

The Effects of Spaying on Average Daily Gain in Implanted Heifers on Pasture

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Introduction

Pasture grazing of beef feeder cattle destined for subsequent grain-fed feedlot production and slaughter can be a cost-effective production approach for regions with large areas of available pasture, as opposed to dry lot production programs. However, due to reproductive cycling, rates of gain (and presumably grass utilization) for heifers on pasture are lower than for steers. Spaying heifers has been identified as a potential way to improve rates of gain in grazing heifers. The purpose of this study was to describe the effects of spaying on rate of gain and health of heifers on pasture in western Canada.

Materials and Methods

Crossbred heifers were sorted into two candidate populations based on weight (heavy or light). One week prior to movement to pasture, 800 implanted heifers were randomly allocated to one of two experimental groups: SPAYED or INTACT. A total of 200 heavy SPAYED, 200 heavy INTACT, 200 light SPAYED and 200 light INTACT animals allocated to the study. The heifers allocated to the SPAYED group underwent transvaginal ovariectomy using the Willis-Drop procedure with pre-surgical anesthesia/sedation/analgesia. Following the spay procedure, heifers were administered a post-operative analgesic/anti-inflammatory agent and held in the grower feedlot for two days to allow recovery from the anesthetic and surgical procedures. SPAYED and INTACT animals within each replicate were commingled and the replicates were moved to pasture for separate rotation over two brome, crested wheat, and native grass pastures. The heavy replicate grazed for 24 days (removed from pasture due to drought) and the light replicate grazed for 137 days. Animal health was monitored daily by trained personnel, and animals with disease were treated, if required, using treatment protocols supplied by veterinarians at Feedlot Health Management Services. Study animals were followed from allocation to the end of the grazing period. Due to the differences in the length of the grazing period, the data were summarized and reported separately for each

replicate. Average daily gain (ADG) was analyzed using least squares analysis of variance for experimental group and weight at allocation. Mortality from allocation to the end of the grazing period was compared between the experimental groups using Poisson regression in a log linear model for experimental group effects. Two animals were removed and nine animals died over the course of the study; all of these animals were removed from weight gain analyses.

Results

For the heavy replicate, the ADG of the SPAYED group was 24% less than the INTACT group ($P=0.005$); which equated to a 7.6 lb (3.4 kg) reduction in weight gain over the 33-day interval from allocation until the end of the grazing period. For the light replicate, the ADG of the SPAYED group was 5.6% better compared to the INTACT group ($P=0.030$); which equated to an 11.7 lb (5.3 kg) increase in weight gain over the 146-day interval from allocation until the end of the grazing period. There was an economic disadvantage of -\$33.84 CDN per animal in the heavy SPAYED group compared to the heavy INTACT group, and an economic disadvantage of -\$20.47 CDN per animal in the light SPAYED group compared to the light INTACT group.

Significance

In this pasture study, spaying implanted heifers was not cost-effective based on ADG of the SPAYED animals compared to the INTACT animals, and after accounting for the cost of the procedure and products. However, it is important to note that this study used products for anesthesia/analgesia/sedation/anti-inflammation in the study design and economic analysis, but these products are not commonly used for spaying heifers in commercial production situations. Additionally, there are managerial benefits (while on pasture and at the time of subsequent feedlot entry) of spaying heifers that are intangible factors to be considered when making the decision to spay grazing heifers.