

"SREMSKA" SAUSAGE WITH THE ADDITION OF PROTECTIVE CULTURES AND BACTERIOCINS

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Introduction

"Sremska" sausage belongs to the group of very desirable dry fermented products of high quality (Tojagic, 1980). In order to ensure product safety and traditional sensory properties, it is useful to add to the product, components with some protective cultures, isolated from naturally fermented sausages as well as bacteriocins. With these additions, growth of some pathogen microorganisms and spoilage microorganisms is inhibited extending shelf-life (De Vuyst and Vandamme, 1994).

The main task of the research was to determine if the protective cultures and bacteriocins have any influence on physico-chemical changes and sensory characteristics of "sremska" sausage during production (smoking, fermentation, ripening and drying).

Materials and Methods

For production of "sremska" sausages pork and frozen pork-back fatty tissue, as well as, nitrite and NaCl mixture as additives and spices were used. The stuffing mass was divided into four parts: control sample (c); with protective cultures (*Lactobacillus sakei* I 154) (I); with protective cultures and bacteriocins (*L. sakei* I 154 and *Leuconostoc mesenteroides* E 131) (II) and with bacteriocins (*Ln. mesenteroides* E 131) (III). Sausage diameter was 32 mm. Smoking and ripening of sausages were carried out under controlled conditions, 21 days at 14-16°C with relative humidity 90-85% and 85-75%. Samples were taken from each batch at day 0, 3, 4, 7, 14 and 21 during production process and subjected to physicochemical analysis (moisture and NaCl content, pH and a_w). Standard analytical methods were used. At the end of production, samples were tested by 10 panelists using quantitative descriptive test (IUS ISO 6658/2002) for evaluation of sensory characteristics of the product.

Results and Discussion

During production of "sremska" sausages, moisture content was gradually reduced, except between day 3 and 4, when a slight stagnation was noticed (Figure 1). The reason probably lies in temperature changes, from 16°C (drying and fermentation) to 14-15°C (ripening and drying), what probably decreased water evaporation. Moisture content of sausages was reduced slightly on average from 50% (day 0) to 20% (day 21). It is obvious that the samples with protective cultures and bacteriocins had lower water content compared with control samples. Faster decrease of pH was observed in experimental groups of the product, compared with control sample (Figure 3). Due to the influence of protective cultures and bacteriocins, faster and complete decomposition of added sugar can be expected, resulting in faster production of lactic acid and lower pH of sausages. a_w and NaCl values (Figure 2 and 4) were changed according to water content reduction of sausages. Protective culture and/or bacteriocins showed no undesirable influence on sensory characteristics of "sremska" sausages (Figure 5).

Conclusions

On the basis of the research results, addition of protective cultures and/or bacteriocins had no influence on physicochemical characteristics of "sremska" sausages. On the contrary, they had a positive effect on sensory characteristics of experimental sausages.

References

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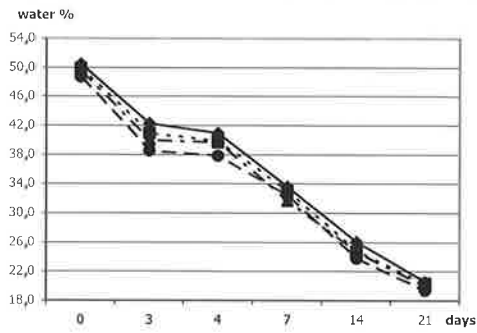


Figure 1: Changes of moisture content (%) during production of "sremska" sausages.

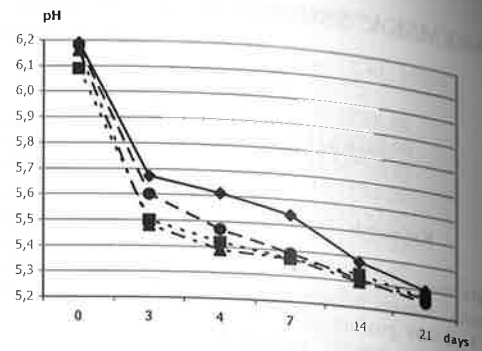


Figure 2: Changes of NaCl content (%) during production of "sremska" sausages.

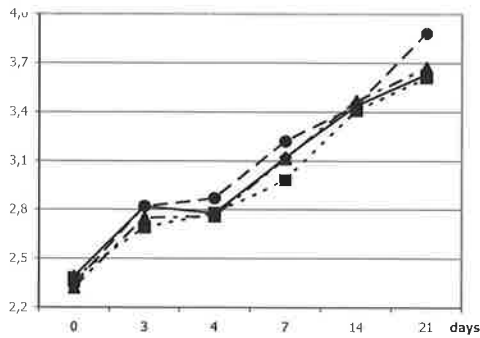


Figure 3: Changes of pH during production of "sremska" sausages.

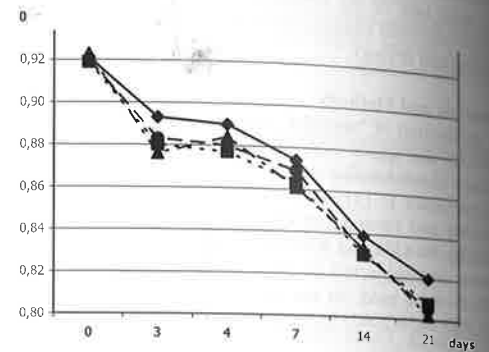


Figure 4: Changes in a_w values during production of "sremska" sausages.

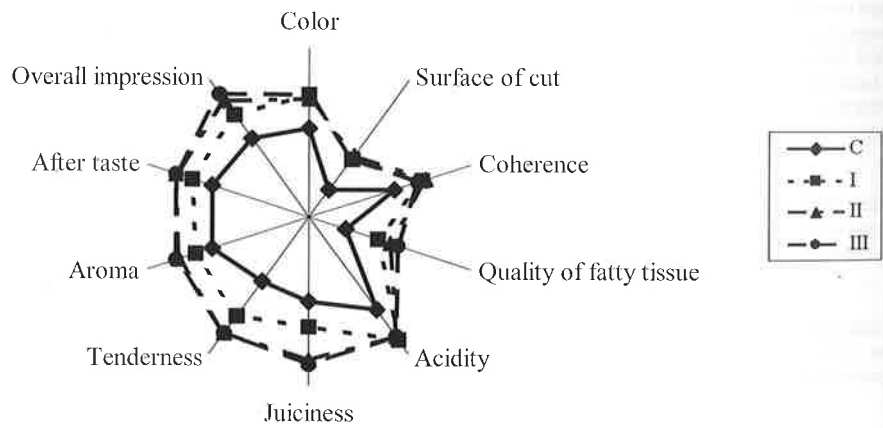


Figure 5: Evaluation of sensory characteristics of "sremska" sausages.