EFFECT OF HEIFER SOURCE ON REPRODUCTIVE PERFORMANCE, CULLING, MARKETING AND PROFITABILITY FOR A COMMERCIAL HEIFER DEVELOPMENT PROGRAM [1]

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Summary

A commercial heifer development operation purchased 483 weanling Angus × Hereford heifers from 11 sources. Heifers were fed a common silage-based diet through an initial developmental period and retained or culled based on average daily gain, pelvic area, and disposition. The percentage of heifers culled from each source ranged from 18.1% to 94.7% and were either sold directly through a local sale barn or sent to a feedlot with retained ownership. Estrus was synchronized, and heifers were artificially inseminated (AI) for 30 days followed by 15 days of natural mating. First service conception rates for each source ranged from 0% to 92.3%, whereas overall pregnancy rates for the 45-day breeding season ranged from 81.3% to 100%. When expressed as a percentage of the original heifers purchased from each source, overall pregnancy rates ranged from 5.3% to 80%. Heifers that lost their fetuses were sold for a net loss of $213 per head. Heifers sold as first service AI bred, second service AI bred, and naturally mated netted $160, $129, and $89 per head, respectively. With accurate records, stringent culling practices, and evaluation of cost and performance, producers can optimize profit potential of replacement heifers. Early culling and pregnancy diagnosis also will decrease costs while increasing opportunities to minimize the financial risks.

(Key Words: Replacement Heifers, Culling, Artificial Insemination, Economics.)

Introduction

Beef producers commonly replace 10 to 20% of mature cows each year with heifers. Those heifers represent the future genetics and profit potential of the operation. Many producers utilize artificial insemination (AI) to hasten genetic progress. Likewise, commercial heifer development programs have grown in popularity in recent years. Our purpose was to evaluate the influence of the source of heifer calves on subsequent reproductive rates, and on the economic performance of both nonpregnant and pregnant heifers.

Experimental Procedures

In October, 1994, a commercial heifer development facility in North-Central Kansas purchased 483 weanling Angus × Hereford heifers (mean body weight = 506 lb) from 11 sources. Heifers per source ranged from 19 to 84, with an average of 44. Heifers were fed a common silage-based diet through the initial developmental period. In March, 1995, a prebreeding exam was done. Some heifers were culled, based on low average daily gain (minimum of 1.4 lb per day), small pelvic area (minimum of 140 cm^2), poor reproductive tract scores, poor disposition, or visually appraised structural unsoundness. Culled heifers were either sold directly through a local sale barn or sent to a feedlot where the producer retained ownership until they were sold for slaughter in September, 1995.

Estrus in the remaining heifers was synchronized by feeding MGA (.5 mg per head per day) for 14 days, then injecting prostaglandin $F_{2\alpha}$ (PGF) 17 days after MGA

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withdrawal. Heifers were observed for signs of estrus beginning 24 hours after PGF and artificially inseminated (AI) 12 hours after the onset of standing heat using semen from one sire. Artificial insemination continued for 30 days followed by 15 days of natural mating to complete the 45-day breeding season. Ultrasonic pregnancy diagnosis was performed approximately 30 days after AI to determine date of conception. Pregnancy rates after first service AI, second service AI, and natural mating were determined.

In August, 1995, all nonpregnant heifers were sold directly through a local sale barn. After the breeding season, all pregnant heifers were moved to native prairie grass pasture until early November, at which time they grazed cornstalk residue for 60 days. Heifers were supplemented with prairie hay when weather limited grazing. Pregnant heifers were returned to drylot facilities for 2 weeks in January, 1996, and prepared for a special replacement heifer sale in south-central Nebraska. Pregnancy was reconfirmed via uterine palpation to determine the percentage of heifers that had aborted since conception. Heifers that lost their fetuses were sold locally. The remaining animals were sorted into groups according to their date of conception and sold at the special sale.

We calculated net profit or loss for each group using actual feed costs throughout the 15-month developmental period and actual market prices at the time animals were sold. In addition, performance and reproductive data were analyzed as a percentage of the heifers originally purchased from each source as well as the percentage of heifers retained from each source for the breeding season.

Results and Discussions

Heifers in this study were sold at various times throughout the 15-month developmental period. The net profit or loss varied for each group (Figure 1). Heifers culled at the time of the prebreeding exams and sold directly had a net loss of $45 per head, whereas those retained in the feedlot had a net profit of $8 per head. Heifers diagnosed as nonpregnant shortly after the breeding season were sold for a net loss of $33 per head; the loss for nonpregnant heifers that were wintered and sold in the following spring was $213/head. These results emphasize the importance of early culling and pregnancy detection to provide alternative sale routes. The remaining pregnant heifers were sold as first service AI bred, second service AI bred, or naturally mated for net profits of $160, $129, and $89 per head, respectively.

