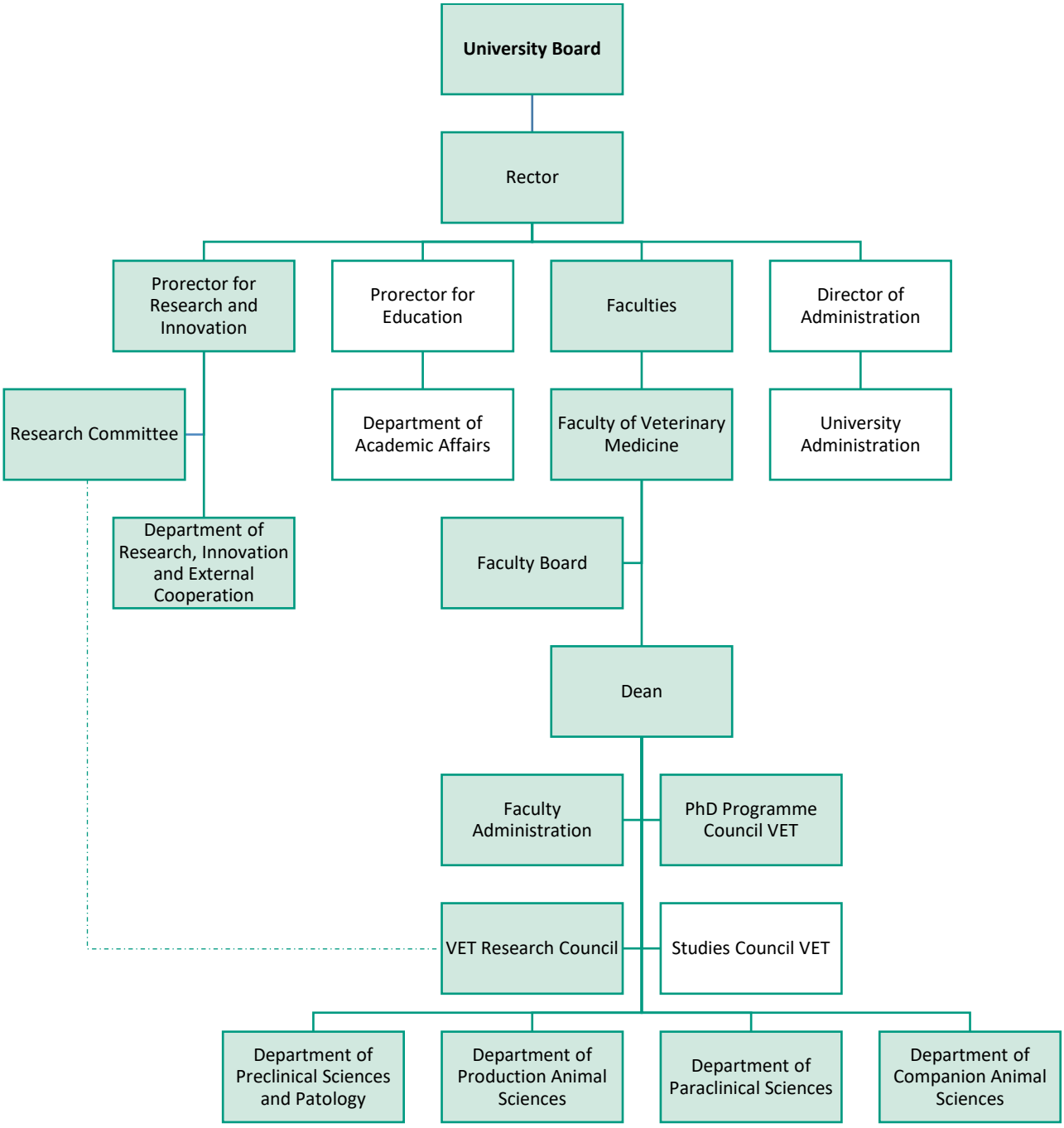

Figure 1: Simplified organizational chart for NMBU. Boxes with a light green background colour are in some way involved in the PhD Programme.

The Rector is employed on four-year terms and cannot serve for more than two consecutive terms. The Rector is responsible for running the university day-to-day in accordance with the plans and strategies

determined by the University Board. The Rector appoints two prorectors, one in charge of matters related to research and innovation and the other in charge of matters related to education.

NMBU consists of 7 faculties, of which the Faculty of Veterinary Medicine has the most staff members. The faculties are organized directly below the Rector with the Dean and the Faculty Board as leadership of the faculty. The Faculty Board is primarily responsible for strategy, organization, and budget, while the Dean is responsible for the day-to-day operations of the faculty.

The Faculty of Veterinary Medicine is organized into four departments, each with a Head of Department and several underlying sections or units. The faculty also has the Faculty Administration led by the Head of Administration, with the sections HR, Finance, and Academic and Research Administration, as well as general support personnel. A simplified organizational chart is shown in figure 2. Most of the faculty of Veterinary Medicine is now collocated with the rest of NMBU in Ås outside Oslo (Campus Ås), however the Section of Small Ruminant Research and Herd Health at the Department of Production Animal Sciences is located close to Sandnes in the west of Norway at their own campus, Campus Sandnes. The research centre SEARCH, cooperating with the University of Stavanger and Stavanger University Hospital, is also located at Campus Sandnes.

The division of responsibility for the PhD programmes is given by the *Governance Regulations for the Norwegian University of Life Sciences (NMBU)* adopted by the University Board [4], the *Regulations for the Philosophiae Doctor (PhD) degree at the Norwegian University of Life Sciences* [5] and by the *Supplementary provisions to NMBU's regulations for the degree of Philosophiae Doctor (PhD) for the Faculty of Veterinary Medicine* adopted by the Dean (Appendix V).

The University Board has the ultimate responsibility for PhD education at NMBU. Managing the university's PhD education falls within the responsibility of the Prorector for Research and Innovation, and the Department of Research, Innovation and External Cooperation (FIE) is responsible for coordinating the different PhD Programmes and coordinating development of shared resources such as forms and procedures, largely through contact with the faculty PhD Advisors. FIE prepares an annual report on the PhD education at NMBU for the University Board, based in part on the annual reports from each of the faculties on their PhD Programmes. The NMBU Research Committee is headed by the Prorector for Research and Innovation and has representatives from each faculty. It advises the Prorector on matters related to research including the PhD education. The Chair of the Research Committee VET represents the faculty in the NMBU Research Committee.

The responsibility for each PhD Programme is largely delegated to the individual faculties. The Dean is ultimately responsible for everything at the faculty, and the Dean has all decision-making authority for the programme, though many responsibilities are further delegated. The PhD Programme Council advises the Dean on matters that fall within their purview and is responsible for the academic management and the PhD Programme in general.

The division of responsibility at the faculty is described in full in Section 3 of the Supplementary provisions, but the gist is that:

- The PhD Programme Council is responsible for admission and courses.
- The Head of Department is responsible for managing the supervisors and candidates, and usually chairs the public defence.
- The Chair of the PhD Programme Council is responsible for matters related to the evaluation of the thesis.
- The Dean resolves disagreements and gives the faculty's final approval that the degree has been completed.

Note that *Head of Department* above means the Head of the department where the candidate is registered. This is, with few exceptions, the department where the main supervisor works.

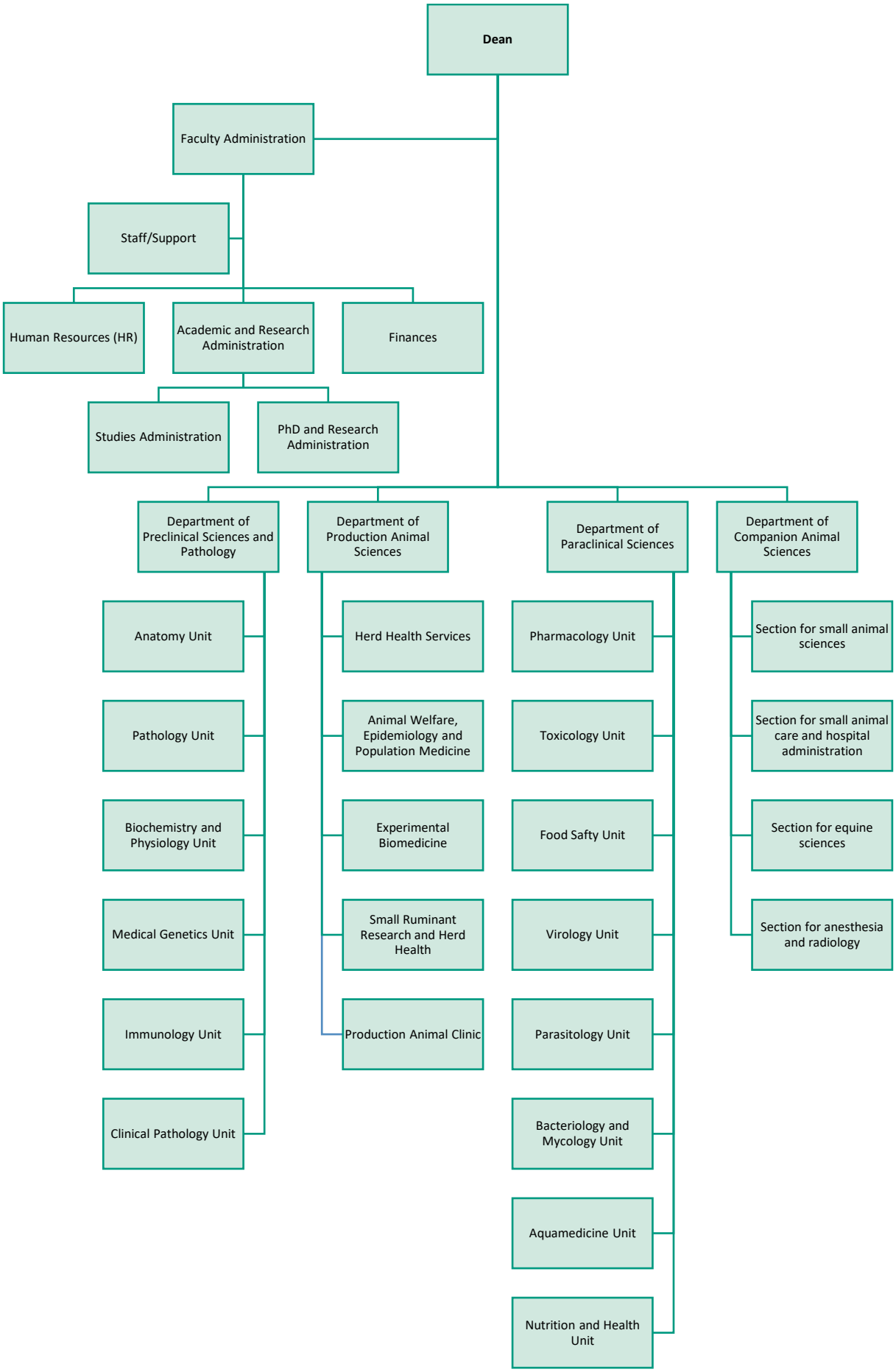

Figure 2: Simplified organizational chart for the Faculty of Veterinary Medicine

1.5.1 Note on reorganisations of the faculty

The faculty has undergone two major reorganisations since the merger into NMBU in 2014. The reorganizations are of minor importance to the current periodic evaluation, but we have included this note to address the old terms that may be present in various data sources.

In the period 2014 to 2016, the departments that make up the faculty were, along with other departments at NMBU, more independent and akin to today's faculties. Our departments were nominally part of a larger faculty, the Faculty of Veterinary Medicine and Biosciences (VetBio), along with two other departments. The four departments from the Norwegian School of Veterinary Science (NVH) as well as the administration were however still located at their own campus at Adamstuen and retained a shared identity as well as shared responsibility for our study programmes. In 2017 NMBU was reorganized into the current faculties, with NVHs former four departments being reunited with some of NVH's former administration as the Faculty of Veterinary Medicine. The organizational blip of 2014-2016 is of little relevance to this evaluation and is not mentioned in the report outside this note. The four departments that made up NVH and now make up the Faculty of Veterinary Medicine is referred to collectively by the latter name, or VET, for the entire period post-merger in this report. Likewise, we only present the data from the four relevant departments in the report.

In 2020 the faculty had a major internal reorganization in preparation for the relocation to the new Veterinary building at Campus Ås. While all departments were affected in the reorganization, the biggest change were in the Department of Basic Science and Aqua Medicine (BasAM) and the Department of Food Safety and Infection Biology (MatInf). These departments went from being subdivided in sections to being subdivided in (smaller) units, and the units were divided into two new departments: the Department of Preclinical Sciences and Pathology (PrePat) and the Department of Paraclinical Sciences (ParaFag). PrePat is largely a continuation of BasAM and ParaFag is largely a continuation of MatInf, but PrePat received one unit from MatInf and ParaFag received two units from BasAM. In addition, parts of the Food Safety Unit at MatInf were relocated to Department of Production Animal Sciences (ProdMed).

