

Pregnancy Loss

From hormone levels to nutrition factors, speakers get to the root of what causes pregnancy loss.

Story & photos by **Troy Smith**, field editor

Reproductive Strategies

Cow-calf producers who utilize artificial insemination (AI) often assume that females found open at pregnancy-testing time failed to conceive — that fertilization of an egg did not take place. However, reproductive physiologists say fertilization usually does occur when fertile females are inseminated, either by AI or natural service. In many cases, embryo loss is the reason they are later found to be open.

Keith Inskeep said many early embryo losses occur because the reproductive tract of the cow has concentrations of certain hormones that are too low or too high.

According to the reproductive physiologist at West Virginia University–Morganstown,



► Keith Inskeep, reproductive physiologist at West Virginia University–Morganstown, explained how hormone levels can cause embryo loss.

about 57% of failed pregnancies in cattle actually result from embryo loss (see Fig. 1). Inskeep talked about reasons why they happen during the Applied Reproductive Technologies in Beef Cattle (ARSBC) Symposium Oct. 15-16 in Staunton, Va.

There can be other reasons, including genetic defects, but Inskeep said many early embryo losses occur because the reproductive tract of the cow has concentrations of certain hormones that are too low or too high. Estrogen, for example, is produced in the ovaries to prepare the uterus for pregnancy, but too much estrogen is detrimental.

“The presence of a persistent (aged)

ovarian follicle results in higher exposure to estrogen and creates higher potential for embryonic death,” said Inskeep, explaining how detrimental amounts of estrogen can result in defective ova (eggs) that can be fertilized, but resulting embryos soon die. Elevated estrogen at 30-35 days of gestation may also contribute to pregnancy loss. This is the time of placenta formation known as placentation. Though high in dairy cows, Inskeep said losses after onset of placentation are low in beef animals that are free of disease, except in reported cases of inappropriate vaccinations.

Progesterone is also essential to initiation and maintenance of pregnancy. Inadequate levels can cause both early and late embryonic losses.

“Low concentrations of progesterone lead to excessive concentrations of other hormones that may cause embryonic death,” stated Inskeep.

He reminded producers that body condition affects response to progesterone, emphasizing the need to have heifers properly developed and cows in adequate body condition well in advance of breeding.

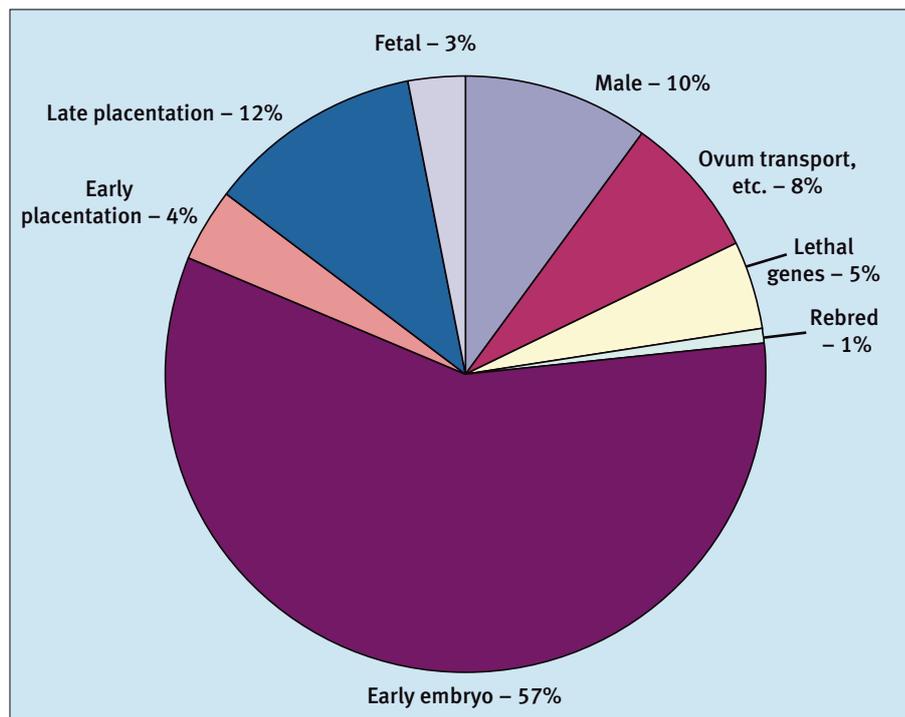
The Virginia experience

There are plenty of reasons why bred cows or heifers might suffer pregnancy loss or fail to deliver a viable calf. Causes of pregnancy loss among Virginia beef herds were discussed by Virginia Tech Extension Veterinarian John Currin.

Experimenting with tub-grinding hay, John Currin says he wasted more in diesel than he saved in hay. A higher fiber content of the mixed ration resulted in a lower dry-matter intake than expected and, therefore, a lower energy intake. Such management decisions can put cows at risk for suffering pregnancy loss or losing a calf at or shortly after birth, and that can be costly (see Table 1).

The Virginia Tech Extension veterinarian cautioned producers to test the quality of

Fig. 1: Distribution of pregnancy failures in cattle



Source: Keith Inskeep presentation, 2013 ARSBC, Staunton, Va.

► Access to shade, alternative forage to fescue and shifting fall calving to cooler months are recommendations from veterinarian John Currin to improve pregnancy rates.



PHOTO BY SHAUNA ROSE HERMEL

such rations, paying attention to neutral detergent fiber (NDF) rather than crude protein or energy.

Currin said reasons for abortions, stillborn and weak-born calves are often relatively easy to diagnose. More frustrating are cases involving failed pregnancies for which determination of cause is uncertain. For many such cases, Currin suspects multiple factors are involved.



