On farm monitoring of animal welfare

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Outline

• Department of Animal Environment and Health, Section of Animal Welfare, SLU
• EU project ‘Welfare Quality’
• Animal welfare inspection in Sweden

Please interrupt and ask questions
EDUCATION
Ethology and Animal Welfare (3 yr), Veterinary Nursing (2 yr). Courses for veterinary and agriculture students at SLU. Further education courses for state animal welfare inspectors.
Research areas in the Section of Animal Welfare

• Behavioural problems
  – Feather pecking and cannibalism in layers
  – Tailbiting in pigs

• Assessment and monitoring of animal welfare
  – Welfare Quality
  – Swedish Milk
  – Inspection methodology (extensive beef production, transport, dogs left alone, inspection reports)

• Emotions in animals
  – Indicators of positive emotions (dogs and poultry)
  – Fear reactions (mainly horses)

• Effects of early experience on later behaviour
  – Mainly horses and poultry
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Integration of animal welfare in the food quality chain: from public concern to improved welfare and transparent quality

The ultimate goals of ‘Welfare Quality’ are to:
1) link animal husbandry practices to informed animal product consumption and
2) to develop innovative practical strategies to improve welfare.

Project duration May 2004 – April 2009.
Coordinator Harry Blokhuis

www.welfarequality.net
Consists of 9 sub-projects of which the 4 main ones are:

1. Consumers, retailers and producers concerns and requirements for animal welfare and welfare friendly products
2. To develop robust on-farm welfare monitoring and information systems for selected farm animal species
3. To define integrated, knowledge-based, practicable species-specific strategies to improve farm animal welfare
4. To implement a welfare monitoring and information system and the welfare improvement strategies developed

Other sub projects involve science society dialog, training and mobility, knowledge transfer etc
Developing a monitoring system to assess welfare quality in cattle, pigs and chickens
Sub project 2
Overview of structure of sub project 2

- **WP 2.1** Definition of a framework for developing monitoring system (0-6 months)
- **WP 2.2** Development of prototype monitoring systems (4-32 months)
- **WP 2.3** Design of methods for multicriteria evaluation of animal welfare (4-52 months)
- **WP 2.4** Definition of final monitoring systems (33-48 months)

On farm, during transport and at slaughter
What is welfare in ‘Welfare Quality’ and how are we assessing it?

• Our meaning of the word welfare has to be credible to a wide range of stakeholders
  Reflecting ‘their’ view of welfare as well as being based on scientific knowledge of animal welfare

• Welfare is multidimensional
  But we can identify certain areas of concern
Some scientific and operational definitions of welfare

• An animal’s welfare is its state as regards to its attempts to cope with its environment (Broom 1986)

• Welfare depends on how the animal feels. (Duncan 1993)

• Five Freedoms
  1. Freedom from Hunger and Thirst
  2. Freedom from Discomfort
  3. Freedom from Pain, Injury or Disease
  4. Freedom to Express Normal Behaviour
  5. Freedom from Fear and Distress
     (Farm Animal Welfare Council 1992)
Overview of structure

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On farm, during transport and at slaughter
Identification of Measures

Identification of Welfare criteria

Are all areas of concern covered by these criteria?
Do we have measures for all criteria?
Are these measures robust and feasible?

Monitoring system

Welfare assessment
Feedback to farmer
Identifying welfare criteria

Based on literature and discussions among scientists, 12 areas of concern were identified, which can be grouped into 4 questions:

- Are the animals properly fed and supplied with water?
- Are the animals properly housed?
- Are the animals healthy?
- Does the behaviour of the animals reflect optimised emotional states?
<table>
<thead>
<tr>
<th>Principle</th>
<th>Welfare criteria</th>
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</thead>
<tbody>
<tr>
<td>Good feeding</td>
<td>1. Absence of prolonged hunger</td>
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<tr>
<td></td>
<td>2. Absence of prolonged thirst</td>
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<tr>
<td>Good housing</td>
<td>3. Comfort around resting</td>
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<td></td>
<td>4. Thermal comfort</td>
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<td></td>
<td>5. Ease of Movement</td>
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<tr>
<td>Good health</td>
<td>6. Absence of injuries</td>
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<td></td>
<td>7. Absence of disease</td>
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<tr>
<td></td>
<td>8. Absence of pain induced by management procedures</td>
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<tr>
<td>Appropriate behaviour</td>
<td>9. Expression of social behaviours</td>
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<td></td>
<td>10. Expression of other behaviours</td>
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<td></td>
<td>11. Good human-animal relationship</td>
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<td>12. Absence of general fear</td>
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</table>
Animal-based measures

- Most valid and most effective to focus on the animal rather than on the environment or management.
- Health and behaviour is the ‘output’ for all the ‘inputs’ on farm to slaughter.
- Resource- and management-based measures can be alternatives e.g. lameness
<table>
<thead>
<tr>
<th>Principle</th>
<th>Welfare criteria</th>
<th>Examples of potential measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good feeding</td>
<td>1. Absence of prolonged hunger</td>
<td>Body condition score</td>
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<tr>
<td></td>
<td>2. Absence of prolonged thirst</td>
<td>Presence of drinker and routine for checking function</td>
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<tr>
<td>Good housing</td>
<td>3. Comfort around resting</td>
<td>Frequencies of different lying positions, standing up and lying down behaviour</td>
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<td></td>
<td>4. Thermal comfort</td>
<td>Panting, shivering</td>
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<td></td>
<td>5. Ease of Movement</td>
<td>Slipping or falling</td>
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<tr>
<td>Good health</td>
<td>6. Absence of injuries</td>
<td>Clinical scoring if integument, carcass damage, lameness</td>
</tr>
<tr>
<td></td>
<td>7. Absence of diseases</td>
<td>Enteric problems, downgrades at slaughter</td>
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<td></td>
<td>8. Absence of pain induced by management procedures</td>
<td>Evidence of routine mutilations such as tail docking, dehorning, stunning effectiveness at slaughter</td>
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<tr>
<td>Appropriate behaviour</td>
<td>9. Expression of social behaviours</td>
<td>Social licking, aggression</td>
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<tr>
<td></td>
<td>10. Expression of other behaviours</td>
<td>Play, abnormal behaviour</td>
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<td></td>
<td>11. Good human-animal relationship</td>
<td>Approach and/or avoidance tests</td>
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<td></td>
<td>12. Absence of general fear</td>
<td>Novel object test</td>
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</tbody>
</table>
Identification of measures

