



# The Veterinary Link

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## Reproductive strategies

Having a highly productive herd that optimizes reproductive efficiency and forage and feed resources should be the goal of every cow-calf operation. Achieving this goal requires attention to many aspects of herd management, including heifer development; bull management; breeding soundness examinations of both bulls and heifers; forage management; forage-supplementation strategies; and control of diseases that can cause infertility, early embryonic death, abortions or the birth of weak calves.

### Complexities of reproduction

Even if a fertile bull mates a fertile cow, many times a live calf is not born from that mating. If the bull and female are both fertile (i.e., producing fertile eggs and sperm), nearly 100% of matings will result in the start of a new embryo. However, reproduction is complex, and there are many opportunities for problems to arise that halt the normal progression of the pregnancy. In fact, it is estimated that about 30% of embryos are lost very early in pregnancy.

If the pregnancy is lost in the first 14 days, the cow will usually be in heat again 21 days after her last heat, and, if the bull is still in the breeding pasture, she will be bred again and have another 70% likelihood to initiate and maintain a pregnancy. This early loss is considered unavoidable and is due to the complexity of reproduction and the loss of imperfect embryos.

Because only 60%-70% of fertile matings will result in the birth of a live calf, it is important that all or most of the cows in the herd have the opportunity to be bred three times before the bulls are removed from the breeding pasture. Using a 65-day breeding season as an example, cows that cycle within the first three weeks of the breeding season have the opportunity to recycle by Day 42 if they lose an early pregnancy from the first mating, and again by Day 63 if they lose a second pregnancy — resulting in three opportunities to get pregnant and maintain a pregnancy all the way to calving.

In contrast, cows that do not start

cycling until the second 21 days of the breeding season only have one more opportunity to be bred if they lose the first pregnancy early enough to recycle. Using an average of 65% successful births of a live calf from fertile matings, 95% of cows that have three opportunities to become pregnant will give birth to a live calf. In contrast, only 88% of cows that only have two opportunities to become pregnant are predicted to give birth to a live calf.

### Importance of body condition

To ensure a high percentage of postpartum cows and first-calf heifers are cycling at the start of the breeding season, it is critical that they calve early in the calving season in good body condition. Remember that pregnancy in cattle lasts about 283 days, which leaves only 82 days between the birth of a calf and a mating that results in a successful pregnancy if the cow is to maintain a one-year calving interval.

Although there are herd-to-herd and year-to-year variations, most herds

require about 50-70 days after calving for a majority of mature cows in good body condition to resume cycling. First-calf heifers require more time to resume fertile cycles after their first calf than mature cows — often about 80-100 days. Both first-calf heifers and mature cows require additional days after calving to resume cycling if they are less than a body condition score (BCS) of 5 on a 9-point scale (see [www.cowbcs.info](http://www.cowbcs.info) for information on how to condition-score your cows).

Once cows begin lactating, it is very difficult to add body condition; therefore, if cows are thin during gestation, you must adjust their diet so that weight is added before they calve. Careful attention to body condition during late pregnancy is critical so that necessary ration changes, such as giving access to high-quality forage or lower-quality forage supplemented to meet protein and energy needs can be accomplished to guarantee good body condition at calving.

Because heifers take longer to resume fertile cycles after having their first calf than after later pregnancies, it is nearly impossible for a group of heifers to have an average calving date for their second calf (as 3-year-olds) as early as the average date for their first calf (as 2-year-olds). This problem can be addressed by scheduling the breeding season so heifers will calve before the cows begin calving or, at the latest, during the first two weeks of the calving season.

In order to ensure heifers have reached puberty prior to their first breeding season, herd managers should measure body weight periodically from weaning to the start of breeding and make adjustments to the diet to ensure that an adequate number of heifers in the replacement pool have reached the herd-specific target weight for puberty (usually 50%-65% of mature weight).

Additionally, prior to the breeding season, a veterinarian can palpate the reproductive tract of all potential replacement heifers to determine if nearly all the heifers have a palpable corpus luteum (CL) and a mature uterus indicating sufficient maturity to become pregnant to an artificial insemination (AI) mating early in the breeding season. If estrous synchronization and AI are utilized, palpating reproductive tracts to ensure that nearly all the heifers are cycling before the time and expense of synchronization and AI are sunk will help protect against disappointing results.

### **Bull breeding soundness**

Bulls must be able to breed all the cows that are in heat each day of the breeding season to achieve good reproductive efficiency. It is critical that bulls be examined for breeding soundness before the start of the breeding season. A complete breeding soundness examination will evaluate the bulls' health, ability to move freely and semen quality. Bulls that fail any of these criteria should not be used for breeding.

In addition to a breeding soundness examination before the start of the breeding season, bulls must be observed closely the first few days of the breeding season. Some bulls have problems with movement, mounting or breeding that are difficult or impossible to detect in a squeeze chute or small pen. Therefore, even bulls that pass a breeding soundness exam must be evaluated closely in the breeding pasture to make sure that they successfully breed the cows showing heat.

Both bulls and cows should be examined throughout the breeding season to make sure that fewer cows are showing heat as the breeding season progresses, indicating successful establishment of pregnancy, and that bulls do not develop any visible problems with feet, legs, penis, testicles or body condition that impair breeding performance.

### **Disease control**

A number of diseases can cause cows to fail to become pregnant or to lose the pregnancy before a live calf is born. Different diseases that cause pregnancy loss act in different ways. Some attack very early in pregnancy; others are more likely to cause problems in mid- or late-pregnancy. Some are spread to pregnant cows from other cows, calves or bulls in the same herd or from cattle in adjacent pastures. Other diseases expose the herd through contaminated

feed. A plan to use available vaccines; isolation of the herd away from high-risk cattle; proper feed harvesting, storage and delivery; and appropriate use of diagnostic tests should be developed with your veterinarian to address the most important risks to your herd.

Herds that have excellent reproductive efficiency do so because herd managers and their veterinarians and other advisors

address many details that affect heifer development, cow body condition, bull fertility and disease control. The result of a reproduction-management strategy that prioritizes all these aspects of animal husbandry is a herd that has early-calving replacement heifers, cows that enter the calving season in good body condition, nearly all the cows resuming fertile cycles before the start of the breeding season,

bulls that are fertile and able to breed all the cows that come into heat, and little or no loss of pregnancy due to disease.



**Editor's Note:** *This column was part of a larger "Reproductive Strategies" theme in the February Angus Journal. For information on how to subscribe to the Angus Journal, go to [www.angusjournal.com](http://www.angusjournal.com).*