

Research and Development

Final Project Report

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Project title

Incorporation of conventional animal welfare assessment techniques into organic certification and farming

DEFRA project code

OF 0314

Contractor organisation and location

Department of Clinical Veterinary Science
University of Bristol
Langford Bristo

Total DEFRA project costs

£ 78,782

Project start date

03/02/03

Project end date

31/03/04

Executive summary (maximum 2 sides A4)

Providing assurances to consumers on the adherence to certain animal welfare-related standards is an important element of organic and farm assurance schemes. This project has ensured that preliminary welfare assessment protocols developed in a conventional farm assurance system (RSPCA Freedom Food scheme) are available for incorporation into organic (& conventional) certification schemes. The final system (available at www.vetschool.bris.ac.uk/animalwelfare) is an assessment tool that can provide credible (repeatable, valid & 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. This promotes a consistent thorough assessment of relevant resource standards and, where appropriate, management requirements concerning appropriate preventive and corrective action that should be contained within written health plans. Furthermore the assessment tool should enable certification bodies and relevant third parties to monitor the ability of schemes to deliver good welfare outcomes, which is useful for policymakers and consumers wishing to assess the welfare assurance associated with membership of a scheme. Finally it should provide a mechanism for assessing the farm's own management of health and welfare parameters with their health planning systems which is now a requirement or recommendation of many welfare standards. This should enable farms to both identify their own strengths and weaknesses with respect to welfare and then to monitor any improvements resulting from husbandry changes. This is important as many of the welfare observations also have a significant influence on a farm's profitability.

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Scientific report (maximum 20 sides A4)

1 Introduction

1.1. Aim and objectives

This project aims to consolidate existing knowledge in both the conventional and organic sector. It provides a welfare assessment tool and a framework for inclusion within advisory and certification activities in the organic sector. The aims of this project are:

- *To formulate welfare assessment protocols for use in organic dairy and beef cattle, pig and laying hen systems. The protocol builds on existing experience within the conventional livestock sector identified through a large research project conducted at the University of Bristol. The protocol is practical and time efficient, this is achieved by focusing on the aspects of welfare concern identified in recent consultation exercises in the organic sector (Hovi, personal communication).*
- *To develop a web-based database system that will produce a welfare benchmarking report for organic farmers based on information from on-farm visits by inspectors, advisors or researchers. This report is a vital advisory and training tool for motivating farmers to maintain and improve welfare standards.*
- *To ensure organic inspectors are appropriately trained to conduct welfare assessments*
- *To produce an information pack that will allow advisors and veterinary surgeons to disseminate information to farmers on the interpretation of benchmarking reports and management of the aspects causing concern. The information will include best practice knowledge currently being developed in associated studies in both the conventional and organic sector.*
- *To collaborate with organic sector bodies on exploring the feasibility of incorporation of welfare assessment into certification requirements of organic health and welfare programmes.*

1.2 Milestones

Miles tone	Target date	Title	achieved
03/01	31/3/03	Phase 1 training (welfare assessment update) for inspectors completed	25/3/03
02/01	31/3/03	Basic web database infrastructure completed	31/3/03
01/01	1/5/03	Steering group formed	26/2/03
01/02	1/7/03	Initial protocols developed	1/7/03
01/03	1/9/03	Pilot testing of protocol completed	1/9/03
01/04	1/10/03	Final protocol & guidance notes produced	1/10/03
03/02	1/11/03	Training course for inspectors / advisors produced	1/11/03
02/02	1/12/03	Final version of web database completed	1/12/03
03/03	1/1/04	Phase 2 training (on-farm aspect) for inspectors completed	12/12/03
04/01	1/2/04	Presentation material farmers meeting produced	1/2/04
04/02	1/2/04	Leaflet for farmers & review article for veterinary surgeons produced	1/2/04
04/03	30/4/04	Regional meetings for advisors / veterinary surgeons completed	2/4/04
05/01	30/4/04	Final report (including agreed action with Sector bodies) completed	

1.3 Background

Assessing farms against compliance with certain welfare criteria is a critical component of certification schemes such as organic certification schemes that provide assurances to consumers. 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). For some husbandry provisions such as provision of a certain space allowance, welfare requirements can be very specific and directly measurable without reference to any further welfare outcomes. These “engineering-based” requirements (Mench, 2003) can be assessed objectively and are used as a statutory control measure in organic livestock production systems in Austria (Barkema, 1999). However, many requirements in organic, farm assurance and legal standards can only be assessed with reference to the animal outcomes. These have been called “performance-based” as they imply that resources provided to the animals should only be considered compliant if they result in certain minimum outcomes. For example, the provision of “adequate nutrition” requires assessment of the body condition of animals in addition to an assessment of the diet.

