

INFERTILITY IN CATTLE

Infertility is the diminished or absent capacity to produce viable offspring. There are many other causes of infertility in cattle. The goal of a breeding program should be to have 90-95% of cows bred in a 65 day breeding season. If pregnancy/calving rates are below this, finding out why is important. There are both infectious and non-infectious causes of infertility.

Non Infectious Causes of Infertility

Female

- Nutrition
- Stress
- Genetics

Male

- Failing to use a bull that has passed a breeding soundness exam
- Insufficient bull numbers for cow numbers and environment
- Bull(s) with poor libido

The most common cause of infertility in beef herds is poor cow nutrition. Over conditioning can also be detrimental, especially in heifers, but is far less common a problem. Body condition before calving, after calving, and at breeding can all contribute to infertility. Cows that calve thin but are gaining at breeding will have better conception rates than cows that remain thin. However, cows that maintain good body condition throughout pregnancy will have the best chance of breeding back. Most commonly protein and energy are deficient in beef cattle diets. But vitamin and mineral deficiencies can also cause infertility. Copper is deficient in forages in parts of LA which can lead to deficiencies in animals. Infertility, poor vaccine response, diarrhea, weight loss, poor growth, weak calves and calf health problems can all stem from copper deficiency.

Stress can cause pregnancy wastage at any stage of gestation. Low stress handling when processing cattle will minimize this problem. Heat stress is also a major cause of infertility, especially early in pregnancy. High humidity exacerbates heat stress and would be expected to impact conception rates even more. Extending your breeding season late into the summer to get extra cows bred is probably a futile exercise.

Finally, genetics and other environmental factors play a role in infertility. Selection for other production traits can sometimes lead to selection against reproductive ability. There are breed differences in reproductive efficiency, especially when comparing *Bos taurus* to *Bos indicus* breeds. In general, *Bos indicus* breeds are superior in subtropical climates, but have later puberty and longer intercalving interval than *Bos Taurus* breeds. There are wide variations between individuals, so selecting for early maturity and shorter intercalving interval will increase efficiency over time. Recent research has also focused on the influence of cow nutrition during gestation and its impact on subsequent growth and fertility in their female offspring ("fetal programming"). Heifers born to cows that are deprived of protein supplementation during late gestation, have lower average daily gains, delayed onset to puberty, and lower conception rates compared to heifers born to protein supplemented cows. Even if heifers are fed properly once they are born, nutrient deprivation in utero negatively impacts their future fertility.

Bulls should have a breeding soundness exam prior to each breeding season. Even if a bull passed last year, there is no guarantee he will pass this year. Bull infertility due to heat stress is a major problem in LA. Although there are general

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rules for how many bulls are needed for a group cows, this varies highly between herds. The age of the bulls, single vs. multi sire breeding groups, terrain and climate can all affect how many bulls are needed. Young bulls, particularly in breeding groups with older bulls, will not service as many cows as mature bulls. If bulls are not used to the heat, they may spend more time in the shade than servicing cows due to lack of libido. A breeding soundness exam does not test libido, so bulls should be watched to make sure they are breeding cows once they are turned out.

Infectious and Toxic Causes of Infertility in Cattle

Leptospirosis

There are several serovars of leptospirosis that can infect cattle, but the most important serovar in the United States in cattle is hardjo-bovis. This serovar is host-adapted to cattle, meaning some cattle remain infected and become carriers. Carrier animals allow the infection to persist in a herd. Vaccination can help prevent infections. The 5-way lepto vaccines that have been available for years prevent the non-host adapted serovars. These vaccines contain a hardjo serovar, but it is hardjo-prajitno, not hardjo bovis. There is some cross protection, but not always. To prevent hardjo-bovis, select a vaccine that is specifically labeled for prevention of the hardjo-bovis serovar.

Trichomoniasis

This disease is discussed in detail at

http://www.lsuagcenter.com/en/crops_livestock/livestock/animal_health/beef_cattle/Bovine+Trichomoniasis.htm

Campylobacteriosis

Campylobacteriosis, also known as “Vibrio” causes problems similar to Trichomoniasis-temporary infertility and early embryonic death. Cattle have irregular estrous cycles and are repeat breeders leading to small calf crops and delayed/prolonged calving seasons. Like Trichomoniasis, it is venereally transmitted. The most effective vaccines against Campylobacter are oil-adjuvanted, and there is only one currently on the market. Herds at high risk should use the oil-adjuvanted vaccine and not rely on combination vaccines containing other adjuvants for protection against of Campylobacter. Control of this disease is similar to Trichomoniasis and is centered on good biosecurity.