1.6 Prior evaluations

This is the first large scale external evaluation the PhD Programme has undergone since the merger of NVH and UMB in 2014. However, since the implementation of NMBU's current quality assurance system for PhD Programmes at NMBU in 2017, the faculty has produced annual reports on the status of the PhD Programme (see Appendix I).

The purpose of the annual reports is to identify relevant issues as well as areas for improvement. Both PhD candidates and supervisors are actively involved in the process through survey questionnaires (annual progress report) and seminars. The report details the specific measures to be taken to mitigate the issues and follow up on the areas for improvement identified during the process, as well as an evaluation of the implementation of previously proposed measures. The final report is presented to the Faculty Board and to FIE. The reports from all the faculties are compiled into an annual report on the state of the PhD education at NMBU [2]. The faculty's annual reports on the PhD programme in Veterinary Science have been included as Appendix I.

Prior to 2017 VET, and previously NVH, evaluated the PhD Programme as part of the annual education quality report, which included the annual evaluation of all three study programs offered at the faculty, i.e. the study programmes in Veterinary Medicine (profession study, 5.5 years) and Veterinary Nursing (bachelor, 3 years) as well as the PhD Programme.

In addition to being accredited by NOKUT, our study programmes in Veterinary Nursing and Veterinary Medicine are also accredited by ACOVENE [5] and EAEVE/ECOVE [6], respectively, both of which are specialized European quality assurance and accreditation organizations. Especially EAEVE's accreditation process is very thorough, and the evaluation touches on our research and continuing

education programs including the PhD Programme in Veterinary Science. The latest full accreditation evaluation is from 2023 [7].

In addition to the evaluations done as part of the quality assurance for the study programs, VET and some of VET's research groups participated in The Research Council of Norway's (RCN) recent evaluation of national research in the field of Life Sciences (EVALBIOVIT) [8], having our fish-related research evaluated. This evaluation of our research may be somewhat relevant to the research quality part of this evaluation [9].

1.7 Relation to university strategy

Two of the main areas of NMBU's strategy 2023-2030 [11] are "Lifelong learning", which emphasizes NMBU's responsibility in providing candidates with the skills and knowledge to meet the problems of tomorrow, and "Joint research efforts", which highlights the role of interdisciplinary collaboration in ground-breaking research and sustainable development. The PhD Candidates' work constitutes a fair portion of our overall research output and is thus vital in reaching the faculty's strategic goals for research. Ensuring high quality research training is an explicit action point in the faculty's strategic action plan, rooted in the university strategy [12].

The university also has a dedicated strategic action plan for its research education for the period 2023-2026, finally approved October 22, 2023. This strategic action plan identifies 5 key areas for improvement: better completion rates, enhance supervisor competence, increased focus on research ethics, increased focus on career guidance and development for PhD candidates, and increased competence in innovation. NMBUs strategic action plan for research education will inform the faculty's priorities highlighted in its annual evaluations going forward.

1.8 About the programme

The PhD programme at the Faculty of Veterinary Medicine had 88 active PhD candidates per the end of the year 2023. As figure 3 illustrates, there has been a decline in the number of active PhD candidates over the last few years. The figure shows a dramatic decline in the numbers of active PhD candidates in 2021. This drop was due to an unusually large number of candidates graduating that year simultaneously as the faculty was increasing focus on terminating contracts for candidates with little or no progress, resulting in several candidates being formally registered as having dropped out. This means that the change in the number of actually active candidates was not nearly so dramatic.

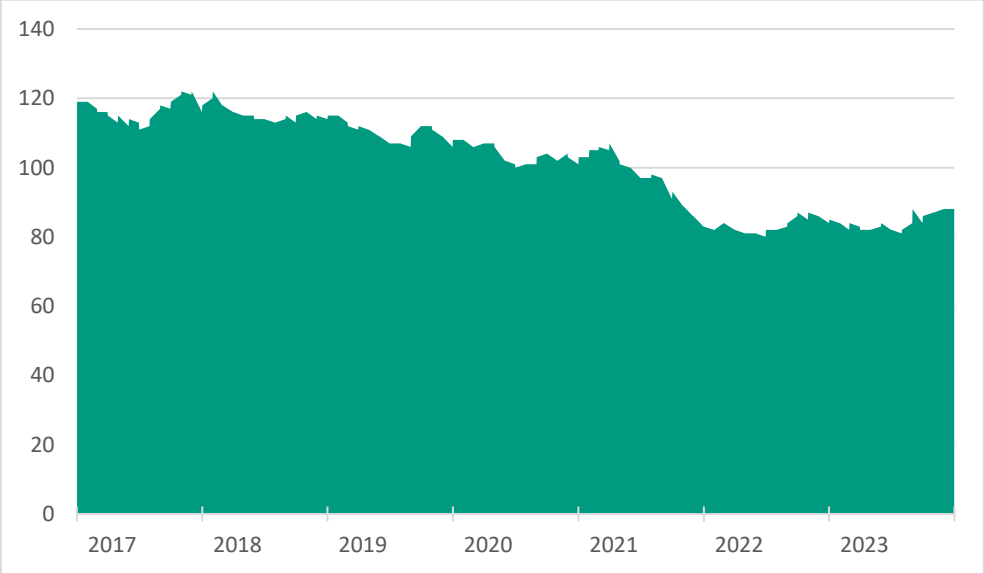

Figure 3: Number of active PhD candidates in the programme 2017-2023 (Source: Innsikt)

Comparing the number of active candidates to the number of candidates admitted and graduating each year as shown in figure 4, there is a slight downwards trend in the number of admitted and graduating candidates. The faculty has not been able to identify any single clear cause, indicating that it's likely the result of multiple factors, the relocation from Oslo to Ås likely among them.

The year 2015 stands out as an outlier in the number of admitted candidates in figure 4. This outlier is due to three large projects aimed at building capacity in the global south and funded by Norway's foreign aid directorate NORAD starting in 2015. In these projects candidates selected by local university partners were admitted to our PhD programme, splitting their time between Norway and their local university. The faculty is still participating in these kinds of programs, but now a larger number of the candidates can take their PhD education the local university. The outlier in the number of graduates in 2021 was influenced by some candidates due to graduate in 2020 being delayed in completing their degrees due to the COVID-19 pandemic, but is likely primarily caused by natural variation.

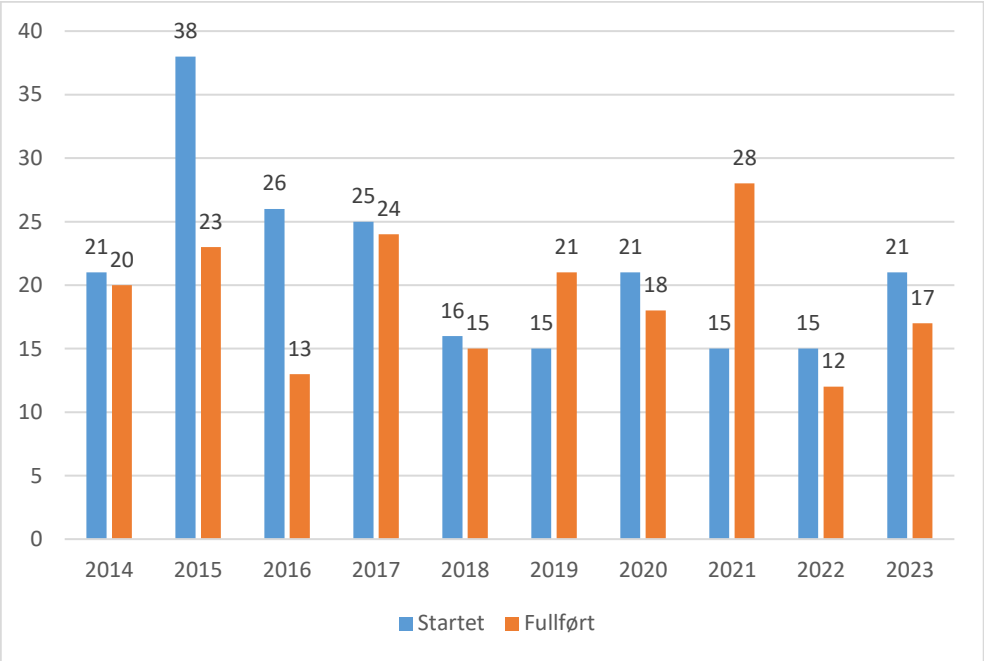

Figure 4: Number of PhD students admitted to and graduating from the programme per year (Source: Innsikt)

Administratively, the PhD programme is divided into three main parts: Admission, implementation and completion. The admission phase covers everything from when the candidates first get in touch about starting a PhD up until the candidates have entered a formal PhD contract with the faculty. The implementation phase covers the candidate's actual research education, including the coursework, the research and the writing of the thesis. Finally, the completion phase covers the submission of the thesis and everything leading up to public defence of the thesis and awarding the degree.

While this is a useful division for administrating the programme, in the materials aimed at candidates and supervisors the timelines focus on the implementation phase until the candidates have submitted their thesis, and only includes activities requiring action or initiative from the candidates. The candidates' initial view of the timeline for their PhD education is presented in figure 5.

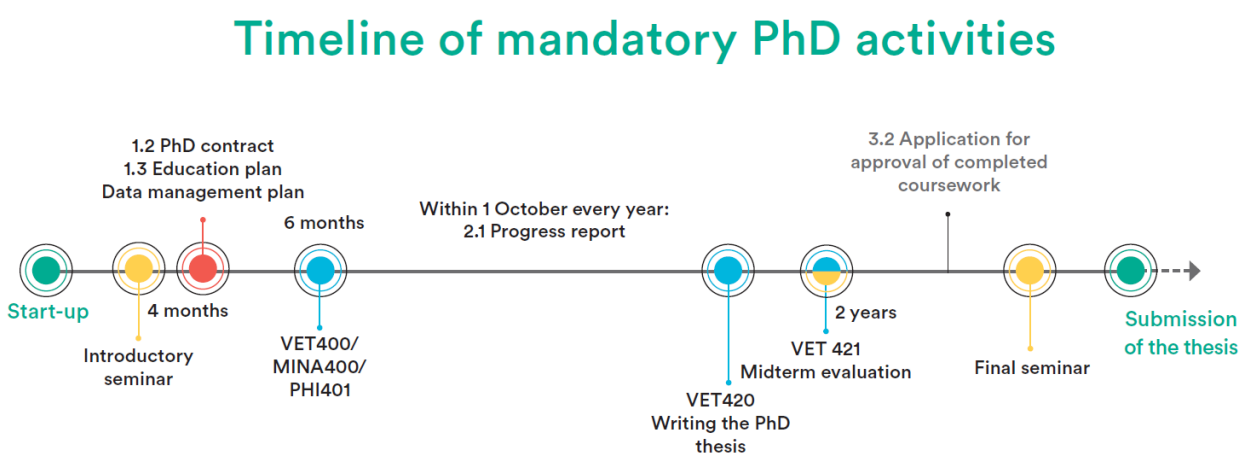

Figure 5: Timeline of mandatory activities from the candidates' point of view. Seminars are marked with yellow, courses with blue and forms in red. Upon submission of the thesis, the candidates receive a similar timeline from submission to the public defense.

2 Research quality

2.1 Infrastructure

The faculty moved into the new veterinary building at Campus Ås in 2020/2021. Veterinary medicine has special requirements, and this building has been designed and built for the Norwegian Veterinary Institute (NVI) and VET for a total cost of approximately 9 billion NOK. It has well-equipped state of the art laboratories and clinics. We also used this opportunity to upgrade our systems for medical laboratory records to new electronic platforms. New buildings always have some issues to work out or get accustomed to, but overall, we have very good research infrastructure available in-house. Our Campus in Sandnes has also been upgraded with the funding of SEARCH in 2017, though there are some older buildings there in need of renovation. Renovation for Campus Sandnes is on our roadmap.

Other faculties, centres, and institutes at the Campus Ås also have research infrastructure we can access. The main infrastructure we lack access to is a regional saltwater aquarium with sufficient biosafety (although such facilities exist on the national level) as well as a radiotherapy unit.

2.2 Bibliometric statistics

As part of RCN's evaluation of national research (EVALBIOVIT), the Nordic Institute in Innovation, Research and Education (NIFU) performed an analysis of publications from VET, focusing on the span 2019-2021.

The analysis shows – perhaps unsurprisingly – that most of our publications are in the field of Veterinary medicine, followed by biosciences and biomedicine.

