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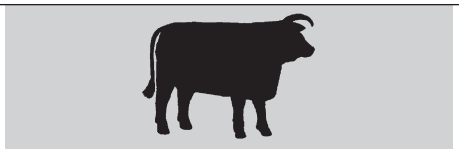

Fall-breeding beef females failing to conceive during spring breeding

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ABSTRACT

A study was conducted to evaluate the economics of retaining ownership and rebreeding nonpregnant spring-calving cows to be sold as pregnant fall-calving cows. Spring-born crossbred females diagnosed as nonpregnant after the regular spring breeding season were used over a 2-yr period at 2 locations, Gudmundsen Sandhills Laboratory (GSL) and West Central Research and Extension Center (WCREC). A partial budget analysis was performed to evaluate the economic aspects of this strategy; total cost was calculated by adding the purchase price, feeding and management cost, breeding expenses, and 6% annual interest rate on the purchase price. The net cost of one pregnant cow was calculated as the difference between total cost and cull value, divided by the number of pregnant cows. A sensitivity analysis evaluated the economics of retaining and rebreeding for market scenarios for the last 5 yr at different pregnancy rates. The overall rebreeding pregnancy rate was 86.1% at GSL and 80.0% at WCREC; the percentage of the pregnant cows that conceived in the first 21 d of the breeding season was 84.4% at GSL and 66.6% at WCREC. The increasing cow prices from November to April and a greater market price for pregnant females resulted in a net gain of $520.29 and $616.81 per pregnant female for GSL and WCREC, respectively. Simulation performed using market prices for the last 5 yr demonstrated the strategy is cost effective in different market scenarios, excluding 2012/2013 because of drought—feed prices were the highest and cow prices the lowest of the 5 yr analyzed. Other than atypical scenarios like drought, positive economic results may be possible even at low pregnancy rates, but as the pregnancy rate increases, net proceeds also increase.

Key words: culling, fall-calving cows, marketing beef females

INTRODUCTION

Probably no single aspect of beef herd management is as complicated, or has potentially greater economic impact, as the cow culling and replacement decision (Melton, 1980). Conventional wisdom has been that nonpregnant beef females should be sold after pregnancy detection to avoid extra feeding expenses. Culling young females for pregnancy failure can be extremely costly to a beef enterprise because they have not yet become profitable (Roberts et al., 2015).

Most often, these nonpregnant beef females are culled and sold into the slaughter market. These sales represent, on average, 10 to 20% of total gross income for the beef producer (Sawyer et al., 2004). The cull cow market has traditionally been seasonal, with October and November monthly average cull cow prices being the lowest for the year because Nebraska beef production is predominantly based on a spring calving system, lending itself to November cow culling. Alternatively, cull beef females may be retained until a period of historically higher market prices and, depending on feed costs, placed on a high energy diet, thus capturing greater weight and prices (Funston et al., 2003).

The United States cowherd is at historical low levels, and several offsetting factors support herd expansion, including unprecedented cow–calf returns, ongoing global beef demand growth, and timing within the current cattle cycle (Tonsor and Schulz, 2015). Therefore, the decision not only to replace breeding females but increase retention to ultimately increase beef supplies must also be considered.

An alternative replacement or expansion opportunity is keeping the nonpregnant beef female to rebreed. This may not be a traditional option, but the variability in cull cow and feedstuff prices suggests an alternative

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could exist. Therefore, a study was conducted to evaluate the economics of retaining ownership and rebreeding nonpregnant spring-calving beef females to be sold as pregnant fall-calving cows.

MATERIALS AND METHODS

Animals

Spring-born crossbred beef females diagnosed nonpregnant after the regular spring breeding season were used over a 2-yr period at 2 locations, the Gudmundsen Sandhills Laboratory (**GSL**; yr 1, n = 61; yr 2, n = 72; Whitman, NE) and the West Central Research and Extension Center (**WCREC**; yr 2, n = 15; North Platte, NE). The GSL females were composite Red Angus × Simmental, and approximately 80% were primiparous or entering their first breeding season before the beginning of the study (on average, 25 mo old; ranging from 15 mo to 7 yr old). The GSL females weighed 393 ± 57 kg at the beginning of the study and 452 ± 60 kg when they were sold. The GSL females were exposed for a 45-d natural service breeding season before the beginning of the study. Pregnancy diagnosis was determined by ultrasound in October, 45 d after bull removal. The WCREC heifers were primarily Angus and 15 mo of age. The WCREC heifers weighed 444 ± 60 kg at the beginning of the study and 473 ± 14 when they were sold. Prior to the breeding season they were synchronized with a melengestrol acetate–prostaglandin $F_{2\alpha}$ (**PG**) protocol before AI, and following AI they were placed with bulls for 60 d. Pregnancy diagnosis was performed in October via rectal ultrasound, 45 d after bulls were removed.