► Virginia Tech Extension Veterinarian John Currin shared results of investigating a reported increase in pregnancy loss among Virginia herds beginning in fall 2012.

He shared experiences from Virginia producers reporting increases in the incidence of pregnancy loss, beginning in fall 2012, as well as data Virginia Tech veterinary personnel had gathered from their work with beef herds managed by the Virginia Department of Corrections. According

to Currin, pregnancy-loss issues varied considerably, and no clear patterns emerged from the limited data. Consideration of recent trends in management practices did spawn a theory.

According to Currin, fall calving is popular in Virginia and more producers are calving earlier than before, in July and August. Also increasing is the practice of fencing cattle away from ponds and waterways. This is laudable for protection of water quality, but it often results in cattle being fenced away from shaded areas near the water. Calving in the summer and less opportunity for cattle to find heat abatement may be contributing to pregnancy losses.

“The best theory is that it is a multiplex problem involving heat, endophyte-infected fescue and immune system function,” said Currin. “I think it is most likely a combination of those factors. It probably won’t happen every year, but it is likely to happen again.”

Hot weather and associated fescue toxicity problems are facts of life in Virginia. There is little, if any, relief from heat stress when cattle do not have access to shade. Additionally, cattle grazing “hot” fescue pastures can experience nutritional stress due to reduced forage intake and reduced forage quality. The cumulative challenge can be great for cows in late gestation and during the calving season, particularly if immune function has not been optimized through an appropriate vaccination program.

For herds in which problems exist, but definite answers have been elusive, Currin offered the following recommendations:

- Make sure cattle have access to shade, as well as ample fresh water.
 - Seek forage alternatives for cows grazing toxic fescue during late gestation.
 - Consider adjustment of calving season, perhaps avoiding July and August.
- “I think we all need to consider why

CONTINUED ON PAGE 128

Table 1: Cost of a lost pregnancy (a.k.a.: How much can we spend to fix this problem?)

	Cow cost from weaning to end of calving season				
Net profit/calf	\$50	\$100	\$200	\$300	\$400
\$100	150	200	300	400	500
\$150	200	250	350	450	550
\$200	250	300	400	500	600
\$250	300	350	450	550	650
\$300	350	400	500	600	700
\$350	400	450	550	650	750
\$450	500	550	650	750	850

Source: John Currin presentation, 2013 ARSBC, Staunton, Va.

Pregnancy Loss CONTINUED FROM PAGE 127

we are doing things the way we are, and also consider the potential negative consequences,” Currin stated.

Abortion diagnostics

If you keep livestock long term, you will experience death losses. Most cow-calf producers expect to suffer some losses due to abortion and stillborn calves. However, they typically expect those to occur in a very small percentage of pregnancies. When they

occur in numbers exceeding expectations, producers want to know the reason or reasons, and whether action is needed to prevent further disappointments. That’s usually when they turn to the veterinary diagnostician.

“Too often the answer to the problem is left dangling between the cow’s hocks,” stated Larry Holler, encouraging cattlemen to submit the placenta, as well as the fetus or calf, when seeking answers to why a cow aborted or lost a calf.

According to the South Dakota State University veterinarian and reproductive disease specialist producers often provide too little evidence to diagnostic laboratories. Good answers, he said, depend on having an accurate herd history — including information about herd nutrition, immunizations and purchases — and a good submission.

What is a good submission? Ideally, it includes the aborted fetus (or dead calf) and the placenta. However, producers more often provide only the fetus or calf. Holler said that is sometimes enough. Pieces and parts (the lung, liver, spleen, heart and other tissues with gross lesions) may even work, but Holler called the placenta valuable evidence.

“I would argue that the placenta is more valuable than the fetus,” stated Holler. “People say I’m obsessed with the placenta, but if I have to choose, I’ll take the placenta.”

Holler said abortions, stillborns and weak calves are often the work of various infectious agents that can be bacterial, viral or fungal. However, he is finding more problems resulting from what he calls “opportunistic pathogens.” These are organisms common to the environment that don’t normally cause problems. Numerous bacillus species of bacteria present in the soil make good examples.

Holler suspects the feedstuffs used during recent years and the ways they are processed and fed are to blame. He noted that because of high feed costs and drought, more low-quality forages are fed to cows. This includes baled corn stover and other crop residues that contain dirt. These forages, as well as hay containing spoilage are ground and blended in total mixed rations.

“Cows can’t be selective because everything, even spoilage and dirt, is ground and mixed together,” said Holler, noting that limit-feeding of cows also discourages selectivity.

Use of vertical mixer wagons has increased and bale processors have become quite common. Drought conditions have led to



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more mixed rations and processed hay being fed on bare soil. In some situations, Holler believes every bite includes a fair amount of soil and soil-born bacteria. In sufficient concentrations, these “dirt bugs” can cause trouble.

“The bacteria peck at the placenta, doing a little damage here and a little there. It adds up, and the total damage can be significant,” Holler explained, adding that reproductive consequences are most common in immune-compromised cows.

Holler said mycotoxins produced by fungus also may cause abortions. Producers should keep that in mind if their feedstuffs appear moldy.

“If there is ‘white’ in it, you’re probably growing a fungus of some flavor. Feed that to something that doesn’t have a uterus. It would be better yet to throw it away,” advised Holler.



Editor’s Note: *Inskeep, Currin and Holler spoke during the ARSBC session focused on dealing with pregnancy and birth losses. Visit the Newsroom at www.appliedreprostrategies.com/2013 to listen to their presentations and to view their PowerPoint slides and proceedings papers. Comprehensive coverage of the symposium is available online at www.appliedreprostrategies.com/2013. Compiled by the Angus Journal editorial team, the site is made possible through sponsorship by the Beef Reproduction Task Force.*