In addition to their use as a certification (or legislation) assessment tool, animal based assessment techniques can be used for research assessments of housing systems and as a management tool to maximise productivity (see reviews by Main et al., 2003 and Johnsen et al, 2001). There has, therefore, been much scientific endeavour in developing and ensuring repeatability of animal-based assessments. For example, a frequently used technique in dairy cattle is the identification and scoring of lameness (Whay, 2002). Leeb *et al.* (2001) used skin lesions as welfare measures in pigs at specific points within the production system. There has been recent interest into the development of welfare assessment techniques at the group level with two international conferences (Copenhagen in 1999 & Bristol in 2002). The EU is also funding a large-scale project, Welfare Quality (Blokhuis et al, 2003) that aims to produce a European standard for welfare assessment. This research group has developed an animal-based welfare assessment protocol of conventional systems for dairy cattle, pigs and laying hens in a research study assessing the welfare impact of the RSPCA Freedom Food scheme (Whay et al., 2002, Whay et al., 2003, Main et al., 2003). This protocol can also be used for organic dairy cattle by Huxley et al. (2004). The assessment protocols used in these studies form the basis of the Bristol Welfare Assurance Programme (BWAP).

The organic certification system is based on assuring a certain production system (Hovi *et al.*, 2003). Whilst the system has been carefully chosen and designed over the years to deliver various outcomes, such as minimal residues, minimal environmental impact and good welfare, the certification system does not take any legal responsibility over the outcomes. The desired outcomes are, however, the reason why governments implement policies that support organic farming and consumers buy organic produce. This was highlighted in the European Action Plan for Organic Food and Farming” (2004) which stated that “Organic land management is known to deliver public goods, primarily environmental, but also rural development benefits and in certain respects may also result in improved animal welfare.” The importance of animal welfare to organic farming was recognised in the recent Soil Association-commissioned report on animal welfare, “Batteries not included” (Pye-Smith, 2003). The Soil Association response to the report proposes that certification bodies should take a more proactive role in guaranteeing good animal welfare outcomes on the farm. The response states that: “Inspections and their reporting will be extended to incorporate a more qualitative animal welfare assessment involving careful observation of temperament and physical condition...”

2 Development of the welfare assessment system

2.1 Definition of parameters

The animal-based parameters 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.*, 2002). Protocols were developed for dairy and beef cattle, pigs and laying hens. Most of the parameters were animal-based and could either be assessed on individual animals, observation of groups of animals or from records or estimations of the farmer. The animal-based parameters used in the final assessment protocol were identified and developed under the guidance of a steering group.

The steering group was established during the final meeting of the SEERAD study (26th February 2003, Edinburgh) and further invitations were sent to all UK certification bodies. The steering group consisted of the following: The recommendations of the steering committee are given in section 8 of this report.

Chris Atkinson, SOPA
Stephen Clarkson, OF&G
Sarah Hardy, Soil Association
Marilyn James, Quality Welsh Food Certification
Katy Owen, Organic Food Federation
Roger Unwin, DEFRA/UKROFS
Malla Hovi, University of Reading
Christine Leeb, University of Bristol
David C. J. Main, University of Bristol
Helen R. Why, University of Bristol

1) First steering group meeting on 2nd July 2003

The aim of this first meeting was to introduce the project, describe other relevant work (FF results & lameness initiative, Duchy Organic study) and give an overview on achieved progress (initial training, prototype web-based database system and evaluation of potential welfare parameters).

2) Second steering group meeting on 23rd September 2003

The specific aim for this steering group meeting was to review the welfare assessment protocols and potential risk assessment procedures (animal based, health plan, qualitative assessment) including their validation and discuss the training requirements for inspectors (on farm assessment).

3) Third steering group meeting on 2nd March 2004

During this final steering group meeting the final version of 'BWAP' including figures for intervention guidelines was discussed. Potential mechanisms for incorporating welfare assessment into the certification systems were evaluated and short and long term review and action were planned. The recommendations of the group were formulated and agreed.

In order to ensure appropriate measures were included in the final protocol the steering group was shown a summary evaluation for each potential parameter against a variety of criteria. The steering group were asked to consider which parameters should remain in the protocol after considering the criteria discussed below. As can be seen from the example for dairy cattle (Table 1), the group used various reasons for including or excluding parameters. Even though this decision was based, where possible, on factual information, the decisions of the group should not be considered as definitive and an on-going evaluation of existing and novel parameters is important.

a) Relevance to organic standards or legal requirements. The relevant "performance-based" standards were identified within the Compendium of UK Organic Standards (DEFRA, 2004) and the Welfare of Farmed Animals (England) Regulations 2000 (HMSO, 2000). These were standards or requirements that should be assessed by evaluating animal-based measures. For example, a requirement to provide "appropriate nutrition" would require an assessment of the body condition of the animals within a group in addition to the assessment of the diet provided. Obviously some "engineering" standards (e.g. space allowance) that define resource requirements more precisely are important for achieving desirable outcomes (animal-based measures). However, these were not considered as part of this evaluation as the assessment of these standards requires examination of the resource only.

