From animal welfare assessment to welfare improvement

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Background

- Clear evidence for substantial welfare problems, e.g. production diseases, behaviour restrictions, poor human-animal relationship, painful procedures etc.

- Close link of animal health and welfare with productivity and farm economics (e.g. lameness in dairy cows)
Why on-farm welfare assessment?

Farmer/vet interest
- Monitoring
- Decision support

Producer group interest
- Farm assurance
- Strategic development of the industry
- Communication to the public

Societal and consumer interest
- Food quality, sustainability
What is animal welfare and how to measure it

Key issues for successful improvement strategies

Examples/potential ways forward
Concepts of animal welfare

**Biological functioning**
(Broom 1996)

- ‘fitness’
- e.g. subclinical disorders

**Mental state**
(Duncan 1996)

- e.g. clinical diseases, lesions, wounds

Broom (1996) defines ‘fitness’ as subclinical disorders, whereas Duncan (1996) focuses on mental states, including emotions such as apathy, fear, and positive affective states.
Concepts of animal welfare

- Biological functioning (Broom 1996)
- Mental state (Duncan 1996)

'Naturalness' (Fraser 2003)

ability to perform normal behaviour repertoire
Measure all aspects

Five Freedoms
- From hunger and thirst
- From discomfort
- From pain, injury and disease
- From fear and distress
- To perform normal behaviour

12 Welfare Quality® Criteria
- Absence of prolonged hunger
- Absence of prolonged thirst
- Comfort around resting
- Thermal comfort
- Ease of movement
- Absence of injuries
- Absence of disease
- Absence of pain …
- Expression of social behaviours
- Expression of other behaviours
- Good human-animal relationship
- Positive emotional state
Animal-based vs. resource-based
# Animal-based measures in Austrian farms with similar husbandry system

N=35; Upper Austria, cubicle loose housing, > 24 cows

<table>
<thead>
<tr>
<th></th>
<th>% very lean animals</th>
<th>% lame</th>
<th>% hock lesions</th>
<th>mastitis incidence</th>
<th>agonistic interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>4 %</td>
<td>39 %</td>
<td>8 %</td>
<td>11 %</td>
<td>1.3/cow*h</td>
</tr>
<tr>
<td>Min-Max</td>
<td>0-9</td>
<td>13-71</td>
<td>0-50</td>
<td>0-40</td>
<td>0.1-4.7</td>
</tr>
</tbody>
</table>

Tremetsberger, submitted

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C. Winckler I ASD 2017 I 9
Comprehensive on-farm welfare assessment systems

- comprehensive, multidimensional protocols
- mainly animal-based measures, combined with few resource-based measures
12 criteria of animal welfare in WQ®

Good feeding
- Hunger
- Thirst
- Expressing social behaviour
- Expressing other behaviour

Good housing
- Thermal comfort
- Comfort around resting
- Ease of movement
- No painful management procedures
- Good human-animal relationship
- Positive emotional state
- No disease
- No injuries

Expressing other behaviour

No disease

No painful management procedures

Good health

No injuries

Good human-animal relationship

Expressing social behaviour

Positive emotional state

Ease of movement

Comfort around resting

Thermal comfort

Hunger

Thirst

Good feeding

Good housing

Appropriate behaviour

Good health

Expressing other behaviour

Expressing social behaviour

Good human-animal relationship

Positive emotional state

No disease

No injuries

Good feeding

Good housing

Appropriate behaviour

Good health
Good health

- Thirst
- Thermal comfort
- Hunger
- Comfort around

Expressing social behaviour
- Expressing other behaviour
- Good human-animal relationship
- No injuries
- Positive emotional state

Score Description
0 Not lame
Timing of steps and weight-bearing equal on all four feet.
2 Lame
Irregular foot fall – uneven temporal rhythm between hoof beats, weight not borne for equal time on each of the four feet. This creates a definite limp and the affected limb is immediately obvious. A favoured limb will move more quickly than the lame limb.
3 Severely lame
Strong reluctance to bear weight on one limb, or more than one limb affected.

