Factors Affecting Embryonic Mortality in Beef Cattle

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After months of hard work and dedicated management, many producers have completed their breeding season in hopes of obtaining pregnancy rates of 95 – 100%. Cow and calf producers strive to lower break-evens each year by improving production capabilities. All cows and heifers should undergo a pregnancy evaluation approximately 45 – 60 days after the completion of the breeding season. Females that are not confirmed pregnant would unnecessarily increase production costs, and should be removed from the herd. There are a few situations which offer alternatives to the fate of these open females such as moving them to another breeding season, continuing to breed until they are pregnant then selling them as bred, or sending them to the stockyards. Whatever the case may be, open females increase feed and production costs without returning any revenue to the operation.

How can low pregnancy rates be prevented? Bulls should undergo a breeding soundness exam, the diet should be balanced, and body condition should be evaluated throughout the year. But what if cattle are still confirmed open? In these situations, the females may have been bred during the breeding season, but that pregnancy terminated due to embryonic mortality.

Illinois researchers report that more than 60% of all losses in potential calf crop are due to three factors: failure to mate, failure to conceive, and failure to establish sustained embryonic development. Embryonic loss can occur at any stage of embryo development, but most losses occur before day 8 of the pregnancy. Researchers with the USDA's Agricultural Research Service have reported that approximately 20% of pregnancies in cattle fail between day 7 and 16 of the pregnancy. If an embryo were terminated before day 8, the female would cycle as if she had never become pregnant; if it is terminated after day 8, then the estrous cycle could be delayed (Knox and Kesler, University of Illinois).

For pregnancy to occur, the female's body must recognize she is pregnant before her next estrous cycle. If this recognition does not occur, hormonal developments that act on the ovary will cause the initiation of a new estrous cycle and any viable embryos would be destroyed (Geisert et al., 1988).

Genes that play a role in embryonic development could be mutated or improperly expressed to prevent pregnancy. Kansas State University reports that if gene expression resulted in embryonic loss it would generally occur within the first five days of embryonic development.

Research from James et al., (1991) reported that toxic plants can cause abortion, skeletal abnormalities, retard fetal growth and even embryonic death. Each year

producers should evaluate pastures for uncommon or unusual weeds. If uncommon plants are identified, measures should be taken to prevent consumption. Toxic plants have been reported to effect spermatogenesis in bulls, oogenesis in cows, and even affect calves through milk consumption (C. Lamb, KSU).

Each year as producers prepare for the breeding season, many producers will vaccinate for reproductive diseases such as Vibro, IBRV, IPV and BVD. Consult your local veterinarian for recommendations on vaccination protocols relevant to your area.

There are many management considerations that can play an important role in the profitability of cow and calf operations. Educating your labor force is an important step in reducing preventable mistakes. Although embryonic mortality is difficult to identify, understanding how it can occur and what steps can be taken to help in its prevention are essential when trying to improve overall production. If you have any questions regarding this topic or any others related to beef cattle, feel free to contact your local County Extension Agent or contact me at (912) 681-5639.