Metabolites of vitamin D and minerals in blood and colostrum of primiparous and multiparous dairy cows postpartum

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Concentrations of calcidiol, calcitriol, and minerals in blood serum and colostrum of 14 primiparous and 16 multiparous Holstein dairy cows during short-period prepartum and postpartum were determined and compared. Blood samples were collected between days 5 and 2 prepartum and 6 h, 12 h, 7 and 21 days postpartum. Nearly 66% of primiparous and 71% of multiparous cows had subclinical postpartum hypocalcemia. Prepartum serum calcium (Ca) and inorganic phosphorus (P) were higher in primiparous cows; Ca decreased in both groups at 6 and 12 h and returned to baseline values 7 days postpartum. Calcidiol and calcitriol concentrations were equal on day 5 prepartum in both groups. In multiparous cows, calcidiol and calcitriol concentration increased at 6 h postpartum and remained elevated at 12 h postpartum; there were no changes in primiparous cows for these analytes. The total secretion of Ca in the colostrum from the first milking was similar in both groups and positively correlated with serum Ca at 6 and 12 h after calving. It is concluded that postpartum increases in the calcidiol and calcitriol concentration were a normal response to the decrease of serum calcium concentration only in multiparous cows. The total Ca secretion in the colostrum of the first milking postpartum does not reflect the grade of hypocalcemia.

Keywords:

calcidiol; calcitriol; calcium; peripartum cow

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