141 Effects of reduced-fat modified distillers grains with solubles in finishing diets of feedlot steers on carcass characteristics, fresh and processed beef quality. M. A. Nelson*, C. Fehrman, A. A. Hohertz, A. DiCostanzo, R. B. Cox, *University of Minnesota, Saint Paul.*

Feeding various concentrations of reduced-fat modified distillers grains with solubles (RFMDGS) in finishing feedlot diets was evaluated using fifty crossbred (Angus × Gelbvieh × Holstein × Jersey) steers (initial bodyweight: 379 ± 32 kg). Steers were randomly assigned to 1 of 4 dietary treatments consisting of 14.93% RFMDGS of dietary dry matter (DMD) with 0.74% corn oil DMD (FF15; 4.58% ether extract (EE)); 15.60% RFMDGS DMD (RF15; 3.92% EE); 30.84% RFMDGS DMD (RF30; 4.79% EE); and 46.27% RFMDGS DMD (RF45; 5.52% EE). Steers were fed 181d using a Calan gate system and were harvested at a commercial abattoir. Hot carcass weight; 12th rib backfat; ribeye area; percent kidney, pelvic, and heart fat; and marbling score were collected 24 h postmortem. Strip loins were collected for vacuum purge loss evaluation and fabricated into steaks for drip loss, cook loss, Warner–Bratzler shear force (WBSF), and sensory evaluation. Untrained panelists evaluated cooked steaks on overall liking, flavor liking, texture liking, toughness, juiciness, and off-flavor. Liking ratings were conducted on a 120 point line scale with 120 being strongest like imaginable. Intensity ratings were conducted on a 20 point like scale with 20 being extremely tough, juicy, or intense. Shoulder clods were processed into ground beef and bologna. Untrained sensory panelists evaluated bologna on overall liking, flavor liking, texture liking, toughness, and off-flavor utilizing the same scales as steak sensory. Data were analyzed using the MIXED procedure in SAS with an α level of 5%. Treatment did not affect carcass characteristics ($P = 0.27$) or moisture loss ($P = 0.09$). Values for WBSF of FF15 steaks were greater compared to all other treatments ($P = < 0.01$). Treatment did not affect liking ratings ($P = 0.07$) of steaks. Subjective steak toughness from FF15 were greater than RF15 (10.78 and 8.77, respectively; $P = 0.01$). Subjective juiciness of FF15 steaks was greater than RF45 (8.50 and 6.94; $P = 0.03$). Bologna from RF45 had a greater subjective overall liking and texture liking compared to FF15 (78.14 and 71.63, respectively; $P = 0.03$; 78.25 and 67.51, respectively; $P = < 0.01$. Subjective toughness of FF15 bologna was greater than all other treatments ($P = < 0.01$). Treatment did not affect subjective flavor liking or off-flavor ($P = 0.22$ and $P = 0.51$, respectively) in bologna. Results indicate feeding 45% RFMDG had no effect on carcass traits, decreased subjective toughness in steaks, and increased overall consumer appeal in bologna.

Key Words: beef, quality, reduced-fat modified distillers grains with solubles

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142 Diets with organic trace minerals Bioplex®) and yeast Protein (NuPro®) improved the water-holding capacity of pork loin meat. R. M. Delles*[1], A. Naylor[2], A. Kocher[2], K. A. Dawson[1], R. S. Samuel[1], *[1]Center for Animal Nutrigenomics and Applied Animal Nutrition, Alltech Inc., Nicholasville, KY, [2]Alltech Australia, Roseworthy, Australia.*

The objective of this study was to investigate the impact of diets with organic trace minerals and yeast protein on pork meat quality during retail display. At 3 wk of age, 324 pigs were weaned, stratified by weight and sex, and placed into 1 of 6 pens, which were randomly allocated to 1 of 2 treatments: (1) barley and wheat diets with inorganic trace minerals (CON) or (2) barley and wheat diets with organic trace minerals and yeast protein (OMN: Alltech, Inc.) Pigs received phase diets over 17 wk. Sixteen pigs (100 ± 5 kg live weight) from each group, 8 replicates per treatment, were slaughtered for meat quality and tissue enzyme activity measurements. Tissue for enzyme and proteomic analysis was obtained from the 10th rib, 2 h post-mortem, frozen in liquid nitrogen and stored at −80°C. After carcasses were chilled at 4°C for 24 h, boneless loin samples (IMPS 414) were removed, vacuum packaged, and frozen at −30°C, for up to 1 mo. Loins were thawed at 4°C in the dark for 36 h, cut into 2.54 cm chops, overwrapped with an air-permeable polyvinylchloride film, and placed in a retail display cooler at 2 to 4°C for up to 7d. Lipid oxidation (TBARS: mg MDA/kg meat) was higher in CON samples, but only significantly ($P < 0.05$) on d4 of retail storage. On d 0, protein carbonyl content was 21.5% lower ($P < 0.05$) in OMN samples compared to CON samples. Water-holding capacity, as measured by purge and cooking losses, was improved in OMN samples on d 4 ($P < 0.05$) and 7 ($P < 0.10$). However, the shear force of OMN pork meat was only lower ($P < 0.05$) than CON samples on d 0 (4.1 vs. 4.4 kgf). Catalase and glutathione peroxidase activities tended to be ($P < 0.10$) and were higher ($P < 0.05$) in OMN samples, respectively. Proteomic analysis revealed that triosephosphate isomerase, creatine kinase, and annexin A1 were overabundant in OMN samples compared to CON. Diets supplemented with organic trace minerals and yeast protein resulted in similar or improved meat quality attributes versus CON, possibly due to the greater enzyme activity and protein expression. OMN pork exhibited improved protein oxidative stability, and subsequently greater water-holding capacity of boneless pork loin chops throughout retail display.

Key Words: Organic trace minerals, Proteomics, Yeast protein

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