- Lameness
- Skin alterations

No disease
- No injuries

Good health

- Hunger
- Thermal comfort
- Comfort around
Appropriate behaviour

- Number of agonistic behaviours during 2 hours (i.e. head butts, displacements, fighting, chasing, chasing-up)

Expressing social behaviour

Expressing other behaviour

Good human-animal relationship

Positive emotional state

No injuries
Appropriate behaviour

- Avoidance distance toward an unknown assessor at the feeding rack

Thirst

- Expressing social behaviour

Hunger

- Expressing other behaviour

Thermal comfort

- Good human-animal relationship

Comfort around

- Positive emotional state

No disease

- No injuries

Ease of movement

- No painful management procedures

Good

- Appropriate behaviour
Assessment protocols in practice

AssureWel
Improving farm animal welfare through welfare outcome assessment

www.assurewel.org
# AssureWel protocol for dairy cattle

**Measures**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mobility/lameness</td>
</tr>
<tr>
<td>2.</td>
<td>Body condition</td>
</tr>
<tr>
<td>3.</td>
<td>Cleanliness</td>
</tr>
<tr>
<td>4.</td>
<td>Hair loss, lesions</td>
</tr>
<tr>
<td>5.</td>
<td>Swellings</td>
</tr>
<tr>
<td>6.</td>
<td>Broken tails</td>
</tr>
<tr>
<td>7.</td>
<td>Response to stockperson</td>
</tr>
<tr>
<td>8.</td>
<td>Cows needing further care</td>
</tr>
<tr>
<td>9.</td>
<td>Mastitis</td>
</tr>
<tr>
<td>10.</td>
<td>Calf/heifer survivability</td>
</tr>
<tr>
<td>11.</td>
<td>Cull and casualty cows</td>
</tr>
</tbody>
</table>
Welfare improvement?
Lameness: still a problem irrespective of farming system

<table>
<thead>
<tr>
<th>Country</th>
<th>Farm type</th>
<th>n</th>
<th>Prevalence</th>
<th>Year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>conv.</td>
<td>53</td>
<td>22%</td>
<td>2001</td>
<td>Whay et al.</td>
</tr>
<tr>
<td>D</td>
<td>organic</td>
<td>50</td>
<td>18%</td>
<td>2004</td>
<td>Brinkmann &amp; Winckler</td>
</tr>
<tr>
<td>A</td>
<td>conv./org.</td>
<td>80</td>
<td>36%</td>
<td>2004</td>
<td>Mülleder &amp; Waiblinger</td>
</tr>
<tr>
<td>A</td>
<td>conv.</td>
<td>30</td>
<td>31%</td>
<td>2008</td>
<td>Dippel et al.</td>
</tr>
<tr>
<td>A</td>
<td>organic</td>
<td>40</td>
<td>26%</td>
<td>2011</td>
<td>Gratzer et al.</td>
</tr>
</tbody>
</table>
The journey to welfare improvement

Assessment/evaluation

Identification of risk factors for welfare problems

Interventions focusing on welfare problems

Whay, 2005
Multifactorial problem

- Housing
- Genetics
- Weather

Lameness

- Management
- Nutrition
- Hygiene
Lameness intervention – an easy job?

Considerable body of scientific knowledge on aetiology etc., but…

- Situation hasn’t improved during the last decades
- Only few intervention studies (published?)
- Most studies not successful (e.g. Bell et al. 2009, Barker et al. 2012) due to lack of implementation
Taking action for welfare improvement

Implementation = translating knowledge into action by inducing change in behaviour of humans through

- **Education** (awareness of problems and potential solutions)
- **Encouragement**
- **Enforcement**

-> Herd health and welfare planning

Main & Whay 2009
Herd health and welfare planning

Formal assessment of welfare state

Analysis of outcomes

Feedback, report of results obtained from the farm

Advice (targeted, farm-specific), selection of appropriate measures

Constant review and adaptation

Tremetsberger & Winckler 2015
**Key issues in AHW planning**

- Sound assessment of baseline situation
- Balanced report including benchmarking

<table>
<thead>
<tr>
<th></th>
<th>Mittlerer Wert</th>
<th>eigener Betrieb</th>
<th>Alle 124 Betriebe (aufgeteilt in Fünftel)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>alle Länder (124 Betriebe)</td>
<td>Österreich (32 Betriebe)</td>
<td>eigener Betrieb</td>
</tr>
<tr>
<td>Anzahl Milchkühe</td>
<td>33</td>
<td>22</td>
<td>32</td>
</tr>
<tr>
<td>Milchleistung (kg/Kuh/Jahr)</td>
<td>6017</td>
<td>6278</td>
<td>6900</td>
</tr>
<tr>
<td>Dauer Weidegang (Stunden/Jahr)</td>
<td>2180</td>
<td>1723</td>
<td>1620</td>
</tr>
</tbody>
</table>

- sehr dünne Kühe (BCS < 2) (%)  
  - alle Länder: 6  
  - Österreich: 4  
  - eigener Betrieb: 0  
  - unter 20%: 0  
  - mittlere 20%: 0  
  - höchste 20%: 0

