

WIAS Midterm Review 2018 Final Report



September 2018

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1. Introduction

1.1 The evaluation system

In the Dutch national research evaluation system, all publicly funded research is evaluated by a peer review once every six years. Wageningen Institute of Animal Sciences (WIAS) has been evaluated by an international peer review panel most recently in 2015. Three years after a peer review, a 'midterm review' is carried out with the objective of providing advice and recommendations in anticipation of the next external peer review which will take place in 2021.

The midterm review was carried out by a committee consisting of the International Advisory Board of the graduate school, extended with experts to cover most of the research domains within the graduate school.

The findings of the Committee are to be made public on the University's website.

1.2 The Midterm Review Committee

The committee consisted of:

- Marta Gomez-Chiarri, professor of Fisheries, Animal and Veterinary Sciences, University of Rhode Island, United States of America
- Sandra Edwards, em. professor of Animal Science and Welfare, Newcastle University, United Kingdom
- Mario Herrero, Chief Research Scientist, Commonwealth Scientific and Industrial Research Organisation, Brisbane, Australia
- Jan Erik Lindberg, em. professor of Animal Nutrition, Swedish University of Agricultural Sciences, Sweden
- Graham Plastow, CEO Livestock Gentec Centre, professor of Animal Genomics, University of Alberta, Canada
- Jos van Putten, professor of Infection Biology at Utrecht University, The Netherlands
- Nico M. van Straalen, em. professor of Animal Ecology at Vrije Universiteit Amsterdam, The Netherlands (Chair)

1.3 Scope of the assessment, assignment to the Committee

In 2015 the Wageningen Graduate Schools underwent a peer review at chair group level as required by the Standard Evaluation Protocol (SEP) for universities in the Netherlands. The SEP also requires a (light) midterm assessment, halfway between two external assessments. Wageningen University (WU) has decided, in line with the SEP, to organise the evaluation of its academic research no longer on the level of single chair groups, but in larger research clusters consisting of several chair groups. The Executive Board of WU expects that these programmatic clusters will have added value in terms of critical mass, viability and societal impact, while at the same time the innovation capacity of chair groups in research and education remains intact.

The shift to evaluation of programmatic clusters of chair groups in research is in line with the SEP of the universities in the Netherlands. The SEP uses the following guidelines for the unit of evaluation:

1. A research unit must have its own clearly defined strategy.
2. A research unit which is subject to assessment should have been established at least 3 years previously. If groups of a more recent origin are to be assessed their self-assessment should indicate their stage of development.
3. A research unit should be known as such, both within and outside the institution and should be capable of proposing a suitable benchmark in its self-assessment.

The midterm reviews for WU in 2018 are to be used as a pilot for the evaluation of these programmatic units. The main goal of the midterm review 2018 is to evaluate whether the newly developed units can deliver a well-described programme containing the requested information on strategy, societal relevance and scientific quality with sufficient coherence to make a SEP-compliant assessment possible.

The Executive Board has requested each graduate school to organise a mid-term review of the research within the school and to invite the International Advisory Board (IAB) of the school to perform this evaluation.

The Executive Board asks the IAB to give feedback at the level of the:

Graduate School:

- Developments in the Graduate School since last peer review and follow up of recommendations

Research unit:

- The relevance of the unit composition
- The presented research themes
- The joint strategy on research quality of the unit
- The joint strategy on societal relevance of the unit
- The presented SWOT (strengths, weaknesses, opportunities and threats) analysis

Chair group:

- Chair groups actions and responses regarding the comments of the peer review committee in 2015.

1.4 Input for the research assessment

This assessment is based on a written self-study provided in advance, and on interviews, presentations and discussions during the site visit with Chair group leaders and researchers, the WIAS management, representatives of the WU and WIAS Boards and, last but not least, PhD candidates and PhD council.

1.5 Working procedure and site visit of the Committee

Prior to the site-visit, the committee members submitted questions, remarks and points for clarification arising from the self-study. These were fed back to the clusters and used for preparation of the presentations during the site visit.

