

## 2018 Reciprocal Meat Conference – Meat and Poultry Quality

## Meat and Muscle Biology™



## Effects of Quality Grade and Aging Time on Yields, Objective Tenderness, Protein Degradation, and Microbial Growth of Dry and Wet Aged Short Loins

A. M. Cavender\*, Y. Yeh-Parker, F. M. Giotto, B. S. Ferguson, and A. S. De Mello

Department of Agriculture, Nutrition, and Veterinary Sciences, University of Nevada– Reno, Reno, NV, 89557, USA

\*Corresponding author. Email: amilton@cabnr.unr.edu (A. S. De Mello)

**Keywords:** dry aging, proteolysis, tenderness, wet aging  
Meat and Muscle Biology 2(2):81

doi:10.221751/rmc2018.071

### Objectives

Dry-aged beef is commonly merchandised by meat purveyors, upscale restaurants, and some retailers as a product with superior tenderness and flavor when compared to wet-aged. To provide a clearer understanding of this popular hypothesis, this study aimed to investigate in depth objective tenderness indicators of dry and wet-aged beef.

### Materials and Methods

A total of 48 short loins (IMPS 174; 24 Prime and 24 Choice) were commercially acquired and assigned to a  $2 \times 2 \times 2$  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  $2^{\circ}\text{C} \pm 2$ . Cooler humidity was maintained at 80 to 85% and air speed at 2 m/sec. Wet aged samples were stored under same temperature in their original vacuum sealed bag. On d 21 and 42, the designated samples were weighed to calculate final yields and swabbed for Aerobic Plate Counts (APC). Strip loins were fabricated and two 2.54-cm steaks were obtained from each strip loin. For Warner-Bratzler Shear Force (WBSF), a minimal of 6 cores were sheared with a V blade set at 250 mm/min. For Slice Shear Force (SSF), the 5 cm slice was sheared with a straight blade set at 500 mm/min. Western blots were performed to evaluate degradation of desmin (38 KDa band). Data were analyzed using PROC GLIMMIX of SAS (SAS Inst. Inc., Cary, NC).

### Results

A significant interaction between aging method and time was observed on final short loin yields. When dry-

aged, higher shrinkage (%) was observed on 42-d samples when compared to 21-d ( $8.99^{\text{A}}$  vs.  $4.68^{\text{B}}$ , respectively). No effect of time within wet aging was noted. Wet-aged samples had significantly higher APC when compared to dry-aged, whereas longer aging time (42 d) led to higher counts when compared to 21 d. Slice shear force analysis revealed an interaction between grade and aging method ( $P = 0.04$ ). Dry-aged Choice samples had lower SSF values when compared to wet-aged, whereas within wet aging, Prime loins resulted in lower shear force values when compared to Choice. For WBSF, statistical differences were observed for individual fixed effects of time and grade ( $P = 0.023$  and  $P = 0.016$ , respectively) Steaks from loins aged 42 d were more tender than steaks aged 21 d. Prime steaks had lower WBSF compared to Choice. Within aging methods, wet-aged Prime steaks had higher degradation of desmin when compared Choice. However, desmin degradation of dry-aged Choice and Prime loins did not differ.

### Conclusion

Extending dry-aging time from 21 to 42 d significantly increased yield loss of short loins. Dry-aging beef decreased microbial counts when compared to wet-aging. Regarding objective tenderness methods, WBSF and SSF provided a detailed perception of effects of grade, aging method, and aging time. Dry-aging does not influence shear force of steaks from different USDA grades. However, Prime steaks usually had lower shear force values than Choice when wet aged. Overall, Prime steaks aged for 42 d had lower shear force than steaks aged for 21 d. This is in agreement with desmin degradation, which was higher on Prime wet-aged steaks. Although lower microbial loads were observed on dry-aged beef, wet-aging Prime showed lower shear force when compared to dry aging.