Effects of Reduced-Fat Modified Distillers Grains with Solubles in Finishing Diets of Feedlot Steers on Fresh and Processed Beef Quality


Animal Science, University of Minnesota, St. Paul, MN, USA

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Objectives

The impact of utilizing varying concentrations of reduced-fat modified distillers grains with solubles (RFMDGS) was evaluated using fifty crossbred (Angus × Gelbvieh × Holstein × Jersey) steers (initial body weight: 379 ± 32 kg) that were randomly assigned to one of four dietary treatments.

Materials and Methods

Dietary treatments consisted of: 14.93% RFMDGS of diet dry matter (DMD) with 0.74% corn oil DMD (FF15); 15.60% RFMDGS DMD (RF15); 30.84% RFMDGS DMD (RF30); and 46.27% RFMDGS DMD (RF45). All steers received Rumensin. Steers were fed dietary treatments for 181 d utilizing a Calan gate system then fed a common diet for 4 d before harvesting at a commercial abattoir. Hot carcass weight (HCW), 12th rib backfat (BF), ribeye area (REA), percent kidney, pelvic, and heart fat (KPH), and marbling score data were collected 24 h postmortem. Strip loins (IMPS #180) were collected for vacuum purge loss evaluation and fabricated into 2.54 cm steaks for drip loss, cook loss, Warner-Bratzler shear force (WBSF), and sensory evaluation (n = 122). Shoulder clods (IMPS #114) were used to create ground beef and bologna. Thiobarbituric acid reactive substances (TBARS) analysis occurred utilizing ground beef while bologna samples were evaluated for sensory attributes (n = 108). Twelfth rib backfat was analyzed for fatty acid composition and calculated iodine value. All data was analyzed using PROC MIXED procedure in SAS (SAS Inst. Inc., Cary, NC).

Results

There was no treatment effect for HCW (P = 0.96), BF (P = 0.63), REA (P = 0.62), KPH (P = 0.27), or marbling score (P = 0.67). All moisture loss attributes did not differ among treatments (P = 0.09). Warner-Bratzler shear force values for FF15 were greater compared to all other treatments (P = < 0.01). There was no treatment effect for overall liking (P = 0.15), flavor liking (P = 0.75), texture liking (P = 0.07), or off-flavor (P = 0.72) in steak sensory analysis. Subjective toughness values of steaks from FF15 were higher than RF15 (10.78 and 8.77, respectively; P = 0.01). Subjective juiciness values of steaks from FF15 were higher than RF45 (8.50 and 6.94, respectively; P = 0.03). There was no treatment effect for flavor liking or off-flavor in bologna sensory analysis. Subjective overall liking was higher in RF45 compared to FF15 bologna samples (78.14 and 71.63, respectively; P = 0.03). Subjective texture liking of bologna from RF45 were higher than FF15 (78.25 and 67.51, respectively; P < 0.01). Subjective toughness liking of bologna from RF30 and RF45 were higher compared to FF15 (77.21, 78.25, and 67.51, respectively; P < 0.01). There was no treatment effect for d 0 or d 14 TBARS (P = 0.94 and P = 0.27, respectively). Treatment did not affect percentage of linoleic acid (C18:n-6, P = 0.34). There was no treatment effect on calculated iodine value (P = 0.59).

Conclusion

Although results indicate feeding 45% RFMDGS had no effect on carcass characteristics, it did decrease fresh beef quality, increase processed beef quality, and had minimal effects on fatty acid composition.