

The main physical-chemical characteristics of smoked ham

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Abstract

The paper presents the sensory and physical-chemical quality of smoked ham, produced by a manufacturer in the western part of Romania. The sensory exam of the samples highlighted: exterior and in section aspect, consistency, taste and flavor. From the performed analysis it was found that there were no changes compared to admitted parameters.

The physical-chemical examination highlighted the sodium chloride, nitrites and easy hydrolyzed nitrogen content of the samples. Medium sodium chloride content was 2.53%, under the maximum admitted limit of 3.5%. Easy hydrolyzed nitrogen registered a medium value of 26.35 mg NH₃/100g product, under the 45% maximum admitted limit. Nitrites content was 4.78 ppm, under the 7 ppm imposed limit.

Keywords: smoked ham, physical-chemical characteristics of ham, admissible limits for smoked ham

1. Introduction

Meat and meat products are important components of the diet of a large number of world populations. Meat contains high quality proteins being rich in essential amino acids that can't be synthesized by the human body.

Red meats, from swine, cattle, sheep, goats and rabbits are generally obtained and consumed in bigger quantities than meats from poultry and fish, but not significantly.

Smoked ham is usually made from the pig's ham (hind leg or thigh), and the process of making smoked ham can take anywhere from six weeks to three months, depending on the size of the ham. Today, the ham is first cleaned, salted and left for about six weeks. Next, it is washed several times to remove the salt, and is hung in a dark, well-ventilated environment for a few days. The surrounding air is important to the final quality of

the ham; the best results are obtained in a cold climate. The ham is then smoked by placing it in a smokehouse to be cured by the action of smoke. The amount of time this takes varies, depending on the size of the ham (about 4-5 days). When the ham is smoked, it is hung to air, either at room temperature or in a controlled environment, for drying [2, 3].

It has been made studies concerning the content of staphylococcal enterotoxins from smoked ham and how the prevalence of the pathogen is influenced during the fabrication process [1].

It was shown that smoked and dry-cured ham were the richest sources of Fe, Zn and Se and, among vitamins, dry-cured ham had the highest level of B2, PP, B6 and B12; cooked ham provided the lowest energy intake. [4]

It was investigated the effect of the intensity of smoking treatment on the evolution of free amino acids (FAAs) of dry cured ham during processing.

The correlation between FAAs and biogenic amines (BAs) content was also investigated as well as its effect on the perception of some sensory characteristics of ripened hams. Also, it was determined the effect of salt, phosphates and other curing ingredients on shrinkage of lean pork meat and the quality of smoked processed ham [5-7].

2. Material and methods

In order to carry out the experimental part were analyzed six samples of smoked ham produced by a manufacturer from the western part of Romania.

The samples were analyzed from a sensorial point of view, aiming the product shape, appearance and in section aspect, consistency, color, taste and flavor. Also, the following physical-chemical parameters were determined: content of sodium chloride, nitrites and easy hydrolyzed nitrogen

3. Results and Discussion

From the sensorial point of view, all analyzed samples were consistent with accepted legal norms:

- **product shape and appearance:** clean, non-sticky surface, without mold or foreign bodies, with specific color;
- **in section aspect:** characteristic for the respective anatomical piece;
- **consistency:** specific to the assortment;
- **color – on section:** uniform, pink to red ruby, with a darker shade on a portion of 6 mm from the edge;
- **taste and flavor:** without foreign taste or odor [8,9].

Physical-chemical examination results of the tested samples are presented in the following figures and table.

Salt content of the analyzed smoked ham samples ranged below the maximum limit of 3.5% for this parameter. The percentage of salt in the analyzed samples showed values between 1.93% and 3.45%. Graphical representation plays suggestive experimental research results (figure 1).

Values of nitrites from the analyzed smoked ham samples ranged between 2.8 ppm and 6.2 ppm. The maximum value admitted for this parameter is 7 ppm, all determined values being below the threshold of admissibility (figure 2).

