

Influence of aging time and technique (dry- vs. wet-aging) on tenderness, color and lipid stability of Belgian Blue beef



4th BAMST Symposium

“Meet the Belgian Meat Researchers”

Melle, December 8th 2016

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INTRODUCTION



Post-mortem aging is a process that occurs naturally in all muscle tissues, which improves palatability attributes of meat such as flavor and tenderness.

Wet-aging

Meat aged in sealed barrier vacuum packages at refrigerated temperatures.



Dry-aging

Unpacked wholesale cuts aged at controlled temperature and relative humidity.

- ⇒ unique flavor and superior quality
- ⇒ destined to high-end consumers





To evaluate the potential effect of:

- aging technique (dry-aging vs. wet-aging),**
- aging time (0, 21, 42 and 63 days), and**
- packaging during display (vacuum vs. shrinkable film wrapping) on**

the pH, tenderness, and pigment and lipid stability of Belgian Blue beef.

MATERIALS AND METHODS



Samples

- 3 x ½ *longissimus dorsi*
(wet aging)

+

- 3 x ½ *longissimus dorsi*
(dry aging)

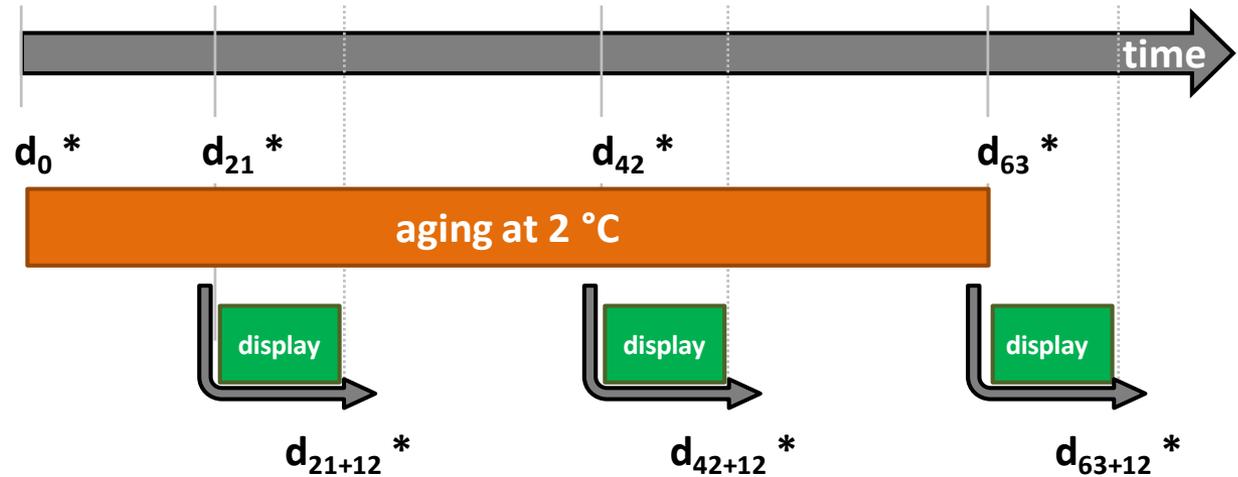
from

2 Belgian Blue cows
(6.5 and 3.5 yr)

* Analysis

- pH
- Tenderness
(Warner-Bratzler peak shear force)
- Color (redness) (CIE L*a*b*)
- Myoglobin oxidation
(K/S 572/525 ratio)
- Lipid oxidation
(TBARS: mg MDA-equivalent/kg)
- Statistics
(ANOVA + Tukey test)

Experimental design



Aging conditions

wet-aging (WA)

or

dry-aging (DA)

Display conditions

vacuum (VP)

