Scientific Papers. Series D. Animal Science. Vol. LXV, No. 2, 2022
ISSN 2285-5750; ISSN CD-ROM 2285-5769; ISSN Online 2393-2260; ISSN-L 2285-5750

INFLUENCE OF QUANTITIES OF RAW MATERIALS AND MATURATION TIME ON THE SENSORY QUALITY OF DRIED BABIC SAUSAGES

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Abstract

This paper aimed to evaluate the differences between six experimental batches of babic sausages from a sensory point of view. The six samples have been differentiated by the ratio of meat raw materials introduced in the composition (mutton, beef, fat) and by the maturing time (20 days, 40 days). The products were manufactured in the Processing Microsection of the University of Life Sciences Iasi and the sensory evaluation was carried out with the help of 8 tasters, in three repetitions, in the Sensory Analysis Laboratory of the Faculty of Agriculture Iasi. The sensory attributes evaluated were appearance, colour, aroma, texture and taste of the experimental lots. The ageing time had major influences from a sensory point of view on the intensity of aroma, salty taste and texture attributes. In terms of the quantities of raw materials, lots L1 and L3 showed the smallest differences, with lot L2 standing out due to its higher fat and beef content.

Key words*: comparison, meat products, sensory analysis.*

INTRODUCTION

Sensory evaluation of food products, used in the past to accept or reject a product from consumption, involves investigating, studying, explaining and interpreting responses given by evaluating subjects using the primary senses (visual, olfactory, gustatory, tactile and auditory) on food products (Ventanas et al., 2020; Ruiz-Capillas et al., 2021). Sensory analysis is defined as an interdisciplinary science that accumulates information and methods adapted from fields such as physiology, psychology, statistics, linguistics, food science, nutrition, chemistry, medicine, sociology, and many others (Chambers, 2019).

Directions in sensory analysis refer to three categories of methods: discriminative methods (duo-trio tests, triangle tests, pairing tests), descriptive methods (descriptive analysis: aroma profile, quantitative descriptive analysis) and affective methods (acceptance, preference, hedonic tests - 9-point scale). In recent years, there has been a selection of sensory analysis methods, thus the main methods used are discriminative and descriptive (Lawless & Heymann, 2010; Stone et al., 2020).

Descriptive sensory analysis is considered a basic method in characterizing food products in terms of perceived attributes and their intensity by the group of evaluators (Drake & Civille, 2003; Suwonsichon, 2019). To carry out sensory analysis of a food product in order to obtain accurate and relevant data, it is necessary to develop descriptive terminology specific to the evaluated product (Chambers, 2019). In descriptive sensory analysis, vocabulary (descriptive terminology) is the communication pathway between different stakeholders, such as evaluation panel members, manufacturers, marketers and suppliers, who have different views on sensory attributes due to different perceptions, backgrounds and cultures (Suwonsichon, 2019).

While descriptive methods of sensory analysis are used to identify and quantify sensory aspects of evaluated products, acceptability and preference tests are tests applied to consumers to identify how well the product fits into consumer preferences (Drake & Civille, 2003).

Sausages are processed meat products that can be obtained in many varieties, depending on the specificity of each area and the availability of raw materials (Carballo, 2021; Artamonova et al., 2021). Babic and ghiudem sausages are two

traditional varieties of dried raw sausages. Babic sausage is a product native to the Buzau area, Romania, traditionally made from a mixture of minced beef and pork in equal proportions, salt, sweet and hot paprika. Today, however, recipes differ depending on the producer and may also include other ingredients such as pepper, thyme and garlic.

The paper aimed to evaluate the sensory changes in babic products following technological interventions on the proportions of raw materials introduced in the batches (beef/sheep meat/fat) and on the maturation (drying) period of the products (20 days, 40 days).

