

Effects of feed location, roof and weather factors on sheep behaviour in outdoor yards

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Background

Europe

- ▶ Ex.: Ireland 10.6 mill sheep
 - ▶ Mean 103.2 sheep per flock (CSO, 2007)
 - ▶ Outdoor areas used all year around

Nordic countries

- ▶ Ex.: Norway 1 mill winterfed sheep
 - ▶ Only 21.3 % of these live in flocks larger than 100 animals (Animalia, 2008)
 - ▶ Often pens with expanded metal floors and 0.7–0.9 m² per animal



New regulations

- ▶ Regulations for organic sheep production
 - ▶ At least 1.5 m² total area per animal (0.75 m² resting area)
- ▶ Sheep can withstand very low temperatures
 - ▶ LCT -30 °C (Webster et al., 1969)
 - ▶ Different weather factors affect this to a large extent
- ▶ Non-insulated buildings are often cheaper
 - ▶ Possible to use existing buildings
 - ▶ Surface, roof and feed location?

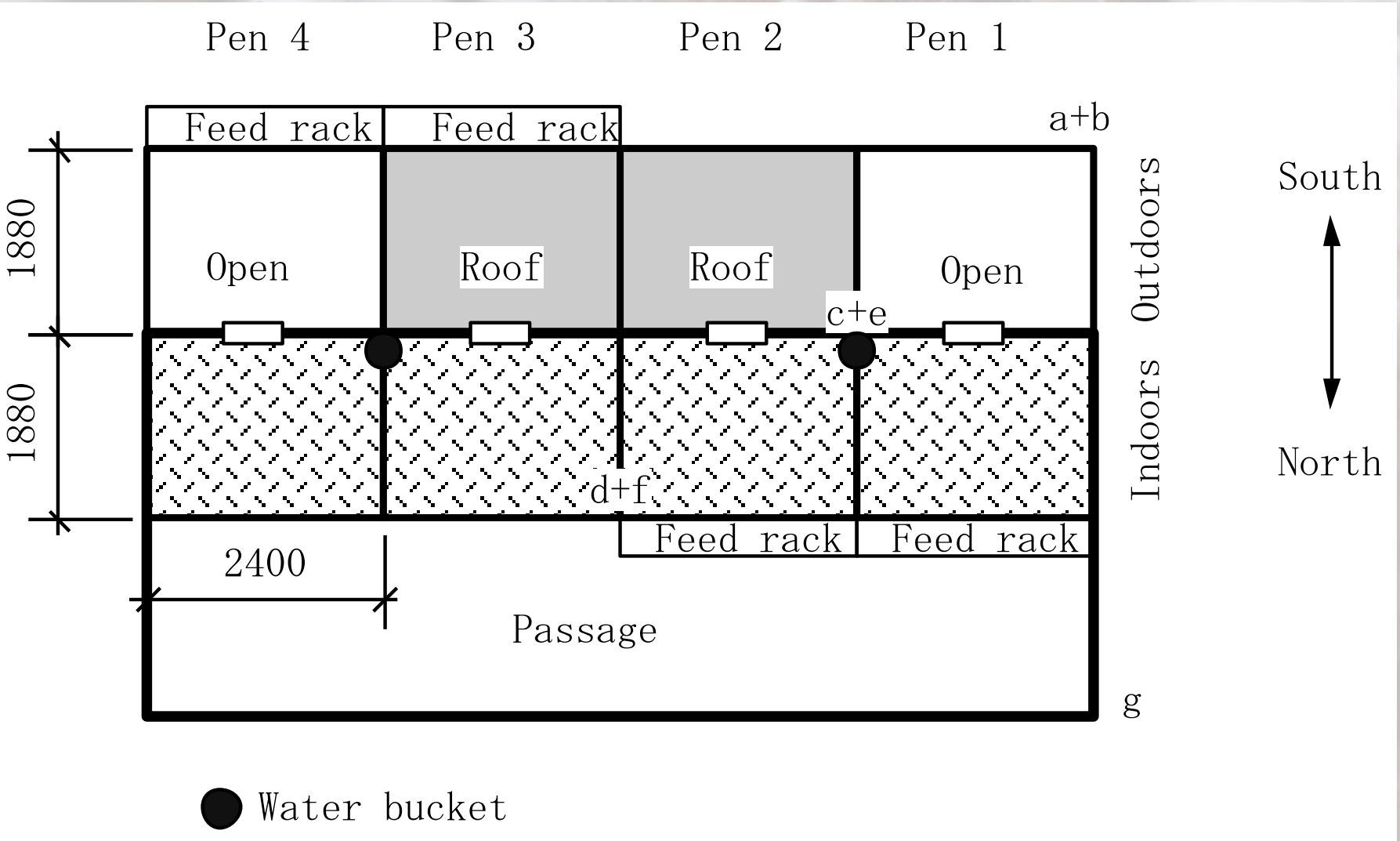


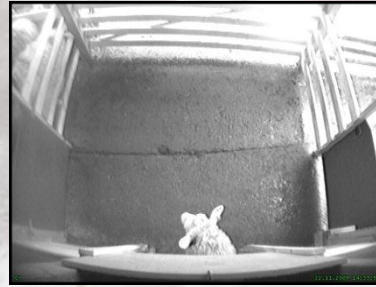
Aim of experiment

- ▶ To investigate how sheep use an outdoor area dependent on weather factors, feed location and a roof covering the yard



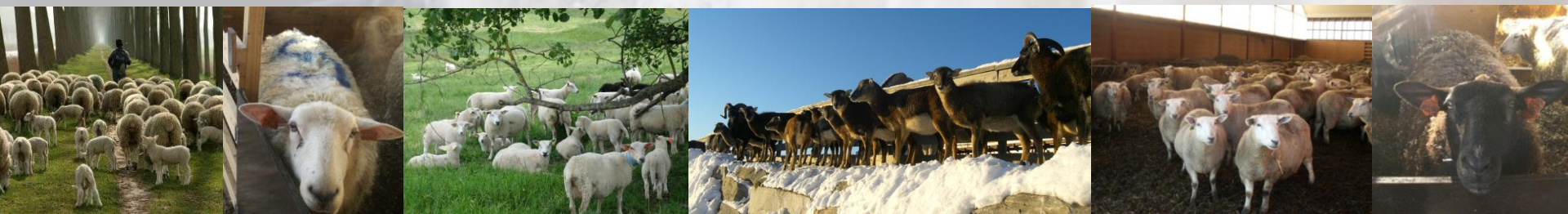
Materials and methods





Materials and methods II

- 24 hours video recordings at the end of each week
- Instantaneous sampling of general behaviour (15. min)
 - Stand/walk
 - Feed
 - Rest
 - Location (indoors or outdoors)
- Weather recordings
 - Temperature indoors and outdoors
 - Wind speed
 - Precipitation
- Five categories based on means over 24 h
 - 1: Mild no rain (+10 til 0°C)
 - 2: Mild with rain
 - 3: Cold no snow (-1 til -12°C)
 - 4: Cold with snow
 - 5: Very cold days (below -12°C)