or

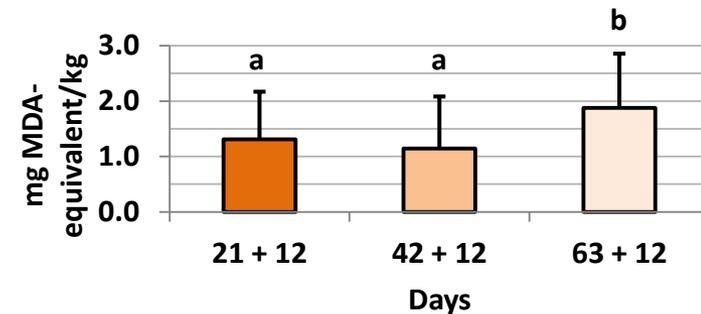
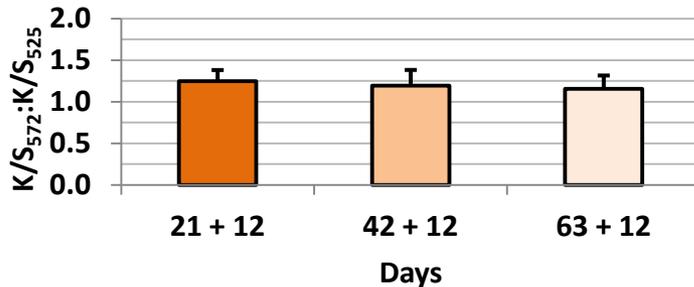
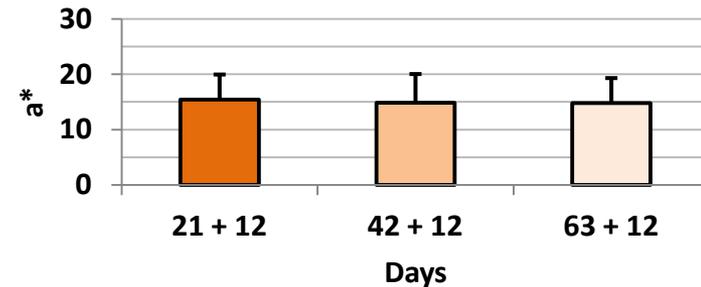
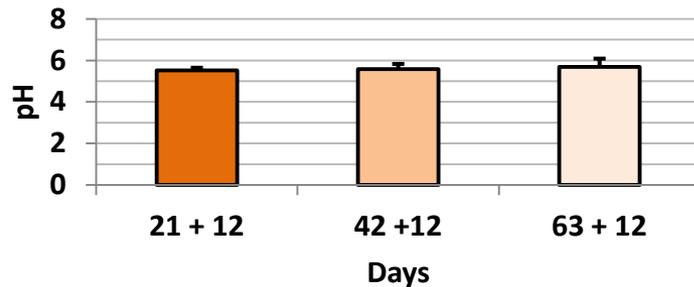
shrinkable film wrapping (FW)

(4 days at 4 °C + 8 days at 8 °C)

RESULTS AND DISCUSSION



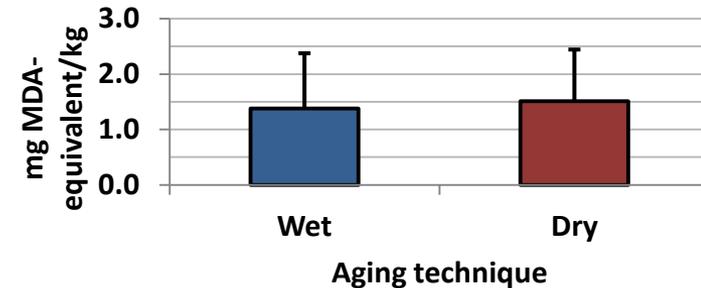
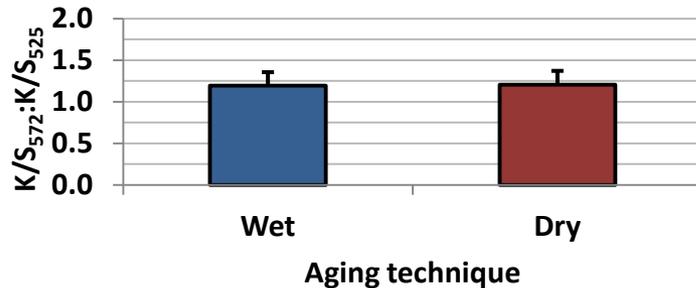
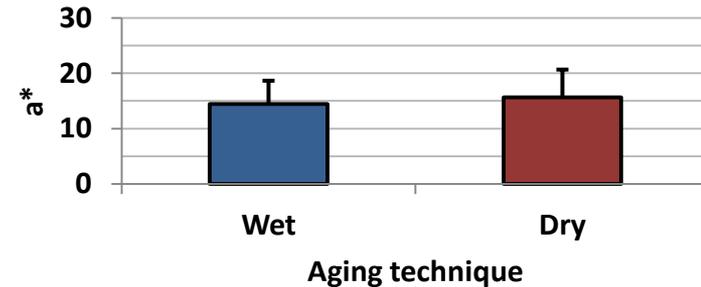
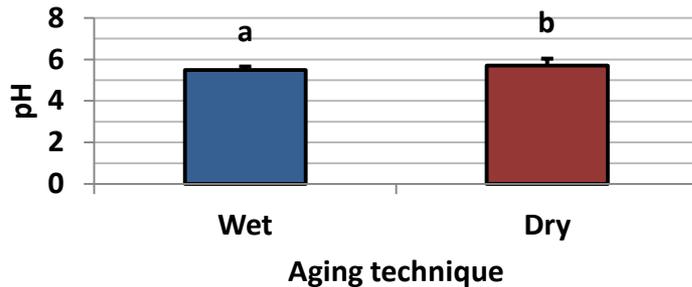
EFFECT OF PREVIOUS AGING TIME