MATERIALS AND METHODS

Preparation of samples

The research was based on the preparation of technological sheets and the formation of experimental batches of babic sausages manufactured in the Processing Microsection of the University of Life Sciences Iasi. For experimental batch 1 (L_1), the proportions of raw materials used were: 40% mutton, 40% beef and 20% fat; for experimental batch 2 (L_2), the proportions of raw materials used were: 20% mutton, 50% beef and 30% fat, and for experimental batch 3 (L_3), the proportions of raw materials used were: 60% mutton, 30% beef and 10% fat.

Two sub batches were formed from the three batches, each of which was subjected to different ripening periods; thus batches L_{12}, L_{22} and L_{32} were matured for 20 days and batches L_{14}, L_{24} and L_{34} were matured for 40 days. All the manufactured samples contained salt (2%), sweet paprika (0.7%), hot paprika (0.5%), thyme (0.5%) and juniper (0.3%).

The raw meat materials (beef, mutton and fat) were purchased from two local slaughterhouses on different days when the production of the batches in question took place. To obtain the products, the raw materials were ground in a meat grinder using a plate of 6 mm of diameter; salt and spices were added and the mixture obtained was homogenised so that the ingredients were evenly distributed in the product mass. The sausage mixture was stuffed using the filling machine, in thin natural membranes which were desalted and moistened. Once obtained, the products have undergone heat treatment, after the following smoking program: preheating: 1 hour at 21-23°C, smoking: 30 minutes at 20-22°C (the smoking stage was carried out in three steps, for 30 minutes each). After smoking, the products were pressed to shape for 48-72 hours (at a temperature of 0-6°C) and smoked again for 2,5 hours at 15-17°C. The batches were dried and matured at 14-15°C and 70-75% humidity for 20 and 40 days, respectively.

Sensory analysis

The sensory analysis session involved five steps to obtain the most accurate and relevant results for the proposed study. In the first stage, the development and drafting of the evaluation questionnaire, the terms, implicitly the attributes to be followed in the evaluation of the samples, were selected and defined with reference to the literature (Perez-Cacho et al., 2005; Braghieri et al., 2009). Therefore, 15 specific attributes for appearance, aroma, texture and taste were selected (Marangon & Moura, 2011; Braghieri et al., 2016). The second stage involved the selection and training of the panelists, the group of evaluators was composed of 8 tasters (5 women and 3 men, between 22 and 24 years of age) who evaluated 3 samples in a session, thus the 6 samples were evaluated in 6 sessions (3 repetitions for each batch).

The sensory analysis session took place between 10-12 a.m., after breakfast, in the Sensory Analysis Laboratory within the University of Life Sciences Iași, a laboratory equipped with individual booths. The test preparation phase consisted of slicing the products using a slicer, placing them on plates and coding by random three-digit numbers.

Samples were served at 16-18°C, water and unsalted biscuits were provided for all members of the evaluation team to clean the oral cavity between samples. A 9-point rating scale was used for the actual evaluation of the samples, with 1 representing the minimum score (very low intensity) and 9 being the maximum score (high intensity); if no score was assigned, it means that the respective descriptor was not identified and the score is 0 (Coloretti et al., 2014; Ruiz et al., 2014; Teixeira et al., 2021).

The collected results were statistically analysed and the significance of the differences between the means obtained for the samples from the six

experimental batches (L_{12}, L_{22}, L_{32}, L_{14}, L_{24} and L_{34}) was calculated with T test with two variables (2-tailed) using the Data Analysis function of the Excel program.

RESULTS AND DISCUSSIONS

On the 9-point rating scale, the appearance of the six samples was analysed in terms of colour uniformity, colour intensity and fat/lean distribution. Ripening time positively influenced the colour intensity of the evaluated samples as well as colour uniformity but to a smaller extent. Hence, insignificant differences ($p>0.05$) were observed between batches, except for batch 2 which obtained lower average scores, being at the inferior limit (L_{22} obtaining 7.33±0.32 points). Diversification of the quantities of raw materials introduced resulted in statistically significant differences ($p<0.01$) between lots L_{12}, L_{22} and L_{32}.

