Acta Agric. Scand., Sect. A, Animal Sci. 2001: Suppl. 30, 11–16
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ACTA AGRICULTURÆ
SCANDINAVICA
ISSN 0906–4702

Animal Welfare as One among Several Values to be Considered at Farm Level: The Idea of an Ethical Account for Livestock Farming

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A proposal as to how to combine animal welfare with other goals using an ethical account for livestock farming is presented. The purpose of an ethical account is to report on the consequences of individual events and routine methods on the farm for all affected parties, and to ensure that the farmer is conscious of his ethical priorities. A procedure for an annual account is presented and the concepts involved in it are explained. Welfare assessment involves information from four sources: the system, the system's application, animal behaviour and animal health. Welfare assessment is an aid for operational management as well as for strategic planning. This ethical account was developed in collaboration with twenty livestock farms over a period of three years. In the course of its evaluation farmers were interviewed by a social scientist who was not directly involved in the project. It was concluded from these interviews that the implementation of welfare assessment, in this way, in the ethical account was a success.

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Key words: animal welfare, livestock farm, management decision-support, ethics.

Introduction

During recent decades public concern about animal welfare in livestock production has grown. The main focus in public debates about the way in which farm animals live has been on housing conditions. However, there is a growing awareness that the way in which the farmer treats his animals and in general manages the production system is a key factor in determining animal welfare. To ensure that a high level of animal welfare is maintained on the individual farm tools are therefore needed to monitor how successfully the farmer is looking after his animals and to provide advice where there are problems on how the relevant management routines need to be altered.

However, in his decision-making the farmer has to consider not just animal welfare but how to produce efficiently, at competitive cost. The farmer is also faced with public concerns other than animal welfare. He may need to consider how his activities affect nature and the environment. He may have to take steps to prevent zoonosis and consider other aspects of food safety. And sometimes what is good for animal welfare may be in conflict with these other goals. Conflict can obviously arise in connection with production costs. A central dilemma in modern animal production is that what is good for animal welfare – for example, sufficient space provisions – is not always economical. But obviously there are

potential conflicts between animal welfare and the other goals as well. To take just one case, outdoor production systems for pigs or poultry may have clear advantages in terms of animal welfare, but they can also be less than optimal when it comes to preventing losses of ammonia or controlling the spread of salmonella, campylobacter and other zoonoses.

Failure to view animal welfare in the context of other goals can ultimately have a negative effect on the animals. For the other goals may be more important for the competitiveness of the farmer. If farmers who promote animal welfare generally go out of business first, then attention to animal welfare will generally decrease. To avoid this it is important that farmers who aim to improve animal welfare are able to do so in a way that simultaneously gives the other goals due consideration. The concept of ethical accounting for livestock farming was developed as a management tool for farmers with this need in mind (Sørensen et al., 1998). The concept and the content of the welfare assessment system applied in the ethical account has been described by Sandøe et al. (1997). The purpose of this paper is to explain how the animal welfare assessment system developed for use in the ethical account can be employed in connection with decisions concerning the whole farm management context.

Combining animal welfare with other goals using an ethical account for livestock farming

The idea

Concern for animal welfare is ethical: it is motivated by the thought that it is normally unacceptable to produce meat, milk and other animal products in a way causing animals to suffer or live lives which are less than good. To act in an ethical manner one must consider the effects of what one does on all affected parties and not just look at one's own narrow self-interest. This is why the farmer and those who buy animal products ought to consider animal welfare. However, in livestock farming animals are not the only affected parties. The interests of other parties should also be considered. And this idea underlies recent attempts to develop an ethical account for livestock farming. The ethical account aims to provide information on how the activities of the farmer affect the interests of different parties. It also aims to facilitate decisions as to how to balance these interests in cases of conflict (Jensen & Sørensen, 1999).

