On-farm assessment of sheep welfare

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Introduction

The increased interest in farm animal welfare has created a need for assessment protocols (Farm Animal Welfare Council, 2001). Hence, the main purpose of this study is to contribute to the development of an operational welfare assessment system for sheep flocks. Existing on-farm monitoring systems are for instance the Tiergerechtheitsindex (TGI) developed in Austria and the Welfare Quality® project protocols. However, there is no existing protocol for on-farm assessment of sheep welfare. The welfare assessment discussed in this study has been based on established protocols, adapted to meet the needs for on farm assessment of sheep welfare. These include protocols used to assess welfare in cattle in the Welfare Quality® project and in the Bristol Welfare Assurance Programme (BWAP), RSPCA's welfare standards for sheep and Certified Humane's animal care standards for sheep. A set of animal- and resource-based measurements has been selected in order to develop the protocol. The indicators to be incorporated in an operational welfare assessment include health and behaviour of the animals as well as the system and the systems application. In combination, these indicators form the basis of animal welfare assessment (Rousing et al., 2001). There are three parts to the protocol: 1) the observations and measurements made by two observers during the visits, 2) a questionnaire completed by the farmers and 3) the analysis of records of health- and production data. Central questions in the questionnaire asked the farmers to describe their own practices (eg. feeding routines, common practices during the lambing season, reasons for culling animals etc.), what they meant by good sheep welfare, their assessment of the welfare of sheep in Norway and their attitudes to pain and sheep in general. Data from the questionnaire, in addition to secondary data from databases of performance and health-parameters at Animalia, will be analysed and validated against registrations collected in 36 selected farms. This study is a part of the project "Sheep welfare in the food chain", which is organised as a collaborative effort between the Norwegian School of Veterinary Science (NVH), Animalia, and the National Institute for Consumer Research (SIFO).

Materials and methods

36 farms in three different geographical regions of Norway (Nord-Østerdal, Rogaland and Sortland) were visited during the lambing season (April-May) in 2007 (n=11) and 2008 (n=25). They were recruited through random sampling from lists of slaughter data obtained from abbatoirs in these three regions. The farmers were contacted by telephone and asked whether they wanted to participate in the study. 11 farmers were then included in the study from the region of Nord-Østerdal (2007), 15 from Rogaland (2008) and 10 from Sortland (2008). Ten animals were randomly selected using systematic random sampling at each farm, and a clinical examination was performed by a veterinary surgeon. All the 360 ewes were included in the analysis. The whole flock was also observed to detect signs of clinical disease, lameness and coughing. Resource-based measurements, like for instance relative humidity, draft and temperature, were measured multiple times in areas were the animals were kept. The human-animal relationship and fear-testing of the ewes were selected as welfare indicators based on behaviour. A qualitative assessment of the general impression of the farm was performed after each visit. Distribution of the data was investigated with basic graphs.

Results

A t-test showed that the ewes in the study were cleaner when the temperature in the barn increased (P=0.001) (Figure 1). The distribution of body condition score, cleanliness, skin lesions, skin irritation, occurrence of calluses on the fore-knee and whether the ear-tag was torn out or in place is shown in Figure 2. There was a large variation between the minimum and maximum values obtained for the resource-based variables measured (Table 1), and also a large variation across farms.

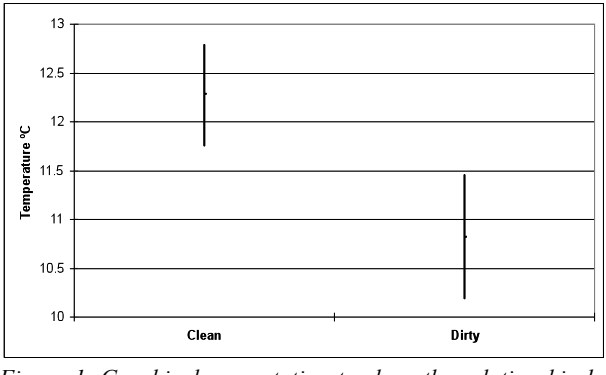

Figure 1. Graphical presentation to show the relationship between temperature (ºC) and mean and 95% confidence interval of the ewes' cleanliness.

