Request for
Fourth Term Accreditation
by
KNAW-ECOS
of the
Graduate School
Wageningen Institute of Animal Sciences
Main part of application for re-accreditation
Research School Accreditation Committee

Year of submission: 2010

Years in which the previous accreditation(s) was/were awarded: 1995 / 2000 / 2005

Name of research school (Dutch): Wageningen Institute of Animal Sciences
Name of research school (English): Wageningen Institute of Animal Sciences
Acronym/abbreviation: WIAS

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Institutes and/or faculties participating in the research school
Wageningen-UR Livestock Research
Institute for Marine Resources and Ecosystem Studies (IMARES)
Animal Sciences Group - Central Veterinary Institute (CVI)

Other institutions with which the research school has a formal partnership
Faculty of Veterinary Medicine of Utrecht University (The Netherlands)
National Institute for Agricultural Research (INRA, France)
École doctorale ABIES (AgroParisTech, France)
Nordic Forestry, Veterinary and Agricultural University Network (NOVA, Scandinavia)
International Livestock Research Institute (ILRI, Kenya)
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Preface

Wageningen Institute of Animal Sciences (WIAS) was established May 25, 1993. WIAS is a graduate school of Wageningen University, engaging in activities in animal sciences and related fields, and encompassing fundamental and strategic research, and training of young researchers. WIAS was first accredited by the Royal Netherlands Academy of Sciences (KNAW) in 1995, and re-accredited in 2000 and 2005. This document contains the application for re-accreditation of WIAS for the period 2011-2015, according to the format prescribed by the KNAW.

In 2009, WIAS underwent an international peer review. The peer review committee concluded that

- WIAS has a strong sense of identity; its members pay a strong allegiance to the Institute's mission and vision,
- WIAS is highly regarded internationally as a leading centre of research and higher education,
- The work of WIAS is relevant both scientifically and to society in general, and part of its work falls in the category “world-leading”,
- Vision and research themes are carefully chosen to ensure relevance to Dutch agriculture and society and WIAS is greatly appreciated by industry,
- Prospects of the school are excellent; the full potential of the new alignment with the DLO part of Wageningen UR is yet to be realized.

Compared with the peer review of 2004, the average score of WIAS groups increased by 0.5 points on a five-point scale (from 3.5 to 4.0)\(^1\). Especially output and productivity have increased considerably. The total number of scientific publications increased from 238, in the period 1999-2003, to 285, between 2003-2008, and the total number of papers in refereed journals increased from 146, in the period 1999-2003, to 196, between 2003-2008. Productivity of papers in refereed journals per FTE research was 43% higher in the period 2003-2008 (11.7) compared to 1999-2003 (8.2). To stimulate further improvement, the committee pointed out a few challenges and issues, which WIAS has already started to address.

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\(^1\) For more information about the scores of individual chair groups, see section 4 (from p. 29) of the assessment report on the international peer review of the Graduate School WIAS 2009.
1. Mission

The graduate school WIAS is responsible for research strategy, research quality, and the PhD program in the field of animal sciences at Wageningen University. These tasks are captured in the WIAS mission:

The graduate school WIAS aims to improve our understanding of animals and their various roles for mankind through fundamental and strategic research and training of early stage researchers (PhDs).

2. Research context

The basic structure of the WIAS research program has remained the same during this past accreditation period. The context, content, and focus of the program, however, has changed to accommodate developments inside and outside the graduate school. Three new research themes have been formulated: animal health and welfare, healthy and safe products, and sustainable systems. These three themes represent the three main issues faced by society in its responsibility towards animals and animal production. The core of WIAS encompasses the life science fields of zoology, genetics, immunology, epidemiology, physiology, and ecology. The research areas of each chair group and expertise of individual staff members reflect the disciplines involved. The joint contributions of chair groups and their associated staff to the program are organized into the three overarching WIAS research themes. In this way, the past accreditation period, WIAS has increased critical mass and enhanced collaboration between chair groups. Furthermore, WIAS has extended its research to participate in emerging trends involving companion animals and non-food functions of animals, and interactions between human and animal research. Collaboration with the Institute for Marine Resources and Ecosystem Studies (IMARES) expanded our research in marine ecology.

New areas of research

Companion animals and non-food functions of animals

During the past accreditation period, WIAS chair groups extended their research and education in companion animals and non-food functions of animals. Examples of new areas include studies on eczema and osteochondrosis in horses, behavior of dogs in relation to nutrition, genetic defects in horses, and obesity in dogs and cats.

Interactions between human and animal research

WIAS research illustrates that human research benefits from ideas, methods and models used in animal research and vice versa. Alliances were created between groups involved in animal science research and groups involved in human research at Wageningen University. Examples of joint research include studies on effects of dietary fiber on satiety in pigs and humans, development of a hypoallergenic species of mussel, studies on immunomodulatory effects of specific probiotic strains, and milk genomics. Other areas of joint interest include infectious diseases and physiology.

