RESEARCH ON THE EVOLUTION OF SENSORY PARAMETERS OF THREE TYPES OF PORK SAUSAGES COMMERCIALIZED ON THE IAȘI MUNICIPALITY MARKET

E.-O. Roșca (Parfenie)*, B.-P. Popa (Tihiniuc-Popa), B. Păsărin, E.C. Nistor

"Ion Ionescu de la Brad" Iași University of Life Sciences, Romania

Abstract

Due to the interest in safe and healthy nutrition, the assessment of food quality, safety, and wholesomeness has become a very important field. Processed meat products, thanks to the advantage of being ready-to-eat without the need for further preparation, are among the most highly consumed products and also have a high nutritional value. Therefore, the sensory examination of processed meats is used to assess the degree of freshness and wholesomeness, as well as their sensory properties, measured by human senses using various objective methods. In this context, the present study presents the results of the sensory examination of three types of processed meats (fresh sausages, semi-smoked sausages, and dry-cured sausages), evaluated using the scoring scale method. The technique is based on evaluating each sensory characteristic (appearance, color, taste, smell, consistency) of the three types of pork products by comparing them to a scoring scale and obtaining an average score. Depending on their state of freshness, pork products can be categorized as: fresh, relatively fresh, and spoiled. It was found that the dry-cured sausages exhibit the best characteristics compared to the semi-smoked and fresh ones.

Key words: *quality, scoring method, sausages*

INTRODUCTION

In general, food quality is viewed by the consumer in terms of the product's state of freshness and wholesomeness, ensuring it does not endanger their health [1, 6]. Therefore, products must be compliant and meet certain norms and standards. Compliance is understood as the totality of the sensory, physico-chemical, and microbiological properties of food—that is, the overall quality of the food [2, 3].

Meat and meat products are among the most appreciated products by consumers due to diversified processing methods [8, 10]. Currently, a wide range of pork products is manufactured in our country, namely: raw products; pasteurized or baked products; smoked products; hot-smoked and pasteurized products or hot-smoked, pasteurized, and cold-smoked products; and specialty products that are pasteurized and smoked [4, 9]. Among all these, the assortment of processed meats falls into the category of the most consumed preparations [5, 7].

MATERIAL AND METHOD

The study was based on the sensory examination of three types of pork products from three different producers each. Specifically, these were fresh processed meats (Pork Parizer), semi-smoked processed meats (Summer Salami), and dry-cured processed meats (Chorizo Salami). The goal was to determine their quality throughout their shelf-life period. The

*Corresponding author: oana.parfenie7@gmail.com

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sensory examination for the fresh products was performed on the first day after the manufacturing date, and subsequently at ten-day intervals up to the thirtieth day of their shelf life. For the other processed meats, the examination was conducted from day zero to day sixty, at twenty-day intervals. This approach was used to monitor the evolution of sensory parameters during storage throughout the validity period. The research was conducted on 5 samples of each product at every analysis interval. To perform the evaluation of sensory properties for the three assortments, certain conditions were met to obtain relevant results. The study involved a panel of five evaluators who were familiar with this type of product. The research took place in a clean, well-lit room, free of foreign odors, under natural light, and at a temperature between 16-20°C. The samples were presented on white, flat plates of the same size. The work stages included preparing the samples for analysis, ensuring optimal conditions for the activity, and establishing the scoring scale. According to the scale used to verify each sensory characteristic, a score between 1 and 10 was awarded. Products scoring 10 points were classified in the "Superior" category; those scoring between 8 and 9 points were in the "Exceptional" and "Very Good" category; and in Category I were products rated as "good," "better than average," and "average," which obtained scores of 7, 6, and 5 respectively (Banu et al., 2007). Based on the final rating, the pork products were classified as fresh, relatively fresh, or spoiled. It should be mentioned that fresh products can be stored for 48-72 hours at 0-6°C, semi-smoked products for 7 to 15 days at 15°C, and dry-cured or long-shelf-life products for 3-4 months at moderate temperatures. The sensory examination method consisted of a visual and tactile inspection of the product's external appearance, as well as a visual check of the cross-section immediately after cutting. The smell was assessed on the product's surface right after it was cut. Similarly, the taste and consistency of the processed meats were evaluated through mastication. After the scores were awarded, the total score was calculated. The results were interpreted based on the quality assessment rating scale. The Microsoft Excel program was used for score calculation.

