NORTH DAKOTA - Flaxseed Enhances Omega-3 Fatty Acids in Grass-Finished Beef

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Daily supplementation of flaxseed to finishing steers grazing Northern Great Plains pasture can improve growth rate and enhance the omega-3 fatty acid profile of their steaks. Research indicates inadequate intake of omega-3 fatty acids is associated with a significant number of the same health problems some believe are connected to high intake of marbled beef, yet beef could be an important source of omega-3 fatty acids for millions of beef-eating people.

In previous research, yearling steers grazing Northern Great Plains pastures gained weight faster when supplemented with flaxseed. Feeding flaxseed, an oilseed with high levels of omega-3 fatty acid α-linolenic acid (ALA), can result in red meat with more healthful omega-3 fatty acids. In 2010, over 90% of U.S. flaxseed production was in ND, which harvested 388,000 acres. Cattle grown and fattened on growing perennial grasses can also have greater intramuscular levels of omega-3 fatty acids than cattle grown on high-concentrate diets that are typically low in omega-3 fatty acids.

The trial objective was to see if daily supplementation of flaxseed for 85 days to steers finished on Northern Great Plains pasture would influence growth and carcass characteristics; and/or fatty acid profile, tenderness, and sensory characteristics of their beef steaks.

Eighteen Angus yearling steers were randomly divided into 3 groups. Treatment 1 steers received a small daily supplement of ground flaxseed. Treatment 2 steers received a small daily supplement of ground corn and soybean meal (CSM) that had CP and TDN levels similar to the flaxseed supplement. Treatment 3 (control) steers were not supplemented. Supplements were fed from mid-August to the day before slaughter in early November.

All steers grazed growing forage from early-May through the first week of November. To maximize individual daily weight gain, grazing was managed to achieve no more than moderate forage utilization so steers were not forced to consume low-quality forage. From mid-August to late September, cattle grazed proso millet. From late September through October, they grazed mixed-species, vegetative regrowth of Kentucky bluegrass, smooth bromegrass, blue grama, green needlegrass, Porcupine grass, western wheatgrass, and small amounts of yellow sweet clover. In the first week of November, they grazed immature winter rye and mixed pasture grasses.

The growth rate of cattle consuming flaxseed was similar to that of CSM-supplemented cattle and 25% greater than that of un-supplemented cattle. Carcass characteristics, tenderness, and sensory attributes were similar across treatments, except for a slightly different flavor detected in steaks from the flaxseed-fed cattle compared to the CSM-fed and un-supplemented cattle.

The omega-3 fatty acids ALA and eicosapentaenoic acid were 62% and 22% greater, respectively, in beef from flaxseed-fed and un-supplemented cattle than CSM-fed cattle. Total omega-3 fatty acid concentration was 39% greater for the flaxseed-fed steers compared to the un-supplemented group, and 71% greater compared to the CSM-fed steers. The ratio of omega-6 to omega-3 fatty acids was smaller (i.e., preferable) in beef from the flaxseed-fed group compared to the CSM-fed and control groups.