

Effect of Integrating Synchronization Protocols and Automated Estrus Detection Systems on Pregnancy Rate to First Postpartum Artificial Insemination

T.A. Burnett, A.M.L. Madureira, B.F. Silper, A.C. Fernandes, and R.L.A. Cerri

University of British Columbia, 2357 Main Mall, Vancouver, BC V6T 1Z4
Email: tracyanneburnett@gmail.com

The aim of this study was to compare two reproductive programs for first AI based on activity monitors and timed AI. Seven hundred and seventy-four lactating Holstein cows from two commercial farms (Farm A, n=322; Farm B, n=452) were enrolled. Animals were presynchronized with two injections of PGF followed by an Ovsynch protocol. Treatments were 1) TAI: all first insemination performed by timed AI and 2) ACT: first insemination based upon estrus detection by activity monitors after the presynchronization, whereas the remaining non-inseminated cows were enrolled onto Ovsynch. All animals had their body condition score (BCS; scale 1-5), hock score (HS; scale: 1-4), gait score (GS; scale:1-4) and corpus luteum presence by ovarian ultrasonography recorded twice during presynchronization. The ACT treatment had 41.5% of cows inseminated by estrus detection, whereas 91.3% of cows were bred by timed AI in the TAI treatment. Pregnancy per AI did not differ ($p=0.54$) and was 30.4% and 33.2% for ACT and TAI, respectively. Median days open was similar between treatments ($p=0.92$). From all cows in ACT inseminated at estrus, only 32.1% and 26.4% were considered lame ($GS>2$) and with a swollen hock ($HS>2$), respectively. Pregnancy per AI was greater in sound compared to lame cows (38.6% vs. 25.7%; $p<0.01$) as well as in healthy compared to swollen hocks (35.7% vs. 24.6%; $p<0.01$). Surprisingly, BCS did not affect the number of animals inseminated by estrus detection, but low BCS decreased pregnancy per AI. Only 10% of the detected estruses were comprised of cows which were not detected with at least one corpus luteum in the presynchronization. In conclusion, pregnancy per AI did not differ between treatments; however, gait score, hock score and cyclic status highly impacted fertility and the number of animals detected in estrus.

Implications: The use of activity monitors for automated estrus detection can be used strategically in a traditional reproductive program for first AI after calving. Inseminating animals upon estrus before submission to a timed AI protocol maintained similar fertility, but potentially reduced labour and pharmacological interventions compared with a more intensive program. Health of foot and legs and cyclic status greatly impacted the efficiency of activity monitors.