Apart from tours around facilities and the campus, all interviews, presentations and discussions were attended by all committee members.

The first draft of the compiled report was presented to the WIAS management for verification of facts and to comment on the findings of the Committee. Factual errors were addressed and the comments were seriously considered and led to some corrections in the final text and/or recommendations. The final report is endorsed unanimously by the entire Committee.

2. Performance of the Graduate School

2.1 Developments in the Graduate School since the last peer review

Since the last peer review, the WIAS research and PhD education programme has been reorganized.

Three clusters of approximately equal size (~ 10 fte of research staff) have been formed, of which the various chair groups are now part. This has given rise to a lot of discussion within the graduate schools over the past half year and the director of WIAS and the chair holders are to be commended for having achieved this in order to strengthen the units whilst maintaining and encouraging interactions between clusters and chair groups where they add further value. It has quickly become common to refer to the three clusters by colours, a convention that we will follow:

- Green cluster: Animals in Future Food Systems and Society
- Yellow cluster: Populations, Interactions and Genomics
- Blue cluster: Integrative Animal Biology

The committee strongly endorses the formation of such larger units. In this way, WIAS will be better able to keep up with the international developments in animal sciences, in which innovations and a competitive forefront position are fostered by collaborative efforts from different disciplines. It is a trend also seen in other Dutch universities as well as internationally: the complexity of modern life sciences calls for collaboration across disciplines, while preserving disciplinary depth.

Also, the societal issues to which WIAS aims to contribute require a collaborative, broad approach. Animal sciences are in the limelight with regard to many societal debates, including animal welfare, sustainable production systems, zoonoses, human health, biodiversity decline, climate change, and many others. Addressing these issues requires a multifaceted approach with answers on different levels of integration. WIAS has chosen the right strategy to align its diversity of expertise with these societal drivers.

At the same time, the committee observes that the process of integration of what were previously independent and often separate chair groups is not yet complete, although the green cluster is obviously much further on this track than the other two. Regarding the blue cluster in particular the committee has expressed its concern about the apparent scientific heterogeneity and lack of focus (see below).

The apparent diversity of pace at which the cluster formation is taking within WIAS, as recognized by the committee, is accepted by the Rector of the University. The rector has emphasized that the formation of clusters should be a bottom-up process, which should take place in broad consensus among the scientists involved. Consequently, different scenarios are possible with different speeds and possibly different endpoints (from a collaborative unit of separate chair groups to a complete merger). The Department of Animal Sciences shares this view. The committee understands the rationale, but at the same time argues for a clear vision on the desired endpoint from an institutional point of view. Without a set point on the horizon, the process of integration may continue to drift and become unfocused, a situation which will be seen as a serious failure in the upcoming peer review of 2021. The committee also noted some hesitation by some chair groups with respect to their position in a cluster.

The committee encourages the development of incentives and strategies that may help catalyse internal coherence. The committee believes that the PhD projects, of which there are many within each cluster, can catalyse the internal coherence when every PhD project committee includes an external adviser from within the cluster, but from another chair group.

2.2 Follow up of previous recommendations

WIAS has detailed its responses and follow-up of the recommendations of the previous peer review in an appropriate manner.

1. The attempts to attract more prestigious projects from the Dutch National Science Foundation, NWO, seemed to have paid off in several cases. WIAS also staged a post-doc program, which however is of limited breadth due to financial constraints. Despite the fact that NWO-projects are highly prestigious, several scientists have pointed out to the committee that a chair group runs into financial loss on such projects. The committee recommends that this issue is taken up by the Department and brought to a solution, for example by providing an institutional bonus upon contracting an NWO-project.
2. The issues on PhD supervision noted in the peer review seem to have been considered very seriously. Also among individual PhD candidates and the WAPS a great degree of satisfaction and pride was noted. The intensive progress monitoring and the personal attention from the WIAS secretariat seem to pay off in a very positive way. This is also reflected in the relatively short "time to defence" period, which is among the best in WU (and the country).
3. The facilities for animal experimentation are superb. Some complaints were heard on the bias towards projects sponsored by non-commercial parties, in the light of the aim to have an overall 25% commercial use, a target necessary to finance the facilities. It was also mentioned that access to animal experiment facilities was sometimes limiting, however, the committee was not made aware of a PhD project that was obviously delayed for this reason. The committee trusts that good management can solve these operational issues.

