



RETAIL PACKAGING OF PRE-SALTED BEEF PATTIES STORED IN HIGH OR NON-OXYGEN ATMOSPHERE



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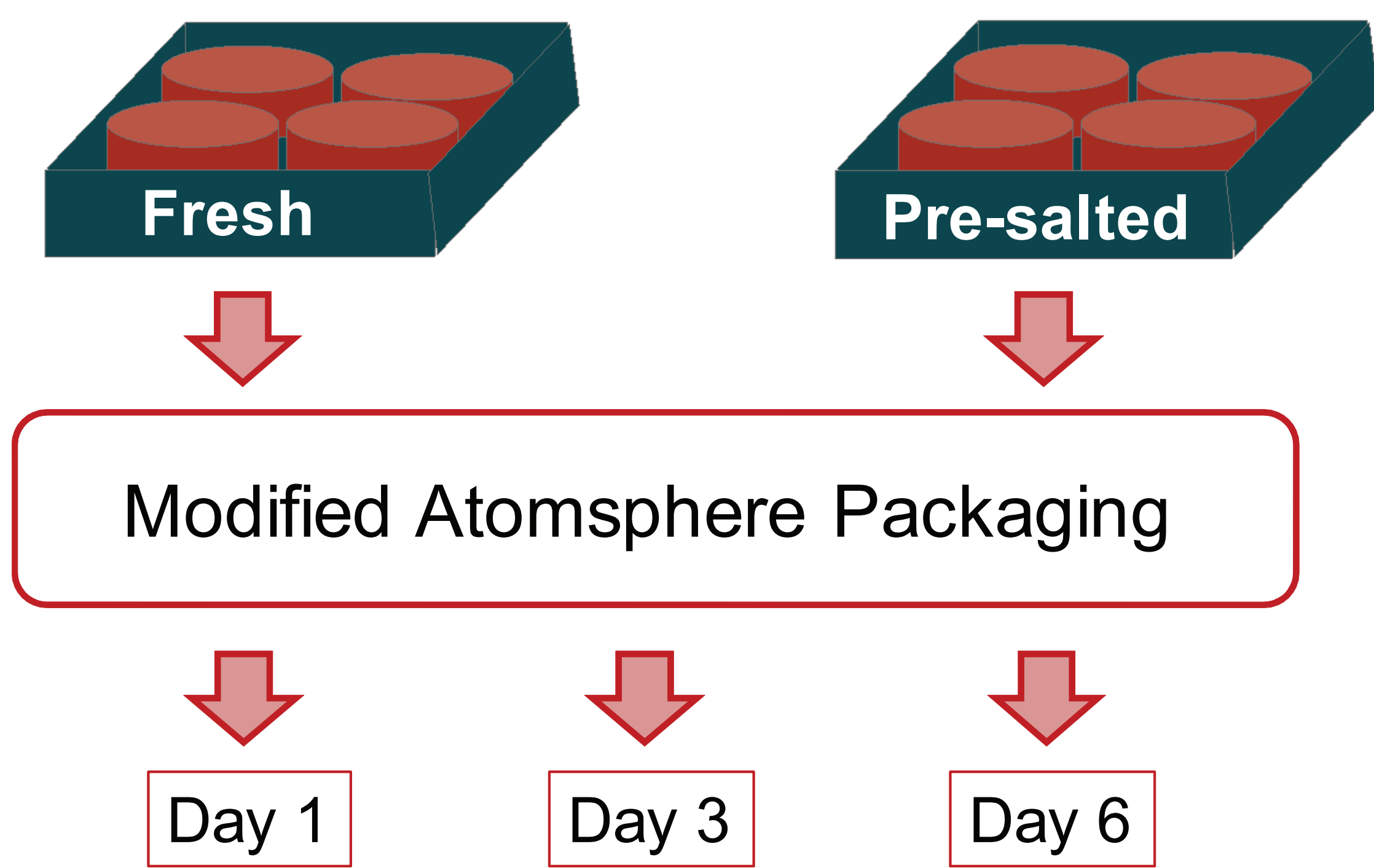
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Keywords—beef patties, pre-salting, high-oxygen MAP, sensory evaluation, lipid oxidation.

Introduction

Pre-salted beef is packed in high-oxygen modified atmosphere packaging (MAP) in order to preserve an attractive bloomed red colour and extend the shelf-life. Although, it is known that salt accelerates oxidation processes.

This study evaluates the effect of recipe (no salt (fresh) or 0.5 % NaCl (pre-salted)) and packaging atmosphere on the sensory quality and the progression.



