

QUALITY ASSESSMENT OF SOME RAW-DRIED SAUSAGES OFFER CONSUMERS FROM DÂMBOVIȚA COUNTY

Maria Iordan*, Elena Corina Popescu, Alexandru Stoica, Elena Bărăscu
Valahia University of Târgoviste, Faculty of Environmental Engineering and Food Science
Department of Food Engineering, Unirii Street, nr.18-24, Târgoviște, Romania
*E-mail: marianaordan@yahoo.com

Abstract

This research paper presents the results of chemical (moisture, fat, protein, salt, nitrite, starch) and sensory characteristics of ten different types of raw-dry sausages, purchased on the market from Dâmbovița County.

The results of analysis were compared with the values from Technical Standards Branch and Romanian Meat Industry Company.

The moisture content of the evaluated assortments ranged from 33.5% and 46.8%, the maximum value is 35%, one assortment (sample 5) has fulfilled the accepted condition.

The fat content of the analyzed samples was within the 21.77% and 37.8%, maximum value is 45% and protein content varied between 16.23% and 22.8%, compared to the minimum allowed of 18%. An assortment of raw-dried sausages analyzed (sample 5) recorded a value of 16.23%, below the minimum allowed.

Salt content in the sausages analyzed varieties ranged between 3.03% and 3.97%, compared with maximum value of 5%, all sorts presenting accepted values.

Nitrite content was between 0.01% and 1.4%, the maximum permissible value being of 7mg/100g. Raw-dry sausages were analyzed on a sensory level scoring 20 points, with penalty points. All sorts were scored in the range of 19.4 to 20 points, grades awarded being "excellent" and "very good", according to current regulations.

Keywords: raw-dry sausages, chemical, sensory characteristics.

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1. INTRODUCTION

The category of raw-dried meat products which are produced in Romania include smoked-dried and seasoned sausages and dry-cured varieties like as „ghiudem” and „babic”. Raw-dried products are obtained by a complex technological process, and their advantage is the highest meat content compared with any other type of sausages and a long shelf life. They are made of minced pork or mix pork and beef, mutton or venison and bacon, all mixed with conservation ingredients, flavorings, filled membrane, dry and cold smoked, and then undergo maturation and cold drying (Banu et.al., 2009).

Technology of raw-dried sausages involves three main stages, steaming, drying, smoking and aging.

By the steaming is achieved a rapid lactic fermentation inside product, lactic fermentation effect being to improve colour consistency and flavor of the product.

Cold smoking is the operation that increases storage life of product, and shall be conducted in the case of raw-dry sausages at a temperature of 9-12° C for 4-10 days. Product moisture during the smoking process must drop to around 45% (Csatlos, 2009).

After smoking, sausages are maintained for 12 hours and then go into storage ripening - drying for a period of 30 days, reaching approximative of 30% product humidity.

During maturation, physicochemical transformations occur in all parts of meat, mainly meat paste acidification caused by spontaneous microflora and enhanced by addition of lactic starter cultures and transforming raw paste in a related structure, firm, consistent, specific finished product feature. It also completes special flavor of these preparations due to proteolysis, lipolysis and glycolysis. (Banu et. al., 1997; Ionescu et.al., 2009).

Raw-dry sausages are products with high nutritional value, containing high quality

proteins and fats, vitamins and trace of minerals. Proteins provide all essential amino acids, serve as energy source and have a plastic role in maintaining cellular integrity and repair, enter into the structure of enzymes and hormones, interfere with the body defense against microorganisms, viruses, toxins. Animal fats are the richest source of energy, comparative with carbohydrates and proteins, is the solvation environment of the liposoluble vitamins (A, D, E, K) and are structural components of cells, mainly by phospholipids (Jordan et. al., 2009).

Raw-dry sausages are produced with heigh energetic value between 350-490 Kcal/100g of product. The energy value defines the potential of nutrients (carbohydrates, lipids, proteins) to provide energy.

Raw-dry sausages are produced in a wide range of specific types of firms made according to various recipes, that include different raw materials, spices and starter cultures. The objective of this study was to evaluate chemical and sensory characteristics of the ten dry-raw sausages wich were obtained from pork meat, fat tissues and different spices. The composition was introduced into natural intestines or artificial sausages skins with a diameter smaller than 40 mm.