2.3 Recommendations for WIAS as a whole

1. **The committee recommends that WU communicate a clear institutional vision regarding the "dot on the horizon" for cluster formation within WIAS.**
2. **The committee recommends that a window of about 2 months is allowed for each individual chair group to possibly reconsider its position in a cluster. After that full commitment to collaboration in the cluster is expected.**

3. **The committee recommends that an external facilitator is hired by WIAS, the Department or the University, who will help chair groups and clusters to define their common goals and ambitions, and lay out a roadmap towards achieving them. This is seen as a temporary task, which should be completed before the end of 2018.**
4. **The committee recommends to the University that financial hurdles or negative incentives to implement NWO-projects are lifted, e.g. by enhancing the institutional bonus system for groups that have acquired such projects..**
5. **The committee notes that the present focus on journal impact factors and Q1-journals should be supplemented with a strategy for evaluation of the citation rate of publications, irrespective of the journal in which a paper is published.**
6. **The committee recommends that WIAS continues its highly successful intensive monitoring system for PhD project progress and minimization of fall-out and long completion times.**
7. **The committee recommends that WIAS installs, with every PhD project, an external adviser from another chair group within the cluster, to provide collegial scientific and mentoring advice from another discipline and to foster cross-links within the cluster.**
8. **The committee recommends that WIAS develops a strategy to deal with the hazards of imbalance between work and life for every individual scientist, e.g. by signaling this issue in the various opportunities emerging, e.g. collegial contacts, social activities.**

3. Performance of the clusters

3.1 Animals in Future Food Systems and Society

The relevance of the unit composition

The composition of this cluster (green cluster) is very coherent and relevant, and builds on existing synergies between the chair groups. It provides the relevant expertise for the acquisition and synthesis of data necessary for modelling different scenarios for livestock production systems and their effects on environment, animals and livelihoods. The role of the fourth chair group (FTE) in this cluster (not evaluated as part of WIAS) was not presented to complete the picture. For the purposes of complete animal food system analyses, the absence of aquaculture from the cluster leaves a gap, and we would recommend that strong linkages to relevant researchers in the Aquaculture and Fisheries Group be made. Overall the committee has a very positive opinion on the leadership, sense of direction and collaborative spirit in this cluster.

The presented research themes

The research themes proposed for this cluster are very good, relevant to current societal issues of importance and all cross individual chair group themes. They provide a potential showcase for cluster collaboration within WIAS. In presenting the cluster, it would be beneficial to be more explicit about how these themes address current (national and international) political priority issues such as climate change and sustainable diets. They are clearly in the portfolio of the groups, but are not mentioned in the research themes in a way that might be clear for non-experts.

The joint strategy on research quality of the unit

The synergies emerging within this cluster make it likely that research quality will score higher for the cluster than the average of the individual groups. The groups have many constructive plans to use the cluster structure to enhance research quality. These include the targeting of key papers to higher profile journals which increasingly accept interdisciplinary system level papers, e.g. Nature Sustainability, in addition to the Q1 discipline journals. It is recognised that tensions exist due to different scientific opinions on the quality of applied and system studies, as opposed to fundamental mechanistic research, but the external perception of the research quality in their field is changing in a positive way. This is reflected in an increasing number of NWO grants, e.g. Veni awards/applications, and esteemed publications. This should be encouraged with follow up Vidi and Vici applications to consolidate the cluster profile. The cluster recognises the importance of increasing their share of these prestigious funding sources, but is also aware that this brings a significant increased financial risk due to the current situation on overhead recovery from such grants and the high facility costs of large-animal research. This is an issue which the University might usefully address (see recommendation 4 above).

