

Energy balance of primiparous and multiparous Holstein cows following short dry periods

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Introduction

Recent literature shows that a 30-40 d dry period is sufficient for maximizing the number of differentiated secretory cells (1 and 2). In itself, shortening the dry period, minimizes the dietary changes frequencies. Consequently, by shortening the dry period, the nutritional stress is also expected to decrease. Further, a short dry period may also improve the survival of the desirable population of rumen flora. Regardless of the productive ability of cows subjected to a short dry period, the energy balance remains an important factor.

Materials and Methods

One hundred and twenty two primiparous and multiparous Holstein cows were assigned randomly to a completely randomized design with traditional or 56 d dry period (T), intermediate or 42 d dry period (I) and short or 35 d dry period (S). Management strategy used to assigning cows in different groups depicted in Figure 1. Body condition score (BCS) was evaluated at dry-off, calving and 15 weeks of lactation during the experiment by one evaluator. Blood samples (10 ml) were collected from the coccygeal vein (tail vein) before expected calving and immediately after parturition.

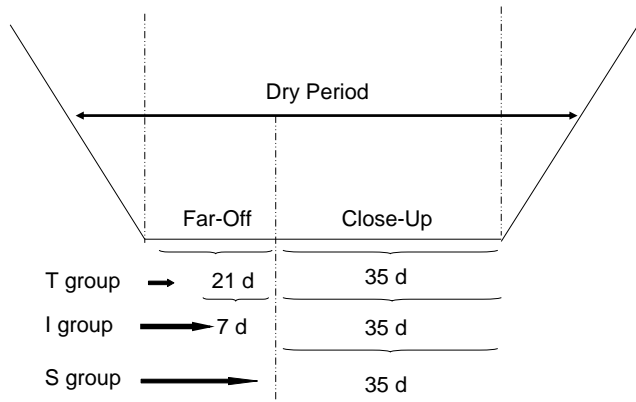


Figure 1. Management scheme of cows subjected to 35 (S group), 42 (I group) and 56 (T group) day dry period lengths

During the experiment, identification number of inflicted cows and date of diagnosis were recorded by technicians and were attested by veterinarians. The PROC MIXED and PROC GENMOD procedures of SAS (3) were used to analyze metabolic parameters and incidence of health disorders, respectively.

Results

- Cows with a 42 and 56 d dry period significantly gained more body condition than those with a 35 d dry period in late lactation
- Postpartum BCS did not change substantially between the groups
- Among primiparous cows, cows in T group had higher levels of serum NEFA than did the cows in S group both in prepartum and postpartum
- Among multiparous cows, S and T groups had no different values for prepartum and postpartum NEFA concentration
- As expected, primiparous cows showed substantially higher serum triglyceride concentration than multiparous cows in S group during both late pregnancy and early lactation
- No significant differences were observed in prepartum and postpartum glucose levels across the treatments
- Serum insulin and IGF-I concentrations were consistent among treatments.
- The incidence of a restricted number of typical postpartum disorders including dystocia, mastitis, displaced abomasum, retained placenta was similar between treatments.

Discussion

Apparently, the shortest dry period, did not provide enough time to replenish the body reserves during the dry period. However, cows in the 35 d dry period group showed a tendency to have higher values of BCS in comparison with those in 56 d dry period group at 15 weeks of lactation. This may be attributed to an improved energy balance of cows with a 35 d dry period. Less nutritional stress, more stable rumen flora and less capability of milk production are possible explanations for having lower levels of both pre and postcalving serum NEFA concentrations in S compared with the T groups among primiparous cows. The difference in serum triglyceride may be attributed to a higher β -oxidation capacity of liver in primiparous cows of the S group.

Conclusion

In conclusion, regardless of parity, cows with a 35 d dry period experienced an improved energy balance or less negative energy balance than the other cows (42 and 56 d dry period cows). Assigning dairy cows to a short dry period (35 or 42 d) did reveal any change in incidence rate of studied health disorders compared with that of traditional (56d) dry period.

References

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