Infectious Bovine Rhinotracheitis (IBR)

This is the most frequently diagnosed viral cause of abortion in the US. This virus causes respiratory disease and pinkeye as well. IBR can cause failure to conceive, early embryonic death, and abortions later in pregnancy. Abortion “storms” where several animals abort in a short period of time can also occur. There are many commercial vaccines available to help control IBR. These should be incorporated into an overall herd health program.

Bovine Viral Diarrhea Virus (BVD)

BVD, like IBR can cause failure to conceive, early embryonic death, and abortions later in pregnancy. This virus can also cause fetal abnormalities, especially of the eye and neurologic system, and weak calves. It also causes persistent infections (PIs) which allow it to stay in a herd from year to year. Again like IBR, there are many vaccination options to help control BVD. Go to

http://www.lsuagcenter.com/en/crops_livestock/livestock/animal_health/beef_cattle/Bovine+Viral+Diarrhea+Virus+BVD+of+Cattle.htm for more information on BVD.

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Neospora

Neospora is a protozoal disease that is mainly reported in dairy cattle, but is being increasingly diagnosed in beef herds. Fetal losses can occur at any time during gestation, but are most common in the second trimester of pregnancy. If the fetus survives, it can become infected and continue the infection in the herd, similar to what occurs with BVD. Canids (dogs, coyotes, foxes, etc.) spread the disease. There is only one vaccine currently available against this disease. Its efficacy is questionable.

Anaplasmosis

Although the most striking presentation of anaplasmosis is acute death, this disease can also cause significant reproductive losses. Anaplasmosis causes a decrease in the red blood cell count in cattle, making it difficult to get oxygen to tissues. A very small decrease in blood oxygen may not cause a cow to become ill, but the fetus requires very high oxygen levels. If the oxygen levels in the cows blood drops even a small amount, it can cause death of the fetus and abortion. Control of anaplasmosis is very herd specific. Producers should contact their veterinarian for help in developing an anaplasmosis control plan.

Nitrate Toxicity

Similar to anaplasmosis, nitrate toxicity decreases the ability of the blood to carry oxygen, and can cause death of the fetus. Nitrate toxicity occurs most commonly in Louisiana in cattle grazing ryegrass pastures or consuming ryegrass hay.

Diagnosis

Infertility is one of the most frustrating problems to try to diagnose. Many times the actual disease or problem (infertile bulls for example) occurs many months before cattle are palpated for pregnancy or begin calving. There is no one test like a blood sample that will test for all of the diseases or problems. Each cause/disease has different procedures required for diagnosis. To diagnose Leptospirosis, urine samples are needed. To diagnose Trich and Campy, specific tests from bulls are required. Although blood samples may help diagnose IBR and BVD in unvaccinated herds if the samples are taken at the proper time, in many instances blood samples are not helpful. The placenta and fetus are the best samples for diagnosis of late term abortions. A good overall herd health history is also important to look for other problems that may be related and help narrow down the list of potential problems.

Control

Bull Management

- Fertility test bulls
- Buy virgin bulls or test for Trichomoniasis and Campylobacter
- Have sufficient bull numbers for cow numbers and environment
- Observe cattle closely during breeding season for bull libido and repeat breeding in cows

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Cow Management

- Sound nutrition program, including minerals
 - Maintain cow body condition and a properly functioning immune system
- Minimize stress, particularly during handling
- Cull cows that are not reproductively sound
- Palpate for pregnancy
 - Pregnancy check via rectal palpation by a veterinarian can identify problems early and make diagnosis of problems more likely
- Raise or purchase only virgin heifers as replacement females
 - Purchasing open non-virgin females is a risk for Trichomoniasis and Campylobacter
 - Purchasing bred females is a risk for introducing BVD

Vaccination and Biosecurity

- A good vaccination program will help prevent major reproductive losses from infectious causes
- Because vaccination is not 100% protective and because there are disease that can't be controlled through vaccination, a good herd biosecurity program is necessary

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June 2010 — Visit our Web site: www.lsuagcenter.com

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Issued in furtherance of Cooperative Extension work, Acts of Congress of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. The Louisiana Cooperative Extension Service provides equal opportunities in programs and employment.