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2 For more information about the role of WIAS, see section 3 (pp. 11-12) of the WIAS Peer Review Documentation 2009.
3 For more information about the research programs of individual chair groups and involvement of senior staff members, see Part B (from p. 37) of the WIAS Peer Review Documentation 2009.
4 For an overview of the current research program, see section 4 (pp. 14-17) of the WIAS Peer Review Documentation 2009.
WIAS has appointed three new chair holders to widen the scientific base of expertise, specifically in the direction of the new areas of research. Prof. Wouter Hendriks was appointed in 2005 as the new chair of Animal Nutrition. He has an excellent record and international framework in the pet-food sector. Prof. Jerry Wells was appointed in 2007 as the new chair of the Host-microbe Interactomics group. His expertise is in the applications of genomics in bacteriology and virology. He combines this expertise with the broad genomic experience of the Animal Breeding and Genetics group and the domain of immunology. Prof. Jaap Keijer was appointed in 2008 as the new chair of the Human and Animal Physiology group. His involvement in the fields of infectious diseases, animal and human nutrition, and genomics, creates closer ties between human and animal research.

Internal collaboration
The peer review committee noted that the relatively small size of several chair groups within WIAS produces some major challenges for management of the Animal Sciences Group. They suggested that these challenges would be best met by combining chair groups into larger managerial entities, while retaining the chairs and some clustering into subject areas. In response to this recommendation, WIAS formed 3 new clusters based on subject areas.

- **Cluster 1. Animal Biology, Nutrition and Health**, which involves the chair groups of Cell Biology and Immunology (CBI), Human and Animal Physiology (HAP), Experimental Zoology (EZ), and Animal Nutrition (ANU).
- **Cluster 2. Epidemiology, Genomics and Interactomics**, which involves the chair groups of Host-Microbe Interactomics (HMI), Quantitative Veterinary Epidemiology (QVE), and Animal Breeding and Genetics (ABG).
- **Cluster 3. Adaptive Animals and Systems**, which involves the chair groups of Animal Production Systems (APS), Animal and Society (AAS), Aquaculture and Fisheries (AFI), and Adaptation Physiology (ADP).

To integrate research in the area of fish culture and fisheries, a fourth, cross-cutting-cluster was formed: **Aquatic Resilience Studies**, involving the chair groups of AFI, CBI, EZ, ABG, QVE, HMI, ANU, and APS.

WIAS also operates in collaborative structures within the Animal Sciences Group, where chairs of the Department of Animal Sciences join forces with their counterparts at the DLO institutes to increase critical mass and to realize effective collaboration. There are joint centers for Animal Breeding and Genetics (Animal Breeding and Genetics Centre, ABGC), and Animal Nutrition (Centre for Animal Nutrition, CAN) which have been positively evaluated by an international committee, as part of the 2008 review of the contract research organization of the Animal Sciences Group. Centers for Aquaculture, and Adaptation and Welfare (Adaptive Animals and Systems) have recently

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5 For more information about the Animal Nutrition group, see Part B (pp. 63-76) of the WIAS Peer Review Documentation 2009.
6 For more information about the Host-Microbe Interactomics group, see Part B (pp. 135-142) of the WIAS Peer Review Documentation 2009.
7 For more information about the Human and Animal Physiology group, see Part B (pp. 143-152) of the WIAS Peer Review Documentation 2009.
started their activities. A center for Animal Infectious Diseases, and a center on Livestock Systems are under development.

In addition to clustering and center formation, two new chair groups will join WIAS. To strengthen research in the area of animal welfare, a new full-time chair will be appointed in behavioral biology. This chair will be part of Cluster 3, Adaptive Animals and Systems. A new professor will also be appointed to strengthen research in the area of fish ecology. This chair will also be part of Cluster 3, Adaptive Animals and Systems, and participate in the cross-cluster Aquatic Resilience Studies.

External collaboration
There is long-standing collaboration in research with the National Institute for Agricultural Research (INRA; France) and the International Livestock Research Institute (ILRI; Kenya) that has been formalized and extended in 2010. Collaboration has been set up, furthermore, between WIAS and NOVA (Scandinavia) and ABIES (Paris, France) for the organization of in-depth courses. The latter collaboration was recently intensified by the formation of the EGS-ABG which was recognized by the EU as Erasmus Mundus joint doctorates program (see Box 1).

The STARS-project, led by the Host-Microbe Interactomics group, is another example of WIAS’ recent success in extending international collaboration in PhD research and training (see Box 2). Each individual chair group also maintains contacts with national and international research groups to sustain knowledge in their research areas and to have access to new insights and techniques. In the coming period, these partnerships will be expanded and we will engage in more European Graduate School activities.

Box 1
The Animal Breeding and Genetics group is one of the four partners in the new European Graduate School in Animal Breeding and Genomics (EGS-ABG). This is an Erasmus Mundus Joint Doctorates program funded by the European Union in 2010. It offers an integrated European doctoral program shaped to train professionals to face the challenges of the animal breeding sector. Partners include AgroParisTech (FR), Aarhus University (DK), Wageningen University (NL), and Swedish University of Agricultural Sciences (SE), as well as representatives from institutes and industry across the globe.

Box 2
The Host-Microbe Interactomics group is the coordinator of the STARS-project (Scientific Training in Antimicrobial Research Strategies). This is an Initial Training Network (ITN) for early-stage researchers who want to undertake post-graduate training in antimicrobial research and development. The STARS-project is funded under the Marie Curie Actions of the Seventh Framework Program (FP7) of the European Union. Partners include the Spanish National Research council, the United Kingdom Medical Research Council, the Latvian Institute of Organic Synthesis, and the University of Siena, Italy.

