Welfare assessment in extensive animal production systems: 
challenges and opportunities

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Abstract

The welfare of animals in extensive systems has received little attention despite significant welfare challenges in these environments. Additionally, recent reform of Common Agricultural Policy payments in the EU have put increasing financial emphasis on farmers to attain improved levels of animal welfare, although suitable methodologies for assessing animal welfare are lacking. Assessment of welfare in extensive systems frequently involves assessing compliance with buildings and space requirements, as well as behavioural observations of animals in their home pens and monitoring of health records. In extensive systems, however, many of these measures are inappropriate or impossible. Environments are often heterogeneous, animals may be difficult to observe, individuals may not be identifiable and health records may be limited or completely lacking. The expression of fear by extensive animals, which rarely come into close contact with humans, often limits the value and practicality of behavioural observations as welfare indicators. Currently, welfare audits of extensive farms rely greatly on mortality and morbidity records to determine welfare status. Whilst these measures are important, the strong health monitoring bias does not adequately allow an interpretation of the emotional experiences of extensive animals. We suggest that developing methodologies based on assessing key features of the environment, such as handling facilities, assessment of the skills, knowledge and planning of the stockperson, and assessing the animal at key points in the production cycle when they are gathered may allow a workable methodology for assessing animal welfare to be developed for extensive systems.

Keywords: animal welfare, extensive, fear, health, human-animal interactions, welfare assessment

Introduction

Techniques for assessing animal welfare have almost exclusively been developed for use under intensive conditions, whilst extensive conditions (defined here as those where the animal receives infrequent handling or close contact with humans) have largely been ignored. In addition to the procedural challenges imposed by an extensive environment and the behaviour of the animals, there are three historically important perspectives that have contributed to this oversight. Firstly, the lack of behavioural restriction faced by extensively managed animals is, at least in the minds of the general public, an important animal welfare benefit (Matthews 1996). Secondly, there has been a perception that the challenges extensively managed animals face are natural (Appleby 1996), and therefore not part of our responsibility, and, thirdly, that the animals have evolved to cope with these challenges. Barnard and Hurst (1996) argue that the severity of a welfare challenge is determined by how similar the current environment is to that in which the animals evolved and for which their goals and mechanisms for achieving these goals are adapted. In this context, the match between the animals and their environment is of importance. This raises two important questions: 1) whether the modern extensive farming environment is indeed the same as that in which the animals evolved, and 2) to what extent domestication and selection for production traits has inadvertently affected the adaptation of the animals themselves to their evolved environment. For example, selection for multiple births in ewes has increased nutritional demands during pregnancy resulting in negative energy balance, especially in hill breeds on unimproved pasture. This illustrates how changes in the demands of an animal can affect the environment’s ability to satisfy those demands, even without substantial changes in the environment itself. Despite the perception of high welfare standards in modern extensive systems, undoubtedly both the environments and animals have been changed by human activity and at present we have poorly developed approaches to assess the welfare implications of these changes.

Here we highlight why the ability to sensitively assess animal welfare under extensive conditions, beyond simply monitoring the final outcomes of severe challenge such as mortality, is becoming increasingly important. The barriers that hinder extrapolation of welfare assessment methodologies from intensive to extensive environments are also considered. There are, however, windows during which we...
can assess the welfare of extensively managed animals and we suggest where effort should be directed to achieve a reasonably holistic impression of an animal’s welfare.

The need for welfare assessment within a changing industry

For many years there has been a need for practical on-farm welfare assessment tools specifically designed for extensive systems, both as a decision support framework to inform management decisions with consequences for welfare, and to understand the primary causes of existing welfare problems. The scarcity of sensitive and validated welfare assessment approaches for extensively managed livestock is particularly an issue now as extensive agricultural systems throughout Europe are adapting in response to Common Agricultural Policy (CAP) reform. This reform has seen the de-coupling of subsidy payments from animal production output, resulting in the granting of a Single Farm Payment (SFP) which is unlinked to current productivity. Major changes in EU extensive farming environments are expected (European Commission 2003; Food and Agriculture Policy Research Institute 2005) with implications for animal welfare. Predicted responses include the division of extensive systems into those whose goals are cost reduction and increased productivity, and those where conventional animal production will be supplemented by income from other sources, including alternative uses of the land and animals (Waterhouse 1996). In the UK, major impacts on the animals could result from reduced labour input, selection for easy-care traits, changes in breed structure and, where marginal pasture land of low quality has to be maintained in agricultural condition for receipt of the SFP, animals may be used simply as environmental grazers. Each of these eventualities has potential welfare implications, and it is important that we can predict and monitor them.

From the perspective of the producer, information is required to establish the wider consequences of management decisions made in response to CAP reform, whilst receipt of the SFP requires cross-compliance with EU legislation on animal welfare. Meanwhile, policy-makers currently have no sensitive mechanism to police cross-compliance beyond the presence or absence of high mortality, significant health problems or clear cases of deliberate cruelty or neglect. In the medium term, a mechanism is also needed to assess the effectiveness of health and welfare strategies adopted under Pillar 2 funding options, to allow benchmarking of welfare across systems and time and to predict the welfare implications of future policy interventions (Winter et al 1998).