The four main groups whose interests are affected by livestock farming are the animals, the farmer, the consumers and future generations (see Fig. 1). The

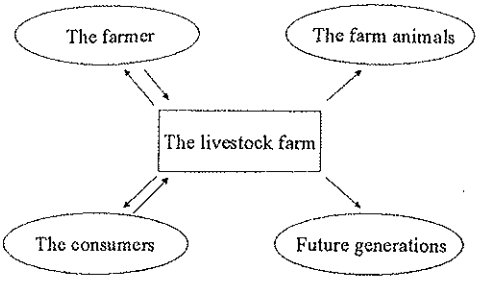

Fig. 1. The parties in a livestock farm.

farmer and his family are, of course, an important party on a livestock farm, with a very real interest in the activities and the outcome from the farm. The consumer has an interest in the availability, price and quality of products, and also in how the livestock production affects his day-to-day life. The consumer and the farmer may be concerned about animal welfare. But the animal needs to be seen as a party having interests of its own. There is also a growing concern about how the farming activities affect environmental goods, such as the soil and bio-diversity, in the long run. In the ethical account these concerns are interpreted as the interests of future generations (Halberg, 1999).

By obtaining information about the consequences of his activities for all affected parties the farmer should be able to make choices where all interests are given due consideration. Unfortunately, it will sometimes be necessary to make hard choices – choices after which some interests will be furthered at the cost of others. Here the ethical account will have the advantage that it enables the farmer to make his choices in a transparent way.

To fulfil its purpose the ethical account needs to involve two parts. First, it should report on the impact of the relevant farming activities for all parties affected. Secondly, the farmer must make explicit his ethical priorities and arrange his production system in accordance with these. Thus it is necessary for the farmer to engage in ethical thinking.

The procedure for ethical accounting

Although there are some similarities between an economic account and an ethical account, there are major differences as well. In the economic account there is a bottom line which is absent in the ethical account. In order to reach the goal of ethical accounting, i.e. that the farmer should clarify his ethical attitude and apply it in his future production process, it is necessary to follow a certain procedure.

Farmers are often not used to explaining their values and expectations. It is therefore necessary to train for this activity, to prepare the farmer for the

annual account. In the project this was done by organising dialogue meetings for groups of farmers in which a certain procedure leads the farmers as a group to formulate statements reflecting the values which currently direct their farming, and also the values they would like their farming to reflect in the future. It can also be helpful to encourage farmers to discuss in groups how they best deal with conflicting interests, taking relevant examples from livestock farming practice.

Farm data are recorded for a year. The data are transformed into indicators, i.e. into parameters describing the actual or potential impact of the farming practices on the interests of the four different parties. These indicators are included in an annual report, which is presented to the farmer. The results are discussed in relation to the farm budget, and changes in operational management are discussed.

After two or three years of annual accounting the farmer and his advisors begin strategic planning. Here the expected consequences of different plans for the parties with an interest in the way the livestock farm is run are predicted. Using this information, the farmer then evaluates the proposed plans, and on this basis new plans are developed, leading once again to new consequences – until eventually the farmer finds a satisfactory compromise. Ultimately the farmer will end up with a strategic plan for the coming 5–10 years.

The annual account

The annual account is organised to provide the farmer with information on how the interests of affected parties are served by the current approach to production. However, it is not organised explicitly around the four parties (e.g. by devoting a section for each party), because many of the indicators describe an effect on the interests of more than one party. It is also important that the structure reflects how the account can be used as a farm management tool. The annual account is structured around the following chapters:

1. An introduction
2. A summary and evaluation
3. Annual economy
4. The values and expectations of the farmer
5. The annual production and product quality
6. The resource use, pesticide use and nutrient balances
7. The value of nature on the farm
8. Animal welfare
9. Appendix with any further documentation

The structure of the annual account is hierarchical, having three levels of aggregation. The chapter on summary and evaluation is at the highest aggregation level. In these one or two pages all the results of the year are summarised and general conclusions are stated. The second level of aggregation is a summary and evaluation as the first page in each chapter. This is the case for chapters four, five, six and eight. In each chapter (and this is the third level of aggregation) the relevance of all the indicators is described. The value of the indicators for the year is also given. The welfare assessment chapter is typically 10–14 pages long.