Fat/lean distribution is an attribute that shows the uniformity of fat distribution in the meat over the slice surface (Perez-Cacho et al., 2005). Table 1 shows results according to which the higher amount of fat introduced in batch 2 had an impact on the scores given by the evaluators, this batch obtaining the lowest means for this attribute, 7.12±0.38 (L_{22}) points and 7.08±0.43 points (L_{24}) respectively. Therefore, distinctly significant differences ($p<0.01$) were observed between batches with different raw material ratios.

Table 1. Sensory appearance of Babic dry sausages as influenced by maturation time and raw materials ratio

Attributes		Exp. batch		n	$\bar{X} \pm s_{\bar{x}}$	V%	Difference interpretation - T-Test (2-tailed)			
							Maturation time		Raw materials ratio	
APPEARANCE	Colour intensity	L_1	L_{12}	24	7.95±0.56	9.43	L12-L14	t=-1.42;	L12-L22	t=3.25; p=0.0022**
			L_{14}		8.20±0.17	5.05		p=0.16ns	L12-L32	t=-0.189; p=0.85 ns
		L_2	L_{22}		7.33±0.32	7.70	L22-L24	t=-2.40;	L22-L32	t=-3.39; p=0.001**
			L_{24}		7.87±0.90	12.02		p=0.124 ns	L14-L24	t=1.57; p=0.124 ns
		L_3	L_{32}		8±0.61	9.75	L32-L34	t=0.54;	L14-L34	t=1.81; p=0.07 ns
			L_{34}		7.91±0.64	10.13		p=0.55 ns	L24-L34	t=-0.14; p=0.88 ns
	Colour uniformity	L_1	L_{12}	24	8.20±0.43	8.02	L12-L14	t=-0.706;	L12-L22	t=3.14; p=0.002**
			L_{14}		8.33±0.32	6.78		p=0.48 ns	L12-L32	t=2.007; p=0.051 ns
		L_2	L_{22}		7.58±0.51	9.46	L22-L24	t=-3.69;	L22-L32	t=-0.6; p=0.34 ns
			L_{24}		8.20±0.17	5.05		p=0.0007**	L14-L24	t=0.874; p=0.387 ns
		L_3	L_{32}		7.79±0.61	10.00	L32-L34	t=-0.961;	L14-L34	t=1.78; p=0.082 ns
			L_{34}		8±0.52	9.03		p=0.341 ns	L24-L34	t=1.22; p=0.228 ns
	Fat/lean distribution	L_1	L_{12}	24	7.87±0.64	10.13	L12-L14	t=-0.549;	L12-L22	t=3.65; p=0.0007**
			L_{14}		8±0.61	9.75		p=0.58 ns	L12-L32	t=-2.01; p=0.051 ns
		L_2	L_{22}		7.12±0.38	8.59	L22 -L24	t=0.227;	L22-L32	t=-7.29; p=6E-09**
			L_{24}		7.08±0.43	9.23		p=0.82 ns	L14-L24	t=4.41; p=6E-05**
		L_3	L_{32}		8.25±0.20	5.36	L32 -L34	t=0.257;	L14-L34	t=-1; p=0.322 ns
			L_{34}		8.20±0.43	8.02		p=0.79 ns	L24-L34	t=-5.94; p=4E-07**

n - no. of evaluations per sample; T- test (2-tailed) - for each analysed character, comparative on experimental batches: ns. insignificant differences ($p>0.05$); *significant differences ($p<0.05$);**distinct significant differences $p<0.01$).

The flavour of the products is determined mainly by added spices, microbial metabolism of lipids, proteins and carbohydrates, and lipid oxidation (Sunesen et al., 2001). Therefore, the flavour of the experimental batches was evaluated in terms of intensity, spice flavour, smoke flavour and rancid flavour, the results of which are shown in Table 2. The ripening time had a positive influence on the total flavour intensity, with significant differences ($p<0.05$) between batches. The intensity of added spice flavour and the smoke flavour was influenced by both time and raw material ratio, with significant ($p<0.05$) and distinctly significant ($p<0.01$) differences between batches. As reported by other authors, the higher the percentage of fat in the meat, the products require a higher amount of seasoning, as fat attenuates the intensity of the seasoning (Braghieri et al., 2016). Concerning the rancid flavour, both maturation time and raw materials introduced had a significant influence. The experimental batches with the highest fat percentages and longer ripening time (L_2 and L_3) received the highest mean scores. Hence, the differences observed between batches L_2 and L_3 were insignificant ($p>0.05$), and batch L_1 stood out with distinctly significant differences ($p<0.01$) compared to the other two.

