

The assessment and implementation of animal welfare: theory into practice

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Summary

This paper reviews the procedures and protocols necessary for the development of a practical programme for the assessment and implementation of animal welfare on farms and in other commercial situations. An effective programme must incorporate measures of both husbandry and welfare. Most current systems are based almost entirely on measures of husbandry provision, e.g. resources and management. However, what the public and the animals need are guarantees of satisfactory welfare and these guarantees must involve animal-based measurements of welfare outcomes. The development and testing of the Bristol Welfare Assurance Programme is described in outline and illustrated with detailed reference to the assessment of welfare in dairy cows. The final section describes how such a programme can be incorporated into the broader concept of quality assurance schemes that incorporate a proper concern for animal welfare into the reasonable needs of different societies for wholesome, affordable food.

Keywords

Assessment – Control – Cow – Dairy – Fitness – Quality – Sentience – Suffering – Welfare.

Introduction: the needs of animals and the needs of society

The new discipline of animal welfare science has helped to increase understanding of how animals perceive the world and what motivates them to action designed to address their physiological and behavioural needs. However, if science is to be of practical service to animal welfare, we must do more than just study it; we must take it out of the confines of the laboratory and into the world where these animals actually live.

It is necessary at the outset to state the author's definition of animal welfare. In full, this reads 'the welfare of a sentient animal is determined by its capacity to avoid

suffering and sustain fitness (6, 7). This can be abbreviated as follows: good welfare = 'fit and feeling good'.

Fitness describes physical welfare, e.g. freedom from disease, injury and incapacity, and this is particularly important when these problems can be directly attributed to the way in which animals are bred, and the conditions in which they are reared (e.g. lameness in broiler chickens and dairy cattle can arise from improper phenotype, improper building design or a combination of the two). 'Feeling good' and 'suffering' describe the mental state of a sentient animal. The author has defined sentience as 'feelings that matter'. A sentient animal is motivated by the need to feel good and avoid suffering. The strength of motivation to act to achieve a resource or avoid a source of suffering is a measure of how much it matters (7). Sentience has evolved as a powerful tool to promote survival and biological fitness and is present in (at least) all mammals and birds. However, the capacity for sentience

carries with it the capacity for suffering. Thus, welfare matters to a sentient animal and it should matter to us too.

This paper will consider two steps that are crucial to the progressive improvement of standards of welfare for sentient animals. These are:

- the development of protocols for the assessment of animal welfare and the provisions that constitute good husbandry in ‘real life’ situations, e.g. farms, laboratories, zoos and wildlife parks, kennels and riding establishments, and rescue centres run by welfare charities
- the implementation of programmes providing welfare assurance that are valued and trusted both by producers and by the general public.

The greatest practical obstacle to the improvement of farm animal welfare is not the reluctance of farmers to change but the reluctance of the general buying public to convert their oft-expressed desire for high standards of animal welfare into a demand for high-welfare goods when they enter the food store. There are several possible reasons for this. Some may be unaware of welfare problems, some may not care, and some may feel that they are unable to judge the good from the bad. Consumers are able to set their own standards for qualities of food such as price, appearance and taste, and adjust their buying habits accordingly. However, in the case of other standards such as food safety, system of production (e.g. organic), country (or farm) of origin and animal welfare, consumers are unable to judge directly for themselves and may be reluctant to trust the label. In the case of animal welfare, this means they require an effective system of quality assurance (QA) based on a proper assessment of animal welfare, and an effective programme designed to resolve any problems uncovered by the assessment.

The growth of these consumer concerns has been identified, indeed exploited, by producers and retailers who have developed QA schemes that ‘guarantee’ standards of production, provenance and hygiene. British schemes such as the United Kingdom (UK) Register of Organic Food Standards and the Royal Society for the Prevention of Cruelty to Animals (RSPCA) ‘freedom food’ (FF) scheme set out quality standards for production that incorporate concerns for animal welfare. Throughout the developed world, a myriad of other standards is emerging. These schemes have much in common, yet most seek to ‘give an edge’ to the producer/retailer on the basis that the product bearing their label carries an added value and should therefore command a premium price. If a high-welfare scheme is to be effective, it must first persuade the consumer that the added value is real. It must also reward the farmer for his commitment to improved welfare. It is reasonable to assure farmers that some improvements to husbandry and welfare can bring profit through the

reduction of disease and injury (if the cost of prevention and treatment is not too high). However, many elements of improved husbandry as perceived by the public (and the animals), such as increased space allowances and an enriched environment, can only be achieved at a cost to the producer. Production systems that claim to be high welfare will only succeed if they can attract a premium from the consumer and transfer most of that premium to the farmer. It is necessary at this stage to stress that animal welfare is important but not all-important. It cannot be considered in isolation from the reasonable needs of society for affordable, wholesome food, nor the need of farmers to earn an honest living. In this context a ‘good’ decision is one that achieves a fair compromise between the reasonable needs of all stakeholders. The needs of consumers and farmers will differ according to their individual economic state and the economics and customs of the society in which they live. However, once any society recognises farm animals as sentient beings it must accept that the animals are also stakeholders in the enterprise and their needs must be built into the equation. The chosen solution for any society will inevitably reflect the value that the society can afford to give to animal welfare. Nevertheless, the prime concern of this paper is animal welfare, not the needs of society. The welfare of the dairy cow will be determined only by its fitness and how it feels, and these things exist independently of the economic status of its owner.

