Public Abstract

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Title:POSTPARTUM HORMONES AND METABOLITES AFFECTING FERTILITY IN HOLSTEIN AND JERSEY DAIRY COWS

Dairy cows have experienced major changes in productivity during the past 70 years. A selective pressure was applied to increase milk yield, but fertility declined. During early lactation, dairy cows are exposed to physiological, hormonal and metabolic challenges. This research was conducted to increase the understanding of these challenges and how they may affect reproductive performance of Holstein and Jersey dairy cows. There is very little data showing the physiological changes postpartum and their correlation with reproductive performance of Jersey. The objective of the two studies was to investigate the interactions between metabolic and physiological status during the first four weeks postpartum and fertility in Holstein and Jersey dairy cows.

Blood from 107 Holstein and 127 Jersey dairy cows was collected during the first four weeks of lactation. Progesterone, IGF-1, NEFA, BHB and glucose were measured to examine the effects of pregnancy status (pregnant to first insemination or pregnant after three inseminations) and parity. In Holstein cows, there was an effect of parity on IGF-1, NEFA, BHB and glucose concentrations. The hormone and metabolite concentrations were not associated with pregnancy outcomes after one or three inseminations. In Jersey cows, IGF-1, BHB and glucose concentrations were affected by parity. There was an effect of pregnancy status on NEFA concentrations.

In conclusion, we found limited data to sustain our hypothesis that metabolic and hormonal changes during the first four week of lactation have negative carryover effects on reproductive performance of Holstein and Jersey dairy cows later in lactation. Infertility and subfertility in dairy cows remains a problem in the dairy industry. More studies need to be done in this area to improve our understanding of the biology of early lactation and the mechanisms that link it with reproductive performance. This understanding may be the key to close the gap between high milk production and fertility in dairy cows.