

## RESEARCH REGARDING QUALITY CONDITIONS OF SOME RAW-DRIED SALAMI

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### Abstract

The paper presents the physical-chemical parameters and sensory quality of certain types of raw-dried sausages sold in our country namely “Sibiu Salami” and “Bănățean Salami”. Regarding the “Sibiu Salami”, was chosen brands Kaufland, Salbac and Reinert and for “Bănățean Salami” were chosen Cristim, Salsa and Salbac brands. The main determinations that led to the examination of physical-chemical were pH, salt content (%), water (%), SU (%), protein (%) and fat content (%). Our results were compared with existing quality standard.

Regarding pH, the highest value when we analyzed samples was  $0.997 \pm 5.962$  assortment of Reinert manufactured. For salt content, the highest percentage was recorded all of salami sold under the brand Reinert namely  $4.80 \pm 0.991\%$  while the salami originated from Salbac company recorded an average of only  $2.966 \pm 0.942\%$ . Regarding the content of fat and protein, the highest levels were found when “Sibiu Salami” produced by Salbac ( $31.534 \pm 23.138 \pm 0.999\%$  fat and  $1.00\%$  protein).

Our results for all six types analyzed within the limits of quality standards, which leads us to encourage use of these preparations.

**Key words:** raw-dried sausages, quality, standards

### INTRODUCTION

In “charcuterie” category are a great variety of meat assortments with a long shelf life term, which have in their composition, a mix of meat (pork, cattle, sheep), bacon and auxiliary raw materials (spices and adjuvant) [4], [2].

Even if the assortments are varied charcuteries are classified function of proprieties of composition in membranes and after particularities of thermal processing process in three categories: boiled salami, semi-smoked salami and raw-dried salami [1], [7].

Raw-dried salami is elaborated as a meat mix which is subjected to a process of smoking, drying and maturation in membrane [5]. During technological process salamis’ are subjected to a fermentation provoked by the existent enzymes in muscular fibres from mixed meat or to a spontaneous fermentation, provoked by enzymes which are produced by bacteria, yeasts and noble moulds (“Sibiu salami”) which are added in drying/maturation stage [3], [6].

Quality of a product is given by the assembly of properties and characteristics which offer it the feature to fulfil both the presented needs as well as the fundamental needs of consumers. In the light of those arguments quality of a product could be observed after correlation between sensorial, physical-chemical properties and consumers’ demands. Regarding the quality of food products, those one is conferred by a succession of qualitative features and conditions, which had an impact on buying decision.

From the above mentioned things, in the current paper we tried to analyse the quality conditions for some assortments of raw-dried salamis, sold on Romanian market, through some physical-chemical determinations.

### MATERIAL AND METHOD

Biological material was represented by “Sibiu salami” produced by Kaufland, Salbac and Reinert and “Bănățean salami” produced by Cristim, Salsi and Salbac (from each assortment being bought 5 units).

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Physical-Chemical determinations were made in according with the existent methods described in literature.

*pH value*, was determined with an electronic pH-oxymeter, by electrode immersion in a watery extract (10 g product and 100 ml distilled water, rest for 20 minutes at room temperature followed by filtration).

Establishment of *salt content (%)* was realised through titration method, principle basing on precipitation of chlorides from salamis with silver nitrate, in the presence of potassium chromate as colour indicator.

*Content in water (%) and DM (%)* was determined by direct method, through drying in oven, method consisting in drying of a sample (at a temperature of +60°C), till is reached a constant mass.

Regarding *proteins content (%)*, those one was determined by Kjeldahl method based on the following principle: nitrate from organic combinations, by heating with concentrate sulphuric acid and in the

presence of a catalyser, is transformed in ammonium sulphate.

*Fat content (%) / DM* was established by Soxhlet method, using an Velp Scientific – SER 148 extraction device.

## RESULTS AND DISCUSSIONS

For **pH values** quality standards for “Sibiu salami” indicate a maximum value of 6.5, the values obtained by us, after effectuated determinations for all assortments didn’t over-pass these maximum. So, the lowest value calculated by us was obtained at assortment produced by Kaufland 5.588, and the greatest value was 5.962 for the assortment produced by Salbac (fig. 1).

