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The effect of different ripening conditions on proteolysis and texture of dry-fermented sausage *Petrovská klobása*

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Abstract

The effect of different ripening processes (traditional, T vs. industrial, I) on proteolytic changes and texture of dry-fermented sausage *Petrovská klobása* was examined. More intensive pH decline was registered in I sausages, which had a positive impact on the drying process and proteolysis. Moisture content in I sausages was consistently lower than in T sausages. Likewise, proteolysis was more pronounced in I sausages, resulting in higher concentrations of nitrogen fractions. During processing, hardness and chewiness were significantly higher in I sausages, but these became almost identical once the required moisture content of sausages (<35%) was achieved in different ripening conditions.

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Keywords: traditional sausage; ripening conditions; proteolysis; texture.

1. Introduction

Petrovská klobása is a traditional dry-fermented sausage manufactured in north-western Serbia (Municipality of Bački Petrovac, Vojvodina). Nowadays, it is produced according to the original recipe in small household

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enterprises during winter. It undergoes slow drying and ripening processes, lasting at least 90 days[1].

Proteolysis occurring during the ripening of fermented sausages is an extremely important biochemical phenomenon which determines the final aroma and texture characteristics of the product. The result of this phenomenon is formation of several low molecular weight components, i.e. peptides, amino acids, aldehydes, organic acids and amines[2,3].

Texture is a multi-parameter attribute, and one of the most important components of meat products quality. Many factors affect final texture of fermented sausages, including ripening conditions. When textural characteristics are evaluated throughout the manufacturing process, instrumental measurements are suitable[4,5].

The objective of this study was to investigate the proteolytic changes and texture of *Petrovská klobása* sausages during ripening in different conditions (traditional vs. industrial).

2. Materials and methods

Petrovská klobása sausages were manufactured from cold lean minced pork and pig fat as described by Ikonić et al.[1]. Raw sausages were divided into two batches which were ripened in a traditional (T) or industrial (I) ripening room. The environmental conditions during the ripening are presented in Fig. 1. For sampling, the seasoned batter (0) and three sausages from each batch were taken after 2, 6, 9, 15, 30, 60 and 90 days. Analyses for all samples were carried out in duplicate.

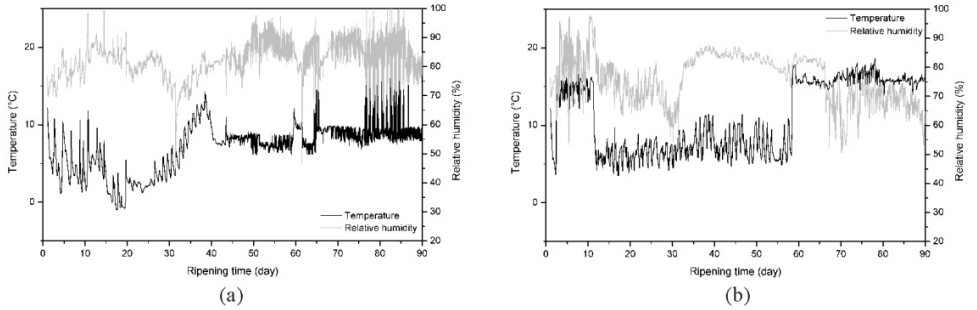

Fig. 1. Temperature and relative humidity recorded during ripening of *Petrovská klobása* in traditional (a) and industrial (b) conditions.

The pH of sausages was measured using a portable pH meter Testo 205. Moisture content was determined according to ISO method[6], and non-protein nitrogen (NPN) and free amino acid nitrogen (FAAN) according to the methods described by Ikonić et al[1].

Texture profile analysis (TPA) was performed as described by Jokanović et al.[7].

One way (ANOVA), Post-hoc (Duncan test) was performed using the software package Statistica 12.0. Differences were considered significant at $p < 0.05$.

3. Results and discussion

Different ripening processes resulted in different drying intensity of sausages. Consequently, moisture content in I sausages was lower throughout the entire processing period (Fig. 2(a)). Moreover, due to higher initial temperature (≈15°C) in industrial ripening room (Fig. 1 (b)) the fermentation process in I sausages was considerably faster, causing intensive pH decline (0.7 units in 9 days) toward the isoelectric point of actomyosin (≈5.0) (Fig. 2(b)).

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