- sehr fette Kühe (BCS > 4) (%)  
  - alle Länder: 7  
  - Österreich: 5  
  - eigener Betrieb: 21  
  - unter 20%: 0  
  - mittlere 20%: 0  
  - höchste 20%: 0

- Liegen außerhalb der Liegefläche (%)  
  - alle Länder: 0  
  - Österreich: 0  
  - eigener Betrieb: 25  
  - unter 20%: 0  
  - mittlere 20%: 0  
  - höchste 20%: 0

- Kollision mit Liegebox beim Abliegen (%)  
  - alle Länder: 17  
  - Österreich: 33  
  - eigener Betrieb: 75  
  - unter 20%: 0  
  - mittlere 20%: 0  
  - höchste 20%: 0

- Erschwertes Aufstehen (%)  
  - alle Länder: 22  
  - Österreich: 25  
  - eigener Betrieb: 25  
  - unter 20%: 0  
  - mittlere 20%: 0  
  - höchste 20%: 0

- Abnormales Aufstehen (%)  
  - alle Länder: 0  
  - Österreich: 0  
  - eigener Betrieb: 0  
  - unter 20%: 0  
  - mittlere 20%: 0  
  - höchste 20%: 0

- verschmutztes unteres Hinterbein (%) (inkl. Sprunggelenk)  
  - alle Länder: 63  
  - Österreich: 63  
  - eigener Betrieb: 93  
  - unter 20%: 0  
  - mittlere 20%: 16  
  - höchste 20%: 48

- verschmutzte Hinterhand (%)  
  - alle Länder: 38  
  - Österreich: 33  
  - eigener Betrieb: 32  
  - unter 20%: 0  
  - mittlere 20%: 16  
  - höchste 20%: 32

- verschmutztes Euter (ohne Zitzen) (%)  
  - alle Länder: 40  
  - Österreich: 50  
  - eigener Betrieb: 57  
  - unter 20%: 0  
  - mittlere 20%: 16  
  - höchste 20%: 33

- verschmutzte Zitzen (%)  
  - alle Länder: 25  
  - Österreich: 34  
  - eigener Betrieb: 54  
  - unter 20%: 0  
  - mittlere 20%: 7  
  - höchste 20%: 19

- Kühe mit haarlosen Stellen (%)  
  - alle Länder: 35  
  - Österreich: 32  
  - eigener Betrieb: 39  
  - unter 20%: 0  
  - mittlere 20%: 20  
  - höchste 20%: 31

- Kühe mit Schwellungen oder Verletzungen (%)  
  - alle Länder: 13  
  - Österreich: 12  
  - eigener Betrieb: 11  
  - unter 20%: 0  
  - mittlere 20%: 6  
  - höchste 20%: 11

- Lahmheit insgesamt (%)  
  - alle Länder: 16  
  - Österreich: 16  
  - eigener Betrieb: 13  
  - unter 20%: 0  
  - mittlere 20%: 3  
  - höchste 20%: 3

- hochgradige Lahmheit (%)  
  - alle Länder: 10  
  - Österreich: 3  
  - eigener Betrieb: 9  
  - unter 20%: 0  
  - mittlere 20%: 0  
  - höchste 20%: 5
Key issues in AHW planning

✓ Sound, formal assessment of baseline situation
✓ Balanced report including benchmarking
✓ Interactive, participatory planning approach
✓ Farmer-owned decisions on goals and measures
✓ Farm-individual interventions
Successful intervention is possible: reduction in dairy cattle lameness prevalence

Proportion of lame cows (%)

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not lame</td>
</tr>
<tr>
<td>2</td>
<td>Lame: irregular foot fall – uneven temporal rhythm between hoof-beats, weight not borne for equal time on each of the four feet. This creates a definite limp and the affected limb is immediately obvious. A favoured limb will move more quickly than the lame limb.</td>
</tr>
<tr>
<td>3</td>
<td>Severely lame: strong reluctance to bear weight on one limb, or more than one limb affected.</td>
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</table>

March & Brinkmann 2011
Successful intervention is possible

Mastitis
- 20% reduction in incidence in farms implementing ≥ 2/3 of recommended measures (Green et al. 2007)
- 30% reduction in treatment incidence (Ivemeyer et al. 2008)

Cow comfort
- +0.6h/d lying time in ‘freestall change’ farms (Morabito et al. 2017)
Take-home messages

- Valid and feasible on-farm welfare assessment systems are available (incl. training material)
- Encouragement of farmers crucial for successful implementation of intervention measures, e.g.
  - ownership
  - benchmarking
- Health and welfare situation may be improved
  - through formal animal health and welfare planning
  - in response to farm-individual intervention measures
Thank you very much