Before any QA system can guarantee its aims and so be worthy of public trust, it must incorporate an effective system of quality control. Specifically, any QA scheme that claims high standards of animal welfare must incorporate an effective audit to ensure that these standards are being met and to remedy specific problems as they occur. In this paper, the author describes and discusses the principles, development, testing and implementation of practical protocols for the assessment of husbandry and welfare at the farm level. The author briefly reviews the principles and essential elements of existing schemes, and then describes in more detail the development of the Bristol Welfare Assurance Programme. The protocol for dairy cattle has been selected for purposes of illustration. Protocols for the assessment of the welfare of laying hens, growing pigs, dairy and beef cattle are available on the University of Bristol website (www.bris.ac.uk/vetschool/animalwelfare) and these programmes are updated regularly.

Provisions and outcomes

Good husbandry includes the provision of appropriate resources of food and shelter, effective management and sympathetic stockmanship. It is the responsibility of farmers to provide these things in order to promote good

welfare, and it is the responsibility of the assessors of any welfare-based QA scheme to ensure that farmers comply with the standards of husbandry as laid down by the scheme. However, compliance with husbandry standards does not guarantee good welfare for all of the animals all of the time and ultimately it is the welfare of the animal that matters. Quality control designed to provide QA as to standards of animal welfare needs to be based both on assessment of the provision of resources and management and on assessment of outcomes, i.e. animal-based observations and records of welfare state. The 'Five Freedoms and Provisions' (2, 3) provide a comprehensive framework on which to hang specific observations and records of both provision and outcome. The key elements of husbandry provision and welfare outcome are illustrated in Figure 1. The main categories of provision are described below in more detail and illustrated by example:

a) physical resources necessary to ensure proper feeding, housing and hygiene:

- well-constructed, properly replenished food stores
- accommodation that is hygienic, physically and thermally comfortable, and unlikely to cause injury
- facilities for routine preventative medicine and the care of individual sick animals

b) strategic management designed to address the physiological, health and behavioural needs of the animals:

- feeding, production, health and welfare plans devised and implemented with professional advice as appropriate to the needs of the system and the individual animals
- comprehensive records relating to feeding, production, health and welfare

c) competent 'stockmanship', sympathetic to the day-to-day physiological, health and behavioural needs of the animals:

- a skilled, sympathetic approach to animal handling
- early recognition and attention to any signs of disease or injury
- work practices that encourage competent and caring stock keepers and which give them the time to develop empathy with the animals in their care.

Observations and records relating to welfare outcomes (and elements of provision directly related to welfare outcomes) can be categorised under the headings of fitness and feelings. These include the following:

a) fitness:

- good body condition, growth, fertility, etc., contingent upon good nutrition
- good condition of the skin and coat, contingent upon comfortable, clean accommodation and absence of external parasites
- good health, contingent upon good hygiene, preventative medicine and early recognition and attention to disease

b) feelings:

- freedom from pain associated with lameness and injury
- freedom from fear and stress induced by exposure to unsafe facilities, inconsiderate humans or other animals
- freedom to exhibit most natural (socially acceptable) expressions of behaviour, including those associated with sensations of pleasure (e.g. social grooming).

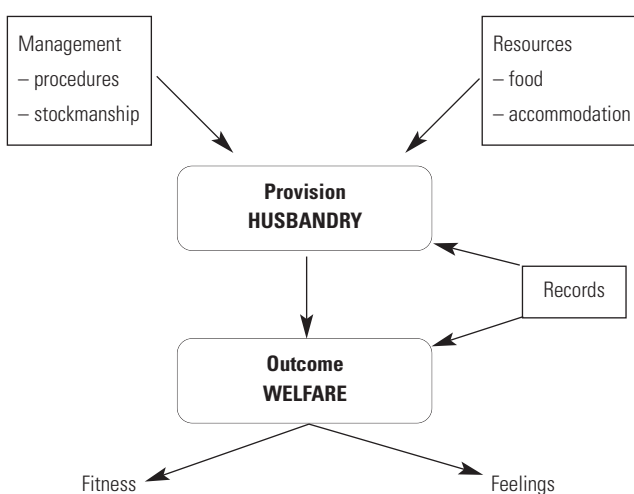


Fig. 1
Elements necessary for the assessment of husbandry provision and its outcome, animal welfare

