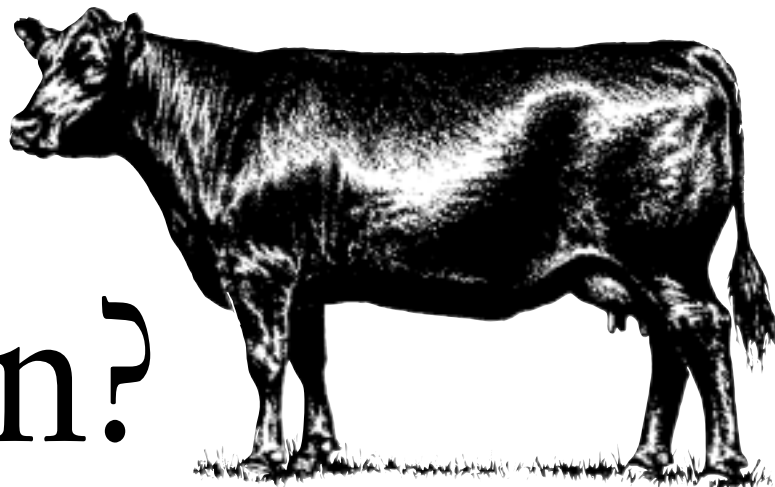


Factors affecting rebreeding:

Why is She Open?



Story by

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Many factors can affect pregnancy rate and the number of open cows at the end of the breeding season, but probably most important is nutrition, says Marie Bulgin of the University of Idaho Caine Veterinary Teaching and Research Center at Caldwell, Idaho. Other factors that affect rebreeding performance are calving difficulty, disease and bull fertility.

Usually the age group with the highest percentage of open cows is the first-calf heifers — 2-year-olds that did not breed back for their second calf. The most challenging to get rebred, they need special feeding to cycle and rebreed.

Robert Bellows of the U.S. Department of Agriculture (USDA) Agricultural Research Service (ARS) Livestock and Ranch Research Laboratory at Miles City, Mont., says he agrees that nutrition is the most important factor that determines whether or not these young cows stay in the herd or come up open.

Start early

Bellows says you have to start planning for lifelong productivity when the heifer is very young. Her age at puberty becomes critical if you want the heifer bred on time for her first calf.

"These animals have to be fed to reach a certain target weight, usually 65%-70% of their eventual mature weight," he says. "If

heifers reach this target weight by breeding time, they are more likely to come into heat and conceive."

Bellows says he has also found that if heifers are bred at first estrus their fertility is less, by about 20%, than if bred at third estrus. Feed them well enough that they've already cycled before the bulls are turned in, he advises. "There's a maturation process; the first cycles are less fertile than later ones."

Body condition score (BCS) at calving is critical for heifers, Bellows says. "You have to make sure she'll calve at adequate

body condition to get through her critical nutritional period. If you calve early [in the year], that means from calving until adequate grass."

Once on grass, she needs to maintain her body weight or, preferably, gain body weight.

Bellows recommends first-calf heifers be fed to a BCS 5 or 6 at calving, although feeding to a BCS 6 isn't always economically possible. "You have to start in the fall at weaning time; you can't do it in the last three weeks before calving," he adds.

Bellows says mature cows can be managed more loosely; their nutritional requirements aren't quite as critical.

A heifer is often in a growing phase until about 5 years of age, says Gary Rupp, director of the University of Nebraska Great Plains Veterinary Educational Center at the Roman L. Hruska U.S. Meat Animal Research Center (MARC) near Clay Center, Neb. "Her requirements become significantly greater when she's developing a fetus, and even

more during her lactation phase. Frequently people don't recognize the importance of meeting those requirements, plus the additional growth she needs, though she's probably only 80% to 90% of her mature size when she calves with her first calf."

Bulgin says that nutrition probably accounts for 80% of rebreeding problems, especially in range conditions, where available forage may be nutritionally deficient, or when heifers are being fed with the main cow herd. In range cattle, if you look at all the open cows in a herd, the heifers coming home with their first calves are generally the highest percent open.

