



EVALUATION OF ORGANOLEPTIC AND NUTRITIONAL CHARACTERISTICS OF SALAMI WITH ALMOND ADDITION

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Abstract: The aim of the present work was to evaluate the effect of the addition of almonds on some quality parameters in a type of dry raw salami made from meat. The new innovative product was manufactured under normal industrial conditions, but in which different proportions of almonds were incorporated (2.5%, 5% and 10%). The addition of almonds led to an improvement of the chemical characteristics of the final products obtained, thus the higher the amount of almonds added, the more the organoleptic and physico-chemical properties were improved. Oxidative stability evaluated by determining peroxide induction, thiobarbituric acid and TOTOX index. The increase in oxidative stability was directly proportional to the proportion of almonds added. Organoleptic analysis involved the evaluation of taste, odour, external appearance, section appearance and general acceptability characteristics. The organoleptic analysis showed that the addition of almonds to the product improved the organoleptic characteristics.

Introduction

Dried fermented meat products are one of the oldest and most remarkable groups of processed meats and are a key aspect of the identity, culture and heritage of many regions [1]. The great interest in traditional dry fermented meats is particularly remarkable in Europe, due not only to their high economic weight, but also to their unique sensory characteristics, which are a consequence of the raw material and the manufacturing process [2]. The product Raw dry cured salami with almonds belongs to the category of hot-smoked, pasteurised and cold-smoked meat products. The objectives established in the second part of the dissertation were: (i) Establishment of the manufacturing recipe for raw-dried salami with almonds; (ii) Obtaining raw-dried salami with almonds; (iii) Organoleptic characterization of raw-dried salami with almonds; (iv) Physical-chemical characterization of raw-dried salami with almonds by analyzing: water content, ash, protein, fat, NaCl, degree of oxidation

Material and method

Fresh meat and fat were purchased from a local producer (SC Smithfield SRL, Timisoara, Romania) and other ingredients from the supermarket. The almond salami was made according to the following basic recipe: 5 kg pork leg, 1 kg fat, 0.130 kg salt, 0.060 kg sugar, 0.015 kg black pepper, 0.015 kg garlic, 0.010 kg thyme. Four samples of salami were prepared, one according to the basic recipe (control sample - S0) and three samples in which the basic recipe was followed and different proportions of almonds were added (2.5, 5 and 10% - S2.5, S5 and S10). The technology of obtaining salami with almonds included the following steps: mincing meat and bacon with the help of a volf through a 4 mm mesh sieve, kneading together with the rest of the ingredients, filling in membranes and binding sticks, maturing, venting, hot smoking, cooling and storage. The obtained almond salami was organoleptically analysed by assessing external appearance as well as appearance on section, colour, smell, taste and consistency. To assess the integrity of the meat preparations, the main components of the raw material were determined: water, fat, protein, sodium chloride. The following ISO methods were used to evaluate the proximate composition of sausage formulas: SR ISO 1443:2008 for total lipid, SR ISO 937:2007 for total protein, SR ISO 1442:2010 for moisture, SR ISO 936:2009 for minerals and SR ISO 91:2007 for NaCl. The oxidative stability of sausages sample was made according to Cadariu et al. (2022) [3].

Results and discussions

Physico-chemical characterisation

Table 1 shows the proximate composition of the salami samples analysed

Sample	Humidity (g/100g)	Ash (g/100g)	Protein (g/100g)	Fat (g/100g)	Salt (g/100g)	Carbohydrates (g/100g)	Nutritional value (kcal/100g)
S0	41.83 ± 1.46	1.94 ± 0.06	19.59 ± 0.65	31.91 ± 1.11	2.89 ± 0.10	1.84	372.91
S2.5	41.55 ± 1.37	2.28 ± 0.06	19.81 ± 0.66	32.27 ± 1.16	2.76 ± 0.10	1.33	374.99
S5	40.91 ± 1.22	2.64 ± 0.07	20.34 ± 0.69	32.52 ± 1.19	2.59 ± 0.09	1.00	378.04
S10	40.64 ± 1.18	2.89 ± 0.07	20.69 ± 0.71	32.74 ± 1.20	2.45 ± 0.09	0.59	379.78

From the data presented in Table 1, it can be seen that the addition of almonds in the composition of salami resulted in an increase in the mineral, protein and fat content and a decrease in the moisture, salt and carbohydrate content. Also the energy value increased due to the addition of almonds.

Oxidative stability

Oxidative stability was assessed by determination of peroxide (PV), thiobarbituric acid (TBA) and calculation of TOTOX value, on the first day of sampling and after 15 days.

