Factors Affecting Expression of Estrus of Lactating Dairy Cows Using Activity Monitors

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The objective of this study was to determine parameters related to increased physical activity as a result of estrus expression. A total of 1163 estrus episodes from 346 lactating Holstein cows were recorded. Cows were monitored continuously using two activity systems, a collar-mounted device and a leg-mounted device. Peak of activity was defined as the highest index or percentage increase during an estrus episode (> 35 [collar] or 180% [leg]). Long duration estrus was defined as greater than 8h. Upon estrus detection, measures of BCS (body condition score) and blood samples were taken, and ovaries were scanned by *per rectum* ultrasonography to identify ovarian structures. Milk production was recorded daily and pregnancy diagnosis was performed at 42±7 d of gestation. Pregnancy per AI (P/AI) was higher for estrus episodes with high peak intensity (50 index or 321% relative increase) of physical activity compared to episodes with low peak. However, duration of estrus (long vs. short) did not influence P/AI. Follicular diameter and milk production had no significant correlation with the readings from the activity monitor devices. Greater parity number and low BCS can reduce estrus expression as measured by activity monitors. Further research is needed to correlate physical activity to endocrine parameters and pregnancy loss.

Implications:

The use of activity monitors can improve the number of animals bred by heat detection in a reproductive program. The information collected by these devices could also serve as markers for monitoring and prediction of reproductive success as well as health status. This study demonstrated that some of these parameters could be monitored over time for herd evaluation and a tool to select animals for different reproductive programs.