

## RESEARCH ON THE QUALITATIVE ANALYSIS OF SOME SOURCES OF SOFT PASTE CHEESE

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### Abstract

Through this paper it was proposed to perform the qualitative analysis of two varieties of cheese with soft paste and mold on the outside, from the same producer, namely President and Delaco, Camembert Cheese and Brie Cheese. The qualitative analysis of the Romanian cheese with soft paste and mold on the outside, Năsal Cheese, produced by Napolact, was also performed.

The qualitative parameters were established in terms of quality sensory indices, as well as physico-chemical ones. Sensory analysis involved assessing the appearance, color, appearance in section, consistency, taste and smell. The characteristics were in line with the norms imposed by the quality standard, obtaining for all assortments the rating "very good", the lowest score being for Brie cheese from the President - 18.51 points, and the highest score being recorded to the Romanian Năsal cheese assortment - 19.38 points. From a physico-chemical point of view, determinations were made to determine the water content (%), dry matter (%), fat / SU content (%), protein content (%), salt level in the product (%) and acidity (° T). Following the determinations performed, it was found that all analyzed indices were within the limits of variation recommended by the standard, therefore, the final conclusion of this study is that all products analyzed are of superior quality.

**Key words:** Brie, Camembert, Năsal, quality

### INTRODUCTION

A balanced consumption of milk leads to a good physical and intellectual development, has the role of preventing the appearance of bone diseases such as osteoporosis and increases the body's resistance to various diseases and their lifespan. Therefore, milk is one of the staple foods in human nutrition but also the raw material for the manufacture of a wide range of products, for food or industrial use. Made since ancient times, cheeses are a method of preserving the main components of milk, namely protein and fat [8], [10].

Cheeses are dairy foods obtained by draining whey from the coagulation of milk. They can be solid or semi-liquid. It is said that one of the best ways to make milk is through the manufacture of cheese [2], [11].

Therefore, cheeses are important foods in human food because they have a high energy value, have multiple uses, have special

sensory characteristics and have a high content of nutrients necessary for the development of the body. Due to them, cheeses can be called an ideal food [5].

It is estimated that currently there are over 2000 cheese varieties, and this list is in continuous growing. Each of these sorts of cheese has a specific particularity, either due to the milk used, processing technology or ingredients [6], [14].

Camembert and Brie cheeses, belong to the soft surface-ripened category of cheeses that originated in France [12]. These cheeses make up a significant portion of the specialty cheese market and are now produced around the world. Many varieties of bloomy rind cheeses are produced using different recipes and cheese making practices; however, they all rely on surface yeasts and molds for ripening [1].

In Romania, ripened dairy products come from a variety of sources, each with its own set of characteristics and nutritional benefits. "Telemea" cheese accounts for 60% of all

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cheeses manufactured in Romania, with nutritional characteristics determined by milk, processing technology, and production location. Similarly, a host of studies have looked at the dynamics of biochemical compounds during the ripening phases [13].

„Năsal” cheese is part of this category of fermented cheeses, soft content, made from cow milk. On its surface there is a bacteria substrate due to the development of *Brevibacterium linens*, which gives the particularity of this product. This bacterium transforms the cheese components offering its specific taste and consistency, not being necessary the artificial adding of mould spores which often are needed in specific French cheeses. This cheese holds an important value to the traditional production of cheese in Romania, given the fact that it is the only one with this particular technology of processing. The ripening is made in a special environment (Țaga cave) that favours the development of *Brevibacterium linens*. In this cave, the temperature and air humidity are constant during the entire year, ensuring the production of characteristic cheese, appreciated of having exquisite sensorial features [4], [13].

Through this paper we aimed to make a comparative study between Brie and Camembert varieties manufactured by two different producers (President and Delaco) and also the analysis of the qualitative parameters of Năsal cheese sold by Napolact, the only distributors.

## MATERIAL AND METHOD

Regarding the establishment of the qualitative parameters for the analyzed products, it was considered necessary a sensory analysis as well as a physico-chemical one.

The sensory examination was carried out, using the points method [9].

Regarding the quality conditions for the final product, determinations were made in order to determine the US content (%) and water (%), determining the protein content (%), the fat content (%), the salt content (%) and acidity (°T).

The water content was made by drying the samples in the oven and the dry one was by difference:  $US (\%) = 100 - \text{water}$ .

The determination of the protein content was performed by the Kjeldahl method, where the principle of the method consists in the conversion of nitrogen from organic combinations into ammonium sulphate, by heating with concentrated sulfuric acid, in the presence of a catalyst in our case, copper sulphate. By adding a strong base, the ammonia becomes free, and by distillation it is captured in a defined amount of acid with a known normality. The excess acid is titrated with a basic solution having the same normality, the total nitrogen quantity being determined by difference.

