Effect of duration and temperature of previous vacuum-packed storage on the microbiological quality of Belgian Blue meat packed in high-oxygen atmosphere

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INTRODUCTION

Modes of processing, distribution and consumption of fresh meat have dramatically changed over the past decades, resulting in a reconceptualisation of the meat industry. Whilst vacuum packaging (VP) is almost exclusively reserved to the intermediate levels of the beef chain, modified atmosphere packaging (MAP) is more common in the retail marketplace.

The shelf life of fresh meat is mainly limited by alteration phenomena and microbial growth that can degrade its organoleptic properties. In this way, a major challenge for the fresh meat industry is to maintain the fresh appearance of this product.

OBJECTIVE

To study the effect of duration and temperature of previous vacuum-packaged storage on the microbiological quality of Belgian Blue (BB) beef packed in high-oxygen atmosphere.

MATERIALS AND METHODS

Samples

Vacuum-packed striploins were supplied 2 days after slaughter.

<table>
<thead>
<tr>
<th>Animal category</th>
<th>Age (yr)</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>bulls</td>
<td>1.81 ± 0.10</td>
<td>4</td>
</tr>
<tr>
<td>culled cows</td>
<td>4.99 ± 0.58</td>
<td>4</td>
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</tbody>
</table>

Experimental design

Analysis started at day 0(±7) and were repeated each 20 d

Microbiological counts

- Total viable count (bioMerieux TEMPO®)
- Lactic acid bacteria (bioMerieux TEMPO®)
- Enterobacteriaceae (bioMerieux TEMPO®)
- Pseudomonas spp. (ISO 13720 : 1995)
- Brochothrix thermosphacta (ISO 13722 : 1996)

RESULTS AND DISCUSSION

The difference in TVC between temperatures tended to disappear after the 26th day once the meats were repacked under MA.

Lactic acid bacteria

Conversely, the difference in LAB and Enterobacteriaceae counts tended to be maintained after modified atmosphere repackaging.

Enterobacteriaceae

CONCLUSIONS

The difference in LAB and Enterobacteriaceae counts over time and between storage temperature showed that duration and temperature of VP storage had influence on microbiological quality of BB meat subsequently stored in high-oxygen atmosphere.

Moreover, chilling at temperatures very close to the freezing point of meat during VP storage, which has already showed several advantages for physicochemical quality of meat, was useful to maintain the microbiological quality of BB fresh meat during subsequent modified atmosphere-packed storage.

ACKNOWLEDGEMENTS

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