

Midterm Review 2012
of the Graduate School WIAS
Final Report



WAGENINGEN **UR**
For quality of life

December 2012

FINAL REPORT OF THE WIAS MIDTERM REVIEW 2012

The Committee

The WIAS Midterm Review Committee (further called the Committee) consisted of the WIAS International Advisory Board (WIAB) and four international experts:

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Introduction

Three years after the International Peer Review 2009, the Committee was invited by the WIAS Board and Director to evaluate WIAS and to give advice and recommendations to the chair groups in anticipation of the next Peer Review in 2015. Firstly, the Committee studied the Documentation 2009-2011 prepared by the WIAS management. The outlines of this Documentation, as well as the evaluation itself, were provided by the Standard Evaluation Protocol 2009-2015, as adapted by Wageningen University and WIAS. Secondly, from 22 to 24 October the Committee discussed the Documentation with the WIAS chair holders, WIAS Board and Director, the WAPS (WIAS Associated PhD Students) Council, the Education Committee, and the Director of the Animal Science Group. On 24 October the Committee presented the preliminary conclusions and recommendations of the Midterm Review 2012 to the WIAS management, chair groups and rector of Wageningen University.

The objectives of this evaluation were to analyse the performance and developments of the WIAS chair groups and graduate school since 2009, to relate these to the conclusions and recommendations of the Peer Review 2009, and to make recommendations with respect to the preparation for the Peer Review 2015. To facilitate these objectives, the Chairman of the

Peer Review Committee 2009, Prof. Moughan, participated in the Midterm Review 2012. In this report the Committee presents two sets of recommendations: one set for the research, management and graduate training at the level of the graduate school as a whole, and one set for the research and management of the individual chair groups. The results of this Midterm Review are not expressed in scores from 1 to 5 for Quality, Productivity, Relevance and Viability. This is reserved for the Peer reviews.

The Committee gratefully acknowledges the constructive and supportive contributions of the WIAS director, the WIAS executive secretary, who also acted as secretary of the Committee, and of the WIAS community before and during the Review. The Documentation 2009-2011, that contained a wealth of quantitative and qualitative information, including bibliometric and SWOT analyses, and a reflection on the findings and recommendations of the Peer Review 2009, were very helpful for the work of the Committee. The discussions were open and constructive.

General conclusions (Part A)

Part A of the Documentation over 2009-2011 contained the information on research programme, personal input, research environment, scientific output, graduate training and supervision, and perspectives at the level of the graduate school.

The Committee started its review with the notion that at least until 2009 the WIAS graduate school has operated at a high level, on the basis of the laudatory comments of the Peer Review 2009: "WIAS is highly regarded as a leading centre of research and higher education. The work of WIAS is relevant both scientifically and to society in general and some of its work falls in the category of being world-leading...WIAS is clearly appreciated by industry". At the end of the midterm evaluation the Committee concluded that these qualifications still apply to WIAS in 2012:

Overall conclusion: The committee was impressed by the productivity, vitality and quality of the work of WIAS. It was considered that every group had improved its position on the 2009 review. Funding has improved as has the general quality of scientific publications.

The Committee discussed the Reflection on the Recommendations of the Peer Review 2009. The Committee evaluates the reply of WIAS Board and management as follows (the numbers 1-17 refer to the recommendations of the 2009 Peer Review report; 18-20 refer to the goals from Peer Review 2009; the 2009 recommendations and goals are printed in italics):

- (1) *Keep managerial interface between WIAS and ASG under scrutiny:* The alignment between WIAS director and ASG management has been improved.
- (2) *Make larger managerial entities:* The chair groups have been clustered in order to increase their critical mass.
- (3) *University should provide a budget to WIAS to improve its profiling:* A specific budget has not been provided.
- (4) *Improve NWO/EU funding strategy:* WIAS is developing a cross-chair group strategy to increase NWO and EU funding.
- (5) *Improve commercial exploitation of research through patents:* According to the Director ASG patent application and commercial exploitation of research take place at ASG level.
- (6) *Stimulate collaboration with DLO:* More centres have been created for collaboration between WU and DLO.
- (7) *Extend research beyond classical livestock species:* Research has been further extended to species such as companion animals and animal models for humans.
- (8) *ASG strategy should reflect difference in goals and aspirations of the university and DLO staff.* This has been addressed in the strategy of the centres.
- (9) *Continue Talents and Topics:* The program has been continued.
- (10) *Revise the resource provision of the new chairs:* The provision has not been changed.
- (11) *More comprehensive succession planning is indicated:* The university has implemented a tenure track system.

