GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN

The Faculty of Agricultural Sciences at the Georg-August University Göttingen seeks to fill a

Professorship "Functional Breeding – Genetics and improvement of functional traits by breeding" (Professorial Salary Scale W3)

within the framework of a new

"Center for Integrated Breeding"

at the earliest possible date.

The professorship is part of a "Center for Integrated Breeding Studies" which is unique in Europe. This center is presently in the development stage und will bring together knowledge from plant- and animal-breeding with contributions from natural sciences as well as social sciences in order to establish an internationally leading role in this field. The establishment of the Center is being supported by leading German companies in the fields of animal and plant breeding.

Profile in research and teaching

The professorship will devote itself specifically to the development and implication of modern, genome based breeding methods for the purpose of improving functional traits in livestock. In recent years, so called functional traits have become increasingly important and have taken a place alongside the primary performance traits. Functional traits are such traits that have to be given in order for an animal to be able to deliver its actual performance. Typical functional traits are to be found in the complexes of fertility, health, behaviour and resource efficiency. Most functional traits show a complex nature, i. e., they are the result of interactions between different factors related to genetics, environment and management. This often makes it difficult to effectively improve them through breeding. On the other hand, functional traits are highly relevant in regard to animal welfare as well as economic efficiency and social acceptability of livestock production.

This leads to special challenges for the researcher, because functional traits are often difficult to assess objectively, show a slight degree of heritability and an adverse genetic

correlation with the primary production traits. Genome-based breeding offers special chances to influence functional traits in a more efficient way by breeding, since elements of mapping causal gene variants can be combined with the evaluation of breeding value and selection on a genome basis. Research carried out by the work group of the professorship should develop appropriate methodological approaches and improve them by refining and optimising genomic methods. The methods developed should subsequently be validated experimentally und applied to real data stemming from existing breeding programmes. The professorship should closely cooperate with the other professorships at the Center for Integrated Breeding and integrate the special expertise of other workgroups within the DNTW, the Faculty of Agricultural Sciences and the University of Göttingen.

The professorship should pay strong, but not exclusive, attention to questions related to poultry breeding. Poultry production is an internationally emerging field[1], which poses special challenges for breeding research because its very high level of genetic performance correlates more than in other livestock species with manifest deficiencies in regard to functional traits. This would enable the professorship to examine problems of the model 'poultry' which will probably only become important for other livestock species at a later point of time.

In teaching, the professorship should contribute to the research orientated MSc-programme "Integrated Plant and Animal Breeding" which is to be established. This contribution should consist of lectures as well as practical exercises in the field of analysis and breeding work on complex functional traits. In addition, the incumbent is expected to offer a class on Poultry Breeding, which is also going to be offered as a facultative module in the MSc-programme "Livestock Sciences". As part of the PhD-programme "Animal Welfare in Intensive Livestock Production Systems" funded by the German federal state of Lower Saxony, a module dedicated to the improvement of animal welfare through functional breeding is to be established. A further part of the teaching commitments is to be provided by supervising master theses as part of the research intensive MSc-programme. Additional teaching commitments are dependent on the special qualifications of the incumbent. The professorship will also significantly participate in teaching within the framework of a graduate school to be established at a later point.

Integration of the professorship into the main research areas of the faculty and the university

The development plan of the Faculty of Agricultural Sciences names the strengthening of breeding research as one of the main challenges. In 2014, the Presidential Board of the university and companies active in plant and animal breeding signed an agreement for a public private partnership to establish a Center for Integrated Breeding at the University of Göttingen.

[1] For instance, the world-wide production of eggs has more than trebled from 21 mio tons in 1970 to 64 mio tons in 2010 (Windhorst, 2014), the average increase being approximately 3% per year.

The demand for products of animal and plant origin will increase very rapidly in the coming decades. This requires a sustainable increase of agricultural production and entails a great challenge for agricultural research. Seeds and varieties of plants and the genetics of livestock are the basis of the production chain, so that animal and plant breeding will be of even higher importance in the future than at the present time. The innovative power of breeding extends along the entire agricultural value chain from characterising and utilising genetic resources to supplying sufficient amounts of high quality products such as food, feed and fuel. The focus on important aspects of developments in breeding such as protection of the environment and climate as well as animal welfare is steadily increasing.

Next-generation breeding strategies demand an efficient combination of classical breeding based on the phenotype with the high throughput methods of molecular genetics. In order to utilise the technological leap in molecular genetics for breeding research, a substantial effort is necessary to develop the theoretical framework of quantitative genetics, population genetics, breeding methods and bioinformatics. As a result, the methodological foundations of animal and plant breeding are increasingly converging. At the same time, there is a significant lack of qualified scientists in the field of quantitative breeding methods so that it is extremely difficult to fill corresponding posts in research and industry with qualified graduates.

The University of Göttingen is internationally known as the origin of important innovations in the areas of plant breeding (i. e. hybrid rapeseed) and animal breeding (e. g. the Göttingen Minipig). The recent past has seen considerable changes in breeding research which were caused by technological innovations. Göttingen played a major role in these changes, especially in the areas of quantitative genetics and genome analysis. This offers optimal possibilities to strengthen the research location by establishing a “Center for Integrated Breeding” at the Georg-August-University in Göttingen in close cooperation with plant and animal breeding companies. The methodological profile of the center will be broadened by involving the Faculties of Forest Sciences and Forest Ecology and the Faculty of Biology and Psychology.

Integration into externally funded research and teaching networks

It is planned to integrate the professorship into a DFG priority programme ‘Selection at work - The dynamics of genetic variation in managed populations’ which is in the application stage.

The professorship is expected to take part in developing a concept for a graduate school after the Center for Integrated Breeding has been established and to involve itself in the application for funding through the Deutsche Forschungsgemeinschaft.

Core endowments of the professorship

The professorship will be endowed with the staff positions customary at the Faculty of Agricultural Sciences, i. e. a position for a research assistant and 1.5 positions for tech-

nical staff (including secretarial staff). Additional positions can be granted from the staff pool of the Department of Animal Sciences if the requirement is made plausible. The professorship is equipped with an annual basic allowance for research and takes part in the performance-related funding system of the Faculty of Agricultural Sciences. Initially, the professorship will be housed in suitable quarters of the Department of Animal Sciences. Facilities for experimental research with animals are available at different sites of the Department of Animal Sciences. On a medium-term basis, it is planned to house all the professorships of the Center for Integrated Breeding in a new facility on the Northern Campus of the university. In addition, funding is available for the initial equipping and the start-up phase of the professorship. These funds will be allocated according to the research profile of the incumbent.

Expected qualifications

- Visibility in national and international research literature in accordance with the career stage.
- Teaching experience in English and/or German in accordance with the career stage.
- Willingness to participate in strategies for internationalisation in research and teaching.

Contact Person: Prof. Dr. Henner Simianer

We expressly welcome applications from abroad. Under certain circumstances, the position may be filled on a part-time basis. The University of Göttingen strives to increase its proportion of female staff in fields where women are underrepresented and expressly encourages qualified women to apply. Severely disabled persons with the appropriate qualifications will be favoured. Disabled persons with equivalent qualification will be given preference.

Applications including a CV with a representation of the applicant's academic education and career, publications and teaching record should be submitted electronically no later than 19. April 2015. Application portal