TechCare: Exploring the use of Precision Livestock Farming for small ruminant welfare management

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Outline

1. TechCare & ClearFarm
2. TechCare approach
3. What’s next?
TechCare & ClearFarm

SFS-08-2018-2019 Improving animal welfare
Scope B Precision Livestock Farming

The TechCare project

5 key steps
1. Prioritise welfare challenges and issues
2. Identify potential innovative technologies solutions
3. Validate the solutions in different and real conditions (pilots and commercial farms)
4. Define appropriate business models
5. Communicate widely the results to the small ruminant sectors and beyond

2 main outputs
1. Ready to use PLF solutions for small ruminant welfare management across Europe (tested and validated)
2. Guidelines/blueprints for adapted solutions that are not ready yet to be widely adopted or deployed at larger scale
Welfare assessment by domains

Scoring system

Welfare domain
(Nutrition, Health, Comfort & Behaviour)

Welfare indicator
(e.g. Lameness)

PLF Traits
(e.g. activity)
The ClearFarm project
The ClearFarm platform

www.clearfarm.eu
1. Prioritisation of welfare issues for sheep & goats

<table>
<thead>
<tr>
<th>Overall welfare priorities (all sheep)</th>
<th>Overall welfare priorities (all goats)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nutritional issues</td>
<td>1. Mastitis</td>
</tr>
<tr>
<td>2. Mastitis</td>
<td>2. Insufficient food &amp; water</td>
</tr>
<tr>
<td>3. Gastrointestinal parasites</td>
<td>3. Agonistic behaviour/feed competition</td>
</tr>
<tr>
<td>3. Lameness</td>
<td>4. Poor environmental management</td>
</tr>
<tr>
<td>5. Ectoparasites</td>
<td>5. Gastrointestinal parasites</td>
</tr>
<tr>
<td>6. Inadequate water supply</td>
<td>5. Ectoparasites</td>
</tr>
<tr>
<td>6. Reproductive disorders</td>
<td>7. Lameness/claw health</td>
</tr>
</tbody>
</table>
2. What welfare indicators could be used?

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**Weight loss or change in body state (animal based)**

- Behavioural change (animal based)
- Milk yield and quality (animal based)
- Environmental indicators (resource based)
3. What PLF tools could be used to assess welfare?

- Available either commercially or within the research teams
- Potential to measure one of the four types of broad welfare indicators
- Meet at least some of the criteria identified within stakeholder workshops for likely uptake by farmers (e.g., cost, robustness, ease of use etc.).

➢ Up to 13 different PLF tools identified
## TechCare

### Example of meat sheep

<table>
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<tr>
<th>Tools</th>
<th>Welfare indicators</th>
<th>Welfare priorities</th>
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<tbody>
<tr>
<td>EID reader (UHF) – RFID</td>
<td>Behaviour</td>
<td>Nutritional issues, Parasitism, Lameness</td>
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<tr>
<td>Accelerometer + geolocalisation</td>
<td>Behaviour</td>
<td>Nutritional issues, Parasitism, Lameness</td>
</tr>
<tr>
<td>GPS + proximity sensor</td>
<td>Behaviour, Use of resources</td>
<td>Nutritional issues, Parasitism, Lameness, Maternal relationship, Lamb mortality</td>
</tr>
<tr>
<td>EID reader (low frequency) – RFID</td>
<td>Behaviour</td>
<td>Nutritional issues, Parasitism</td>
</tr>
<tr>
<td>Weigh crate</td>
<td>Body state/weight, Mastitis</td>
<td>Nutritional issues, Parasitism, Mastitis</td>
</tr>
<tr>
<td>Environmental sensors</td>
<td>Environmental/Shed environment indicators</td>
<td>Nutritional issues, Parasitism, Mortality/morbidity</td>
</tr>
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</table>
Testing of tools in pilot sites across Europe

Welfare issues studied

- Under nutrition; Malnutrition
- Mastitis
- Water availability and quality
- Gastrointestinal parasites
- Inappropriate housing/climate stress
- Lameness; Claw health
- Maternal relationship and lamb mortality
- Food competition; Agonistic behaviour
- Ectoparasites
- Inappropriate housing; Malnutrition
- Italy, UK, Israel
- Italy, UK, Norway, France
- France, England, Italy, Israel, Norway
- UK
- Norway, Israel
Conclusions

• Welfare prioritisation allowed to focus on farmers’ priorities
• Using PLF tools potentially acceptable to them
• Next?
  • Testing in pilots
  • Deploy on commercial farms
  • Look at transport
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