

Reproduction Is a Luxury

Fertility in females is dependent on a balance of genetics, nutrition, health and management.

by **Heather Smith Thomas**

Cow-calf producers know fertility is the most important function of a cow herd, and is by far the most important factor in turning a profit. Whether a heifer reaches puberty early or a cow breeds back in timely

fashion after calving depends on a combination of genetics, nutrition, health and management. Steve Hendrick, DVM, Coaldale Veterinary Clinic, Coaldale, Alberta, shares how various factors can influence fertility in females.

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Replacement selection. When selecting replacement females, one thing to keep in mind is the ideal cow will calve on time each year.

"It's important to put selection pressure on replacement heifers with a short breeding season – just one or two cycles," Hendrick says. "The ones that don't breed early are not as fertile."

He recommends giving heifers a very short time with a bull and culling those that are not pregnant. Additionally, he advises keeping heifers from older, dependable cows with longevity in the herd to create a more fertile herd in the long run.

It helps to select for genetics producing lower birth weights, but still provide good growth after birth. A short gestation period also allows for lower birth weights, and gives the cow more time to breed back. "Fertility and performance don't have to be completely antagonistic," Hendrick notes. "We can try for a happy medium rather than saying some traits are maternal and some are terminal. With conscientious selection, the herd can do a good job of both."

Growth and size. Most beef producers have been selecting for growth and carcass traits for the past 50 years at the expense of reproduction. A problem in many herds is producers have selected for more growth and less back fat, inadvertently selecting for lower levels of fertility. Those cows may wean off big calves, but they tend to be hard-keeping, high-maintenance, unproductive cows. The all-too-common "solution" to this problem has been to reduce stocking rates and/or increase supplemental feeding – instead of producing cows well-suited to their environment, many producers have artificially changed the environment to fit their cows.

Hendrick challenges the belief the two most determining factors of pregnancy rates are the age and size of heifers at breeding. "I agree with age as a criteria, but size is a tricky topic," he says. "It's all too easy when selecting heifers to choose the bigger animals, but they may be slower to mature." Bigger heifers are often still growing at the time smaller ones have already reached puberty.

Hendrick has been working with feedlot clients as well as cow-calf producers to receive carcass data on heifers and then estimating their mature body weight. He has found cows in most breeds today are much larger than they used to be on average. "This makes it hard to judge a heifer and determine whether she will mature to be 1,300 pounds or 1,500 pounds," he says.

"When estimating whether a heifer is between 55-65 percent of her mature body weight at breeding time, you don't really know. You could look at the



PHOTO BY BROOKE JENSEN

Maintaining a short calving window on heifers can aid in selecting profitable females to retain in the herd.

dam and have an idea, but that's only half the equation. We don't always know what genes for size the heifer got from her sire," he explains.

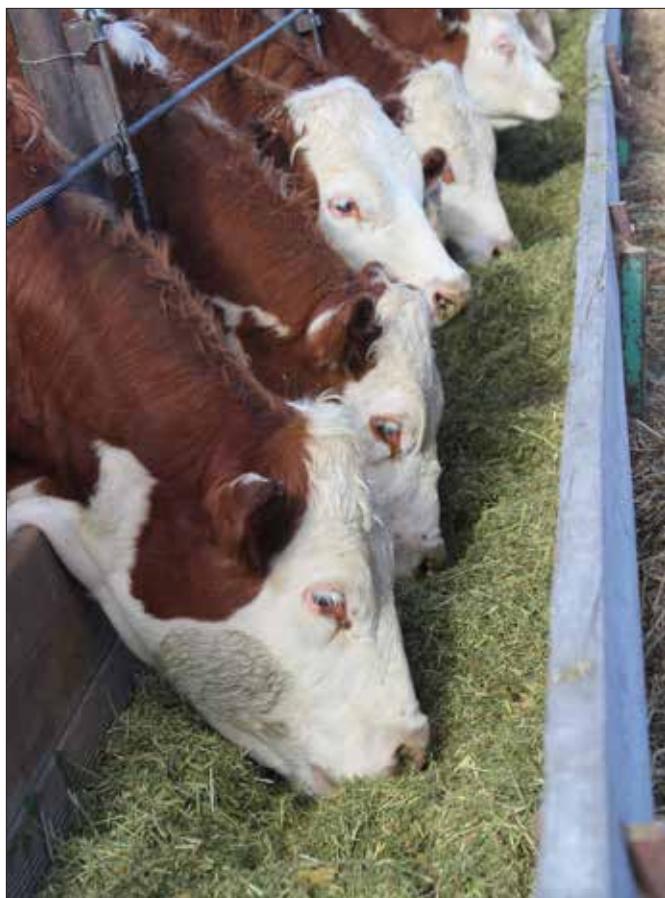
Fleshing ability. Fertility is primarily a function of fleshing ability, which is a function of low maintenance requirements. Reproduction is a luxury – it cannot happen until maintenance requirements have been met and cows are storing energy reserves in the form of fat.

