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## **METHODOLOGY OF FARM ANIMAL BEHAVIOUR STUDIES**

COMMISSION OF THE EUROPEAN COMMUNITIES, AGRICULTURE,  
FARM ANIMAL WELFARE PROGRAMME

*Workshop held on 22-23 November 1984 at Liffré, Rennes (France)*

### **Methodology of Farm Animal Behaviour Studies — A CEC Workshop**

- Scientific organizer: R. Dantzer (Bordeaux)
- Local organizers: A. Aumaitre and M.C. Salaun (Rennes)

### **Scientific Program**

- Welcome address (A. Aumaitre, Rennes)
- Introductory statements (R. Dantzer, Bordeaux)
- Guest lecture: An ethologist's view on applied ethology (D.J. McFarland, Oxford)

*Session 1: Description of behaviour: the ethological approach* (Discussion leader: D.J. McFarland)

#### *1.1. Ethograms*

- Definition, establishment and application to the study of the influence of housing conditions and management factors
- Criteria useful to distinguish main and relevant behaviours (P. Wiepkema, Wageningen)
- Relations between ethograms and methods of observations (W. Schouten, Wageningen)
- Use of ethograms to assess influence of environmental and management factors (M. Verga, Milano)
- Demonstration and interpretation of behavioural differences in gilts according to housing conditions (M.C. Schlichting, Trenthorst)
- Assessment and interpretation of behavioural differences in fattening pigs according to housing conditions (A. Rossillon-Warnier, Namur)
- Methodological aspects in the study of behaviour of young fattening bulls in confinement (K. Nielsen, Copenhagen)
- Methods for the study of cattle behaviour during road transport (V. Tarrant, Dublin)

#### *1.2. Detailed assessment of specific behaviours: the case of social behaviour*

- Qualitative and quantitative description of social behaviour in pigs (W. Schoutenn, Wageningen)
- How reliable are dominance hierarchies in fattening pigs (M.C. Salaun, Rennes)
- Individual differences in the establishment and maintenance of hierarchies in pigs (M. Hagelso, Orum)
- Social tolerance and preferential relationships (M.F. Bouissou, Nouzilly)
- Social attraction (J.M. Faure, Nouzilly)

*Session 2: Experimental approaches to the study of behaviour* (Discussion leader: D.J. McFarland)

*2.1. Assessment of temperament*

- Assessment of genetic differences in temperament of poultry (J.M. Faure, Nouzilly)
- The significance of interindividual variations or the average animal does not exist (P. Wiepkema, Wageningen)
- Standardized tests for assessment of temperament in pigs (M. Hagelso, Orum)
- What does the open-field test measure in cattle and sheep? (M.F. Bouissou, Nouzilly)

*2.2. Deprivation experiments*

- Choice comparisons between lying and eating under different deprivation levels in cattle (H. Wierenga, Zeist)

*Session 3: Use of behaviour in epidemiological studies* (Discussion leader: J.P. Signoret, Nouzilly)

- Can behaviour be used to characterize organismic factors in epidemiological studies? (R. Dantzer, Bordeaux)
- Relevance of behavioural data to present epidemiological research (F. Madec, Ploufragan)
- Definition and collection of information in field studies on pigs (M. Hagelso, Orum)

*Session 4: General discussion. What is the future for basic behavioural studies in farm animals?* (Discussion leaders: J.Y. Gautier, Rennes; D.J. McFarland, Oxford; J.P. Signoret, Nouzilly)

## **METHODOLOGY OF FARM ANIMAL BEHAVIOUR STUDIES. REPORT OF A DISCUSSION MEETING**

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During the last decade, farm animal behaviour studies have tended to become standard procedures for assessing animal welfare in different housing and management conditions. However, methodologies are diverse, varying from description of the full range repertoire of animals via continuous observation on the one hand to assessment of a limited number of behavioural activities (e.g. "abnormal" behaviours) occurring in focal animals and observed over short time periods on the other. In addition, inference about the welfare of observed animals, made from differences in frequencies and intensities of specific behavioural patterns are often not qualified. The purpose of this workshop was to bring together scientists actively engaged in farm animal behaviour research, in order to examine the methodological aspects of this research, to discuss the way it can be improved to allow more objective conclusions about the

welfare of animals in intensive husbandry, and to point out questions of interest for future studies. Participants were asked to focus on two main points:

- (1) The methodological issue. The methods currently available for the study of farm animal behaviour were critically assessed.
- (2) The conceptual issue. It was hoped to conduct a critical appraisal of the main behavioural concepts as they are used in applied behavioural sciences, in order to discover whether this use is fully justified.