Pork meat is an excellent source of vitamins (vitamin B6, B12, niacin, thiamine, riboflavin) and oligoelements (iron, magnesium, phosphorus, potassium and zinc), (Segal, 2002; Banu et.al., 2005; Mihaiu, 2010).

The Standards of the raw-dry meat preparations from Romania require some admissible limits for fat, protein, salt, nitrite, starch, and moisture content. Sensory analysis of meat preparations made on a scale of 20 points, with penalty points in accordance with specific assortments.

2. MATERIALS AND METHODS

The types of raw-dry sausages were bought from supermarkets and local stores, being produced by companies specialized in meat production (Table 1) and were stored under

refrigeration condition at a temperature of 4 °C, before chemical analysis.

All products have a shelf life of 60 days. Moisture (g /%), fat (g /%), protein (g /%), salt (g /%), nitrogen (mg /%) and the presence of starch were determined according to the procedures from in Romanian Standards Collection „Meat and Meat Products" developed by the Romanian Institute for Standardization, Bucharest, 1997.

Table 1. The types of raw-dried sausages evaluated

Company producing	Energy value (Kcal/100g)
VASCAR (Sample 1)	393
CRIS-TIM (Sample 2)	370
LERFRUMARIN (Sample 3)	365
SERGIANA (Sample 4)	380
STRIVEX TRADING (Sample 5)	367
ANGST (Sample 6)	395
AGRICOLA (Sample 7)	370
ANCAROL (Sample 8)	290
KORANI (Sample 9)	310
C+C (Sample 10)	287

Sensory analysis of the assortments of raw-dried sausages was made according to STR 3252/85 (Meat Industry Standards Collection, Volume II, Bucharest, 1987).

Sensory characteristics were examined on a scale scored of 20 points (table 2).

From the maximum score given for each feature are deducted penalty points corresponding to defects found (defined specifically for each feature).

Table 2. Rating scale for assessing sensory characteristics of the raw-dry sausages uncovered mold on the membrane

Features examined	Maximum score given	Maximum number of penalty points
Appearance	4	0,5-2,0
Aspect in section	5	0,5-5,0
Color	4	1,0-4,0
Taste	5	1,0-5,0
Odour	2	0,5-2,0

The panel group is composed of an odd number of members (5-9), but allowed 3 members for the current control of sensory characteristics.

The head group of tasters evaluates individual standard forms of analysis and calculates the average value for each product, expressed to one decimal place, and final results of the analysis are given in summary form.

Assessment of sensory quality of products allows their classification by categories such as:

- „Excellent": 19,5 to 20 points;
- „Very good ": 18.0 to 19.4 points
- „Good ": 16.0": to 17.9 points;
- „Satisfactory ": 13.0 to 15.9;
- „Unsatisfactory ": under 13 points.

It is considered corresponding products, those that are evaluated by at least 13 points, but none of the features may not be denoted by 0.

3. RESULTS AND DISCUSSION

Test results of analysis and the mean recorded values of the chemical characteristics evaluated of the raw-dry sausages assortments are presented in table 3.

Recorded values were compared among themselves and in relation to permissible limits of existing standards.

The moisture content of samples is ranged between 33.5 and 46.8%. One sort examined (Sample 6) has a moisture content of 33.5%, the maximum limit being of 35%. Humidity of 8 types of sausages (Sample1, Sample 2, Sample 3, Sample 4, Sample 7, Sample 8, Sample 9, Sample 10) goes up to 3% maximum value, being within the range 35-38%, and an assortment (Sample 5) has 46.8%

moisture, value that far exceeds the accepted limit.

From the data we observed that all types of raw-dried sausages have a fat content between 21.77% and 37.8%, falling within the permitted limit value of 40%.

Protein content of raw-dried sausages evaluated had following values: 8 varieties of raw-dry sausages have a protein content between 20% and 27.79%, an assortment (Sample 4) contains 18.6% protein, with less than the minimum allowed by min. 18%, and one variety of sausage (Sample 5) does not meet standard regulations, having a 16, 23% protein content.