Easy-fleshing and easy-keeping cows tend to be more fertile than cows requiring a lot of feed to get them bred. "Measuring individual animal intakes and feed efficiency is something we don't give a lot of thought to in the cow herd,"

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Cows with a higher fleshing ability are likely to breed back sooner and maintain increased fertility during their lifetime.



Proper nutrition is critical to fertility in a cow herd.

Hendrick says, noting there are always some cattle that hold their flesh better than others under the same environmental conditions. Cows need to be able to maintain themselves and still wean enough pounds of calf, and become pregnant again. If a cow holds her weight but doesn't produce enough milk for her calf, she's also not what you want. It's often best to select heifers from the good, old cows that stay in the herd, raise a good calf every year, and never missed a calf.

Nutrition and body condition. Adequate nutrition is critical in getting females to breed quickly and calve early, which in turn means they have a higher chance of rebreeding and tend to stay in the herd longer. "When you realize gestation is roughly 285 days and you only have 365 days in a year — and you want them calving every 12 months — this only leaves 80 days to breed back," Hendrick explains. "If cows are not in good body condition when they calve, it's

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difficult for them to rebreed in 80 days. It may stretch to 100 days or longer."

Proper nutrition is necessary for a female to return to heat — and if she is subject to a short breeding season, she will likely end up open if she did not receive adequate nutrients. Hendrick says body condition scores are a good indicator of sufficient energy and protein levels in the diet, but to not "forget the minerals. ... Minerals are important for cows cleaning, and having vigorous calves, and are also important for fertility," he says. "We see different minerals in forages, and ultimately in cows and in how they perform reproductively."

Producers should check the mineral levels of their feeds and, sometimes, their soils. Hendrick suggests checking mineral levels in feed first — if the feed is lacking in certain minerals then checking the soils growing those feeds would be necessary.

Soil minerals can vary by region and even by pasture. In some regions, soil is known to be deficient in copper or selenium and other important trace minerals. Additionally, mineral profiles vary by plant type even between plants grown in the same soil. Cattle are adaptable, and will naturally seek out plants to help balance their diet, but if there is a serious mineral deficiency it will show up — often in the animal's fertility and breed-back/pregnancy rate.

Disease. Reproductive diseases like vibriosis or trichomoniasis may adversely affect pregnancy rates. Other diseases including infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD) and leptospirosis are noted for causing abortion. "These are problems we may not see until after breeding season, when cows come up open, or lose their calves during pregnancy," Hendrick points out. "Some of these diseases are

sleepers because you see the cows being bred and think everything is fine, but with early embryonic loss the cows may cycle back again." He advises working with your veterinarian to come up with a vaccination or testing program best suited for your herd.

Birthing difficulties. Conditions like dystocia or an injury or infection in the reproductive tract adversely affect fertility. For example, a cow with a uterine infection may not clear the infection in time to rebreed on schedule. "If you assisted a cow or heifer at calving, or delivered the calf by C-section, some of these females

may have complications afterward," Hendrick explains. "The less we have to intervene at calving, the less risk for causing infections in the cow or heifer afterward."