Synchronization Protocol and Rebreeding

GSL. Females were synchronized with a controlled internal drug-release insert (**CIDR**; Zoetis, Florham Park, NJ) on d 0 followed by CIDR removal and PG (Lutalyse, Zoetis) on d 7 before a 60-d natural service breeding season beginning November 13. A 1:25 bull-to-cow ratio was used. Pregnancy diagnosis was determined by ultrasound 30 d after bulls were removed; 2 wk later nonpregnant cows were sold. Pregnant cows were sold 2 mo after pregnancy detection at a local livestock auction.

WCREC. Heifers were synchronized with CIDR and gonadotropin-releasing hormone (**GnRH**; Fertagyl, Intervet Inc., Millsboro, DE) on d 0 followed by CIDR removal and PG on d 7 and AI 60 h later. Estrus detection patches (Estrotect Heat Detectors, Rockway Inc., Spring Valley, WI) were used to detect standing estrus, and the second gonadotropin-releasing hormone injection was administered at fixed-time AI only to heifers that did not have their patches rubbed. Heifers were AI November 11 and after AI were placed with bulls until sold at local livestock auction (approximately 170 d). Pregnancy diagnosis was determined by ultrasound 135 d after AI.

Diet

GSL. Hay and supplement (29% CP; 0.90 kg/d per head) were fed from November to February. The cows diagnosed as nonpregnant were sold March 1, and in yr 1 the pregnant cows grazed meadow pastures until April. In yr 2 the pregnant cows were fed hay until they were sold in April.

WCREC. Heifers grazed winter range from November to April with a self-fed cooked molasses 30% CP tub, consuming approximately 0.23 kg/d per head. After the rebreeding season, nonpregnant heifers were sold April 14, and the pregnant heifers were sold 2 wk later.

Economic Analysis

A partial budget analysis was performed to compare economics of selling nonpregnant cows immediately after pregnancy diagnosis (November) versus rebreeding to be sold as pregnant fall-calving cows in a potentially more favorable market (April).

During the study, hay prices ranged from \$99 to \$143 in yr 1 and from \$83 to \$121/t in yr 2; an average hay cost of \$121/t for yr 1 and \$97.21/t for yr 2 was assumed. Grazing meadow cost per animal was considered to be \$1/d, the cost of grazing winter range per animal was also assumed to be \$1/d, and basic management and yardage for each female was estimated at \$0.30/d. The supplement (\$424/t, DM basis) was composed of processed grain by-products, plant protein products, roughage products, calcium carbonate, molasses products, urea, vitamin A supplement, copper sulfate, zinc oxide, magnesium sulfate, and monensin. Average feeding costs per day are presented in Table 1.

Cow value at the beginning of the study was calculated from the Nebraska average price reported by the USDA Agricultural Marketing Service for the corresponding date and respective average BW. Total breeding

Table 1. Average feedstuff prices for each location

	$/d per head	
Description	**GSL[1]**	**WCREC[2]**
Hay[3]	1.43	—
Winter pasture	—	1.00
Meadow pasture	1.00	—
Supplement[4]	0.18	0.08
Yardage	0.30	—

[1]Gudmundsen Sandhills Laboratory (GSL, Whitman, NE): hay and supplement (0.90 kg/d per head) were fed from November to February. In yr 1 the females grazed meadow pastures March and April. In yr 2 hay and supplement were fed until females were sold in April.

[2]West Central Research and Extension Center (WCREC, North Platte, NE): heifers grazed winter range and received supplement (0.23 kg/d per head) from November to April.

[3]Hay cost assumed as \$121/t for yr 1 and \$97.21/t for yr 2.

[4]Supplement containing approximately 29% CP, DM priced at \$424/t.