The groups see that a higher degree of management integration could free up time from the current administrative burden to reallocate to research. They also suggest that greater financial integration could allow pooling of resources for cluster investment in facilities and postdoc employment. This greater degree of integration should be encouraged.

The joint strategy on societal relevance of the unit

The themes addressed within this cluster are of high societal relevance and their impact on society can be of great value if well communicated. They make a good bridge between fundamental and applied science in their research. The cluster could be more explicit about how their research impacts on international development and on the importance of their strong interaction with industry on national wealth creation.

The presented SWOT

This is a well-aligned, cohesive cluster with an integrated vision. It is good to see the growing numbers of PhD candidates as an opportunity. The unit has good insight in its strengths and weaknesses and is already actively addressing the key issues in its SWOT analysis. Work-life balance is identified as an issue for research staff, but can be put in the SWOT at a higher level since it is not specific for this cluster (see recommendation 6 above). Limited capacity of animal facilities and the need to generate external income to cover the costs of these facilities poses a challenge.

Recommendations

- 1. The committee recommends that the present course towards integration of the chair groups into a green cluster be continued.**
- 2. The committee recommends that the cluster pays due attention to communicating its contribution to societal issues of present interest, including climate change, sustainable diets and international development.**

3.2 Animal Populations, Interactions and Genomics (APIG)

Relevance of unit composition

The APIG cluster (yellow cluster) is composed of three chair groups. Two of the groups are physically and managerially integrated and are already working towards further integration. The third group is in a different building and has its own infrastructure. Wageningen Livestock Research is an important partner. Content wise, each participant in the cluster has unique disciplinary expertise, and the groups have identified common ground on a number of themes and see the opportunity for real synergies. The Cluster indicated they can address important issues in new ways (that would not have been done in the separate chair groups). The panel sees opportunities to integrate more. At this point the chair group staff is involved on a project basis and it is recommended that cluster-specific events be initiated to develop a cluster culture. There is a nascent strategic plan for the next two and a half years. It is recommended that this be developed for the review to include explicit targets in terms of the amount of current and potential joint activities the increase in this percentage/growth strategy and mechanisms/actions to achieve this. This should look at potential mechanisms to strengthen the culture at all levels of the participating chair groups. At the moment the cluster continues to include additional links to other chair groups in terms of expertise but not necessarily for the purpose of the cluster themes. It is recommended that they consider if there are further opportunities to strengthen the cluster by including other chair group expertise.

Presented research themes

The listed topics of joint activities seem appropriate and have been well articulated during the presentation. The themes are timely and well linked to the strategy of WU. The themes should give a greater prominence to their relevance to the One Health agenda. Excellent examples were identified and the panel was especially enthusiastic about the presentation of the H2020 PIGSs-project and the role of the cluster. The research themes should be consolidated and presented in this way for the next review.

The joint strategy on research quality of the unit

The chair groups are of very high scientific level. Joining forces across disciplinary boundaries is expected to bring synergy. It is recommended that the cluster focusses on articulating how this potential will be realised. The panel believes that this cluster will catalyse further growth to deliver excellence and viability.

The joint strategy on societal relevance of the unit

The area of One Health provides an excellent opportunity for societal profiling of the cluster. The research addresses human and animal health and their interaction e.g. in the area of antimicrobial resistance and robustness of animals. The environmental aspects of One Health (e.g. microbial pathogens in the environment) could be strengthened in collaboration with other groups. The strategy should be clearly described in the report including its impact on global One Health, which is one of the strategic topics of WUR. Again, choose the examples carefully to support the stated goals (the societal relevance of the beak size adaptation was not clear). The strategy in relation to social relevance and impact can be further strengthened with a focus on global One Health. This should incorporate examples across all stakeholder groups from the public, regulators, industry and also the developing world.