Another objective was to evaluate the influence of heifer source on reproductive efficiency. Following prebreeding exams, 194 heifers were culled primarily on the basis of low average daily gain and small pelvic area. The percentage of heifers culled from each source ranged from 18.1% to 94.7% (mean = 41.7%; Figure 2). Of the heifers retained for breeding, the average daily gain was 1.63 lb per day, and the mean pelvic area was 167 cm^2. First service conception rates for each source ranged from 0% to 92.3% (mean = 66.8%). Following the 45-day breeding season, overall pregnancy rates for each source ranged from 81.3% to 100% (mean = 93.8%). When expressed as a percentage of the original heifers purchased from each source, pregnancy rates ranged from 5.3% to 80% (mean = 51.8%). These results indicate that source is a major factor in predicting heifer performance. Initial culling prior to the breeding season can reduce feed costs and provide opportunities for alternative sale routes. Initial culling also reduces breeding costs and saves time and labor associated with low-fertility heifers.

Replacements for the second year were purchased from the same source only if at least 75% of heifers purchased in the year before had become pregnant during the 45-day breeding season. This resulted in repeat purchases from only 3 of the 11 original ranches and provided 33% of the heifer crop for the second year. As a result, the culling rate for the second year decreased from 41.7% to 8.6%. For producers who opt to purchase replacement heifers each year, accurate records and evaluation of heifer source, development costs, and marketing options are essential to optimize performance and improve overall management of the operation.

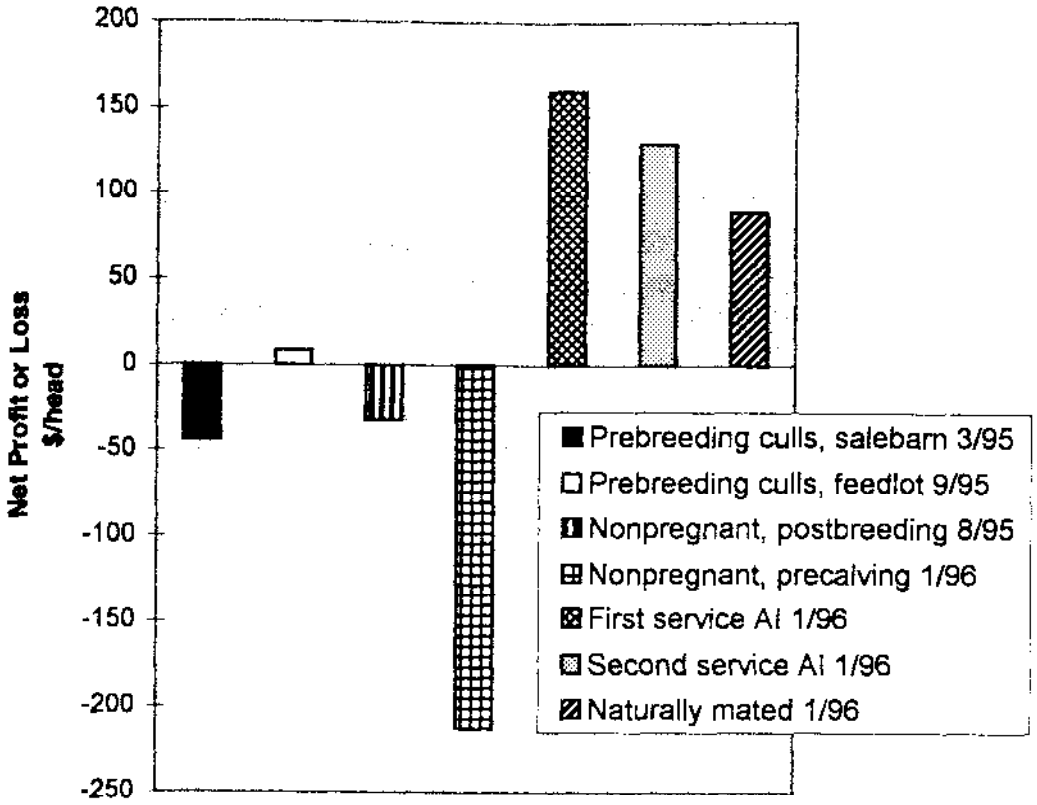

Figure 1. **Net Profit or Loss Associated with the Sale of Heifers of Various Physiological Status during a 15-Month Developmental Period.**

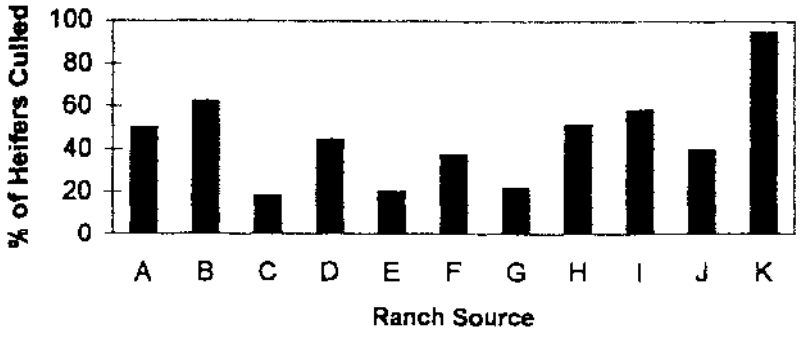

Figure 2. **Percentage of Heifers Culled from Each Source Prior to the Breeding Season.**