

Impact Of Postpartum Milking Frequency On The Immune System And Metabolic Diseases Of Dairy Cows.

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The transition from pregnancy to lactation is marked by metabolic, hormonal and immunological changes that have an impact on the incidence of infection and metabolic diseases. The aim of this study was to evaluate the effect on immune function and blood metabolite concentration of reducing the negative energy balance by limiting milk production in early lactation. Twenty-two multiparous Holstein cows were milked either once a day (1X) or twice a day (2X) for the first postpartum week. All cows were milked twice daily for the rest of the lactation. Blood concentrations of nonesterified fatty acids (NEFA), β -hydroxybutyric acid (BHBA), calcium, bilirubin, urea, phosphorus and glucose were determined in samples collected from 5 weeks before to 5 weeks after calving. Peripheral blood mononuclear cells (PBMCs) and polymorphonuclear leucocytes (PMNs) were isolated from blood to evaluate lymphocyte proliferation, PMN chemotactism, phagocytosis and respiratory burst. Cows milked 1X produced 31% less milk (20.2 vs 29.4, $P = 0.0014$) than cows milked 2X during the first week of lactation. Over the first 14 weeks of lactation, milk production was 3.5 kg lower ($P < 0.05$) in cows milked 1X during the first week than in cows milked 2X. Calving induced an increase in the concentrations of NEFA, BHBA, urea and bilirubin. These increases were significantly higher in cows milked 2X compared with 1X for NEFA ($P = 0.0323$) and BHBA ($P = 0.0020$). During the same period, the glucose concentration decreased ($P < 0.001$) but remained higher ($P < 0.001$) in cows milked 1X. Blood calcium on day 4 ($P < 0.05$) and blood phosphorus on day 4 ($P < 0.07$) and day 5 ($P < 0.02$) were higher in cows milked 1X. The difference between the two groups persisted beyond the treatment until *postpartum* day 24 for NEFA and glucose, and until *postpartum* day 14 for BHBA. The immune functions, evaluated for the PBMCs and PMNs, did not show clear-cut *peripartum* immunodepression. Accordingly, these parameters were not significantly affected by the treatments.

In conclusion, once-daily milking in the first week of lactation may limit metabolic disorders but milk production continues to be depressed after the switch to twice-daily milking.