Risk and prediction of aerobic-induced silage bale deterioration

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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.

Interrelationships between live weight, body measurements, BCS and energy balance of dairy cows

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This paper characterizes changes of energy balance, live weight, body measurements and BCS during lactation. Live weight is predicted and the influence of stage of lactation is discussed. Data were derived from Simmental (FV100), Holstein (HF100) and crossbred dairy cows of AREC Raumberg-Gumpenstein. Parameters were measured during 11 experimental periods (63 cows each) during a whole year. Ration was forage-based with concentrate supplementation to meet individual requirements. Breed failed to influence energy balance and its development during lactation. Live weight and BCS decreased significantly with increasing genetic potential for milk performance from FV100 (730 kg, 3.57 points) to HF100 (613 kg, 2.76 points). FV100 differed significantly from all HF groups. A genetic proportion of 12.5% Simmental in Holstein cows caused a significantly higher live weight and tendentially more BCS compared to HF100. Changes of parameters during lactation were significant. In contrast to BCS, live weight started to increase while energy balance was negative. In dry period correlation coefficients between live weight and most body measurements were higher, especially the relationship to BCS. The two models for live weight prediction with three body measurements as regression variates (belly girth, heart girth, BCS or chest depth) had smallest RMSE (17.0 and 18.7 kg). Regression coefficients changed during lactation. In conclusion breeds differ especially in BCS and live weight, depending on genetic proportion and their genetic potential of milk production. BCS describes mobilisation and recovering of body reserves better than live weight. During dry period bigger belly girth, heart girth, body width and chest depth depend more on fatness than on actual size of bones compared to lactation. Furthermore the physiological stage seems to change the influence of body measurements on live weight during lactation.