Table 2. Sensory flavor profile of Babic dry sausages as influenced by maturation time and raw materials ratio

Attributes		Exp. batch		n	$\bar{X} \pm s_{\bar{x}}$	V%	Difference interpretation - T-Test (2-tailed)			
							Maturation time		Raw materials ratio	
AROMA	Aroma intensity	L_1	L_{12}	24	6.12±0.46	11.09	L12-L14	t=-3.47; p=0.001**	L12-L22	t=1.16; p=0.248 ns
			L_{14}		6.70±0.21	6.92			L12-L32	t=-0.17; p=0.481 ns
		L_2	L_{22}		5.87±0.63	13.57	L22-L24	t=-0.95; p=0.034*	L22-L32	t=-1.91; p=0.062 ns
			L_{24}		6.08±0.51	11.79			L14-L24	t=3.58; p=0.346 ns
		L_3	L_{32}		6.25±0.28	8.50	L32-L34	t=-2.23; p=0.03*	L14-L34	t=0.89; p=0.376 ns
			L_{34}		6.58±0.253	7.65			L24-L34	t=-2.79; p=0.007**
	Spices aroma	L_1	L_{12}	24	4.41±0.254	11.40	L12-L14	t=-5.34; p=3E-06**	L12-L22	t=1.50; p=0.138 ns
			L_{14}		5.29±0.389	11.79			L12-L32	t=2.35; p=0.023*
		L_2	L_{22}		4.16±0.406	15.28	L22-L24	t=-4.02; p=0.0002**	L22-L32	t=0.28; p=0.778 ns
			L_{24}		4.79±0.172	8.65			L14-L24	t=3.26; p=0.002**
		L_3	L_{32}		4.12±0.114	8.19	L32-L34	t=-8.67; p=8E-11**	L14-L34	t=0.77; p=0.441 ns
			L_{34}		5.16±0.231	9.32			L24-L34	t=-2.89; p=0.005**
	Smoke aroma	L_1	L_{12}	24	2.62±0.245	18.83	L12-L14	t=-5.75; p=7E-07**	L12-L22	t=3.86; p=0.0004**
			L_{14}		3.45±0.259	14.71			L12-L32	t=8.05; p=2E-10**
		L_2	L_{22}		2.04±0.303	26.94	L22-L24	t=-3.30; p=0.008**	L22-L32	t=3.81; p=0.0004**
			L_{24}		2.58±0.341	22.59			L14-L24	t=5.53; p=2E-06**
		L_3	L_{32}		1.45±0.259	34.90	L32-L34	t=-6.80; p=2E-08**	L14-L34	t=6.80; p=2E-08**
			L_{34}		2.45±0.259	20.70			L24-L34	t=0.79; p=0.433 ns
	Rancid aroma	L_1	L_{12}	24	0.83±0.319	67.76	L12-L14	t=-3.30; p=0.0019*	L12-L22	t=-4.51; p=5E-05**
			L_{14}		1.33±0.232	36.12			L12-L32	t=-2.73; p=0.009**
		L_2	L_{22}		1.62±0.418	39.81	L22-L24	t=-2.65; p=0.0109*	L22-L32	t=0.93; p=0.355 ns
			L_{24}		2.16±0.58	35.14			L14-L24	t=-4.53; p=5E-05**
		L_3	L_{32}		1.41±0.775	62.16	L32-L34	t=-1.95; p=0.057ns	L14-L34	t=-3.00; p=0.004**
			L_{34}		1.87±0.548	39.51			L24-L34	t=1.34; p=0.185 ns

n - no. of evaluations per sample; T- test (2-tailed) - for each analysed character, comparative on experimental batches: ns. insignificant differences (p>0.05); *significant differences (p<0.05);**distinct significant differences p<0.01).

