Heifer Development Program Considerations

Rachael Boyle
Phillips-Rooks District Extension Agent
Agriculture and Natural Resources

Replacement heifers are likely some of the most valuable livestock on an operation, as they represent the genetic foundation of the enterprise for several years to come and significant financial investment. Producers should consider that the sale of several calves is required to generate sufficient calf-revenue to recover the costs associated with purchasing, developing and maintaining heifers. In most cases, the sale of 3-5 calves will be required to recover the initial investment and maintenance costs of a replacement female. Therefore, it is important to develop and manage replacement heifers in a manner that is sensitive to development costs, reproductive success, and longevity in the herd. Heifer development programs are developed around two factors. 1). the desired or "target" weight that heifers will be developed to prior to breeding and 2). the strategy of weight gain used to grow the heifers to the target weight.

Reproductive development and puberty in heifers is a function of both age and bodyweight. However, bodyweight is the primary method of gauging puberty attainment of beef heifers in production settings. Heifers are developed to achieve a specific "target weight" prior to the breeding season (expressed relative to the expected mature weight of the heifer). This concept was based on the theory that physiological maturity (the point at which consumed energy is directed away from lean tissue deposition toward body reserves) and reproductive maturity occur at about the same point in the animal's physiological growth curve. Historically, it was recommended that heifers be managed to achieve 60-65% of their mature bodyweight prior to their first breeding season. More recently, research has demonstrated that developing heifers to achieve lower target weights (approximately 55% of their mature bodyweight) prior to breeding may reduce heifer development costs without significantly influencing heifer pregnancy rates, calving rates or retention. However, choosing a target development weight for heifers does warrant careful consideration as there are advantages and disadvantages to both higher and lower development targets. Developing heifers to a lower target weight may reduce development costs, but it may also result in a greater proportion of heifers that are not cycling prior to the breeding season. Operations that select a lower development target should consider that a greater number of heifers may need to be developed to achieve the desired number of replacement females for the operation. Conversely, an operation that develops heifers to greater target weights prior to breeding will likely have higher development costs, but a larger proportion of heifers will likely be cycling prior to the breeding season. Producers should consider the number of replacement females required and the number of potential replacement heifers available for development when selecting a target development weight for replacement heifers. If only a few heifers are required as replacements (i.e. smaller herd) or the number of potential replacements females is limited, selecting a higher development target weight may be advantageous.

The strategy of weight gain used to grow heifers to the target development weight prior to breeding is the second factor that should be considered when developing heifers. Heifers may be developed using one of three strategies. One of the most common strategies used is to grow heifers at a relatively constant rate of gain post-weaning to the target weight. Replacement females do not typically need to gain more than 200-400 lbs of weight post-weaning to achieve the target weight, thus only moderate amounts of energy/supplemental feed are required using this strategy. Heifers may also be developed by growing them more rapidly post-weaning and then at slower, yet increasing rate closer to the breeding season. The advantage of developing heifers using this strategy is that a greater proportion of heifers will likely attain puberty and begin cycling earlier due to the greater plane of nutrition. However, the disadvantage of this strategy is that heifers are

grown to larger weights early in the development period. Thus, producers are maintaining a larger animal, with greater nutrient requirements during the development period. The third development strategy is to grow heifers slowly for a period of time post-weaning and then at a more rapid rate closer to the breeding season. The primary advantage of this strategy is that a smaller animal, with lower maintenance requirements is fed during the development program, which lowers feed inputs/costs. Producers developing heifers in extensive forage-based systems often use this strategy. The risk associated with this development strategy is that heifers may not achieve puberty, and begin cycling prior to the breeding season if they are unable to gain rapidly enough to achieve the target weight prior to the breeding season.

Regardless of the development strategy used, it is critical that heifers are developed and maintained on a positive plane of nutrition, such that they are gaining weight, albeit at different rates and times post-weaning. Heifers that lose weight during the development period may achieve puberty, but may cycle erratically or stop cycling. The heifer development strategy employed is often a function of resource availability and thus is effected by drought and weather conditions (cold, wet, winter) which affect feed resources or heifer weight gain. Weight gain and bodyweight of heifers should be evaluated at least 90-120 days prior to the breeding season to ensure that heifers will achieve the target weight.

Replacement females are essential to an operation; they represent the future genetics of the herd and require significant financial and labor investment. As such, heifer development strategies warrant careful consideration, as they must balance development costs, reproduction, longevity, and be responsive to environmental risk. The factors that determine the best heifer development strategy are unique for each operation and may change from year to year and even during the development period. Unfortunately, there is no “one size fits all” to an operations heifer development strategy.

For more information, please contact the local K-State Research and Extension Office.