



Maybe the New Sixty-Five

Research suggests benefits to breeding some heifers at lighter weights.

by **Wes Ishmael**

“**R**eplacement 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,” says Justin Waggoner, Kansas State University beef systems specialist at Garden City, Kan. “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.”

More specifically, it typically takes the sale of three to five calves to recover the initial investment and maintenance costs of a replacement female, according to Waggoner, in a 2021 Beef Tips newsletter article, Heifer Development Program Considerations.

“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,” Waggoner says. “Heifer development programs are developed around two factors: 1) the desired or target weight that heifers will be developed to prior to breeding; 2) the strategy of weight gain used to grow the heifers to the target weight.”

Waggoner explains reproductive development and puberty in heifers is a function of both age and body weight, as expressed relative to the expected mature weight of the heifer. He adds the latter is the primary puberty gauge in production settings.

“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,” Waggoner explains. “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 impacting heifer pregnancy rates, calving rates or retention.”

Likewise, John Hall writes, “Achieving a target weight of 65% of mature weight by the beginning of the breeding season

ensures nutrition does not limit reproductive success of heifers; however, it appears a target weight of 55% has application for some operations and may have positive effects on heifer longevity.” That’s from Management Considerations in Beef Heifer Development and Puberty from Veterinary Clinics of North America: Food Animal Practice.

Hall conducts applied research at the University of Idaho’s Nancy M. Cummings Research, Extension and Education Center.

Hall’s article is from 2013. At the time, he noted, “The studies supporting the 55% target weight were conducted with crossbred/composite heifers which tended to reach puberty earlier. A follow-up study indicated that developing heifers to 50% mature body weight

compared to 55% body weight resulted in similar overall pregnancy rates but decreased calf weaning weight from 2-year-old cows and delayed calving in 3-year-old cows ... Although overall pregnancy rates were not compromised by the 55% target weight, several studies indicated decreased conception early in the breeding season or to artificial insemination.”

Keep in mind these studies are based on Bos Taurus cattle.

Waggoner emphasizes choosing a target development weight for heifers warrants careful consideration.

“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,” Waggoner explains. “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.”

“Another way of thinking about it is that there’s little room for error when developing heifers to a target weight of 55%. Developing them to heavier target weights is more forgiving,” Hall explained.

“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

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for replacement heifers,” Waggoner says. “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.”

In sum, Hall says, “Consideration must be given to heifer biological type, breeding (purebred vs. crossbred), development costs and marketing options before selecting or recommending a target weight goal.”

How much gain and when

After deciding the target weight, Waggoner says the next consideration should be the strategy for achieving the desired weight gain prior to breeding.

In the studies Hall cites, there was no impact of the pattern of gain on heifer pregnancy rates. The studies included heifers achieving a target weight via: rapid gain followed by slow gain; steady gain; slow gain followed by rapid gain.

“Therefore, managers can design feeding programs to maximize gain during times of abundant forage, low-cost feed supplies or favorable environmental conditions,” Hall says.

Waggoner notes growing heifers at a relatively constant rate of gain, post-weaning, is a common approach.

“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,” Waggoner explains. “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 other strategy, as Hall mentioned, is growing heifers slowly after weaning and then more rapidly closer to 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,” Waggoner explains. “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.”

“Research has shown that with a good nutritional plan, it is reasonable to expect replacement heifers to reach maturity between 11 and 13 months of age,” explained Bob Larson, K-State veterinarian, in a Beef Cattle Institute Cattle Chat podcast. “Heifers that will weigh 1,200 to 1,300 pounds when they are mature will typically reach puberty by the time they weigh 750 to 850 pounds.”

So, Larson says, that means gain will likely average from 1 to 2 pounds per day for most replacement heifers at nine months of age.

No matter the gain strategy, Waggoner emphasizes it’s critical for heifers to be developed and maintained on a plane of nutrition that enables them to gain throughout the post-weaning period.

“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 affected by drought and weather conditions (cold, wet, winter), which impact 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,” Waggoner says. **HW**

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