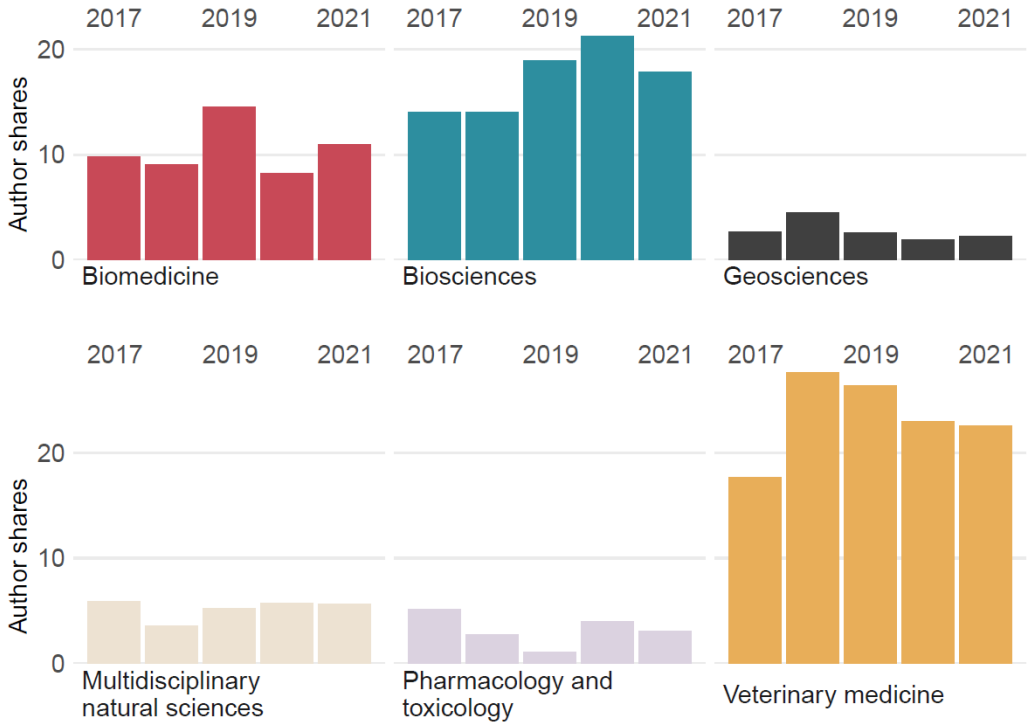

Figure 6: Author shares in most published academic fields by year (Source: NIFU's bibliometric report)

To assess the performance and quality of the published work, NIFU performed an analysis where they analysed the share of the faculty's publications that fell within the 10 % most cited publications. Thus, for a completely average performance you'd expect this number to be 10 %. For all the years analysed, the faculty scored a little over 10%, with a high of 12 % in 2017, indicating the quality of publications are slightly above average.

NIFU's full report of bibliometric statistics and analysis of VET is included as Appendix IV.

2.3 Funding sources

PhD candidates admitted to the programme are either be employed in a PhD Candidate position at the faculty (internal candidates) or employed outside the faculty, receiving a stipend or – in rare cases – employed in a different position at the faculty (external candidates). The funding of the PhD candidate's salary/stipend and operational costs for projects can either by based on external grants or on internal funds from NMBU or other institutions. Internal candidates do not pay tuition, but are rather salaried employees hired to work on their degree for three years, sometimes with 25 % other work duties for a total duration of 4 years. Of the candidates graduating in the period 2017-2023, 56 % were employed in a PhD Candidate position at the faculty. The main source of external funding for the graduates was the research council of Norway (RCN), closely followed by candidates with foreign aid stipends from Norwegian sources. This data is shown in figure 7.

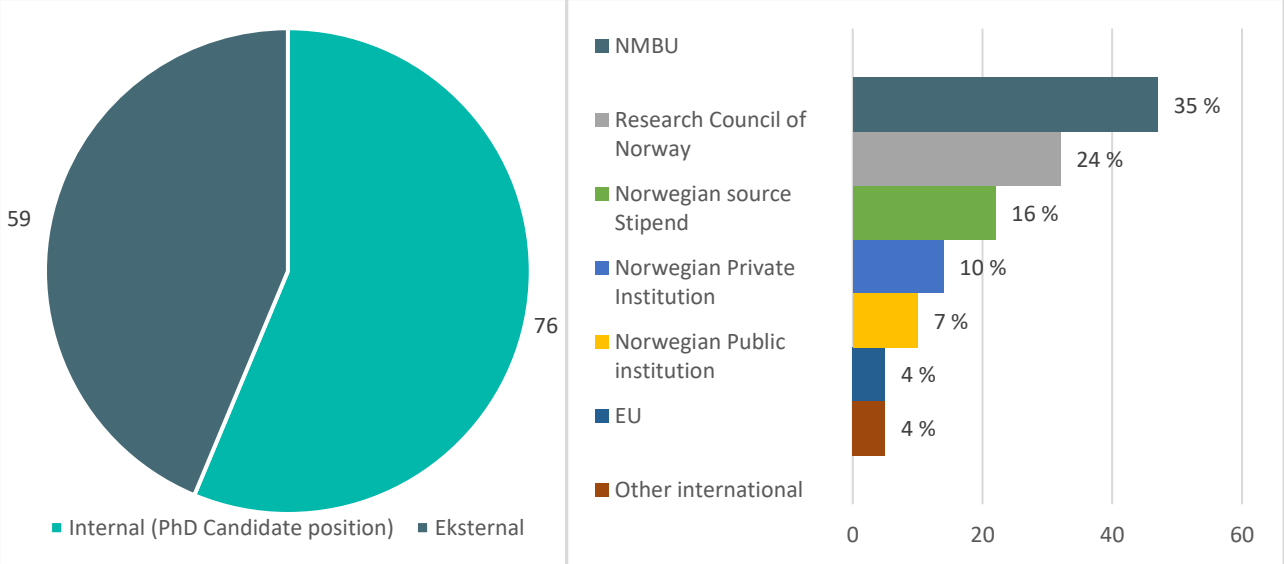

Figure 7: Share of PhD Candidates graduating 2017-2023 that were internal (employed at VET in a PhD Candidate position) (left) and source of funding for these graduates (right) (Source: FS)

2.4 Financial aspects

The direct costs associated with the PhD Programme are mainly the salary of staff in the faculty administration working with the PhD Programme, costs associated with the public defence of the thesis, costs associated with events and seminars, and costs associated with the organization and teaching of PhD courses at VET. There is currently no detailed overview of the substantial costs related to salaries and research expenses for academic staff, so these costs are not reported here.

There are three members of administrative staff who have the PhD Programme as part of their main responsibilities. When subtracting other responsibilities this comes to a net total of roughly two full time equivalents. In 2022 there was an extra employee for a total of three full time equivalents, however when this person quit the position was not renewed due to general poor finances at the faculty. In addition, other members of the administration are involved in aspects of the PhD Programme as part of their regular duties.

Other than salary costs, the significant expenses associated with the PhD Programme are the costs connected with the assessment of the theses and the public defence. An account of these costs is given in table 1.

The candidates are required to submit two copies of their printed thesis to the national library and four copies to the faculty. Additionally, printed versions of the thesis should be available to the audience at the public defence. The faculty covers up to NOK 8 000,- for printing the thesis, which is a reduction from the NOK 10 000,- previously.

The public defence of the thesis is usually conducted with the candidate, the opposition, and the chair physically present, with associated travel costs for opponents. To limit travel costs, only opponents from Europe are invited to participate physically and the faculty tries to appoint one opponent with limited travel costs, if possible. Regardless of whether they attend physically or virtually, the external opponents are of course to be remunerated for their efforts.

Table 1: Main direct costs in NOK for the PhD programme 2019-2023 excluding salaries. (Source: Agresso)

	2019	2020	2021	2022	2023	Total
Gifts (flowers, vase)	600	11 095	10 020	7631	3 294	32 643
Travel costs	323 012	114 661	44 592	120 650	240 712	843 627
Hospitality	92 642	59 109	26 118	31 872	86 728	296 469
Printing	187 025	143 381	116 756	85 870	137 144	670 176
Remuneration	358 388	308 636	428 756	343 489	409 107	1 848 376
Total	**961 667**	**636 882**	**626 242**	**589 512**	**876 985**	**3 691 291**

The way public universities are financed in Norway, there are financial incentives that follow several given indicators. One of these indicators is candidates completing their PhD. This income is referred to as result-based financing and is shown in figure 8. The result-based financing has a two-year delay, so the sum paid out in 2022 is the result of successful defences in 2020 and so on.

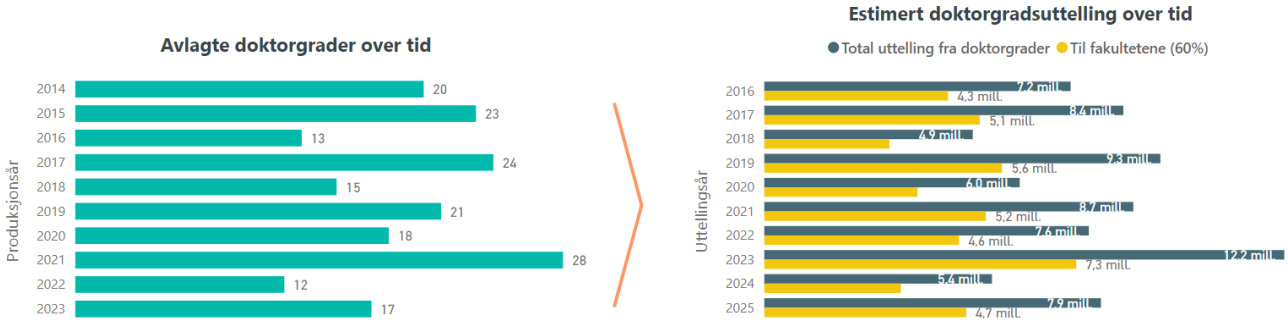

Figure 8: Relationship between awarded PhDs 2014-2023 and financial reward. The figure indicates graduates per year (left) and financial result two years later, with the total sum to the university in blue and the sum to the faculty in yellow (right) (Source: Innsikt)

In addition to the result-based financing, the faculty receives funds to cover salaries and operating costs for some of the university funded PhD Candidates. In 2022, the total rate was NOK 938 000. The average salary for a PhD candidate is NOK 550 000 which amounts to an expense of NOK 716 000 when including social costs. This means that NOK 222 000 is left to cover all operating expenses including the use of laboratories, operating materials, publication, and all other direct and indirect costs associated with the completion of the doctoral degree.

2.5 Internationalization

VET fosters extensive collaboration with foreign universities and institutions, both in research and education. Two examples are the "*Promoting sustainability of higher education through global collaboration, student program development, mobility and training (EDUPROMO)*" project with Makerere University, Mbeya University of Science and Technology, University of Dar es Salaam and University of Zambia; and the "F*ostering quality graduate and postgraduate training and research (FORTECASE)*" project with University of Zambia and University of Makerere. Groups of students (at both master's level

and PhD level) from the above-mentioned African institutions are invited to NMBU for a period of 3 to 9 months, where they are introduced to faculty members and PhD candidates at VET, take courses, receive laboratory training, and undertake internships.

Furthermore, VET participates actively in the Marie Skłodowska-Curie Actions (MSCA) doctoral networks (e.g. ChickenStress) and works closely with our partner institutions to train and develop promising PhD candidates toward becoming future research leaders in their respective fields.

PhD candidates at VET are encouraged to include an international research stay in their education plan, and candidates are granted 1.5 credits per two weeks for such stays, for a maximum of 3 credits total. There are grants available for most PhD Candidates to facilitate this. Some candidates also have research stays with other universities or research institutes in Norway, most commonly with a collaboration partner in a larger research project.

Some of our PhD candidates have co-supervisors based at universities and institutions overseas. It is therefore natural for them to tap on such resources to embark on research stays overseas (ranging from two weeks to six months), although there is also funding available at both the faculty level and the University level should they opt for other institutions.

It is common for VET's PhD candidates to take courses at universities abroad, especially universities in Sweden, Denmark, Finland, and The Netherlands. We have developed and maintain a master list of courses that our former and current PhD candidates have taken as part of their coursework component, and it is shared with all new PhD candidates at VET during the welcome session at the beginning of their PhD education.

In addition, all PhD candidates at VET are encouraged to present their work at both national and international conferences, which also serve as a platform for them to meet other researchers, exchange ideas, explore opportunities for collaboration and build up their professional network.

While most PhD candidates at the faculty are Norwegian, 31 % of graduates in the period 2017-2022 had citizenship outside Norway and 21 % outside Europe, see details in table 2. The national numbers for the same period are 36 % and 18 %, respectively. While our PhD programme has a somewhat lower proportion of international candidates than the national average, there is still a substantial international presence.

