

## EFFECTS OF DRY PERIOD LENGTH AND DIETARY ENERGY SOURCE ON METABOLIC STATUS OF DAIRY COWS IN EARLY LACTATION

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### Abstract

High-producing dairy cows experience a severe negative energy balance (NEB) during early lactation, which is related to metabolic disorders. Omitting or shortening dry period length may ameliorate the NEB. Further, the effects of different dietary energy source on energy metabolism in cow after alteration of dry period length have not been evaluated yet. The objective of this experiment was to study the effects of dry period length and dietary energy source on energy balance and metabolic status of dairy cows in early lactation.

Holstein-Friesian dairy cows (N=167, average milk production: 10005 ± 105 kg/305 days; MEANS ± SEM) were randomly assigned to one of three dry period (0, 30, 60 days) and one of two diets (glucogenic: high starch; lipogenic: high fiber and saturated fat). Milk yield and feed intake were recorded daily and energy balance (EB) was determined weekly from week 8 prepartum till week 8 postpartum and averaged per week. Non-esterified fatty acid (NEFA), beta-hydroxybutyric acid (BHBA), urea, glucose and insulin-like growth factor-1 (IGF-1) were determined weekly from week 3 before the expected calving date until week 8 postcalving. Data are expressed as MEANS ± SEM. Prepartum milk yield for cows on no dry period treatment was 14.1 ± 0.4 kg/d and 7.6 ± 0.4 kg/d for cows on shortened dry period treatment from week -8 to 0. The cows with no dry period had greater feed intake and prepartum plasma BHBA, urea compared with cows with a shortened or traditional dry period ( $P < 0.01$ ). Prepartum, diet did not affect milk yield, EB or plasma metabolites. Postpartum, cows with no dry period had less milk yield ( $P < 0.01$ ) (32.1 ± 0.5 kg/d) and improved EB ( $P < 0.01$ ) compared with cows with a shortened (38.3 ± 0.4 kg/d) or traditional dry period (43.1 ± 0.4 kg/d). Moreover, plasma NEFA was lower while the plasma glucose and IGF-1 were greater for cows with no dry period than cows with a shortened or traditional dry period ( $P < 0.01$ ). Additionally, plasma urea concentration was greater in cows fed the lipogenic diet compared with cows fed the glucogenic diet ( $P < 0.01$ ).

In conclusion, metabolic status can be improved by omitting the dry period in early lactation.