Formal animal-based welfare assessment in UK certification schemes

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Abstract

Providing assurance of improvement in welfare outcomes is the desire of some UK certification schemes. However, this is only likely to be achieved if such schemes monitor welfare outcomes rather than rely on defining welfare resources that should be provided. The University of Bristol has developed protocols for the on-farm evaluation of animal-based welfare parameters for incorporation into certification schemes. The assessment system is designed to provide credible (repeatable, valid and feasible) evidence for assessment of compliance with welfare standards in organic and conventional farming systems. For issues identified as causing potential concern the assessor is encouraged to conduct further investigations of the relevant resource standards and, where appropriate, management requirements. Furthermore the assessment tool enables certification bodies and relevant third parties to monitor the ability of schemes to deliver good welfare outcomes. Finally, it provides a mechanism for farmers to review their own health and welfare performance. The practical application of these systems is now being pursued by some UK certification bodies.

Keywords: animal-based welfare measures, animal welfare, certification schemes

Introduction

Assessing farms against compliance with a set of welfare criteria is a critical component of most farm-based quality assurance schemes. Welfare standards within certification schemes (or legislation) usually attempt to specify what should be provided to the animal. However, evaluation of provisions or resources is a less direct evaluation of welfare than outcomes such as direct observation of the behaviour and physical condition of the animal (Webster *et al* 2004).

The aim of this paper is to provide an overview of the process for development and potential application of animal-based welfare parameters for dairy cattle, laying hens and pigs into UK certification schemes. The Farm Animal Welfare Council (2005) has recommended that animal-based measures should be incorporated into certification schemes. In addition to their use as a certification (or legislation) assessment tool, it is also important to recognise that these protocols can also be used for research assessments of housing systems and as a management tool to maximise productivity (see reviews by Johnsen *et al* 2001 and Main *et al* 2003).

Development of protocols

The animal-based parameters for dairy and beef cattle, pigs and laying hens used in the welfare assessment protocol were developed through evaluating and, where appropriate, incorporating protocols that had been used in previous studies (Whay *et al* 2003a). The parameters involved either assessment of individual animals, observation of groups of animals or from records or estimations of the farmer. The criteria for inclusion were as follows: relevance to welfare (validity), prevalence of the condition, reliability of the measure, relevance to organic standards or legal requirements, feasibility of using the measure during a certification visit and importance of a parameter to a farm's profitability. The outcome of this evaluation process was a list of parameters for each species (Table 1).

The protocols also allow the assessor to record information on the normal management system for common welfare concerns. For instance, for issues like lameness in dairy cows, the assessor reviews the prevention and treatment protocols present on the farm and the farm's monitoring/recording systems. The assessor is encouraged to examine general aspects of farm management, such as use of advisory services and the regular review of management practices.

The format of the assessment system was carefully designed so that it is easy to use on farm (eg paper versions included), can be consistently applied and the assessment can integrate with various certification systems. A manual was produced for each species which contains a definition of the parameter with pictures as required and a description of how to assess the parameter and to convert the results into standard units. A separate 'farmer significance' report gives

Table 1   List of the animal-based parameters that were included in the final version of the Bristol Welfare Assessment Protocol.

Cattle	Pigs	Laying hens
Thin cows	Thin animal	Poor comb colour
Fat cows	Fat sow	Poor beak condition
Dirty side	Dirty side/hindquarter	Thin birds
Dirty hind limb	Head/neck/side lesion	Fractures
Dirty udder	Genital and hindquarter lesions	Red mites/lice
Skin lesions	Tail lesion	Soiling of feathers
Swollen hocks	Limb bursas	Feather damage
Claw overgrowth	Time to return to observer	Feather loss
Flight distance	Animal appears obviously sick/dull	Trauma/injury
Rising restriction	Signs of scouring	Limb/toe problems
Animal appears obviously sick/dull	Coughing/sneezing/dyspnoea	Flight distance
Rumen bloated	Lameness	Animal appears obviously sick/dull
Eye abnormalities/nasal discharge	Sunburn	Thermal discomfort
Coughing	Skin irritation (mange, lice, scratching)	Respiratory problems
Skin irritation (alopecia/scratching)	Abnormal oral behaviour	Poor quality of litter
Abraded/ulcerated hock	Playing (running/toy/straw)	Uneven grass wear in range
Lameness	Other (eg abscesses, udder, shoulder sore, haematoma, rectal prolapses)	Evidence of calcium deposits in eggs

Table 2   Example of a repeatability (inter-observer variability) exercise for the parameter 'dirty side' observed on 10 dairy cattle by 10 assessors.

