

# Vet Call

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## Utilizing target weights to assure proper replacement heifer development from weaning to breeding

How replacement heifers are managed is one of the most important decisions a cattle producer makes in determining the profitability and genetic improvement of the cow herd. The benefits of proper heifer development include a genetically superior cow herd, short breeding and calving seasons, older average cow age because of lower culling rates for 2- and 3-year-old females, decreased dystocia rates, healthier calves from heifers and correspondingly increased profits.

In order for heifers to reach puberty by 12 to 13 months of age they must receive adequate nutritional intake to signal the body that the "luxury" of reproduction is attainable. Once puberty is attained, nutrition must be at a level that allows the heifer to continue cycling, ovulate a viable oocyte and establish pregnancy.

Heifers have higher demands for both energy and protein compared to the mature cow herd because heifers require nutrients for body growth as well as maintenance. Because of these higher nutritional demands and the social interaction within beef herds that dictates a lower status to smaller, younger animals, heifers must be fed separate from the mature cows in order to obtain the necessary nutrients.

The National Research Council (NRC) estimations for energy and protein requirements for heifers from weaning through early pregnancy should be used as a guideline in formulating heifer development rations but adjustments may need to be made to achieve desired gains. Factors such as amount of activity required for grazing, environmental temperature, breed and compensatory gain may decrease or increase the actual requirements when compared to the NRC values. Using NRC estimates plus adjustments, one can calculate requirements to meet a desired target weight at a specific time during development. If the target weight is not met, adjustments can be made so the desired weight at the start of the breeding season is achieved.

The target weight concept is based on the fact that English-breed heifers such as Angus are expected to reach puberty at about 60 to 65 percent of mature weight. One can determine the target weight for heifers by knowing the average mature weight of the cow herd, if it's a uniform herd, or by knowing the heifer's frame score and predicting mature weight. Once the target weight is known and the number of days until the start of the breeding season (or until a mid-development ration change) is determined, the rate of gain needed is a simple calculation:

$$\frac{(\text{Target weight} - \text{present weight})}{\text{number of days}} = \text{pounds gain/day}$$

Meeting the target weight, but not grossly exceeding it, is important for heifer fertility and production. Developing heifers on a high plane of nutrition (both energy and protein) from weaning to breeding results in earlier puberty, improved udder development and increased conception rates compared with a low plane.

Researchers at Miles City, Mont., showed that pregnancy rates after a 60-day breeding season in heifers fed to gain .6 pounds (lb./day, 1 lb./day or 1.5 lb./day from weaning to breeding were 50 percent, 86 percent and 87 percent respectively. Adequate gains during the weaning to breeding phase are also necessary for proper udder development and future milking ability.

Overfeeding heifers before breeding has also been demonstrated to have detrimental effects on pregnancy rates. Heifers at Kansas State University, Manhattan, that gained 1 to 1.5 lb./day had higher pregnancy rates during a 45-day breeding season than did heifers with gains above or below this range. Body condition scores in the same group of almost 2,000 heifers showed the same result; with improving first-service conception rates as body condition increased up to a score of 6 and then declining in very fat

heifers. Other reports have also indicated that gains above 2 lb./day have a negative impact on heifer fertility. 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 exceed energy intake needed for optimal post-weaning gain and subsequently deposit fat in the udder.

Although hitting the target weight at the start of the breeding season is important for fertility and future productivity, weight gains do not need to be consistent throughout the weaning to breeding period. Researchers at Kansas State compared groups of heifers managed differently, but that reached the same target weight and body condition score prior to breeding. Half of the heifers were fed to gain about 1.3 lb./day throughout the weaning to breeding period. The other half of the heifers were fed at a low rate of gain for 105 days (0.12 to 0.55 lb./day) and then fed for higher gains the last 54 days before breeding (2.5 to 3.5 lb./day). These groups of heifers reached puberty at the same age and weight, had the same first-service pregnancy rates and the same pregnancy rates to a 45-day breeding season even though rate of gain was managed differently.

In order to be assured that the target weights and body condition scores are being met, a sub-group of heifers should be weighed and scored for body condition at reasonable intervals (monthly) in order to confirm that targeted gains are being reached. If gains are not near target levels, the ration should be adjusted accordingly.

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