Table 2: Citizenship of graduates from VET 2007-2022 (Source: SSB provided excerpt from table 13593)

Region of citizenship	2017-2010	2011-2014	2015-2018	2019-2022	Total
Norway	50	61	46	42	199
Europe (excluding Norway)	3	7	7	13	30
Africa	0	17	6	11	34
Asia	0	3	6	10	19
Other regions	2	0	4	2	8
Total	55	88	69	78	290

2.6 The quality of submitted theses

The faculty appoints an evaluation committee, which consists of two external members (opponents) and one internal coordinator, to evaluate the quality of PhD theses submitted by PhD candidates. The evaluation committee is required to submit a joint, qualitative evaluation of the PhD thesis, and the two opponents are asked to subjectively score the PhD thesis separately on the following areas: Originality; Depth and coverage; Theoretical level; Methodological level; Skills in written presentation; Contribution to the advancement of the field; and External relevance. The table below shows the average scores of the PhD theses submitted by VET's PhD candidates from 2016 to 2023.

Table 3: Average evaluation of PhD theses 2016-2023. The scale of the evaluation is excellent (4), very good (3), average (2) below average (1)

	2016	2017	2018	2019	2020	2021	2022	2023
Originality	3,31	2,79	2,97	2,71	2,89	2,78	3,21	3,03
Depth and coverage	3,15	2,81	3,10	2,79	2,69	2,70	2,83	2,85
Theoretical level	2,88	2,69	2,93	2,76	2,78	2,80	3,13	2,85
Methodological level	3,15	2,75	3,10	2,98	3,11	2,88	2,88	2,91
Skills in written presentation	3,15	2,94	2,87	2,71	3,22	3,19	3,29	3,41
Contribution to the advancement of the field	3,15	2,81	3,17	2,90	2,94	2,82	3,25	3,15
External relevance	3,08	2,85	3,13	3,05	2,97	2,82	3,21	3,21
Mean	**3,12**	**2,81**	**3,04**	**2,84**	**2,94**	**2,86**	**3,11**	**3,06**

2.7 Evaluation of research quality

The SWOT-analysis is based on the output from a workshop consisting of PhD candidates, supervisors, PhD Advisors and the Chair of the PhD Programme Council as detailed in section 1.3.

2.7.1 SWOT analysis

Strengths

- High-quality research with supportive environments and dynamic collaboration within and across departments and universities.
- Good international collaborations and research networks.
- Regular opportunities for practicing communication skills through activities like PhD days and journal clubs.
- Accessibility and approachability between candidates and higher-level faculty.

Weaknesses

- Lack of clear, organized research strategies across departments.
- Challenges with coordination and resource allocation impacting research quality. The responsibility for the PhD candidates is divided between administrative and research areas.
- This can lead to situations where there is a lack of harmonization between responsibilities and allocation of resources.
- Frustration regarding administration and bureaucracy. There is a concern that internal invoicing for bench fees can create a barrier preventing PhD-candidates from seeking assistance outside of the core group.

Opportunities

- Further develop international and inter-departmental collaborations.
- Enhance methodological and technological training, including the use of AI.
- Leverage existing research strengths to develop strategic areas and initiate joint programs with other universities.

Threats

- Economic constraints limiting the scope and quality of research activities.
- Potential negative impacts of reliance on AI and digital tools on traditional research methods.

2.7.2 The faculty's evaluation

The weaknesses highlighted in the SWOT-analysis include uncertainty regarding research strategy, coordination and resource allocation, and administrative inefficiencies. Both the problem of unclear research strategies and administrative inefficiencies have been highlighted in other evaluations. The faculty will undergo processes to develop a joint research strategy.

The faculty is facing a challenging financial situation and measures to control expenses are necessary. It is therefore important to allocate the resources wisely to ensure high quality PhD education. Internal invoices and bench fees are parts of this system.

Annual progress reports for all PhD candidates have been established to identify challenges concerning research progress caused by either scientific or personal issues. We have to ensure that these reports also include a dialogue regarding resource allocations and administrative issues.

The identified opportunities for improvements in inter-departmental collaborations as well as increased international collaborations are relevant in the context of developing the faculty's research strategy.

Extensive collaboration with both industry and government contribute to relevant and applied research questions, and our future strategy should ensure continues opportunities both for high quality basic and applied research projects.

3 Educational quality

The PhD programme in Veterinary Science is governed by the *Regulations for the Degree of Philosophiae Doctor (PhD) at the NMBU* [6] as well as the Faculty of Veterinary Medicine (VET)'s supplementary provisions (Appendix V). The PhD Programme in Veterinary Science has a nominal length of three years of full-time study (or four years with 25% teaching and/or clinical duties) and consists of the following:

- an independent work of research conducted in collaboration with supervisors and relevant external parties (e.g. partners in other universities or the industry)
- a coursework component of at least 30 ECTS
- participation in active research communities, both nationally and internationally
- academic dissemination that is closely related to the PhD work
- the preparation and writing of a PhD thesis based on the research work

All PhD candidates are required to hold three mandatory seminars during their PhD education: a start-up seminar, a midway assessment seminar and a final seminar. These mandatory seminars are public and announced for the entire faculty. The seminars are aimed at monitoring the PhD candidate's progress in both coursework and research and offering an opportunity to identify areas for improvement. The midway assessment seminar also functions as a checkpoint, as this assessment includes a sensor outside the supervisory group. Details regarding the seminars are provided in section 3.7.4.

3.1 Coursework component

The coursework component is organized into mandatory courses (10 ECTS), including a course in research ethics and the philosophy of science (5 credits), and electives (minimum 20 ECTS). The electives are to be at PhD or master's degree level. Courses offered by VET, courses at other faculties at NMBU and courses at external universities are accepted. Complementing the research and thesis, the coursework component provides the PhD candidate with essential academic breadth and specialisation. Practical courses and/or training in generic and transferable skills may constitute up to 5 ECTS of the elective part of the coursework component. The PhD thesis must be an independent scientific work that meets international standards and be of high academic quality in terms of the formulation of research questions, the specification of concepts, the methodological, theoretical, and empirical basis, documentation, the use of literature and the form of presentation. The thesis shall contribute to the development of new knowledge in the chosen field and must be of such quality as to qualify for publication as a part of the body of scientific literature in the field.

The thesis should include two to three scholarly papers, and the PhD candidate must be the main- or first author of at least two manuscripts. In addition, the thesis includes an introductory chapter which summarises and compares the research questions and conclusions presented in the manuscript and documents the coherence of the thesis. The PhD candidate must be the sole author of the introductory chapter.

PhD candidates are encouraged to present their work at both national and international conferences and embark on research stays with universities or institutions abroad. Candidates are awarded up to 4 and 3 ECTS for these activities as part of their coursework component, respectively.

3.2 Learning outcomes

Knowledge

Upon completion of the PhD Programme in Veterinary Science, new doctors are expected to:

- have in-depth knowledge in the chosen subject area within the PhD Programme of study in Veterinary Science, and to be at the forefront of knowledge in their field of expertise within this discipline
- have in-depth knowledge about scientific theories and methods associated with the field
- be able to assess and analyse different theories, methods and processes in research and academic development projects - also from an international perspective
- contribute to the development of new knowledge, new theories, and methods in the field

Skills

Upon completion of the PhD Programme in Veterinary Science, new doctors are expected to:

- be able to formulate research questions, and plan and conduct research and academic development work of high international calibre within their field
- know how to use the scientific equipment, instruments, and analysis tools of their field of specialisation, and master equipment normally used by researchers
- master relevant statistical methods and be able to assess the utility and limitations of different statistical methods
- have conducted original research that has led to new knowledge that can be published in the form of academic articles in international peer-reviewed journals
- be able to handle complexity, create an overview, and synthesise scientific information
- be able to perform critical assessments and give constructive criticism on scientific work in their field

General competence

Upon completion of the PhD Programme in Veterinary Science, new doctors are expected to:

- be able to conduct their research with professional and ethical integrity, for example, take into consideration animal welfare and environmental issues, and be able to identify new relevant ethical questions
- be able to participate in - interdisciplinary tasks and projects.
- be able to disseminate research and development work through recognised national and international channels, and participate in scientific debates in international forums
- be able to disseminate the results of their research work to the livestock or aquaculture industry, the authorities and public administration, to colleagues in the field and to the public through contact with the media
- be able to place own research in larger academic and societal contexts
- be able to assess the need for and, if required, stimulate innovation in the field

3.3 Organization and responsibilities of the PhD education

At the topmost level, the University Board has the overall responsibility for PhD education and the NMBU Research Council, as authorized by Rector, is tasked with quality control and assurance, including identifying areas for improvement, and taking necessary measures to enhance the quality of PhD education at NMBU.

At the Faculty level, the PhD Programme Council is responsible for the PhD Programme in Veterinary Science, as authorized by the Dean, while the PhD and Research Administration is responsible for the day-to-day administration. The VET PhD Programme Council is responsible for the structure, content,

and quality of the PhD Programme. The VET PhD Programme Council includes one academic representative from each of VET's four Departments, two PhD candidates, one specialist candidate (resident) and one veterinary student. The full mandate of the PhD Programme Council is included as Appendix VI.

The faculty also has a research council, the VET Research Council, which comprises faculty members from VET's four Departments as well as representatives from technical staff and PhD candidates. This is the faculty's strategic body for research and provides advice and input to the Dean in matters related to research, innovation, external research collaboration and research training. The Chair of VET Research Council represents the faculty at NMBU Research Council. The full mandate of the VET Research Council is included as Appendix VII.

There is thus a mismatch between the organization of responsibilities for the PhD programme between the topmost and the faculty level, as the university has no body analogous to the PhD Programme Council. This necessitates good cooperation and exchange of information between the Chair of the PhD Programme Council and the Chair of the VET Research Council whenever the NMBU Research Council is discussing matters related to the PhD education.

3.4 PhD-programme's training component

3.4.1 PhD Courses

The faculty currently offers five PhD courses as outlined in table 4. The course VET410 Introduction to biostatistics was once taught by a statistician as a lengthier course but has been presented for the past five years as a one-week intense course designed to prepare candidates for subsequent courses. After internal deliberation, it was determined that NMBU instructors from other faculties with formal competency in biostatistics would teach the material currently offered through VET410. This course was therefore taught for the final time during the spring of 2024.

Table 4: List of PhD courses currently offered by VET

Course	Name	ECTS	Semester	Compulsory	Average number of participants[1]	Web
VET400	Introduction to biomedical research	5	Spring and fall[2]	Yes[3]	24	
VET403	Scientific publication	2	Spring	No	14	
VET410	Introduction to biostatistics (discontinued)	3	Spring	No	15	
VET411	Introduction to veterinary epidemiology	7.5	Spring	No	10	
VET420	Writing the PhD thesis	2	Spring and Fall	Yes	17	
VET421	Midterm evaluation	3	Continuous	Yes	17	

[1]Average number of participants in the last 5 years (2019-2023). Research track students are included in the count (except for VET420 and VET421). However, the number of research track students is low. The courses are also open to other PhD candidates at NMBU.
[2] From spring 2023 this course only runs in the spring semester
[3] VET400 Introduction to biomedical research was obligatory until 2023 but can now be substituted by PHI401 Research Ethics and Philosophy of Science I, MINA400 Research Education Across Disciplines or another 5 ECTS course in research ethics and the philosophy of science.

Course	Name	ECTS	Semester	Compulsory	Average number of participants[1]	Web
VET414	Applied statistics for experimental and laboratory oriented studies in veterinary science (discontinued)	5	Spring	No	9	

In addition to the courses offered, all PhD candidates at VET can also create a special syllabus where they define the contents of a course together with their supervisor or another faculty member assigned as the course's responsible teacher. An agreement for a special syllabus associated with a doctoral degree (PhD) typically requires a minimum of five ECTS and is graded on a "pass/fail" basis. It is organized by a faculty member acting as a teacher/supervisor, and someone outside of the research group is appointed to evaluate the candidate's work. The subject area, learning goals, content, coursework, and evaluation criteria are defined by the applicant and must be accredited by the PhD Programme Council. This option offers great flexibility in terms of what the PhD candidate can learn, as it is not restricted by the focus of established courses at VET. Despite the simplicity and availability of this process, it is not extensively utilized.

Candidate activities in PhD courses include participation in lectures, watching films of recorded lectures (VET400), writing essays, PhD thesis drafts, and article drafts, writing programming code, running calculations, solving statistical tasks, and describing the results with uncertainties, giving presentations for one another, participation in group discussions and preparatory reading. Teaching activities involve lecturing and mentorship during group discussions, writing exercises, reviewing published articles, evaluating, and providing feedback to other participants, and helping candidates to run calculations using statistical software. For evaluation, we use attendance as well as quantitative and qualitative evaluation of participation and assignments during the course of the teaching (formative evaluation) and at the end of the courses (summative evaluation).

3.4.2 Course evaluations

VET started a pilot to evaluate the PhD courses in Autumn 2023/Spring 2024. The PhD advisors have sent out an anonymous questionnaire to participants attending all our courses The response rate has been very good (mostly between 70 and 90 %, with one course below 50 %). The participants answered 20 questions by choosing on a 5-point scale and could also submit comments if they so wanted.

