Evaluation of Physicochemical and Microbiological Parameters of Smoked Sausages

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ABSTRACT
Meat and meat products continue to supply nutrients and play a vital role in human life because of their high biological value protein, iron, zinc, selenium and vitamin B12 contents, being a crucial component of a well balanced diet. The objective of this paper was to analyse the microbiological and physicochemical characteristics of smoked sausage obtain by a modern recipe. The meat material was obtained from local butchery (Cluj-Napoca, Romania). The physicochemical analyses highlighted the moisture (Drying-oven at 105 °C), protein (Kjeldahl method) and fat (Soxhlet method) content, as well as nitrite (Griess method) and sodium chloride concentrations (Mohr method) of the final products. Microbiological and physicochemical analysis of the examined samples found no deviations from legal norms imposed for smoked sausage. All of the quality parameters comply with the limits stipulated by STAS.

Keywords: smoked sausage, nitrite, microbiological and physical-chemical quality indicators.

INTRODUCTION
Nowadays, food industry invest an important part of their resources to ensure the quality of their manufactured products, mainly with regard to the hygienic-sanitary quality, due to the great economical losses produced as a consequence of the microbiological alteration, both in the foods and the consumers (Escudero-Gilete et al., 2014).

Meat and meat products are important for human diet due to high quality proteins, rich in essential amino acids that. The microbiological quality and safety of meat products is hampered by system failures or abuses during food animal production, product processing, distribution, and preparation for consumption, as well as by consumption habits (Sofos et al., 2014). Smoked sausages are important in human’s diet, because they are available in a large variety and could be consumed fresh, without any thermal processing.

MATERIALS AND METHODS
The pork meat was purchased from local butchery (Cluj-Napoca, Romania) and the final product, smoked sausages, were produced after a modern recipe adding nitrite. The physicochemical and the microbiological analyses were carried out at the Faculty of Food Science and Technology, Cluj-Napoca, Romania.

Assessment of quality parameters referred to the determination of physico-chemical properties (moisture, protein, fat, salt and nitrite content) of the finished product.

The samples of the meat specialties were analysed according to AOAC method (Association, 2011). Moisture content (%) was investigated by oven-drying up to a constant weight; the salt content was determined by the titration method. The protein was determinated by the Kjeldahl method and consisted of the total nitrogen determination, which, multiplied, with the coefficient of the transformation of nitrogen in protein, resulted in the quantity of protein. Fat was determinated by extraction with organic solvents in the Soxhlet apparatus and the nitrite content was measured by Griess method.
The microbiological evaluation was performed in order to determine the eventual presence of pathogens: Staphylococcus aureus, Salmonella spp. and the total number of germs obtained at 37 °C/24h (TNG).

RESULTS AND DISCUSSION

The composition of smoked sausage product is in agreement with the ranges published in literature (Salanta et al., 2014, Salagean et al., 2012). The moisture content in smoked sausage specialties was 48.43%, the content of fat was 15.73%, the salt content was 2.66%, the content of protein was 21.83% and the nitrite content was 1.75%. The results obtained show a lower content in fat and a higher protein intake, which is normal considering that the raw material used to obtain specialty was pork sirloin.

The presence of Salmonella spp. and S. aureus were not detected in any of the analyzed samples. Under the applicable regulations, the smoked sausage after a modern recipe was microbiologically safe and had the appropriate physical and chemical characteristics.

CONCLUSION

Analysed meat products were prepared according to modern recipes of Romanian households and comply with hygiene available regulations of the European Union. The chemical analyses showed that all quality parameters are within the maximum limits allowed by law. According to the microbiological determinations, TNG values are considered within normal limits, Salmonella spp and S. aureus were not identified in the analyzed products.

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