The presented SWOT

The SWOT is well balanced and seems appropriate, especially with the elaboration provided in presentation and discussion, (e.g. the approach to incorporating gene editing). Some description on how the different aspects of the SWOT analysis are translated into actions is needed. It is recommended that the potential for contributing to the current high profile issue of antimicrobial resistance and antimicrobial measures be highlighted in relation to One Health. The strength of the Cluster will also serve as an opportunity to attract more talent and address this weakness as well as helping address critical mass.

Recommendations

- 1. The committee recommends that the cluster clarifies its relationship with Wageningen Livestock Research and evaluates the opportunities.**
- 2. The committee recommends that the cluster seeks opportunities to integrate more, e.g. by organizing cluster-wide events, soapbox talks or the like. It is also recommended to define the integration strategy in quantitative terms (e.g. number of joint projects, number of joint publications), and set goals for improvement for such indicators.**
- 3. The committee recommends that the cluster projects a clear vision on its contribution to the WUR Global One Health theme and the national initiative on One Health. It is also recommended that the potential for contributing to the issue of antimicrobial resistance and antimicrobial measures be highlighted in relation to One Health.**

3.3 Integrative Animal Biology

The relevance of the unit composition

The Integrative Animal Biology cluster (blue cluster) focuses on the study of fundamental questions in animal function and adaptation using an integrated approach. Important themes are food production, animal and human health and sustainability of ecosystems. The cluster combines six chair groups with strong disciplinary strength spanning from molecular and cell biology to ecology. A chair group outside Animal Sciences (Resource Ecology) participates in the cluster. As is the case in the other clusters in WIAS, potential research synergies will be facilitated by the collaboration between groups with complementary expertise allowing for a gene-to-ecosystems approach to solving problems in sustainability, food production and health. The focus of this cluster, however, is very broad, which the committee considers a challenge to its viability.

In general, the panel were not convinced that this was a "natural" cluster despite the positioning of "molecules to populations". The themes are all question-driven and a variety of tools are implemented to foster collaboration, however, the heterogeneity of questions and tools is quite large and so the panel was not convinced as to the rationale for the cluster. We recommend the cluster considers its internal structure again and thinks about the potential joint scientific outcomes it wants to achieve.

The cluster would benefit from finding a more specific and distinctive overall theme that defines their major strengths to the outside world. For example, an option to achieve more focus would be to highlight the overall strength of the cluster (with WMR) by defining a theme on aquatic and marine species, which permeates and integrates the three proposed themes. The committee recommends that the cluster defines a joint project focusing on a single topic of common interest, for example, "Sustainability in the aquatic environment" to illustrate the power of their "from molecules to ecosystems" approach. Focus on the aquatic and marine environment will not only increase the cluster's visibility within Wageningen and the outside world, but will also provide a common theme along which collaboration and true integration can be achieved. This could mean that some groups (or parts of groups) will feel it necessary to reconsider their position in the cluster or (preferably) will set an even stronger course towards cluster integration. The committee realizes that this could turn out to be a radical change compared to the present situation. A common roadmap should not marginalize groups but use all power to achieve coherence. It is important the cluster is able to show progress in this direction and evidence of attempts to achieve a common goal well in advance of the review.

The presented research themes

The cluster highlighted three overlapping broad themes and described a series of exciting and solid projects involving different combinations of groups. These projects illustrated the existing levels of collaboration between the groups. It was unclear to the review committee, however, how much the cluster composition and structure were facilitating additional collaboration across the cluster or providing additional synergies. The cluster would benefit from additional discussion of what brings them together, and try to find a unifying theme that would more effectively allow for synergies, as argued above. The review committee also encourages the cluster to illustrate that potential in their future review with a representative large project showcasing the potential of the gene to ecosystems approach to solving relevant societal issues, and involving most, if not all, of the participant groups.

The joint strategy on research quality of the unit

The cluster groups show excellent research quality, but a joint strategy for ensuring and growing the research quality of the cluster as a single unit without compromising the research quality of individual groups is not obvious. This strategy should be defined with participation of the whole unit, from PhD candidates to chairs.