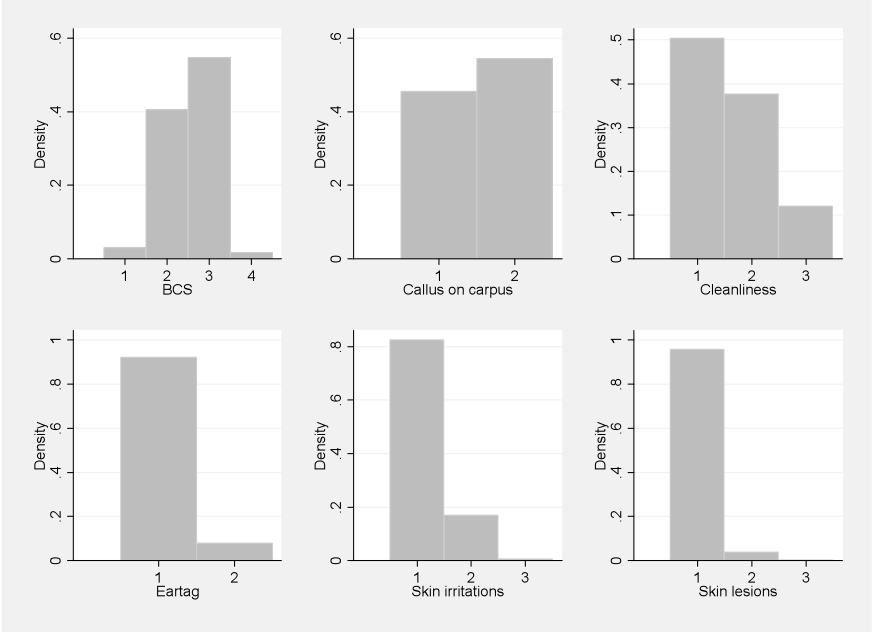

Figure 2. Graphical presentation of some of the selected animal- based measurements used as indicators of sheep welfare: body condition score (1: very thin 2: thin 3: average 4: fat 5: very fat), cleanliness (1: clean, 2: some dirty parts, 3: dirty, 4: very dirty), skin lesions (1: no skin lesions, 2: lesions >1x1 cm, 3: ulcerations), skin irritations (1: normal, 2: loss of wool, 3: redness/swelling, 4: parasites or flies), callus on carpus (1: no callus, 2: callus, 3: callus with ulcerated skin) and eartag (1: eartag in place, 2: eartag torn out).

Table 1. Mean ± SD of some of the selected resource based measurements measured in 36 farms.

Variable	**Observation (n)**	**Mean**	**Std. Dev.**	**Min**	**Max**
Lux	292	308.9	512.1	1.7	4000
Relative humidity	264	65.4	13.4	32	95.8
Surface temperature	304	11.2	3.2	4.2	20
Draft m/s	190	0.23	0.34	0.01	2.6
Ammonia	170	6.2	4.3	1	25
$C0_2$	126	304.3	409.8	20	1800
Temperature	255	11.7	3.4	4	19

Discussion

Assessing body condition is an important animal based measurement and ideally a ewe should have a body condition score (BCS) of 3 at lambing (Stubbings, 2007). Graphical evaluation of the data indicates that the majority of the ewes had a BCS of 3. However, a relatively large proportion of the ewes had a BCS of 2 (figure 2), which in turn can increase the risk of nutritional stress, diseases and low production. To assess the cleanliness of the animals is of relevance because the dirt irritates the skin and allows optimal conditions for ectoparasites, and dirty animals can for instance indicate a dirty environment or diarrhoea. Preliminary findings in this study show an interrelationship between the temperature in the barn and cleanliness of the ewes, but the grounds for this finding are still not clear. The farms were recruited from 3 different, geographical regions in Norway, and do not necessarily represent the welfare conditions of sheep throughout the whole country. We propose that the study constitutes the largest independently observed assessment of on farm sheep welfare carried out in Norway. We are aware of the fact that this assessment provides a "snapshot" of the welfare of sheep at the time of the visit. We expect that, the animal- and resource-based measurements chosen indicate the welfare of the animals over the previous weeks or months. The preliminary results from the on-farm welfare assessment in 36 farms will be further analysed, and data from the questionnaire and secondary health- and production data will be validated against these results. The chosen approach may provide results that are valid for other livestock species held under similar management systems such as in goats and beef herds. A protocol for on-farm assessment of sheep welfare will be a valuable instrument to help farmers and the industry to assess and to improve animal welfare, meeting the current societal demands .

References

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