For more information about internal collaboration, see section 4 (pp. 14-15) of the WIAS Peer Review Documentation 2009.

For more information about external collaboration of the different chair groups, see Part B (from pp. 37) of the WIAS Peer Review Documentation 2009.
Talents and Topics

In September 2008, the WIAS director started a program called “Talents and Topics” to address two challenges simultaneously: stimulate career development of post-docs and young scientists, and encourage collaboration between chair groups. The program contributes, furthermore, to the overall strategy for implementation of the three interdisciplinary research themes. Currently, 3 rounds have been completed, with excellent results, which has led to the decision to organize the program annually. Up to now, the work of the participants in the Talents and Topics program has resulted, for example, in a collaborative program between the Animal Breeding and Genetics group and the Adaptation Physiology group on social interactions in group-housed animals, financed by STW/NWO. Another collaborative program was realized between the Animal Production Systems group and the Animal Nutrition group on greenhouse gas emissions from livestock systems, financed by the livestock industry and the Ministry of Economic Affairs.

3.1. Training and supervision program

The training and supervision program (TSP) of WIAS has proven to be a solid base for the education of young researchers. A PhD study at Wageningen University lasts for 4 years, where 3 – 3.5 years are spent on the research project leading to the PhD thesis and 0.5 – 1 year are spent completing a tailor-made education and training program. The education program aims to develop so-called ‘T-shaped skills’: a combination of broad personal skills and of in-depth scientific knowledge, both of which are essential for a PhD candidate to become a professional animal scientist with a high academic level. Since the last accreditation period, several elements have been added to the TSP to provide more focus:

1. intake interviews with the Assistant-director, the Secretary, the Education Coordinator, and the Confidant of WIAS, and exit interviews with the Assistant-director and the Secretary;
2. new competence acquisition targets have been formulated;
3. a system of waivers for compulsory courses has been introduced for PhD applicants with proven skills based on work experience;
4. new courses, e.g. Modeling, Statistics for Life Sciences, Epigenetics, and Ethics, have been added to the curriculum of in-depth courses, based on evaluations by the PhD council (WAPS).

Ad 1. The intake interview ensures that each candidate is informed about the requirements of WIAS, with respect to the TSP and their project proposal, and gives the candidate the opportunity to ask any specific questions he or she might have. The meeting with the confidant also provides more clarity about the procedure to be followed if the candidate encounters a problem during his or her project, e.g. with supervision. The exit interview has been established to evaluate supervision, the course program, and the value of reviewing projects.

Ad 2. A WIAS PhD graduate must be able to translate developments in science and society into research proposals of high relevance and quality, to present research proposals and project results clearly for broad audiences, to manage scientific projects successfully, and to become a recognized member of international scientific networks. To arrive at this profile of a WIAS graduate, five competences must be acquired during the education program.

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10 For a summary of the WIAS PhD training and supervision program, see section 7 (pp. 21-23) of the WIAS Peer Review Documentation 2009.
• Perform efficiently and effectively as a PhD candidate during the four-year period;
• Be aware of the position of a scientist and of relevant developments in science and society;
• Have up-to-date knowledge of the developments in the relevant scientific area;
• Be able to communicate with a broad audience, establish a scientific network, and become aware of stakeholders and funding institutions; and
• Be able to manage a project (group).

Ad 3. In 2007, WIAS had its education program evaluated by a university committee. WIAS was praised for its curriculum and quality control system. We were advised, however, to offer more flexibility in mandatory elements of the program. As a result of this recommendation, candidates with skills based on working experience, for example, can get waivers for compulsory elements of the TSP and still gain a WIAS education certificate.

Ad 4. The PhD council conducts a survey every two years to ensure that the in-depth courses provided by WIAS satisfy the needs of the PhD candidates. Results of this survey provide the WIAS management and relevant chair groups with priorities to organize new courses that fill the gaps indicated by the PhD candidates. As a result of the last survey, WIAS gained courses in modeling, statistics for life sciences, epigenetics, and ethics.

