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Relationship between backfat thickness and fertility from the point dry off to the day 150 post partum

Optimization of herd fertility and milk yields is of great interest in modern farming management. Therefore the body condition plays a very important role. The purpose of this study was to characterize relations of the body condition, especially during early lactation, and the fertility. As a result of evaluating the tendency of the energetic balance during this period, successful insemination can be increased.

For this reason, backfat thickness (RFD) of milk cows have been measured from the point dry off to the day 150 post partum. Out of these measurements 651 complete data sets were compiled for statistical evaluation. The measured RFD data points were reduced to 8 characteristic parameters, which were related to milk yields and fertility.

The statistical evaluations demonstrate that the body condition is strongly affected by age of the cow and the milk yield. The majority (87 %) of the tested animals conceived after overcoming the nadir of body condition. The nadir was reached at an average of 63 ± 25 days with a RFD of $13,11 \pm 5,46$ mm. In this group, younger animals generally remained on a lower level of body condition and milk yield than older group members.

The remaining 13 % of the statistically recorded animals conceived before or around the nadir of body condition. These animals were in particular capable of combining a good fertility with good milk yields and revealed the broad biological variance of the individuals. These animals were surprisingly young. The nadir of body condition was reached at an average of 86 ± 19 days with RFD values of $8,66 \pm 4,41$ mm. Lactation started with a larger amount of body fat, which could be utilized for energetic adjustment. As a consequence, those animals passed through an extended negative energy level. The body condition around parturition and the increasing depletion of body fat during early lactation is predisposing for the following fertility period.

Furthermore, a body condition of less than 9 mm RFD significantly increased the artificial insemination rate as well as the calving intervals. Likewise extended intervals for both – insemination and calving – were observed with increasing amounts of body fat losses. The first insemination usually took place at about 13 days after NEB. Meanwhile conception took place on an average of 58 days after crossing the conditional bottom. In addition, RZ and ZTZ are closely related ($r = 0,35$; $p = 0,001$). At this point, the body condition was always increased compared to the condition at nadir.

High milk yields were mostly related to a lower body condition and a prolonged NEB and therefore to milk protein values. Concentrations below 3,20 % indicate energy deficiency. High-performing animals consumed all their energy deposits and were not able to recover completely until next lactation period.

Monitoring of body condition of dairy herds is an appropriate management tool for economic performance-related improvement of the productivity. Controlling the loss of body fat during early lactation allows adequate feeding and an increased energy uptake for the cow. The optimized energy balance shortens ZTZ and prevents miscarriages, while less than 10 mm RFD result in significantly higher artificial insemination rates.