Sometimes a major nutritional deficiency can affect the whole herd, however.

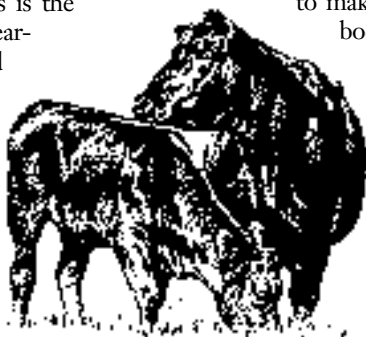
"In one case we looked at, the rancher had moved to a new property in a different area of the state, and that fall he had 30% open cows," Bulgin says. Some investigating revealed that the cows were low in phosphorus and many of them had inactive ovaries.

"The nutritional deficiency was probably due to the change in location," she says. "The rancher put those cows on a phosphorus supplement, and it solved the problem."

Bellows says, "The bottom line, from our data in this semi-arid region, is that ranchers should coordinate breeding with the optimum time for range forage. This is by far the cheapest way to raise calves. Forage-based livestock production is not only the most economical, but also most effective and efficient.

Stockmen should seek the optimum reproductive level, not the maximum, Bellows says. "If you can get up to 92% pregnancy rate, the probability that you'll get it any higher gets extremely more difficult and very expensive.

"Optimum will differ for each producer," he notes. "Producer A's optimal level might be a pregnancy rate of 92% to 93%,



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while operator B’s might be 80%, due to different ranching conditions.”

Dennis Maxwell of Iowa State University’s McNay Research and Demonstration Farm, near Chariton, Iowa, says minerals and supplements are controversial, “but if the major quality of the feed is taken care of, probably the minerals and other nutrient needs of the cow are taken care of, too. There are a lot of expensive supplements being fed, but these are not always needed.”

Maxwell says there are certain areas of the country with specific mineral deficiencies that need to be addressed. How to remedy the deficiencies is known, but just how they affect reproduction needs further study.

Importance of fat

Bellows says that a cow’s nutritional health is dependent upon adequate energy, protein, vitamins and minerals in a balanced diet, “but our most recent research work has shown that the last 50-60 days of gestation, the fat content of the diet is critical in terms of rebreeding and calf survival.”

The jury is still out on whether the fat covers an additional nutrient need or whether it is just being used as an energy source.

“The thing we do know is that we’re probably looking at the unsaturated fatty acids that the cow cannot synthesize herself,” he says. What phase of reproduction is affected is unclear, but the data show a definite effect on reproduction, rebreeding in particular.

Studies have repeatedly shown that feeding low-energy diets during pregnancy has a

detrimental effect on calf viability at birth and the dam’s ability to recover and rebreed. Bellows cites studies where a 10% reduction in calf survival at birth was attributed to the dam’s low-energy diet.

He says there also seems to be a carry-over effect from the fat eaten during gestation, which results in improved pregnancy rates at rebreeding. But the success or failure of fat supplementation may depend on the type of fat used. Studies are still evaluating various fat sources, how long the fat must be fed to the cow, and which levels are most economical and effective.

Calving difficulty

“We have two studies now that show long labor reduces survival of the calf and rebreeding performance of the dam,” Bellows says. To create the short-labor group, once the calf’s feet were visible, the researchers pulled it, regardless of need. Heifers in the long-labor group were allowed to stay in labor until the calf was delivered, with assistance given only in emergencies.

He reports about a 13% increase in the rebreeding rate in the short-labor group within a 45-day breeding season. The calves from the short-labor group also gained more rapidly between birth and weaning.

Rupp says calving difficulty can be related in some degree to nutrition (how large and well-developed the heifer was or wasn’t when she calved), bull selection and calf size at birth. Any calving problem that causes injury or excessive bruising to the dam would delay rebreeding.