For this purpose, the meeting was organized in three sessions according to methodology, from the descriptive approach to the experimental approach and the use of behaviour in epidemiological studies. Participants were asked to contribute by pointing out the difficulties encountered in setting up experiments and interpreting the results rather than just reporting data, and sufficient time was allowed for discussion.

The basic methodology used in studies of farm animal behaviour was presented in different contributions. Matters like the choice of the behavioural categories under investigation, the type of observation and the method of observation were thoroughly reviewed. The design of laboratory and field experiments was also discussed in detail, together with specific experimental procedures (e.g. open-field tests, deprivation experiments). In addition, some attention was paid to concepts like social dominance, temperament and domestication. In the discussion, the constraints arising from observation on farm animals and the applied nature of this work were emphasized.

Abstracts of individual contributions are attached to the present report which, therefore, contains no explicit reference to any of these contributions. Its content is limited to a description of the general issues raised during discussion time and to a list of needs for future research, which came out of the last discussion session.

### **General issues**

- (1) In terms of methodology, it was emphasized that for a thorough description of behaviour, behavioural elements should be mutually exclusive and the description should be exhaustive. In addition, continuous observation should be preferred to time sampling, since it provides a permanent data base which can be used with different hypotheses.
- (2) Behavioural observations should not be carried out without a clear statement of the hypothesis under test from the beginning. In many cases, results are submitted to post hoc interpretation instead of serving to assess the validity of the initial hypothesis or to set up new hypotheses to be tested.
- (3) In terms of interpretation, it was pointed out that too much emphasis on proximate factors for explaining behaviour may obscure the identification of ultimate causes. For example, fighting may be related to reproductive success rather than to access to immediate resources. This last event could just set up the opportunity for the expression of this behaviour rather than being a true causal factor.
- (4) Deprivation experiments are sometimes used to assess the importance of a given behaviour, with the assumption that when important behaviours may not be performed, there is a build-up of motivational potential (or frustration) which results in damming-up effects. However, such effects may equally be due to dishabituation. A proper approach to assessing the importance of an activity to the animal is to think in terms of resilience, or demand functions.
- (5) When considered from outside, intensive farming does not appear to make use of all the resources available to the animal. There is too much emphasis on energy constraints and not enough time on time as a resource. It is, therefore, theoretically possible that optimal production (in terms of saleable commodity per unit of expenditure) could be achieved by less intensive methods. This could be a more appropriate starting point for research by applied animal behaviourists than just the consideration of the way current intensive husbandry systems constrain species specific repertoire.

### **Future Needs**

- (1) Individual variability in the way animals react to specific situations should be given more attention since its study has both fundamental (identification of the factors responsible for this variability) and practical (selection) aspects.
- (2) There is a lack of knowledge on what aspects of the environment are relevant to the animal. This information could help to conceptualize what may be an impoverished environment and an enriched

environment for the animal itself rather than for the experimenter. In addition, it would enable a proper design of substitutive objects (or toys).

(3) The respective role of genetic factors and ontogeny in adaptation to intensive husbandry has not received sufficient attention. Behavioural plasticity allows the development of new sets of competences and performances in most animal species, but its relative contribution to the process of domestication is largely unknown.

(4) Epidemiological studies aiming at determining the set of pathogenic factors involved in the appearance of abnormal behavioural patterns and at evaluating the risk for a given population in a given set of environmental conditions should be carried out more systematically since they allow field applications for decreasing the incidence of disorders and provide the data basis for the experimental investigation of possible causal factors.

(5) Applied animal behavioural science should rely on a sufficient body of information concerning the behavioural requirements of farm animal species and an agreed set of theoretical principles. Basic research about the organization and causation of behaviour in these species should, therefore, be given high priority.

## ABSTRACTS

### Criteria useful to distinguish main and relevant behaviours

P.R. Wiepkema

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The following points are essential for distinguishing main and relevant behaviours:

- (1) being thoroughly familiar with the behaviour of the species under consideration and having a reliable description of the complete behavioural repertoire
- (2) having a clear-cut hypothesis that predicts behavioural changes
- (3) those behaviours are relevant that, when not performed during a substantial amount of time, lead to the development of abnormal behaviours
- (4) those behaviours are essential that after varying periods of deprivation are compensated in a quantitative way
- (5) abnormal behaviours as listed in the CEC report. We urgently need data on their occurrence (percentage of animals showing them in order to evaluate given systems)

#### Reference :

*Abnormal behaviours in farm animals.* CEC report, Autumn 1983.