

Risk and prediction of aerobic-induced silage bale deterioration

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Abstract: Conservation of grass in silage bales has been developed as an alternative to clamp silos. Engineering progress enhanced throughput and density in baling technique.

The effect of reheating at the opened silo is avoided by the closed cover of every single bale. Many users are convinced of lower feedlosses and better silage quality in bales compared to clamp silos. Previous investigations have proved high silage quality in bales.

Bulk density which is an important factor in bales, leads to mechanical stable shape and reduces film- and transport costs. A compact pressed bale minimises losses in case of small damages at the film surface and improves silage quality.

Silage reheating is responsible for energy and nutrition losses in preserved fodder, potentially leading to deterioration of silage and endangering animals' health. It is effected by microorganisms, the fermenting products and physical parameters. The cooperation project pursues the qualitative and quantitative measurement and evaluation of the physical parameters influencing aerobic-induced reheating of silage bales.

A test bench was used to measure physical parameters like density and temperature. It works with a penetrometer measuring the bale's resistance against a cone and the temperature inside the bale. To get data about the dynamic of reheating under controlled conditions the same crop pressed into bales is ensiled in tons and glasses and observed by sensing elements and thermography. The fermenting products and the aerobic stability of the silage are tested in standard laboratory analysis.

Model based prediction of reheating is one objective in the project. In the presentation the multi-sensor experimental equipment will be demonstrated. Statistical results will be illustrated by two- and three-dimensional mapping.

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