“You can probably correct some of this with early assistance in heifers,” he says, “and some problems can be reduced with proper assistance, such as not delivering the calf until the heifer is dilated.”

Maxwell says many of the problems that stem from calving can be avoided these days with use of expected progeny differences (EPDs) and selective genetics when selecting bulls and replacement heifers.

Physical problems

Occasionally a breeding problem will be due to some individual abnormality, such as an abnormal reproductive tract, a small or abnormally shaped pelvis, nonfunctional ovaries, cystic ovaries, etc.

Heifer development programs like the Show-Me-Select replacement heifer program at the University of Missouri (MU), where they check all heifers by palpation and give them reproductive tract scores as to their breeding potential, can help weed

out heifers that would have trouble breeding, Bellows says.

AI programs

The rebreeding success rate in an artificial insemination (AI) program will depend a lot upon the people doing it.

“You have to have good operator ability and expertise for a good reproductive rate,” Bellows says. “We’ve also found (as have the scientists at Clay Center, Neb.) that 3 seconds of clitoral massage after insemination definitely will increase the conception rate in cows. It doesn’t seem to work in heifers for some reason, but it does in cows.”

Another factor affecting AI success is how cows are handled after breeding.

“Colorado studies show that if you move cattle after they’ve been synchronized and bred, it is very crucial *when* you move them,” Bellows shares. “They should be moved soon after breeding.”

Waiting either 10 days or 30 days increases the chance of losing the pregnancy, he says, by putting stress on the cow at the wrong time. At about 10 days postbreeding, the message is going from the embryo to the cow that she’s pregnant so she won’t come into heat again. About 30 days postbreeding, the embryo is implanting in the uterus.

“Don’t move those cows 10 days or 30 days after breeding,” Bellows advises.

Diseases

Bulgin says that if many cows are open at pregnancy check, you first need to determine whether the open cows are scattered among all age groups or if they appear primarily to be young cows.

“If it’s all ages, the problem may not be nutritional,” she says. “It may be a contagious disease, such as trichomoniasis or vibriosis, and it would be wise to have the bulls checked for disease and for fertility.”

She recommends having a veterinarian check open cows to see if they have active ovaries, a healthy uterus or individual problems that might cause infertility. Some of the diseases that cause abortions should also be considered.

“In years past, the main culprits were leptospirosis and vibriosis when cows came up open, the latter in range situations and community pastures,” Bulgin says. With vaccination, both diseases have pretty much been eliminated as major problems.

“Of the infectious diseases today, the major one causing reproductive problems is BVD (bovine viral diarrhea),” Bulgin says, “primarily because some people don’t vaccinate for it, or they are using killed vaccine only once a year rather than the modified-live virus (MLV) vaccine. The killed vaccine gives only 4 to 6 months’ protection.”

Maxwell is involved in an ongoing project to figure out what's best in vaccines and disease control. "There are no exact answers yet on whether to use killed or modified-live virus vaccine for BVD," he says. "We're still working on that." He recommends ranchers work closely with their local veterinarian, since there can be some variations in individual situations.

Bulgin suggests seriously considering BVD any time a look at total herd production reveals as many as 5% of cows open; a 2%-3% abortion rate; 2%-3% calf abnormalities, such as calves that are blind or with cataracts, calves with improperly shaped heads or jaws, or slow calves; and perhaps 5% of calves that die with diarrhea or pneumonia at 3-4 months of age.

She says BVD can be a major factor in young cows. "If they were infected before birth, they can be shedders of the virus, putting the rest of the herd at risk. Some young animals will die at 3 to 4 months of age due to lack of immune resistance to other diseases, but some of them will go on, and if kept as replacement heifers, can become a problem in the herd."

Bull fertility

Bull fertility is a necessary component of a good rebreeding rate. Producers should make sure bulls are fertile and healthy, with good libido, and fed properly.