Some "performance-based" standards were not specific and could apply to several potential animal welfare relevant parameters. For example, the Welfare of Farmed Animals (England) Regulations 2000 (HMSO, 2000) requires that "Owners and keepers of animals shall take all reasonable steps (a) to ensure the welfare of the animals under their care; and (b) to ensure that the animals are not caused any unnecessary pain, suffering or injury". The Compendium of UK Standards (DEFRA, 2004) also requires that "8.1.1 Housing conditions for livestock must meet the livestock's biological and ethological needs". Hence, if there is no specific standard designed to address a particular

welfare concern such as mastitis and lameness then the occurrence of these conditions is relevant for assessing these general requirements.

b) Prevalence of the condition. The relative prevalence of various welfare concerns was considered to be a relevant criteria as a relatively uncommon problem should have less priority than a more common condition. Although of course severity of the condition should also be considered. For dairy cows the prevalence of most parameters was known from previous work (Whay *et al*, 2003), the equivalent data for pigs and laying hens was not available fully at the time of the study.

c) Reliability. The evaluation of reliability of potential parameters was based on scientific studies, where available, and previous practical experience of the measures. Various studies have examined the repeatability of specific animal-based measures. These have included lameness in dairy cattle (Winkler *et al*, 2000) and pigs (Main *et al.*, 2000). In a review of several animal-based measures, Winckler *et al.* (2003) used a subjective assessment of reliability to compare different parameters. The evaluations used in our study have been presented as both within observer (e.g. different times of the day/year) and between observers. Repeatability was assessed on a scale of 0-3, where 0 was considered not repeatable, 1 was poor repeatability (i.e. intensive training/instructions necessary or no scientific evidence for repeatability), 2 was good repeatability (i.e. some training/instructions necessary) and 3 was excellent repeatability (i.e. established/published method)

d) Feasibility. The feasibility in terms of time necessary to assess per animal/group of animals was known from previous work.

e) Importance. The importance of a parameter to a farm's profitability and the animal were subjectively assessed on a scale from 0-10 (0: not important at all – 10: extremely important). Profitability was based on evaluations of knowledge of conditions and published costs of clinical disease (Kossaibati and Esslemont, 1997 and Bennett *et al.*, 1999). Importance to the animal was based on previous knowledge and published work, such as consultation exercises (Whay *et al*, 2002). The estimation of importance for the animal was influenced by the likely subjective experience of the animal. For example, reduced milk yield is of minimal importance to the cow as she is unlikely to perceive such an event, even though reduced milk yield may be as a result of another welfare concern.

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Table 1 Evaluation of the relevance to standards, occurrence of the condition, repeatability, time taken and importance to the farmer and the animal of 7 potential animal-based parameters prior to inclusion within the final protocol.

Examples of potential dairy cow parameters	Specific “performance” based standards that could be assessed by quantification of the relevant parameter		Average UK occurrence (Whay, et al, 2003)	Subjective assessment of reliability (Minimum 0 – Maximum 3)		Estimate of time taken	Subjective assessment of importance (Minimum 0 – Maximum 10)		Inclusion within final protocol plus reasons
	<i>Compendium of UK organic standards (2004)</i>	<i>Welfare of Farmed Animals (England) Schedule 1 (2000)</i>		Within observer	Between observers		Importance for farm profitability	Importance for the animal	
Thin cows (% of cows with less than Body condition score 2)	“ 4.1 Feed is intended to ensure quality production rather than maximising production, while meeting the nutritional requirements of the livestock at various stages of their development. “	“ 22. Animals shall be fed a wholesome diet which is appropriate to their age and species and which is fed to them in sufficient quantity to maintain them in good health, to satisfy their nutritional needs and to promote a positive state of well-being. “	17 %	2.5	2.5	6 minutes / sample of 20 cows	8	8.5	Yes – important for specific standards
Swollen hocks (% of cows with any swollen hocks)	“ 8.3.6 The housing must be provided with a comfortable, clean and dry laying/rest area “	“ 11. Materials used for the construction of accommodation shall not be harmful to them... “	33 %	2.5	2.5	6 minutes / sample of 20 cows	7.5	8.5	Yes – important for specific standards
Dirty udder (% of cows with any evidence of dirty udders)	“ 8.2.5 Housing, pens, equipment and utensils must be properly cleaned and disinfected to prevent cross-infection and the build-up of disease-carrying organisms. “	“ 4. Where any animals are kept in a building they shall be kept on, or have access at all times to, a lying area which either has well-maintained dry bedding or is well-drained. “	21 %	2.5	2.5	4 minutes / sample of 20 cows	7.5	4	Yes – important for specific standards
Mastitis (Number of recorded cases / 100 cows / year)	No specific standards but general requirements, such as ensuring “welfare of animals under their care”, meeting “biological and ethological needs”, recording medicinal treatments and providing appropriate care if ill or injured, may be relevant.		29 cases/100 cows/year	2.5	3	10 minutes to examine records	9	5	Yes – important for farm & quick to assess
Milk yield (Average annual milk production in litres)			7300 l	2.5	3	0.5 minutes for verbal question	9.5	3	No – minimal direct importance to animal
Locomotion scoring (% of cows with a detectable lameness)			22 %	1.5	1.5	3 hours / 100 cow herd	9	9.5	Yes – but may not be sufficient time to estimate whole herd prevalence
Dull coat (% of cows with a dull / non-shiny coat)			7 %	2.5	2	4 minutes / sample of 20 cows	4	4.5	No – minimal importance to farm and animal

2.2 Development of assessment system

The outcome of this evaluation process was that the steering group selected and approved a list of parameters for each species (Table 2).