The participants were very satisfied with the PhD courses at VET. When asked (first question): “All in all, how satisfied are you with the course?”, almost all the candidates responded either “to a large extent” or “to a very large extent”. Only three participants responded: “to some extent” on two separate courses, as shown in figure 9.

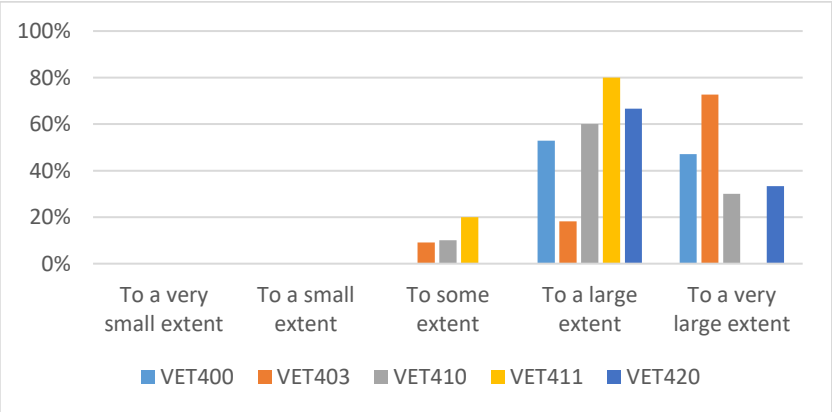

Figure 9: Candidate's answer to the question "All in all, how satisfied are you with the course" for each course

The participants also (in general) find the courses relevant and are satisfied with the learning outcomes, work and teaching methods, course activities, feedback from teachers, and the learning environment. In the last question, they got the opportunity to give recommendations on how the course could be improved. These recommendations provide the course administrator with suggestions that can be used to revise the course and are part of the quality assurance system. A full set of reports from the course evaluations sans comments is included as Appendix II.

In addition to the course evaluations, the yearly surveys conducted at VET show that the PhD candidates rated the PhD courses at NMBU as very useful for their education (average score 4.6, median 5), but that they are less satisfied with the selection of courses (average score 3.7, median 4) (2021).

3.4.3 Learning outcomes

The pedagogical approaches that are used are diverse but share a common goal of shifting the focus from a teacher-centred view to one that empowers and engages candidates in their own learning, fostering deeper understanding, critical thinking, and lifelong learning skills.

- Constructivism: Constructivist approaches emphasize that learners actively construct their knowledge and understanding of the world based on their prior experiences and interactions with the environment. Teachers facilitate learning by creating meaningful learning experiences that build upon students' existing knowledge and encourage them to explore and discover concepts independently.
- Social Constructivism: Similar to constructivism, social constructivism emphasizes the importance of social interactions in the learning process. Students learn not only from their individual experiences but also from collaborating and engaging with peers. Collaborative learning, group projects, and discussions are key elements of social constructivist approaches.
- Experiential Learning: This approach focuses on learning through direct experiences. Students engage in hands-on activities or real-world projects, which helps them connect theoretical concepts to practical applications, making the learning more relevant and meaningful.
- Problem-Based Learning (PBL): PBL places students at the centre of the learning process by presenting them with real-world problems or scenarios to solve. Through inquiry and investigation, students develop critical thinking and problem-solving skills while constructing knowledge in the context of authentic challenges.
- Inquiry-Based Learning: Inquiry-based learning encourages students to ask questions, explore topics of interest, and seek answers through research and investigation. It promotes curiosity, self-directed learning, and the development of research skills.
- Student-Centred Pedagogy: This is a broad category that includes various approaches, all of which prioritize the needs, interests, and abilities of individual learners. It involves personalized learning plans, student choice in assignments, and learning activities that cater to students' learning styles and preferences.
- Active Learning: Active learning approaches promote student engagement and participation in the learning process. It involves activities such as discussions, debates, group work, problem-solving exercises, and role-playing, which encourage students to actively construct knowledge and apply it in practical contexts.
- Differentiated Instruction: This approach recognizes that students have diverse learning styles, abilities, and needs. Teachers tailor instruction and learning activities to accommodate these individual differences, ensuring that all students can access and engage with the material effectively.

The connection between learning activities, evaluation, and expected learning outcomes for each course is as follows. In the Introduction to philosophy of science course (VET400) the main emphasis is on helping candidates to engage in philosophical reflection. This is achieved through the presentation of ideas in written and oral format, engaging them in group discussions, and supporting them in

formulating their individual perspectives on chosen topics. Written and oral assignments are used as the basis of a pass or fail score for the course where the aim is to ensure that the candidates demonstrate that they have reflected about selected topics in the area of philosophy of science and research ethics.

In the Scientific publication (VET403) course the candidates engage in theoretical and practical activities directed at critical reading of published articles, evaluating, and choosing journals for publication, and writing skills. The candidates evaluate their own texts iteratively in order to ensure they learn how to write scientific articles. They also do role playing exercises to demonstrate their ability to argue in support of different views regarding philosophical and ethical issues.

Every semester (twice per year), VET runs the intensive course Writing the PhD thesis (VET420), which is mandatory for all PhD candidates at VET. Over a period of five days, PhD candidates discuss different topics related to supervision, co-authorship, scientific publishing, the structure of the PhD thesis, etc. and are expected to submit a first draft of their PhD thesis by the end of the course. For this course the candidates are engaged in lectures, group discussions and writing sessions directed towards establishing a thesis outline and producing a working draft of their thesis. The candidates also engage in lectures, group discussions, and workshops on intellectual property and research ethics. A core activity is collaboration with a teacher in performing a critical evaluation of a first draft of their own thesis.

For the course Introduction to veterinary epidemiology (VET411) the candidates are engaged in lectures, group discussions and assignments directly related to gaining competence in veterinary epidemiology. Their participation and their assignments are evaluated to ensure they have a working knowledge of designing epidemiological field trials, independently handling databases, and analysing the data in an appropriate manner. They are trained to critically analyse the methodology used in epidemiologically oriented studies. For the course Midterm evaluation (VET421), the candidates present the status of their PhD research in written and oral forms and obtain feedback from internal and external sensors in order to identify the need for any adjustments that must be made in order to facilitate the timely completion of their project. The expected learning outcome, in this case, is to become aware of any adjustments to their work plans that are needed.

The courses that are offered exclusively address core areas of relevance for work as a researcher working towards a PhD degree, including perspectives in philosophy and research ethics (as required by NOKUT), planning and statistical analysis of scientific studies, writing articles, and the PhD thesis itself, and evaluation of progression in the PhD project which is necessary to ensure timely completion of the PhD project.

All courses offered by the Faculty of Veterinary Medicine are open to all PhD candidates affiliated with the faculty. Although other courses at NMBU, that provide similar learning outcomes, are available for the PhD candidates at the Faculty of Veterinary Medicine, most candidates at the Faculty of Veterinary Medicine opt for internal courses and complement their studies with offerings from other faculties.

Individual adjustments to the teaching activities are commonly implemented within the framework of existing courses by the course administrator and teachers responsible for each course. As examples, the focus of the published articles to review, texts, article drafts and thesis are dependent on the interests of the PhD candidate, as is the orientation and focus of the status of the PhD project. Course participants are normally asked to provide suggestions for emphasis and learning activities within the remit of the course. On a more general scale, PhD candidates contribute to the PhD programme through participation in the Faculty PhD Programme Council and through feedback used in connection with yearly evaluations of the whole PhD programme using questionnaires.

The courses that are currently offered at the faculty focus on the core competences necessary for completing the PhD project, including planning, conducting, and analysing of studies, preparing, and submitting articles for publication, and writing the thesis. Current courses also focus on philosophical

and ethical perspectives on research projects. Courses related to scientific theories and methods are either organized at the individual level or must be taken through external institutions. Courses in project leadership, data handling, presentation technique, and career planning are not offered at the Faculty of Veterinary Medicine.

The courses that are offered at the faculty are at the level of the PhD education. The teaching forms and candidate activities are adapted to the forms of evaluation and learning outcomes as previously described. The courses are organized, as far as possible, to occur during the same weeks each year to ensure that the candidates can plan their activities. As previously described, the PhD courses that are offered address core competencies necessary for work with the PhD project and thus directly address selected elements of the learning outcome descriptions of the PhD programme.

The courses are scheduled in blocks at more or less regular times each year to make it simple for candidates to participate in these courses without compromising their work with field studies, experiments, or lab work. Sometimes, adjustments must be made due to variations in the dates of national holidays from year to year.

3.5 PhD programme's research and thesis work

3.5.1 Academic supervision

In addition to the coursework component, PhD candidates carry out independent research under the supervision of experienced senior researchers, namely a supervisory group appointed by the PhD Programme Council VET. The research work takes a minimum of two and a half years and culminates in the submission of a PhD thesis, which normally consists of three scientific articles as well as an introductory chapter that brings together the articles in a holistic perspective and documents the coherence of the thesis.

A typical supervisory group at VET consists of one main supervisor and two co-supervisors. The main supervisor must be a full-time faculty member at VET. Exceptions were previously made for the Norwegian Veterinary Institute (NVI), which is located within five minutes' walk away and has close and extensive research collaborations with VET. Exceptions are not currently made for NVI. The co-supervisors can be employed at VET, another faculty at NMBU, and/or other research institutions in Norway or abroad. In previous cases where a researcher at NVI was appointed as the main supervisor, at least one of the co-supervisors had to be an internal faculty member at VET.

All supervisors must be active researchers that hold a doctoral degree or have associate professorial or professorial competence within the relevant field. Furthermore, the main supervisor is expected to have had at least several years of supervisory experience as co-supervisor. The composition of the supervisory group is evaluated and approved by the PhD Programme Council, which ensures that the supervisors as a team have the necessary qualifications, expertise and competencies required and are able to provide guidance to the PhD candidate on important matters pertaining to the research project. With the exception of special cases the number of co-supervisors is limited to two (2) so as to foster close relationship and regular contact between the PhD candidate and supervisory group.

There are a number of programmes in place to help new and experienced supervisors get more familiar with their role and further improve their supervisory skills. In collaboration with the other six faculties at NMBU, NMBU organizes a yearly supervisor training workshop that takes place over a period of 4 weeks. Participants from across NMBU come together and discuss important topics related to supervision of PhD candidates. This also serves as a great platform for them to share experiences and best practices. In addition, VET organizes bimonthly lunch seminars for both new and experienced supervisors. For each seminar there is usually a specific topic, for example, supervision and co-authorship, how to help improve PhD candidates' writing skills, how to provide PhD candidates with guidance on career planning, etc.

Based on results from the annual PhD survey (2017-2021) and the annual progress report, the vast majority of PhD candidates at VET have regular meetings with their supervisors and are generally satisfied with the quality of the supervision they receive related to the PhD project and other academic maters (about 5 on a scale of 6). However, results shave shown that there is a general lack of guidance on career planning and follow-up on the PhD candidates' social well-being.

3.5.2 Research work

All PhD candidates at VET are required to submit an "Education Plan", a "Project Description" and a "Data Management Plan" within four months after the start date of their PhD education. They are expected to work actively with their supervisors to plan for both the coursework component and the research component of their PhD education. In addition, all PhD candidates are required to hold a start-up seminar, preferably before submitting the "Education Plan" and "Project Description", where they could present their project plan and receive constructive feedback from a larger audience.

3.5.3 Writing the PhD thesis

In connection with starting their work with writing their PhD thesis, all candidates take the course VET420 Writing the PhD theses. In addition to a template for PhD theses at NMBU, the VET PhD Programme Council has worked with both supervisors and PhD candidates to develop a guide for the writing of the introductory chapter specific for the field of veterinary science.

The PhD candidate discusses the thesis with their supervisors on a regular basis, and especially during the last stage of the PhD education. Before a PhD thesis can be submitted to the faculty, it has to be read and vetted by the main supervisor who is expected to ensure that the thesis meets the necessary requirements and is of high quality. It is then formally approved by the Head of Department before being sent to the evaluation committee for evaluation.

3.5.4 Three mandatory seminars

All PhD candidates at NMBU are required to hold three mandatory seminars during their PhD education (PhD Regulations section 9.1 and § 9.2). The purpose of these seminars is to ensure that PhD candidates have an opportunity to discuss academic and practical challenges related to the PhD project with a broader audience than the supervisory team and obtain constructive feedback.

The start-up seminar shall be conducted within four months from the start date of the PhD education, before submitting the PhD contract, the education plan, and the data management plan to the PhD advisors for approval. During the start-up seminar, the PhD candidate presents the project plan and seeks feedback on the project scope, design, methodology, etc. The discussion should also cover the academic, technical, and practical challenges related to the project and the resources available to mitigate such challenges. The PhD candidate should also seek advice/tips on potential courses, seminars, conferences, etc., as well as a potential research stay abroad.