Comparison of current schemes for assessing on-farm welfare

The development and animal welfare implications of existing Farm Assurance schemes have been reviewed by the Farm Animal Welfare Council (4). Most current schemes set out in detail standards of husbandry provision designed to promote good welfare. They are all based on the Codes of Recommendations for the welfare of livestock produced by the UK Department for Environment, Food and Rural Affairs (DEFRA – www.defra.gov.uk), which 'aim to encourage all those who care for farm animals to adopt the highest standards of husbandry'. Table I summarises the approach used by DEFRA in the production of its two most recently revised Codes (at time of writing) for cattle and pigs (2). The Codes are prefaced by a statement of principle, namely the Five Freedoms and Provisions, and reference to relevant legislation, e.g. the Welfare of Farmed

Table 1
Summary, with examples, of the format of the Codes of Recommendations for the welfare of pigs and cattle produced by the United Kingdom Department for Environment, Food and Rural Affairs (2)

General recommendations	Examples	
	Pigs	Cattle
Stockmanship	Health and welfare plan	Health and welfare plan
	Basic skills	Basic skills
	Health inspection	Health inspection
	Handling	Handling
Health	Biosecurity	Biosecurity
	Condition scoring	Condition scoring
	Lameness	Lameness
	Parasites	Parasites
	Sick and injured animals	Sick and injured animals
	Health records	Health records
Accommodation	Space allowances	Cubicles
	Floors	Cowsheds and straw yards
	Temperature and ventilation	
Food and water	Design of equipment	Access to roughage
	Trough space	Water requirements
Management	Farrowing sows and piglets	Pregnancy and calving
	Weaners and rearing pigs	Calf rearing
	Dry sows and gilts	Dairy cows
	Boars	Milking
	Outdoor husbandry systems	Management at pasture

Animals (England) Regulations (2000, with later amendments). The Codes then proceed to consider the essentials of good husbandry, i.e. stockmanship, health care, accommodation, provision of food and water, and management specific to the needs of different classes and ages of animal. The elements of stockmanship are set out in detail, including the creation of a written health and welfare plan, acquisition of handling and husbandry skills (e.g. castration, tooth clipping), and the ability to recognise early signs of ill health. The sections of the Codes on health consider, in some detail, important issues such as body condition scoring, lameness, control of parasites and the care of sick animals. The sections on accommodation, food and water, and the specific recommendations for management also reflect in considerable detail the differing needs of the different species and classes of stock.

The revised Codes provide an excellent, authoritative (and refreshingly animal-orientated) introduction to the principles of good husbandry and are reinforced by suggestions for further reading. If it could be guaranteed that all farmers would abide by all elements of the welfare codes, there would be few problems. However, to provide an assurance of good welfare and inspire trust in assurance,

then an effective audit of the outcome of husbandry is needed, namely, a robust, animal-based protocol for the direct assessment of animal welfare. At present none of the current QA schemes for farm animals incorporates a significant element of animal-based welfare assessment. However, there is clear recognition among animal welfare scientists and others of the need for animal-based protocols, not necessarily to replace existing provisions-based schemes but to complement them. This was a central theme of the 2nd International Workshop on Animal Welfare Assessment at Farm and Group Level, held at Bristol in 2002 (8).

Development of the Bristol protocol for animal-based welfare assessment

The FF scheme, set up by the RSPCA in 1994 was the first farm assurance scheme to concentrate on animal welfare. The scheme has attracted international recognition and its principles have been adopted as the basis for similar schemes in many countries. The commitment of the RSPCA to the principles and practice of the FF scheme has undoubtedly been a powerful force for good, whose impact has extended far beyond the strict confines of those farms currently registered within the scheme. However, the RSCPA Council, to their credit, recognised that they could not guarantee the FF standards of high welfare either to the customers or the animals unless they were prepared to submit the scheme to an independent audit. The key questions are:

- Does compliance with the standards of the FF scheme ensure high welfare?
- Does compliance with the standards of the FF scheme ensure better welfare than on non-FF farms?

These questions can only be answered on the basis of measurements of outcome, i.e. welfare state. To do this, one has first to develop animal-based protocols that meet the criteria of feasibility, validity, reliability, repeatability and objectivity. A team consisting of B. Whay, D. Main, L. Green and J. Webster (author of this paper) was contracted by the RSPCA to develop the protocols, conduct the independent audit of FF, and advise the RSPCA in the light of the results and their implications. The sequence of steps involved in this process was as follows:

- a) a first review of expert opinion was conducted
- b) the relative importance of different welfare problems was assessed
- c) approaches to the measurement of welfare problems were established

- d) protocols for on-farm assessment of animal welfare were developed and tested
- e) welfare on a statistically valid sample of farms was assessed
- f) strengths and weaknesses on individual farms were identified
- g) a second review of expert opinion was conducted
- h) the need for intervention to address specific welfare problems was assessed
- i) an action plan to address specific problems on individual farms was developed
- j) the outcome of the action plan was reviewed.