The welfare assessment concept in ethical accounting

Sources of information

The assessment of animal welfare will require a decision to be taken concerning what is meant by animal welfare. The animal welfare part of the account is supposed to mirror the point of view of the animals, for which positive and negative experiences are assumed to matter greatly. Therefore in the account animal welfare is defined in terms of such experiences – or 'feelings' as they are sometimes called.

The experiences of animals cannot be measured directly. They need to be assessed indirectly. Two kinds of information may be relevant for the assessment: 1) information about production and management system; and 2) information on how the animals respond to the way they live and are being treated. In the ethical account animal welfare is assessed using both sources of information. Each source of information can be subdivided into two, giving four types of welfare parameters: the system, systems applications, animal behaviour and animal diseases (see Fig. 2 and Sandøe et al., 1997 for detailed discussion).

Systems (both the housing systems and the outdoor area) play an important role in animal welfare by providing resources and limiting the animals in various ways. Indicators concerning systems consist of information on housing (such as size and shapes of pens and stalls) and, for example, in the case of

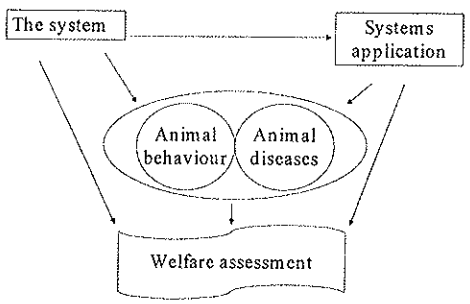

Fig. 2. Sources of information for assessing animal welfare.

cattle, information on the quality of pasture (such as the availability of shadow and shelter and the distance from the milking parlour to the pasture).

A system can be applied in many ways, and these applications may affect animal welfare quite differently. Space allowance in group housing is an example of a system-application factor affecting animal welfare. System-application is here interpreted in a broad sense, including daily management (and thus feeding management and hygiene operations).

Animal behaviour observations can be very useful in animal welfare assessment. The main problem in developing a feasible on-farm welfare assessment system is the provision of robust and valid indicators for use in the field. Behavioural observations include standardised fear tests to measure the man-animal relation, comfort behaviour, such as getting-up behaviour, and some degree of observation of social behaviour.

Animal health data are rarely straightforward to use. Veterinary treatment records do not give a precise measure for diseases, and diagnoses do not normally describe animal welfare implications. In the ethical account, health measurement focuses primarily on systematic clinical examinations, using a protocol for measuring any clinical symptoms that are relevant to animal welfare. Examples of such symptoms are skin lesions, lameness, body condition, ectoparasites and clinical diseases.

Requirements for a welfare indicator

The welfare part of ethical account for livestock farming consists of a range of indicators of the types described above. Ideally any welfare indicators used in the ethical account will satisfy the following requirements. They will:

1. Describe relevant and significant aspects of what matters from the point of view of the animals
2. Express changes over time
3. Be capable of being influenced by decisions and actions taken by the individual farmer
4. Be measurable in a relatively cheap and easy manner

The first requirement relates to the validity of an indicator in welfare assessment on the farm. The indicator needs to relate to animal welfare. Given the full list of welfare indicators, it also needs to make a significant marginal contribution to the welfare assessment in which it is examined.

The second requirement relates to the use of annual data in an on-farm decision-support system. The farmer needs to track the development through time of important aspects of animal welfare. Where animal welfare problems are on the increase, he needs information on how to take action, and he needs to be able to measure the results of any changes he makes in the way he deals with his animals.

The third requirement demands that indicators should relate to aspects of farm practice which the farmer can decide to modify. Some potential indicators, such as the spread of contagious diseases like foot and mouth disease and classical swine fever, may be affected by farming but nevertheless such that the individual farmer has no direct control over them. This 'uncontrollable' kind of factor would not be used as an indicator in an ethical account.

The fourth requirement is important, since it is essential that the ethical account for livestock farming can be used in practice. Many otherwise useful-looking welfare indicators may not be viable because they are much too expensive. An example is 24-hour observation of behaviour.

