



## Influence of Cattle Backgrounding Systems on Animal and Carcass Characteristics

J. A. Langlie<sup>1\*</sup>, B. O. Omontese<sup>1</sup>, A. D. DiCostanzo<sup>1</sup>, R. B. Cox<sup>1</sup>, and M. J. Webb<sup>1</sup>

<sup>1</sup>Animal Science, University of Minnesota, St. Paul, MN, USA

\*Corresponding author. Email: langl144@umn.edu (J. A. Langlie)

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### Objectives

Cattle can be managed differently during the backgrounding segment, which may alter long-term animal and carcass characteristics. Therefore, the objectives of this study were to 1) measure carcass composition over time, and 2) determine the effect of different backgrounding diets on animal growth and carcass characteristics.

### Materials and Methods

Angus and Angus × Simmental crossed calves ( $n = 65$ ) were stratified by dam age, birth date, weaning weight, breed, and sex post weaning in a completely randomized design to one of three treatments: (1) perennial pasture (PP; grazing quack grass, orchard grass; smooth brome grass, red clover, and alfalfa); (2) summer annual cover crop (CC; grazing cereal oats, purple top turnips,

hunter forage brassica, and graza forage radish); and (3) dry lot (DL; bunk fed a haylage ration consisting of 28 NEm Mcal/50.8 kg DM) during backgrounding for 55 d. Concluding backgrounding, the CC and PP treatments were transported to pens where all treatments were sorted by gender and acclimated to a finishing ration over a period of 14 d and continued receiving 3 step-up diets over the next 25 d. Two pens during the finishing segment were utilized to house heifers and steers, respectively. The heifers were top dressed with melengestral acetate till harvest, which was determined by targeting a common backfat thickness per treatment. From backgrounding to harvest, cattle were weighed to determine body weight (BW), average daily gain (ADG) and hip height (HH) measurements were recorded every 28 d. Five periodic carcass ultrasound measures were recorded to evaluate ultrasound rib eye area (uREA), rib fat thickness (uRFT), and percent intramuscular fat (uIMF). At harvest, car-

**Table 2.** Least squares mean performance responses and ultrasound-measured composition (averaged across all periodic measurements) according to the backgrounding treatment<sup>1</sup>

Variable <sup>2</sup>	Treatment			SEM	P-value <sup>3</sup>
	DL	CC	PP		
BW, kg	368 <sup>a</sup>	357 <sup>b</sup>	349 <sup>b</sup>	7.48	< 0.001
ADG, kg	1.17	1.08	1.07	0.10	0.202
uREA, cm <sup>2</sup>	51.03	51.23	48.77	0.19	0.280
uRFT, cm	0.46	1.35	0.41	0.21	0.384
uIMF, %	3.94 <sup>a</sup>	3.36 <sup>b</sup>	3.53 <sup>ab</sup>	0.17	0.049
HH, cm	114	113	113	0.18	0.396

<sup>a,b</sup>Least squares means within a row with different superscripts differ ( $P \leq 0.05$ ).

<sup>1</sup>Perennial pasture (PP; grazing quackgrass, orchardgrass; smooth bromegrass, red clover, and alfalfa); 2) summer annual cover crop (CC; grazing cereal oats, purple top turnips, hunter forage brassica, and graza forage radish); and 3) dry lot (DL; bunk fed a haylage ration consisting of 28 NEm Mcal/50.8 kg DM) during backgrounding for 55 d.

<sup>2</sup>Weaning weight used as a covariate for all analyses.

<sup>3</sup>Probability of difference among least square means.

cass measurements included hot carcass weight (HCW), LMA, 12th rib backfat (FT), kidney, pelvic and heart fat (KPH), marbling and maturity score and objective color ( $L^*$ ,  $a^*$ ,  $b^*$ ). Statistical analyses were conducted using mixed model procedures and animal weaning weight was used as a covariate. Least square means were computed and separated using least significant differences when treatment effects were significant at  $\alpha \leq 0.05$ .

## Results

Cattle ADG, uREA, uRFT, and HH did not differ ( $P \geq 0.05$ ) among treatments from backgrounding to harvest (**Table 2**). Cattle in DL were heavier ( $P \leq 0.05$ )

in BW than CC and PP, which were similar ( $P \geq 0.05$ ). Percent uIMF was greater ( $P \leq 0.05$ ) for DL and similar ( $P \geq 0.05$ ) to PP though CC was lower ( $P \leq 0.05$ ) and similar ( $P \leq 0.05$ ) to PP.

## Conclusion

Treatments utilizing different backgrounding diets influence average body weights and ultrasound intramuscular adipose. Cattle grazing forages have lighter body weights and lower ultrasound intramuscular adipose though, cattle grazing perennial pastures were most variable in carcass ultrasound intramuscular adipose.