K-STATE Research and Extension

Why aren't my cows pregnant?

When the number of pregnant cows is far below expectations, poor reproductive performance, by both cows and bulls, must be considered. In some cases, multiple issues may contribute. This publication addresses questions often asked when troubleshooting low pregnancy rates and starts with common terminology and a few realistic expectations.

Definitions and Benchmarks

Pregnancy rate is typically defined as the number of females pregnant as a proportion of the total number exposed to bulls within a given time period (AI pregnancy rate, season-long pregnancy rate). **Conception rate** is the number of pregnant females expressed as a proportion of those inseminated. In natural service settings, conception rate is rarely known.

Benchmark data can serve as a baseline for average performance. The CHAPS database (updated 09/28/18) maintained by North Dakota State University shows an average breeding-season pregnancy rate of 93.7%. Of those, 63% calved in the first 21 days of the calving season. The length of the breeding season is not part of the data set, but 96% of calves were born by day 63 of the calving period.

Similar data are not available for yearling heifers. Oosthuizen et al., 2021 reported treatment means ranging from 80% to 84% for 18 locations representing 2,448 heifers with a range of season-long pregnancy rates of 68% to 90% (mean 82%) for individual locations. A lower pregnancy rate in heifers compared to cows may reflect difficulty in identifying subfertile heifers before the first breeding season.

With shorter breeding seasons, lower pregnancy rates are expected to a point. Pregnancy rates of 80% or better have been achieved in well-managed herds in a 30-day (Deutscher et al., 1991) or 32-day breeding period (Grings et al., 2005) using estrus synchronization to achieve two breeding opportunities during that period.

Troubleshooting Poor Reproductive Performance in the Bull

A review of data and management practices helps identify reasons for low pregnancy rates. Producers should answer the following questions, which are designed to explore possibilities and rule out potential problems.

What breeding activity was observed during the breeding season? If cows are cycling and bulls are fertile, breeding activity should be high at the start of the season then drop until it reaches a low point, where it remains.

Did all bulls have a breeding soundness exam (BSE) before breeding? Were any bulls on the borderline for passing segments of the exam? Bull fertility will change over time, nevertheless, information from a pre-breeding, breeding-soundness exam is a starting point when bull fertility is questioned. A complete exam should include a physical evaluation, palpation, and semen evaluation. If a low pregnancy rate is noted at weaning time, a ***second*** breeding soundness exam may be warranted; however, if the bull tests as a satisfactory breeder at that point, he may still have had an illness or injury that decreased fertility earlier in the breeding season. For example, it takes about 60 days from the end of a fever from foot rot for a bull's sperm production to return to normal.

Was complete intromission observed for each bull? There is not a good test for libido or mating ability, so monitoring activity is the only way to ensure successful mating occurs. One of the challenges with libido tests is that bull performance improves with experience. Keep in mind, an injury during the breeding season may keep a dominant bull from mating, and yet he could still prevent other bulls from doing so.

What was the bull-to-female ratio and size/type of pasture? Standard recommendations for bull-to-female ratios are one female per month of age for bulls under 2 years of age. For mature bulls, typical ratios are one bull to 25 to 30 females with adjustments for pasture size and terrain. There are no specific guidelines related to pasture size and terrain adjustments.

Studies identifying sires of calves in multi-sire breeding pastures consistently show a wide range in number of calves sired. At present, there is no way to identify in advance sires that will produce a disproportionately large number of calves. Some bulls can service far more than the standard number of females, but unfortunately, they look exactly like bulls that cannot. Bulls should be in planned breeding groups before turnout so a pecking order and any injury in the establishment occurs before the start of the breeding season.

In multiple-sire pastures, bulls will establish a pecking order that will change as the bulls age. Breeding groups with bulls of the same age had higher pregnancy rates than those with bulls of mixed ages.

A single-sire breeding pasture has no fights between bulls, but no backup. Use of a breeding soundness exam and monitoring during the season are crucial management steps, especially with single-sire pastures and increased cow-to-bull ratios.

Was there any mixing with neighboring herds? It is important to record the dates cattle crossed fences (either way), which may serve to document disease exposure or a potential injury. Based on the type of abnormalities present in a semen sample, timing of these insults may be estimated. Likewise, timelines for the progression of various diseases or other injuries can be compared to periods where few or no cows became pregnant or remained pregnant.

Did bull body condition change during the breeding season? It is not uncommon for bulls to lose body condition during the breeding season; however, a bull with a body condition of 4 or less (1 = emaciated, 9 = obese) will have poorer semen quality than bulls in moderate condition. A record of bull body condition score at the time of a breeding soundness exam and at turnout provide a reference point for any change. Photographs on your phone make a good reference.

What biosecurity practices are in place? Purchased bulls should be negative for a persistent infection of bovine viral diarrhea virus (BVD) and isolated for 30 to 45 days before exposure to the herd. Avoid use of non-virgin bulls, but if you must, use them only after a negative trichomonas test.