The initial contract of the team was to assess the welfare of dairy cows, growing pigs and laying hens on free-range units. The first step was to gather the opinions of animal welfare experts as to the most important welfare problems for these animals and the most appropriate animal-based measures of welfare assessment (9). This review of expert opinion was carried out using the Delphi technique. This involves the preparation of a structured (but non-leading) consultation document that is sent to a panel of experts, each of whom is asked to contribute their knowledge and opinions. The first round of replies is summarised and returned to the panel, who is then asked to comment on, or rank the views of the other panel members. This two-stage approach leads progressively towards a consensus of opinion and, because the experts never meet, a consensus that is unlikely to be biased by the force of individual personalities.

The experts were asked to identify at least five welfare issues for each species, rank each according to its importance both to the individual animal and to the UK industry, and to state their opinion as to the extent to

which each issue could be avoided by good husbandry practice. The experts who replied to the questionnaires included veterinarians, ethologists and animal production scientists. The aim of this Delphi review was to ensure that the team's approach to assessing welfare on farm truly reflected expert opinion and not simply the team's own prejudices. The 'top ten' measures for each species are listed in Table II (9). It is notable that criteria relating to both fitness and feelings were identified for all three species, but that behavioural measures were given far more importance for the laying hen than for the other two species.

The dairy cow protocol

The first protocol to be developed, tested, implemented and published was that for dairy cattle (10). The protocol was based on direct indices of welfare derived from a combination of direct observations, recordings and farmers' estimates, and used for a planned evaluation of welfare on 40 FF farms and 40 non-FF farms paired by farm type and location. All observations were made by B. Whay. Unfortunately, due to the UK Foot and Mouth epidemic of 2001, the study had to end earlier than intended after only 53 visits, but subsequent analysis revealed that this number was sufficient for the team's purposes. The results for all farms are summarised in Table III. The observations and records have been grouped according to nutritional state, reproduction, disease, external appearance, environmental injury and behaviour. The results for the various indices of welfare state are arranged 'from best to worst' in five quintiles A to E, so that the results of the top-scoring 20% of herds are in Band A and those of the bottom-scoring 20% of herds are in Band E. Obviously, the allocation of a farm to a particular band is specific to each observation.

Table II
The 'top-ten' measures of the welfare of dairy cattle, pigs and laying hens

Rank	Cattle	Pigs	Laying hens
1	Observing lameness	Observing lameness	Observing feather appearance
2	Examining health records	Examining limb lesions (PM)	Examining mortality records
3	Observing disease	Examining mortality records	Examining health records
4	Observing mastitis	Examining medicine records	Observing feather pecking behaviour
5	Observing general demeanour	Examining lung pathology	Observing fear behaviour
6	Scoring body condition	Observing feeding behaviour	Observing pecking injuries
7	Observing stockmanship	Scoring body condition	Observing calmness
8	Observing lying behaviour	Observing limb lesions	Observing use of range
9	Examining production records	Observing response to a novel object	Examining parasite treatment records
10	Observing skin lesions	Observing social behaviour	Observing perch use

PM: post mortem

Table III
Results profile for indices of welfare on 53 dairy farms in the United Kingdom

The results are arranged in quintiles from best (A) to worst (E), i.e. Band A contains the results of the top-scoring 20% of farms for each welfare assessment indicator and Band E contains the results of the lowest-scoring 20%. Obviously, the allocation of a farm to a particular band is specific to each indicator: a farm with a low prevalence of thin cows but a high prevalence of cows with a bloated rumen would be included in Band A for the first indicator and Band E for the third indicator (10)

Indicator of welfare state	Type	Range of results for each quintile				
		A	B	C	D	E
Nutrition						
Thin cows ^(a) (%)	Obs.	0-6	>6-11	13-21	22-31	33-62
Fat cows ^(b) (%)	Obs.	0	0	0	1-5	>5-28
Bloated rumen (%)	Obs.	0	3-6	7-17	18-24	25-47
Hollow rumen (%)	Obs.	0-6	7-14	>14-20	21-31	32-82
Milk fever (%/y*)	Est.	0	0	0	1	>1-31
Metabolic disease ^(c) (%/y)	Est.	0-3	>3-4	5-7	>7-9	10-19
Reproduction						
Conception to first service (%)	Est.	80-68	66-60	59-56	55-49	47-28
Assisted calving (%/y)	Est.	0	0	1	>1-5	>5-40
Disease						
Mastitis (%/y)	Rec.	0-9	11-21	>21-34	41-46	47-120
Mastitis (%/y)	Est.	3-13	15-19	20-33	>33-47	>47-89
Lameness prevalence (%)	Obs.	0-14	>14-18	20-23	24-30	31-50
Lameness incidence (%/y)	Rec.	0	0	2-4	>4-11	>11-42
Lameness prevalence (%/y)	Est.	3-9	>9-14	15-21	>21-34	35-54
Claw overgrowth (%)	Obs.	0-12	>12-25	27-34	35-46	>46-76
External appearance						
Dirty hind limbs (%)	Obs.	65-85	90-96	97-100	100	100
Dirty udder (%)	Obs.	0-8	10-18	>18-23	24-33	36-70
Dirty flanks (%)	Obs.	0	2-7	8-11	14-23	26-78
Hair loss (%)	Obs.	0	4-7	8-13	15-31	33-88
Environmental injury						
Hock hair loss (%)	Obs.	0-8	10-22	>22-45	47-71	74-92
Swollen hock (%)	Obs.	0-11	>11-28	29-36	37-68	70-97
Ulcerated hock (%)	Obs.	0	3-4	5-12	>12-25	29-50
Non-hock injuries (%)	Obs.	6-43	46-59	>59-66	67-79	80-100
Behaviour						
Average flight distance ^(d) (m)	Obs.	0.6-1.1	1.2-1.5	>1.5-1.7	>1.7-1.9	2.1-3.4
'Idle' cows ^(e) (%)	Obs.	0-3	>3-4	5	6-8	>8-25
Rising restriction ^(f) (%)	Obs.	0-10	12-20	30	33-40	50-78

