

Tips for Reducing Embryonic Loss

8 a.m. session, Wednesday, Dec. 7, 2005

Presenter: Tom Geary, USDA-ARS, Miles City, Mont.

RAPID CITY, SOUTH DAKOTA (Dec. 7, 2005) — Embryonic loss may represent the single greatest economic loss for cow-calf producers, Tom Geary, U.S. Department of Agriculture (USDA) Agricultural Research Services (ARS), told producers at the 2005 Range Beef Cow Symposium in Rapid City. “With 40 million beef cows and heifers exposed to breeding each year in the U.S., annual losses exceed \$1.2 billion. ... If we could prevent embryo wastage in just five out of every 100 cows, we would wean an additional 2,100 pounds (lb.) per 100 cows.”

Geary reviewed the estrous cycle and pregnancy stages, noting the differences between early embryonic mortality (EEM; fertilization to day 27), late embryonic mortality (LEM; day 28 to day 42) and fetal mortality (after day 42). The majority of losses are EEM. Geary then divided the causes of embryonic loss in four categories: genetics, nutrition, environment and miscellaneous.

Genetics. Genetic abnormalities account for approximately 10% of embryonic losses, with the most common defect being an abnormal number of chromosomes resulting from polyspermy (fertilization by more than one sperm). Polyspermy is more common when artificial insemination (AI) occurs closer to ovulation. Although fertilization rate is lower when insemination occurs closer to the onset of estrus, the embryonic survival rate is higher. Geary recommended Aling 12 hours after the onset of estrus.

Nutrition. Embryonic losses due to nutritional factors represent approximately 32% of losses, Geary said. Cows bred when they are gaining weight have higher pregnancy rates than cows bred when they are losing weight. He recommended determining cows' body condition scores (BCS) shortly after calving and adjusting diets accordingly.

He cautioned producers against selecting for excess milk, since all lactating cows have a negative energy balance. “Use early weaning at the start of the breeding season. You can go from a negative energy balance to a positive energy balance in just two days,” which will have a positive effect on fertility, Geary said.

Some studies show feeding fishmeal suppresses oxytocin-induced prostaglandin



Tom Geary, of USDA's Agricultural Research Service, discussed causes of and ways to prevent embryonic loss. [PHOTO BY LYNN GORDON]

secretion in heifers with low progesterone concentrations. Geary explained that this suggests fishmeal “may improve an embryo’s ability to signal maternal recognition of pregnancy.”

Environment. Environmental factors influence approximately 15% of embryonic losses. Geary cited heat stress and handling stress as the most common environmental culprits.

He explained that gathering and handling cattle through working facilities is perceived as being more stressful by heifers than cows. Thus, injectables designed to inhibit prostaglandin production and increase pregnancy rates are often less effective in heifers than in cows. Geary said the stress caused by handling alone is enough to counteract the possible benefit of such an injection in heifers.

Miscellaneous. “Progesterone is obligatory for the establishment and maintenance of pregnancy,” Geary said. The use of a CIDR, gonadotropin-releasing hormone (GnRH) or human chorionic gonadotropin (HCG) may increase progesterone concentrations, but Geary cited several studies showing their inconsistent ability to improve embryo survival and pregnancy rates.

— by Meghan Soderstrom, assistant editor, Angus Productions Inc.
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