3.2 Quality assurance in Education and Supervision Program

WIAS ensures the quality of the training and supervision program through a number of actions:
• Each new PhD project proposal is submitted to three external reviewers from abroad who assess the scientific quality and feasibility of a PhD project. Their critical remarks improve the proposals and safeguard their scientific quality. Such a review is skipped only if the project has already been reviewed, e.g. by NWO,
• Employed PhD candidates are selected in a job application procedure. Candidates from abroad, with a foreign Master degree, have to pass an English language test or take a qualifying exam,
• Since 2005, a formal go/no go decision is taken by the promoter and supervisor within eighteen months, based on a formal evaluation of the PhD candidate’s performance,
• From the beginning of their PhD project (Introductory course) candidates are strongly encouraged to publish their work in refereed journals and to present their research at international meetings,
• The University Commission on Animal Experiments assesses the ethical and animal welfare aspects of all animal experiments and has the authority to prohibit or alter certain experiments. A WIAS-approved ethics course, furthermore, is compulsory for the TSP. WIAS has recently (2010) developed a new course that focuses on ethical issues encountered by PhD candidates in their own projects,
• The draft PhD thesis is approved by an independent examination committee appointed by the University, before the candidate is allowed to publicly defend his or her thesis, and
• International professors who take part in the examination committee of PhD candidates are invited as guest speakers during WIAS seminars, frequently held before the defense of the PhD thesis.
As part of this re-accreditation, WIAS assessed its tenured and non-tenured staff based on 7 criteria used by all graduate schools of Wageningen University. Based on these 7 criteria, 61 tenured and 9 non-tenured staff members are currently members of the WIAS graduate school. The number of associated members has also grown in the last 6 years (see Table 1). In addition, more than a dozen guest researchers spend one to nine months at WIAS each year. Funding comes from a variety of external sources, and from WIAS itself. WIAS has an annual budget for support of guest researchers of k/€32.

Table 1. Number of WIAS staff and associated DLO members in 2004 and 2010 by level of admittance

<table>
<thead>
<tr>
<th>Level of admittance</th>
<th>2004 WU</th>
<th>2004 DLO</th>
<th>2010 WU</th>
<th>2010 DLO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted as senior</td>
<td>39</td>
<td>10</td>
<td>49</td>
<td>6</td>
</tr>
<tr>
<td>Admitted</td>
<td>13</td>
<td>8</td>
<td>21</td>
<td>12</td>
</tr>
<tr>
<td>Conditionally admitted</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Total number of staff</td>
<td>56</td>
<td>19</td>
<td>70</td>
<td>25</td>
</tr>
</tbody>
</table>

PhD candidates at the beginning of their project, complete their TSP form, in which they make a course plan for the coming 4 years, and discuss their needs with respect to supervision. In this way, there are clear agreements between each candidate and his or her supervisor about frequency of contact with the supervision team, feedback on manuscripts, and progress made by the candidate. The peer review committee, in their report of 2009, expressed their concern about the supervisory load of tenured staff. Chair groups have taken action by attracting more post-docs to aid in PhD supervision and by sharing supervision of PhD candidates with their DLO counterparts. WIAS recognizes the importance of monitoring supervision and has made a two-step plan to ensure that standards remain high. In the first step, the current situation with respect to supervision will be assessed by means of a survey. Candidates will be asked to fill in anonymously some general information about themselves and their supervisory team, and to answer questions about the quality and organization of their supervision. In the second step, exit interviews will be organized for PhD candidates, shortly before their graduation. These interviews will provide a more constant flow of information about supervision and help to identify problems and areas for improvement.

4. Education in Bachelor’s and Master’s phase

During the last accreditation period, WIAS was one of the initiators and co-financers of one of the two Wageningen University pilot Research Master’s (RM) programs. This Research Master’s, which started in September 2007, is an MSc specialization for candidates with research ambitions and talents, enrolled in the masters’ “Animal Sciences” and “Aquaculture and Marine Resource Management”. Each year 8-10 MSc students are enrolled in the program. The focus is on orientation, preparation, and selection of MSc candidates for a PhD in WIAS or elsewhere. Candidates are required to write two master’s theses, of which one is completed at an excellent institution abroad. In addition, they follow a series of courses aimed specifically at acquiring and improving professional skills in writing and defending a scientific research proposal. In 2011, WIAS will apply for the NWO Graduate Program, which will result in further development of the synergy between MSc and PhD education.

11 For more information about researchers and other personnel, see section 5 (pp. 17-19) of the WIAS Peer Review Documentation 2009.
5. Career prospects for alumni

The employment success of WIAS PhD graduates is high (see Table 2). We have monitored employment after graduation for fifteen years. The percentage of graduates with a first job in research has increased from 50% in the 1990s to almost 80% now. This increase is strong support for the research-oriented approach of the WIAS PhD program. To stimulate career awareness during the PhD study, a workshop on ‘career coaching’ is offered by WIAS for PhD candidates and their supervisors. In addition, job assessments are available for all PhD candidates, so they can orient themselves in the next step of their career.

Table 2. Employment success of PhD graduates, 2003-2008 (N=125)

<table>
<thead>
<tr>
<th>First job after graduation</th>
<th>In the Netherlands (%)</th>
<th>Abroad (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>University</td>
<td>21%</td>
<td>26%</td>
</tr>
<tr>
<td>Research institute*</td>
<td>17%</td>
<td>12%</td>
</tr>
<tr>
<td>Trade and industry</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>Government</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2%</td>
<td>6%</td>
</tr>
<tr>
<td>Unemployed and looking for a job</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Unemployed and not looking for a job</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>49%</td>
<td>51%</td>
</tr>
</tbody>
</table>

* including about 5% R&D in industry

6. Graduation rate

Measures taken by WIAS to reduce time to graduation (as advised by ECOS in 2000) have been fruitful: since the mid-1990s, median time to degree (the time for 50% of a cohort to graduate) has decreased by 8 months. During the last accreditation period (2005-2009), the graduation time stabilized at about 4.5 years, which is the original benchmark set by ECOS. This graduation time includes about 4 months between submission of the thesis and the public defense.