The midway assessment seminar, also known as the midterm evaluation, aims to provide the PhD candidate with the opportunity to practice presenting their research project in both written and oral forms. The project should be placed by the PhD candidate in a wider scientific context and evaluated critically from the perspective of research ethics. The midterm evaluation is also meant to motivate the PhD candidate and the supervisors to keep up their work efforts and to identify any aspects of the project in need of attention. The midway assessment seminar shall be conducted within two years after the start date of the PhD education. The midway assessment also includes an informal discussion between the candidate and the Head of Department, without the supervisors present, where the candidate can discuss any issues they may have with their supervision.

The PhD candidate is expected to hold a final seminar when the writing of the PhD thesis is close to completion. During the final seminar, the PhD candidate discusses the results of the PhD project and seeks feedback on the PhD thesis. This could also serve as an opportunity to obtain tips on how to

prepare for the trial lecture and the public defence, which is often how it's utilized since in practise. The final seminar is often held after the thesis has been submitted.

3.5.5 NMBU biostatistics advising service

Since relocating to join the rest of the university at Campus Ås, VET has been exploring avenues for cooperation with the other faculties at NMBU. The Faculty of Chemistry, Biotechnology and Food Science (KBM) has established a biostatistics advising service [14] where candidates can get advice on the factors for robust data from study design to suitable analytical methods. In 2022, VET made arrangements with KBM so our PhD Candidates can access to this service at no cost to their project. The faculty is still working to raise awareness of the service, but candidates who have used the service tell us they found it useful, and candidates are saying they wished they had access to the service earlier in their PhD.

3.6 Non-academic support

NMBU annually surveys the PhD candidate's satisfaction with and experience of various aspects of the PhD education. The questions are mostly structured by asking how satisfied they are with a particular aspect of the education on a scale from 1 to 6, where 1 is Very Dissatisfied and 6 is Very Satisfied. Prior to 2022 this was done through a separate survey, however this survey suffered from a relatively poor completion rate. Starting 2022 a simplified version of the survey has been integrated with the compulsory annual progress report.

The 2023 survey showed that the PhD candidates were generally satisfied with administrative support from the faculty. The PhD candidates were very satisfied with the administrative support from the PhD advisors (average 5.29, median 5 on the question "How would you rate the administrative support of the PhD coordinator(s) at the faculty, with this last year in mind?") and from the library (average 5.44, median 5,5 for the question "How would you rate the Library Services at NMBU, with this last year in mind?"). Several PhD candidates showed their dissatisfaction with the faculty's support regarding career support, even though both the average (4.04) and the median (4) were 4 or above.

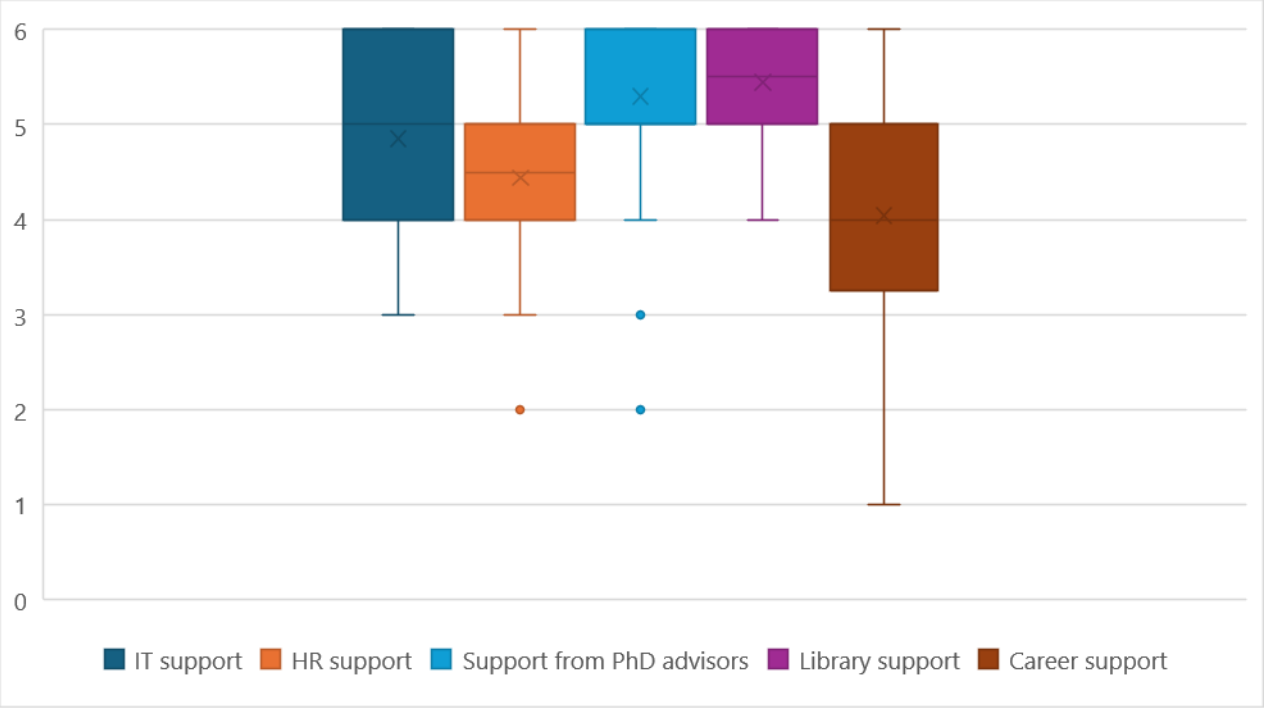

Figure 10: Satisfaction of PhD candidates (VET) based on the annual progress preport 2023, where 1 is Very Dissatisfied and 6 is Very Satisfied

3.7 Completion rates for the PhD candidates

A PhD degree is expected to comprise three years of fulltime work. According to national regulation, the normal employment period for candidates employed in a PhD Candidates position should be four years with 25 % work duty (that is work not directly related to the PhD, like teaching courses or clinic duties). Nevertheless, the norm at VET is that PhD Candidates are employed in 3-year positions without work duties.

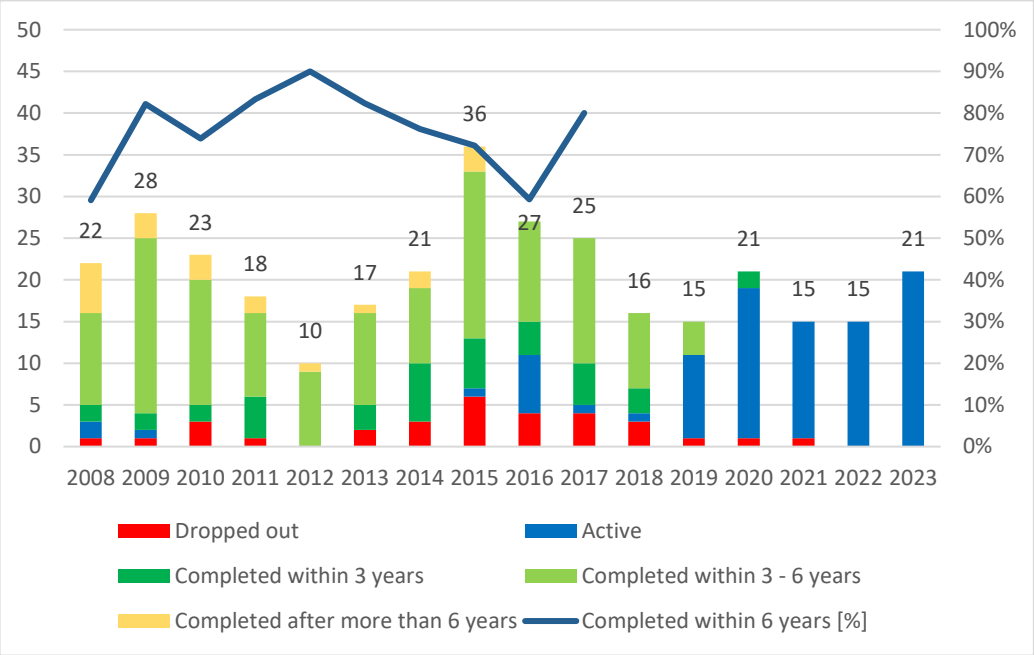

Figure 11: Candidate status by starting year per 31.12.2023. Starting year on the x-axis, number of candidates in each category on y-axis (bar chart), total number admitted (number) and percentage that has completed their PhD within 6 years (line chart) (Source: Innsikt)

Figure 11shows that of PhD students admitted at VET in 2017, 80% had completed their degree within 6 years. Historically, the 6-year completion rate has ranged from 60 % to 90%. At a national level, 14% of PhD students complete their education within 3 and 34% within 5 years (ssb.no).

SSB collects numbers for the candidates that do submit their thesis. Comparing average time from starting a PhD to the candidates submits their thesis, shown in table 5, the time is comparable to or slightly better than the national average which was around 5.0 (4.8-5.1) for all genders in the timeframe 2013-2022.

Table 5: Average time in years from start of PhD at VET to submitting thesis (Source: SSB provided extract from table 13594)

Gender	2013-2014	2015-2018	2019-2022	2013-2022
Women	4.8	5.7	5.2	5.3
Men	4.5	4.3	4.5	4.4
All	4.7	5.2	4.9	5.0

There are several formal and informal checkpoints the candidates pass throughout the programme where the faculty can identify candidates who are falling behind. The two most important checkpoints are the annual progress reports and the midterm evaluation.

The candidates are required to submit an annual progress report by October 15 each year. In this report, they indicate whether their research and coursework are on schedule, they are asked whether they've had any difficult obstacles and they're asked if they would like to discuss issues of supervision or progress with someone other than their supervisors. The progress reports are collected and evaluated

by the PhD Advisors, and then discussed in a meeting with the Heads of Department and the Chair of the PhD Council. In the meeting any concerns flagged either by the candidates or by the PhD Advisors are addressed, and it's decided whether and how to follow up.

Candidates may be exempt from submitting a report (e.g. while on parental leave), but if a candidate who hasn't been exempt fails to submit the report, this is in itself treated as a cause for concern and followed up with their supervisors and/or the relevant Head of Department as necessary.

The Heads of Department and the PhD Advisors employs an explicit open-door policy and encourage PhD Candidates to raise any concerns they may have. Open-door policy is prevalent throughout the organisation, so most if not all intermediate managers, supervisors and colleagues will be likewise available.

A PhD is expected to comprise three published or submitted manuscripts, of which the candidate is first author on at least two, as well as coursework of at least 30 ECTS and an extensive Introductory chapter for the finished thesis. This is a substantial amount of work to complete in 3 years, especially if the data for the articles has not been collected prior to the candidate starting. There is not a lot of room for exploration and failure on the part of the candidate, which constrains the degree to which the candidate can participate in designing the project and making groundbreaking research very risky for PhD projects. This conflicts both with the candidate's ownership of their project and the research goals for ambitious research. There is a difficult trade-off between risk and ambition for the PhD projects.

3.8 Candidate well-being

When allocating university funded research fellowships at the faculty, emphasis is placed on affiliation to research groups and networks. The faculty works to ensure our research groups have a high international quality. Nationally, we have research collaboration with strong research institutions such as UiO, UiB, NTNU and SINTEF.

Of the 61 PhD candidates who submitted a progress report in 2022, 51 have answered "Yes" to the question "Are you part of a research group?", while 10 have answered "No". Eight of the ten who answered no are external PhD candidates. Those who belong to a research group are generally satisfied with academic support from the research group (average score 5.1, median 5 for the question "To which degree have you been satisfied with the support from your research group/environment you have received this past year?"). When revising the faculty's supplementary provisions in 2020 we introduced a one-year residency requirement for external PhD candidates working outside NMBU's campus to facilitate inclusion in a local research group at VET.

Many of the faculty's research groups are small, but there is extensive internal collaboration, as well as collaboration with the Norwegian Veterinary Institute and with other academic environments.

VET moved to Ås in 2021. The new building better facilitate informal contact between the different groups and, as such, the PhD candidates become part of a larger academic environment. In addition, the co-location with the rest of the university makes it easier to collaborate with the other faculties at NMBU. The PhD candidates now have easy access to other laboratories and a larger research community. They also become part of the larger body of PhD candidates from all the faculties. Still, it takes time to settle into the new building and establish a professional community. Settling in is probably a process that will continue for some time.

According to the PhD regulations, the main supervisor should be employed at NMBU. Previously VET frequently granted exceptions from this rule, especially allowing main supervisors at NVI, but in the last few years we've stopped granting these exemptions. This change was made to make sure the main supervisor was familiar with the routines and best practises for the PhD Programme.