Sodium chloride helps to maintain texture, improves taste and increases the products shelf life. Salt content of sausages assortments varied between 3.03% and 4.91%; all samples is below the maximum permissible value of 5% NaCl.

Sodium nitrite is a chemical preservative with a stabilized action in the product, reacts with meat pigments (myoglobin) forming the characteristic color of salted meats; contributes to meat flavor and has mild antioxidant action. In the raw-dried sausages analyzed were recorded nitrite values between 0.01 mg/100g (Sample 3) and 1.74 mg/100g (Sample7) below the permissible standards values (maximum 7 mg/100g). In addition, we see that seven samples of raw-dry sausages have values below 1 mg NaNO₂/100g, which is beneficial to human health.

Table 3. Chemical composition of raw-dried pork sausages

Company producing	Moisture %	Fat %	Protein %	NaCl %	NaNO ₂ mg/100g %	Strach
VASCAR (Sample1)	37,2	31,3	22,8	4,29	0,23	-
CRIS-TIM (Sample2)	37,98	30,67	21,6	4,16	0,68	-
LERFRUMARIN (Sample3)	37,2	33,97	20,64	4,2	0,01	-
SERGIANA (Sample4)	37,7	34,74	18,6	4,91	1,4	-
STRIVEX TRADING (Sample5)	46,8	29,7	16,23	3,11	0,36	+
ANGST (Sample6)	33,5	37,8	22,25	3,65	0,12	-
AGRICOLA (Sample7)	37,49	29,98	24,77	3,03	1,74	-
ANCAROL (Sample8)	35,88	36,82	21,4	4,39	0,93	-
KARANI (Sample9)	37,76	21,77	22,79	3,07	0,87	-
C+C (Sample10)	35,58	25,07	27,79	3,33	1,02	+

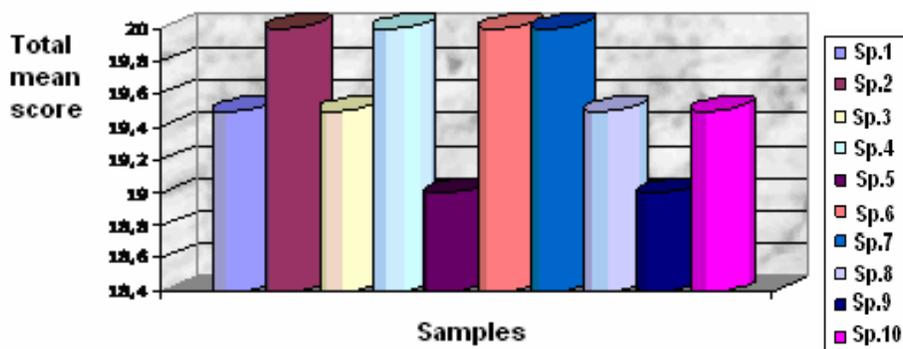


Fig.1. Centralized recording results of sensory analysis of raw dry sausages

In two of the varieties (Sample 5 and Sample 10) was identified starch, which is unacceptable according to regulations. Sensory analysis was performed using the method outlined above. Results on total average score is shown in figure 1.

The presented data show that samples were obtained scores between 19 and 20 points. Four types (Sample 2, Sample 4, Sample 6, Sample 7) have obtained excellent rating (20 points), with very specific sensory raw-dried sausages and well defined. Four types (Sample 1, Sample 3, Sample 8, Sample 10) have obtained a result of 19.5 points, with a small agglomeration of fat in section, and two varieties (Sample 5, Sample 9) showed clusters of fat on the surface, score obtained being 19 points.

4. CONCLUSIONS

The study was conducted to identify the chemical composition of the assortment of raw-dried sausages suitable for human consumption offered on the market from Dâmbovița County. Thus, a single raw-dried meats (Sample 7) meets the acceptable values of all characteristics assessed. Other samples have a moisture content above the permissible; Sample 5 recorded a protein content less than acceptable value and in Samples 5 and 10 it was identified the presence of starch. The content of fat, salt and nitrites respects the acceptable values and are even well below of this, satisfying the consumers demands for products with health benefits.

In order to meet the rules food safety, it is recommended the control of authorities to manifest the requirement in the inspections carried out.

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