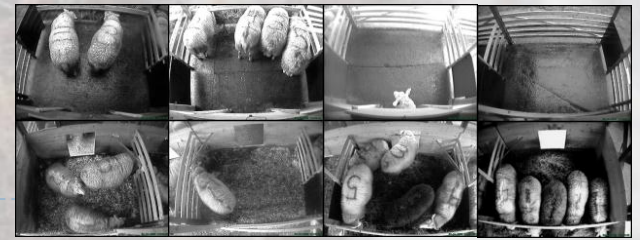
Results



Effect of roof over outdoor yard

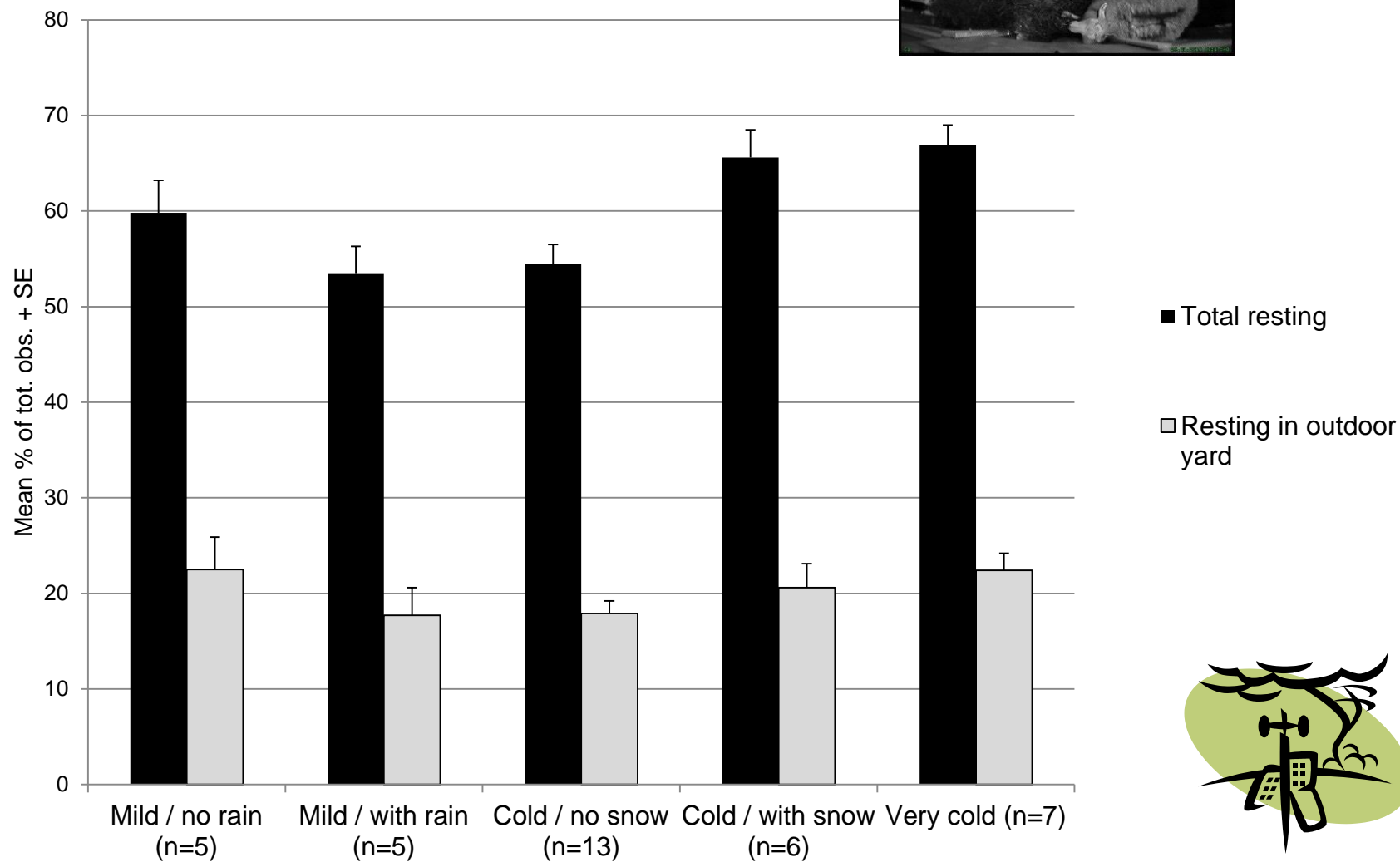
| Mean % of tot. Obs. | Roof | No roof | P-value |
|-------------------------|------|---------|---------|
| Be in outdoor yard | 43.8 | 36.3 | <0.05 |
| Rest | 60.6 | 58.1 | <0.0001 |
| -indoors | 36.3 | 42.6 | NS |
| -outdoors | 24.2 | 15.5 | <0.01 |
| All rest simultaneously | 34.0 | 29.1 | <0.01 |
| Feed | 26.0 | 24.7 | NS |
| Stand /walk | 13.4 | 17.1 | <0.001 |
| -indoors | 6.8 | 8.7 | <0.01 |
| -outdoors | 6.5 | 8.4 | <0.01 |

Effects of feed location



| Mean % of tot. Obs. | Effect of feed location | | |
|-------------------------|-------------------------|--------------|---------|
| | Indoors | Outdoor yard | P-value |
| Be in outdoor yard | 34.8 | 45.2 | <0.01 |
| Rest | 57.7 | 60.9 | <0.0001 |
| -indoors | 31.6 | 47.4 | <0.0001 |
| -outdoors | 26.2 | 13.5 | <0.001 |
| All rest simultaneously | 31.4 | 31.7 | NS |
| Feed | 25.3 | 25.5 | NS |
| Stand /walk | 16.9 | 13.6 | <0.01 |
| -indoors | 8.2 | 7.4 | NS |
| -outdoors | 8.7 | 6.2 | <0.001 |

Effects of the weather



Conclusion

- ▶ Roof or feed location had no effect on time spent feeding
- ▶ Minimal effect of the weather
- ▶ If the resting area is offered indoors the feed should be located in the outdoor yard
 - ▶ This will also increase the need for cleaning the yard (firm surface)
- Time spent outdoors increase with the presence of a roof over the yard
 - ▶ A roof may be beneficial in areas with large amount of rain and snow



Thank you for your attention

- ▶ This experiment was funded through the project: "Housing and environment for organic farmed sheep" by the Norwegian Research Council
- ▶ More information and results from this project can be found here:
- ▶ <http://www.umb.no/iha/artikkel/miljo-til-sau>



- **Questions?**

