

Southeast Dairy Producer's Check-Off Program

Research Summary

Development of a reproductive strategy to reduce the use of reproductive hormones in lactating dairy cows

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Implications

Selecting multiparous cows for first AI in estrus based on EPEC reduced the use of reproductive hormones without impairing the likelihood of pregnancy. The long-term use of AMD may expedite the establishment of pregnancy among cows that do not display an intense estrus early-postpartum.

Methods

Holstein cows from two herds ($n = 1,930$) were enrolled and fitted with an AMD at 251.0 ± 0.4 d of gestation. Early-postpartum estrus characteristics (EPEC; intense estrus = heat index ≥ 70 ; 0 = minimum, 100 = maximum) of multiparous cows were evaluated at 40 (Herd 1) or 41 (Herd 2) days in milk (DIM) and EPEC of primiparous cows were evaluated at 54 (Herd 1) or 55 (Herd 2) DIM. Control cows were subjected to the Double-Ovsynch protocol for first postpartum AI at fixed time at 55 and 56 DIM (primiparous, Herds 1 and 2, respectively) and 41 and 42 DIM (multiparous, Herds 1 and 2, respectively). Control cows were re-inseminated when detected in estrus by herd personnel [Herd 1: visual detection of signs of estrus; Herd 2: visual detection of signs of estrus and activation of EstrotecTM (Rockway Inc., Spring Valley, WI)]. Cows in the targeted reproductive management (TRM) that had at least one estrus detected by the

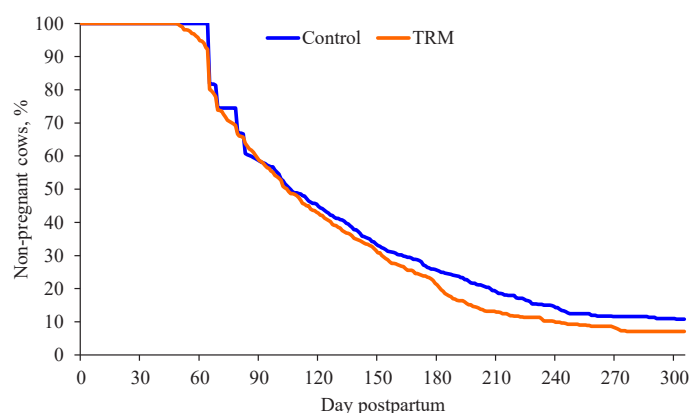


Figure 1. Effect of treatment on pregnancy rate up to 305 days postpartum. Control: Cows subjected to the Double-Ovsynch protocol (Souza et al., 2008) for first postpartum AI at fixed time at 55 and 56 DIM (primiparous, Herds 1 and 2, respectively) and 41 and 42 DIM (multiparous, Herds 1 and 2, respectively). Cows re-inseminated when detected in estrus by herd personnel [Herd 1: visual detection of signs of estrus; Herd 2: visual detection of signs of estrus and activation of EstrotecTM (Rockway Inc., Spring Valley, WI)]. TRM: Cows that had at least one estrus detected by the automated device with heat index ≥ 70 (0 = minimum, 100 = maximum) by 54 and 55 DIM (primiparous; Herds 1 and 2, respectively) and 40 and 41 DIM (multiparous; Herds 1 and 2, respectively) were allowed to be inseminated upon estrus detected by the automated device starting at 64 DIM (primiparous) and 50 DIM (multiparous). Cows not inseminated in estrus within 42 d were submitted to the Double-Ovsynch protocol and fixed-time insemination. Cows that were not detected in estrus or had heat index < 70 were subjected to the Double-Ovsynch protocol and fixed-time insemination as in the control treatment. Cows were re-inseminated upon estrus detected by the automated device. Control | median = 106.0 d, mean (\pm SE) = 137.7 ± 2.9 d, TRM | median = 105.0 d, mean (\pm SE) = 127.2 ± 2.5 d.

automated device with heat index ≥ 70 (0 = minimum, 100 = maximum) by 54 and 55 DIM (primiparous; Herds 1 and 2, respectively) and 40 and 41 DIM (multiparous; Herds 1 and 2, respectively) were allowed to be inseminated upon estrus detected by the automated device starting at 64 DIM (primiparous) and 50 DIM (multiparous). Cows not inseminated in estrus within 42 d were submitted to the Double-Ovsynch protocol (Souza et al., 2008) and fixed-time insemination. Cows in the TRM that were not detected in estrus or had heat index < 70 were subjected to the Double-Ovsynch protocol and fixed-time insemination as in the control treatment. All cows in the TRM were re-inseminated upon estrus detected by the automated device.

