



# Vet Call

► by **Bob Larson**, Kansas State University

## Reproductive management of beef cattle herds

*There are a number of important factors that interact to impact the number of calves weaned per cow exposed for breeding. One of the important factors that is not often recognized is that the previous years' timing of calving will have either a positive or negative effect on this year's reproductive success. I use the term "herd momentum" to describe the impact that previous reproductive outcomes have on the current and future reproductive performance of the herd.*

### Creating momentum

Several key facts about the cattle reproduction and cow-calf production impact each year's reproductive success. First of all, it is necessary for beef cows to calve at about the same time each year to appropriately match the cow production cycles with the forage production cycle.

Recognizing that pregnancy lasts 283 days means that there are 82 days from the time a cow calves to the time she needs to become pregnant again to maintain a 365-day calving interval.

This fact is important to remember when we understand that beef cows have a period of time after calving, called postpartum anestrus, when they do not display heat behavior necessary to initiate mating, and they do not ovulate fertile eggs. It takes about 70 to 100 days from calving for 90% of cows to resume fertile cycles if they are in good body condition, but this period is longer in cows that calve in thin body condition.

Because of these limitations, only cows that calve in good body condition during the first 42-52 days of calving are likely to resume fertile cycles before the start of breeding or during the first 21 days of breeding. In contrast, cows that calve later than the 52nd day of calving are not likely to resume fertile cycles until the second 21 days of the breeding season or later.

Most producers recognize that first-calf heifers take about 20 to 30 days longer to resume fertile cycles after calving than mature cows. In order to have fertile cycles by the

start of the breeding season for their second pregnancy, first-calf heifers need to calve in good body condition at least 100 days ahead of breeding — which is before the mature cows start calving.

Whether cows calve in the first, second or third 21 days (or later) in the calving season impacts the timing of when they will resume fertile cycles and can become pregnant in the following breeding season; therefore, cow-calf herds have reproductive momentum from year to year. This momentum can be positive (most cows calve early in calving season and breed early in the following breeding season) or negative (most cows calve late in calving season and breed late in the following breeding season). Positive momentum results in cows that calve early and have increased longevity in the herd.

### Breeding probabilities

Another important fact to understand about cattle reproduction is that even when a perfectly fertile cow is mated to a fertile bull, not every mating will result in successful fertilization and embryo development. In fact, we estimate the likelihood that a fertile mating will result in a pregnancy that can be detected at preg-check time is 60% to 70%.

Most commonly, this pregnancy failure occurs during the first 14 days of pregnancy, and the cow will express heat and ovulate a fertile egg about 21 days after her last heat and have another 60%-70% chance of conceiving and maintaining a pregnancy. Cows with three opportunities to be mated to a fertile bull (each with a 60%-70% probability of a successful pregnancy) during a breeding season will have a 90%-95% probability of giving birth to a calf at the end of gestation.

Animals in the herd expected to have completed the postpartum anestrus period and to be having fertile estrous cycles by the 21st day of the following breeding season

include nearly all mature cows that calve in good body condition during the first 21 days of calving, many of the mature cows that calve in good body condition in the second 21 days, some of the cows that calve between 42 and 52 days into the calving season, and first-calf heifers that calve before the start of the mature cow calving season.

Cows with only two opportunities to be mated to a fertile bull during a breeding season will have about an 84% to 91% probability of becoming pregnant and maintaining a pregnancy to the end of gestation. Cows with only two or fewer opportunities for mating would include mature cows that give birth to a calf more than 42-52 days after the start of the calving season, first-calf heifers that calve after the start of the mature cow calving season, and first-calf heifers or mature cows that are thin and have a prolonged period of postpartum anestrus.

Extending the breeding season longer than 65 days (three 21-day periods) will allow more cows to become pregnant, but cows that conceive more than 52 days after the start of breeding are very unlikely to begin fertile estrous cycles until the second or later 21-day period of the breeding season. Cows that conceive more than 82 days after the start of breeding will not calve until after the start of the following breeding season. This scenario could be described as "negative reproductive momentum."

From a reproductive standpoint, herds should be managed so that 95% or more of the cows have resumed fertile cycles early enough to be mated during the first 21 days of the breeding season. This will result in herds that are "front-end loaded" and have "positive momentum," in that 60% or more of the cows will calve in the first 21 days, and 85% of the cows will calve in the first two 21-day periods. In order to achieve this goal, producers must focus on developing heifers to become pregnant early in the breeding season, ensuring bull breeding soundness, aligning the calving period with optimal resource availability, managing forage and supplementation to ensure good cow body condition going into calving, and minimizing reproductive losses due to disease.

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