Table 2 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	Ocular/nasal discharge	Fractures
Dirty udder	Head/neck/side lesion	Red mites/lice
Skin lesions	Genital and hindquarter lesions	Soiling of feathers
Swollen hocks	Tail lesion	Feather damage
Claw overgrowth	Bursas on limb	Feather loss
Flight distance	Time to return to observer	Trauma/injury
Rising restriction	Animal appears obviously	Limb problems/toes
Animal appears obviously	sick/dull	Flight distance
sick/dull	Signs of scouring	Animal appears obviously
Rumen bloated	Coughing/sneezing/dyspnoea	sick/dull
Eye abnormalities/nasal	Lameness	Thermal discomfort
discharge	Sunburn	Respiratory problems
Coughing	Skin irritation (mange, lice,	Poor quality of litter
Skin irritation (hairloss,	scratching)	Uneven grass wear in range
scratching,)	Abnormal oral behaviour (other	Evidence of calcium deposits in
Abraded/ulcerated hock	than straw, eat, drink)	eggs
Lameness	Playing (running/toy/straw)	
	Other (e.g. abscesses, udder,	
	shoulder sore, haematoma,	
	rectal prolepses)	

The format of the assessment system was carefully designed so that it was easy to use on a farm (e.g. include paper versions), could be consistently applied (e.g. full guidance notes) and that the assessment could integrate with various certification systems. Each parameter was included on either the animal observation or record data collection forms. The forms were formatted so that once printed they printed onto single A4 pages that could be used on a farm. An assessor manual was produced for each species (cattle, pigs and laying hens). The manual contained an appropriate definition of the parameter with pictures as required and a description of how to assess the parameter. Guidance notes also gave an indication of the appropriate number of animals that should be examined. The assessment forms included conversion of the observations and records into standard units, i.e. prevalence % observed and incidence no of cases / 100 animals / year. A separate "farmer significance" report gave a short explanation of the significance (both welfare and profitability) of the parameters.

All the protocols, assessment forms and examples of completed forms are available from the following website : <http://www.vetschool.bris.ac.uk/animalwelfare>.

2.3 Intervention guidelines

Initial intervention guidelines were also proposed for each parameter. These guidelines, which could be modified by a scheme, were designed to guide further investigations by the assessor. If a welfare parameter would exceed the pre-defined guideline, the assessor would be encouraged to further investigate the issue. Exceeding an intervention guideline would not necessarily mean that the farm was non-compliant with organic, farm assurance or legal standards. However, it would provide evidence that certain resources provided to the animal might not be adequate. Hence, further investigations would include both a detailed

assessment of compliance with the relevant “performance” based standard and an assessment of the management action being taken by the farm.

The guidelines used in the provisional cattle protocols were derived from another study (Whay *et al*, 2003). In this study 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 the intervention guideline. These intervention guidelines were slightly adapted for dairy cows and beef animals and were discussed and agreed during the steering group meetings. Intervention guidelines for pigs and laying hens were based on a series of visits to farms (Whay, personal observations) and relevant literature. It is important to note that different schemes might choose to set their own intervention guidelines in accordance with their own scheme goals. The authors would recommend that the guidelines are periodically reviewed in the light of assessment results.

2.4 Further investigations: Compliance checklist

For measures above the intervention guideline, the assessor would be encouraged to re-examine specific resources defined within a “compliance checklist”. This compliance checklist was generated from the Compendium of UK Organic Standards (DEFRA, 2004) and the Welfare of Farmed Animals (England) Regulations 2000 (HMSO, 2000). Compliance with specific standards is particularly important for those welfare measures that are associated with specific outcomes (e.g. body condition with diet or injuries with damaged fittings). A checklist gives a short series of relevant questions, such as “Does feed meet legal requirements ?” for each parameter that relate to a specific organic or legal requirement. If the assessor then identifies non-compliance with the specific standard, the assessor would be able to report a non-compliance in line with the certifier’s existing procedures. The results of the animal-based assessment would be included as part of the certification body’s normal reporting systems.

2.5 Further investigations: Health plan assessment

An assessment of action taken by the farmer in response to a particular concern is detailed on the “health plan form”. Again, for measures that are above the intervention guideline, the assessor would be asked to conduct further investigations. In particular, the assessor would examine the farmer’s awareness of the issue and whether appropriate investigations and actions have been taken. The health plan form also allows 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 would examine the prevention and treatment protocols present on the farm and examine the farm’s monitoring / recording systems. The assessor would also be encouraged to examine general aspects of farm management, such as use of advice and the regular review of management practices. If the assessor identified concerns with the routine management or a farm’s response to a particular welfare concern, the evidence collated in the health plan form would also be used to generate appropriate non-compliance. As with the standards compliance, this evidence would be included with the assessors normal reporting systems. An example of a completed health plan is shown in BWAP web site.

2.6 Reporting system

An optional, but potentially valuable, component of the system is the capability to benchmark results between farms. Providing information to the farmer of their own performance with respect to their peers is a powerful motivational tool that is an important benefit from welfare assessment (see later). The benchmarking system operates via a web-linked database of assessment results enabling establishment of “norms” for systems being examined. For each farm assessed a report would be generated in printable, web page or email version. The report would give the summary of the results and provide information on their performance with respect to their peers.

