Body fat and reproduction in suckling cow

Postpartum body lipid mobilization does not affect the resumption of luteal activity after calving but enhances the behavioral expression of estrus of cows.

Many studies identified the main factors playing on the reproductive performance of suckling cows : parity, suckling frequency, nutrition, calving date. The effect of nutritional status was mainly analysed considering the influence of body condition at calving on the length of the anoestrus period. This approach is considered to be restrictive since the resumption of postpartum cyclicity is only one of the successive stages involved in the elaboration of the reproductive performance. Knowledge is lacking about the effects of how nutrition influences cyclicity, expression of sexual behavior or embryonic mortality. Moreover, the influence of nutrition on reproduction may not be summarized through the only effect of body condition at calving. A more dynamic approach appears to be developed that considers the joined effects of the amount of body lipids at calving and their postpartum variations. This study was driven on primiparous cows that are known to be more sensitive to the effects of nutrition.

The aim of our study was to analyze the effects of postpartum body lipid changes on the main components of the reproductive performance. Two successive similar experiments were carried out on primiparous Charolais cows that were assigned to a Low (L) vs. a High (H) (65% vs. 125% of energy requirements) energy level diet from calving to turn out. After turn out, cows were exposed to a bull and grazed permanent meadows. As reported in previous studies, the interval from calving to resumption of luteal activity was higher in low body condition cows at calving. Postpartum loss of body lipids observed in L cows did not influence the length of calving to cyclicity interval. However, we observed higher estrus duration and intensity in L than in H groups. Pregnancy rates tended to be lower in L cows only when body lipid mobilization continued during the mating period. We concluded that primiparous cows have the ability to undergo moderate period of postpartum feed restriction but feeding strategies that prolongs restriction over the breeding period may damage cows' fertility.

This study showed that the different components (physiological and behavioral) of the reproductive performance could be affected either by the amount of body lipid reserves, the body lipid change over time or both. This highlights the importance of taking into account the effect of the body lipid trajectories when considering the adaptative response of cows to nutritional constraints. Despite it would be interesting to confirm our results on larger numbers of cows, our study provided evidence that body lipid amount and mobilization are to be considered as predictors of the reproductive performance, and models of reproduction would have to integrate their quantitative effects on the successive stages of the reproductive process.