

# Calf Keeping

Knowns and unknowns of pregnancy loss.

by *Heather Smith Thomas*

Pregnancy loss in beef cow herds costs the collective industry billions of dollars annually, according to multiple studies. Yet, these losses are commonly unseen.

“Early pregnancy loss is not noticed, and you don’t have a clue because we rarely do early pregnancy diagnosis in beef cattle,” says Ahmed Tibary, DVM, professor of theriogenology at Washington State University’s Department of Veterinary Clinical Sciences. “And if cows are pregnancy tested early or into mid-gestation, a few of those that are determined to be pregnant will lose the fetus between that time and when they would have calved. It’s hard to quantify early pregnancy loss in beef cows, since we often don’t see them frequently if they are out in big pastures.”

For perspective, Tibary explains 40-56% of embryos are lost after

fertilization, and 70-80% of the losses occur in the first month of pregnancy.

Generally speaking, pregnancy losses are categorized as embryonic death, abortion and stillbirth.

Cattle producers should always suspect the possibility of pregnancy loss whenever the calving season is longer than average or more late-calving cows than normal are discovered at preg-check, according to Tibary. Some of the cows that settled late may have bred early but lost their pregnancies and rebred on a later cycle.

“In beef cattle, we like to have most of the pregnancies established (cows settled) after the first cycle,” Tibary says. “If the herd is well managed, with no problems nutritionally or health-wise, cows should breed up very quickly.”

Many producers allow two cycles for heifers and no more than three cycles for cows. Early pregnancy loss typically occurs so early that it doesn’t affect the

length of time in which the cow returns to estrus. The cow comes back in heat on schedule, just as though she hadn’t been bred, Tibary explains.

When a cow is cycling and bred to a bull with normal fertility, chances of fertilization are quite high — well above 90%, according to various studies.

“Most of the embryos that are lost die before the eighth day after fertilization, before or just as they come down the fallopian tube into the uterus,” Tibary explains. “These embryos are already degenerating. There is also a substantial loss observed before day 14. When you look at how many of these fertilized eggs are lost, you realize the overwhelming majority of pregnancy losses occur before day 14, which means the loss will not affect the cow’s return to heat.”

A much lower number of losses occur later in gestation. In these instances, the producer may see evidence of the abortion



and want to send the aborted fetus to a diagnostic lab to determine the cause of loss. However, the success rate of determining the cause of loss is less than 50%, according to Dietrich Volkmann, DVM, professor of theriogenology at University of Missouri's College of Veterinary Medicine. He adds that's true even when both the fetus and the afterbirth are available for examination.

Determining the cause of early pregnancy loss is even more difficult.

"Some producers use AI and synchronize the animals, breeding them on the same day. At some point later, they turn out cleanup bulls. Then they want to know which cows are pregnant to AI and which are pregnant to the cleanup bull, a determination that must be done no later than 100 days after the AI," Volkmann explains.

"At that pregnancy diagnosis, the animals that became pregnant to the bull might be only 40 or so days pregnant," Volkmann says. "Quite a few pregnancies we diagnose at 40 days never make it to term. There are many losses for which we have no evidence other than the fact that the cow was originally pregnant. If you do pregnancy exams at weaning time, those cows are well beyond 100 days in mid-gestation. Pregnancy losses — for whatever reason

— are less likely to happen after 100 days than before."

### **Infectious causes**

"Usually when there's a poor pregnancy rate, we suspect infectious causes, like trichomoniasis or campylobacteriosis, but there may be non-infectious causes as well," Tibary says.

As for known infectious causes, Volkmann notes producers can vaccinate against such culprits as infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD), leptospirosis and vibriosis (campylobacteriosis).

"When cattle are vaccinated, we don't find BVD, IBR, leptospirosis or vibriosis causing abortions," Volkmann says. "We can diagnose those in our labs, and they are not the causes of very many abortions anymore. So, we need to focus on the causes for which we currently don't vaccinate for or acknowledge that there are causes we don't know about yet."

For instance, Volkmann believes the industry should revisit the role of neospora caninum.

"We know it causes abortions in dairy cows but have not fully investigated the role of neosporosis in beef cattle," Volkmann explains. "We need fetuses for that. Occasionally, we get some and can diagnose neosporosis, but maybe we

should assess how many beef herds are actually infected. I've worked on this a little and have yet to find a beef herd that doesn't have any neosporosis. This disease doesn't pose a huge threat for an abortion storm; it's more likely to cause a trickle of abortions."

Volkmann adds that producers can become accustomed to a trickle of abortions and accept them. But, he says, "Each one of those losses is not 'normal' because something went wrong. We need to discover what went wrong."

