# BEEF CATTLE RESEARCH UPDATE

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**Economics of Rebreeding Non-Pregnant Females**

Conventional wisdom has generally been that non-pregnant cows should be culled and sold after pregnancy detection into the slaughter market to avoid extra feeding expenses. In a spring-calving herd, cows are typically culled from the herd in the fall after weaning calves and pregnancy checking. As a result, cull cow prices show a distinct seasonal pattern with lows in the fall and prices gradually improving to a peak in late spring to early summer (Figure 1).[1]

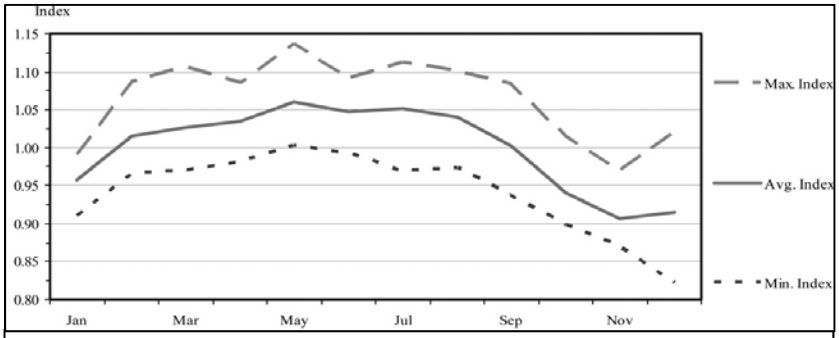


Figure 1. Seasonal price index for utility cows in the Southern Plains, 2000-2009. Source: Amadou et al., 2014.

A recent University of Nebraska study used a budget analysis to compare the economics of selling non-pregnant spring-calving cows immediately after pregnancy diagnosis (November) or rebreeding non-pregnant cows to be sold as pregnant fall-calving cows in a potentially more favorable market (April).[2] In this study, spring-born, crossbred females diagnosed as non-pregnant after the regular spring breeding season were utilized over a two year period at two locations, the Gudmundsen Sandhills Laboratory (GSL; 133 head) in Whitman, NE and the West Central Research and Extension Center (WCREC; 15 head) in North Platte, NE. The GSL females were composite Red Angus × Simmental and approximately 80% were 1 and 2 years of age at the beginning of the study. These females were exposed to a 45 day natural service spring breeding season prior to the beginning of this study. The WCREC heifers were primarily Angus and one year of age. At the spring breeding season, they were synchronized with a melengesterol acetate prostaglandin (MGA-PG) protocol prior to artificial insemination (AI) and following AI were placed with bulls for 60 days. At both locations pregnancy diagnosis was determined by ultrasound 45 days after bulls were removed.

At GSL, the non-pregnant females were synchronized with a controlled internal drug-release insert (CIDR; Zoetis, Florham Park, NJ) on day 0 followed by CIDR removal and prostaglandin (PG; Lutalyse, Zoetis) on day 7 before a 60-day natural service breeding season (1:25 bull-to-cow ratio). Pregnancy diagnosis was determined by ultrasound 30 days after the bulls were removed.
At WCREC, the non-pregnant females Heifers were synchronized with CIDR and gonadotropin-releasing hormone (Fertagyl, Intervet Inc., Millsboro, DE) on day 0 followed by CIDR removal and PG on day 7 and timed AI 60 hours later. After AI, the heifers were placed with bulls for approximately 170 days. Pregnancy diagnosis was determined by ultrasound 135 days after AI.

In this project, a sensitivity analysis evaluated the economics of retaining and rebreeding using five years of market scenarios (2010 to 2015) at different pregnancy rates (10 to 90%) for each location. Feeding was assumed to be similar for the two locations (hay and supplement for a 160 day period) and average hay prices for each year were obtained from the Nebraska average price reported by the USDA Agricultural Marketing Service. Cow and heifer value in November, March, and April were calculated from the Nebraska average price reported by the USDA Agricultural Marketing Service for the corresponding date and respective average body weight. Total breeding costs were assumed to be similar each year.

These researchers reported that the overall pregnancy rate during the rebreeding season was 86.1% for GSL and 80% for WCREC with a high percentage conceiving in the first 21 days of the breeding season (84.4 and 66.6% for GSL and WCREC, respectively). The authors noted that cows calving earlier in the calving season will be more adaptable to the fall calving system and be more productive as fall-calving cows.[3]

The economic simulation performed for the five years of market prices demonstrated that the rebreeding strategy was cost effective in different market scenarios, excluding the year 2012/2013 (Table 1). As a result of a drought in 2012, feedstuff prices were the highest and cow market prices were the lowest of the five years analyzed. As a result, this management practice was not profitable, regardless of pregnancy rate in 2012/2013. However, in the other years, the strategy appeared to be cost effective even at a modest pregnancy rate (~50% plus). As pregnancy rate increased, the net proceeds also increased.

Table 1. Sensitivity analysis of rebreeding non-pregnant females for market scenarios for the years 2010-2015 at different pregnancy rates.

| | Net Proceeds, $/heifer exposed | | | | |
|---|---|---|---|---|---|
| Pregnancy Rate, % | 2010/2011 | 2011/2012 | 2012/2013 | 2013/2014 | 2014/2015 |
| | Gudmundsen Sandhills Laboratory - Natural Service Breeding | | | | |
| 10 | −92.16 | −207.67 | −802.44 | 63.66 | −84.79 |
| 30 | 52.44 | −55.82 | −730.17 | 147.12 | 85.58 |
| 50 | 197.03 | 96.02 | −657.91 | 230.59 | 255.95 |
| 70 | 341.62 | 247.86 | −585.65 | 314.05 | 426.31 |
| 90 | 486.21 | 399.71 | −513.38 | 397.51 | 596.68 |
| | West Central Research and Extension Center - Fixed-Time AI | | | | |
| 10 | −91.01 | −206.05 | −860.31 | 92.52 | −57.27 |
| 30 | 35.56 | −76.86 | −808.62 | 150.11 | 83.81 |
| 50 | 162.14 | 52.34 | −756.94 | 207.69 | 224.89 |
| 70 | 288.72 | 181.54 | −705.26 | 265.27 | 365.97 |
| 90 | 415.29 | 310.73 | −653.57 | 322.86 | 507.05 |

Adapted from da Silva et al., 2016.

These authors noted that the best candidates for this strategy would be “young females that have more productive life remaining and the greatest potential for added value when sold later as a bred cow compared with her current value as a cull cow”. Since older cows have less productive life remaining, “it is less likely there would be enough extra value to capture to make the strategy profitable.”

These researchers concluded that in their study, satisfactory reproductive and economic performances were achieved by retaining non-pregnant females and rebreeding for a fall calving season since positive economic results were observed even at low pregnancy rates except in an atypical scenario such as a drought. Thus, this strategy provides an alternative to potentially increase financial returns with cull beef females.

[1] Amadou, Z., K. C. Raper, J. T. Biermacher, B. Cook, and C. E. Ward. 2014. Net returns from feeding cull beef cows: The influence of initial body condition score. J. Agric. Appl. Econ. 46: 139-155.

[2] da Silva, G. A., D. C. Adams, and R. N. Funston. 2016. Fall-breeding beef females failing to conceive during spring breeding. Prof. Anim. Sci. 32: 243-247.

[3] Cushman, R. A., L. K. Kill, R. N. Funston, E. M. Mousel, and G. A. Perry. 2013. Heifer calving date positively influences calf weaning weights through six parturitions. J. Anim. Sci. 91: 4486-4491.