Risk and prediction of aerobic-induced silage bale deterioration

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Silage Reheating Experiments
1. Introduction

- Great importance of silage in animal production
- Process of ensiling is completely understood
  - conditions for high silage quality are known
  - risk of silage deterioration is small
  - (Woolford, 1984)
- Deterioration of silage is a worldwide problem for farm profitability and feed quality
- Silage deteriorates as it is exposed to air
- (Tobacco et al. 2011)
Silage Reheating Experiments

1. Introduction

- Low compacted silage bales are strongly threatened by reheating (Büscher et al. 2013)

- High compaction and airtight coverage prevent and reduce energy losses (Maack et al., 2007)

- If plastic film is opened time of air influence has to be short (Büscher et al. 2013)
Silage Reheating Experiments

2. Material and Methods

- 8 tons with a volume of 60l
- Filled with maize silage
- 40kg (low-density; n=4) or 50kg (high-density; n=4)
- 3 temperature sensors in each ton (Experiment 1)
- 3 temperature sensors and one oxygen sensor in each ton (Experiment 2)
Silage Reheating Experiments

3. Results (Experiment 1)

Reheating of corn silage in tons of different densities

Weight: 50kg

Weight: 40kg
Silage Reheating Experiments

3. Results (Experiment 1)
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3. Results (Experiment 2)
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4. Conclusions and Future Prospects

High compaction of plant material reduces energy losses

Physical factors have great influence on silage deterioration

→ Further investigation of physical influencing factors
→ Create a prediction model for silage deterioration
5. References

Büscher, W.; Y. Sun; P. Lammers; F. Ross; C. Maack; Lin JianHui; Cheng QiAng; Sun Wei. (2009). Improved bulk density determination of silage round bales from penetrometer data. Verbesserte Dichtebestimmung von Silageballen mit Penetrometern Landtechnik Vol. 64 No. 3 pp. 187-190


Thank you for your attention!

„I would recommend this to any cow – it’s good acids, preservatives, toxines, bugs, effluent – there’s even some grass here somewhere!“ (Woolford, 1984)