

The impact of progesterone concentrations during superovulation of Holstein heifers in a randomized trial

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The aim of this study was to evaluate the effect of different progesterone (P4) concentrations during the follicular growth on the intensity of estrous expression, and embryo production and quality in superovulated heifers. A total of 63 Holstein heifers were randomly assigned into two experimental groups: Low P4 (n = 31) and High P4 (n = 32). Animals received a pre-synchronization protocol followed by a protocol of superovulation that included the allocated P4 treatment. Activity was monitored continuously by an automated activity monitor, and estrus characteristics (maximum intensity and duration) were recorded. Embryo collection was performed 7d post artificial insemination (AI). Embryos were counted and graded from good/excellent (1) to degenerated (4). A total of 105 embryos (High P4 =42; Low P4=63) were graded for quality. Different P4 levels did not affect the maximum intensity (High P4=497.8 ± 23.9; Low P4=542.2 ± 23.5%; P = 0.19) or the duration (High P4=13.5 ± 1.5; Low P4=14.3 ± 1.4 h; P = 0.70) of estrus. High P4 heifers tended to have better embryo quality when compared to Low P4 (OR=1.98; P = 0.08). However, Low P4 heifers had 2.48 times greater number of embryos when compared to High P4 (P = 0.03). Although estrous expression was not associated to embryo quality, the number of embryos recovered 7d post-AI was shown to be 1.04 and 1.5 times higher as the duration and the intensity of estrous expression increased, respectively (P > 0.01).

Take home message: supplementation with P4 prior to estrus might have the potential to increase the probability of pregnancy in embryo transfer programs by increasing the quality of transferable embryos. In addition, expression of estrus of greater intensity and duration may be an important marker of improved embryo production in superovulated heifers.

Effects of raw and steam pressure toasted faba bean seeds in diets of high producing dairy cows

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The existence of alternative feed ingredients of good nutritional value is important for the livestock industry. Introducing new feeding options requires reliable information to prove beneficial or detrimental impacts on animal productivity. This study aimed to evaluate the use of raw or steam pressure toasted Faba bean seeds (FBS) as an alternative for traditional feeding ingredients such as soybean and barley grain. Snowbird FBS were processed by steam pressure toasting (SPT) at 121°C for 0, 7.5, 15, and 30 min using a thermal hydrolysis batch reactor (Saskatoon Boiler Mfg.). Rolled FBS (10% inclusion in total mixed rations, TMR) were fed to lactating Holstein cows (2nd and 3rd lactation, 69 ± 15 days in milk, and 720 kg mean body weight) for 120 days. Data were analyzed with the MIXED procedure of SAS 9.4, using a double Latin Square (4x4) design model with treatment as the fixed effect and cow as the random effects. Polynomial contrasts were used to evaluate the effects of SPT duration and significance was declared at P<0.05. The average milk yield and fat content for all the diets were 39.4 kg/cow/day and 3.86%, respectively (P>0.10). Milk urea nitrogen (MUN) decreased from 12.18 with TMR_0 to 11.10 mg/dl with TMR_30 (linear P<0.01). Based on the current findings, a potential use for FBS in ruminant diets is presumed, as no negative effects were observed on the production performance of high producing dairy cows.

Take home message: FBS could be a promising feed alternative for the dairy industry as partial replacement for soybean meal and barley grain. Optimal processing method, processing time, and level of inclusion of FBS remain broad fields of research in ruminant systems to find the best revenue and profits for the dairy industry.