



BEEF CATTLE RESEARCH UPDATE

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Economic Analysis of Cow Longevity

Longevity and lifetime productivity are important factors influencing profitability in a cow-calf operation. Texas A&M University researchers used data on a cowherd (116 cows born from 1982 to 1985 that were F₁ crosses) from the Texas A&M AgriLife Research station at McGregor, TX to determine the economic impact of increasing the productive lifespan of a beef cow and the economic gains from a longer peak productive life.¹ The dams of these cows were purebred Hereford cows and the sires of these cows were Angus, Gray Brahman, Red Brahman, Indu-Brazil, Gir, and Nellore bulls (mated by artificial insemination). This dataset included reproduction records, calf weights, and cow removal records for these cows from 1985 to 2005. In this study, cows were exposed to bulls annually in 78-day breeding seasons in multiple-sire pastures. Cows were culled from the herd after two failures to wean calves (from annual exposure to bulls) through 12 years of age. Subsequently cows were culled after a single failure to wean a calf. In addition, cows were culled at any time for severe udder problems, structural unsoundness, and health conditions. A total of 1,278 calves were born to these cows from 1985 through 2005.

These researchers reported that the value of inclusion of an additional year of peak performance ranged from \$118 per cow for the Angus crossbreds to \$244 per cow for Indu-Brazil sired cows. They concluded that increasing cow longevity by one year has a positive and large effect on cow value. The average cow age at culling in this study was about 13 years.

Effect of Development System on Growth and Reproductive Performance of Beef Heifers

Management of beef replacement heifers from weaning to breeding is critical to their lifetime productivity. Historically, replacement heifers have been fed a diet to achieve 60 to 65% of mature body weight (BW) by breeding at 14 months of age.² This practice was based on research conducted during the late 1960s through the early 1980s. However, research conducted over the last 10 years has found that feeding beef heifers to 50 to 55% of mature BW reduced body size and development costs without compromising pregnancy rate. Recently published Canadian research evaluated reproductive performance in beef heifers born over a 2-year period to determine the effects of target breeding weight on growth and subsequent reproductive efficiency.³ In this study, spring-born Angus heifers (558 lb) were randomly allocated over 2 consecutive years to be developed to either 55% (772 lb) of mature BW (moderate gain) or 62% (871 lb) of mature BW (high gain) of a projected 1405 lb mature weight (based on historical cow BW). All heifers received bromegrass-alfalfa hay as the base forage along with supplemental barley grain (1.39 to 5.29 lb/day) to reach the desired target BW over a 202-day development period. After the development period, heifers were exposed to bulls for a 63-day breeding season. Pregnancy rates were determined by rectal palpation at approximately 50 days after the bulls were removed.

These researchers reported that during the development period, moderate gain heifers gained slower ($P = 0.01$) and had lighter BW ($P = 0.01$) at breeding than high gain heifers

(1.10 vs. 1.54 lb/day and 779 vs. 874 lb, respectively). From the end of the development period to pregnancy diagnosis, moderate gain heifers compensated and gained faster than the high gain heifers (1.83 vs. 1.54 lb/day; $P = 0.04$) but still weighed less than high gain heifers (992 vs. 1056 lb; $P = 0.01$). In addition, high gain heifers had greater ($P = 0.02$) pre-calving BW than moderate gain heifers (1056 vs. 992 lb) and reached a greater percent of mature BW (78.3 vs. 75.5%) at precalving. It was reported that the proportion of heifers attaining puberty by 14.5 months of age was less ($P = 0.05$) in moderate gain than high gain heifers (20 vs. 52%). However, first-calf pregnancy rates did not differ between treatments (86 and 88% for moderate gain and high gain heifers, respectively). Furthermore, there was no difference ($P = 0.73$) for calf birth BW, date of first calf born ($P = 0.51$), calving difficulty score, and proportion of heifers calving in the first 21 days of the calving season ($P = 0.47$). Research has shown that heifers calving early during their first calving season have a greater lifetime calf production than those calving late and are more likely to become pregnant sooner at 2 years of age.⁴

In this study, heifer development treatment did not affect the first-calf pregnancy rate or the number of heifers calving in the first 21 days. In addition, second- and third-calf pregnancy rates of cows, developed in either a moderate gain or high gain system as heifers, were not different (94.7 vs. 95.9% and 93.8 vs. 93.9%, respectively). An economic analysis of the data showed that developing heifers to 55% compared with 62% of mature BW reduced development cost by about 21% or about \$58 per head.

These authors concluded that these results provide additional evidence that post-weaning development of heifers to achieve 55% of mature BW before breeding does not negatively affect reproductive performance during first and second calving compared with developing heifers to achieve 62% of mature BW.

¹ Garcia, J., A. D. Herring, D. G. Riley, J. O. Sanders, and D. P. Anderson. 2014. Economic analysis of cow longevity. *Proc. West. Sec. Am. Soc. Anim. Soc.* 65: 83-86.

² Funston, R. N., J. L. Martin, D. M. Larson, and A. J. Roberts. 2012. PHYSIOLOGY AND ENDOCRINOLOGY SYMPOSIUM: Nutritional aspects of developing replacement heifers. *J. Anim. Sci.* 90:1166-1171.

³ Lardner, H. A., D. Damiran, S. Hendrick, K. Larson, and R. Funston. 2014. Effect of development system on growth and reproductive performance of beef heifers. *J. Anim. Sci.* 92: 3116-3126.

⁴ Mousel, E. M., R. A. Cushman, G. A. Perry, and L. K. Kill. 2012. Effect of Heifer Calving Date on Longevity and Lifetime Productivity. In: *Proceedings, Applied Reproductive Strategies in Beef Cattle.* p 23-31.

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