- (12) *Discuss the bibliometric performance indicators as measures of relevance.* This is an on-going discussion within university and WIAS.
- (13) *Incorporate measures of wider impact of WIAS research:* Societal relevance is a new element in the self-evaluation reports.
- (14) *Keep record of job applications and interviews:* HRM keeps track.
- (15) *Introduction and Discussion of theses should be student's own:* Is now mandatory.
- (16) *Monitor supervisory load:* A survey held in 2010 indicated satisfaction for 90% of PhD students.
- (17) *Consider broadening "Science meets Society" event.* This workshop was not repeated after 2008.
- (18) *Continue with "Talents and Topics".* This programme has been continued.
- (19) *Support and stimulate existing and new centres within ASG.* WIAS supported existing centres and formation of new centres.
- (20) *Organize joint PhD courses and stimulate exchange of PhD students at European level. Inter-graduate school collaboration has been promoted.* The recently founded European Graduate School in Animal Breeding and Genetics was recognized by EU as an Erasmus Mundus Joint Doctorates Programme.

Conclusion 1: Most recommendations of the Peer Review 2009 have been addressed successfully.

Conclusion 2: Some of the recommendations need further action.

In particular:

Ad (2): Cluster formation:

Whereas some of the centres are apparently already successful, the clusters are still in development and some chair holders are not convinced of, or even doubt, their added value. Clusters place additional demands for time on all participants. On the other hand some of the smaller groups (especially those that were not affiliated with a successful centre) clearly valued belonging to a cluster.

The Committee noted that there is a potential conflict in "cluster" versus "centre" objectives and strategies. Also, the composition of the clusters at times seems arbitrary. Some groups remain small in size and thus vulnerable to vagaries in funding and staffing. The research programs of the small groups all cover a specific sub-discipline, which increases the heterogeneity of the WIAS research program. The Committee considers the clusters an important instrument for increasing the visibility of the chairs, for reducing the administrative overhead per chair holder, for stabilizing the financial structure, for reducing the heterogeneity of the research, and for improvement of research coordination and cooperation. In particular the smaller chair groups will benefit from the clusters. The clusters cannot be seen as alternatives for centres. The main objective of the centres is the cooperation between university and DLO staff, including joint applications for industrial projects.

Recommendation:

The functioning and composition of the clusters need the attention of WIAS management and staff. Objectives and milestones need to be set, and weaknesses targeted.

Recommendation:

WIAS/ASG should give considerable attention to either the growth of small groups or consider appropriate amalgamations. Clustering for small groups is critical for helping to ensure the groups are viable and successful.

Ad (3): Lack of profiling budget.

Some profiling has taken place in the reporting period, in particular via winning the Academic Year Prize. Although WIAS can be complimented with winning this prestigious national award, the Committee took notice of the ad hoc instead of structural financing of the profiling during the reporting period.

Recommendation :

The Committee recommends the formation of a structural profiling budget.

Ad (4): NWO support.

Although some successes have been obtained, the total NWO support slightly declined in the reporting period, in contrast to funding from industrial sources. This decline implies that the balance between the fundamental and more applied research within WIAS is under pressure. The very high competition for NWO grants implies that obtaining these grants is a sign of scientific excellence.

Recommendation:

More attention should be given to securing prestigious grants (in particular NWO grants: Veni Vidi Vici and Open Competition). This is also important for maintaining the balance between fundamental and application oriented research.

Ad (5): Improve commercial exploitation.

Several groups appeared not aware of the fact that patent application and commercial exploitation are managed at ASG level. The Committee considers that there is some potential for WIAS to increase and diversify its income streams, by paying closer attention to the protection and exploitation of intellectual property (IP). This is also a means of increasing the groups national and international profile.

Recommendation:

ASG should develop and propagate a clear policy on IP, which assists and gives incentives to WIAS staff to commercialize relevant findings and discoveries.

Ad (10): Very modest start up funds for new chairs.

Whereas the Committee was impressed by the performance of the new chair holders, the Committee also noticed the very high work load of these chair holders and their very limited staff, partly as a result of the funding system for teaching at WU. Start up funding should be increased and should allow the funding of staff for teaching and research program development as well as scientific infrastructure during the start up period.

Recommendation:

The start up budgets for new chairs should be increased.

Recommendations not related to the Peer Review 2009:

1. Funding

The Committee concludes that in the last three years the funding of the research has further increased and as a result also the number of PhD students. This is mainly due to the increase in funding by industrial contracts, stimulated by the successful cooperation within centres.

Recommendation:

Although funding is already strong, there is still some potential for growth, especially at the international level (e.g. EU Framework Program and cooperation with industry). Further growth can be recommended, provided that sufficient staff is available for PhD supervision.

2. The bibliometric analysis.

The system of bibliometric analysis adopted by WUR/WIAS has been developed to assess the productivity and impact of fundamental research. It tends to under-appreciate the value of application-oriented research. WUR/WIAS need to be aware of worldwide trends, especially in agriculture, towards mapping and reporting outcomes of research and post-graduate teaching in terms of impact for society and economy. In particular, there is a trend towards supplementation of bibliometric output with information about how the research impacted or will impact society and economic development, in terms of creation of new jobs, of sustainability, or profits (the metrics).

Recommendation:

WIAS/ASG should develop and implement a cohesive set of outcome measures to assess societal and economic impact where possible.

