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Review article

Pivotal periods for pregnancy loss during the first trimester of gestation in lactating dairy cows

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Abstract

Loss of pregnancy can occur at many different stages of gestation and for a variety of causes but clearly produces a negative impact for reproductive and economic performances

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pregnancy loss during this period targeting improved oocyte quality by alleviating heat stress, inflammatory diseases, and body condition loss, and by increasing progesterone concentrations during preovulatory follicle development. The second pivotal period, from Days 8 to 27, encompasses embryo elongation and the classical “maternal recognition of pregnancy” period with losses averaging ~30% but with surprising variation between farms (25%–41%). Maintenance of the CL of pregnancy is produced by the embryonic signal interferon-tau and alteration in uterine secretory patterns of prostaglandins F2 α , E1, and E2. Failures or delays in trophoblast elongation and/or embryonic development result in loss of pregnancy during the second pivotal period possibly due to suboptimal histotroph. The third pivotal period is during the second month of pregnancy, Days 28 to 60, with losses of ~12% based on a summary of published results from more than 20,000 pregnancies in high-producing dairy cows. Delays or defects in development of the chorioallantoic placentomes or embryo result in CL regression or embryo death during this pivotal period. Finally, a fourth period during the third month of pregnancy has reduced pregnancy losses (~2%), compared with the first three periods but can be elevated in some cows, particularly in those carrying twins in the same uterine horn. Thus, there are varied causes for pregnancy losses during each pivotal period that correspond to key physiological changes in the embryo, uterine environment, and ovary. Similarly, strategies to reduce these losses are likely to require a multifaceted approach using rational methods that target the critical physiology in each pivotal period.

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Keywords

Blastocyst; Dairy cattle; Pregnancy loss

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