RESULTS

In Table 1, the sensory evaluation of the fresh-type product, "Pork Parizer," during its shelf life, presents the scores given by the five evaluators following a sensory examination conducted over 30 days. The purpose was to monitor how the sensory properties change during the shelf-life period. On day 0, it was found that product P3 obtained the highest average score (9.19 ± 0.46), followed by product P2 (9.12 ± 0.43) and then P1 (9.00 ± 0.38), thus demonstrating that product P3 exhibited the best quality. By day 10 of the product's shelf life, it was observed that product P2 degraded the most, followed by P1 and then P3. Consistency is the sensory characteristic that recorded an average decrease of 0.25. By day 20, sample P3 lost more of its organoleptic properties compared to the other two.

At the end of the shelf-life period, the three products reached similar average scores, their quality thus becoming comparable. Taste and smell were the sensory attributes that registered the most visible decreases. From the table data, it is observed that for sample P1, as it aged, the taste score decreased from 9.20 to 8.65, while for sample P3, the smell score decreased from 9.25 to 8.76. In terms of appearance and color, the values remained stable. In Figure 1, the average values for the three parizer samples during their shelf-life period are highlighted. Table 2 highlights the average scores obtained for the 'Chorizo Salami' product over a 60-day shelf life. The three salami samples were sensorially analyzed on days 0, 20, 40, and 60.

Table 1. Sensory evaluation of the fresh-type product "Pork Parizer", during its shelf life (n=5 samples)

Sensory characteristics	Shelf life (days)											
	0			10			20			30		
	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
External and cross-section appearance	9.00± 0.50	9.20± 0.38	9.35± 0.40	8.75± 0.25	9.10± 0.15	9.20± 0.35	8.68± 0.24	9.00± 0.50	9.10± 0.15	8.50± 0.40	8.85± 0.30	9.00± 0.50
Color	8.75± 0.25	9.25± 0.32	9.20± 0.38	8.80± 0.26	9.15± 0.45	9.15± 0.45	8.75± 0.25	8.95± 0.30	9.00± 0.50	8.65± 0.27	8.75± 0.25	8.85± 0.30
Smell	9.05± 0.34	9.00± 0.50	9.25± 0.15	8.95± 0.27	8.75± 0.25	9.05± 0.34	8.80± 0.27	8.65± 0.33	8.85± 0.30	8.65± 0.27	8.50± 0.40	8.75± 0.25
Taste	9.20± 0.35	9.15± 0.45	9.00± 0.50	9.10± 0.15	9.00± 0.50	8.95± 0.30	9.00± 0.5	8.75± 0.25	8.75± 0.25	8.85± 0.30	8.65± 0.27	8.50± 0.40
Texture	9.00± 0.50	9.00± 0.5	9.15± 0.45	8.75± 0.25	8.75± 0.25	9.00± 0.50	8.65± 0.33	8.50± 0.40	8.85± 0.30	8.50± 0.40	8.40± 0.35	8.35± 0.37
Average score	**9.00± 0.38**	**9.12± 0.43**	**9.19± 0.46**	**8.87± 0.23**	**8.95± 0.32**	**9.07± 0.33**	**8.77± 0.23**	**8.77± 0.23**	**8.91± 0.33**	**8.63± 0.39**	**8.63± 0.39**	**8.69± 0.36**

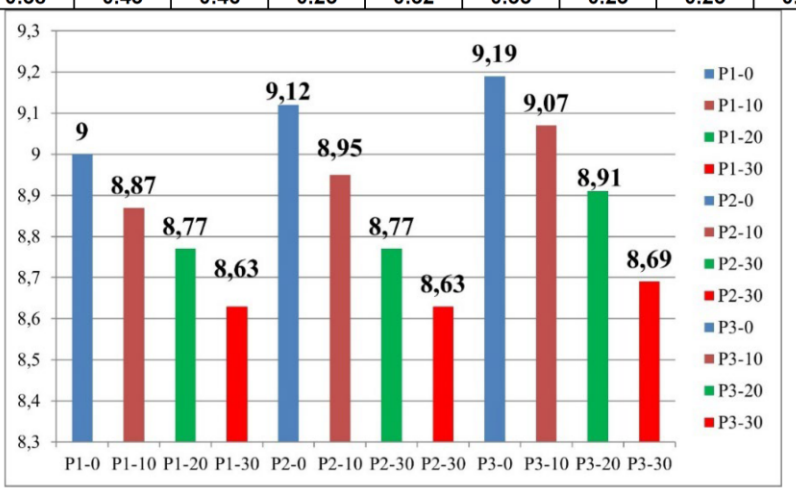

Fig. 1. Average scores for 'Pork Parizer' during its shelf-life period

Table 2 Sensory evaluation of the product "Chorizo Salami", during its shelf life (n=5 samples)