3. Human versus animal science.

In the field of human nutrition the relationship between human, plant and animal science is clear. However, the position of human science in an animal science environment such as WIAS/ASG needs specific attention, to avoid competition with the medical field (in which small isolated groups have no future) and to secure a solid basis in WIAS and ASG. If the groups concerned do not succeed finding a good balance between human and animal science, they will not benefit from the specific advantages that their animal science environment offers, and may end in a marginal position, with low visibility and societal relevance. In addition, opportunities will be missed to bring the best of human science to bear on animal science problems.

Recommendation:

The balance between human and animal science within WIAS needs attention within all groups concerned. Development of a strategy at WIAS level is recommended.

Meeting with WAPS Council and Chair Education Committee

ECOS accreditation KNAW 2011: "Training and supervision programme and the organisation of graduate school are excellent"

The discussion with the WAPS council and Education Committee representatives confirmed the results of the Supervision Survey that the large majority of the PhD students is satisfied with the quality and organisation of their research by their supervisors. About 80% was "well" to "strongly" satisfied. About 11 % was less satisfied. Part of the dissatisfaction of the remaining 9 % may be related to cultural differences experienced by students from abroad. The WAPS representative mentioned that the Training and Supervision Plan is viewed by some students as less flexible than they would like.

Recommendation:

Attention should be paid to the 20% of the students who were less than "well" to "strongly" satisfied with their supervision.

The Chair Groups (Part B)

Animal Breeding and Genetics (ABG)

Research Program. The research program and scientific quality is of a very high standard. ABG has an excellent infrastructure for genetic research and has a good understanding of which topics are appropriate for the focus of the group and which are not. Further, the genetic expertise, including a large part PhD students and staff well trained in bioinformatics, allows the group to tackle research in a wide range of different animals. The emphasis on bioinformatics is vital for their future role as leaders in animal genetics. ABG made a good decision to limit sequencing efforts and outsource the technology, thus allowing their group to focus on the analysis.

Composition of the Group. The Committee recognized that this is a group of significant size and that it benefits from internal synergism. The group is well aware of the risk that the group could become fragmented, and responds adequately. Mechanisms to avert this risk include colocation of teams working on different aspects, regular meetings etc. The numbers of staff and PhD students are well balanced.

Research Environment and Embedding. A risk that needs to be addressed is the lack of adequate computer infrastructure at Wageningen University, which poses a risk for this particular group. It could impact other high class research groups, such as plant genetics. Furthermore, the ABG is a good partner for other groups within WIAS to carry out collaborative projects. This presents an opportunity that needs to be explored further.

Scientific Output. The output in terms of numbers and quality of publications and PhD theses is excellent.

Societal Relevance. Much of the research is of immediate significance for the industry. The group has been communicating this to the public. The publications published in “Nature” have a wide impact.

Vitality and Perspectives. The vitality and perspectives are considered outstanding. The program is well-funded and is expected to sustain a productive research line. In view of the rapid developments in Genetics, continuous changes in strategy are inevitable. The difficulty in attracting and recruiting PhD students and staff (especially internationally) was highlighted and the group explained that this was despite considerable efforts to source good candidates – the pool of applicants seemed very limited. The committee considers that the group may be proactive in seeking to recruit from other areas specializing in topics such as genetics, genomics and molecular biology, for example in the biomedical or plant science arenas.

Recommendations

- It is important to think out of the box in attracting new talent from abroad.
- The access to sufficient computer-power should be secured.
- The focus on working with multiple species should be developed into a strength, but may become a weakness if left unattended.
- Research areas to be considered in the next three years include systems genetics.

Adaptation Physiology (ADP)

Research Program and Scientific Quality. The quality of the group is very good. This productive group combines research on fundamental animal physiology with more applied animal science and production. The group seems to have difficulties in defining the balance between these two aspects of its scientific profile, for example when it does not want to be considered as a fundamental biology group, while at the same time it is aiming at publications in higher-ranked journals. The Committee recommends nevertheless that the group expands its scope in fundamental animal physiology, without losing its profile in animal science and maintaining the links with industry.

Composition of the Group. The size of the group is appropriate and stable over the years. It harbours some highly promising young scientists with the potential to build up an excellent publication record. A policy to allow such young talents to grow is in place and this is supported by the Committee.

The group has taken the recommendations from the previous peer review seriously and has succeeded in attracting more grants from NWO (NWO programme on animal welfare). The Committee recommends this strategy be continued in the future and address the open competition programme. The Committee also feels that a greater yield from EU programmes can be achieved by the group. This is especially obvious given the large number of publications (40%) with colleagues from abroad.

Research Environment and Embedding. The group is very active and well positioned in WIAS. The group successfully collaborates with DLO colleagues in Lelystad within the Centre of Animal Welfare and Adaptation. This cluster is functioning well with benefits to the group. The group is optimistic about its position in the cluster on Adaptive Animals and Systems. The formation of collaborative links with the Human and Animal Physiology group, as recommended in the 2009 review, has however not yet been successful. The Committee recommends to further pursue this recommendation.

