



10.45 – 11.15 hrs.

## **Behaviour, stress and welfare – genetic and phenotypic side-effects of selection for production traits**

*Dr. Per Jensen*

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### **Summary**

The last 50 years has brought about a dramatic change in the way animals are kept and utilised. In our research we have examined the extent to which behaviour and needs of animals has changed during domestication, and we have demonstrated that much of the basic natural behaviour of domestic animals has passed relatively unchanged through the process. For example, when released into natural environments, pigs still perform more or less the same behaviour as their ancestors, the European Wild Boar. This is a basis for major welfare concerns, since modern farm environments rarely allow a natural behaviour, and the result may be stress-related diseases and behavioural abnormalities. On the other hand, our research has provided a basis for designing new housing systems which may allow for a more natural behaviour and thereby allowing intense farming with acceptable welfare.

Over the last few decades, also selection for increased production has increased dramatically, and average production levels of farm animals have doubled. This may have consequences for unrelated aspects of the biology of farm animals, such as their ability to adapt to stressful environments. We study the selection side effects with molecular methods in an attempt to clarify the genetical aspects of such unintended selection consequences. For this, we use modern laying hens, and their ancestors, the red jungle fowl. By using molecular methods and QTL-analysis, we have detected genomic regions which are likely to contain genes affecting growth and egg production, as well as behaviour relevant for stress adaptation. This research may help us in the future to design more efficient breeding programs, which take the welfare of animals into account.



## CV



## Per Jensen

### Present and previous positions

- Guest professor in ethology, Linköping university, Department of Biology, IFM, since 2002-09-01
- Head of research, Department of Biology, Linköping university, since 2002-09-01.
- Professor in Ethology, Swedish University of Agricultural Sciences, Department of animal environment and health, 1988-2002 (off duty since 2002-09-01).
- Head of Section of Ethology, Swedish University of Agricultural Sciences, Department of animal environment and health, 1984-2002.

### Education and competence

- PhD (fil dr) Applied Ethology, Swedish University of Agricultural Sciences, 1983
- Docent in Applied Ethology (ass. professor, honorary title based on achievements), Swedish University of Agricultural Sciences, 1984.
- Offered the professorship in applied ethology at the University of Berne, Switzerland, 1987
- Personal professorship in Ethology, 1988

### Professional appointments (selected)

- Member of the EU-commission's Scientific Committee on Animal Health and Animal Welfare, since 1994.
- Chairman of the EU-commission's Scientific Committee on Animal Health and Animal Welfare, since January 2001.
- Member of the Editorial board of Applied Animal Behaviour Science 1989 - 1997.
- Editor-in-Chief of Applied Animal Behaviour Science since 1.1.1997.
- Reviewer for several journals, such as Animal Behaviour, Physiology and Behaviour, Animal Welfare, Journal of Theoretical Biology
- Member of scientific board for PhD-training school, University of Utrecht, since 2001

### Examination and opposition, PhD, and other faculty tasks

- External examiner, faculty opponent, etc, for 17 PhD theses in Sweden, Norway, Denmark, Finland, Holland, Australia
- Faculty scrutinizer of professor competence, NLH, Ås, Norway, 2001, University of British Columbia, Canada 2003
- Peer reviews of scientific grants for the Norwegian Research Council, Danish Research Council, and Research Council for Food and Agriculture in USA.



### **Supervision**

- Lena Lidfors (licentiate thesis 1992: Behaviour of bull calves in two different housing systems)
- Lena Lidfors (doctoral thesis 1994: Mother-young behaviour in cattle)
- Kerstin Malm (doctoral thesis 1995: Behaviour of parents and offspring in two canids)
- Maria Andersson (doctoral thesis 2000: Domestication effects on behaviour)
- Jens Jung (doctoral thesis 2001: Foraging behaviour in cattle)
- Karin Schütz (doctoral thesis feb 2002: Trade off in resource allocation between behaviour and production in fowl)
- Christina Lindquist (Project: Selection effects on feeding behaviour and adaptability in poultry, planned disputation in 2004)
- Johanna Väisänen (Project: Selection effects on social behaviour and adaptability in poultry, planned disputation in 2004)
- Jennie Håkansson (Project: Behavioural and genetical aspects on conservation of small animal populations in zoos, using jungle fowl as a model species, planned disputation in 2007).

### **Assistant supervisor for**

- Ingrid Redbo (doctoral thesis 1992: Stereotypies in dairy cattle)
- Katja Grandinsson (project: Genetical analysis of maternal quality in pigs, planned disputation in 2003).

### **Invited talks at international conferences during the last three years**

- International animal welfare conference, Davis, USA 1999: Behaviour, stress and welfare
- Nordic conference for agricultural research, Oslo, 1999: Animal welfare in ecological farming
- Dahlem Conference, Berlin, 2000: Motivation and coping
- International Conference on Applied Ethology, Florianopolis, Brazil, 2000: Large scale recording of behaviour in genetic studies.
- Departmental Seminar, Bordeaux, 2000: Domestication and behaviour
- German Conference on Animal Welfare, Hannover, 2000: Natural behaviour of farm animals
- EU Animal Welfare Conference, Stockholm, 2001: Domestication, behaviour and welfare
- International Conference on Poultry Welfare, Frankfurt, 2002: Ethology meets genomics.

### **Publications**

In total over 200 publications, out of which 60 are refereed papers, 2 reviews, 4 single-authored books, and one edited introductory textbook in animal behaviour.