The role of welfare assessments in a decision-support framework

Operational management

Daily management routines have a considerable effect on animal welfare. Relevant aspects of operational management can often be changed with relatively little effect on the interest of other parties in the ethical account. It is therefore possible, when discussing the annual account, to point to changes in operational management which benefit animal welfare, and to consider only the practical constraints and direct costs, if any, associated with the change.

A dairy farm can be used to illustrate this. The farm has a high-yielding dairy herd with 80 cows and additional young stock. An extract showing indicators for systems, systems application and animal behaviour from an annual account is shown in Table 1,

Table 1. The systems application and cattle behaviour in a tie-stall dairy herd

System	
Stall width	96–121 cm (norm > 120 cm)
Stall length	171–177 cm (norm > 175 cm)
Systems application	
Chain length	42–70 cm
Cow trainers not adjusted	14%
Amount of straw	Negligible
Animal behaviour	
Difficulties with getting up	43%

and results of clinical examinations are shown in Fig. 3.

It appears from Table 1 that some of the tie-stalls were too short and too narrow, that the length of neck-chains was too short, that some of the cow trainers need to be adjusted, and that the straw bedding was not maintained satisfactorily. It also appears that the cows were having difficulty getting to their feet. The clinical examinations shown in Fig. 3 appear to suggest that during the winter there were problems with lameness and skin lesions. The cows were on pasture during the summer.

During the discussion of the annual account, several suggestions for improving animal welfare through changes of operational management were discussed. The farmer was advised to adjust cow trainers more frequently in order to avoid unnecessary electric shock. The number of cow trainers not adjusted had decreased from last year but there was still room for improvement. The bedding procedure was also discussed and the farmer was advised to use more straw per day. The short neck chains needed to be replaced or made longer to ease resting behaviour. Feeding practice was discussed in an effort to prevent lameness caused by laminitis. The farmer could make these changes in operational management without investment and without any major increase in his workload.

Using welfare assessment in a strategic planning procedure

As a part of the process, the farmers involved in an ethical account were invited to discuss how certain activities could have differing (positive and negative) effects on the interests of different affected parties.

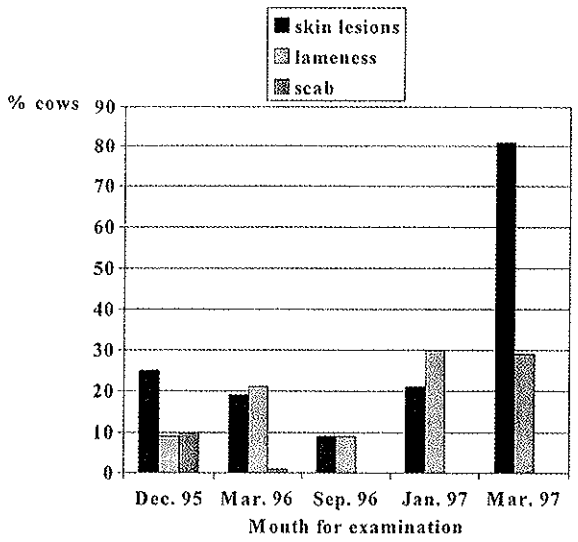

Fig. 3. Clinical examinations in a tie-stall dairy herd.

The idea was to facilitate a process in which the farmer clarified his ethical attitudes to himself and his family. Using the experience gathered over two years of ethical accounts, the farm family was also asked to set goals to be met in the future development of their farm. The consequences that this plan would have for the various interests in the ethical account were predicted in terms of estimated indicator values (i.e. the gross margin, the N-surplus at farm level as well as the degree of leg disorders etc.).

Alternative plans, and their predicted consequences, were discussed with the family, which was asked to give priority to some of the plans. (For example, they might prefer a plan which includes increased grazing to a plan for building a deep litter bedding stable.) The family was also asked to put an emphasis on some of the indicators. (For example, a significant reduction of cow leg-disorders might be considered more important than a 20% increase in N-surplus.)