Despite the fact that there are good connections with industry, the group is not very active in protecting intellectual property rights for inventions in the group. This partly relates to the absence of a clear university policy on patenting. The panel recommends that attention be paid to this issue and a more aggressive strategy be followed.

Scientific Output. Quantitatively the output is stable and at a high level. The impact is around world average. With some more attention to fundamental physiology it should be possible to publish more than 20% of the papers in journals with an impact factor above 3, while maintaining publication output in the more specialist animal science journals which often have a lower impact factor, but a more focused readership.

Societal Relevance. The relevance (animal welfare, sustainability of production systems) is evident. The group is active in organizing post-academic seminars aimed at colleagues within the Centre and outside, an activity that is commended by the Committee. Animal welfare in developing countries is an emerging issue. The type of expertise developed by the group could be of benefit to these countries.

Vitality and Perspectives. Vitality was considered excellent in the Peer Review 2009 and this has not changed since then.

Recommendations

- Redefine the group's position with respect to the balance between applied animal and fundamental animal physiology.
- Revive the attempts to develop a collaborative link with the Human and Animal Physiology group.
- Consider broadening the issue of animal welfare to developing countries by transfer of knowledge to the benefit of these countries.

Animal Nutrition (ANU)

Research Program and Scientific Quality. This is a very productive group working at a very good to excellent level. All recommendations of the Peer Review 2009 have been actively addressed in a positive manner and appropriate changes have been made. There has been a very significant increase in funding since 2009 with funding from NWO/KNAW/ERC and from industry contracts. The chair group has increased its proportion of overall WIAS funding. Of particular note was the two million dollar Erasmus Mundus grant obtained by the group (first out of 143 applicants).

Composition of the Group. The number of PhD students has increased. The Committee notes with concern the high workload of staff in the group which is only likely to increase, with the current and anticipated flow of new funding.

Research Environment and Embedding. The Committee noted with concern the opportunities lost to WUR overall, in that to date strong collaborative links have not been made between the high performing ANU and the Human Nutrition chair group. This must remain an imperative. The group needs to be further supported by WIAS in its plans to further secure cooperation with the DLO nutrition group and partners in the Centre for Animal Nutrition.

Scientific Output. The productivity is good to very good. ANU are publishing papers with CI's and RI's indicating average to high quality (we also note that between 2008 and 2010 16% of papers were in the top 10% most cited papers in the field). The Committee recognizes the shortcomings of focusing on citation rates of papers alone to the exclusion of other measures of quality, but citation rates, nevertheless, remain important and the group seems to have potential for a higher average impact. In relation to this, the group may give some consideration as to where to publish specifically in relation to impact factor of the journal, and likely citation rate.

Societal Relevance, Vitality. The research of the group, with emphasis on animal health, welfare and sustainability, has very high relevance and vitality. The group is active in dissemination.

Recommendations:

- Consider consciously where to publish with respect to impact factor and likely citation rate.
- Continue to foster collaboration with the Human Nutrition chair group.
- Be mindful of overloading staff.
- Secure further cooperation with DLO nutrition and partners in Centre for Animal Nutrition.

Animal Production Systems (APS)

Research Program and Scientific Quality. The Committee recognized the relatively new chair of the group and commended the impressive progress made in a relatively short time, in particular with respect to publication of refereed articles. The group has responded well to the 2009 review recommendations, especially in terms of a more focused and clearly articulated research strategy. The Committee explored whether the focus on value chains could potentially exclude some important issues, but this was considered not to be the case, since the group's portfolio encompasses a wide range of assessments at various levels, and includes assessments of greenhouse gases, water and land at farm level and at regional levels and beyond.

Research Environment and Embedding. The presentation and discussion with the Committee highlighted the group's positive engagement with the Centre WACASA, which includes groups outside of WIAS, and contrasted this to the seemingly less positive engagement with the cluster within WIAS in which APS participates. The WACASA collaboration seems logical, and could be expanded further, perhaps to include areas such as social and economic systems research to complement the biological systems teams currently participating. In particular the Committee recommends collaboration with DLO, if possible in WACASA. The Committee would like to highlight the importance and high social profile of the systems research. The group chair clearly has good connections and excellent social capital that has allowed her to pursue integrated research and engage in profitable collaborations as well as sourcing the data needed by her group for its research.

Composition of the group. The group is very small. The committee considers that the group should continue seeking growth in a way that is well in line with the strategic focus. The integrated research of APS would greatly benefit from WUR incentives in particular in relation to funds and credits for PhD students when these are shared across groups.

Scientific Output. The Committee commends the group on the number of refereed and well received articles published since the start of the new chair.

Societal Relevance. Given the potentially high social profile of the group's work, the committee recommends some consideration be given to an intentional communication strategy that addresses the need for the empirical evidence contained in the scientific publications to also be shared with the more "popular press".

Recommendations:

- Continue growth in line with the newly developed strategic focus.
- Given the high social profile of the research, to develop an intentional communication strategy to share the group's work with the wider public.
- To promote integrated research, WUR should consider incentives, in particular funds and credits, for PhD students when these are shared across groups.