The joint strategy on societal relevance of the unit

The cluster provided solid and diverse examples of societal relevance. A joint, more unified, strategy should be better articulated that is not so much project focused, but focused on the overarching theme.

The presented SWOT

The SWOT provides an exhaustive list of items, but they appear to be a compilation from individual projects and not from a unified team. It is evident to the review team that the cluster Chair members have been working together to find a common thread to their research, but they are still in the initial stages of the process, probably due to the larger number and greater diversity of chairs groups that compose this cluster. It might help to have an external facilitator to support the scientists in this strategic process through guided discussions (c.f. recommendation 3 for WIAS).

Recommendations

- 1. The committee recommends that the cluster reconsiders its research themes and thinks about the potential scientific and societal outcomes it wants to achieve, making use of the external adviser mentioned in the general recommendation 3 in chapter 2.**
- 2. The committee recommends defining a joint project for the cluster to work on for the coming time, up to the peer review 2021, focusing on a single topic of common interest (although not necessarily covering all research lines in the cluster); it seems to be most logical to focus such a project on the "blue world".**
- 3. The committee recommends that, to supplement and even reinforce the unmistakable core of scientific excellence in this cluster, a strategy is laid-out to define the societal relevance of the cluster's overall research themes.**

Annex 1. Site visit programme

Tuesday 26 June

Arrival of committee-members to Wageningen and dinner with WIAS-board

Wednesday 27 June, location: building Impulse, room Decision

Morning:

- 9:00-10:30 Introduction of WIAS and contributions of the RC and EC committees from WIAS.
- 10:30-11:00 Welcome by the rector and dean.
- 11:00-12:00 Lab tour in Radix and Zodiac: PhDs present their research.

Lunch 12:00-13:00

Afternoon:

- 13:30-16:00 Tour at animal facilities (Carus): PhDs present their research.
- 16:00-17:30 Interaction with PhDs: WAPS, WSD, WPC.
- 17:30 Drinks with PhD candidates

Evening

- Dinner during which the committee members exchange their first impressions.

Thursday 28 June, location: building Impulse, room Decision

Morning 9:00-12:00:

- Clustersession 1 ADP/ANU/APS: Presentation of the cluster and afterwards internal discussion of the committee including writing draft advice.

12:00-13:00 Lunch

Afternoon

- 13:00-14:00 Campustour incl. information on combination with companies such as FC and Unilever.
- 14:00-17:00 Clustersession 2 AF1/BHE/CBI/EZO/HAP/MAE: presentation of the cluster and afterwards internal discussion of the committee including writing draft advice.

Evening:

Dinner with WIAS-board.

Friday 29 June, location: building Impulse, room Decision

Morning 9:00-12:00:

Clustersession 3 ABG/HMI/QVE: presentation of the cluster and afterwards internal discussion of the committee including writing draft advice.

12:00-13:00 Lunch with the director of ASG

Afternoon 13:00-16:00:

- Internal discussion of the committee and writing up the draft report.
- First feedback to the WIAS community on findings committee.

Annex 2. Brief CV's of the Committee members

Marta Gomez-Chiarri

Professor of Fisheries, Animal and Veterinary Sciences, University of Rhode Island, United States of America

Marta Gómez-Chiarri is a Professor at the University of Rhode Island (URI). Marta earned her Ph.D. in Biochemistry and Molecular Biology from the Universidad Complutense de Madrid (Spain) in 1992. Previous to joining URI in 1997, she was a postdoctoral fellow at Hopkins Marine Station, Stanford University. Marta was Graduate Coordinator for the Sustainable Agriculture and Food Systems specialization of the Biological and Environmental Sciences MS and PhD programs until she became Chair of the Department of Fisheries, Animal, and Veterinary Sciences, her current position. Marta's research interests include the use of multidisciplinary approaches, from genomics to ecology, to the management of diseases in marine organisms.