A model web-based database was developed for the first steering group meeting. This was further refined in line with the developed protocols. The web design was subcontracted to Dr. Neil Ambrose of Smart Tuna.

2.7 Pilot testing of the system

The parameters were pilot tested for each species on a total of 25 farms (6 beef, 13, dairy, 2 pig, 4 laying hen) in England, Scotland and Wales in order to assess the repeatability and feasibility of the assessments during normal inspections or independently from that. At the same time photographs were taken for defining the parameters in the assessment manual.

Table 3 : Summary of pilot testing

Species	Number of farms visited in :			<i>During organic CB inspections</i>	<i>Including data collection</i>	Total
	England	Wales	Scotland			
Dairy cows	4	2	0	3	4	6
Beef cattle	5	1	7	3	8	13
Pigs	2	0	0	0	1	2
Laying hens	2	1	1	0	2	4
Total	13	4	8	6	15	25

2.8 Repeatability exercise

A model for evaluation of the repeatability of parameters and/or the consistency of individual assessors was developed. After initial training (theoretical and practical) of 10 assessors in the morning and afternoon, all of them assessed the same 10 animals (dairy cows and finishing pigs) independently. The repeatability results were used to identify poor repeatability of some parameters and poor performance of individual assessors. Data were described as percentage of correct assessments compared to most common finding (mode) (Figure 1 and 2). Since the parameters are assessed as being either present or absent, a 50% agreement would be expected by random chance. For those parameters showing lower agreement, the definition and illustration of parameters within the guidance notes was improved.

Figure 1 The proportion of assessments agreeing with the mode (i.e. 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).

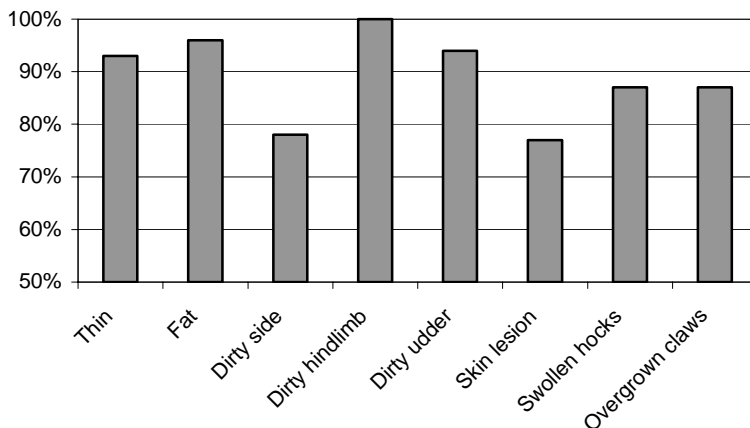
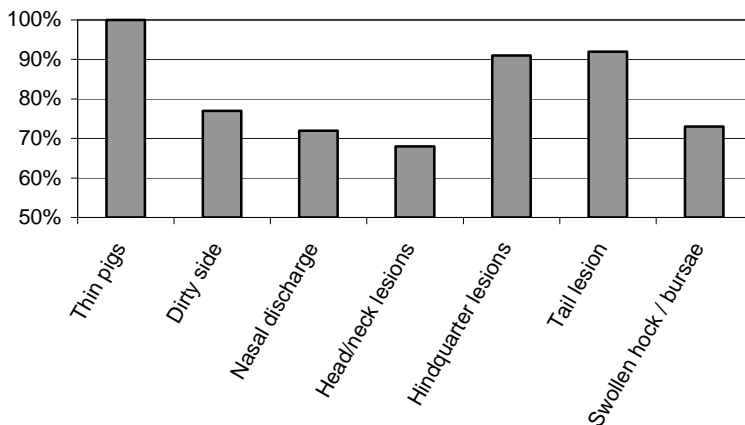


Figure 2 The proportion of assessments agreeing with the mode (i.e. most common) response for 7 parameters assessed in finishing pigs conducted on 10 pigs by 10 assessors (due to some missing data the number of assessments ranged between 96 and 100).



Further analysis of kappa values for individual assessors was used as an indicator of reduced repeatability by individual assessors. An example of this process is shown in table 4 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 ($p < 0.05$ & $\text{kappa} > 0.6$) agreement with the mode response. However the poor repeatability within the remaining assessors 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.

Table 4 : Repeatability for the parameter “Dirty side” observed on 10 dairy cattle by 10 assessors.

Assessor identification	Agreement with mode response	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 (\pm s.d.)	78 %(\pm 17%)	0.504 (\pm 0.252)	

3 Dissemination

3.1 Training

Training was conducted in 2 phases as planned in the original proposal and offered to all organic certification bodies.

Workshop 1: The objective of this workshop was to discuss the animal welfare assessment requirements within current legislation and codes of practice and introduce the principles of animal-based welfare assessment within certification systems. These workshops were held on three dates : 20th, 24th, and 25th March 2003. There were 27 participants (18 SA, 3 DEFRA, 2 DARD, 2 Biodynamic, 1 OF&G, 1 Independent).

Workshop 2: The second phase (one 5 day course) covered the detailed aspects of animal-based assessment and its application to a dairy farm, laying hen and pig unit). This workshop was held over 5 days (8th -12th December) and was delivered to 9 participants (4 SA, 2 OF&G, 1 SOPA, 1 QWFC, 1 OFF).