### **Noninfectious causes**

Most noninfectious causes of abortion are familiar, such as toxic plants like poison hemlock, ponderosa pine needles, etc. There are also molds and fungi that cause problems.

"We can recognize fungal infection, just as we can bacterial infection, when we examine the fetus and placenta. We can find the fungus and culture it. Sometimes toxins produced by fungi (mycotoxins) cause more harm than the fungus," Volkmann says.

Although some producers and veterinarians believe fescue toxicosis (from mycotoxins produced by a fungus in the fescue plant) causes abortion, Volkmann says there is no direct evidence.

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“There is very little scientific support for that, but there can be other mycotoxins that cause problems,” Volkmann explains. “We know that some are estrogenic, and too much estrogen will interfere with ability to conceive a pregnancy. Certain clovers in pasture can affect pregnancy rate, interfering with early pregnancy. I don’t know to what extent some mycotoxins might interfere with later loss of pregnancy.”

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Nitrate poisoning can cause abortion in certain instances, and diagnostic labs have procedures to diagnose nitrate poisoning.

“It can be a handy culprit to pick because we use so much nitrogen fertilizer in agriculture. Excess intake of nitrates, either through plants that concentrate nitrates or through water contaminated with excess nitrites and nitrates, can cause problems. But if this were the missing piece of the puzzle, I think diagnostic labs would be able to determine this from the aborted fetuses,” Volkmann says.

There are many unknown causes, too.

“The fact we don’t know what causes some abortions is frustrating, and we tend to make assumptions. We blame the weather — heat, drought — or stress,” Volkmann says. “A producer might say he worked cows and some aborted, but pregnancy is wonderfully designed so that stress in the dam will not cause an abortion. It’s hard to stress an animal enough for her to abort,” Volkmann explains.

With that said, Volkmann explains a too-high heat index (temperature and

humidity) is recognized as the cause for some early pregnancy loss. As an example, breeding cows in July and August can be challenging in some parts of the nation, like Florida, Texas and the Midwest.

Losses from heat stress in this instance would occur in the first week or so after breeding, but the heat and humidity can also have a long-term effect on quality of the eggs. If fertilized, those eggs produce a very poor-quality embryo, resulting in very early loss. Those cows would return to heat as though they didn’t have a bull with them.

### Avenues of promise

New and exciting research seeks to identify genetic factors associated with early embryonic loss, from both the sire and the dam.

“We know that some errors in chromosomes on the sire side can lead to faulty embryos and a higher incidence of early embryonic death. Sometimes one bull’s semen will create embryos that are not viable, and the producer may have to change bulls to get better results,” Tibary says.

On the female side of the equation, Tibary explains the uterus of some cows has less ability to interact properly with the embryo.

“Research is now focusing on this problem, using heifers that have been identified as not being able to maintain pregnancy for this reason. We are looking to see if there are certain genes that are not expressed in these cattle, which would not allow them to dialog with the embryo,” Tibary says. “Heifers with this problem have a high likelihood of failing to maintain a pregnancy for their entire life. This is a good reason to cull any heifer that does not settle in her first breeding season.

“We don’t always realize the reason, but it’s simply good management never to give a heifer a second chance. Everything considered, if heifers are managed properly, they should become pregnant quickly unless something is abnormal. If a heifer had good nutrition, the bull is fertile, etc. she really has no excuse to not become pregnant.” BA

## Preventing Abortions

Diligent vaccination is key to preventing pregnancy losses.

“If a particular herd has high antibody titers to leptospira and has abortions, we can move the lepto vaccination to the time of pregnancy examination — vaccinating closer to the time when it’s more likely the cow would abort (late pregnancy) — so her antibody titers would be higher,” explains Dietrich Volkmann, DVM, professor of Theriogenology, University of Missouri’s College of Veterinary Medicine.

“Several of my clients assume they know what causes abortions on their farm because they sent one to a lab once, and it was lepto,” Volkmann says. “Or maybe some years back there were some dead calves and Dr. ‘So-and-So,’ who is now retired, said it was selenium deficiency. We need to be honest and keep trying to find the real answers.”

“There’s often nothing we can do about sporadic abortions. Occasionally bacteria get into the uterus and cause an abortion; at least that’s what we assume. Some of the bacteria we isolate, however, might not be the cause; they might be incidental findings because the sample was contaminated. It gives us a name of a bacterium that might have caused the abortion, but we don’t really know.” BA

**Editor’s note:** Heather Smith Thomas and her husband, Lynn, have ranched near Salmon, Idaho, for more than four decades. She also writes cattle articles that appear in numerous U.S. and Canadian cattle publications, including *Baldy Advantage*. She is the author of numerous books, including “The Cattle Health Handbook.”