Are bulls vaccinated appropriately for your location and disease challenges? Bulls should receive annual vaccinations of infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD), campylobacter (vibrio), and leptospira as directed by your local veterinarian.

Troubleshooting Poor Reproductive Performance in Cows

The most common reason for poor pregnancy outcomes is related to the female's nutrition. Heifers may not have achieved sufficient growth in time for breeding and cows may not have the needed energy reserves to resume normal cycles and rebreed. Several diseases and issues can have a negative effect on pregnancy rate. In addition, the nutrient status of the female will influence her ability to fight disease or develop immunity in response to vaccination.

Did females achieve an appropriate weight and body condition by the time of calving? Bred heifers should reach 85% of mature weight by first calving in a body condition of 5.5 to 6. For raised replacements, weight of mature cows should be known. In other cases, estimates should be realistic. Replacement heifers should be weighed and body condition scored periodically to monitor progress toward weight and condition targets.

At term, the weight of the fetus and fluids in mature cows is about 150 pounds. If cows do not gain this much weight during gestation, they are losing body condition. In addition to the weight gain of the fetus, first-calf heifers have an additional demand for growth. Adequate body condition at calving is considered paramount to successful rebreeding. Given the quality of typical feed resources and the level of milk production in the U.S. cow herd, meeting total energy demand for milk production

with enough left over to increase body condition is extremely challenging. If cows are thin at calving and lose condition after giving birth, they will be slow to resume normal estrous cycles and are at risk of not rebreeding. A positive energy balance is needed to end postpartum anestrus.

This emphasizes the importance of monitoring body condition year-round to avoid the need to add body condition when nutrient demands are high, and a considerable amount of high-energy supplementation is needed to improve cow condition. Too often, this gap is not filled and results in low pregnancy rates. In extreme cases, calving time brings weak calves, poor quality colostrum, and low milk production. Consult the following resources to learn how to score the body condition and track changes through the year.

- *Guide to Body Condition Scoring in Cows and Bulls*, MF3274, (*bookstore.ksre.ksu.edu/pubs/MF3274.pdf*);
- *Body Condition Score Card,* MF3230, (*bookstore.ksre.ksu.edu/pubs/MF3230.pdf*);
- *Body Condition Scoring Record Book,* MF3277, (*bookstore.ksre.ksu.edu/pubs/MF3277.pdf*).

Extended and unexpectedly harsh winter weather conditions can cause a bigger energy drain than normal feedstuffs can address. Failure to make adequate adjustments will show up in reduced pregnancy rates and, in extreme cases, mortalities.

Were feedstuffs analyzed for nutrient content and rations balanced accordingly? Maintaining necessary body condition requires accurate information on the quality of feedstuffs, so any deficiencies can be met. The use of "book values" to balance rations has been the cause of more than one instance of poor pregnancy performance.

Do you know how much cows weigh, and do you use this to determine stocking rates and feed delivered? Weight of the animal is a major determinant of how much an animal eats. Pastures should be stocked by weight rather than at a rate associated with a period in history when most mature cows were smaller. If actual weights are not available, it can be estimated by taking the weight of cull animals and adjusting for condition.

What has been the trend in pregnancy rate and calving distribution over time? While the benchmark pregnancy rate mentioned from CHAPS is 93.7%, some operations may find that a pregnancy rate in the 88 to 90% range optimizes the trade-offs associated with lower feed costs and higher reproductive performance. Annual pregnancy rate data is needed for a herd baseline. Both bull and cow fertility are considered acceptable when 60% or more of calves are born in the first 21 days of the calving period.

When was the poor reproductive performance noted? Often both late-term abortions and weak calves are observed in the same herd simultaneously if vitamin or trace mineral imbalances are a factor. Vitamin and mineral imbalances may contribute to lowered reproductive performance, but overall protein and energy status are a more likely explanation for many open females. Many cows cycling late in the breeding season or after the end of the breeding season may point to a disease such as trichomonas.

Were more open females observed in any age or management group? Young cows often represent the largest share of opens because they are still growing and experience more calving difficulty. Growing females have different nutrient demands than mature cows; and, because of size, they may not be getting their share of supplied nutrients when managed as a single group.

Did 2-year-old cows calve in advance of the mature cows? Young cows need more time to resume normal estrus cycles following calving. Breeding heifers two to three weeks ahead of mature cows helps keep young cows on schedule. Exceptions can be made if the genetics are well suited to the environment and stressors such as calving difficulty are absent.

Did open 2-year-old cows calve early or late in relationship to contemporaries? Heifers that conceive in the first two cycles of their first breeding season are in the best position to rebreed in a timely manner in subsequent seasons and to remain in the herd longer.

What biosecurity practices are in place? Quarantine all purchased cows and bulls, and do not buy used cows less than 120 days pregnant to avoid trichomonas. If a neighboring herd has no biosecurity practices in place (no use of quarantine or health requirements for new purchases), some type of set-back fence may be needed to prevent contact.

