



Effects of Feeding Calcium Hydroxide Treated Corn Stover During Backgrounding on Beef Carcass and Quality Characteristics

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Keywords: backgrounding, beef, calcium hydroxide, corn stover, meat quality
Meat and Muscle Biology 1(2):84

doi:10.221751/rmc2016.081

Objectives

Sixty-seven purebred Angus steers (initial BW 197 ± 38 kg.) were used to evaluate the effects of calcium hydroxide treated corn stover in backgrounding diets and a common finishing phase.

Materials and Methods

Steers were randomly assigned to 1 of 4 treatments: untreated corn stover (CON), corn stover treated with 50% DM water (H₂O); 50% DM water and calcium hydroxide treated corn stover (CaOH₂); grazing on a turnip cover crop (CC) for 29 d before adapted to ad libitum alfalfa haylage diet fed in feed bunks for remaining 20 d of backgrounding. Steers were fed individually using a Calan system. All diets were formulated on a dry matter (DM) basis to contain 30% corn stover, 15% alfalfa haylage, 25% dried distillers grains with solubles, 25% dry rolled corn, and 5% supplement containing monensin. Steers were harvested at 240 d on feed. Carcass characteristics were recorded 48 h postmortem. Strip loins and shoulder clods (IMPS #180 and #114) from the right side of the carcass were collected. The shoulder clods were frozen immediately on arrival to the meat lab. Strip loins were fabricated into 2.54 cm steaks at 96 h postmortem. Strip loin steaks were used to evaluate vacuum purge, cook loss, and Warner-Bratzler shear force (WBSF). Shoulder clods were processed to ground beef before processing into bologna. Consumer sensory panels comprised of untrained panelists were utilized for both strip steaks (*n* = 130) and bologna (*n* = 126) to evaluate overall liking, flavor liking, texture liking, toughness, juiciness, and off-flavor. Data was analyzed using Proc Mixed of SAS 9.4 (SAS Inst. Inc., Cary, NC).

Results

Treatment had no effect on HCW (*P* = 0.694), REA (*P* = 0.259), backfat (*P* = 0.780), USDA Yield Grade (*P* = 0.890), USDA Quality Grade (*P* = 0.877), and marbling score (*P* = 0.845). Although purge loss (*P* = 0.884) and cook loss (*P* = 0.149) were not affected by treatment, WBSF values were lower for CC than CON (1.6 vs. 2.23kg respectively; *P* = 0.001). Objective L* and b* values for bologna were different among treatments (*P* < 0.001) with CaOH₂ being higher than all other treatments. Objective a* values were lower for H₂O than CC and CaOH₂ (*P* < 0.001) and higher for CC and CaOH₂ than CON on Day 0 (*P* = 0.002 and *P* < 0.001 respectively). For steak sensory, no differences were found in flavor liking (*P* = 0.102), juiciness (*P* = 0.375), or off-flavor (0.313). Differences were found in overall liking (*P* = 0.008) with CC being more liked than CON (*P* = 0.013) and CaOH₂ (*P* = 0.019). Texture liking (*P* < 0.001) for CC was higher than CON (*P* < 0.001), H₂O (*P* = 0.021), and CaOH₂ (*P* < 0.001). Toughness scores were lowest for CC (*P* < 0.001) compared to CON (*P* < 0.001), H₂O (*P* = 0.015), and CaOH₂ (*P* < 0.001). For bologna sensory, no differences among treatments were found in overall liking (*P* = 0.610), flavor liking (*P* = 0.707), texture liking (*P* = 0.828), juiciness (*P* = 0.371), and off-flavor (*P* = 0.716). A difference in toughness was found (*P* = 0.011) with H₂O being more tough than CaOH₂ (*P* = 0.008).

Conclusion

The use of calcium hydroxide treatment in backgrounding diets of beef calves does not affect carcass characteristics or moisture loss, but does affect processed meat shelf life, and sensory characteristics for fresh steaks and bologna.