• Based on literature and discussions among scientists identified 50+ potential animal-based measures
• For recording on farm to slaughter for the different species
  Dairy and beef cattle, veal calves, fattening pigs, sows and piglets, broiler chickens and laying hens.
• Decided where further work needed
to evaluate validity, reliability and feasibility.
• Research and development now in progress to evaluate these potential measures
• Also identifying potential resource and management-based measures
Animal Based Measures for dairy, beef and veal calves

- Clinical scoring (injuries, external parasites, body condition and cleanliness), lameness, health, behaviour around resting (e.g. time to lie down/get up, frequencies of different lying positions), agonistic, injurious and abnormal behaviour, qualitative measures of emotional state, indicators of positive behaviour (e.g. play, social licking, caudal licking), fear related behaviours (to caretaker or general fear)

- Dead/dying on arrival, slipping or falling, resting during lairage, recovery time from panting, tremoring, stunning effectiveness carcass damage, slaughterhouse downgrades and meat quality
Animal Based Measures for sows, piglets and fattening pigs

- Clinical scoring (wounds on body, tailbiting, vulva lesion, body condition), health (respiratory, enteric, neurological, reproductive, general debility), behaviour around resting (getting up and lying down), lameness, thermoregulatory behaviour, abnormal behaviour (stereotypies, belly nosing), qualitative methods for emotional state, new indicators of positive emotions (e.g. play), fear behaviours indicating quality of human animal interaction and also of general fear, vocalisations.

- Dead on arrival, acute phase proteins, meat quality and health status at slaughter. Slipping during unloading and moving to lairage or to stunning, stunning effectiveness, indicators of fear or pain during loading and unloading, gut content as measure of food deprivation before slaughter.
Animal Based Measures for Poultry

- Clinical scoring (wounds, plumage, cleanliness, breast blisters, foot condition, broken bones), lameness, health status (skin or feather pathologies, respiratory, enteric, neuropathological and musculoskeletal, metabolic), fear (general or in human-animal interaction), vocalisation, qualitative methods for assessing emotional states, dehydration, positive emotions (play and anticipation)
- Dead on arrival, vocalisations, pre-stunning shock, stun quality, carcass damage and quality
Selecting the best measures from the lists of potential measures

• Some potential measures will not satisfy our requirements regarding reliability and feasibility when they are evaluated and it may be we can not even find valid measures in some areas.
• Some measures overlap in the information they provide e.g. comfort around resting, has many potential measures (related to time, position, location).
• Some measures can be recorded on farm or at slaughter, select the most feasible e.g. foot pad scoring in broilers.
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We are doing this now
Testing the monitoring system

Data collection
  Full system
  ↓
Data analysis
  Delete measures that do not give additional information
  Select most feasible measure
  ↓
Final System
  Data collected on farm goes back to farmer – basis for advice and implementation strategies
  ↓
Overall welfare assessment
  Bronze Silver Gold
  * ** *** ***** ******
  ↓
Final scheme with balance between sensitivity and complexity
Constructing an overall assessment

- Measures
- Criteria
- Welfare principles

Comprehensive assessment

- Measures in the same criterion are combined to give a score on a value scale from good to poor e.g. all measures of injuries combined.
- This score is combined with others in the same principle e.g. injuries, diseases, pain from management procedures to give an overall health score - from good to poor.
- The overall score for health is combined with the score for feeding, housing and behaviour to give an overall assessment.
- Everything put on the scale from good to poor so that they can be combined, but since on areas can not fully compensate (good health can not compensate for poor housing, non additive measures will be used)
Checking Acceptability

• For a wide range of stakeholders
  – Advisory Committee
  – Focus groups
  – WQ conference (Nov 2005)

• The monitoring scheme is a **tool** that allows us to quantify different aspects of welfare

• Although some decisions are being made the **final** decision of what is acceptable or not is going to be made by stakeholders
People in Sub project 2

- Björn Forkman
- Christopher Winkler, Antonio Velarde, Cecile Arnould
Other on farm monitoring projects in Sweden

• Swedish milk – linking to health and economy data bases (Sweden and Denmark)
• Developing new animal based measures especially those indicative of positive welfare states (play, vocalisation etc)
• Inspection methodology
  – using behaviour to promote inspection in extensively kept animals (training animals, stockmanship skills)
  – Analysis of state animal welfare inspectors reports
  – Training inspectors in animal based methods
Animal Welfare Inspectors

• Each community in Sweden has the responsibility to inspect all animal ‘units’ in their community.
• Requirements for changes can be legally binding, result in fines, ban on keeping animals etc.
• The dilemma - owners complain about ‘millimetre’ legislation over ‘common sense’ legislation and support the move to animal based measures. But animal based measures are considered to be difficult to standardise and to use in court.
• Animal welfare inspectors inspect ALL situation, not only farms. Can we use on farm monitoring techniques for pets?