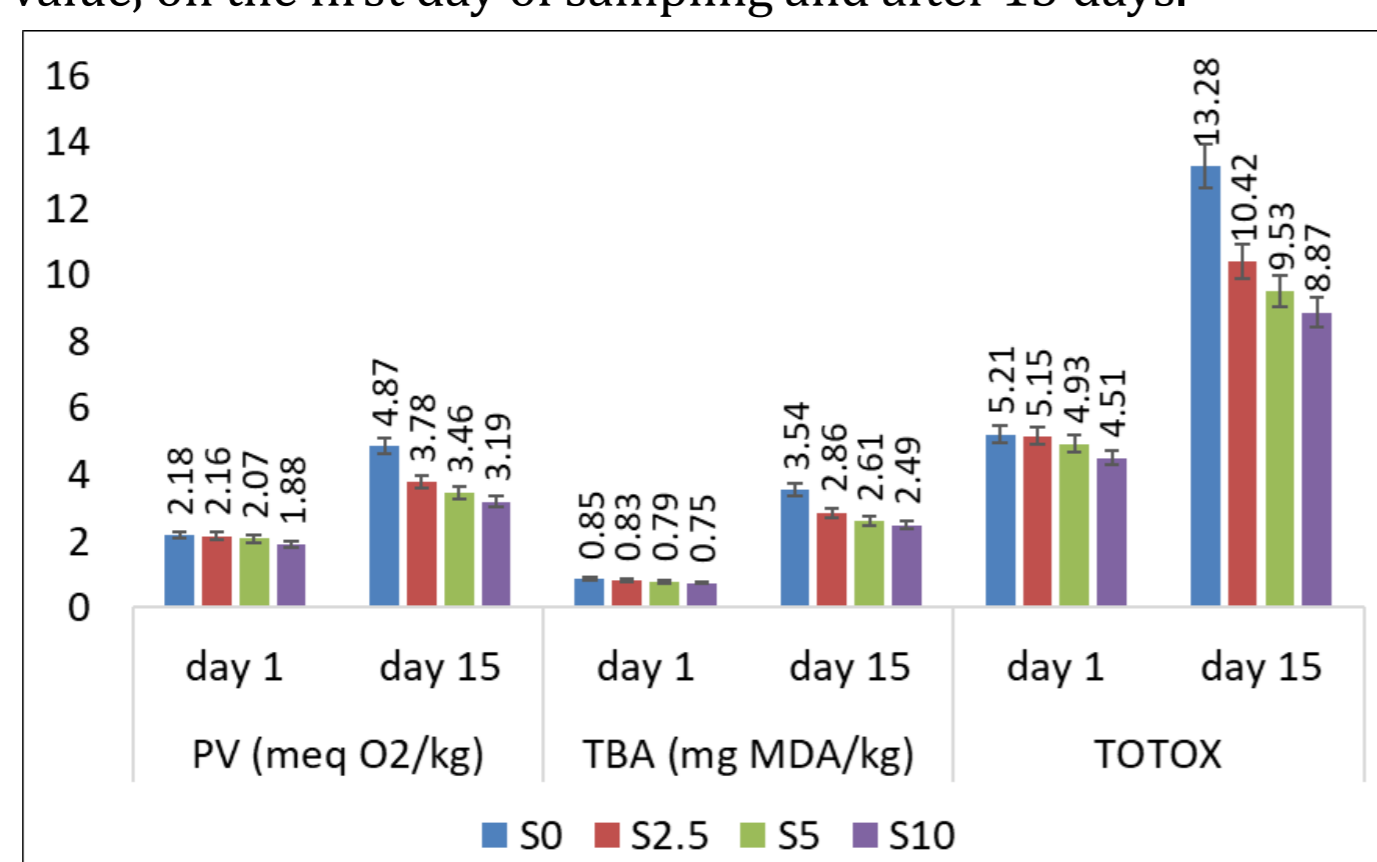


Figure 1. Oxidative stability expressed by PV, TBA and TOTOX of salami samples

From the data presented in Figure 1 it can be seen that the addition of almonds to the salami composition led to an increase in oxidative stability, which varied in proportion to the proportion of almonds added. Thus, on the first day values between 1.88 - 2.18 meq O2/kg were recorded for PV, values between 0.75 - 0.85 mg MDA/kg were recorded for TBA and the calculated TOTOX value was between 4.51 - 5.21. After 15 days, the evolution of the values remained linear, the oxidative stability being proportional to the amount of almonds added. For day 15, the values recorded were: 3.19 - 4.87 meq O2/kg, 2.49 - 3.54 mg MDA/kg and between 8.87 - 13.28 for TOTOX. In all cases the lowest values were recorded for S10 and the highest values were recorded for S0, which means that the addition of almonds in the salami composition provides a good protection against the oxidation process.

Sensory analysis

Figure 2 shows the results of the sensory analysis performed on the salami samples.