The researcher (mimicking the role of an adviser) then used this information regarding the family's preferences to formulate alternative plans and calculate their consequences. When the family agreed that a certain plan was a satisfactory compromise between their various goals, the process was stopped.

This procedure ensured that a certain strategic initiative for improving animal welfare was analysed for its effects on other parties – on future generations, the consumer and the interests of the farmer himself. In addition the effect on animal welfare of initiatives for decreasing pollution from the farm needed to be analysed.

In the case above, one strategic plan would be to replace the tie-stall system with a new deep litter stable. The predicted consequences of this plan are illustrated in Table 2. The prevalence of lameness and tarsal joint lesions is expected to decrease. It was

Table 2. Building a new deep litter stable for the dairy cows

Indicator	Tie-stall	Deep litter
Land, ha	110	110
Cows	90	90
% lameness	25	5
% tarsal lesions	21	5
N-surplus (kg N ha^{-1})	204	225
P-surplus (kg N ha^{-1})	19	20
Energy use MJ $kg\ milk^{-1}$	3,0	3,3
Use of pesticides TDI[1]	0,8	0,8

[1] Treatment dose index (Halberg 1999).

further assumed that the problems with getting up would disappear. It therefore seems reasonable to conclude that animal welfare was expected to improve. It also appears from Table 2 that the kg N surplus per hectare would increase, as would the energy used to produce one kg milk. The reason for this last increase is the differences in the N-utilisation efficiency between the deep litter system and the slurry system in the tie-stalls. The energy used per kg of milk produced is relatively high in the deep-litter system owing to the fuel used in transporting straw in the deep litter system. It follows that the consequences of the plan are affecting parties with interest in the livestock farm differently. The procedure of the ethical account for livestock farming does not offer any conclusion on how to balance such conflicting interests. However, the procedure for strategic planning does do this. It allows the farmer to study such conflicts in detail. For example, a third solution would be to consider a cubicle loose housing system for the cows. This may improve the effect of the plan on the environment. It may also be more expensive for the farmer. The idea of the strategic planning process is to enable the farmer to make all the relevant ethical considerations.

Evaluation of the ethical account

The concept of an ethical account was developed in collaboration with twenty dairy and pig farms over a period of three years. Each year an ethical account procedure was carried out and its results were presented in an account which was also produced and discussed annually. The content and the structure of these annual accounts were developed following their presentation. Thus, the farmers received an annual report each year with a different design and content. After the report had been discussed at the farm the farmer was interviewed by social scientists who were not directly involved in the project. The results of this evaluation are described extensively in Michelsen & el Seady (1998). One of the questions put to the farmer was whether he found the results in the annual account interesting. If the reply was 'Yes', it was asked whether it was the account as a whole or part of the information that was interesting. For the third year 79% of the farmers found the account as a whole interesting and 74% of the farmers found parts of the account to be important. These replies indicate that the farmers found the whole-farm approach in ethical accounting to be important. The farmers were also asked: "Did the ethical account make you alter your management concerning animal welfare?" In all 68% answered 'Yes' to this question after the third year. It was concluded from these interviews that the implementation of welfare assessment in the ethical account had been a success. The farmers found the information interesting and useful in the entire farm management context.

Perspectives

For on-farm use of a welfare assessment system it is important to implement welfare assessment systems in a whole-farm context, including economic, environmental and food safety considerations. It was calculated that the time spent on welfare assessment in the project was 40–50 hours in an 80 dairy cow herd. It was 30–35 hours in a 250 sow herd with 5000 finishing pigs a year. This is believed to be too expensive for commercial use. New research projects have therefore been initiated to produce more easily operable and less costly animal welfare assessment systems for livestock farms.

Acknowledgements

The authors want to thank project participants Lis Alban, Niels Peter Bådsgård, Karin Hjelholt Jensen, Karsten Klint Jensen, Torfi Johannesson, Ole Kristensen, Thorbjörn Meyer, Johannes Michelsen, Lene Munksgaard, Bjarne K. Petersen, Teodorita el Seady and Ellen-Margrethe Vestergaard for inspiration and their input to the ideas presented in this paper.

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