Sensory characteristics	Shelf life (days)											
	0			20			40			60		
	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
External and cross-section appearance	9.75± 0.25	9.80± 0.31	9.85± 0.30	9.60± 0.20	9.72± 0.22	9.75± 0.25	9.50± 0.36	9.65± 0.24	9.63± 0.26	9.40± 0.31	9.50± 0.36	9.50± 0.50
Color	9.85± 0.30	9.75± 0.35	9.68± 0.23	9.70± 0.18	9.67± 0.24	9.55± 0.37	9.65± 0.25	9.50± 0.36	9.40± 0.31	9.55± 0.37	9.40± 0.27	9.30± 0.30
Smell	9.75± 0.35	9.85± 0.30	9.70± 0.18	9.60± 0.20	9.80± 0.28	9.64± 0.22	9.50± 0.36	9.70± 0.30	9.50± 0.36	9.40± 0.31	9.62± 0.23	9.35± 0.25
Taste	9.70± 0.18	9.85± 0.30	9.80± 0.29	9.55± 0.37	9.75± 0.25	9.70± 0.25	9.35± 0.31	9.65± 0.24	9.60± 0.25	9.20± 0.22	9.50± 0.36	9.50± 0.36
Texture	9.50± 0.36	9.50± 0.36	9.60± 0.20	9.35± 0.23	9.35± 0.31	9.45± 0.32	9.25± 0.23	9.15± 0.20	9.35± 0.30	9.15± 0.20	9.00± 0.50	9.20± 0.37
Average score	**9.71± 0.28**	**9.75± 0.32**	**9.72± 0.24**	**9.56± 0.23**	**9.65± 0.26**	**9.61± 0.28**	**9.45± 0.30**	**9.53± 0.26**	**9.49± 0.29**	**9.34± 0.28**	**9.40± 0.34**	**9.37± 0.35**

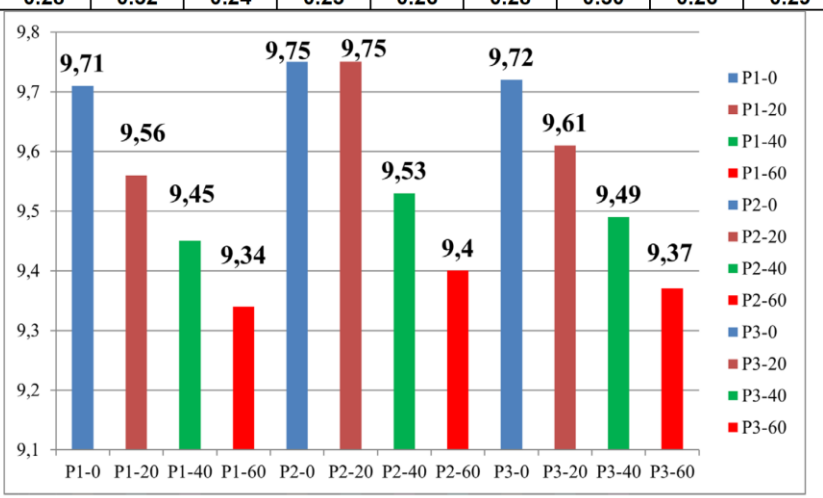

Fig. 2. Average scores for 'Chorizo Salami' during its shelf-life period

Table 3. Sensory evaluation of the semi-smoked product, "Summer Salami", during its shelf life (n=5 samples)

Sensory characteristics	Shelf life (days)											
	0			20			40			60		
	P1	P2	P3	P1	P2	P3	P1	P2	P3	P1	P2	P3
External and cross-section appearance	9.50± 0.31	9.40± 0.38	9.55± 0.37	9.30± 0.25	9.25± 0.23	9.30± 0.25	9.20± 0.45	9.10± 0.48	9.20± 0.45	9.10± 0.40	9.00± 0.50	9.10± 0.50
Color	9.00± 0.50	9.30± 0.45	9.35± 0.23	8.80± 0.26	9.20± 0.45	9.25± 0.15	8.70± 0.25	9.10± 0.48	9.15± 0.48	8.60± 0.27	9.00± 0.50	9.05± 0.30
Smell	9.20± 0.34	9.15± 0.45	9.25± 0.15	9.10± 0.15	9.05± 0.25	9.15± 0.45	9.00± 0.15	8.95± 0.28	9.00± 0.50	8.85± 0.27	8.80± 0.40	8.85± 0.25
Taste	9.15± 0.25	9.20± 0.34	9.10± 0.48	9.10± 0.15	9.10± 0.19	9.00± 0.50	9.00± 0.15	9.00± 0.25	8.85± 0.25	8.85± 0.30	8.85± 0.27	8.70± 0.40
Texture	9.00± 0.50	9.00± 0.50	9.15± 0.45	8.75± 0.25	8.75± 0.25	9.05± 0.48	8.65± 0.33	8.60± 0.41	9.00± 0.50	8.55± 0.40	8.50± 0.35	8.85± 0.37
Average score	**9.17± 0.38**	**9.21± 0.42**	**9.28± 0.33**	**9.01± 0.48**	**9.07± 0.27**	**9.15± 0.36**	**8.91± 0.26**	**8.95± 0.38**	**9.04± 0.31**	**8.79± 0.32**	**8.83± 0.40**	**8.91± 0.36**