- No effect of aging time on pH, redness (a^*) and myoglobin oxidation ($K/S_{572}:K/S_{525}$ ratio) in samples after 21, 42 or 63 days of aging at 2 °C + 12 days of display (4 days at 4 °C + 8 days at 8 °C).

- Previous aging time favored lipid oxidation (increase in mg MDA-equivalent/kg) during display.

EFFECT OF AGING TECHNIQUE



- The difference in pH (DA > WA) could be related to the growth of proteolytic bacteria (e.g. *Pseudomonas*) in aerobic conditions and of lactic acid bacteria in low-oxygen conditions.

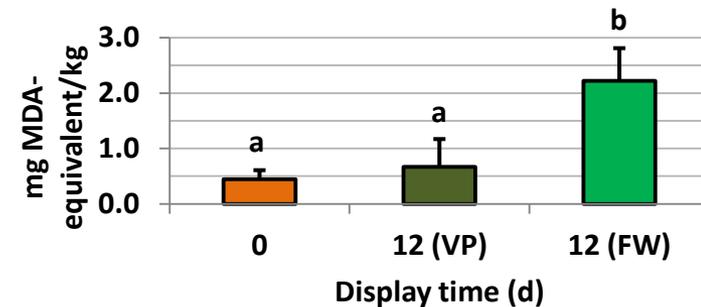
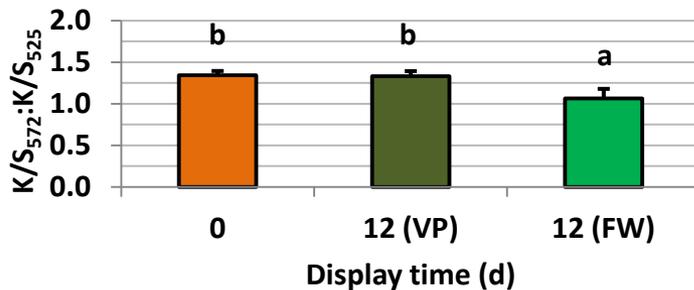
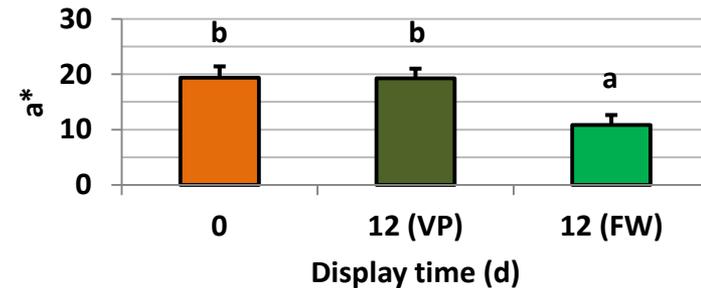
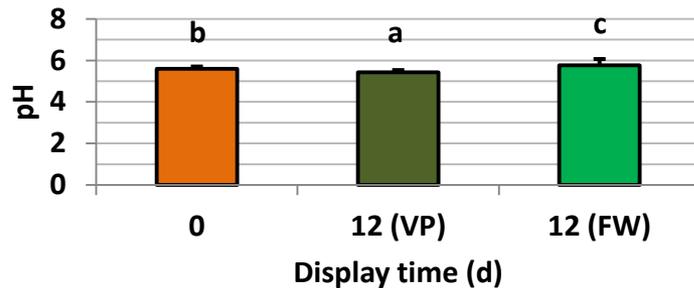
- No effect of aging time on redness, myoglobin oxidation and lipid oxidation in samples after WA or DA at 2 °C + 12 days of display (4 days at 4 °C + 8 days at 8 °C).