3.2 Regional meetings

Five regional meetings were organised to disseminate information about the project to organic farmers advisors and policy makers. In particular the meetings were designed to explain animal based assessment techniques and discuss its application to organic certification. The meetings were held at the following locations : Dorchester 25th February, Aberystwyth 10th March, Dumfries and Galloway 30th March, Perth 31st March and Langford 2nd April

3.3 Web-site

A web-site (<http://www.vetschool.bris.ac.uk/animalwelfare>) was constructed that contained the assessment protocol, guidance notes and assessment forms. It includes all the supporting information such as explanations for farmers, examples of completed forms and example of compliance checklists. This information is freely available to anybody. A registration system enables the University of Bristol to record the people and organisations that wish to use the protocols. This is slightly different format to the original intended dissemination mechanism (leaflets) but this was seen as a much more powerful tool.

3.4 Other communicated outputs

- Final Meeting of SEERAD study (26th February 2003, Edinburgh)
- ADAS Workshop on Health and welfare in organic beef and sheep production. (10th April 2003 Redesdale) "Frameworks for improving the welfare of organic stocks"
- 'The good life of calves in organic dairy herds' Workshop (8. -9th May, 2003 Foulum, Denmark)
- Organic farming magazine
- SAFO conference, 25th-27th March 2003, Witzenhausen, Germany

4 Discussion

4.1 Credibility of the assessment system

The development of the welfare assessment system was guided by the goal of producing a valid, reliable and feasible assessment tool that could be used within existing organic or conventional certification schemes. It is important to consider the extent to which the system achieves this objective.

Validity

This system aimed to be valid in as much as it should include welfare-relevant parameters. Since welfare can be considered to be influenced by many components (Webster et al., 2004), it would be inappropriate to consider each parameter as an "indicator" of an animal's overall welfare state. No single parameter or "indicator" is ever likely to reflect all of these components (Mason & Mendl, 1993). Furthermore the BWAP does not integrate different parameters into a single score. This avoids the inevitable value judgements in weighting different components (Spooler et al. 2003). For assessment of compliance with either certification or legislative requirements, the critical concept is one of compliance or not. The authors advocate that the level of a certain parameter is not used directly to determine compliance or not. Assessors using the BWAP would be encouraged to further investigate compliance with either the relevant resource standards or the management / health plan requirements once the measure exceeds the intervention guideline.

The parameters were based on those that experts considered to be valid welfare-relevant parameters (Whay et al., 2002). This approach is obviously likely to be limited as it relies upon a subjective interpretation using existing (and often limited) knowledge. However, it is important to recognise that this need not be the definitive list of parameters. The measures should be added to or amended as new

knowledge becomes available. Indeed research work into assessing the welfare significance of these parameters should be encouraged. In particular, the parameters tend to concentrate on welfare in terms of the lack of a certain condition such as presence of injuries or dirty coat condition rather than directly observing positive aspects. The facility to record subjective general impressions was considered by the steering group as a mechanism for assessors to include (and report back to farmers) comments on more general positive aspects such as integrity and mood. Further work in defining positive parameters should be encouraged.

It is important to recognise that animal-based parameters should not replace more precisely defined and valid resource standards. For example, this system does not directly assess water provision as more obvious methodology is to assess the availability of water rather than to construct an animal-based parameter of thirst. Similarly enabling behavioural choice may be better assessed by the diversity of the environment. However, the actual use of the elements of the diverse environment is an animal-based parameter that could be used to verify that the animals have been provided with an environment that they value.

Reliability

The reliability of parameters is an important consideration as most measures inevitably involve some degree of subjectivity. The most critical aspect of assessment is the degree of consistency of assessment between and within assessors. Some degree of assessment error is inevitable. The critical issues are how much error is acceptable for certification purposes and the extent to which the repeatability of such assessments is monitored throughout its application. One should consider the consequences of an assessment error. As previously discussed the authors would not advocate that a certain level of a parameter should constitute a non-compliance in itself rather it would instigate further investigation. Since further steps are required to demonstrate a non-compliance 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. However, it is important to strive for consistency for the credibility of the system so the authors would advocate some sort of monitoring exercise along the lines of the exercise presented in this paper (table 4). This should be instigated at training (until a minimum is achieved) and at regular (e.g. annual) intervals.

Feasibility

As already stated the system was designed to be feasible within existing certification system. So for example the system needs to operate both as paper-based on a farm and electronically for inclusion within a database. The duration of current certification visits 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. Obviously research exercises (e.g. evaluating novel husbandry systems) would not be limited by these constraints, as the assessments would be able to assess the animals in greater detail.

4.2 Incorporation of the assessment system into certification systems

This system could generate three key benefits (certification of individual farms, monitoring the effectiveness of certification bodies and to provide benchmarking information to individual farmers) when incorporated into part of a certification (or enforcement) system:

a) *Certification benefits.* The assessment system provides credible objective evidence for certification bodies or enforcement agencies wishing to assess compliance with animal welfare related standards or legislation. A formal assessment of outcomes is relevant when assessing "goal orientated" or "performance based" standards that define the provision such as diet or housing in terms of what is "adequate", "necessary", "sufficient" or "appropriate".

