UTILISATION AND EFFECT OF DRIED APPLE PEELS IN PREPARATION OF A NEW DRY SAUSAGE PROTOTYPE

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Abstract

The purpose of this study was to develop a new recipe to obtain a special innovative pork sausage, to develop the manufacturing process, technological stages, and nutritional analysis of the final product. We obtained this product starting from a classic recipe (of pork sausage), it was added by adding of dry apple peels

The apples are fruits with a rich content of ascorbic acid, and biominerals, and also have a high content of antioxidants.

Our work has focused on evaluation of the sensory characteristics, biochemical, and nutritional characteristics a type of sausage obtained by adding of dry apple peels (sausage DAP). Sensory examination was performed by analyzing the appearance, texture and taste.

The main physico-chemical features observed in the sample of sausage (simple sausage and sausages prepared with added dry apple peels) were: the content of humidity (%), ash (%), soduim chloride (%), protein (%), fat (%), carbohydrates (%) and energetic value (kcal/100g).

Following the research that have been undertaken in this work, the obtained product (sausage obtained by adding of dry apple peels – sausages DAP) can be included in the category of secure products of consuming.

This prototype can be considered a food variant due to its high nutritious properties and to its distinguished taste too.

Keywords: sausage, apple peels, antioxidants, pork meat, sensory and nutritional properties

Introduction

Sausages are a meat product usually made from ground meat, often pork, beef or poultry, along with salt, spices and other flavors. Some sausages include other flavoring ingredients. The word "sausages" can refer to meat free of sausages, which can be formed into pies or stuffed into a skin. When called "sausages", the product is usually cylindrical and embedded in a skin. Usually a sausage is formed in a carcass

The paper aims as main objective the study of sensory characteristics and the main physical - chemical properties of the sausage obtained by adding of dry apple peels (sausage DAP). The addition of antioxidants to meat products is done to prevent lipid oxidation, delay the development of off- flavours and improve colour stability.

The study was designed to evaluate the effect of dry fruit on physico-chemical properties and sensory profile of pork sausages. This study aimed to improve the nutritional quality of dry sausages using dry fruit rich in bioactive compounds.

Experimental

The samples that were taken in the analysis were homemade dry sausages prepared by us and other two dry pork sausages samples purchased on the Romanian supermarket.

Notations used: sausages from different industrial manufacturers purchased on the Romanian supermarket (SM1, and SM2) and homemade sausages dried (CA1 - sausages with dry apple peels, CAM2 - control sausage).

The sausages were prepared according to the traditional recipe from Oltenia Region. In the case of sausages with dried fruit, we used the same recipe, but we added blueberries dried fruits. The fruit ratio: (meat + meat and fat) was 1:20.

The spice mixture content we used For preparation of the pork sausages: coriander *(Coriandrum sativum)* -13%, allspice *(Pimenta dioica,* also called *Myrthus pimento)* -15%, black pepper *(Piper nigrum)* -29%, thyme *(Satureja hortensis)* - 43%. Apple peels are leftovers after preparing various cakes. which were then dried and packed.

In the manufacture of sausages, we went through the following stages: choosing the connective tissue (lean meat) and fatty meat, cutting the meat and hard fat into cubes of 5 ÷ 7 cm; obtaining minced meat with the electric mincing machine (with a sieve that has 6 mm holes); measuring ingredients; adding them to the mixture of meat and lard and homogenize the composition.The meat paste was stuffed into pork intestines. The sausages underwent the drying process. The ripening process lasted 30 days until the desired sensory, physical and (bio)chemical and microbial characteristics of the products were reached.

Physicochemical analysis and nutritional characteristics

All chemicals used for analyses were of an analytical grade. All samples were analysed for physicochemical parameters within the next 48 hours upon arrival into the Laboratory.

The moisture content in sausages samples were determined gravimetrically at 103°C in an oven (according to ISO 1442:1997) [3].

