Consequenses of feeding management on body condition and reproductive performance in primiparous Charolais cows

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Introduction Beef cattle livestock systems mainly rely on forage resources. Due to environmental constraints, forage stocks may not be sufficient for the whole winter period and cattle might have to undergo feed restriction. Body condition at critical times and its variation around the year may affect female reproductive performances (Richards et al., 1986), and thus farms economic viability. The aim of our study was to determine the influence of two postpartum feeding strategies on body condition and reproductive performance of primiparous Charolais cows. Reproductive efficiency was evaluated by both physiological and behavioural criteria.

Material and method Two experiments (Trial 1: n=14 and Trial 2: n=16) were successively carried out using primiparous Charolais cows. In each trial two energy level diets (High: 125% energy requirements (H1: trial 1; H2: trial 2) vs. Low: 65% energy requirements (L1: trial 1; L2: trial 2) were applied from calving to turn out. Diets were formulated with pasture hay (90% in H and 95% in L diets) and concentrate (10% in H and 5% in L diets). Cows were reared in groups (n=7 or 8) in a loose-housing system from mid-November to mid-May. Weight and body condition score (BCS, scale 0-5) were respectively measured once a week and once a month (trial 1) or twice a week and twice a month (trial 2). Measures of adipose cells diameter at calving and turn out were used to assess change in body composition during postpartum period (Robelin et al., 1981). Cyclicity was studied through plasmatic progesterone profiles (two samples per week). Ultrasonographic examination was performed at 195±16 d (trial 1) and 198±10 d (trial 2) after calving to determine cows' pregnancy status. Oestrus expression was analyzed from 24h/24h video camera records that were studied using The Observer® software. Effect of feeding management on body condition change, oestrus behaviour and cyclicity was analyzed using ANOVA (SAS software).

Results BCS at calving was 2.4±0.1 in trial 1 and 2.0±0.2 in trial 2. Postpartum BCS changes were -0.2±0.2 (L1) vs. 0.2±0.2 (H1) and -0.4±0.2 (L2) vs. 0.1±0.2 (H2). In L groups, despite underfeeding and lipid mobilization, growth was not totally inhibited as protein depots were observed (figure 1). Within each experiment, BCS change and lipid variation during postpartum period, were significantly different between L and H groups (figure 1). Protein depots significantly differed between L and H cows in trial 2 but not in trial 1. Postpartum underfeeding did not affect calving to first oestrus interval (76±22d (L1) vs. 75±13d (H1) and 100±13d (L2) vs. 97±12d (H2)). Pregnancy rates were lower in L cows in trial 1 (43±53% (L1) vs. 86±38% (H1), P<0.05) but not in trial 2 (88±35% in both groups). In both trials, standing to be mounted represented between 3% and 5% of all sexual behaviours expressed during oestrus and was not significantly influenced by postpartum nutritional level. Oestrus intensity reached 287±175 (L1) vs. 204±97 (H1) and 317±194 (L2) vs. 159±108 (H2) (figure 2). In both trials, oestrus duration (time between first and last standing to be mounted) was not influenced by postpartum energy level (8±6h (L1) vs. 4±4h (H1) and 9±4h (L2) vs. 5±7h (H2)).

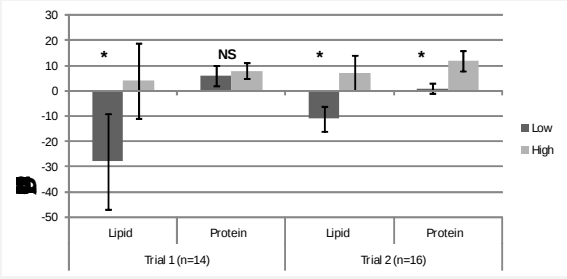

Figure 1: Lipids variation from calving to turn out was influenced by nutritional level. Protein depot was observed in all groups but difference between L and H diets was only significant in trial 2. (*Treatment effect P<0.05, NS : Non Significant)

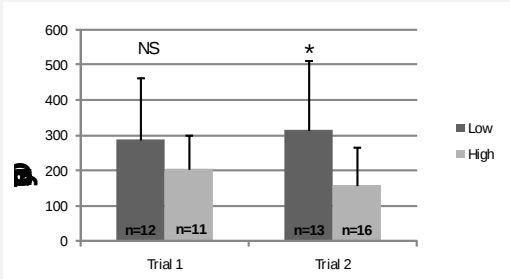

Figure 2: Oestrus intensity (sum of all sexual behaviours occurring during oestrus) was significantly higher in L group but only in trial 2 (*Treatment effect P<0.05, NS : Non Significant)

Conclusion In the present study postpartum nutritional level did not affect calving to first oestrus interval as shown by Richards et al (1986). Data of trial 2 were in agreement with Richards et al. (1986) showing that in cows loosing body condition after calving, pregnancy rate may not be significantly depressed if calving condition was good to moderate. Results of trial 1 were not consistent with that, showing a significant decrease in pregnancy rate of L cows. This might be explained by the higher level of lipid mobilization observed from calving to turn out in trial 1. Oestrus duration was not significantly affected by postpartum nutritional level in trials 1 and 2. This observation was in agreement with results of Ciccioli et al. (2003). Feed restriction as tested in this study did not totally affect growth and reproductive performance when lipid mobilization remains moderate. Our results showed the ability of well-developed primiparous cows to undergo periods of moderate feed restriction.

References

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Robelin J. 1981. *Journal of lipid research*. **22**, 452 -457.