Materials/Methods

Preparation, packaging and storage

- Beef patties 100g was prepared as "Pre-salted" 0.5 % salt or "Fresh".
- Four beef patties were placed in each tray and packed in three different modified atmospheres (70 % O₂/30 % CO₂, 70 % N₂/30 % CO₂, and 100 % N₂).

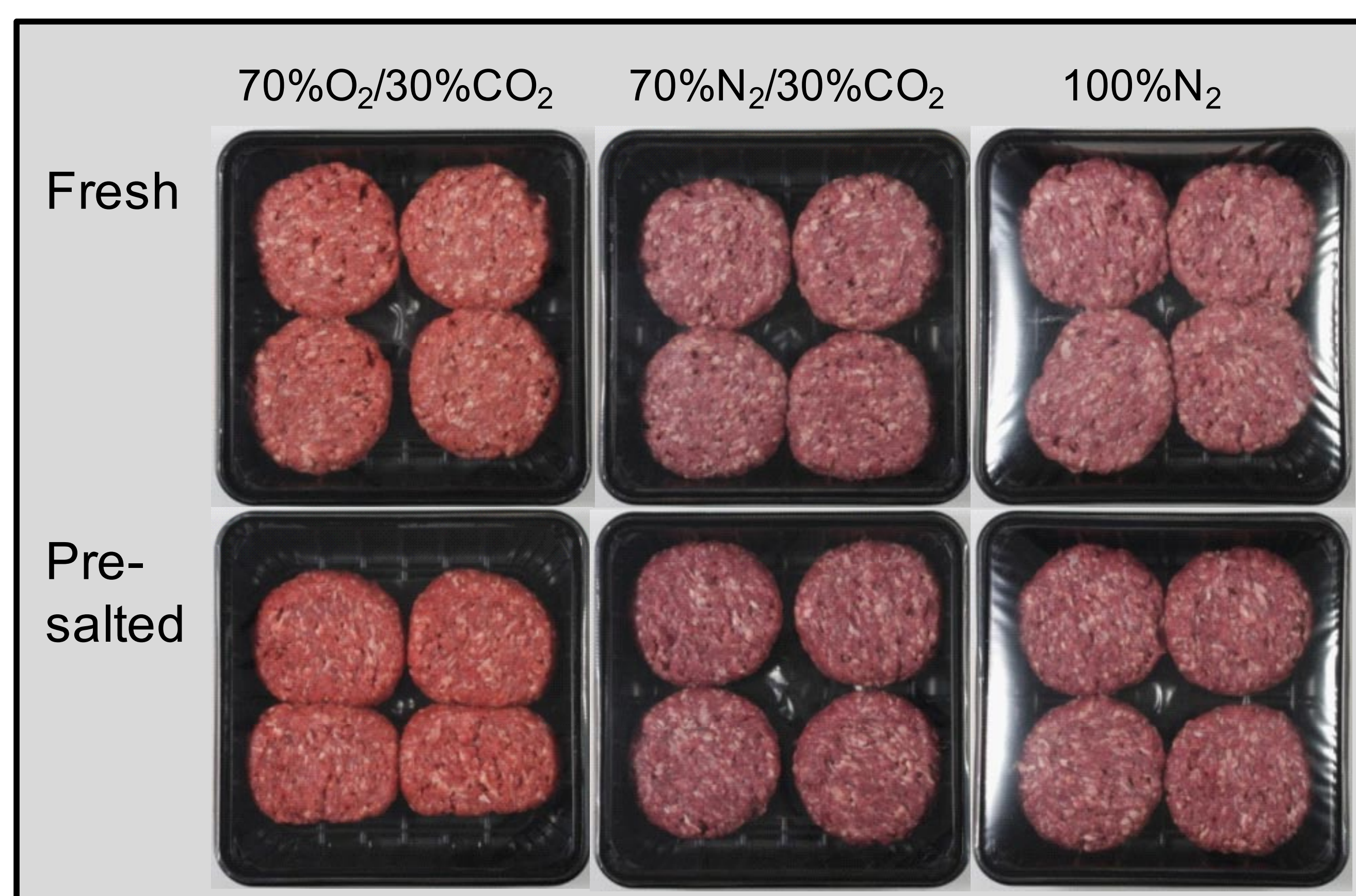


Figure: Visual colour of beef patties at day 6.

Analysis

The sensory quality of cooked beef patties was evaluated by a trained panel using a 15-point unstructured line scale. The development of lipid oxidation was measured as thiobarbituric reactive substances (TBARS) in µmol MDA/kg of meat.

