

**RELATIONSHIP BETWEEN AN ENRICHED FAT DIET, METABOLIC PARAMETERS AND REPRODUCTIVE FITNESS POST PARTUM IN HIGH YIELDING DAIRY COWS**

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Genetic improvement of dairy cows has led to a dramatic increase in milk production associated with an overall decrease in reproductive performance. In this study, the effect of a linoleic acid enriched fat diet on reproductive parameter in high yielding dairy cows will be considered with respect to metabolic parameters.

Altogether 32 Holstein Friesian cows were allocated into 2 groups. The experiment was started 40 days before parturition and finished 100 days after calving. Feeding prior to parturition enclosed 4 components and was equal for control and experimental group. After parturition diet contained 13 components. In contrast to controls, in the experimental group the tapioca pellets were replaced by Ca-protected fat (80 % palm fat and 20 % soya). Blood was drawn 2 times per week by venous puncture. Furthermore 5 animals per group were used for frequent blood sampling via catheter about 8 hours on days 25, 30, 35 and 40 after parturition to investigate characteristics of LH secretion. Ultrasonographic examinations of follicular development were carried out 2 to 3 times per week.

Milk performance in 305 days was  $9514 \pm 1167$  kg in the control group and  $10142 \pm 1444$  kg in the experimental group. Body mass and backfat thickness decreased significantly ( $p < 0.05$ ) in experimental and control groups. In both groups glucose and insulin concentrations showed the same pattern. However, concentrations were significantly increased for several weeks in control animals. Concentrations of  $\beta$ -hydroxybutyrate were higher ( $p < 0.05$ ) in animals of experimental group from week 4 to 14 after parturition. Although plasma and follicular cholesterol concentrations of dominant follicles 7 days after ovulation were increased ( $p < 0.05$ ) by the fat diet, there was no positive effect on the total number of follicles  $> 5$  mm in diameter, and on the interval from calving to first ovulation. In the experimental group the frequency of LH pulses was also higher than in controls (2.8 to 4.0 vs. 3.2 to 4.8 pulses in 8 hours). However, these data did not find a reflection in a better reproductive fitness. The interval from calving to first ovulation was longer in experimental group compared to controls ( $66.4 \pm 48.4$  vs.  $49.2 \pm 37.2$  days).

In summary, data suggest that replacement of carbohydrates by protected fatty acids in the chosen manner did not improve reproductive functions. Obtained results ask the question, if high yielding dairy cows would utilize additional energy for improvement of reproductive fitness or for acceleration of milk production.