



# Vet Call

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## Beef cow nutrition and herd reproductive strategies

*An overarching plan for optimum herd reproductive efficiency involves many important factors, including heifer development, management of the mature cow calving and breeding seasons, and appropriate bull management. Because proper herd nutrition touches all these factors, it deserves special attention.*

### Feed to gain appropriately

In order to calve at approximately 22-24 months of age and to reach puberty early enough to become pregnant before the start of the breeding season of the mature herd, heifers must reach puberty by 11-13 months of age. Beef heifers are expected to begin to have fertile cycles once they reach 50%-65% of their mature weight. Developing heifers on a plane of nutrition (both energy and protein) from weaning to breeding that allows them to reach puberty by 11-12 months of age results in improved udder development and increased pregnancy rates. However, be aware that overfeeding heifers before breeding has also been demonstrated to have negative effects on the likelihood of becoming pregnant.

A study showed heifers that gained 1 pound (lb.)-1.5 lb. per day from weaning to the start of breeding were more likely to become pregnant during a 45-day breeding season than were heifers with gains above or below this range. Body condition scores (BCS) in the same group of 1,863 heifers showed the same result, with first-service pregnancy rates improving as body condition increased up to a score of 6 (9-point scale) and then declining in fat heifers.

In addition, excessive supplemental feeding of beef heifers before puberty has been shown to reduce lifetime calf weaning weights due to impaired milk production. This impaired milk production appears to occur in heifers that had high body condition and that deposited fat in the udder.

Once puberty is attained, nutrition must be at a level that allows the heifer to continue cycling, produce healthy eggs and establish pregnancy. Nutritional demands of heifers during pregnancy are greater than for mature cows because the heifer is using nutrients for her own growth, as well as fetal growth.



This increased demand for nutrients continues through early lactation, when the beef female has her highest nutritional requirements. Deficiency of energy or protein for extended periods of time during the first two and a half years of life can have a negative impact on fetal development, calf health, milk production and rebreeding for the next pregnancy.

Researchers have shown that heifers calving at a greater BCS were more likely to be cycling at the start of the next breeding season and more likely to be pregnant during a 60-day breeding season. If heifers or cows are found to be thin during the middle third of pregnancy, increased nutrient intake for the three to four months leading up to calving can substantially improve pregnancy rate in the following breeding season compared to cows that calve in thin body condition.

It is very difficult for cows to gain body weight once they have calved and started lactating — even if heavily fed. Therefore, cows should reach their desired breeding body condition by the time they calve. In order to have enough days for thin cows to gain weight, they should be evaluated for BCS three to four months prior to calving. If evaluated at this time, the weight gain for a BCS 3 cow to reach breeding condition (BCS 5) will be approximately 1.5 lb.-2.0 lb. per day (which is very possible with good forage and supplementation). In contrast, if cows only have two months to gain two body condition scores, they will need to gain more than 3 lb. daily — a much more challenging task.

The energy requirement for lactating cows averages about 20% higher than for

dry cows (the actual requirement varies based on milk production), and this demand peaks at approximately 60 days after calving. This higher demand makes it difficult to add body condition once lactation begins. Because postcalving condition score and energy balance control ovulation, and being in good body condition is required for high pregnancy rates, both body condition at calving and level of nutrition after calving are important factors that influence pregnancy rates.

### Nutrition for bulls

Nutritional management of bulls is also important for bull fertility. Similar to the importance of how replacement heifers are managed from weaning to the first breeding season, how bulls are fed from weaning to their first breeding season greatly affects their future physical soundness and fertility. Growing bulls should be fed so that they are able to express their full growth potential, and restricting energy or protein can delay puberty and possibly reduce lifetime sperm production.

As with heifers, bulls that become too fat after weaning have been shown to be less fertile than bulls fed to gain appropriately from weaning to yearling age. Yearling bulls should probably be about a BCS of 6 and mature bulls should be BCS 5 to 6 at the start of the breeding season. In order to ensure that bulls are in good body condition, in the 60 days leading up to the breeding season they need to have access to good, quality forage and little to no concentrate supplement to maintain condition, and moderate to high amounts of concentrate if they need to add body condition.

Proper nutritional management of growing heifers and bulls, as well as timely assessment and management of mature cow and bull body condition are the foundations for an efficient and productive reproduction plan. Without a good nutritional plan, the best reproductive techniques and technologies will fail.

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**Editor's Note:** Bob Larson is professor of production medicine at Kansas State University.