Conclusions

- Packaging with non-oxygen-containing atmospheres minimised oxidation of beef patties and preserved the intensity of the meat flavour and salt taste, while high-oxygen packaging seemed to increase juiciness compared to non-oxygen atmospheres.
- In pre-salted beef patties, oxidation developed very rapidly. However, the salt taste was found to mask the rancid flavour. Furthermore, pre-salting improved the juiciness of beef patties during storage.

Results/Discussion

TBARS increased when fresh meat was stored in high oxygen MAP. No increase was observed when fresh beef patties were stored in non-oxygen MAP. In pre-salted beef storage when packed in a non-oxygen. TBARS values decreased when were packed in high-oxygen MAP, probably because lipid oxidation reactions progressed into the development of tertiary lipid oxidation products.

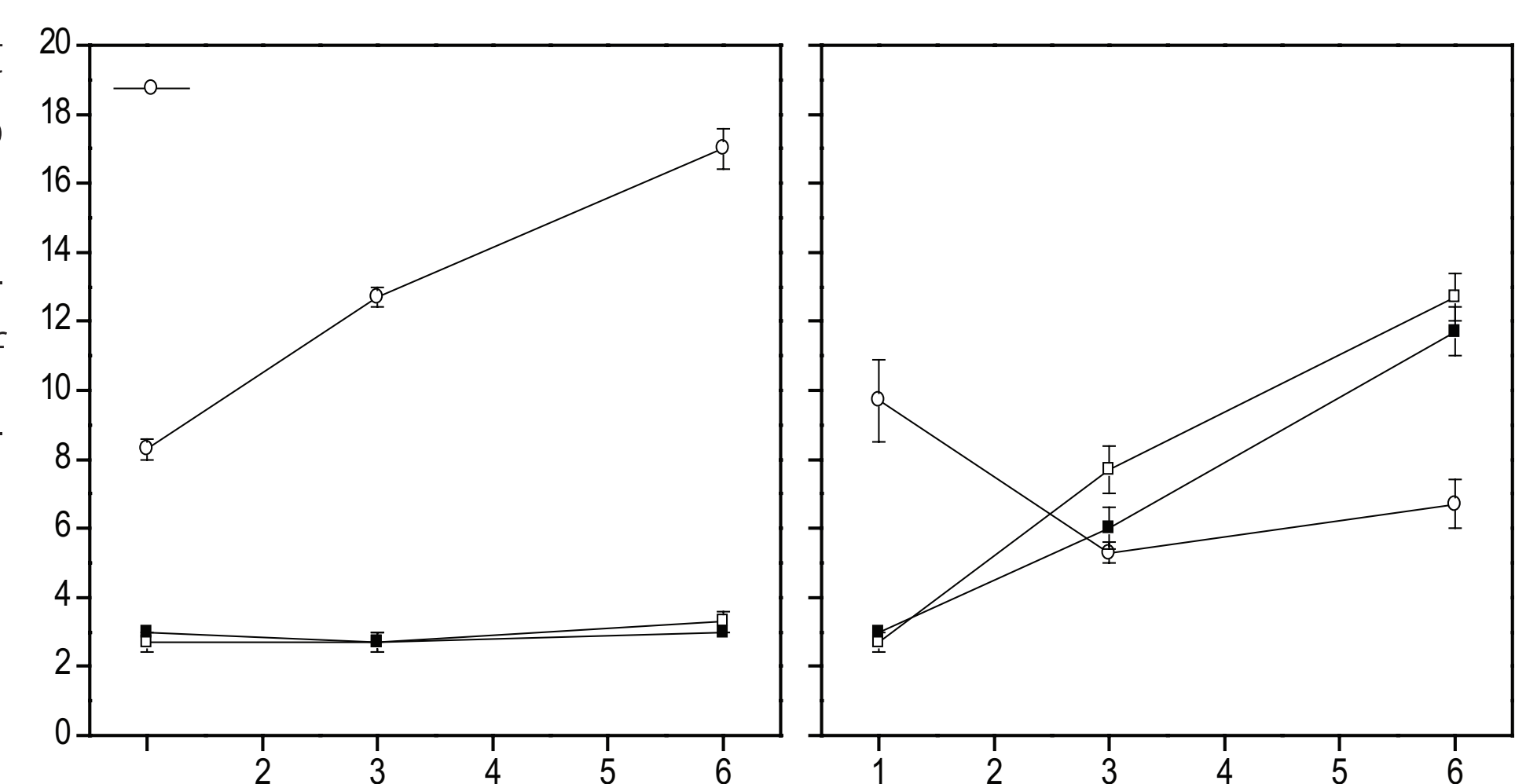


Figure 1. Effect of recipe and MAP on TBARS

Rancid flavour developed differently depending on the recipe and the packaging atmosphere. Fresh beef patties developed a rancid flavour between 4 and 6 days of storage when a non-oxygen-containing atmosphere was used. When packaging in a high-oxygen atmosphere, rancid flavour developed during the first 24 hours of storage. Pre-salted beef patties did not develop a rancid flavour for up to 6 days of storage when packed in a non-oxygen-containing atmosphere, probably because the intense salt taste masked the rancid off-flavour (Figure 2)