In 2020, almost 70% of the PhD candidates responded that they had contact with their main supervisor at least once a week. The results of the survey in 2020 and 2021 show that the PhD candidates are satisfied with how their main supervisor follows them up regarding their research work and academic writing. They are less satisfied with the support the main supervisor provided regarding future career planning. PhD candidates largely feel that supervisors care about their "social wellbeing", but almost 35% (13 of 38) are dissatisfied with the social arena.

In 2022, 2023 and 2024 the faculty has arranged "VET PhD Day", where PhD candidates can participate with posters, oral presentations or conduct one of their compulsory seminars. In 2023 and 2024, we also invited several companies, to encourage future collaboration.

In 2019 the PhD Advisors started to invite the candidates to lunch seminars. During the pandemic, no candidate lunches were held. The lunches were launched again in the spring of 2022 and since then the PhD Advisors have arranged 10 candidate lunches. The topics have varied from the relationship between candidate and supervisor, dissemination of research, preparation for the trial lecture and public defence, and handling of stress and expectations in the PhD education.

In the autumn of 2022, the PhD Advisors started conducting introductory meetings with new PhD candidates. All new candidates and their main supervisors are invited to a conversation with the PhD advisors a few months after admission. The aim of the introductory meeting is for the new candidates to get to know the PhD Advisors and know where they can find the necessary information about their PhD education. During the conversation, the PhD advisors talk about compulsory activities in the PhD education, routines, forms, and social and professional meeting places. NMBU has a standard form that candidates and supervisors are encouraged to complete to align expectations, and the candidate and supervisors are encouraged to do this immediately after the introductory meeting.

All PhD candidates are members of Society of Doctoral Candidates at NMBU (SoDoc), which is an independent and democratic interest organisation that represents PhD candidates and postdoctoral researchers at NMBU. In recent years, SoDoc has had a strong focus on improving the working conditions and wellbeing of its members and maintains regular contact with the university management through the Department of Research, Innovation and External Cooperation (FIE). Throughout the academic year, SoDoc organises both academic seminars and social activities such as cabin trips, Christmas dinners, etc that are open to all members.

3.9 Evaluation of educational quality

The SWOT-analysis is based on the output from a workshop consisting of PhD candidates, supervisors, PhD Advisors and the Chair of the PhD Programme Council as detailed in section 1.3.

3.9.1 SWOT analysis

Strengths

- Flexible coursework options with both mandatory and elective courses relevant to the candidates' needs.
- High-quality, specialized courses, particularly in writing and midway reviews.
- Physical course settings that facilitate better networking and engagement.

Weaknesses

- Limited course offerings and difficulties in accessing diverse courses or courses at other universities.
- Some areas, such as advanced statistics and specific research methodologies, are underrepresented.

Opportunities

- Expand and diversify course offerings, potentially in collaboration with other institutions.
- Explore and develop unique courses that highlight NMBU's specialized capabilities.
- Increase interdisciplinary learning opportunities and advanced coursework in underrepresented areas.

Threats

- Competition from other universities with more diverse or technologically advanced course offerings.
- Economic challenges may lead to reduced funding for courses and fewer external collaborations.

3.9.2 The faculty's evaluation

While the evaluation has shown that the PhD courses offered at VET are of high quality, it is also clear that the faculty has a limited number of PhD level courses. The SWOT analysis has identified that there are areas with a lack of good courses, and other faculties at NMBU do not offer courses that fill this gap. The faculty needs to expand and diversify the portfolio of PhD courses offered to our candidates, either by developing new courses ourselves or in cooperation with other institutions, or through formal or informal collaboration with other universities.

4 Recruitment

4.1 Marketing of the PhD Programme

Open positions at VET are announced at JobbNorge and on the university's website. Some positions are announced in English. The number of applicants varies from position to position, but the positions announced in English tend to have more applicants.

The faculty also offers research funding and structured research training to veterinary students to increase the recruitment of qualified PhD candidates. On the Career Day for veterinary students on September 13th, 2023, the PhD Programme had a stand where veterinary students could talk to PhD candidates about the PhD Programme and their experiences as PhD candidates. This is the first time since relocating to Ås we've held our own career day for the faculty's students, and including a stand for the PhD Programme was very successful.

It is also possible to gain admission with other funding than employment as a doctoral research fellow: we have candidates employed at research institutes and in private and public sectors or are part of the Norwegian Programme for Capacity Development in Higher Education and Research for Development (NORHED) programme financed by NORAD, the Norwegian foreign aid organization. Candidates with external funding must be able to document full funding for the entire period of study. Information about external funding can be found on the programme website.

4.2 Recruitment to the PhD Programme

Most candidates are recruited to the PhD Programme through PhD Candidate positions at the faculty, and these candidates are referred to as "internal". These positions may be funded by the university or through external project financing from e.g. the Research Council of Norway or the EU. An associate or full professor will be the project leader and are responsible for recruitment. The project leader will have an initial project plan for the PhD and will write a job announcement and associated recruitment documentation based on this plan. We do not have a tradition for announcing open positions where we solicit proposals from potential candidates, as is common in some fields.

For each announced position, the faculty will establish an ad hoc selection committee consisting of two employer representatives appointed by the faculty, one of whom will be the project leader, and one employee representative appointed by the unions. The selection committee will evaluate all the applications, and conduct interviews and tests as required to find the most qualified applicants. They will then write a recommendation and give an ordered nomination of well qualified candidates which should be offered the position.

Once the selection committee has decided on which candidates to nominate, the PhD Advisors will check whether the nominated candidates meet the formal requirements to be admitted to the PhD Programme. This includes checking that all the necessary documentation for admission is provided and verifying the documentation if required. If it is unclear whether a nominated applicant is qualified, supporting documentation is collected or an evaluation is requested from the relevant local academics. The PhD Advisors then fill out a checklist outlining whether the applicant meets the various admission criteria. This completed checklist is included as an attachment to the selection committee's recommendation and sent to the hiring committee for a final decision.

The hiring committee for academic positions is chaired by the Dean and consists of two representatives in permanent academic positions appointed by the Faculty Board, two representatives appointed by the unions and one student representative appointed by the faculty's student democracy. The hiring committee evaluates the recommendation from the selection committee and determines which nominated candidates should be offered the position and in which order. The hiring committee may also

return the case back to the selection committee if they find the recommendation lacking or to get their opinion on an applicant that was not nominated. Once the hiring committee has made their final decision, the position is offered to the top ranked applicant.

There is no similar recruitment process for external candidates, i.e. candidates that are not employed in a PhD Candidate position at the faculty (including candidates employed at the faculty in other positions). External candidates apply directly for admission to the PhD Programme.

4.3 Information to candidates in the initial stages

The HR team has contact with the applicants in the recruitment and application phases for positions at the faculty. When the HR Advisor has made the employment contract the PhD Advisor is CCed and can register the candidate in the student system FS and give information about the programme to the new candidate. There are several HR Advisors who make employment contracts for doctoral research fellows, and it has happened that they have forgotten to inform the PhD Advisors when the contract is made. The welcome letter from the PhD Advisors has therefore in some cases been delayed.

The supervisors must be appointed by the faculty. The PhD Advisors do not get this information before the new internal candidate submits the PhD contract after 4 months. However, the PhD Advisor gets information from the HR team who the project leader is. The project leader is usually part of the planned supervisor team, enabling the PhD Advisors to arrange a welcome meeting with the candidate and the main supervisor before formalization of the PhD Programme 4 months after start-up date.

4.4 Admission

4.4.1 Two procedures in the admission process

Procedure for internal candidates

Admission to the PhD programme happens as part of employment in a PhD fellowship position:

- The applicant sends his/her application through the portal JobbNorge.
- The selection committee assess the applicants and make a short list of the highest-ranked candidates.
- The PhD Advisor goes through the documentation in JobbNorge, checking formal requirements.
- The hiring committee decides who will be employed.
- The HR team, which is part of the faculty administration, makes the contract of employment and informs the PhD Advisors.
- The PhD Advisor registers the new candidate in the student system FS and sends a welcome mail.

Procedure for external candidates

Candidates with external funding must follow different procedures and are evaluated by the PhD Programme council:

- Within two months after the start of his/her funding period the applicant fills in form *1.1 Application for admission* in collaboration with their supervisors and sends the completed form with all the supporting documents and a project outline to the PhD Advisors.
- The PhD Advisor checks the formal requirements and forwards the application to the Department's representative in the PhD Programme council.
- The representative assesses the application by filling in the form "Evaluation of applicant with external funding" and presents his/her evaluation in the meeting.
- The PhD Programme Council decides whether the applicant should be admitted or not.
- The PhD Advisor registers the new candidate in the student system FS and sends an admission letter and welcome mail to the new candidate.

The PhD contract, individual education plan and data management plan

Four months after the start-up date all candidates must formalize admission to the PhD programme by submitting a written agreement, accompanied by an individual education plan with a project description and a data management plan. The PhD Programme Council also assesses, sometimes suggests improvements, and finally approves this documentation.

4.4.2 Challenges with the admission procedures

The two different procedures for internal and external applicants have been confusing for supervisors and representatives in the PhD Programme Council, especially concerning the project description: External candidates must first submit a project outline together with the application within two months after start-up, and then a project description after four months. Internal candidates only need to submit a project description four months after starting. On several occasions, we have had to clarify the difference between a project outline and a project description. The representatives in the PhD Programme Council also do not see the need to evaluate external candidates' project outline/description twice.

Internal candidates do not fill in the Form 1.1 Application for admission since their admissions are processed in connection with employment in a PhD fellowship position. This means that we do not receive information about the supervisory team before the candidate submits the PhD contract. We have solved this by creating a new form (Proposal for supervisory team).

The faculty will evaluate the procedures with the HR team and the PhD Programme Council. There was a higher degree of equal treatment in the old regulations where the applicants followed the same procedures in the application process. Never the less, the faculty must comply with regulations set by the University Board.

4.4.3 Challenges with evaluation of the candidate's formal education

The PhD Advisors at have limited competence in evaluating whether submitted documentation is authentic, however this evaluation happens at the faculty level. The NMBU Student Admission Unit, located in the university administration, has more competence in education systems and requirements in different parts of the world. The PhD Advisors have therefore proposed that this unit should be checking the background of the PhD candidates as well as also the authenticity of university diplomas and language tests, to better ensure the quality og PhD candidates enrolled at NMBU.

4.4.4 On-boarding of new candidates

All candidates receive a welcome email from the PhD Advisors informing them about the PhD programme and start-up procedures. In addition, the PhD Advisors invite the candidate and main supervisor to a welcome meeting. The purpose is to get familiar with the candidate and show where they can find help with different challenges. In this meeting, we give information about the PhD education, the timeline, and activities. We also advise the candidate and the supervisor to fill in the questionnaire "Establishing a good relationship from the beginning", and to compare and discuss the answers. The PhD Advisors have received feedback from the candidates and the supervisors that they find this meeting insightful. The PhD Advisors also find it pleasant and useful to say hello to new candidates and supervisors and start fruitful administrative cooperation from the beginning.

The PhD Advisors have created a separate room (PHDVET) for PhD candidates on the learning platform Canvas. Here the candidates receive information from the PhD Advisors and course leaders. The PhD candidates have also a group in Microsoft Teams with the name "Our PhD Journey". This is a place where candidates share tips and discuss any matters that are relevant to them as a PhD candidate. These platforms make it easier for the PhD candidates and PhD Advisors to connect and communicate.

4.5 Relation to other degrees

The Faculty of Veterinary Medicine (VET) offers a 5,5 - 6-year Candidate of Veterinary Medicine (*cand.med.vet.*) degree programme as well as a 3-year bachelor's degree programme in Veterinary Nursing. Students who have successfully completed the *cand.med.vet.* degree programme are qualified to apply for admission into the PhD Programme in Veterinary Science.

In addition, selected students enrolled in the *cand.med.vet.* degree programme may opt into the Research Track, a two-year programme that equips participants with necessary training in veterinary medical research and lays the foundation for a running start if they continue their studies with a PhD in Veterinary Science.

From 2018 to 2023, roughly 63 % of new PhD candidates had a degree in veterinary medicine on admission to the PhD programme in Veterinary Science. A detailed account is given in table 6.

Table 6: Percentage of admitted PhD Candidates who are veterinarians.

Admission Year	Admitted PhD candidates	Admitted PhD candidates who are veterinarians	Percentage of admitted PhD candidates who are veterinarians
2018	16	9	56 %
2019	15	9	60 %
2020	21	13	62 %
2021	15	13	87 %
2022	15	9	60 %
2023	21	12	57 %
Total	**103**	**65**	**63 %**

4.6 Career pathways: PhD graduates at NVH 2008-2013

In 2013, a career survey was conducted among the doctoral candidates who completed their doctorate in the years 2008-2013 at the Norwegian School of Veterinary Science (NVH). The purpose of the survey was to find out which career path the doctoral candidates had taken after completing their doctorate, and whether the acquired competence was perceived as relevant for the job market. The response rate was very good: 67,9 % (70 persons out of 101).