Results

The interaction between treatment and parity affected pregnancy at 66 d after the first AI (primiparous: control = 37.6%, TRM = 27.4%; multiparous: control = 41.0%, TRM = 44.7%). The TRM treatment increased re-insemination in estrus (control = 48.3%, TRM = 70.5%). Pregnancy at 66 d after re-insemination tended to be affected by the interaction between treatment and EPEC (no intense estrus: control = 25.3%, TRM = 32.0%; intense estrus: control = 32.9%, TRM = 32.2%). Similarly, the interaction between treatment and EPEC affected pregnancy by 305 DIM (no intense estrus: control = 80.8%, TRM = 88.2%; intense estrus: control = 87.1%, TRM = 86.1%). Although treatment did not affect the number of treatments with reproductive hormones among cows that had not had an intense estrus (control = 10.5 ± 0.3 , TRM = 9.1 ± 0.2 treatments/cow), cows that had an intense estrus enrolled in the TRM treatment received fewer treatments with reproductive hormones (2.0 ± 0.1 vs. 9.6 ± 0.2 treatments/cow).

Table 1. Effects of treatment on outcomes referent to first post-partum insemination and re-inseminations.

Variables	Primiparous		Multiparous		P – value		
	Control ¹	TRM ²	Control ¹	TRM ²	Treatment	Parity	Treatment x Parity
	First postpartum insemination						
Insemination in estrus, %	0.0	55.8	0.0	42.9	< 0.01	0.02	-
Pregnancy 31 d	40.5 (279)	29.2 (260)	44.5 (470)	50.3 (471)	0.22	< 0.01	< 0.01
Pregnancy 66 d	37.6 (277)	27.4 (259)	41.0 (463)	44.7 (468)	0.15	< 0.01	< 0.01
Pregnancy loss	6.3 (111)	5.3 (75)	5.9 (202)	10.7 (234)	0.14	0.44	0.28
	Re-inseminations						
Re-insemination in estrus, % (\pm SEM)	59.4 (475)	78.1 (498)	41.5 (646)	64.1 (590)	< 0.01	< 0.01	0.95
Pregnancy 31 d	31.2 (470)	33.6 (497)	33.8 (636)	36.6 (579)	0.17	0.69	0.59
Pregnancy 66 d	31.2 (470)	33.6 (497)	33.8 (636)	36.6 (579)	0.14	0.76	0.51
Pregnancy loss	10.3 (143)	7.8 (166)	11.3 (212)	8.2 (208)	0.19	0.56	0.99

¹Control: Cows subjected to the Double-Ovsynch protocol (Souza et al., 2008) for first postpartum AI at fixed time at 55 and 56 DIM (primiparous, Herds 1 and 2, respectively) and 41 and 42 DIM (multiparous, Herds 1 and 2, respectively). Cows re-inseminated when detected in estrus by herd personnel [Herd 1: visual detection of signs of estrus; Herd 2: visual detection of signs of estrus and activation of Estrotec™ (Rockway Inc., Spring Valley, WI)].

²TRM: Cows that had at least one estrus detected by the automated device with heat index ≥ 70 (0 = minimum, 100 = maximum) by 54 and 55 DIM (primiparous; Herds 1 and 2, respectively) and 40 and 41 DIM (multiparous; Herds 1 and 2, respectively) were allowed to be inseminated upon estrus detected by the automated device starting at 64 DIM (primiparous) and 50 DIM (multiparous). Cows not inseminated in estrus within 42 d were submitted to the Double-Ovsynch protocol (Souza et al., 2008) and fixed-time insemination. Cows that were not detected in estrus or had heat index < 70 were subjected to the Double-Ovsynch protocol and fixed-time insemination as in the control treatment. Cows were re-inseminated upon estrus detected by the automated device.