Housing and management risk factors affecting body condition and traits of animal health in ewes

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Animal health and welfare

- Main topics in organic and conventional farming

- Prophylactic use of antimicrobials is prohibited in organic farming and only allowed for limited therapeutic indications

- Optimal housing, well-balanced feeding and adapted animals are needed

Objective:

To evaluate sheep’s health on organic farms and to analyse the assessed status with regard to housing and management conditions
Material and methods

- 10 farms in Schleswig-Holstein
- 10 farms in Lower-Saxony
  - In total 3,500 ewes
  - Herd-size: 40 – 1,200 sheep
  - Lambing-period: January – May 2010 and 2011
  - Organic systems

- Production traits (husbandry):
  - Meat (n=9)
  - Dairy (n=6)
  - Landscape management (n=5)

- Animal information
Material and methods

• Inspection of
  - **Body condition (BCS):** very thin (-2) to very fat (+2)
  - **Constitution of hoofs:** too long, overgrown horn or lameness (1) to without any disorders (5)
  - **Respiratory symptoms:** respiration rate high, dyspnea, dry cough (1) to without any disorders (5)

• Assessment at three different stages of performance:
  - Before, during and after lambing

• In total 2,031 ewes were assessed in all three stages
  • 6,093 observations included in the analysis
### Material and methods

#### Purpose
- **Primary purpose** (3 classes; meat, dairy, extensive)

#### Age
- **Age** of the ewe (6 classes; 1, & , e 6 years)

#### Period
- **Year * production period** - interaction including the time point before, during and after lambing in 2010 and 2011 (6 classes)

#### Bed
- **Bedding** (not routine/ routine all two days)

#### Feed
- **Concentrate feeding** (none or not routine/ more than once a day)

#### Med
- **Medicinal treatment** (none or not routine/ routine application of anthelmintics in fact of respiratory symptoms or vaccination in case of hoof disorders)

#### Min
- **Mineral supplementation** (none/ free access)

#### Area
- **Grazing area • per ewe** (< 0.5 ha/ e 0.5 ha)

#### Ewe
- Random effect of the ewe nested within primary purpose and flock

<table>
<thead>
<tr>
<th>Trait</th>
<th>Mean (SD)</th>
<th>model</th>
<th>purpose</th>
<th>age</th>
<th>period</th>
<th>bed</th>
<th>feed</th>
<th>med</th>
<th>min</th>
<th>area</th>
<th>ewe</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCS</td>
<td>-0.02 (0.69)</td>
<td>mixed</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hoofs</td>
<td>4.3 (259/6,093)</td>
<td>logistic</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Respiratory</td>
<td>2.6 (159/6,093)</td>
<td>logistic</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trait</th>
<th>disorders % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCS</td>
<td></td>
</tr>
<tr>
<td>Hoofs</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td></td>
</tr>
</tbody>
</table>
Results

Least square means and standard errors of body condition score for the primary purpose and the age of the ewe

a,b,c: Different letters within an effect show significant differences between categories (p<0.05)
Results

Odds ratios of the effects influencing constitution of hoofs ($n = 6,093$)

a,b: Different letters within an effect show significant differences between categories ($p<0.05$)
Results

Odds ratios of the effects influencing respiratory diseases (n = 6,093)

<table>
<thead>
<tr>
<th>Primary purpose</th>
<th>Extensive</th>
<th>Dairy</th>
<th>Medicinal treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat</td>
<td>0.3\textsuperscript{a}</td>
<td>0.9\textsuperscript{b}</td>
<td>1.0\textsuperscript{b}</td>
</tr>
<tr>
<td>not routinely Bedding</td>
<td>0.4\textsuperscript{a}</td>
<td>1.0\textsuperscript{b}</td>
<td>-</td>
</tr>
<tr>
<td>routinely Bedding</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>none Medicinal treatment</td>
<td>-</td>
<td>-</td>
<td>4.1\textsuperscript{a}</td>
</tr>
<tr>
<td>routinely Medicinal treatment</td>
<td>-</td>
<td>-</td>
<td>1.0\textsuperscript{b}</td>
</tr>
</tbody>
</table>

\textsuperscript{a,b}: Different letters within an effect show significant differences between categories (p<0.05)
Conclusion

- Management and housing factors associated with insufficient body condition and health are different.
- Body condition scoring should be used more as a key-tool on on-farm management.
- Bedding, medicinal treatment, concentrate feeding and mineral supplementation influences animal health significantly.
- Management on farm should be adequate and proper for the respective sheep breed and its primary purpose.

As result….
- Development of a management-tool in order to improve
  - overview of the herd
  - animal health and welfare
  - procedures in sheep husbandry (e.g. medicinal treatment)
Thank you very much for your attention
Body condition II

Least square means and standard errors of body condition score for year* production period and the grazing area

a,b: Different letters within an effect show significant differences between categories (p<0.05)
Constitution of hoofs

Odds ratios of the effects influencing constitution of hoofs (n = 6,093)

- Concentrate feeding:
  - none: 0.3<sup>a</sup>
  - routinely: 1.0<sup>b</sup>

- Mineral supplementation:
  - none: 2.4<sup>a</sup>
  - ad libitum: 1.0<sup>b</sup>

- Bedding:
  - none: 0.5<sup>a</sup>
  - routinely: 1.0<sup>b</sup>

<sup>a,b</sup>: Different letters within an effect show significant differences between categories (p<0.05)
Odds ratios of year*production period influencing constitution of hoofs and respiratory symptoms (n=6,093)

a,b,c: Different letters within an effect show significant differences between categories (p<0.05)
Odds ratios of the effects influencing udder health (n = 4,062)

<table>
<thead>
<tr>
<th>Primary purpose</th>
<th>Mineral supplementation</th>
<th>Flock size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat</td>
<td>none</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Dairy</td>
<td>ad libitum</td>
<td>100-199</td>
</tr>
<tr>
<td>Extensive</td>
<td></td>
<td>≥ 200</td>
</tr>
</tbody>
</table>

a,b: Different letters within an effect show significant differences between categories (p<0.05)