The NaCl content was determined through the Mohr method according to STAS 9065-5/73 [4].

The amount of crude protein and ***fat*** in the samples was determined on the dry sample. Fat content was estimated by Soxhlet extraction by using petroleum ether [5]. The Kjeldahl method was used to determine the crude protein content (the FOSS 8400-8420 apparatus) were following the manufacturer's application notes.

Total carbohydrates were calculated by difference. ***The energy value*** was calculated by using the following equation: energy (kcal) = 9 × (g lipid) + 4 × (g protein + g carbohydrate).

All determinations were performed in duplicate, calculating the arithmetic mean of the two separate determinations. The data were statistically analysed using the program Microsoft Excel.

Results and discussion

The results of *water content* of samples are shown in Figure 1. The result was the arithmetic mean of the two parallel determinations (for each sample), which do not differ by more than 0.5 g of water per 100 g of sample to be analysed.

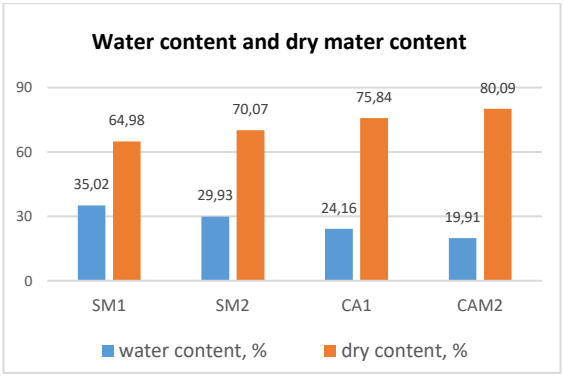

Figure 1. Water and dry mater content of sample

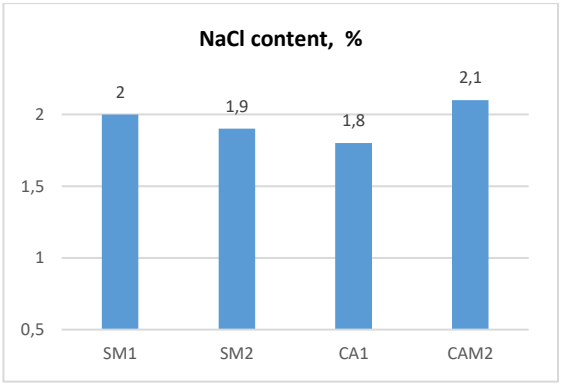

Figure 2. Salt content of analysed samples

The salt content of the sausage samples varied below the maximum limit of 2.3%. The percentage of salt in samples showed values between 1.8% and 2.1% (Figure 2). The lower content in salt (NaCl, %) is for CS1. This sample had the highest water content.