Figure 1. Trends in median time to degree of employed PhD students in WIAS, Wageningen University (WU; data until cohort 2001) and the Netherlands (NL; data from VSNU until cohort 1999).

The time to degree of PhD candidates is low compared with national and international averages (Figure 1) as a result of appropriate selection of candidates, critical review of project proposals,
and balanced supervision\textsuperscript{12}. The percentage of people who stop during their PhD study (average of 6.4\%) is also low. Additional information about time to degree and drop-out percentage can be found in Appendix 1.

7. The measures taken in response to criticisms made at the time of the previous re-accreditation

In the letter of re-accreditation sent to WIAS in 2005, two recommendations were made by the ECOS committee:

1. Attract more funding from the National Research Council (NWO)
Chair groups have been increasingly successful in attracting external funding from the National Research Council (NWO). WIAS scientists, furthermore, contributed to the establishment of a new NWO program ‘Appreciation of Animal Welfare’, co-funded by the Ministry of Agriculture, which resulted in funding for several WIAS groups. Table 4 shows that research input in NWO funded projects has more than doubled since 2004. A list of Veni, Vidi, Vici and ERC grants can be found in Appendix 2.

2. Focus more on using an integral approach for the study of environmental problems in research within the newly formed research theme Ecology and Society.
Within the new WIAS theme “Sustainable Systems”, substantial activities have been developed in the area of ecology. The Animal Production Systems group has taken the lead in this area\textsuperscript{13} with research on ecological footprints of different animal production systems, using life cycle analysis methods. The chair group has also created alliances with other chair groups in WIAS to study potential factors affecting these footprints. Recently, an Innovation Subsidy was granted, for reduction of methane emission in cattle by means of nutrition, by the Ministry of EL&I. Moreover, the Ministry of EL&I and the Product Board for Animal Nutrition granted “Carbon Footprint Animal Nutrition”, which aims at the development of a practical tool to compute the carbon footprint of feed production and utilization in animal production. Based on the FAO report "Livestock’s Long Shadows", WIAS initiated seminars for staff members and a workshop on “Science Meets Society” for PhD students. This resulted in projects on the use of animal waste for biofuel production and on the reduction of GHG in livestock production systems.

In 2006, Prof. Peter Groot Koerkamp and his group, which is part of the chair group Farm Technology, joined WIAS. He and his group focus on the design of new animal husbandry systems that integrate economic, ecological and societal demands. WIAS’ involvement in marine research was expanded by appointing Prof. Adriaan Rijnsdorp and Prof. Aad Smaal from IMARES as special chairs. To strengthen the research activities in their area, WIAS is in the process of appointing a professor in Marine Systems Ecology. At this stage, we are also investigating if we can develop a cross-cluster graduate school with the environmental sciences groups in our university.

\textsuperscript{12} For more information about time to degree and drop-out rates, as well as WIAS time to degree compared with national averages, see section 10B (pp. 24-26) of the WIAS Peer Review Documentation 2009.

\textsuperscript{13} For more information about the Animal Production Systems group, see Part B (pp. 79-89) of the WIAS Peer Review Documentation 2009.
8. Measures proposed in response to the most recent external peer review

The Peer Review Committee that evaluated WIAS from 9 to 11 June 2009 considered WIAS to be a leading centre of research and higher education, with excellent prospects for the future. “The Review Committee ... concluded unequivocally that WIAS has a strong sense of identity and that the staff and students understand and pay strong allegiance to the Institute's mission and vision. The standard of management and leadership ... is very high. WIAS is highly regarded internationally as a leading center of research and higher education.”

Recent developments within WIAS are mostly in line with recommendations made by the Peer Review Committee. Some recommendations are to the Executive Board or university-wide organizations, which WIAS will bring to their attention and discuss. A complete overview of the recommendations is provided, including the reply of WIAS to each, in Appendix 3.

9. The male/female ratio among the members of the tenured staff, non-tenured staff and PhD candidates in the school

Table 3. Number of tenured and non-tenured staff members, and PhD candidates, and percentage of men and women in each category

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Men (#/%)</th>
<th>Women (#/%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenured staff</td>
<td>62</td>
<td>52 / 84</td>
<td>10 / 16</td>
</tr>
<tr>
<td>Non-tenured staff</td>
<td>26</td>
<td>18 / 69</td>
<td>8 / 31</td>
</tr>
<tr>
<td>PhD candidates</td>
<td>171</td>
<td>84 / 49</td>
<td>87 / 51</td>
</tr>
</tbody>
</table>

*#=absolute number, %=percentage of relevant category

At the moment, about 16% of tenured staff, 31% of non-tenured staff and 51% of the PhDs are women. We regularly give voice to the request for a more balanced male/female ratio, although decisions on this matter are outside the realm of the graduate school. Also, the general board is aware of this unevenness and encourages women to apply for key posts but at the same time will choose the person who is best equipped for the job.