Sandra Edwards

Em. professor of Animal Science and Welfare, Newcastle University, United Kingdom

Sandra Edwards holds a BA (Hons) in Natural Sciences from the University of Cambridge, and a PhD on livestock management and welfare from the University of Reading. She has since worked for more than 30 years in applied research on farm livestock. Senior posts included Head of the Animal Management and Health Department of SAC and Reader in Animal Science at the University of Aberdeen. In 2000, she was appointed to the Chair of Agriculture at the University of Newcastle, where her research interests focussed on the multidisciplinary interactions between nutrition, reproduction, behaviour and welfare in pigs and other farm livestock. She has been a Council member of the European Federation of Animal Science and President of the British Society of Animal Science. In 2017 she retired to take the status of Emerita Professor.

Mario Herrero

Chief Research Scientist, Commonwealth Scientific and Industrial Research Organisation, Brisbane, Australia

Mario Herrero is a Chief Research Scientist and Office of the Chief Executive Science Leader at CSIRO Agriculture and Food and Honorary Professor of Agriculture and Food Systems at the University of Queensland, Australia. Before coming to Australia in 2013, he spent 12 years in Kenya, leading the Sustainable Livestock Futures and Climate Change programmes and the Targeting Pro-Poor Interventions team at the International Livestock Research Institute (ILRI). Mario has published more than 400 fully refereed papers, book chapters and reports in his areas of expertise.

Jan Erik Lindberg

Em. professor of Animal Nutrition, Swedish University of Agricultural Sciences, Sweden

Professor (emeritus) Jan Erik Lindberg was awarded a PhD in ruminant nutrition at the Swedish University of Agricultural Sciences (SLU) in 1983 and was appointed to associate professor in Animal Nutrition at SLU in 1985. In 1996 he received a Faculty Chair in Mono-gastric Animal Nutrition at SLU. He's research has been focused on feed evaluation including various aspects on energy, protein and mineral nutrition. In recent years, the research focus has been more directed to the interaction between the diet and the gut microbiota, and its impact on nutrient utilization and gut health. During his research career he has published close to 300 scientific papers and supervised 45 PhD students.

Graham Plastow**CEO Livestock Gentec Centre, professor of Animal Genomics, University of Alberta, Canada**

Graham is Professor of Livestock Genomics at the Department of Agricultural, Food and Nutritional Science and CEO of Livestock Gentec at the University of Alberta. He is an Adjunct Professor at the Department of Production Animal Health, Faculty of Veterinary Medicine, University of Calgary. Prior to rejoining academia he worked in the agrifood industry for more than 20 years. He has led and participated in numerous international research collaborations and has held positions on boards and committees of industry and research organizations including the Roslin Institute and currently DairyGen Canada.

Jos van Putten**Professor of Infection Biology at Utrecht University, The Netherlands**

Van Putten (MD, PhD) is a renowned expert in the field of infection biology and has more than 25 years of expertise in Infection biology research. He has a long track record in project management as a leader of research groups at various institutes including the Max-Planck-Institute for Biology, Germany (1990-1995) and the National Institutes of Health, USA (1995-1999). Van Putten is Head of the Infection Biology group and Vice-dean of Research of the faculty of Veterinary Medicine of Utrecht University. Other professional activities include: Chairman of the Medical/Veterinary section of The Netherlands Commission on Genetic Modification (COGEM) and Membership of the ERC Advanced Grants Expert Panel.

Nico M. van Straalen**Em. professor of Animal Ecology at Vrije Universiteit Amsterdam, The Netherlands (Chair)**

A biologist by training, Nico is interested in evolutionary biology, zoology, molecular ecology and environmental toxicology and has a long-term experience as teacher in these fields at the Vrije Universiteit Amsterdam. He was head of the Department of Ecological Science and served in the Faculty of Science Board as a vice-dean for Education. Nico was a supervisor for more than 70 PhD students. He has published 270 journal articles and 11 books, including textbooks on Ecological Genomics and Human Evolution & Development. His main study object has been the community of invertebrate animals living in soil, and their adaptation to soil pollution and interactions with microbes.