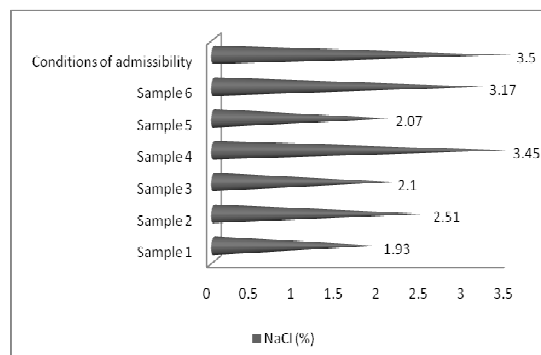


Figure 1. Salt content of analyzed smoked ham samples

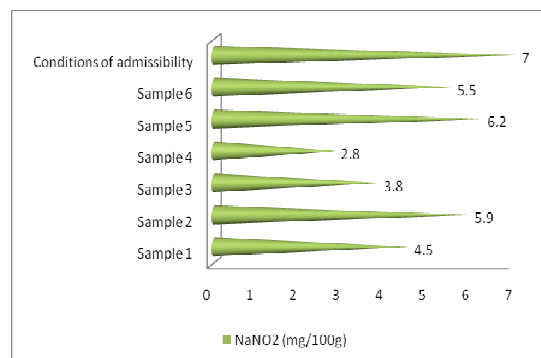


Figure 2. Nitrites content of analyzed smoked ham samples

The freshness degree of the analyzed samples was appreciated by determining the easily hydrolysable nitrogen, expressed as $\text{NH}_3/100\text{g}$ product. None of the six smoked ham samples exceed the maximum permissible limit of 45 mg $\text{NH}_3/100\text{g}$ product. The lowest value of this parameter was recorded in sample 6 (21.2 mg $\text{NH}_3/100\text{g}$ product) and the maximum determined value was 30.6 mg $\text{NH}_3/100\text{g}$ product, in sample 3.

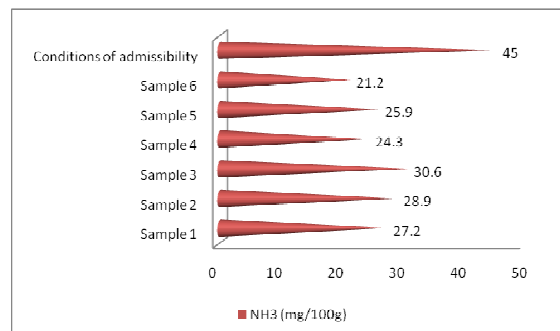


Figure 3. Values of easily hydrolysable nitrogen for the analyzed smoked ham samples

Also, the freshness degree of the analyzed samples was appreciated after making Kreiss reaction.

Table 1. Kreiss reaction in smoked ham samples

Specification	Kreiss reaction
Sample 1	Negative
Sample 2	Negative
Sample 3	Negative
Sample 4	Negative
Sample 5	Negative
Sample 6	Negative

The data analysis shows that the six smoked ham samples were fresh; there are no sign of alteration thereto.

4. Conclusion

Sensorial and physical-chemical analysis of the examined samples found no deviations from legal norms imposed for smoked ham.

From the performed studies which concern the physical-chemical characterization of smoked ham, it can be indicated the following conclusions:

- salt content of the analyzed smoked ham samples ranged below the maximum limits on this parameter of 3.5%;
- the amounts of nitrites from the examined smoke ham samples were below the maximum permissible value of 7 ppm;
- content of easily hydrolysable nitrogen ranged between 21.2 mg NH₃/100 g and 30.6 mg NH₃/100 g, indicating that all samples are fresh.

It can be concluded that the manufacturing company produces smoked ham with sensorial and physical-chemical qualities in the admitted limits, proper for consumption.

Compliance with Ethics Requirements. Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human / or animal subjects (if exist) respect the specific regulation and standards.

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