Are females vaccinated appropriately for your location and disease challenges? Typically, annual vaccinations should include infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD), campylobacter (vibrio), and leptospira. Consult with your local veterinarian on use of killed and modified-live vaccines and timing to avoid causing abortions.

Was the breeding season length appropriate? In a well-managed herd, a 60-day breeding season should allow a pregnancy rate of 90% or greater. Through use of estrus synchronization, a shorter, 45-day breeding season that starts with all cows inseminated on day one of the season can further increase the average calf age and weight at weaning without sacrificing pregnancy rates.

If something unexpected happens to reduce the number of cows pregnant in the first cycle, cows may only have one more chance to conceive. Ways to maintain a shorter calving season and minimize risk of a poor pregnancy outcome include an early pregnancy check (30 to 45 days into the season) with the possibility of extending the breeding season or leaving bulls out longer and doing a pregnancy check early enough to stage pregnancies. As a short-term strategy, consider retaining some late-bred females if the early response was poor, but avoid continuing this practice. Aim for both a tight calving season and optimizing returns from opens or late-bred cows that do not fit the production system.

Shortening a long breeding season (longer than 100 days) with a series of gradual steps can result in higher pregnancy rates than previously achieved with extended breeding periods (Lamb, 2015). If cows are in poor body condition at calving, and feedstuffs are of marginal quality or quantity post calving, a short breeding season typically will be disappointing.

Mature cows in good body condition take 45 to 55 days to resume normal cycles after calving, and young and thin cows often take twice as much time. This information, combined with what is known about early embryonic loss, can be used to project when and how many cows will become pregnant in the next breeding season.

Some producers elect to use a short breeding season to select heifer replacements. If taking this approach, be realistic about how many heifers are cycling before the start of the breeding season and therefore, likely to conceive during the first cycle. If estrus synchronization is used at the start of the heifer breeding season, the length of the breeding season would need to be 25 to 30 days to allow most heifers a second chance to conceive.

Was the bull-to-female ratio appropriate for the situation? A review of literature on bull-to-female ratios used after synchronization of ovulation with all cows fixed-time inseminated on the first day of the breeding season found similar season-long pregnancy rates for ratios of 1:25 to 1:30 or 1:40 to 1:50. (This assumes 50% pregnant to AI and 50% of cows remaining for natural service.) Producers without AI experience or those with reason to fear a poor AI response may want to take a more conservative approach.

Studies on the use of natural service with estrus synchronization have shown acceptable pregnancy rates with mature bulls and a typical bull-to-cow ratio of 1:25 to 1:30 and moderate pasture size. Bull-to-heifer ratios of 1:7 to 1:51 in single-sire matings were used immediately following synchronization with Synchro-Mate-B with no adverse effects on pregnancy rates. This supports the idea that return heats after successful synchronization and insemination do not require additional bull coverage. But in both cases, activity should be monitored closely in case of bull injury. With smaller breeding-group sizes and fewer bulls, a single sire with low libido or some other issue can have a bigger effect. Too many bulls can be counterproductive, for example, in a case with inexperienced yearling bulls with a synchronized estrus or the cycle after a synchronized estrus.

Were there any weaknesses in an estrus synchronization and AI program? The goal of an AI program is to impregnate as many cows as possible to desired genetics on the first day of the breeding season.

A successful AI program is reliant on paying attention to details such as nutrition and health year-round as well those steps more directly related to the breeding season. Several good options to synchronize estrus and ovulation are identified in resources provided by the Beef Reproduction Task Force available online at *www.BeefRepro.org* and in the publication, *Tips for a Successful Estrus Synchronization and AI Program,* MF2574, *(bookstore.ksre.ksu.edu/pubs/mf2574.pdf).* When few cows get pregnant early after estrus synchronization and AI, the protocol or AI are often blamed.

Based on extensive research and field data, the task force recommendations have proven successful for numerous operations. If an appropriate protocol was selected and applied correctly, a different protocol would likely give the same poor result. While females will conceive without showing estrus after a fixed-time insemination, a low estrous response at AI generally results when fewer cows are cycling. This response information should be part of a final review of the breeding season plan (number of natural service sires, length of season, timing of pregnancy checks) and associated risks.

An estrus synchronization program that includes a progestin can induce noncycling cows to cycle and result in an earlier conception date even if they do not conceive to AI. It can be difficult to determine causes of a low early pregnancy response in production settings as the data needed to rule out various possibilities are not routinely collected by producers, and AI programs are blamed. Observations that females stopped cycling after AI may reflect embryonic loss at some point past when they would normally return to estrus.

Reproduction is the most important factor in profitable cow/calf enterprises because there is no calf to sell from an open cow. This guide should help producers review common problems.

Additional Resources

Heifer CONSULT (*ksubci.org/heifer-consult/*) is a tool to help beef cow-calf producers improve the reproductive success of heifers and young cows. It uses questions similar to this publication to help producers identify problem areas and possible solutions.

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