The texture of the six products obtained was sensory evaluated using the attributes stiffness (hardness), tenderness, elasticity and fat consistency (oiliness), as shown in Table 3. Rødbotten et al. (2004) defined stiffness as the force required to bite into a sample. The stiffness or hardness of the batches scored mean values ranging from 2.16±0.492 (L34) to 3.12±0.375 (L12). The samples were evaluated on a 9-point scale, with 1 representing very low hardness and 9 representing very high hardness. Ripening time did not significantly influence hardness, except for lot 2, with distinctly significant differences ($p<0.01$) between lots L22 and L24. The ratio of raw materials significantly influenced the evaluation and scoring, with differences between batches being significant ($p<0.05$) and distinctly significant ($p<0.01$), as according to the results obtained by Gadiyaram & Kannan (2004) sausages made from beef showed higher hardness compared to those made from mixed meat.

Differences in tenderness between batches were evident and significant, with this attribute being influenced by both maturation time ($p<0.05$; tenderness increased with maturation time) and the ratio of raw materials introduced ($p<0.01$), with the order of mean scores for the three batches in terms of tenderness being L3, L1 and L2.

Elasticity was defined as the speed with which the product returns to its original shape after the action of a deforming force has ceased (Braghieri et al., 2009; Marangoni & Moura, 2011), and fat consistency (oiliness/fatness) is an attribute referring to the perception of the amount of fat released during mastication (Perez-Cacho et al., 2005). Ripening time influenced elasticity and fatness perception, products with a higher ripening period showed lower elasticity, and fatness sensation was more intense after 40 days of ripening. Regarding the ratio of raw materials introduced, the batches showed distinctly significant differences ($p<0.01$) in elasticity, and batch L1 showed distinctly significant differences from the other two batches ($p<0.01$) in fat sensation.

Table 3. Sensory texture of Babic dry sausages as influenced by maturation time and raw materials ratio

Attributes		Exp. batch		n	$\bar{X} \pm s_{\bar{x}}$	V%	Difference interpretation - T-Test (2-tailed)			
							Maturation time		Maturation time	
TEXTURE	Hardness / Stiffness	L_1	L_{12}	24	3.12±0.375	19.596	L12-L14	t=1.41; p=0.164^{ns}	L12-L22	t=1.28; p=0.0204*
			L_{14}		2.87±0.375	21.300			L12-L32	t=4.97; p=1E-05**
		L_2	L_{22}		2.91±0.253	17.267	L22-L24	t=3.75; p=0.0005**	L22-L32	t=4.10; p=0.0002**
			L_{24}		2.37±0.244	20.823			L14-L24	t=3.11; p=0.003**
		L_3	L_{32}		2.33±0.231	20.638	L32-L34	t=0.959; p=0.343 ^{ns}	L14-L34	t=3.72; p=0.0005**
			L_{34}		2.16±0.492	32.398			L24-L34	t=1.18; p=0.0241*
	Tenderness	L_1	L_{12}	24	5.62±0.331	10.236	L12-L14	t=-2.73, p=0.0087**	L12-L22	t=2.87; p=0.006**
			L_{14}		6.08±0.340	9.593			L12-L32	t=-4.41; p=6E-05**
		L_2	L_{22}		5.20±0.172	7.965	L22-L24	t=-2.09; p=0.042*	L22-L32	t=-8.52; p=6E-11**
			L_{24}		5.54±0.432	11.874			L14-L24	t=3.01; p=0.004**
		L_3	L_{32}		6.29±0.215	7.380	L32-L34	t=-2.08; p=0.0426*	L14-L34	t=-3.17; p=0.002**
			L_{34}		6.58±0.253	7.650			L24-L34	t=-6.15; p=2E-07**
	Elasticity	L_1	L_{12}	24	2.87±0.114	25.889	L12-L14	t=-2.208; p=0.034*	L12-L22	t=-4.56; p=5E-05**
			L_{14}		2.54±0.432	11.751			L12-L32	t=2.42; p=0.0019**
		L_2	L_{22}		3.29±0.215	14.105	L22-L24	t=2.84; p=0.006**	L22-L32	t=7.38; p=5E-09**
			L_{24}		2.83±0.405	22.483			L14-L24	t=0.28; p=0.0077**
		L_3	L_{32}		2.08±0.427	31.385	L32-L34	t=0.64; p=0.522 ^{ns}	L14-L34	t=10.09; p=4E-13**
			L_{34}		1.96±0.476	35.247			L24-L34	t=6.48; p=2E-07**
	Oiliness/ fatness	L_1	L_{12}	24	3.25±0.282	16.357	L12-L14	t=-2.84; p=0.006**	L12-L22	t=-3.18; p=0.002**
			L_{14}		3.66±0.231	13.133			L12-L32	t=-3.54; p=0.0009**
		L_2	L_{22}		3.70±0.215	12.521	L22-L24	t=-1.15; p=0.256 ^{ns}	L22-L32	t=-0.31; p=0.751 ^{ns}
			L_{24}		3.87±0.288	13.850			L14-L24	t=-1.41; p=0.163 ^{ns}
		L_3	L_{32}		3.75±0.195	11.795	L32-L34	t=-0.62; p=0.535 ^{ns}	L14-L34	t=-1.19; p=0.236 ^{ns}
			L_{34}		3.83±0.231	12.562			L24-L34	t=0.28; p=0.778 ^{ns}