a) thin cows: cows with a condition score of < 2%

b) fat cows: cows with a condition score of > 3.5%

c) metabolic disease includes diseases such as ketosis and hypomagnesaemia, but not milk fever, mastitis or lameness

d) distance at which cows retreat from the observer

e) standing cows performing no activity

f) cows showing severe difficulty in rising, hitting fittings, and 'dog-sitting'

Est. = estimated by farmer

Obs. = observed

Rec. = recorded by farmer

m: metres

*Annual incidence is expressed as cases/100 cows per year (%/y)

A complete analysis of the results is given in Why *et al.* (10). Only a selection of the results is discussed here to illustrate major welfare concerns. Nutritional state was obtained from observations of body condition (thin or fat cows), state of the rumen, and the prevalence of milk fever (periparturient hypocalcaemia) and other production-related diseases. Table III shows for example, that for the

specific observation 'thin cows' (condition score less than two), prevalence in the 'best' 40% of herds (Bands A and B) was 0% to 11%. In the 'worst' herds (Band E) it ranged from 33% to 62%. Reported conception to first service was used as a simple index of infertility. This is not in itself a source of distress but it is a key indicator of loss of fitness. The recorded and estimated annual incidence of mastitis

agreed with other national surveys. There was a good association between farmer estimates of mastitis incidence and records of treatment. This reflects the policy of farmers to treat mastitis early and record each treatment. The prevalence of lameness, identified by the expert panel as the most important welfare problem for dairy cows, was approached in three ways. True prevalence (percentage) was assessed by observing the locomotion score of all cows as they left the milking parlour. The farmer's perception of lameness was obtained from records of incidence (percentage per year) and their estimates of prevalence at the time of the visit were also recorded. The proportion of cows recorded as moderately or severely lame from direct observation of locomotion score was 0% to 14% in Band A, rising to 30% to 50% in Band E. The overall lameness prevalence was 23%, which compares closely with that recorded by a team of researchers at Liverpool University in 1989 (1). However, farmer estimates of lameness prevalence were, on average only about 20% of that observed during locomotion scoring. Moreover, there was no correspondence between farmer estimates of lameness prevalence and those identified by Why as severely lame. This identifies a major welfare concern. When at any time, 20% of animals are lame and a far greater proportion cannot be said to be walking truly soundly, such behaviour can appear 'normal'. This is a powerful illustration of a general conclusion that one of the major tasks for those seeking to improve farm animal welfare is to improve farmer perception of the problem. There was also a significant correlation between the prevalence of true lameness and other environmental injuries, especially ulcerated hocks. Hock damage can serve as a simple and robust indicator of inadequate standards of comfort and injury for dairy cows. The behavioural observations included in the protocol were average flight distance, rising restrictions and the percentage of cows observed to be standing 'idle' (not eating, ruminating, grooming, socialising, etc.). Flight distance is a good measure of whether cows are calm or nervous and this clearly reflects the social interaction between the cows and their stock keepers. Rising restriction is a good index of physical discomfort, associated with a mismatch between the dimensions of cow and cubicle.