10. Organization and management

WIAS has an efficient governance structure that has provided a solid framework for WIAS activities in the past accreditation period and will continue to do so in the future. PhD candidates play an important role in the decision-making process in the PhD education program. Half of the education committee consists of PhD candidates. The chairman of the PhD council is a member of the WIAS Board, which makes formal decisions about changes in WIAS policy with respect to research and education. The WIAS Board, furthermore, consists of WIAS staff members selected from several chair groups and DLO to ensure that all participants in WIAS are represented. All three clusters are represented in the Board. The WIAS management (1.7 FTE) is responsible for implementing decisions made by the Board and has an advisory function to the board. In January 2008, Prof. Bas Kemp became the new Scientific Director, replacing Prof. Johan van Arendonk. Since March 2006, dr. Kor Oldenbroek has been acting as Assistant Director for the Talents and Topics.

For more information about the governance structure, see section 3 (pp. 13-14) of the WIAS Peer Review Documentation 2009.
program, review of projects, and expansion of collaboration on PhD courses. In December 2009, Patricia Huijbers, MSc, took over as WIAS Secretary from Gab van Winkel. Marianne Bruining is the Education Coordinator, responsible for the TSP and organization of courses.

WIAS aims for an open style of communication that takes into account cultural differences among multinational PhDs and post-docs. The means of communication within the graduate school are

- regular meetings between the WIAS director and general director of the Animal Sciences Group (ASG);
- interviews of the WIAS Director with each chair group twice a year;
- monthly meetings of chairs of the Department of Animal Sciences, where the WIAS Director informs chair groups of important developments and puts items on the agenda;
- informative meetings for staff and PhD candidates on new initiatives;
- the annual WIAS Science Day, with (poster) presentations by PhD candidates, organized by the PhD council (WAPS);
- the WIAS Internet site; and
- the ‘WIAS Update’, a brochure about the PhD program, which is published every two years since 2006.

Internal communication is guaranteed, because many WIAS staff and candidates are housed in the same building, Zodiac. In 2011, all candidates and staff will be moving to new, up-to-date, high-quality facilities at the University Campus; where several DLO colleagues are already located. External communication now takes place mainly through the WIAS website (www.wias.nl).

11. Financial resources

An overview of the resources, funding, and facilities of WIAS is given in the Peer Review Documentation 2009\(^{15}\). WIAS has been successful in increasing funding from research grants (NWO) and contract research as shown in Table 4. Direct funding has remained stable.

| Table 4. Funding at institutional level in FTE (WIAS) |
|-----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Funding (FTE)               | 2004        | 2005        | 2006        | 2007        | 2008        | 2009        |
| Direct funding              | 29.5        | 29.4        | 29.0        | 29.8        | 29.2        | 29.8        |
| Research grants             | 9.0         | 7.9         | 11.2        | 14.2        | 15.6        | 18.6        |
| Contract research           | 27.4        | 24.8        | 26.4        | 30.8        | 35.1        | 37.1        |
| Total funding               | 65.9        | 62.1        | 66.6        | 74.8        | 79.9        | 85.5        |

| Table 5. Funding at institutional level as percentage of total (WIAS) |
|-----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Funding (%)                 | 2004        | 2005        | 2006        | 2007        | 2008        | 2009        |
| Direct funding              | 45          | 47          | 43          | 40          | 36          | 35          |
| Research grants             | 14          | 13          | 17          | 19          | 20          | 22          |
| Contract research           | 41          | 40          | 40          | 41          | 44          | 43          |

\(^{15}\) For more information about resources, funding and facilities, see section 6 (pp. 19-21) of the WIAS Peer Review Documentation 2009.
12. Staffing in the preceding period

As indicated in the tables below, the number and FTE input of tenured staff members has remained stable in the last 6 years. The number of non-tenured staff members has doubled since 2005, as has their input in FTE. The number of PhD students also continues to grow.

**Table 6.** Research staff (number) at institutional level (WIAS)

<table>
<thead>
<tr>
<th>Category</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenured staff</td>
<td>59</td>
<td>60</td>
<td>56</td>
<td>59</td>
<td>63</td>
<td>62</td>
</tr>
<tr>
<td>Non-tenured staff</td>
<td>16</td>
<td>13</td>
<td>23</td>
<td>32</td>
<td>35</td>
<td>26</td>
</tr>
<tr>
<td>PhD students</td>
<td>126</td>
<td>133</td>
<td>128</td>
<td>142</td>
<td>158</td>
<td>171</td>
</tr>
</tbody>
</table>

**Table 7.** Research staff (FTE) at institutional level (WIAS)

<table>
<thead>
<tr>
<th>Category</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenured staff</td>
<td>16.55</td>
<td>16.4</td>
<td>15.55</td>
<td>16.34</td>
<td>17.35</td>
<td>17.41</td>
</tr>
<tr>
<td>Non-tenured staff</td>
<td>9.15</td>
<td>8.6</td>
<td>12.6</td>
<td>16.58</td>
<td>18.54</td>
<td>16.32</td>
</tr>
</tbody>
</table>

13. Conclusion

In the past six years, WIAS has grown and expanded its horizons, while maintaining the high quality in training and supervision described in the previous ECOS application. Scientific output and productivity have increased, as has funding from NWO and contract research. We have seen a 38% increase in the number of PhD candidates (from 21 in the period 1999-2003 to 29 in the period 2003-2008; in 2009, the inflow was 39). The median time to degree has been decreased from 5.4 to 4.6 years, with a completion rate of 90%. WIAS has increased critical mass and better internal and external collaboration in research and training. The ambition of WIAS is to continue development of talent-driven courses, like the research master and T&T, to stimulate scientific careers of master students, PhD candidates and postdocs, and to increase participation in European graduate school activities, like ESG-ABG.
## Appendix 1 – Time to degree of employed, sandwich, guest and external PhD candidates in the period 2000-2008