Aquaculture and Fisheries (AFI)

Research program and scientific quality. In the 2009 Peer Review the activities of the group were assessed as good to very good. The Committee noticed a trend to improve on this quality level. The approach of combining physiological research at the animal level with ecological and technical research at the level of the environment, i.e., water and (eco)systems, is convincing. Expansion into marine and fisheries research has been successfully realised without overstretching the resources. This was effected by combining existing expertise on fish nutrition and physiology, water quality management and aquaculture engineering as well as coastal zone management with fisheries and marine research with geographical focus outside Europe. With respect to a refocusing of the group towards coastal aquaculture, discussed during the review in 2009, the Committee unanimously agreed with the group's decision to address the area in relation to the environmental and social embedding of coastal aquaculture in the context of coastal zone management, but not to refocus the activities of the entire group on this research area. The functioning of the group has improved in the reporting period.

Composition of the Chair Group. Staff development of tenure and non-tenure personnel is stable, while the number of PhD students has increased in recent years, with AFI supervising 16 and IMARES 13 PhD. Funding of the university and NWO has slightly decreased, while external contracts have increased. One of the results is the relatively high amount of PhD students from abroad funded by grants of their governments as sandwich PhD candidates. While the Committee acknowledges this strategy to boost productivity and societal relevance of the group, it may come with the cost of reduced activity and visibility at the home base, and should be balanced by recruitment via the new Master in Aquaculture and Marine Resources Management established in 2010, which should be considered to be lifted at an international level.

Research environment and imbedding. The group has strong links with IMARES, with AFI concentrating on freshwater and marine aquaculture and fisheries/marine research outside Europe, and IMARES covering fisheries and marine aquaculture research in Europe. Collaboration is expected to be even more intense by exchanging staff in both directions, a strategy which will support AFI's ambitions in Europe and IMARES's ambitions in Asia and Africa. The functioning of the newly founded cluster Adaptive Animals and Systems can still be improved, but its core philosophy focusing on concept development for animal production and adaptive physiology is viable. The planned new chair on Marine Animal Ecology will strengthen the cluster and is expected to increase cooperation within ASG as well as with IMARES. Another line of cooperation inside the university, which may be intensified, is with social and economic sciences. Overall cooperation with industry is intense with feed production companies, but increasingly also with primary producers, processing companies and retailers, covering the entire production chain. It is recommended to use this concept as well in the cluster, enhancing cooperation in life cycle analysis.

Scientific Output. In response to the 2009 recommendations, focus was put on production of peer reviewed publications, which clearly had a positive effect not only in terms of magnitude of production, but also in quality indicators, which is positively acknowledged by the Committee.

Societal relevance and Perspectives. From an international perspective the relevance is clear. The importance of fisheries and aquaculture as a primary production sector in The Netherlands and Europe is declining, which poses a threat to national funding lines. However, this is compensated for by the growing importance of the sector outside Europe, both with respect to investment in sustainable primary production, production technology, and feed development. Moreover, Europe depends on the import of seafood, which drives a substantial processing industry in The Netherlands. This requires scientific engagement in aquaculture, the world wide fastest growing food production sector, but also in the implementation of the ecosystem approach to fisheries management. The strategy of the chair group to intensify collaboration with industry throughout the production chain, with a specific regional focus on Asia and Africa, and in collaboration with IMARES is well chosen. In combination with actions to increase scientific productivity it will further increase relevance and vitality of the group.

Recommendations

- Continue the successful strategy of boosting productivity and relevance through enhancing the numbers of PhD students and intensifying collaboration.
- Counteract reduced activity and visibility at the home base, caused by focus on Asia and Africa, for instance by stimulating recruitment through the new master in Aquaculture and Marine Resource Management.
- Further intensify collaboration with IMARES.
- Intensify cooperation within ASG, through work on concepts in animal production and environmental interactions, including socio-economic aspects and life cycle analysis.
- Further intensify cooperation with industry throughout the production chain.

Behavioural Ecology (BHE)

Research Program and Scientific Quality. This is a newly established and promising chair group that was not part of the Peer Review 2009. The new chair has developed a comprehensive view on how to integrate knowledge from social behaviour of animals in the wild, farm animals and companion animals. The overarching theme is the role of personality differences between individuals in a population, and between animals and humans. The work mostly focuses on birds (great tit, chicken and quail) and dogs. Despite the heterogeneity of the study objects the Committee was convinced that the scientific approach is solid and creates unity in the group. The theme of personality and individuality in a social context is expected to provide a good basis for extrapolation to wild animals, farm animals as well as companion animals, and the results will contribute to behavioural sciences in general.