Constraints on the use of assessment approaches developed for intensive systems

Environmental constraints

Intensive systems have closely controlled environments to maximise aspects of animal productivity. These beneficial environmental conditions have typically been adopted across regions, thereby increasing environmental homo-
Table 1  Environmental, contingency planning and stockmanship criteria with potential value as indicators of risks to welfare in extensive conditions.

<table>
<thead>
<tr>
<th>Environment</th>
<th>Handling facilities</th>
<th>Suitability of flooring</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Existence of protrusions</td>
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<tr>
<td>Winter housing</td>
<td>Adequacy of ventilation</td>
<td>Gradient of slopes</td>
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<tr>
<td>Contingencies</td>
<td>Health</td>
<td>Presence of a health plan</td>
</tr>
<tr>
<td>Extreme weather</td>
<td>Availability of medication</td>
<td>Specific health knowledge</td>
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<tr>
<td>Stockmanship</td>
<td>Handling</td>
<td>Use of aversive handling techniques</td>
</tr>
<tr>
<td></td>
<td>Inspection</td>
<td>Frequency and quality of inspection</td>
</tr>
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<td></td>
<td>Attitude</td>
<td>Empathy with animals</td>
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</tbody>
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Welfare assessment in extensive systems: opportunities

Assessment of risks to welfare through environmental and management auditing of resources and animal-based measures of welfare output are both required to maximise the utility of a welfare assessment system (Webster et al 2004).

Opportunities for environmental and management auditing

Sampling of the full range of micro-environments available on an extensive farm is impractical and open to seasonal fluctuations, although a gross assessment of the suitability of the genotype for the typical sward composition may be sufficient to identify mismatches between breed choice and pasture quality. Managing high fecundity breeds on pasture of poor quality for example may be expected to result in subsequent negative energy balance during lactation and associated risks to health. Greater emphasis should be placed on auditing the availability, use and success of contingencies that can prevent suffering and stockmanship, than auditing the environment itself. Specific aspects of the environment, such as the handling facilities and winter housing, may be suitable for auditing using methodologies developed for intensive conditions. Table 1 lists some aspects of the environment and management that could be suitable for auditing in extensive conditions.

Opportunities for animal-based assessment of welfare outcomes

High quality health records do not exist on many extensive farms. Although some producers may opt-in to national health monitoring schemes which are emerging since CAP reform, for many sheep producers, it will remain difficult to accurately estimate even mortality rates in their flocks. For cattle, health records of acceptable quality often do exist. Additionally, there are windows of opportunity when livestock, including sheep, are confined and handled and when close observation is possible. These windows coincide with predetermined husbandry tasks, often involving gathering the whole herd or flock, or may take place during periods of housing, such as overwintering or during parturition. At these periods, it ought to be possible to obtain snapshots of the animal’s health status, body condition and experience of injuries and to estimate their fearfulness of handling. Tasks requiring individual handling, or the handling of small groups, offer the advantage that animals experiencing welfare challenges may be more readily identified than when hidden amongst a large number of group members. By concentrating observations of animal-based measures during specific handling tasks, the welfare of the animals for large periods when pastured will remain unobserved. However, by selecting indicators of chronic welfare problems, such as poor condition, an estimation of the welfare challenges experienced since the last handling episode can be inferred; a suggestion also made by Webster et al (2004) to maximise the information gained during quality assurance inspections on intensive farms. Furthermore, assessing welfare at critical times, such as parturition, will concentrate observations on those periods when many welfare challenges can arise. Observations during periods of confinement offer opportunities for the use of welfare assessment approaches designed for intensive conditions, although validation in many cases will be required (Appleby 1996). Where mandatory health inspections are performed by state veterinarians for the presence of zoonoses, these handling periods could also provide an opportunity for a more structured independent audit of on-farm welfare.

Conclusions and animal welfare implications

Although the welfare of extensively managed animals has largely been ignored, the perception that welfare in these systems is good is not based on scientific assessment. Additionally, there are pressing reasons why scientifically validated methods of welfare assessment are required. Simple extrapolation of methodologies developed in intensive systems to extensive conditions is constrained by the heterogeneous extensive environment, the lack of close contact between animals and their carers (leading to problems of identification, inspection frequency, fear and
issues with treating individuals), and the difficulties of determining welfare problems from animal observation alone. However, there are opportunities to assess aspects of the environment, and stockmanship, particularly evidence of planning for contingencies, as well as opportunities to observe the animals themselves during times of predetermined husbandry procedures. Effort directed at these opportunities could allow the development of a more holistic approach to welfare assessment of extensive animals than currently available.

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References
Boivin X, Garel JP, Mante A and Le Neindre P 1998 Beef calves react differently to different handlers according to the test situation and their previous interactions with their caretakers. Applied Animal Behaviour Science 55: 245-257
Dwyer CM 2004 How has the risk of predation shaped the behavioural responses of sheep to fear and distress? Animal Welfare 13: 269-281