### 1 Time to degree of employed PhD candidates

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrolment</th>
<th>&lt; 4 years</th>
<th>4 - 5 y</th>
<th>5 - 6 y</th>
<th>6 - 7 y</th>
<th>&gt; 7 years</th>
<th>still busy*</th>
<th>Drop-out**</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>16</td>
<td>0%</td>
<td>75%</td>
<td>6%</td>
<td>13%</td>
<td>6%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2001</td>
<td>6</td>
<td>17%</td>
<td>33%</td>
<td>33%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>17%</td>
</tr>
<tr>
<td>2002</td>
<td>11</td>
<td>36%</td>
<td>45%</td>
<td>18%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2003</td>
<td>10</td>
<td>0%</td>
<td>40%</td>
<td>10%</td>
<td>0%</td>
<td>40%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>14</td>
<td>14%</td>
<td>21%</td>
<td>0%</td>
<td>0%</td>
<td>57%</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>9</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>2006</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>2007</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>2008</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>

* still busy refers to PhD who have not yet finished their PhD
** drop-out refers to PhD candidates who stopped during their PhD
*** grey-coloured fields are not final yet
**** time to degree percentages are not relevant for external (mostly part-time) PhD candidates

### 2 Time to degree of sandwich and guest PhD candidates

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrolment</th>
<th>&lt; 4 years</th>
<th>4 - 5 y</th>
<th>5 - 6 y</th>
<th>6 - 7 y</th>
<th>&gt; 7 years</th>
<th>still busy*</th>
<th>Drop-out**</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>8</td>
<td>50%</td>
<td>25%</td>
<td>13%</td>
<td>0%</td>
<td>0%</td>
<td>13%</td>
<td>0%</td>
</tr>
<tr>
<td>2001</td>
<td>13</td>
<td>31%</td>
<td>31%</td>
<td>23%</td>
<td>0%</td>
<td>8%</td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td>2002</td>
<td>14</td>
<td>21%</td>
<td>43%</td>
<td>21%</td>
<td>7%</td>
<td>0%</td>
<td>7%</td>
<td>0%</td>
</tr>
<tr>
<td>2003</td>
<td>8</td>
<td>38%</td>
<td>38%</td>
<td>13%</td>
<td>0%</td>
<td>0%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>6</td>
<td>67%</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>2005</td>
<td>11</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>91%</td>
<td>9%</td>
</tr>
<tr>
<td>2006</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>2007</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>94%</td>
<td>6%</td>
</tr>
<tr>
<td>2008</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>

### 3 External PhD candidates

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrolment</th>
<th>Graduated</th>
<th>still busy*</th>
<th>Drop-out**</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2001</td>
<td>5</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2002</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2003</td>
<td>1</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2004</td>
<td>3</td>
<td>33%</td>
<td>67%</td>
<td>0%</td>
</tr>
<tr>
<td>2005</td>
<td>9</td>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>2006</td>
<td>2</td>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>2007</td>
<td>4</td>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>2008</td>
<td>6</td>
<td></td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Appendix 2 – Overview of Veni, Vidi, Vici and ERC grant obtained by WIAS

*Veni*

2006 dr. Bas Rodenburg Animal Breeding and Genetics
2009 dr. Joost van den Borne Animal Nutrition
2010 dr. Maria Forlenza Cell Biology and Immunology
2010 dr. Tobias Seidl Experimental Zoology

*Vidi*

2008 dr. Piter Bijma Animal Breeding and Genetics

*ERC Advanced Grant*

2009 Prof.dr.ir. Martien Groenen Animal Breeding and Genetics
1. Keep the interface between WIAS and ASG under scrutiny to prevent possible misalignment
To ensure alignment between WIAS and the Animal Science Group (ASG), the Directors of WIAS and ASG have monthly meetings to discuss and safeguard the activities and duties of WIAS. In response to this Peer Review recommendation, the WIAS Director was appointed as member of the ASG Management Team. In this way, the interface between WIAS and the ASG is formalized independent from its directors. Decisions on, for example, appointment of new chairs, support of chairs, clustering of chairs and allocation of strategic funds are made after proper consultation.

2. Combine or cluster smaller chair groups into larger managerial entities on the basis of similarity of subject areas
Appropriate action was taken, and substantial progress was made by WIAS to combine or cluster smaller chair groups, as is discussed in the body of this application (p. 4).

3. Provide WIAS with a budget to improve its profiling
WIAS and its associated chair groups use various media such as newsletters, websites, and brochures to increase visibility both nationally and internationally. Evidence that profiling has been successful can be seen, for example, in the steady increase in contract research funding. Recently, the Experimental Zoology group won the annual Dutch Academic Award. This prize is given to a scientific research proposal that appeals to a broad audience and receives extensive media coverage, further improving the visibility of WIAS research. In addition, dr. David Lentink of the Experimental Zoology group was accepted as a member of the KNAW Young Academy. WIAS will continue to monitor its visibility and explore new media to improve profiling in 2011. Discussions about our findings will take place with other Graduate Schools, and joint actions will be formulated.