Assessor identification	Percentage agreement with mode reponse	Kappa value (measure of repeatability)	P-value
1	100	1.000	0.001
5	91	0.621	0.026
2	91	0.621	0.026
6	90	0.615	0.035
7	89	0.609	0.047
4	78	0.526	0.073
8	70	0.400	0.114
9	64	0.313	0.154
3	60	0.200	0.292
10	50	0.138	0.389
Total (± SD)	78 ± 17	0.504 ± 0.252	

Table 3   Potential benefits of Bristol Welfare Assurance Programme associated with different types of visit conducted on UK assurance schemes.

Possible visit types during which an animal-based assessment could be implemented	Certification tool (Results used to inform certification decisions)	Monitoring tool (Results used to monitor (internally or externally) performance of certification body)	Benchmarking tool (Report identifying strengths and weaknesses given to farmer)
All farms at initial and surveillance visit	Complement existing assessment****	Complete assessment of performance****	All farms receive report****
All farms at initial visit only	Additional threshold for new members***	Results do not reflect farms in scheme*	Limited to first visit only**
Farms identified as higher risk eg history of previous problems	Useful for higher risk population***	Only data from high risk farms*	Useful for higher risk population***
Sample of farms in scheme	Not usable as only sample*	Useful assessment of performance***	Only sampled farms**

Potential benefits: * minimal, ** some, *** medium, **** maximum.

a short explanation of the relevance (both welfare and profitability) of the parameters. All manuals, guidance notes and forms are available at www.vetschool.bris.ac.uk/animalwelfare.

Application of the protocols

A methodology for the application of this system has been proposed and is described here. Since all schemes in the UK have their own mechanisms for modifying their own certification process each scheme may implement some, all or none of this proposed system. A critical feature of this system was the concept of 'intervention guidelines' for each parameter. Exceeding an intervention guideline provides evidence that certain resources provided to the animal might not be adequate and that further investigation defined as follows would be required: i) a 'compliance checklist' would guide the assessor to one or more short questions associated with the relevant 'performance' based standard, eg if there was a high prevalence of thin animals the checklist would prompt 'does feed meet legal requirements?' and ii) a 'health plan form' would ensure assessors examine the farmer's awareness of the issue and whether appropriate investigations and actions have been taken.

The guidelines used in the provisional cattle protocols were derived from previous work (Whay *et al* 2003b). Dairy cattle welfare experts and veterinary surgeons were asked to consider, for each parameter, at what herd incidence level 'action should be taken to improve the situation'. An initial arbitrary herd incidence level at which 75% of experts agreed was defined as intervention guideline. Intervention guidelines for pigs and laying hens were based on a series of visits to farms (Whay personal observation 2003) and relevant literature (Leeb *et al* 2001). Since each scheme could use different intervention guidelines, the authors would recommend that they are periodically reviewed in the light of assessment results.

A model for evaluation of the repeatability of parameters used by individual assessors was also developed. After initial training (theoretical and practical) all assessors examined the same 10 animals independently. Data were described as percentage of correct assessments compared to the most common finding during each assessment (ie mode). Since the parameters were assessed as being either present or absent, a 50% agreement would be expected by random chance. An example of this process for 8 dairy cattle parameters is shown in Figure 1.