Inspectors for organic or conventional certification schemes can be very experienced and skilful stockpeople that have a significant knowledge of appropriate welfare standards. This system formalises this assessment and encourages them to report animal-based observations. Seppanen and Helenius, 2004

argued that organic inspectors should go beyond assessing compliance and had a valuable role to play in providing advice. However, it is important to recognise that assessors working within an accredited certification body that complies with the European standard, EN 45011, must not provide “prescriptive advice or consultancy as part of an evaluation” (EA, 1999). The author’s believe that a BWAP assessment does not constitute advice as it aims to identify problems (e.g. failure to comply with standards) rather than provide advice on potential farm specific husbandry solutions. This could and should be provided by existing advisory systems such as the attending veterinary surgeon. Furthermore failure to promote the recording and reporting of perceived/observed welfare problems to the certification bodies, may actually encourage advisory activities during inspection.

b) Monitoring / Surveillance tool benefits. The assessment tool can also be used on a sampling basis to monitor the effectiveness of the assurance process . For example third party / monitoring organisations could assess the overall effectiveness of the certification system in delivering an assurance on welfare to consumers. It could also be used as a management tool by certification bodies to improve their own performance by identifying strengths and weaknesses in existing procedures. The results from welfare assessment could also enable schemes to identify particular areas of concern, this would enables the standard setting bodies to modify and generate new standards for dealing with specific problems areas.

c) Benchmarking / Management benefits. By providing information on animal health and welfare performance with respect their peers, farmers and their advisors would be able to identify farm specific strengths and weaknesses. The attitudes and motivations of stockpersons and farmers have a critical influence on animal welfare. The benchmarking report is a mechanism for educating and encouraging staff with respect to welfare performance and it is a powerful motivation for improved welfare. For example, a recent assessment of cattle welfare (Whay et al., 2003) has shown that a mean of 22% of dairy cattle are lame at any one time. However, when asked how many cattle are lame the stockmen were only aware of 6%. Informing stockpersons on the actual levels and showing them how to assess lameness accurately is an essential first step for herd control measures. It is also established that benchmarking of welfare assessment results can have a very positive encouragement effect. (Huxley et al., 2003).

However, the extent to which each potential benefit is achieved depends upon the number and type of farms assessed (see table 5). For example if all farms are assessed by the certification body at initial and surveillance visits then the full benefits would be received. If members were assessed on their initial visit prior to joining a scheme then the results would not be useful for monitoring the “welfare performance” of members within a scheme. However, the certification and benchmarking benefits would still be of benefit to the new members. If farms were assessed after some form of risk assessment (e.g. after a history of certification problems) then the assessment would be useful for certification and benchmarking but of limited value for monitoring performance of the scheme. However, a random sample would generate information about the scheme “welfare performance” but it may not be equitable for it to be used as a certification tool as only sampled farms would be monitored in this way. Hence the 3 benefits (certification, monitoring and benchmarking) that would be generated would depend on which farms are assessed.

Table 5. : Potential benefits of Bristol Welfare Assurance Programme associated with different types of visit.

Visit type	Potential benefits (- minimal, + some, ++ medium, +++ maximum)		
	Certification tool	Monitoring tool	Benchmarking tool
	Results used to inform certification decisions	Results used to monitor (internally or externally) performance of certification body	Report identifying strengths and weaknesses given to farmer
All farms at initial & 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 the scheme	Limited to first visit only

Farms identified as higher risk e.g. 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

5 Conclusions

The aims of the Bristol Welfare Assurance Programme are to deliver :

- Standardised **assessment of welfare outcomes** that is valid (relevant to welfare), feasible (can be incorporated into existing assessments) and repeatable (generates consistent results).

Standardised **assessment of health and welfare planning** provides evidence of farm specific preventive and corrective action

This system achieves this using the following elements :

- Assessor **manual** providing guidance on assessment
- **Data collection** system that can be used on farm
- Optional web-based **data entry** system that produces a benchmark report
- **Farmer significance** manual providing an interpretation of the results for the farmer
- **Compliance checklist** outlining the links with welfare standards and legislation

This system can generate **three key benefits** when incorporated into a certification system:

- **Certification benefits.** The assessment system provides credible objective evidence for certification bodies or enforcement agencies wishing to assess compliance with animal welfare related standards or legislation. A formal assessment of outcomes is relevant when assessing "goal orientated" or "performance based" standards that define the provision such as diet or housing in terms of what is "adequate", "necessary", "sufficient" or "appropriate".
- **Monitoring / Surveillance tool benefits.** The assessment tool can also be used on a sampling basis to monitor the effectiveness of the assurance process. For example it can be used as a management tool by certification bodies to improve their own performance by identifying strengths and weaknesses in existing procedures. The data collected could also guide future development of the organic standards by quantifying the impact of organic standards & inspection on animal welfare.
- **Benchmarking / Management benefits.** By providing information on animal health and welfare performance with respect their peers, farmers and their advisors would be able to identify farm specific strengths and weaknesses.