The fat determination was performed by the acid-butyrometric method, with the Van-Gulik butyrometer, the principle of the method consists in delimiting the fat from butyrometers, by dissolving the protein substances with sulfuric acid in the presence of isoamyl alcohol followed by centrifugation.

The determination of sodium chloride has as its principle, the precipitation of chlorides in cheese (in this case, telemea cheese) with silver nitrate, using as an indicator the potassium chromate.

The acidity determination was performed, as in the case of milk raw material using the Thörner method, where the acids in the cheese composition are neutralized. A sample volume of sodium hydroxide (NaOH) is titrated, in which case a color indicator such as phenolphthalein is also required.

Regarding the physical-chemical examination of the cheeses, five determinations were made for each qualitative parameter. The results obtained were compared with those indicated on the product label, these being taken as reference values.

After reviewing the data acquired via surveys, data were analyzed by using a suitable statistical packet program

## RESULTS AND DISCUSSION

Regarding the sensory analyzes performed for each assortment, the total scores were 18.97 points for the Brie cheese

made by Delaco (Table 1) and 18.51 (Table 2) points for the one made by the President.

Regarding the Brie assortment, both products were appreciated by the six

members who performed the tasting, the final scores placing the product in the category "VERY GOOD" (18.5 - 20 points).

Table 1 Summary sheet of the results obtained by the method of the scoring scale for Brie cheese from Delaco

No. crt.	The name of the taster	Individual score (Pi)			
		Exterior appearance	Appearance in section	Smell	Taste
1	Taster 1	5	5	5	5
2	Taster 2	5	5	4	5
3	Taster 3	4	5	5	5
4	Taster 3	5	5	5	4
5	Taster 4	5	4	5	4
6	Taster 5	5	5	4	5
Unweighted average score ( $P_{mnp}$ )		4.83	4.83	4.66	4.66
Weighted average score ( $P_{mp}$ )		5.8	3.86	1.86	7.45
Weighted total score		<b>18.97</b>			

Table 2 Summary sheet of the results obtained by the method of the scoring scale for Brie cheese from President

No. crt.	The name of the taster	Individual score (Pi)			
		Exterior appearance	Appearance in section	Smell	Taste
1	Taster 1	5	5	5	5
2	Taster 2	4	4	4	5
3	Taster 3	5	4	5	5
4	Taster 3	5	4	5	4
5	Taster 4	4	5	5	5
6	Taster 5	4	4	5	5
Unweighted average score ( $P_{mnp}$ )		4.5	4.33	4.83	4.83
Weighted average score ( $P_{mp}$ )		5.4	3.46	1.93	7.72
Weighted total score		<b>18.51</b>			

The results of the sensory examination performed for Camembert cheese produced by Delaco obtained an average total score of 18.72 points (Table 3), lower compared to

that obtained by Camembert produced by the President (18.84 points) (Table 4). And this time, the final values included the products analyzed in the "VERY GOOD" category.

Table 3 Summary sheet of the results obtained by the method of the scoring scale for Camembert cheese from Delaco

No. crt.	The name of the taster	Individual score (Pi)			
		Exterior appearance	Appearance in section	Smell	Taste
1	Taster 1	5	5	5	4
2	Taster 2	5	4	4	4
3	Taster 3	5	5	4	5
4	Taster 3	5	5	5	5
5	Taster 4	4	5	5	4
6	Taster 5	5	5	5	5
Unweighted average score ( $P_{mnp}$ )		4.83	4.83	4.66	4.5
Weighted average score ( $P_{mp}$ )		5.8	3.86	1.86	7.2
Weighted total score		<b>18.72</b>			

Table 4 Summary sheet of the results obtained by the method of the scoring scale for Camembert cheese from President

No. crt.	The name of the taster	Individual score (Pi)			
		Exterior appearance	Appearance in section	Smell	Exterior appearance
1	Taster 1	5	5	5	5
2	Taster 2	5	5	5	5
3	Taster 3	5	4	5	5
4	Taster 3	4	4	4	5
5	Taster 4	5	4	5	4
6	Taster 5	4	5	5	5
Unweighted average score ( $P_{mnp}$ )		4.66	4.5	4.83	4.83
Weighted average score ( $P_{mp}$ )		5.6	3.6	1.92	7.72
Weighted total score		<b>18.84</b>			

The last assortment analyzed from a sensory point of view was represented by Năsal cheese where the maximum score obtained was 19.38 points, being also the highest score obtained (Table 5).