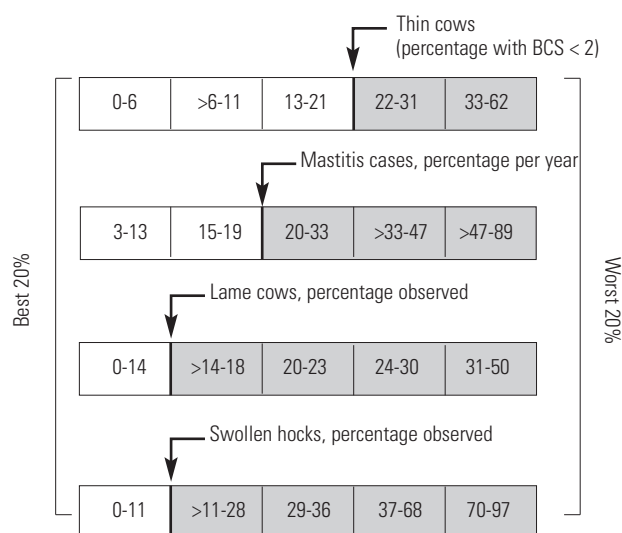
By allocating a score of zero (best quintile) to four (worst quintile) for each individual welfare assessment, it was possible to arrive at a cumulative 'welfare score' for each farm. Obviously some farms were worse than others but, overall, there were no thoroughly good, or thoroughly bad farms. All had some problems and these were specific to the farm. This implies that when a welfare assessment is made using a wide range of animal-based measurements it is, in most cases, impossible to reduce the results to the simplistic conclusion that welfare is 'good' or 'bad'.

Having obtained measurements and records of the incidence and prevalence of these specific welfare issues,

the next stage in the development of the protocol was to submit the information summarised in Table III to a second round of expert opinion. Veterinarians, ethologists and animal welfare scientists were asked to indicate the score category (quintile) at which they considered intervention would be necessary to remedy a welfare problem apparent at herd level. Arbitrarily the team identified a clear herd problem as one where the prevalence or incidence was such that 75% of experts recommended intervention.

Figure 2 presents four important examples of expert opinion as to the need for intervention (as illustrated by the arrows). The prevalence ranges in each quintile are those given in Table III. In the case of thin cows, 75% considered that intervention was necessary for farms in Bands D and E (i.e. in the 40% of farms where prevalence was > 21%). For mastitis, intervention was recommended at an annual incidence above 20% (60% of farms). For lameness and swollen hocks, intervention was recommended in Bands B to E (when prevalence was greater than 14% and 11%, respectively). In other words, 75% of competent judges considered that lameness was a welfare problem that required attention at a herd level in 80% of the farms in the study!

The final step in the development of the welfare assurance programme was to implement an Action Plan designed to address specific welfare problems. As has been said previously, farms did not perform consistently well or badly; most were good at some aspects, poor at others. It



BCS: body condition score

Fig. 2
Examples of expert opinion as to the need for intervention in four major problems for dairy cows

The arrows indicate the point at which 75% of the experts questioned agreed that intervention would be necessary

follows from this that remedies for welfare problems need to be tailored according to the specific needs of specific farms. It is also important to note at this stage that there was no difference in overall welfare scores between FF and non-FF farms (5). Thus, the team was unable to conclude that membership of the FF scheme ensured better overall welfare than on non-participating farms. This may, at first sight, seem like bad news for the RSPCA. However, the RSCPA then, with the assistance of the team, instituted action plans tailored towards specific problems on FF farms and implemented them with the active collaboration of the farmers and their veterinary surgeons. It then, of course, becomes necessary to evaluate the action plan to discover how well it is working. This completes (and by definition, recommences) the cycle of assessment, action and review. However, it is fair to say that the independent audit of the FF scheme for dairy cows has not served to diminish the scheme but to strengthen it, since it now includes a protocol that can identify specific welfare problems that may occur in spite of compliance with the standards of provision laid down by the scheme, and an action plan designed to resolve these specific problems.

Animal-based welfare measurements: practicalities and problems

The key to the welfare assurance programme outlined in this paper is the protocol for animal-based welfare measurements (observations and records) to be taken by a trained observer at a single visit. This approach introduces problems that do not arise in more conventional QA schemes that are based (almost) entirely on records of provision. Measures of provision, such as stocking density or cubicle dimensions, are unequivocal. However, measurements relating to welfare outcomes such as malnutrition, pain or fear are, by definition, subjective and are therefore subject to observer bias. There is moreover, the danger that the observer will arrive 'on a bad day' and obtain a snap shot that distorts the normal standards of husbandry and welfare on the farm. An effective animal-based welfare assessment protocol must be practical, integrative, non-intrusive and robust. Each of these concepts is discussed in further detail below.

Practicality

The assessment should be based on a visit from a trained observer that can be completed within a single day. The farmer should be notified in advance of the visit and asked to prepare a self-assessment document relating to most elements of provision and some records of welfare. The assessor will spend some time observing the animals and

some time with the farmer evaluating the self-assessment document.

Integration

The measures used to assess animal welfare should, as far as possible, be designed to integrate the long-term consequences of past husbandry practices. In the dairy cow protocol, for example, body condition is used as an integrative measure of past nutrition, and hock lesions are used as an integrative measure of past housing. Similarly, skin lesions and feather loss can be used as integrative measures of social problems in pigs and poultry respectively. This approach reduces the risk of injustice arising as a result of catching the farmer on a bad day. It also reduces the opportunities for the farmer to paint himself in a favourable light, e.g. by putting out an unusually generous amount of bedding on the day of the visit.