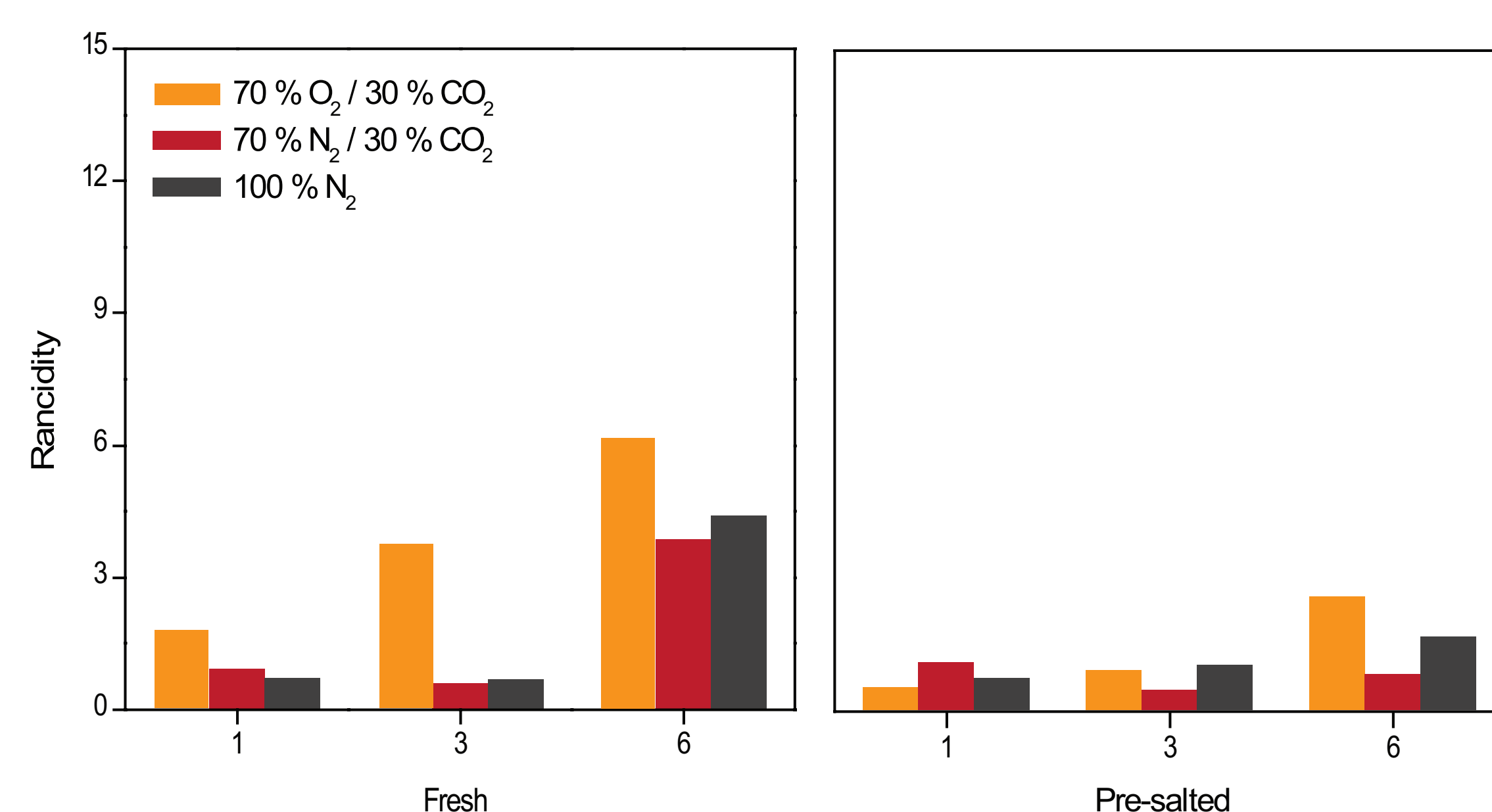


Figure 2. Effect of recipe and MAP on Rancid flavour

The juiciness of pre-salted beef patties was improved compared with fresh beef patties (Figure 3). Furthermore, an unexpected interaction between atmosphere and storage period was observed, with juiciness decreasing for beef patties packed in 100% N₂ and increasing for beef patties packed in high oxygen.

