

Effect of Carbohydrate Source in Diet on Reproductive Performance of Lactating Dairy Cows

Animal Science, Animal Production System

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Background and objective: High protein diets can increase milk yield in early lactation period. However, high crude protein (CP) intake and blood urea nitrogen (BUN) can be detrimental to estrous expression due to poor follicular development which will reduce estradiol production to show expression of estrus. Feeding large amount of grain can provide energy to sustain high milk yield during early lactation, but reduce ruminal pH, reduce dry matter intake (DMI) and in turn disturb on reproduction. As an alternative carbohydrate source in high protein diet, beet pulp which is digestible fiber can be used to maintain ruminal pH and prevent decreased DMI. The objective of this study was to test whether postpartum anovulatory interval (PPAI), resumption of estrous cycle and intensity of estrous behaviors can be enhanced by feeding a concentrate rich in high digestible fiber instead of grain rich in starch with high CP basal diet during early lactation by 45 days postpartum.

Materials and methods: Seven Holstein cows were blocked at random to two groups; barley (BA) (4kgFM/d) as control and beet pulp (BP) (4kgFM/d) as treatment. Basal feeds were alfalfa hay (ad libitum) and formula feed mix (4kgFM/d). Body weight (BW) and body condition score were recorded every 7 day. Visual observation (1h/d) in paddock, 24-hourly video recording in stall, daily milk collection and blood collection (3times/wk) were made. Chemical analysis was made for plasma insulin and milk progesterone (P4), non-esterified fatty acid (NEFA) and BUN.

Results: Cows in BP showed high intensity of estrous behaviors than those in BA. Cows in BP were standing immobile to be mounted by other cows (standing heat) during estrous period although cows in BA did not express standing heat. Cows in BP showed more behavioral activities of mounting, chin resting and sniffing vagina than those in BA. Total DMI/BW, resumption of estrous cycle and days of first rise in milk P4 were not significantly differed between cows fed two diets. Plasma insulin, NEFA and BUN of cows in BP was higher than that of cows in BA when compared between cows recovered estrous cycle. It is concluded that the intensity of estrous behaviors can be enhanced by feeding BP to the early lactating dairy cows. Resumption of estrous cycle and PPAI were similar by postpartum feeding of BP compared with BA. High plasma insulin seemed to be associated with the high intensity of estrous behaviors.