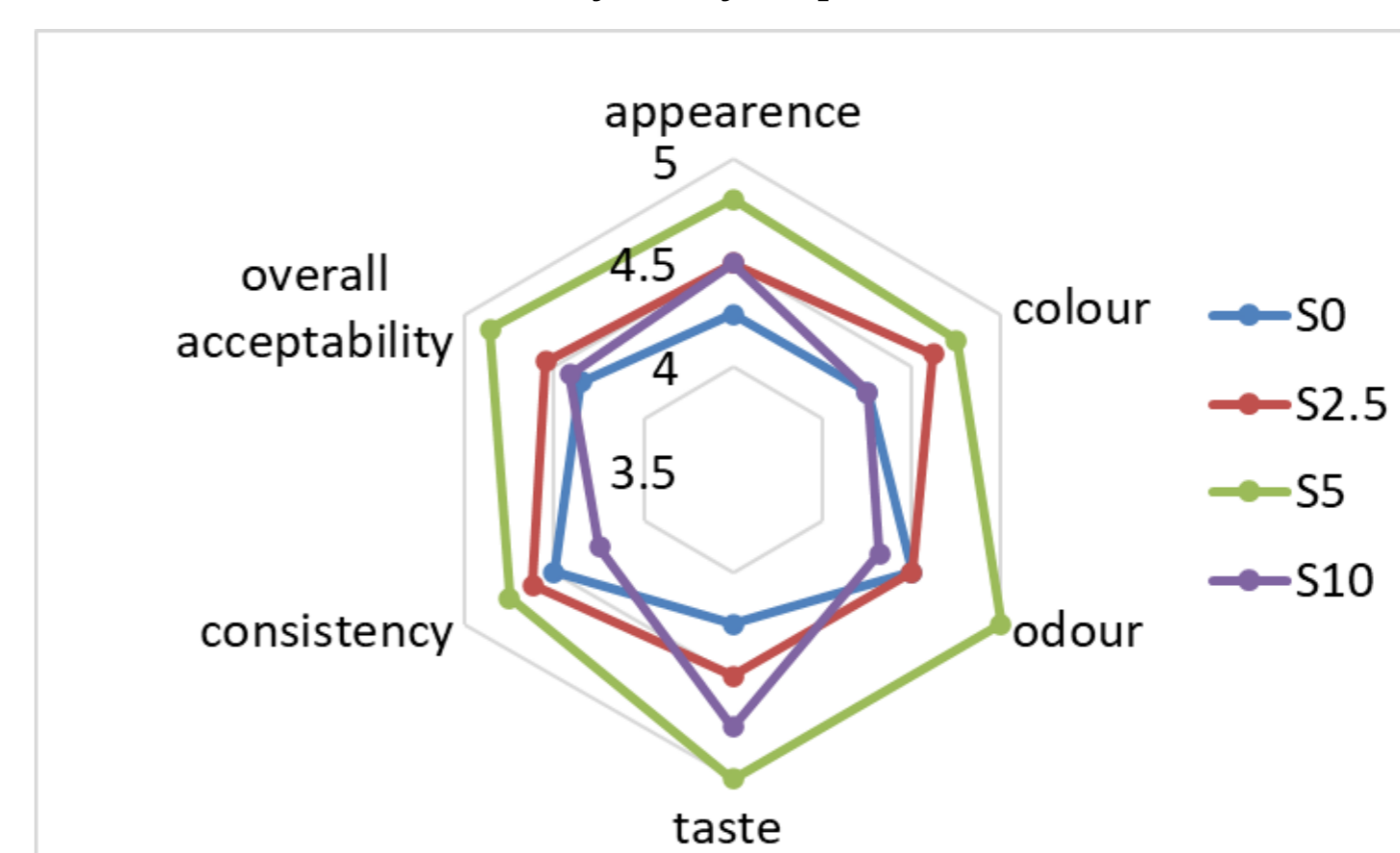


Figure 2. Sensory analysis of the salami samples

As a result of the sensory analysis carried out for the four salami samples, the highest total and individual score for each characteristic was obtained for the 5% almond salami sample. The descending order of the scores recorded in the sensory analysis was: S0 < S10 < S2.5 < S5.

Conclusions

The findings generated by this study provide solid evidence of the physicochemical and antioxidant properties of almonds. The inclusion of almonds in the raw-dried salami recipe was found to improve the nutritional profile of the samples, providing a higher level of ash, protein, but also higher quality fat compared to the control sample. Also an important aspect is the limitation of primary and secondary lipid oxidation processes, thus contributing to increase their oxidative stability. The sensory analysis carried out showed that the addition of almonds in moderate proportions (5%) contributes to the improvement of the appearance, taste, smell and general appreciation of the development of knowledge on improving the functionality of meat products by increasing the levels of high value bioactive compounds.

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