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Impact of Extended Aging Time and Freezing on Tenderness of Beef Top Sirloin Steaks

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Objectives

The beef top sirloin steak is a popular cut among cost-conscious consumers, yet often does not deliver a desirable eating experience when compared to other cuts from the rib and loin. The objectives of this study were to 1) assess whether extended aging periods for the top sirloin were necessary to improve tenderness, and 2) evaluate the impact of freezing top sirloin butts during subprimal storage to see if quality attributes of resulting steaks would be enhanced.

Materials and Methods

Paired USDA Choice top sirloin butts (n = 40) were collected from 20 carcasses and divided equally among 2 experiments: 1) left sides 14- versus right sides 35-d refrigerated aging (all subprimals stored ~ –1°C for the assigned number of days), and 2) right sides refrigerated aging (aged under refrigeration for 35 d before cutting into steaks) versus left sides frozen aging (aged under refrigeration for 14 d, frozen for 14 d, and then placed back in refrigeration for 7 d before cutting into steaks). Consumers (n = 80 per experiment) evaluated 4 samples for sensory testing to determine if they could discern a difference in tenderness, flavor, juiciness, and overall likeability between treatments. Steaks also were subjected to Warner-Bratzler Shear (WBS) force for objective tenderness evaluation.

Results

Comparisons for both objective and subjective tenderness evaluations showed no ($P > 0.05$) treatment differences in either experiment (Table 1). Results of the 14- versus 35-d refrigerated aging treatments indicated that top sirloin butts do not require extending-aging periods to increase tenderness. The lack of differences in consumer panel ratings between refrigerated and frozen treatments reflect an absence of consumer preference for either treatment.

Conclusion

Regardless of treatment, there were no differences in subjective or objective evaluations indicating that purveyors have options and flexibility in inventory control for top sirloin butts.

Table 1. Paired t-tests for sensory panel ratings and WBS force values for steaks from subprimals subjected to different aging treatments.

		Sensory panel ratings[b]				
	n[a]	Overall like/dislike	Tenderness like/dislike	Flavor like/dislike	Juiciness like/dislike	Warner-Bratzler shear force (N)
Experiment 1[c]						
14 d	10	6.0	5.6	6.3	5.6	30.7
35 d	10	6.1	6.0	6.1	5.9	27.5
SE		0.25	0.29	0.20	0.28	1.81
Prob > t		0.6321	0.1868	0.3795	0.2948	0.1215
Experiment 2[d]						
Refrigerated	10	6.3	6.0	6.4	5.8	26.7
Frozen	10	6.1	5.8	6.2	6.1	30.7
SE		0.14	0.21	0.11	0.26	1.97
Prob > t		0.0946	0.3017	0.1005	0.2870	0.0733

[a] Number of subprimals per treatment.
[b] Sensory panel ratings: 9 = like extremely; 1 = dislike extremely.
[c] Experiment 1: 14 d = top sirloin butts were aged for 14 days under refrigeration before cutting into steaks; 35 d = top sirloin butts were aged for 35 days under refrigeration before cutting into steaks.
[d] Experiment 2: Refrigerated = top sirloin butts were aged under refrigeration for 35 days before cutting into steaks; Frozen = top sirloin butts were aged under refrigeration for 14 days, frozen for 14 days, and then placed back in refrigeration for 7 days before cutting into steaks.