For “Bănăţean salami” the highest mean was obtained for salami produced by Salsi, 5.036 being followed by the assortment produced by Salbac (pH=4.888) and by the assortments produced by Cristim (pH= 4.618), all the valued being in the maximum admissible limit by the quality standard, 6.00 (fig. 2).

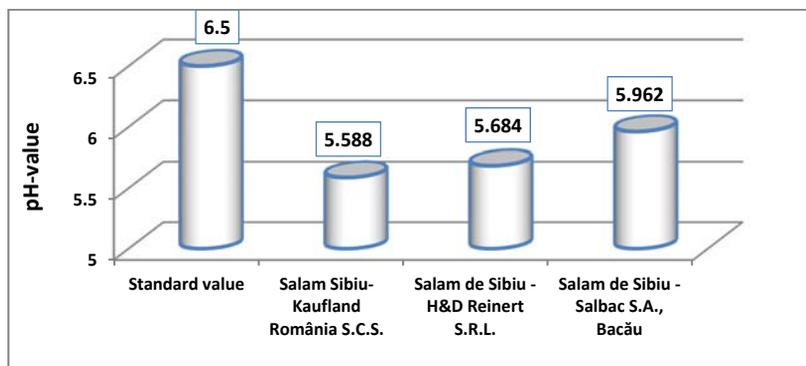


Fig. 1 Determination of pH value for “Sibiu salami”

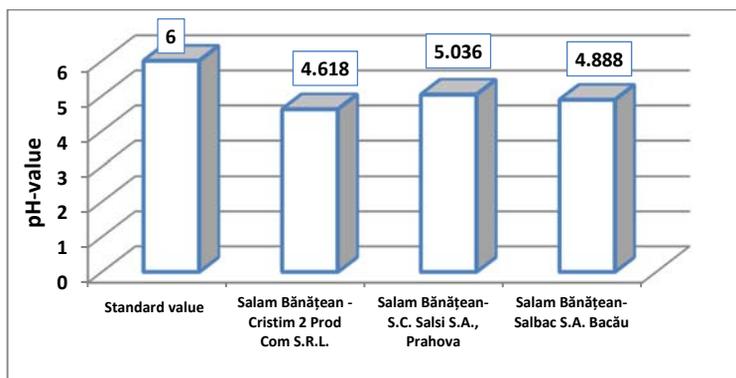


Fig. 2 Determination of pH value for “Bănăţean salami”

Regarding salt content, quality standards indicates a maximal value of 6% for both "Sibiu salami" and for "Bănățean salami". The highest mean regarding salt content for "Sibiu salami" was obtained for assortment produced by Kaufland,  $4.912 \pm 0.976\%$  whit a

minimum of 4.68% and a maximum of 5.09%. Regarding the studied character, this one presented a very good homogeneity, the value of variation coefficient being 3.271% (tab. 1).

Table 1 The content of salt (%) in analyzed products

Specification	Standard value (%)	N	$\bar{X} \pm s_{\bar{X}}$ (%)	V (%)	Min. (%)	Max. (%)
<b>"Sibiu salami"</b>						
<b>Kaufland</b>	Max. 6	5	$4.912 \pm 0.976$	3.271	4.68	5.09
<b>Salbac</b>			$2.966 \pm 0.942$	4.495	2.8	3.15
<b>Reinert</b>			$4.80 \pm 0.991$	2.975	4.62	4.97
<b>"Bănățean Salami"</b>						
<b>Cristim</b>	Max. 6	5	$3.053 \pm 0.951$	6.117	2.808	3.276
<b>Salsi</b>			$2.958 \pm 0.924$	6.682	2.749	3.217
<b>Salbac</b>			$3.122 \pm 1.027$	5.023	2.925	3.334

For "Bănățean salami", the lowest value was recorded at the assortment produced by Salsi,  $2.958 \pm 0.924\%$  with a minimum of 2.749% and the highest value reached a level of 3.217% (tab. 1).

From chemical point of view were determined water content (%), DM (%), fat content (%) and the one in proteins (%).

For "Sibiu salami" produced by Kaufland data obtained by us show the fact that all analysed parameters are in the existent quality standards. So for DM content the mean was  $76.986 \pm 0.999\%$ , protein level being  $22.542 \pm 1.026\%$  and fat content was  $30.684 \pm 0.992\%$  (tab. 2).