86% responded that they were very satisfied or satisfied with the doctorate education at NVH. 70% were satisfied with their main supervisor. When asked how relevant the PhD degree had been in getting a job, 91% said that the doctorate had been significant in getting the job they were in now.

In the figure below you will see career wishes before the start-up of the doctorate education, the career wishes after completion of the degree, and the actual place of work.

The survey showed that most candidates started a PhD education with the aim of a further academic career. Even after completing their doctorate, the majority still wished for a continued research career. Neither public administration nor industry were significant recipients of veterinarians with doctoral competence in 2013.

Most of the participants (90%) were in full-time jobs, but 50% had a fixed-term employment contract. 87% were employed within 3 months after completing their doctorate. Despite the uncertain work situation that temporary employment entails, nearly 90% still said they were satisfied with their current working conditions.

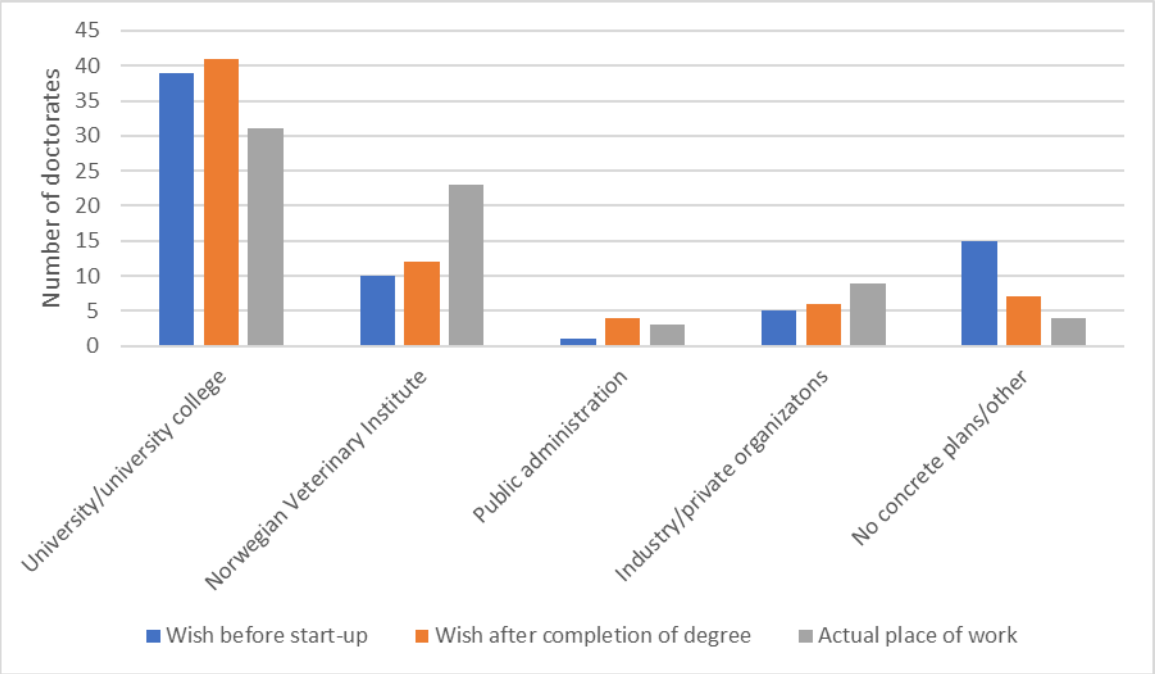

Figure 12: Comparison of career wishes prior to start up and actual place of work for PhD-candidates at NVH 2008-2013 (Source: Career Pathways report)

The faculty is currently working on conducting a new survey to collect data for candidates who have graduated since 2014. In addition to surveys performed by the individual institutions, Statistics Norway (SSB) collects data on the occupation of graduates. Their data show that in 2022 50 % of PhD graduates from VET were working in academia in Norway with a further 32 % working national jobs outside academia, as shown in table 7. This is very comparable to the national numbers of 51 % and 31 %, respectively.

Table 7: Place of work for graduates from VET based on year of public defence (source: SSB provided extract from table 13895)

Place of work in 2022	2007-2010	2011-2014	2015-2018	2019-2022	Total
Academia	18	40	27	38	123
- The Institute sector, including hospitals	10	15	11	14	50
- The university and collage sector, including university hospitals	8	25	16	24	73
Outside Academia	8	21	25	25	79
No data (e.g. unemployed or emigrated)	3	18	15	9	45
Total	29	79	67	72	247

4.7 Evaluation of recruitment

The SWOT-analysis is based on the output from a workshop consisting of PhD candidates, supervisors, PhD Advisors and the Chair of the PhD Programme Council as detailed in section 1.3.

4.7.1 SWOT analysis

Strengths

- Effective visibility of PhD positions attracts suitable applicants.
- Strong branding as a prestigious institution.
- Good information availability and support structures for potential candidates online.

Weaknesses

- Lack of consistent support and expertise in recruitment processes.
- Unclear career progression post-PhD, impacting attractiveness of the programme.

Opportunities

- Enhance internal and external communication strategies to better promote the PhD programme.
- Develop structured networks and communities among PhD candidates to improve engagement and retention.
- The expertise of PhD candidates trained at VET is very attractive outside of academia. In connection with recruitment, one could emphasise this point and more clearly articulate and promote career pathways and opportunities post-PhD to prospective candidates.

Threats

- Insecurity due to the nature of temporary and competitive academic positions.
- Competition with private sectors and other universities could detract from NMBU's ability to attract top talent, especially within areas where the private sector will offer substantially better salaries.
- Potential devaluation of the PhD experience due to economic cutbacks and perceived instability.

4.7.2 The faculty's evaluation of recruitment

The faculty needs to work on efficient marketing of its PhD programme to sustain good recruitment. VET has a special responsibility to ensure that there are enough veterinarians in Norway with PhD level competence. At present most of our PhD candidates are veterinarians and we need to ensure further recruitment. VET needs to work on presenting the candidates with clear career opportunities after they've completed their degrees, and the SWOT analysis shows that it's important to continue working to foster a stronger feeling of community and belonging among our PhD candidates. Overall, we are able to attract talent for our PhD program and need to keep up the good work to maintain this situation for the future.

5 Concluding remarks

The main findings of this PhD programme self-evaluation are:

- Candidates are satisfied with administrative support and follow-up from supervisors.
    - VET could strengthen efforts regarding career-planning, at an institutional level as well as for individual candidate/supervisor groups.
- Completion-rates are high; 80% of candidates defend their thesis within six years of admission.
- The PhD-level courses offered are rated as good, but more courses catered to our candidates needs should be offered.
    - Statistics training is an example.
- Our aim is to educate candidates that fill societal needs as well as to deliver high quality research. A balance between applied and fundamental research must be sought.
    - Candidates find relevant job after defending PhD.
- Concerns were raised regarding strained financial situation and increased focus on covering expenses for research. It is important to maintain academic creativity and access to laboratory facilities for PhD students, good systems need to be in place that ensure this.
- The need for a clear research-strategy at the faculty is highlighted. This will enable overall better use of shared resources such as internally funded PhD positions, as well as targeted efforts to deliver both high quality research and candidates that fill societal needs.

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Glossary

Organizations and institutions

Abbreviation	Norwegian	Explanation
NMBU	Norges miljø- og biovitenskapelige universitet	The Norwegian University of Life Sciences
NVH	Norges veterinærhøgskole	The Norwegian School of Veterinary Medicine was an independent scientific college that merged with UMB in 2014 to form NMBU.
UMB	Universitetet for miljø og biovitenskap	University of Life Sciences was a Norwegian agricultural university that merged with NVH in 2014 to form NMBU.
NVI	Veterinærinstituttet	Norwegian Veterinary Institute is a research institute co-located with VET and an important national collaborator.
NOKUT	Nasjonalt organ for kvalitet i utdanninga	Norwegian Agency for Quality Assurance in Education is the national quality assurance agency in Norway.
SSB	Statistisk sentralbyrå	Statistics Norway, the national Norwegian statistics bureau.
RCN	Norges forskningsråd (Forskningsrådet)	Research Council of Norway The national research council of Norway and largest national source of research funding by far.
ACOVENE		The Accreditation Committee for Veterinary Nurse Education is a European organization accrediting education programmes in veterinary nursing
EAEVE		The European Association of Establishments for Veterinary Education is an organization accrediting profession studies in veterinary medicine. They are registered in the European Quality Assurance Register alongside the national quality assurance agencies like NOKUT.

Regulations and guidelines

Abbreviation	Norwegian	Explanation
PhD regulations	Forskrift for graden *philosophiae doctor* (Ph.d.) ved Norges miljø- og biovitenskapelige universitet	Regulations for the Philosophiae Doctor (PhD) degree at the Norwegian University of Life Sciences
Supplementary provisions	Utfyllende regler til NMBUs forskrift for graden *philosophiae doctor* (Ph.d.) ved Veterinærhøgskolen (VET)	Supplementary provisions to NMBU's regulations for the degree of Philosophiae Doctor (PhD) for the Faculty of Veterinary Medicine (VET)

Organizational units, councils, and committees

Abbreviation	Norwegian	Explanation
VET	Veterinærhøgskolen	*Faculty of Veterinary Medicine* is a faculty at NMBU.
FIE	Avdeling for forskning, innovasjon og eksternt samarbeid	*Department of Research, Innovation and External Cooperation* is part of the university administration, organized under Prorector for Research and Innovation. They are responsible for the top-level administration of the PhD educations at NMBU.
PhD Programme Council	Ph.d.-programråd for Veterinærvitenskap og utvalg for diplomatutdanning (Ph.d.-programråd VET)	*The PhD Programme Council and Committee for the Diplomate Education* is responsible for the overall curriculum and organization of the PhD Programme in Veterinary Science
VET Research Council	Forskningsutvalget ved Veterinærhøgskolen (FU-VET)	Advisory body to the Dean on matters related to research and innovation.
NMBU Research Council	Forskningsutvalget (FU)	Advisory body to Rector on matters related to research and innovation and tasked with ensuring the quality of NMBU's PhD education.
PrePat	Institutt for prekliniske fag og patologi	*Department of Preclinical Sciences and Pathology* is a department at VET after 2020 reorganization
ProdMed	Institutt for produksjonsdyrmedisin	*Department of Production Animal Sciences* was and is a department at NVH and VET
ParaFag	Institutt for parakliniske fag	*Department of Paraclinical Sciences* is a department at VET after 2020 reorganization

Abbreviation	Norwegian	Explanation
SportFaMed	Institutt for sports- og familiedyrmedisin	*Department of Companion Animal Sciences* was and is a department at NVH and VET
BasAM	Institutt for basalfag og akvamedisin	*Department of Basic Sciences and Aqua Medicine* was a department at NVH and VET prior to 2020 reorganization
MatInf	Institutt for mattrygghet og infeksjonsbiologi	*Department of Food Safety and Infection Biology* was a department at NVH and VET prior to 2020 reorganization

Other

Abbreviation	Norwegian	Explanation
cand.med.vet.	Veterinær	The degree awarded from completing the profession study in Veterinary Medicine in Norway, short for *Candidatus medicinæ veterinariæ* (male) or *Candidata medicinæ veterinariæ* (female).
Research Track	Forskerlinje	A research specialization for the professional study Veterinary Medicine. Students electing to take this specialization have a normalized time to complete their veterinary degree of 6.5 rather than 5.5 years.
Introductory chapter	Kappe	The first part of a Norwegian article-based doctoral thesis serves as an introductory chapter, connects the separate articles and functions as a comprehensive synopsis.
Introductory meeting	Velkomstsamtale	Meeting with a new PhD candidate and their main supervisor, held by the PhD Advisors.

Appendices

Appendix I	Årlig ph.d.-programevaluering 2017-2023 Annual PhD programme evaluations for the years 2017 through 2023
Appendix II	PhD Course evaluations Student comments have been omitted to ensure answers remain anonymous
Appendix III	Career pathways: PhD graduates at NVH 2008-2013
Appendix IV	NIFU's report Bibliometric statistics and analysis for use in evaluations of Norwegian research: NMBU, Faculty of Veterinary Medicine
Appendix V	Supplementary provisions to the PhD regulations for VET
Appendix VI	Retningslinjer for Ph.d.-programråd for Veterinærvitenskap og utvalg for diplotmatutdanning (Ph.d.-programråd VET) Mandate for the PhD Programme Council
Appendix VII	Retningslinjer for Forskningsutvalget ved Veterinærhøgskolen (FU-VET) Mandate for VET Research Council
Appendix VIII	Guide on the content and scope of the introductory chapter (*kappe*) of doctoral theses
Appendix IX	Accepted theses 2014-2023 Complete list of accepted theses for the period