n - no. of evaluations per sample; T- test (2-tailed) - for each analysed character, comparative on experimental batches: ns. insignificant differences (p>0.05); *significant differences (p<0.05);**distinct significant differences p<0.01).

The taste was assessed in terms of four basic tastes: salty, sour, bitter and sweet, which are familiar and easily identified by tasters. Table 4 presents the mean scores obtained for each experimental batch. These data were analysed using Student's t-test to highlight differences between batches generated by time and raw material quantity.

The specificity of the raw materials used and also of the maturation time applied for each experimental batch were found on the sensory properties of the analyzed batches. The salty taste was the most intense of the four, with mean scores ranging from 1.83±0.318 (L32) to 2.62±0.505 (L12). Ripening time influenced the perception of salty taste (p<0.05), being more intense after the 40 days of ripening. Sour, bitter and sweet tastes, although showing an increase in mean scores, differences between batches were not significant (p>0.05). The different amounts of raw materials introduced in the experimental batches caused small changes in taste, the differences being insignificant (p>0.05).

In relation to the raw materials used and also to the ripening time, the bitter taste and the salty taste were identified as having the lowest intensities, from 0.83±1.536 (L1-L12) for the bitter taste and 0.75±0.717 (L2-L22). However, for both, the bitter taste and the sweet taste, the differences identified between the experimental groups were generally insignificant (p> 0.05).

Table 4. Sensory taste evaluation of Babic dry sausages as influenced by maturation time and raw materials ratio

