



283 Days

Gestation length in cattle affects birth weight and breed back.

by Heather Smith Thomas

There are several factors that affect birth weight in calves. These factors can include: 1) breed — some breeds have larger calves; 2) genetics of sire and dam — size of calf at birth is heritable; 3) length of gestation — also heritable; 4) age and size of the dam — heifers tend to have smaller calves and shorter gestation than mature cows, and large cows tend to have larger calves than small cows; 5) sex of the calf; 6) environmental factors; and 7) nutrition and health of the dam.

Gestation length is heritable. Some breeds and some family lines within breeds tend to have gestation lengths slightly shorter or longer than the “average” 283 days. Low-birth-weight cattle often have shorter-than-average gestation length. High-birth-weight cattle tend to have longer-than-average gestation length.

The fetus grows fastest in the final stages of gestation, so several more days of gestation create a larger calf. One study showed that each extra day of

gestation amounts to at least a pound increase in size of the calf. In breeds with large calves, this may be more than a 2 lb. increase per day.

Bull calves tend to be larger than heifer calves of the same breed, partly because bovine males are larger than females and partly because male calves tend to be carried longer than heifer calves. If a cow goes past her due date, she often has a bull calf, whereas if she calves a few days early, the calf is often a heifer.

Avoid extremes

Calves genetically large at birth tend to be large as weanlings and then as yearlings. Small calves tend to have lower weaning and yearling weights. This difference in weight is one reason many breeds inadvertently developed more calving problems, selecting for heavier weaning and yearling weights.

This got to be such a problem by the 1980s that many breeders began selecting for lower birth weights. Most breeds eventually

developed a birth weight expected progeny difference (EPD) and then calving ease EPDs so stockmen could have a way to try to select bulls that sired smaller calves at birth, especially for use on heifers.

Birth weight is heritable and is influenced by gestation length, which is also heritable. The calf inherits tendencies for birth weight from his sire and dam. You may not resolve all your calving problems by purchasing bulls with low birth weight if your heifers were large at birth. A good rule of thumb is to never keep a heifer that was heavier than 90 lb. at birth.

It's wise to avoid extremes. Low birth weight is generally beneficial, as long as the calf is not too small. Dr. Steve Hendrick, Western College of Veterinary Medicine at the University of Saskatchewan, says there are some concerns when calves are too small.

Michael MacNeil, who recently retired from the research station at Miles City, Mont., and now has a consulting business, says gestation length is an interesting trait. He participated in a number of earlier research projects looking at gestation length, calving ease, etc.

“Intermediate optimum is clearly important, rather than either extreme,” MacNeil says. “If gestation length is too short, calves are born not only too small, but premature and not fully competent, and they die. If calves are carried too long they get too big. There's actually a fairly narrow window of acceptable gestation length.

“Mother Nature does not allow us to breed cattle outside that window or she will kill them,” he adds.

They die if they are premature and can't be born if they are too big. But there are advantages to having calves in the lower end of average (born easily) rather than on the high end of average where you end up pulling 120-lb. calves or delivering them by C-section.

Regarding birth weight, it's best to find a happy medium — medium-size calves at birth that still give good performance. Or, you can look for the exceptional individuals that are born small but grow quickly, catching up by weaning time. There are cattle with a 70 to 80 lb. birth weight that grow fast enough to give excellent performance at weaning and as yearlings.

Dr. Ron Skinner, veterinarian and seedstock producer near Hall, Mont., says producers need to be cautious about selecting for really small (60- to 65-lb.) calves. “If you keep them as breeding stock, you may end up with a body type that is not optimal for calving. Some of these animals will have short bodies (not enough length) and not enough thickness. You can

build yourself into a trap where these smaller cows can't give birth to a 90-lb. calf,” says Skinner.

It's more common, however, for stockmen to get into trouble at the other extreme, since many people keep their biggest heifers as replacements. If you keep selecting this type of animal, you soon have cows a frame size or two larger than you started with and bigger calves at birth.

“Do not keep heavy birth weight females. Even if you breed them to easy-calving bulls, you may still have to assist them at birth. It's just as important to watch birthweight on females as it is on the bulls you select,” Skinner says.

“When trying to bend the curve with moderate birth weight and high performance, much of your success will depend on where you get your genetic seedstock. You need to know how your bull producer selects genetics and how careful he is on keeping good records.”

Some cattle have low birth weights and ease of calving and still give high performance, but you have to look a little harder to find them.

Search for shorter gestation

Buddy Westphal, a seedstock breeder from Polson, Mont., went on a search more than 40 years ago for bulls with shorter gestation. “When I was a student at Colorado State University, one of my professors, Jim Wiltbank, worked with several beef research stations. His mandate for the cattle business was that a cow had to have a calf every 365 days,” Westphal says.

