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Effect of GnRH or Estradiol on Emergence of a New Follicular Wave, Follicular Development and Pregnancy Rate in a CIDR-Based Timed AI Protocol in Holstein Cows

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The objective of this study was to evaluate the effect of GnRH or estradiol in a CIDR-based timed AI (TAI) protocol on follicular turnover, synchronized ovulation and pregnancy rates in Holstein cows. Cows were treated at random stages of the estrus cycle with an insertion of an intravigal progesterone (1.9 g) device (CIDR, Day 0) and either no other treatment (control group; n=10), injection of 100 ug fertirelin acetate (GnRH group; n=10) or 4 mg estradiol benzoate (estradiol group; n=10). Seven days later devices were removed and an injection of 25 mg $PGF_{2\alpha}$ was administered. On Day 9, 100 ug GnRH was administered. Cows received a fixed-time insemination 16 h after injection of the GnRH. The ovaries of each cow were examined every 24 h from Days 0 to 9, on Day 11, and Day 14 of treatment by transrectal ultrasonography. Emergence rate of a new follicular wave was higher ($P<0.01$) in the GnRH group (9/10) and estradiol group (7/10) than in the control group (2/10). Interval to a new follicular wave was longer ($P<0.05$) in the estradiol group (5.0 ± 1.0) than in the GnRH group (3.1 ± 0.4). The average diameters of dominant follicles on Day 7 and preovulatory follicles on Day 9 in the GnRH group were greater ($P<0.05$) than those in the estradiol group. The proportion of cows with synchronized ovulation was not different ($P>0.05$) among 3 groups. The pregnancy rate in the GnRH group (7/10) tended to be higher ($P=0.14$) than in the control group (3/10) or estradiol group (3/10). We conclude that GnRH in a CIDR-based TAI protocol effectively induces a new follicular wave, follicular development and synchronized ovulation, and offers a better pregnancy rate in Holstein cows.

Key words) *CIDR, Estradiol, GnRH, New Follicular Wave*