Composition of the Chair group. Finding its base in existing as well as new staff, the group has a good mixture of experienced scientists and promising young scientists. For the coming years human resource management may require special attention of the chair. This should be aimed at further reinforcing the sense of common interest and scientific unity in the group. Ecological research of birds is a very competitive field in the Netherlands, with very strong groups in Groningen University, the Netherlands Institute of Ecology, and Leiden University. The present group is more specialized on social behaviour than the others. This is a good niche, although competition for grants will be extremely fierce. The chair holder has well-developed collaborative links with the other Dutch groups and this is endorsed by the Committee.

Research Environment and Embedding. Cooperation with other groups in WU has been established within the newly established Centre for Animal Welfare and Adaptation (CAWA) and the chair sees further possibilities for cooperation within the ASG cluster Adaptive Animals and Systems, which may help to secure funding of the more fundamental research on behavioural ecology.

Scientific Output and Quality. It is too early to comment on the scientific output of the group. The group's scientific potential is great. The young staff already has an impressive track record, which is expected to grow in the near future.

Societal Relevance. The research strategy is expected to provide a good basis for development of tools and guidelines for stakeholders in animal production, contributing to an improvement of health and welfare in farming systems. Translating science in health and welfare, so that the public can understand and evaluate it, is critical for success of farming systems today and into the foreseeable future.

Recommendations:

- Given the fierce competition at the national level, try to find a research niche with a firm basis in the WIAS/ASG/WUR environment.
- Focus on human resource management aimed at creating a sense of common goal-directedness in the group.

- Capitalize on the talents in the group and aim for scientific excellence, with publications in high-ranked journals.
- Create synergy and increase funding potential by enhanced cooperation within CAWA and AGS cluster Adaptive Animals and Systems, specifically ADP.
- Capitalize on the WIAS cluster

Cell Biology and Immunology (CBI)

Research program and Scientific Quality. The 2009 peer-review committee assessed CBI as very good, but indicated the research interest of the group as “extremely broad” and recommended more focus. This recommendation still holds as no major changes in research topics were noted. Particular in the immunomodulation group, more focus will likely increase scientific impact (now at world average) and coherence. Focus may further provide more synergy and visibility of the group. The aquatic immunology group has more focus and good scientific quality (CI well above world average), and obtained a prestigious VENI grant.

Composition of the Group. This is a sizeable group of about 11 staff members. Staff dedicate only a limited amount of time to research (4.2 fte), but this does not seem to be problematic. The group hosts a considerable number of PhD students.

Research Environment and Embedding. The group is well funded and has a large national and international network. At the local level, collaboration within WIAS and ASG is limited, although links with ABG and ADP are worth mentioning. Nevertheless, here is room for improvement and development of joint research strategies that exploit the available complementary expertise within ASG.

Scientific Output and Quality. The Peer Review 2009 concluded that the quality and productivity of the group are very good, and this high level has been maintained during the reporting period. The output is still very good in terms of number of publications, and PhD theses. However, publications in high impact journals are lacking, or are outside of the main research scope of CBI (some of the high impact publications are not mentioned in the list of “key publications”). In particular the publications in the field of immunology have a relatively low impact, possibly due to the diversity in research topics which limits in depth studies needed for a high impact.

Societal Relevance. The research is relevant to health professionals and policy makers. The allergy research and the micronutrient research are of interest to the wider public. The chair holder is well-represented on expert panels and advisory boards.

Vitality and Perspectives. The CBI is under a very energetic leadership, and is unlikely to run out of ideas. However, a research strategy with clear focus is needed to sustain and improve its output. With the addition of zebrafish research, a novel line has been started, that is promising. It builds on previous expertise, but also allows innovation. In order to make this novel research line a strength for the CBI, it is important to reduce the efforts on part of the extensive portfolio.

Recommendations

- Aim at fewer, but stronger research lines that have more critical mass; discontinue those that are unlikely to have high impact or are less in line with WIAS/ASG research strategy.
- Strengthen collaboration with other groups within WIAS/ASG to gain momentum needed for multidisciplinary and more mechanistic studies.

Experimental Zoology (EZO)

Research programme and scientific quality. The quality of this group was assessed as excellent by the Peer Review 2009. Mission, vision and approach combining physics, engineering, molecular techniques and modelling in a quantitative systems analysis have brought the group worldwide to the forefront of science in animal mechanics and developmental mechanics with applications to animal health and welfare and bio-inspired designs.

Funding constraints are experienced with respect to NWO, although some progress has been made recently, and more pronounced in contracts from industry, as research results are relatively far from implementation. The group has limited international grants and possibilities to increase funding from international sources should be explored further, e.g. ERC grants. Very recently a Marie Curie fellowship was obtained. Another strategy may be to attract PhD students and post-docs with their own funding. Given the international visibility of the group, this should be feasible and will increase the activity level, although building up and sustaining in-house expertise is more difficult with non-structural funding.

Research environment and embedding. The group is internationally well positioned and cooperates with top groups from Caltech, Harvard and University of Tokyo. This offers opportunities to capitalise more with respect to international funding and recruitment of scientists coming to EZO with their own funding. At the national level, there is cooperation with the Technical Universities of Delft and Eindhoven, and with the Hubrecht Institute. Scientific cooperation within WIAS and WUR does occur (e.g. with Entomology), but is limited. Although this is understandable given the highly specialized and fundamental research niche of the group, this can lead to an isolated position and could reduce the viability of the group at the longer term. The local and national visibility of the group is very good, as a result of the publicity generated by their scientific activities.