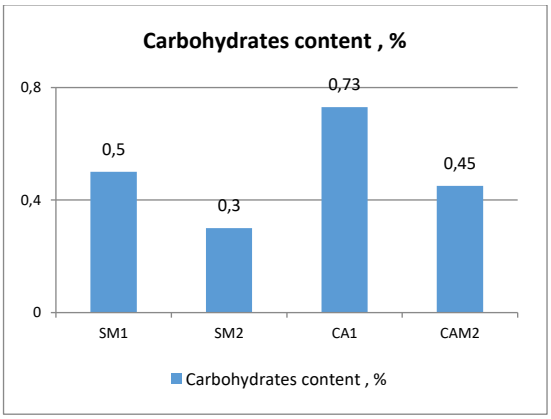

Figure 3. Carbohydrates content in sausage samples

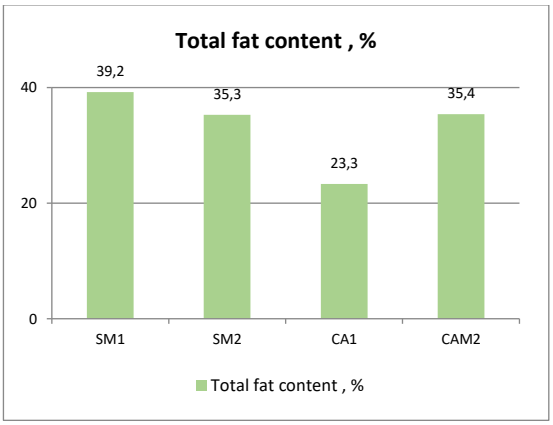

Figure 4. Total fat content in sausage samples

Total carbohydrates content from the sausage samples is showed in figure 3. The highest carbohydrate content was found in the homemade sample (CA1) in which was added dried apple peels.

In figure 4 is showed total fat content from the sausage samples, where is placed the value of arithmetic means of the two parallel determinations for each sample.

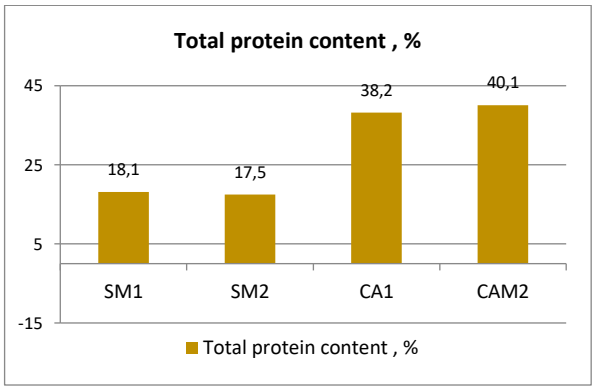

Figure 5. The crude protein content of the sausage samples

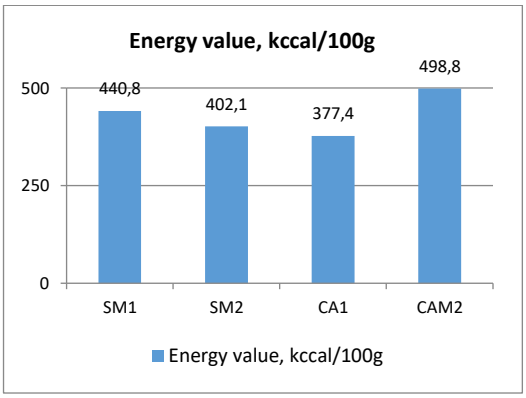

Figure 6. Caloric content of sausage sample

The fat content in our sample was between 23. % and 40 %. The lowest content of fat was found in sample of homemade sausage with dry fruit in composition. This can be explained by replacing a portion of fat with dried fruit.
Total crude protein content from samples are presented in Figure 5.
The data regarding the energy sausages value is shown in Figure 6. The energy sausages value was calculated.
The highest caloric content is for simple homemade sausages (CAM2), control samples, sample without dry fruit in composition. This sample have a highest content of dry mater, and the lowest content of water. The sausages with dry blueberry have a low caloric content. In conclusion, the replacement of pork fat with dry apple peels were reduced the fat content of sausages (see figure 4). The caloric content (the energy value) of sample with dry fruit was decrease.

Conclusion

Our results indicate some different between the sausage with dry fruit peels in the composition and without added dry fruit.
Our research consists in developing an innovative meat product by using dry apple peels rich in bioactive compounds.
The salt and fat content of the analysed sausage samples had values below the maximum permissible limits.
The replacement of pork fat with dry fruit were reduced the fat content of sausages and consequently the caloric content of sample with dry fruit was decrease.
These fruits have high content of antioxidants. The addition of antioxidants to meat products is done to prevent lipid oxidation, delay the flavours development and improve colour stability.
Following the undertaken research in this work, the obtained product (sausages with fruit) can be included in the category of safe products for consumers.
Due to the high content of bioactive substances in dry fruit it was increased the nutritive and phytomedical potentials of homemade sausages with dry fruit.
In conclusion, this sausage prototype can be considered a food variant due to its high nutritious properties and to its distinguished taste.

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