Table 2 Chemical indicators for "Sibiu salami" - Kaufland Romania S.C.S.

Specification	Standard value	Statistics estimators				
		N	$\bar{X} \pm s_{\bar{X}}$	V%	Min.	Max.
<b>Water (%)</b>	30	5	$23.014 \pm 1.001$	0.140	22.98	23.07
<b>DM (%)</b>	75	5	$76.986 \pm 0.999$	0.043	76.93	77.02
<b>Fat (%)</b>	46	5	$30.684 \pm 0.992$	1.732	30.01	31.32
<b>Proteins (%)</b>	22	5	$22.542 \pm 1.026$	3.028	21.99	23.41

For assortment produced by Salbac water content had a mean value of  $24.5 \pm 0.982\%$  difference, respectively  $75.5 \pm 1.005\%$  being for DM content. Regarding fat content, the

calculated mean value was  $31.534 \pm 0.999\%$  and protein content had a mean value of  $23.138 \pm 1.002\%$  (tab. 3).

Table 3 Chemical indicators for "Sibiu salami" – S.C. Salbac S.A., Bacău

Specification	Standard value	Statistics estimators				
		N	$\bar{X} \pm s_{\bar{X}}$	V%	Min.	Max.
<b>Water (%)</b>	30	5	$24.5 \pm 0.982$	1.920	24.13	25.02
<b>DM (%)</b>	75	5	$75.5 \pm 1.005$	0.623	74.98	75.87
<b>Fat (%)</b>	46	5	$31.534 \pm 0.999$	1.034	31.25	32.02
<b>Proteins (%)</b>	22	5	$23.138 \pm 1.002$	0.942	22.98	23.51

Must be mention the fact that also in the case of this product the values obtained by us were in the limits imposed by standard, fat

content being less with 14.466% than the maximum imposed by standards.

Last assortment of analysed “Sibiu salami” was represented by the one from Reinert, where for water content, mean calculated value was  $26.87 \pm 0.985\%$ , minimum being of 26.35% and the maximum value reaching a level up to 27.13%. For DM content the studied character presented a very

good homogeneity, value of variation coefficient being 0.451% and mean recording a value of  $73.13 \pm 1.005\%$  lower with 1.87% than the minimum imposed by standard. Regarding content in fat and proteins the values obtained by us were in the limits imposed by standard (tab. 4).

Table 4 Chemical indicators for “Sibiu salami” – S.C. H&amp;E Reinert S.R.L.

Specification	Standard value	Statistics estimators				
		n	$\bar{X} \pm s_{\bar{x}}$	V%	Min.	Max.
Water (%)	30	5	$26.87 \pm 0.985$	1.230	26.35	27.13
DM (%)	75	5	$73.13 \pm 1.005$	0.451	72.87	73.65
Fat (%)	46	5	$30.864 \pm 1.002$	0.747	30.55	31.15
Proteins (%)	22	5	$22.556 \pm 1.001$	1.214	22.29	23.01

For “Bănăţean salami” produced by Cristim, water content was  $25.35 \pm 0.993\%$  and DM content reached a mean value of  $74.65 \pm 1.002\%$  higher with 4.65% than minimum imposed by standard.

Regarding fat content (%) and the one in proteins (%), calculated mean values were in the limits imposed by quality standards (tab. 5).

Table 5 Chemical indicators for “Bănăţean salami” – S.C. Cristim 2 Prodcom S.R.L.

Specification	Standard value	Statistics estimators				
		N	$\bar{X} \pm s_{\bar{x}}$	V%	Min.	Max.
Water (%)	30	5	$25.35 \pm 0.993$	0.752	25.12	25.61
DM (%)	70	5	$74.65 \pm 1.002$	0.255	74.39	74.88
Fat (%)	46	5	$34.546 \pm 0.995$	0.712	34.21	34.81
Proteins (%)	30	5	$24.786 \pm 0.997$	0.534	24.66	25

“Bănăţean salami” produced by S.C. Salsi S.A. Prahova had a mean value for DM content of  $74.25 \pm 1.001\%$  higher with 4.25% face to minimal value from standards. Fat content had a mean value of  $37.846 \pm 1.000\%$

minimum being 37.52% and maximum of 38.02%. Proteins content presented a very good homogeneity inside batch, value of variation coefficient being 0.364% and mean reaching a level of  $26.032 \pm 1.000\%$  (tab. 6).