At day 6 beef patties packed in high-oxygen atmospheres were slightly juicier than patties packed in non-oxygen containing atmospheres. This interaction can be explained by differences in cooking loss (data not shown).

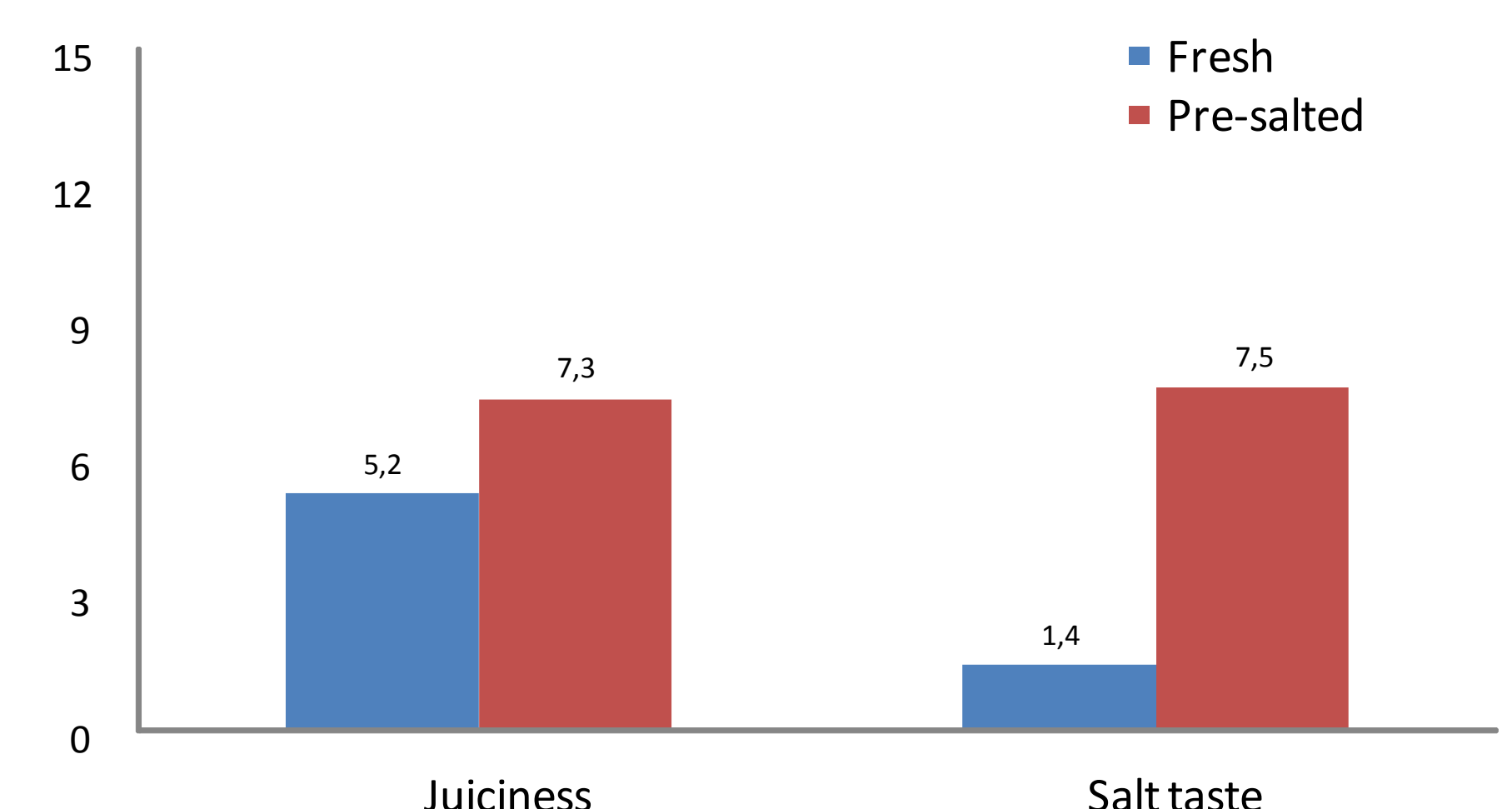


Figure 3. Effect of recipe on juiciness and salt taste (n=8)