INTRODUCTION

The shelf life of fresh meat is mainly limited by the development of pathogenic or spoilage microorganisms, and/or the oxidation of some of its constituents. In order to limit these phenomena, the European legislation allows chilling or freezing, eventually combined with vacuum or modified atmosphere packaging. The oxidation of myoglobin turns this pigment to metmyoglobin, which gives a brown color to meat. Lipid oxidation results in formation of aldehydes, some of them being often associated with the development of off-flavors even at low concentrations. Myoglobin and lipid oxidation often appear to be linked. The Belgian meat sector often complains of a sensitivity of Belgian Blue (BB) beef to oxidation processes, in particular in high-oxygen modified atmosphere packaged (MAP) meat previously aged in vacuum conditions.

OBJECTIVE

To evaluate the effect of two breeds (Belgian Blue vs. Limousin) and previous storage time and temperature on color and lipid stability of meat packaged in high-oxygen atmosphere.

MATERIALS AND METHODS

Samples

Vacuum-packaged (VP) striploins from cows supplied 2 days after slaughter

<table>
<thead>
<tr>
<th>Breed</th>
<th>Age (yr)</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgian Blue</td>
<td>7.0 ± 2.4</td>
<td>4</td>
</tr>
<tr>
<td>Limousin</td>
<td>6.0 ± 1.0</td>
<td>4</td>
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</tbody>
</table>

Performed analysis

Color measurement (C.I.E. L*a*b*)

<table>
<thead>
<tr>
<th>Metmyoglobin %</th>
<th>TBARS</th>
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<tbody>
<tr>
<td>Limousin MAP sample</td>
<td>BB MAP sample</td>
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Analysis started at day 0 (-7) and were repeated each 20 d

Experimental design

BB MAP sample

RESULTS AND DISCUSSION

No spectacular change of color observed in VP samples, but decrease of the chromaticity a* after repackaging under modified atmosphere.

Limousin samples presented grater initial chromaticity a* values, but values of a* from MAP Belgian Blue samples tended to stay longer stable.

CONCLUSIONS

The Limousin meat samples of this study presented a higher sensitivity to myoglobin and lipid oxidation, possibly due to its higher fat content. The duration and temperature of VP storage seemed to influence the sensitivity of samples to pigment and lipid oxidation during subsequent MAP storage.

Lipid and myoglobin oxidation appear to be linked. An understanding of the oxidative processes and their interaction would provide basis for explaining quality deterioration in meat and also for developing strategies (e.g. antioxidant supplementation) to maintain sensory quality.

ACKNOWLEDGEMENTS

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