Table 6 Chemical indicators for “Bănăţean salami” - S.C. Salsi S.A., Prahova

Specification	Standard value	Statistics estimators				
		N	$\bar{X} \pm s_{\bar{x}}$	V%	Min.	Max.
Water (%)	30	5	$25.75 \pm 0.995$	0.701	25.55	26.01
DM (%)	70	5	$74.25 \pm 1.001$	0.243	73.99	74.45
Fat (%)	46	5	$37.846 \pm 1.000$	0.602	37.52	38.02
Proteins (%)	30	5	$26.032 \pm 1.000$	0.364	25.89	26.12

Last analysed “Bănăţean salami” assortment was the one produced by S.C. Salbac S.A. Bacău. Water content recorded a mean value of  $25.888 \pm 1.027\%$  minimum being 25.63% and maximum value reaching 26.12%. For DM content minimal value calculated by us was 73.88% maximum

being at a level of 74.37% mean value being  $74.112 \pm 0.998\%$ . Fat content recorded a mean of  $45.796 \pm 1.008\%$  and the ones in proteins had a value of  $17.896 \pm 0.983\%$ . Regarding the studied character this one presented a very good homogeneity for all the analyzed parameters.

Table 7 Chemical indicators for "Bănățean salami" - S.C. Salbac S.A., Bacău

Specification	Standard value	Statistics estimators				
		N	$\bar{X} \pm s_{\bar{x}}$	V%	Min.	Max.
Water (%)	30	5	25.888±1.027	5.023	25.63	26.12
DM (%)	70	5	74.112±0.998	0.253	73.88	74.37
Fat (%)	46	5	45.796±1.008	0.680	45.25	46.01
Proteins (%)	17	5	17.896±0.983	1.291	17.52	18.12

## CONCLUSIONS

"Sibiu salami" produced by Kaufland România S.C.S. recorded a mean pH value of  $5.588 \pm 0.995$ , lower with 0.912 face to admissible value by standards; (6.5). For salt content (%), after comparing the obtained mean values with standard value, was observed a difference of 1.088%;

DM content of "Sibiu salami" produced by S.C. Salbac S.A. Bacău, recorded an increase of mean value with 0.5% face to value from standard; for fat content (%) was obtained a mean value of  $31.534 \pm 0.999$ .

For "Sibiu salami" produced by S.C. H&E Reinert S.R.L. mean value obtained for pH was with 0.538 lower face to standard; for salt content (%), mean value calculated by us ( $4.8 \pm 0.991\%$ ) didn't over-pass the value imposed by standard (6,000%); regarding water percent, the obtained value was  $26.87 \pm 0.985\%$ , and the standard value which must be respected is 30%.

"Bănățean salami" produce by S.C. Cristim 2 Prodcom S.R.L. recorded a mean value of pH lower with 1.382 face to standard (6); for salt content (%), mean value was  $3.053 \pm 0.951\%$ , lower with 0.447% face to standard; regarding water content (%), was observed a difference of 5.65% between the obtained mean values and standard value.

In case of "Bănățean salami" produce by S.C. Salsi S.A. Prahova, water percent is  $25.75 \pm 0.995\%$  and at the DM one was remarked an increase with 4.25%, face to standard. Fat percent and proteins content (%) didn't recorded deviations from standard values.

Salt content (%) in "Bănățean salami" produced by S.C. Salbac S.A. Bacău, recorded a mean values ( $3.1222 \pm 1.027\%$ )

close to standard value (3.5%), difference between those two values being of 0.378%.

For DM content (%) was observed a concentration with 4.112% for mean value face to standard value and fat percent obtained a mean value close to standard, difference between those two vales being of 0.204%.

In according with the obtained results for analysis of physical-chemical indicators was observed that aren't deviations from products' specifications, situation valid also for sanitary state of studied salamis.

The obtained results for those two analysed types of salamis are in the standard limits, fact which allow us to encourage the consumption of those two products.

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