4. Develop a cross-chair strategy and plan to increase NWO and EU funds in an integrated and comprehensive fashion
In 2005, the ECOS committee recommended that WIAS increase its funding from the National Research Council (NWO). Several actions have already been taken:
• Establishment of the Talent and Topics program, which contains elements such as Writing Winning Grant Proposals to help young researchers write successful proposals,
• Establishment of the NWO-LNV program “Appreciation of Animal Welfare”, which resulted in funding for several WIAS groups,
• Providing funds for external support in writing proposals, and
• The Directors of the Wageningen Graduate Schools advise candidates applying for Veni, Vidi, Vici grants on their proposals and presentations.
WIAS will continue to monitor its strategy in 2011, to maintain steady growth of NWO and EU funds.

5. Commercial exploitation of research through avenues such as own patents and joint commercial ventures. Review best practices in knowledge exchange at other Dutch universities and adopt the approach that suits best
WIAS will develop a strategy in 2011 to exploit research commercially. First, experts of Wageningen University will be consulted. Second, the required actions will be defined, together with the other Graduate Schools. Third, collaboration in this field will be set up through the newly formed centers.
6. **Stimulate even greater collaboration, exchange of staff, and expertise with the DLO part of Wageningen UR (greatest benefit would no doubt be realized by amalgamation of groups onto a single site)**

This action has been completed. Centers have been created to formalize collaboration between DLO and WU, as described in the body of this application (p. 4). These centers are evaluated every four years by an international committee. In addition, WU staff members will move to the Wageningen University Campus in 2011, where some of our DLO partners are already located.

7. **Extend research activities beyond classical livestock species, e.g. companion animals and animal models for human medical research**

WIAS continues to expand its research in the area of companion animals and non-food functions of animals, as well as establishing collaborations between fields of human and animal research. Progress made by WIAS and groups involved in these areas of research are described in the body of this application (pp. 3-4).

8. **Develop a research strategy for ASG as a whole that allows for the differences in goals and aspirations of the university, and DLO staff**

This recommendation is being addressed together with recommendation 6. Formation of centers will improve development of research strategy and stimulates synergy between ASG and DLO by making fundamental and strategic funds available for PhD research. The centers also provide opportunities for commercial exploitation.

9. **Continue financial support of Graduate School strategic initiatives like the WIAS “Talents & Topics” program**

We are happy to report that funding has been secured from the strategic funds of the Animal Sciences Group for future rounds of this successful program.

10. **Revise the level of resource provision of new chairs**

New chairs are funded by the rector and PhDs or Postdocs are funded by WIAS from its strategic funds. New chairs are now part of a cluster (p. 4 of this application). The cluster leader, Director of WIAS and Director of the ASG decide how much additional strategic funds should be allocated to the starting professor to ensure a successful start.

11. **Make staff development policies and practices more explicit, as part of a more comprehensive succession plan in general**

Action on this recommendation is being taken at the level of the university with the implementation of the tenure-track system. WIAS has initiated the Talents and Topics which stimulates career development of talented young researchers. The success of T&T has prompted the other Graduate Schools to develop similar programs.

12. **Start a thorough and careful discussion on the pros and cons of performance indicators resulting from various bibliometric assessments**

This is an ongoing discussion at the level of the university. No concrete actions have been formulated, but WIAS actively participates in the ongoing discussion and will continue to do so.

13. **Consider ways to incorporate measures of the wider impact of research (outcomes rather than output)**

Currently the Environmental Science Group of Wageningen University is running a pilot study to discover parameters to measure the wider impact of research. When the results of this study are presented, WIAS will use the conclusions to start a discussion among its members.
14. Keep records of the numbers of job applications received and job interviews held
Action on this recommendation has been completed. Human Resource Management keeps track of the number of job applications and reports on this to WIAS.

15. Safeguard that the Introduction and Discussion sections of the Wageningen PhD thesis are substantial independent pieces of work that can be assessed as the candidate's own
The College of Deans has defined guidelines for the Introduction and Discussion sections of the PhD thesis. These guidelines state that the introduction and discussion of the thesis must be independent pieces of work and must place the research in a broader scientific and social context. The WIAS director has notified the professors of all associated groups of these guidelines.

16. Determine standards for the availability of staff to act as daily supervisors, and for the availability of members of the supervisory team in general, before expanding current numbers of PhD candidates any further
The action taken by WIAS with respect to this recommendation is discussed in the body of this application (p. 8).

17. WIAS should consider to broaden the “Science meets society” events to include all animal science university research
WIAS has engaged in several activities that reflect our active participation in the translation of science to society. The animal sciences group has, for example, initiated a Wageningen University and Research Center-wide Task Force on Careful Animal Production in response to the public debate on animal production. WIAS is an active participant in the debate about intensive animal production systems in the Netherlands, as well as a contributor to the publication of a white book for antibiotics, which proposes measures for reduction of antibiotics in animal production systems.