You don't want a cow that has a longer calving interval each year, or, eventually, she calves too late or comes up open.

“You only have about 80 days to clean up a cow and get her bred back, and if she has an overdue calf, she doesn't have as much chance to rebreed on time. I didn't want to lose my calving interval, so I went in search of bulls with shorter gestation length,” Westphal explains.

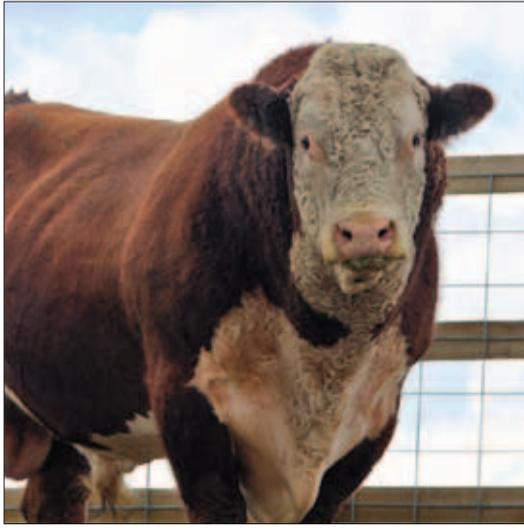
In 1968 he came across a Canadian research project called Canadian Conception to Consumer Test. This multi-year study was testing bulls for various traits, including birth weight and gestation length as well as performance. This was the first large-scale progeny test program in North America designed to provide detailed breeding-to-slaughter and carcass evaluation of the sires that were available through AI (artificial insemination). The study utilized thousands of cows on the PFRA (Prairie Farm Rehabilitation Administration) community pastures — which hundreds of ranchers utilize for summer

grazing — with bulls supplied by the government.

“For this study, they bred a lot of the cows AI to different bulls,” he says. “The people doing the AI work only knew the code on the semen and didn’t know whether it was Simmental, Chianina or Charolais, etc. Even when the cow calved, they didn’t know what breed the sire was; it was simply a crossbred calf. They just kept track of all the dates and details such as weights through yearling age and slaughter. When the data came back, it was unbiased, down to the hour the calves were born, how much they weighed, etc.

“Thousands of cows in the PFRA community pastures were part of this study, mating them to the new French and European bulls of all breeds. When the data came back they were able to tell what happened with which sires, in which breed. It was extremely accurate and unbiased data, and I used it for 20 years,” he says.

During those years, Westphal sold a lot of his bulls to the research centers at Miles City and Havre, Mont., and got the data on those bulls. “The Miles City station, for instance, was also studying gestation length in terms of breed-back time. Cows that give birth to calves with longer than average gestation don’t have as much time



to recover and breed back. That was the reason for my quest — to have an adequate calving interval,” he says. The shorter gestation solved calving problems, as well.

“As soon as I started seeking bulls that sired calves with a gestation under the 283-day average, I was no longer doing C-sections. If I could find a bull with a 278- or 280-day gestation, birth weights became more reasonable.”

This was a secondary benefit that he now utilizes in producing easy-calving bulls for commercial customers — which he feels is possibly more important than the increased window for breed back, which was the reason for his original search.

Heritability

“Heritability for gestation length is moderate,” MacNeil says. “Estimates of heritability are somewhere around

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0.3 which means it’s just a bit higher in heritability than weaning weight. The misleading thing about this, however, is that we can select for weaning weight and actually change it, whereas there’s a limit to how much we can select for gestation length and change it. We can keep selecting for bigger and bigger weaning weight almost indefinitely — and this is what many breeds have done in the past 50 years. On the other hand, if we select for shorter gestation length, we can only make it shorter by a little bit and still have a healthy viable calf.

You want gestation length to be appropriate, but not outside that acceptable window.

“It’s a trait that we can’t do much with because heritability is merely moderate,” MacNeil explains. “If you want to minimize calving difficulty you are better off to select on direct and maternal calving ease EPDs. You might not care as much whether the gestation length is 279 days or 286 days (the most practical range), as long as the calf is born easily. There’s only about a

10 day window that’s actually useful — though a calf carried 278 days may be born easier than one carried 288 days.”

The dam doesn’t have as much influence on gestation length as does the sire — though she will have an influence on how big the calf gets before it’s born. A large cow tends to have a larger calf

than a small cow, and the nutrition the fetus obtains from the dam can make a difference in how fast it grows.

But gestation length is determined mainly by the calf itself — its fetal maturity is what triggers labor, and this is a function of genetics via the sire. Some bulls consistently sire longer-gestation calves (or shorter-gestation calves) than average.

“The sire of the calf that’s in utero is the more important piece in this equation,” MacNeil says. **HW**