



Effects of Dry and Wet Aging on Quality Attributes of USDA Choice and Prime Strip Loins

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Objectives

This study aimed to investigate the effects of dry aging on sensory parameters and flavor-correlated attributes such as lipid oxidation and fatty acid profile of USDA Choice and Prime strip loins.

Beef that undergoes dry-aging processes is usually merchandised as a product with enhanced tenderness, juiciness and flavor. This study aimed to investigate the effects of dry aging on sensory parameters and flavor-correlated attributes such as lipid oxidation and fatty acid profile of USDA Choice and Prime strip loins.

Materials and Methods

A total of 48 short loins (IMPS 174; 24 Prime and 24 Choice) were commercially acquired and assigned to a 2×2×2 factorial design. Fixed effects were aging method (dry and wet), USDA quality grade (Choice and Prime), and aging time (21 and 42 d). Dry-aged samples were held at 2°C ± 2, humidity was maintained at 80–85%, and air speed at 2 m/sec. Wet-aged samples were stored under same temperature in their original vacuum sealed bag. After aged, strip loins were fabricated into 2.54-cm steaks. Samples were evaluated for sensory attributes, cooking loss, lipid oxidation and fatty acid profile. A trained-panel of 8 members evaluated juiciness, tenderness, connective tissue amount, off-flavor intensity, and presence off-flavor descriptors. Lipid oxidation was evaluated by measuring thiobarbituric acid reactive substances, and fatty acid profile was estimated by gas chromatography. Data were analyzed using SAS.

Results

Cooking loss was not affected by any fixed effect. For sensory analysis, an interaction between USDA grade and

aging method was observed for tenderness ($P = 0.0006$). When wet-aged, Prime steaks were more tender than Choice steaks. Within USDA-Prime grade, wet-aged steaks were more tender than dry-aged steaks. For Choice steaks, dry aged was more tender than wet-aged. An interaction between USDA grade and aging method was also observed for connective tissue amount ($P = 0.0021$). Panelists scored higher connective tissue amount values for wet-aged Prime steaks when compared to wet-aged Choice steaks. Within USDA-Prime grade, wet-aged steaks had more connective tissue than dry-aged steaks. For juiciness, only grade effect was significant ($P = 0.0054$) whereas Prime steaks were juicier than Choice. When evaluated for off-flavor intensity, only aging time effect was significant ($P = 0.0368$). Steaks aged for 42 d had higher off-flavor intensity than steaks aged for 21 d. When evaluating descriptors, higher frequency of bitter flavor was identified by panelists on steaks aged for 42 d when compared to 21 d ($P = 0.045$). Higher frequency of metallic descriptor was also observed by panelists on wet-aged samples when compared to dry-aged ($P = 0.0418$). Higher values of C20:3n6 and C20:1n9 were observed in samples aged for 42 d when compared to 21 d, whereas wet aged steaks had higher concentrations of C20:1n9, PUFA and n6:n3.

Conclusion

Minimal effects of aging method were observed on sensory attributes. USDA grade seems to play a more important role on flavor development than aging method. Extending aging time may increase off-flavor intensity, which is commonly associated to higher lipid oxidation. However, in this study, we did not observe significant effects of aging method, grade, and aging time on lipid oxidation, possibly, because before cooking, external dry surface of steaks was trimmed. Some fatty acids may contribute to presence of off-flavor descriptors in beef.