



Effects of Feeding Field Pea Diets on Fresh Beef Quality

H. R. Voegelé^{1*}, C. Calkins¹, K. I. Domenech¹, E. K. Kunze¹, F. A. Ribeiro¹, K. Jenkins¹, and J. C. MacDonald²

¹Animal Science- Meat Science, University of Nebraska- Lincoln, Lincoln, NE, USA;

²Animal Science, University of Nebraska- Lincoln, Lincoln, NE, USA

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Objectives

The objective of this study was to evaluate the effects of feeding field peas during 2 phases of production (grazing and finishing) on beef tenderness, lipid oxidation, color, and fatty acid profiles of beef.

Materials and Methods

A total of 232 crossbred steers and heifers were randomly assigned to 1 of 6 dietary treatments in a 3 × 2 factorial consisting of 3 pasture and 2 finishing supplementations. The pasture phase consisted of 1) no supplement, 2) field peas at 0.5% BW, or 3) dry-rolled corn supplement at 0.5% of BW. The finishing phase consisted of 1) field peas at 20% DM or 2) no field peas. The study was conducted over a 2-yr period (with steers for year 1 and heifers for year 2) and at harvest strip loin samples were obtained and aged for 14 d. After aging, steaks were subject to retail display for a total of 7 d. Analyses included tenderness (WBSF and SSF), objective (L*, a*, b*) and subjective color, lipid oxidation (TBARS) and fatty acid composition.

Results

There were minimal effects due to diet. Dietary treatment had no effect on tenderness (WBSF or SSF) or content of saturated fatty acids, unsaturated fatty acids, monounsaturated fatty acids, or polyunsaturated fatty

acids ($p > 0.05$). However, cattle backgrounded with no supplementation had greater content of C18:1v in comparison to cattle backgrounded on peas or corn (151.19 vs. 95.34 and 69.66 mg/100 g, respectively; $P = 0.0285$). There was an interaction between grazing and finishing diets ($P < 0.0001$) for total content of fatty acids. For cattle backgrounded without supplementation, those finished with field peas had greater total fatty acid content in comparison those finished with corn. Whereas, for cattle backgrounded with field peas, those finished on corn had greater total fatty acid content in comparison to those finished on field peas. Meat from cattle finished with field peas had slightly greater lipid oxidation than samples from cattle not receiving field peas during finishing (1.56 vs. 1.44 mg malonaldehyde/kg tissue, respectively; $p = 0.0541$). Thiobarbituric acid reactive substances had a significant retail display effect, increasing over time (0d = 0.94, 4d = 1.46 and 7d = 2.11 mg malonaldehyde/kg tissue; $p < 0.0001$). Discoloration, L* and a* statistically displayed triple interactions for retail display, pasture and finishing diets ($p < 0.0001$, $p = 0.0524$ and $p = 0.024$, respectively). Although these interactions were statistically significant, no consistent patterns due to treatments could be identified.

Conclusion

These data indicate field peas may be used as an alternative diet for growing and finishing cattle with minimal to no negative impact on fresh meat quality.