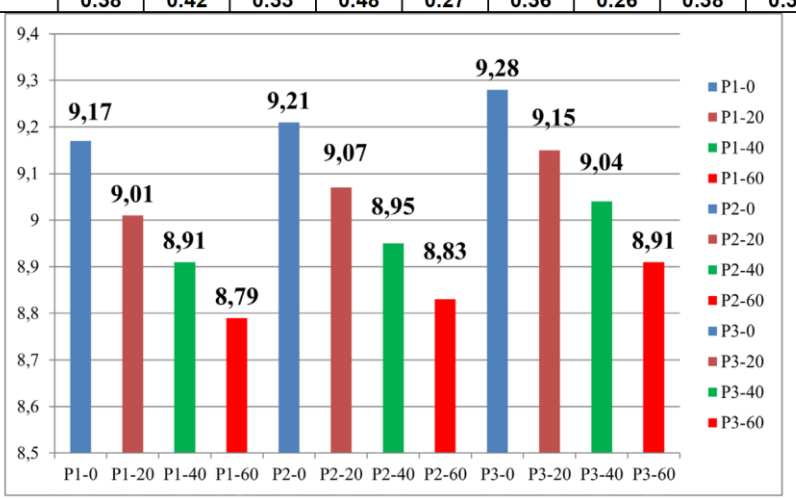

Fig. 3. Average scores for 'Summer Salami' during its shelf-life period

Throughout the shelf-life period, the three samples maintain balanced scores, showing a slight and predictable degradation without major fluctuations.

Notably, sample P2 is the best-performing, starting at 9.75 on day 0 and ending at 9.40, recording a loss of only 0.35 points. Sample P2 is followed by P3, with an average score that starts at 9.72 and ends at 9.37, recording a loss identical to that of sample P1. Throughout the 60-day shelf-life period, sample P2 maintains a balanced average score. The most stable attributes over the 60 days are color and taste, thus demonstrating that the pigment and aromas developed during maturation are highly developed. For sample P2, consistency is the characteristic that records the largest change, from 9.50 to 9.00 points. However, this is a normal evolution for matured products, and in the end, the result remains quite good, making it fit for consumption.

In conclusion, throughout the shelf-life period, the average scores remain at a very high level, demonstrating that the maturation and drying process was very well controlled. Figure 2 highlights the average values recorded for the three 'Chorizo Salami' samples during the four phases of the shelf-life period.

Table 3 contains the sensory analysis data for three types of 'Summer Salami', evaluated over a 60-day shelf-life period at four key moments: days 0, 20, 40, and 60. On day 0, the average scores for these products ranged between 9.01 and 9.21 points. Figure 3 presents the average values for the three types of 'Summer Salami' during the shelf-life period.

Consistency is the sensory attribute that records more noticeable changes compared to the other indicators. For example, in the case of product P2, the consistency score decreases from 9.00 to 8.50, thus indicating a slight modification. Smell and taste remain at balanced levels. As an example, on day 0, taste has an average score between 9.10-9.15 and reaches between 8.70-8.85 by day 60. Regarding appearance and color, a decrease in the average score for product P1 is observed on day 60, from 9.00 to 8.60.

It is thus noted that product P3 has the best sensory profile as well as the best stability over time. Product P2 ranks second, being very close to P3. Product P1 is in last place, presenting the lowest score, although it remains a quality product.

CONCLUSIONS

The Pork Parizer, a product with a shorter shelf life, also exhibits lower sensory stability. Very good results are noted at the beginning of its shelf life, however, these scores register a visible decline over the course of the 30 days.

'Chorizo Salami' demonstrates excellent sensory stability and quality, maintaining a high standard throughout the 60-day period with a nearly insignificant decrease in its scores.

Likewise, the 'Summer Salami' product maintains its sensory stability and quality very well throughout its shelf life. Even though a slight decrease in the sensory profile is observed, the product retains its qualities at a high level, making it fit for consumption.

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