Non-intrusiveness

The measures used to assess welfare (i.e. fitness and feeling good) should be non-intrusive and cause minimal disturbance to the animals. This is partly for reasons of practicality and cost, but mainly because it is essential not to distort the natural behaviour of animals in their environment. The sequence of measures should start with the least intrusive observations of the behaviour of the flock or herd (e.g. resting behaviour, flight distance) and leave any observations that require handling individuals to the end (e.g. examination of laying hens for body condition, sternal fractures, etc.).

Robustness

The observations relating to fitness and behaviour need to be tested to ensure that they are reasonably free from observer bias. Any subjective measure is inherently prone to variation both between observers and even within the same observer as s/he becomes progressively more or less sensitive over time. Between-observer variation can be reduced through effective training. However, it is important to discard any measure where observer bias is shown to be significant. The team's evaluation of welfare in free-range hens, as yet unpublished, used two measures to assess attitude within a spectrum of curiosity-timidity, namely, response to a novel object (a traffic cone) and flight distance (from the assessor). With the latter measure, observer variation was significant; in the former it was not. Only the former measure was robust.

Many scientists and veterinarians are bound by a fundamentalist belief system that considers 'subjective' impressions of welfare state based on observations of

behaviour (e.g. lameness) or body condition to be inferior to 'scientific' measures of welfare based on objective measures (e.g. laboratory analyses of blood samples). In the opinion of the author, this view presents a substantial obstacle to the proper assessment and implementation of animal welfare on the farm and in other practical situations. There is not space here to develop this argument in any detail but the author has discussed this in a previous publication (7). In brief, the value of the so-called 'objective' magic markers of animal welfare (e.g. cortisol, endorphins, acute-phase proteins) is strictly limited on two counts: these markers are non-specific and measure short-term variation in arousal induced by acute stressors (e.g. handling and transport). Assessment of welfare on farm depends on integrative measures of the long-term consequences of chronic stressors. The most practical and effective of these measures are inherently subjective. However, observer variation can be taken into account through proper attention to scientific method. A well-planned set of behavioural observations can be as scientific as a blood sample and infinitely more useful.

Development of welfare-based quality control procedures

So what should be the next step in the development of welfare-based quality control procedures? To recapitulate, the key issues relating to the current state and future development of welfare-based QA and quality control schemes for farm animals are as follows:

- any comprehensive audit of animal welfare should incorporate a review of both provisions and outcome, i.e. husbandry and welfare
- current QA schemes are mostly based on elements of provision and place little emphasis on animal-based measurements of welfare outcomes
- assessment of welfare is only part of the QA requirement for farm assurance, which will also require assurances as to food safety, biosecurity, etc.
- voluntary welfare-based QA schemes will only succeed if they are understood, trusted and seen to add value by all parties, i.e. consumers, retailers and farmers.

The aim for the future should be to develop protocols that can both highlight welfare problems and identify failures in provision that have contributed to these problems. The suggested approach of the author would involve the following steps:

a) the QA scheme should lay down clear guidelines for husbandry, following a format similar to that of the DEFRA Codes of Recommendations for the welfare of livestock

(Table I) and modified, as necessary, to meet minimum standards for the scheme where these differ from the welfare codes (e.g. space allowances, enriched environments)

b) the farmer should, in the first instance, be required to measure compliance with the standards by a process of self-assessment that would, in part, consist of ticking boxes relating to matters of fact, but that would also require self-assessment of the quality of key areas of husbandry

c) the independent assessment of compliance with the provisions of the scheme should primarily involve animal-based observations and records of welfare outcomes. These would be conducted by trained assessors, who would also make a random selection of checks on some (not all) of the farmer's self-assessment of elements of provision

d) if the assessor identified no welfare problem serious enough to warrant attention (on a herd basis) and no deficiencies arising from spot checks on the self-assessment, then the farmer would pass the test of compliance with the standards of the scheme

e) if the assessor identified a welfare problem(s) serious enough to warrant attention, it would then be necessary to check specific items of provision (as defined in the standards) that may contribute to the specific welfare problem. These can be identified relatively easily (if slowly) within existing lists of standards. Computerising the process would make the process both faster and more accurate

f) when specific welfare problems can be clearly linked to failures of provision, then the farmer would have to remedy these problems in order to remain in compliance with the standards of the scheme

g) if the assessor identified specific welfare problems but these could not be clearly linked to specific deficiencies of provision, then the farmer would be required to seek professional (e.g. veterinary) advice and prepare an action plan to resolve (or at least reduce) the problem. The assessor, in association with the farmer and his veterinarian, would review the situation after an appropriate interval to decide whether or not sufficient had been done to meet the standards of good husbandry required by the scheme.