Composition of the Chair Group. The group is a multidisciplinary team consisting of biologists, biophysicists and engineers and has been growing in most recent years, but has still a rather modest size. A further growth of the group is limited by financial constraints. Besides this, recruitment of good students is a problem, as combination of biological, quantitative and engineering skills are rare in the Netherlands. In contrast, international recruitment at scientist level appears to pose no major problem.

Most staff members have a high teaching load. Although this is essential for the university funding of the group, it restricts the scientific efforts of the staff. As teaching is conducted in Zoology, Marine Biology and Developmental Biology, not all teaching activities contribute substantially to recruitment of MSc and PhD students.

Scientific Output. The quality of the individual publications is very high, whereas the productivity in numbers of publications is at a moderate level. There is an apparent contrast between the numerous very high profiling publications in Nature and Science as well as prestigious scientific prizes awarded to the group, and the results from the bibliometric analyses, which show low impact values. This contrast can partly be explained by i) the specialized and small research area not sustaining high citation rates, and ii) the fact that zoology in the bibliometric analysis is not considered as a separate

research field having a lower average world level WoS citation than Plant and Animal science and Biology and Biochemistry, the benchmark was conducted against. Compared to other zoology groups in the Netherlands EZO is doing very well.

Scientific quality and societal relevance. Research is relevant for society and in general society shows much interest in it, but results of the group are far from implementation by industry, with exception of some of the research on animal health. Strategic alliances and cooperation with the technical universities for example may facilitate implementation, and promote the recruitment of adequately trained students and scientists.

Analysis, perspectives and expectations. Together with the suggestions given above to enlarge the group, expansion of the research profile should be considered to broaden the presently limited research niche. However, this requires careful consideration to secure the top level at which the group is operating. The recently initiated collaboration on zebrafish with the Hubrecht Institute is an important step to combine the biomathematical expertise of the group with genetic expertise and zebrafish biology.

Recommendations

- Attention is needed to reduce the apparent contrast between high profiling publications, prestigious prizes, and the rather low citation scores.
- Develop expansion strategy; university should consider increased financial support.
- Continue to explore target international funding, such as ERC and Marie Curie (individual grants or training grants).
- Attract PhD students and post-docs having own funding (international reputation allows for this)
- Intensify strategic alliances, e.g. with technical universities facilitating implementation of results, enhanced industry collaboration and allowing recruitment of quantitatively trained students

Host Microbe Interactomics (HMI)

Research program and Scientific Quality. The chair started building from scratch a new research group since 2007. Productivity and quality have not been assessed in the Peer Review 2009. Since then major investments were made to obtain an optimal technology infrastructure. Recruitment of experienced technicians and several new strategic professors with impressive track records have created potential for the group to become a top laboratory in the field. The major challenge is now to capitalize on the investments. The scientific quality is rapidly increasing in the last few years and points to a high potential of the group.

Composition of the Group. This is a relatively small group. More critical mass is needed to ensure supervision of the rapidly growing numbers of PhD students and interactions with industry. The university may consider investing more in this research line.

Research Environment and Embedding. The group is well funded and has excellent connections with industrial partners. On-going interactions with DLO may further increase visibility, output, and critical mass. The group could be more active in supporting personal grant applications

Scientific Output. Output is very good and increasing; publications are in high impact journals. This publication policy should be continued and will certainly promote the international visibility and status of the group.

Societal Relevance. The topic of infectious diseases and microbiota has great potential and is of high societal importance. The chair holder has good contacts with industrial stakeholders; interactions with other societal stakeholders need to grow.

Vitality and Perspectives. HMI has great potential, although the small number of staff limits the potential for expansion. The maintenance of a good balance between number of staff and PhD students is important and deserves attention.

Recommendations

- Continue the current growth and publication policy.
- Increase the number of staff to ensure PhD supervision.
- Promote the personal grant applications for staff.
- Continue to promote the internal and external collaborations and capitalize on the WIAS cluster.

Human and Animal Physiology (HAP)

This group received low scores during the 2009 Peer Review for all four categories, after a long period without a permanent head, a low number of staff, and a high teaching load. The new leader of the group has a clear vision and has succeeded in presenting a convincing and coherent new research programme. The group should be commended for their progress over the last 3 years. The primary focus of the group is the study of mitochondrial functioning as it relates to energy and substrate metabolism in order to improve health. They concentrate on using molecular (primarily microarrays), histological and biochemical methods to assess mitochondrial function. Most of the work of this group occurs with model systems. Recently the group has added the ability to conduct some human trials. In the future, the group may expand their study of mitochondrial function to include disease susceptibility.

