

101 Lipid oxidation and color stability of raw restructured beef steaks prepared from mature cows. S. P. Suman^{*1}, Y. L. Xiong¹, J. F. Stika², S. P. Blanchard¹, and W. G. Moody¹, ¹*University of Kentucky, Lexington*, ²*Certified Angus Beef Program, Wooster, OH*.

Mature cows are vital contributors to the beef supply in the United States. However, limited merchandizing options exist for beef from advanced maturity cows due to inferior quality attributes such as inherent off-flavors. Restructuring technology can effectively be utilized for efficient incorporation of ingredients that can potentially enhance storage stability of mature beef. Our objective was to investigate how restructuring, in combination with an antioxidant, could improve quality attributes of mature cow beef. Beef trimmings from nine mature Angus × Simmental cows ($n = 9$), equally representing three animal age groups (2-4, 6-8, and 10-12 years), were restructured into steaks formulated with propyl gallate (0.02%), alone or in combination with a beefy flavoring agent (0.75%), to enhance stability during 6 months of frozen storage at -29°C under aerobic condition. Raw steaks were thawed after 1, 3, and 6 months of storage and analyzed for surface color (L , a , b , chroma, and hue values), and lipid oxidation (TBARS). Steaks were cooked to an internal temperature of 70°C and sensory characteristics were evaluated by an 8-member trained panel.

Animal age did not influence ($P > 0.10$) instrumental color of restructured steaks. The inclusion of a beefy flavoring agent, although decreased steak a and b values, and saturation index at 0 month, was effective in curtailing pigment oxidation during extended frozen storage until 6 months. TBARS was not influenced by animal age, but increased significantly ($P < 0.01$) in the absence of propyl gallate, and over extended periods of storage. Although rancidity scores increased ($P < 0.05$), significantly beyond 3 months, propyl gallate delayed its onset. Nevertheless, propyl gallate alone did not prevent the development of off-flavors inherent to mature beef. On the other hand, inclusion of beefy flavoring agent intensified beefy flavor and masked all mature beef off-flavors. The physiological age of mature cows had little influence on the frozen storage stability of steaks.

Our findings suggested the potential of restructuring technology to utilize mature cow beef. Furthermore, the results demonstrated that the combination of propyl gallate and beefy flavoring agent was effective to enhance the color and lipid stability of restructured beef prepared from mature cows. Incorporation of proper antioxidant(s) and flavoring agent(s) could be utilized for the manufacture of acceptable beef steaks from mature cows.