This approach addresses the objectives that the author has set for identifying welfare problems, the causes of welfare problems, and actions designed to remedy welfare problems. However, it is important to emphasise the need for continued development and testing of the efficacy of practical protocols such as these against established, more searching indices of animal welfare established under experimental conditions with small numbers of animals. Ideally (for the animals), those concerned with animal welfare should work towards achieving a satisfactory degree of international uniformity as to method and

interpretation, because welfare problems, as perceived by the animals, do not recognise national boundaries. This becomes especially important if minimum standards are to be set by legislation both for the provision of good husbandry and its outcome, good welfare.

Conclusion

In conclusion, the question remains 'how may welfare assessment best be incorporated within the broader aims of sustainable economic agriculture?' As previously stated, animal welfare is important but not all-important. It has to be incorporated within a broader assessment of quality that takes proper account of the interests, views and demands of all parties, both those that have an active stake in the free market, i.e. consumers, retailers and producers, and those who do not, i.e. farm animals and the living environment. Thus, animal welfare standards cannot be set in isolation. They must involve compromise with the needs of the other stakeholders and these needs will vary according to the economics and customs of different societies. Another practical problem is that animal welfare is only one of many concerns in the minds of those who make it their business to check up on farmers. Hygiene, biosecurity, pollution, health and safety of employees, land allocations for 'set aside', all create large amounts of paperwork and impose controls on what a farmer can and cannot do on his own land. It is in the interests of everyone to streamline these operations. This is not the place to discuss in any detail the co-ordination of all elements of Farm Assurance. The author suggests, however, that those whose prime concern it is to ensure high standards of

animal welfare through QA should seek to co-ordinate their procedures with other registration bodies. A farmer should not have to write the answer to the same question in six separate self-assessment forms, still less stand around while six separate assessors armed with clip boards read the questions out loud. The assessment protocol that has been described above calls for qualified assessors to evaluate welfare from animal-based observations and records. If these protocols, or developments of these protocols, were accepted as international standards of assessment (or even accepted across a broad range of voluntary QA systems), then the qualified assessors could be empowered to assess the outcomes of all, or a wide range of QA schemes.

In a free market society, the ultimate success of any QA scheme will require recognition, both by farmers and by consumers, that it gives added value, where this concept includes a proper recognition of the intrinsic value of sentient animals. In this way all parties can benefit from the scheme. For the consumer, there will be more trust; for the farmer there will be more pride. As for the animals, they are more likely to be fit and feel good.

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L'évaluation et la concrétisation du bien-être animal : de la théorie à la pratique

J. Webster

Résumé

Le présent article examine les procédures et les protocoles nécessaires à l'élaboration de programmes pratiques destinés à l'évaluation et à la concrétisation du bien-être animal dans les exploitations et dans d'autres situations commerciales. Un programme efficace doit comprendre des mesures visant à la fois l'élevage et le bien-être. La plupart des systèmes actuels reposent presque entièrement sur des mesures pour l'élevage, axées sur les ressources et la gestion. Pourtant, ce dont le public et les animaux ont besoin est l'assurance d'un bien-être satisfaisant ; laquelle passe par une évaluation des accomplissements en matière de bien-être, dans une perspective animale. La création et l'expérimentation du Programme d'assurance bien-être de l'université de Bristol sont décrites dans les grandes lignes et illustrées par des références à l'évaluation du bien-être chez les vaches laitières. La dernière

partie décrit les modalités d'intégration de ce programme au sein d'un concept plus large de programmes d'assurance qualité qui conjugue le souci du bien-être animal et les exigences raisonnables des diverses sociétés en matière d'aliments sains et peu coûteux.

Mots-clés

Aptitude – Bien-être – Contrôle – Évaluation – Laiterie – Qualité – Sensibilité – Souffrance – Vache.



Evaluación y materialización del bienestar animal: de la teoría a la práctica

J. Webster

Resumen

El autor pasa revista a los procedimientos y protocolos necesarios para instituir programas destinados a evaluar y hacer realidad el bienestar de los animales en explotaciones pecuarias y otras instalaciones de carácter industrial. Para ser eficaz, un programa debe contener medidas relativas tanto a la zootecnia como al bienestar. La mayoría de los sistemas actuales reposan casi por completo en medidas zootécnicas, relacionadas con los recursos o la gestión. Sin embargo, lo que tanto animales como consumidores necesitan son garantías de trato satisfactorio, con una apreciación de los resultados de las actuaciones en el ámbito del bienestar, desde el punto de vista de los animales. El autor describe sucintamente la elaboración y aplicación experimental del Programa de aseguramiento del bienestar de Bristol, deteniéndose a exponer en detalle un ejemplo ilustrativo: la evaluación del grado de bienestar de vacas lecheras. En la última parte del artículo explica el modo en que un programa de esta clase puede tener cabida en un concepto más amplio como el de los sistemas de garantía de calidad, pensados para conciliar las oportunas consideraciones de bienestar animal y la necesidad razonable de distintas sociedades de disponer de alimentos sanos a precio asequible.

Palabras clave

Adecuación – Bienestar – Calidad – Control – Evaluación – Lechería – Sensibilidad – Sufrimiento – Vaca.



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