



RESEARCH RECAP

Summary of Dry-Aging Beef Techniques for Domestic and International Markets*

Recently there has been increased interest and demand for dry-aged beef products in foreign markets. There are some challenges in providing dry-aged products to these markets since there is a much longer transportation time for delivery of fresh beef. In addition, many times products are frozen prior to shipping to foreign markets.

The objective of this study was to develop a dry-aging program that would maximize flavor and shelf life along with ensuring the safety characteristics of traditional and value beef cuts for domestic and international consumers.

Export rib, top sirloin, top sirloin cap (coulotte), shortloin, bone-in short rib and boneless short rib were used in this study. The following table describes the four different techniques evaluated in this study.

For study purposes the products were wet aged 14 or 28 days and dry aged for 0, 14 or 28 days.

All product was evaluated for dry-aging yield, cutting yield, cooking loss and chemical composition of moisture and fat.

Eating quality was evaluated on top sirloin cap steaks, top sirloin steaks, bone-in ribeye steaks, T-bone steaks, bone-in short rib steaks and boneless short rib steaks with a consumer sensory panel (134 individuals) comprised of individuals with ethnic backgrounds from mainland China, Taiwan, South Korea and the U.S. Tenderness evaluations were also conducted using Warner-Bratzler shear force.

Aging Techniques

Technique	Step 1	Step 2	Step 3	Step 4
A	Wet Age in the U.S.	Export	Dry Age in the Foreign Market	
B	Wet Age in the U.S.	Dry Age in the U.S.	Freeze in the U.S.	Export
C	Freeze in the U.S.	Export	Dry Age in the Foreign Market	
D	Wet Age in the U.S.	Dry Age in the U.S.	Wet Age During Transit	Export

Recommendations

- Techniques A, B and C are acceptable methods to dry-age beef products with acceptable variation in eating quality, product yield and cooking loss
- Technique D is not recommended because of a high risk of spoilage.

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RESULTS OF AGING TECHNIQUES

Technique	Step 1	Step 2	Step 3	Step 4	Expected Eating Quality	Dry Aging Yield	Cut Yield	Cook Loss	Moisture (%)	Fat (%)
A	Wet Age in the U.S	Export	Dry Age in the Foreign Market		★★★★	★★★★	★★★★	★	★★★★	★★
B	Wet Age in the US	Dry Age in the U.S.	Freeze in the U.S.	Export	★★★★	★★★★	★★★★	★★	★★	★★
C	Freeze in the U.S.	Export	Dry Age in the Foreign Market		★★★★	★★★★	★★	★★★★	★	★★
D	Wet Age in the U.S	Dry Age in the U.S.	Wet Age During Transit	Export	Not Recommended Due to High Risk of Product Spoilage					

Stars are used to show differences in various characteristics of finished beef cuts that underwent different aging techniques. Three stars are better than two stars and two stars are better than one. Actual values and statistical analysis is available in the final research document.

CONCLUSIONS

- Technique D is not recommended because of a high risk of spoilage because vacuum packaging after the dry aging results in switching from an aerobic (dry aging) to an anaerobic (vacuum packaging) environment and creates microbiological issues that accelerate spoilage.
- Consumers could not detect any sensory characteristic differences between the various techniques or days of aging for the sirloin, bone-in or boneless short ribs. Therefore, combinations of wet aging, freezing and dry aging may not have a large impact on the consumer's preferences as long as the steaks are consumed soon after dry aging.
- While bone-in and boneless short ribs received high ratings from the consumer panelists, dry aging short ribs may not be economical due to approximately 20% product loss during the aging process.
- Dry-aging yield did not differ across the three accepted techniques. Similar amounts of trimming to remove dried tissue and excess fat was necessary for all three techniques.
- Cut yield is the finished weight of the steak compared to the dry-aged trimmed primal weight. Techniques A and B had similar cut yields but Technique C was lower, probably due some moisture loss during freezing and thawing.
- There was less cooking loss with Technique A followed by Technique B and then Technique C. This was verified by the percent moisture. As expected the cuts with the higher moisture tended to have greater cooking loss.
- Fat content across the three acceptable techniques did not vary significantly.

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