Influence of aging time and technique (dry- vs. wet-aging) on tenderness, color and lipid stability of Belgian Blue beef

INTRODUCTION MATERIALS AND METHODS RESULTS AND DISCUSSION CONCLUSION

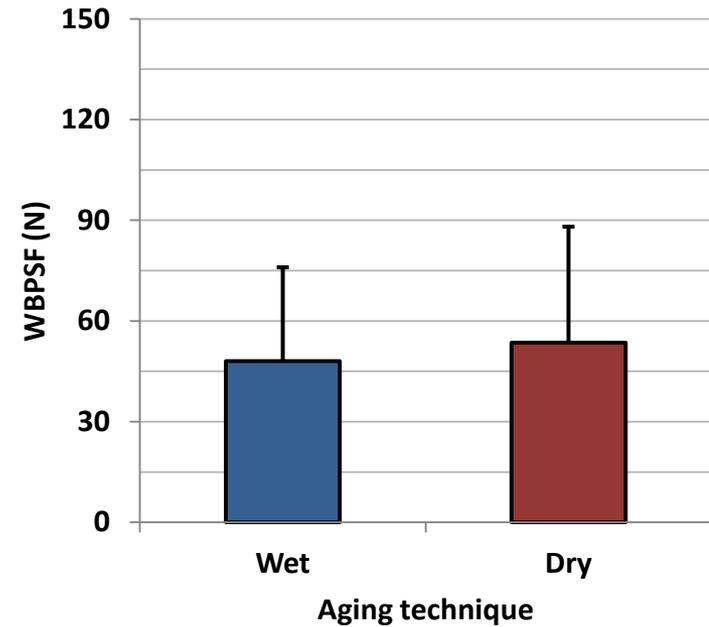
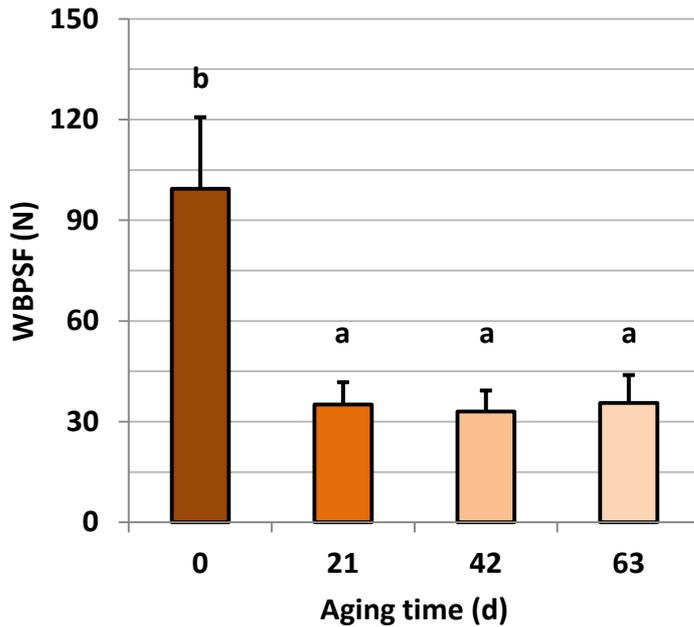
EFFECT OF RETAIL PACKAGING



- The difference in pH (FW > VP) could be related to the growth of proteolytic bacteria (e.g. *Pseudomonas*) in aerobic conditions and of lactic acid bacteria in low-oxygen conditions.

- Samples before display (orange bars) and samples after a twelve-day display under vacuum conditions (dark green bars) presented no statistically significant differences in redness, myoglobin oxidation and lipid oxidation. The contact with atmospheric air in FW samples (display time = 12 days) may have contributed to meat discoloration, myoglobin oxidation and lipid oxidation.

EFFECT OF TIME AGING TIME AND TECHNIQUE ON TENDERNESS



- Increase in tenderness (decrease in WBSF values) during the first 21 days of aging.
- No influence of the aging technique on tenderness.

CONCLUSION





- **The physico-chemical quality of samples did not change after repackaging under vacuum and 12 days of display (4 days at 4 °C + 8 days at 8 °C).**
- **A higher sensitivity to oxidation was observed with shrink wrap packaging during display.**
- **Twenty-one days of aging permitted to achieve the maximum tenderness observed and would be compatible with a subsequent 12-day display under vacuum.**
- **Further research will be conducted to study the microbiological quality of these meats as well as their antioxidant capacity.**



ACKNOWLEDGMENT



Antoine
CLINQUART



André
TEIXEIRA
GONCALVES



Mike
KRANTZ



Jacqueline
THIMISTER

THANKS FOR YOUR ATTENTION

