



# Enzymatic, sensory and microbiological changes in marinated vacuum packed high pressure treated pork tenderloins during cold storage

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## Introduction

The purpose was to investigate enzymatic, sensory and microbiological changes in high pressure (HP) treated tenderloins during cold storage.

## Methods

Pork tenderloins were tumbled with 5% brine containing 10% NaCl. Afterwards a spicy marinade was added. The tenderloins were vacuum packed and HP treated at 5°C

- 500 or 600 MPa
- 3 or 6 minutes

After 1 day (week 0), 1, 4, 8 and 12 weeks of storage at 2°C, the samples were analyzed for:

- Activity of cathepsins B+L (Table 1)
- Sensory assessment of texture after oven roasting (Figure 1)
- Number of aerobic total count and lactic acid bacteria (Figure 2)

Non-HP treated samples were used as reference.

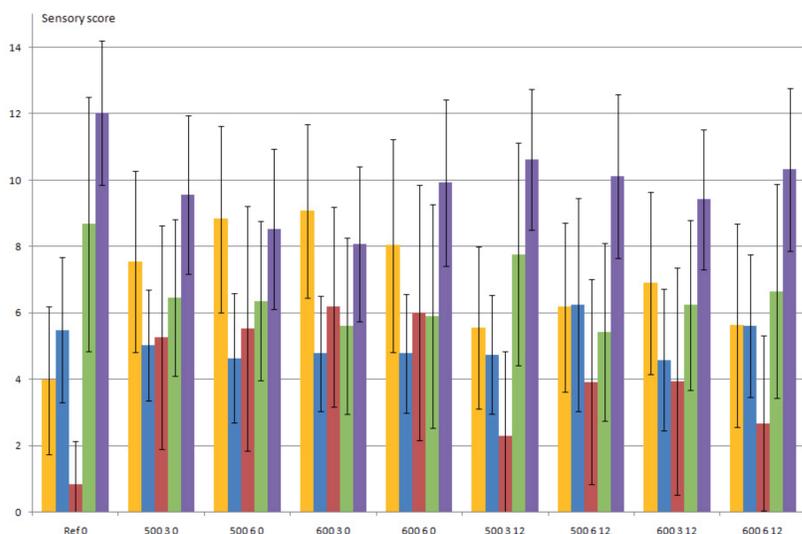
## Results

**Table 1 Cathepsin activity**

MPa min	Week0	Week1	Week4	Week8	Week12
Ref	16.445				
500 3	21.407	27.848	37.927	27.416	25.765
500 6	22.792	29.614	36.991	33.413	28.117
600 3	25.878	36.362	52.337	40.678	32.937
600 6	28.277	37.58	55.347	47.049	32.948

Activity expressed in velocity of the reaction values (fluorescence intensity/sec) in HP treated tenderloins during storage (n=3).

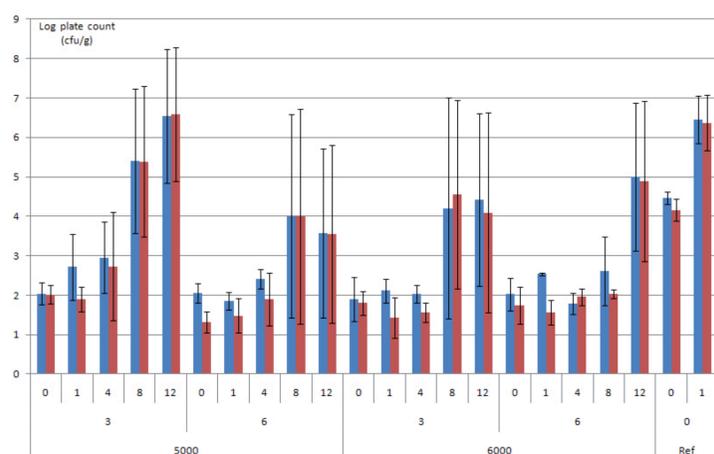
**Figure 1 Texture assessment**



Meat structure (yellow), juiciness (blue), stringiness (red), crumbliness (green) and tenderness (purple) of HP treated roasted tenderloins during storage (n=24).



**Figure 2 Microbial counts**



Aerobic total count (blue) and acidic acid bacteria count (red) in HP treated tenderloins during storage (n=3).

## Conclusion

### Cathepsins activity

- Increased with increasing pressure
- No effect of increased holding time
- Optimum after 4 weeks of storage

### Texture assessment

- HP treated meat not perceived as tender as reference
- No significant changes during storage of HP treated meat
- More stringy and meat-structured with higher cathepsin activity

### Microbial counts

- 2 log reduction by HP
- Initial bacteria count reached after
  - 12 weeks of storage by 600 MPa/6 min
  - 8 weeks of storage by other HP combinations

## Acknowledgement

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