"We don't see many problems with bulls if they are in reasonably good flesh and run at the proper ratio," Rupp says. "Most producers tend to run more bulls than they need."

Using bulls that have passed a good breeding soundness exam, producers should be able to use fewer bulls to cover the same number of cows, he says.

The biggest worry would be when using just one bull in a group, Rupp says. "Then it's really critical to know if he's going to do the job."

"Sometimes you can have an infertile dominant bull, and though there are other bulls with the cows, the dominant bull keeps them from breeding," Bulgin says.

Bulls should always be checked before the breeding season, she reminds. "Just because they were checked last year and found to be fine does not mean they'll be OK this year."

Bulls should be tested for BVD prior to turnout, Bulgin advises. Even if the cow herd is closed, a purchased bull could introduce BVD to the herd.

Proper bull nutrition is crucial. Bellows did a study using the National Research Council (NRC) requirements for

feed. He compared nutrient requirements of a 1,700-pound (lb.) bull with those of a 1,200-lb. cow giving 10 lb. of milk daily.

"You always hear about how high the lactating cow's requirements are, but the bull's dry-matter requirement is greater than hers, and his metabolic energy requirements are higher," he says. "Their total protein needs are almost equal, but he needs more TDN (total digestible nutrients). Their calcium and phosphorus requirements are almost equal, but he needs more vitamin A."

Bulls need to be fed well for a couple of months before the breeding season, since spermatogenesis takes about eight weeks. In other words, the sperm formed today will be ready for ejaculation in eight weeks, Bellows says.

"Nutrition can affect not only semen quality and sperm production, but also his general health and breeding ability, his energy level, etc.," Bellows says. Thin bulls may not be able to do their job, and overly fat bulls may also be impaired. They wear out more quickly and can't stand the pace of a hectic breeding season, and may have fertility problems due to extra fat deposits in the scrotum that keep the testicles too warm for optimum fertility.

There are also some unpredictable factors that can enter the picture. A hot spell during the middle of the breeding season hit a lot of herds in Iowa last year, adversely affecting bull fertility, Maxwell says. Hot weather can affect a bull's fertility and his desire to breed.

Each producer must choose the best calving-breeding season for his own situation, taking into consideration available feed resources and climate, to most effectively and economically get an optimum pregnancy rate, he continues.

Management

Another consideration in rebreeding rate is matching cow size to the environment, Rupp says. "If you are in a range situation, you need cows with moderation in milk production, especially if there's variation in how much grass you have and when it grows."

Calving season can sometimes be changed to avoid problems, timing nutritional stress when grass is best, Rupp says. "In a lot of cases, if people are having problems in getting heifers to rebreed, early weaning can be another consideration to think about, in addition to the level of milk production selected for."

Developing a cow herd that is fertile and that breeds back quickly takes good management and several years of planning. "It's all part of a good replacement heifer program, which essentially has three phases," Rupp says, describing them as

- (1) **The planning phase.** Select the genetics you want.
- (2) **The labor phase.** Select replacement heifers at weaning time and develop them until they are ready to calve.
- (3) **The evaluation phase.** Over the next three years, measure how good of a job you've done by how well they breed back.

"If you mess up in any one of these three phases, it can really cost you," Rupp says.

The cattle industry is failing to get the job done in management, he says. "The average cow age in most herds is too low. We're not keeping heifers in the herd long enough for them to really pay us back for their feed and be productive."

If heifers are developed and managed properly, producers should be able to keep them in the herd until they are at least 9-10 years old, he says, adding the average cow age in most herds is 5-6 years.

"We know it takes between \$700 and \$900 to develop a replacement heifer to her first calf. Some recent information indicates that if she doesn't rebreed, she's worth only half that," Rupp says. "We can't afford to have her open. Cow longevity is one of the big economic factors in a herd in terms of profitability," he says.

While producers are bound to see a few cows end up open for reasons beyond their control, Rupp says they can't afford percentages of open heifers greater than 10%.

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