For those parameters showing poor agreement, such as skin lesions and dirty side in this example, it would be important to examine both the competence of the assessors and the suitability of the guidance notes in order to identify potential improvements in the system. The repeatability results should be used to identify poor repeatability by individual assessors. An example is shown in Table 2 for the parameter 'dirty sides'. For this parameter, which had relatively low overall repeatability (78%), certain assessors 1, 5, 2, 6 and 7 demonstrated significant ($P < 0.05$; kappa > 0.6) agreement with the mode response with four assessors achieving more than 90% agreement. The poor repeatability

Figure 1
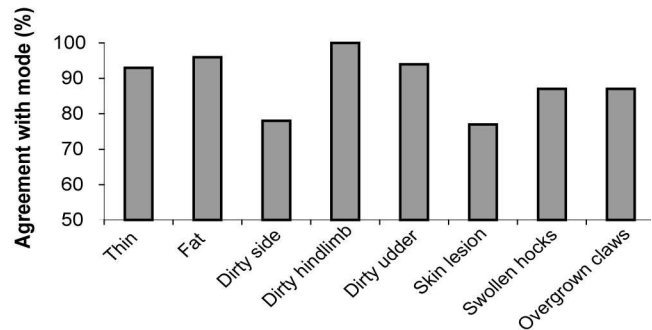
The proportion of assessments agreeing with the mode (ie most common) response for 8 parameters assessed in dairy cattle conducted on 10 cattle by 10 assessors (due to some missing data the number of assessments ranged between 94 and 100).

within the remaining assessors, therefore, indicated a need for further training. The authors recommend that this procedure is used as an ongoing system for the training and monitoring of assessors.

Discussion

This system was designed to improve the certification process of livestock assurance schemes by providing a mechanism for the consistent assessment of animal-based parameters. In addition to this direct benefit to the certification process the system should also be useful for monitoring the effectiveness of the overall certification system by analysing the results of a sample of (or all) farms within a scheme and benchmarking an individual farm's performance by comparison with their peers. This benchmarking benefit can help farmers and their advisors identify a farm's specific strengths and weaknesses. Use of the results for monitoring or benchmarking purposes would not conflict with their use as a certification tool provided of course pooled data was anonymous.

Farms that are members of UK farm assurance schemes are subjected to an initial and then regular (normally annual) surveillance visit. Some schemes also conduct additional visits either on a random basis or after a risk assessment basis. The extent to which each potential benefit (certification, monitoring and benchmarking) is achieved depends upon which type of visit an animal-based assessment is implemented (see Table 3). For example, a random sample could generate information about the scheme's overall 'welfare performance' but it could not be used as a certification tool as only sampled farms would be monitored in this way.

The development of the welfare assessment system was guided by the goal of producing a valid, repeatable and

feasible assessment tool that can be used within existing certification schemes. It is important to consider the extent to which the system achieves this objective.

The parameters were based on those that experts considered to be valid welfare-relevant parameters (Whay *et al* 2003a). This approach is therefore limited by subjective interpretation of experts using existing knowledge. The parameters tend to concentrate on welfare in terms of the lack of a certain condition such as injuries rather than directly observing positive aspects. It is, therefore, important to recognise, that this need not be the definitive list of parameters and the Farm Animal Welfare Council (2005) recommended that further validation of measures was important.

The system does not integrate different parameters into a single score because certification schemes are required to assess compliance with each individual requirement. It is also important to recognise that animal-based parameters should not replace valid resource standards. For example, this system does not directly assess water provision as the more obvious methodology is to assess the availability of water rather than to construct an animal-based parameter of thirst.

The repeatability of parameters is an important consideration as the assessment involves some degree of subjectivity. However, since further steps are required to demonstrate a non-compliance if a parameter exceeds the intervention guideline, it seems reasonable to allow a certain amount of assessment error. Indeed one could argue that the risk of some farmers having to institute corrective action even though their animal-based result could be an overestimate is a price worth paying to ensure those farms that are underestimated also take corrective action. The authors would, however, advocate that repeatability is maximised by initial training (until a minimum is achieved) and at regular (eg annual) intervals.

The system was designed to be feasible within existing certification systems. The duration of current certification visits in the UK varies between schemes but is usually between 2 and 8 hours. The authors believe that the system could replace some elements of existing assessments and extend others so it is difficult to predict the additional time required but it is likely to be between a 30 minute to 2 hour extension for most UK beef, dairy, pig or laying hen systems.

Conclusions

This welfare assessment system aims to increase the ability of certification schemes to deliver assurance to consumers on animal welfare. This system provides a mechanism for observing and recording welfare outcomes on a unit and then relating this to the resource and management standards that are defined within the assurance scheme or by legislation.

Acknowledgements

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