Attributes		Exp. batch		n	$\bar{X} \pm s_{\bar{x}}$	V%	Difference interpretation - T-Test (2-tailed)			
							Maturation time		Maturation time	
TASTE	Salty	L_1	L_{12}	24	2.41±0.340	27.083	L12-L14	t=1.109; p=0.027*	L12-L22	t=2.76; p=0.086 ns
			L_{14}		2.62±0.505	24.149			L12-L32	t=4.27; p=0.051 ns
		L_2	L_{22}		2.04±0.563	36.764	L22-L24	t=-2.04; p=0.046*	L22-L32	t=1.08; p=0.283 ns
			L_{24}		2.45±0.432	26.766			L14-L24	t=-0.23; p=0.817 ns
		L_3	L_{32}		1.83±0.318	30.800	L32-L34	t=-2.45; p=0.019*	L14-L34	t=0.18; p=0.852 ns
			L_{34}		2.37±0.853	38.894			L24-L34	t=0.36; p=0.720 ns
	Acid	L_1	L_{12}	24	0.87±0.375	69.985	L12-L14	t=-1.14; p=0.164 ns	L12-L22	t=-2.016; p=0.05 ns
			L_{14}		1.12±0.375	54.433			L12-L32	t=-1.21; p=0.230 ns
		L_2	L_{22}		1.29±0.650	62.435	L22-L24	t=-0.36; p=0.715 ns	L22-L32	t=0.47; p=0.637 ns
			L_{24}		1.37±0.592	55.976			L14-L24	t=-1.25; p=0.219 ns
		L_3	L_{32}		1.16±1.01	86.333	L32-L34	t=-0.88; p=0.384 ns	L14-L34	t=-1.45; p=0.150 ns
			L_{34}		1.29±0.331	41.875			L24-L34	t=-0.55; p=0.580 ns
	Bitter	L_1	L_{12}	24	0.83±1.536	148.73	L12-L14	t= -0.2; p=0.806 ns	L12-L22	t=-0.67; p=0.501 ns
			L_{14}		0.91±1.210	120.01			L12-L32	t=-1.03; p=0.308 ns
		L_2	L_{22}		1.08±1.731	121.48	L22-L24	t=-0.47; p=0.638 ns	L22-L32	t=-0.14; p=0.889 ns
			L_{24}		1.25±1.239	89.05			L14-L24	t=-1.04; p=0.302 ns
		L_3	L_{32}		1.12±0.375	54.43	L32-L34	t=0.65; p=0.515 ns	L14-L34	t=-0.13; p=0.895 ns
			L_{34}		0.95±1.172	112.97			L24-L34	t=0.92; p=0.362 ns
	Sweet	L_1	L_{12}	24	0.91±1.384	128.34	L12-L14	t=-0.48; p=0.631 ns	L12-L22	t=0.56; p=0.576 ns
			L_{14}		1.08±1.471	111.96			L12-L32	t=-0.11 p=0.910 ns
		L_2	L_{22}		0.75±0.717	112.93	L22-L24	t=-1.16; p=0.250 ns	L22-L32	t=-0.63; p=0.529 ns
			L_{24}		1.12±1.766	118.14			L14-L24	t=-0.11; p=0.910 ns
		L_3	L_{32}		0.95±1.867	142.61	L32-L34	t=-0.79; p=0.432 ns	L14-L34	t=-0.51; p=0.606 ns
			L_{34}		1.29±2.38	119.67			L24-L34	t=-0.40; p=0.690 ns

n - no. of evaluations per sample; T- test (2-tailed) - for each analysed character, comparative on experimental batches: ns. insignificant differences (p>0.05); *significant differences (p<0.05);**distinct significant differences p<0.01).

CONCLUSIONS

The descriptive sensory analysis of the products allowed a description and comparison of the six experimental batches obtained in the Meat Processing Microsection of the University of Life Sciences in Iasi. According to the Student test, the ripening time influenced the sensory quality, especially the attributes of aroma and texture, as well as the intensity of the salty taste. The overall aroma intensity of the products, as well as the perception of the spicy and smoky aroma, showed distinctly significant differences (p<0.01), the batches matured for 40 days were appreciated with higher average scores by the evaluators.

The ratio of the raw materials introduced in the technological sheets of the six experimental batches was the factor that showed the most evident differences between the samples. Texture attributes showed the greatest differences, with the batches showing distinctly significant differences in stiffness, tenderness and elasticity. The assessors scored the samples from batches 1 and 3 as showing insignificant differences in appearance (intensity, colour uniformity, meat/fat distribution). Although the percentage of fat is different in the two experimental batches, L_3 contains a higher amount of mutton, a raw material with a higher fat content compared to beef.

After the diversification of the technological sheets in terms of the quantities of raw materials introduced in the three experimental batches, we found that the L_1 and L_3 samples were assessed with higher average scores compared to L_2, possibly due to the lower quantity of fat, which influenced the evaluation of the analysed attributes.

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