The Committee noted the need to continue to think about the balance of their portfolio relative to human and animal physiology; for consolidation of their position in WIAS, ASG and WUR, animal science needs to have a solid basis in HAP. While the group needs to continue to make progress, they have the potential for being a strong group in the future.

Composition of the group. The group is still small, but new staff has been attracted and integrated in the group. The first contracts from industry for funding of PhD students have been obtained. NWO applications are planned but have so far not been submitted. It appeared that as a result of internal regulations the substantial financial reserves of the group could not be utilized. It is important in the present start-up situation that these reserves become available for investment at the short term. The composition of the chair group will need to be further developed as they currently have a small number of PhD students, and have not yet finished a PhD from a WIAS student in the last 3 years.

Research Environment and Embedding of the Group. The group continues to build the research environment with strong contacts throughout Europe and developing contacts internationally. Linkages to the human medical community are growing. There is currently no clear collaboration across animal science groups or the cluster. The group is open for collaboration within WIAS and ASG, although the clustering with CBI, EZO and ANU, or attempts to collaborate within ASG, have so far not been very productive. Efforts to collaborate with the centres have also not been productive. With the focus on energy metabolism, HAP has functional links with ANU and ADP, and technical links with HMI and CBI. The group should take care that HAP will become well integrated in the near future. The group clearly shows new vitality and potential, but remains vulnerable without a solid basis in animal science. Key collaborative partners would strengthen the applied research by adding a mechanistic framework and would strengthen this chair group by linking it to animal industry.

Scientific Output and Quality. The output of the group is still moderate. Improvement is possible by reducing the very high teaching load for the tenured staff and increasing the low number of PhD students. The impact of the papers is slightly above world average. Nevertheless, the group has made tremendous progress in output since the Peer Review 2009 and the research output of the staff has increased by 20-30%. They rank very good in terms of the journals they are publishing in and they should be commended for the substantial growth of papers in the top 10% of their field.

Societal Relevance. There is indication of substantial societal relevance relative to energy utilization and functional foods. However they are not at a stage to capture that information yet.

Recommendations

- Make sure that the research is differentiated from other groups (nationally and internationally) working on mitochondrial function; try to find a niche that is firmly based in the WIAS/ASG environment.
- Continue to build bridges to animal science groups and develop a balanced portfolio in human and animal physiology.
- Focus on obtaining funds to grow graduate program; especially NWO/ERC need attention.
- Continue to grow research output.
- The chair should be enabled to utilize the reserves of the group in order to secure the infrastructure that is needed for the new research programme.
- Focus on capturing information that shows societal relevance of the research.
human and animal physiology.
- Capitalize on the WIAS cluster

Quantitative Veterinary Epidemiology (QVE)

Research program and Scientific Quality. The group focuses its research on population dynamics of infectious agents in animals. The program fits in the scope of ASG and WIAS. The staff is rather small but widely experienced. The scientific quality of the group is very good with a high number of publications per fte and a high average citation rate (CI: 1.88). The scientific quality even increased in the reporting period.

Composition of the Group. This group has a small number of staff (0.95 fte) but a relatively very large number (12) of PhD students. This ratio is out of balance and makes the group vulnerable. It is recommended to increase the number of staff capable of supervising PhD students, either by recruitment or close collaboration with other groups or institutions. The chair is an excellent scientist but lacks the joy of management duties, which may sometimes negatively influence the growth of the group. The group should benefit more from embedding in the cluster.

Research Environment and Embedding. The group works closely with a number of groups both at the local and national level. There is good collaboration with groups at CVI. The chair is scientifically well recognized, but operation as a small independent group with small staff is limiting capitalization from granting agencies. The group would benefit from incorporation into a larger group to reduce vulnerability and to share management duties. This chair group has taken some advantage of clustering, but needs to continue to take full advantage of the cluster to leverage its value to WIAS.

Scientific Output and Quality. This small group has been very productive with an average of 21 refereed articles per year with 31% of the articles in the top 10%, which is above world average, and with very high impact. In addition, 1.73 PhD theses have been completed per year. The group was evaluated as very good to excellent in the Peer Review 2009 and maintained this high level during the last three years.

Societal Relevance. While the topic has tremendous societal relevance, the Chair group has not capitalised on this with only 1 reported publication for the general public in the last 3 years. The Committee recommends the chair to create opportunities to communicate with the public and to report these efforts in the bibliometric analysis. His membership of the Gezondheidsraad (National Health Council) is illustrative of his expertise.

Vitality and Perspectives. This chair group is extremely small with the chair supervising the majority of the PhD students. While the chair indicated he wanted to engage a post-doc to help with development of grants and to train more PhD students, it is unclear how this approach will provide long term stability for the group. QVE is a vulnerable group because of the staff size compared to the large number of PhD students. Incorporation of the group into a larger group deserves consideration.

Recommendations

- Consider expanding in size, merging with other groups, and effective clustering to ensure proper balance between students and staff and to increase the vitality of this extremely productive group.
- Continue to pursue grant opportunities (NWO).
- Enhance output to the public to increase societal relevance.