

Effect of a GnRH Injection after a Timed Artificial Insemination Protocol on the Conception Rate in Cattle

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A timed artificial insemination (TAI) protocol using GnRH and PGF2 α (OvSynch) has been applied in cattle industry worldwide. Although fertilization rate could be high when AI is conducted at a correct time, conception rate (CR) wouldn't be comparable to the fertilization rate. Early embryonic death is one the main reasons that decreases CR. It has been reported that GnRH administration after AI may be effective to prevent from embryonic death. The objective of this study was to evaluate the effect of a GnRH injection after a TAI protocol on CR in cattle.

On day 0 of the study, a total of 97 cows received IM injection of 10 μ g GnRH analog (buserelin) at a random stage of the estrous cycle. All the cows received IM injections of 25 mg PGF2 α and 10 μ g GnRH on days 7 and 9, respectively, and were bred by fixed-timed AI 16 h (day 10) after the 2nd GnRH injection. The animals were then randomly allocated either to a treatment group (n=51; 41 Holstein and 10 Japanese Black cows) or to a control group (n=46; 36 Holstein and 10 Japanese Black cows). Treatment group received a dose of GnRH (3rd GnRH) on day 21, while control group received no GnRH after TAI. Blood samples were taken from 65 out of the 97 cows on days 0, 7, 11, 21 and 25 to determine plasma estrogen (E2) level, progesterone (P4) level, and activity of early pregnancy factor (EPF), a protein detected in plasma in response to the presence of a newly fertilized egg in the oviduct.

Treated cows had significantly higher CR than control cows (61% vs 39%, P<0.05). Average E2 concentrations were lower and average P4 concentrations were higher on day 25 (4 days after 3rd GnRH) in treated cows than those in control cows. EPF positive rate on day 25 (15 days after TAI) in the animals diagnosed as non-pregnant on day 60 by rectal palpation was similar between treated cows (9/14, 64.3%) and control cows (15/21, 71.4%).

In conclusion, the use of GnRH 11 days after a timed AI protocol appears to be effective for reducing the risk of early embryonic death between 15 and 50 days post-AI, and improving conception rate.

Keywords: Cows, Early pregnancy factor, GnRH, Ovulation, Synchronization