Don't forget the bull. A bull with borderline fertility may sire daughters with borderline fertility. "We often correlate the bull's scrotal circumference with fertility of his daughters," Hendrick says. "There's been a push to select for larger scrotal size, and some emphasis on this is good, at least meeting the minimum for the age of the bull. The bull also needs an acceptable number of normal sperm and good libido." **HW**



Productivity in a cow herd is a two-way street — selecting for fertile bulls is just as important.

A study of 8,000 cows

Duane Mickelsen, DVM, spent his career specializing in reproductive problems in cattle and is the first veterinarian to diagnose trichomoniasis in Washington, Oregon and Montana in 1978. Commonly known as "trich," this venereal disease in cattle leads to infertility, low pregnancy rates, extended calving seasons and abortions.

At the time, Mickelsen and his students were keeping records on more than 8,000 cows. "We saw open cows with an involuted uterus, which signified abortion," he says. "Some cows were pregnant and then a few days to a few months later, they sloughed the fetus. That's when I started looking closer and discovered trichomoniasis. Those cows were pregnant early on, but lost the fetus."

Cows examined in the study were classified into different age groups. One group included 1,000 heifers — these had been exposed to a bull and should have been pregnant with their first calf. "A high percentage of them were not pregnant," Mickelsen says. "The 2-year-old group had calved and should have bred back again for a second calf. A similar number of them did not get pregnant."

He cites dystocia as a main reason for poor breed back in the 2-year-olds. "Calving ease is a major factor in a heifer's future ability to breed back," he explains.

In the 3-year-old group, 25 percent of the cows were open when they should

have been pregnant with a second calf. Dystocia and inadequate feeding — particularly during the last trimester — were the culprits in this case. Without proper nutrition for her own growth and maintenance, her fetus and lactation, a cow cannot cycle soon enough to breed back.

Mickelsen notes, "Some cattlemen still believe that if they feed heifers too well during the last trimester they will have bigger calves and more calving problems, so they don't feed their heifers adequately." However, he points out they are shortchanging cows when needs they have high nutritional needs.

"Inadequate feed will reduce birthweight a little, but is detrimental to the heifer and to her ability to create adequate colostrum," Mickelsen stresses. "If you feed them poorly during their last trimester it causes too many problems. The heifer puts it all into the calf and won't breed back."

Still, there was an age group which experienced a 97 percent pregnancy rate. "The most successful group in our study were the 6,000 cows in the 4 to 9-year-old group," Mickelsen says. "They are in their prime and tend to have good body condition. They no longer need extra nutrients for growth, and know how to get to the feed trough."

Within that group, though, was a group of "old gummer cows," where only 78 percent were pregnant. This might vary

from ranch to ranch, depending on the feed program, management, health program, and genetics of the cow. Crossbred cows, especially, tend to last longer in the herd before they are deemed too "old."

"The clients who took really good care of their cows and monitored them didn't have very many open cows," Mickelsen observes. "A good [vibriosis] and [leptospirosis] vaccination program seemed to help. We also didn't see much IBR [infectious bovine rhinotracheitis] or BVD [bovine viral diarrhea] in those herds. Our main problems seemed to be trichomoniasis and nutrition.

In the herds where at least 25 percent of the replacement heifers came up open, Mickelsen asked two questions: Number one was the fertility of the bull(s) and number two was nutrition.

"Inadequate nutrition can delay puberty, lower conception rates, decrease skeletal and muscle growth and increase the frequency of dystocia and failure to cycle again after calving," Mickelsen says. "In one herd we looked at, 87 percent of the heifers were not cycling due to lack of protein and energy in their diet. Sometimes it's partly genetics if the heifers are big-framed slow-maturing cattle, especially if they haven't had adequate feed. Our study showed that in this group it was primarily a feed problem." **HW**



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