The extent to which each potential benefit is achieved depends upon the level of application (i.e. the number and type of farms assessed). For example if all farms are assessed by the certification body at initial and surveillance visits then all 3 benefits would be received. Conversely if the assessment were used on a sampling basis by the certification body to monitor their own performance then the benchmarking would be limited to the sampled farms.

The certification and monitoring benefits of this system are the most important issues for ACOS, DEFRA & certification bodies. The benchmarking / management benefits are important for promoting the system to farmers. The system as proposed helps certification bodies and DEFRA collect **objective evidence** of compliance with **existing organic standards and welfare legislation**. This is line with DEFRA responsibilities as outlined in the Compendium of UK Organic standards Provision 9 paragraph 6 : "...DEFRA shall (a) ensure that the inspections carried out by the inspection body are objective [and] (b) verify the effectiveness of its inspection"(DEFRA, 2004). Furthermore, collation of evidence during a farm visit is an important element of compliance within EN 45011.

Most inspectors do already make some evaluation of the animals during visits to livestock units. For example a good assessor assessing compliance with adequacy of an organic diet would observe the animals and record a sample of body condition scores. This system, however, allows the assessor to also use other standardised assessments of welfare-relevant conditions such as injuries or lameness. The goal, however, of this system is to achieve a more **repeatable and transparent** assessment. In essence this system reflects how animal welfare standards could (and arguably should) have been evaluated in the past.

The system has been fully developed and is freely available on the web (www.vetschool.bris.ac.uk/animalwelfare) . Several organic certification bodies were positively involved in the development phase (see Steering committee recommendations) and Soil Association have starting using the system. After a meeting between University of Bristol, RSPCA & DEFRA it was decided to investigate the establishment of a Bristol Welfare Assessment User Club. This club would maintain the system and provide training and technical resources to users. Although the methodology and the forms will be freely available on the web potential users would be encouraged to contribute to & receive certain benefits from the Club.

6 Recommendations of the Steering Committee

These recommendations were formulated by the following individuals on the project Steering Committee (they do not necessarily reflect the views of their relevant organisations) :

Sarah Hardy	Soil Association	Chris Atkinson	SOPA	Christine Leeb	University of Bristol
Barbara Messenger	Soil Association	Katie Owen	Organic Food Federation	Becky Whay	University of Bristol
Stephen Clarkson	OF&G	Roger Unwin	DEFRA	David Main	University of Bristol
Marilyn James	QWFC	Malla Hovi	University of Reading		

Background

1. The Steering Committee (SC) recognises that an important goal of organic farming is to deliver high animal welfare standards. *“The development and management of organic livestock systems requires special care in nurturing positive health and vitality, ensuring the proper control of disease and the encouragement of positive animal welfare.”* (ACOS, 2003). **A transparent system that could demonstrate that these goals have been achieved would be highly desirable.**
2. The Bristol Welfare Assurance Programme (BWAP), which has been funded by DEFRA & RSPCA, has built upon the animal based welfare assessment protocols used for the evaluation of the RSPCA Freedom Food scheme (Whay et al, 2003). It has addressed a desire for **quantifiable animal welfare assessment** in organic certification and farming as highlighted by the recent SEERAD funded project (Hovi et al, 2003).
3. Animal welfare assessment schemes are also being developed in other European countries. For example, the “Animal Needs Index” is an additional legal requirement for organic farms in Austria. The importance of animal-based assessment schemes has been recognised by the recent approval of a €14 million EU funded integrated project, which will further develop such systems in Europe.
4. The critical components of the BWAP have been fully developed and pilot tested but the SC believe that **some additional resources will be required to fully implement the system.** In addition to the basic infrastructure (i.e. a user group, training resources and web database) there are resource (time) implications for certification bodies.

Relevance to Organic Certification Bodies

5. The SC believes that the BWAP is a **credible, repeatable and valid** assessment system that can be used by certification bodies to assess compliance with both animal welfare-related and health / management plan-related organic standards. The SC would like to see the development of protocols for sheep, broilers and calves.
6. Several organic CBs have demonstrated a **significant commitment** to the goals of this project by investing their time into the project by attending meetings, training courses and organising regional meetings for farmers.

Implementation of BWAP

7. The SC commends the approach to ACOS and recommends they seek to ensure the application of the system to organic certification and the **long term goal** that the assessment system be **fully implemented** by all certification bodies for both initial and surveillance inspections.
8. The SC recognise, however, that implementation of this system should be in a **staged approach** that neither reduces the competitiveness of individual certification bodies nor provides a regulatory burden for UK organic producers. The staged implementation of the assessment system should ensure that increasing levels of application (i.e. types of farms assessed) are applied by **all certification bodies at the same time.**

Maximising benefits from the system

9. ACOS, DEFRA & the organic farming bodies have a responsibility to advocate the **health and productivity benefits** of welfare assessment and benchmarking to farmers. In particular the assessment system should be incorporated into advisory visits during the conversion process.
10. The SC recognise that this evidence based system can be used to generate **marketing claims** concerning high animal welfare standards on UK organic farms which ACOS and other organic bodies should use to promote UK organic farming once the system has been successfully implemented.
11. In addition to certification and management benefits the SC believe that DEFRA could also use the system as a **measurable outcome of a public good** that might be relevant for future aid / single farm payment schemes.

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