Table 5 Summary sheet of the results obtained by the method of the scoring scale for Năsal cheese from Napolact

No. crt.	The name of the taster	Individual score (Pi)			
		Exterior appearance	Appearance in section	Smell	Taste
1	Taster 1	5	5	5	5
2	Taster 2	5	5	4	5
3	Taster 3	5	5	4	5
4	Taster 3	5	5	5	4
5	Taster 4	5	5	5	5
6	Taster 5	4	5	5	5
Unweighted average score ( $P_{mnp}$ )		4.83	5	4.66	4.83
Weighted average score ( $P_{mp}$ )		5.8	4	1.86	7.72
Weighted total score		<b>19.38</b>			

As regards the physico-chemical determinations made on the Brie assortment, there were differences, however, following a comparison with the values indicated by each producer, it was found that the products complied with the requirements mentioned by each producer on the label.

Therefore, regarding the DM content for Brie Delaco the average value was  $80.62 \pm 0.05\%$  and for the one from the President an average value of  $79.32 \pm 0.08\%$

was obtained. Regarding the fat/D.M content, the values were similar, for Brie Delaco the average was  $60.36 \pm 0.08\%$  and for Brie President  $60.45 \pm 0.02\%$ .

For the salt level, the ones from Delaco indicate on the label a maximum value of 1.7%, the average obtained by us being 1.65%, while the ones from President indicate the maximum value as 1.2%, the average value calculated by us being 1.19% (Table 6).

Table 6 Physico-chemical characteristics of Brie cheese

Producer	Specification	Standard value	Statistical estimators				
			N	$\bar{X} \pm s_{\bar{X}}$	V%	Min.	Max.
0	1	2	3	4	5	6	7
Delaco	Water (%)	Max. 56	5	$19.38 \pm 0.05$	0.61	19.21	19.52
President		Max. 56	5	$20.68 \pm 0.08$	0.85	20.47	20.89
Delaco	D.M (%)	Min. 43	5	$80.62 \pm 0.05$	0.15	80.48	80.79
President		Min. 43	5	$79.32 \pm 0.08$	0.22	79.11	79.53

0	1	2	3	4	5	6	7
Delaco	Proteins (%)	Min. 18	5	18.27±0.04	0.53	18.19	18.42
President		Min. 17	5	17.29±0.04	0.57	17.18	17.41
Delaco	Fat (%)	Min. 28	5	30.91±0.02	0.16	30.85	30.98
President		Min. 28	5	30.81±0.06	0.41	30.62	30.92
Delaco	Fat/D.M (%)	Min. 40	5	60.36±0.08	0.08	60.29	60.42
President		Min. 40	5	60.45±0.02	0.08	60.39	60.51
Delaco	Salt (%)	Max. 1.7	5	1.65±0.02	2.46	1.59	1.69
President		Max. 1.2	5	1.19±0.01	0.96	1.17	1.2

For the Camembert assortment, the differences of the values obtained were quite large, but for both products the results obtained by us were within the values mentioned on the label. Therefore, for the DM content (%) the average value calculated for Camembert Delaco was  $80.63 \pm 0.05\%$ , while the average for the Camembert President was only  $66.72 \pm 0.20\%$  (the minimum value indicated by the manufacturer being 48%).

Regarding the protein level, those from Delaco indicate on the label a minimum value of 18%, the average value obtained by us being  $18.17 \pm 0.04\%$ . For Camembert from

the President the minimum value indicated by the manufacturer is 19% and the average calculated from the determinations was  $19.13 \pm 0.03\%$ .

For the fat/DM content, the average value obtained for Delaco was  $60.53 \pm 0.13\%$  higher by 15.05% than that produced by the Presidency, where the manufacturer indicates a lower value (min. 45%).

The last parameter calculated was the salt content (%) for which the values obtained were  $1.65 \pm 0.02\%$  for Camembert Delaco and  $1.36 \pm 0.02\%$  for Camembert President (Table 7).

Table 7 Physico-chemical characteristics of Camembert cheese

Producer	Specification	Standard value	Statistical estimators				
			N	$\bar{X} \pm s_{\bar{X}}$	V%	Min.	Max.
Delaco	Water (%)	Max. 49	5	19.37±0.05	0.61	19.22	19.55
President		Max. 51	5	33.28±0.20	1.38	32.49	33.59
Delaco	D.M (%)	Min. 50	5	80.63±0.05	0.15	80.45	80.78
President		Min. 48	5	66.72±0.20	0.69	66.41	67.51
Delaco	Proteins (%)	Min. 18	5	18.17±0.04	0.55	18.05	18.29
President		Min. 19	5	19.13±0.03	0.38	19.03	19.22
Delaco	Fat (%)	Min. 31	5	31.14±0.05	0.34	31.1	31.32
President		Min. 21	5	21.23±0.03	0.30	21.16	21.33
Delaco	Fat/D.M (%)	Min. 60	5	60.53±0.13	0.47	60.39	61.04
President		Min. 45	5	45.48±0.04	0.17	45.38	45.58
Delaco	Salt (%)	Max. 2.5	5	1.65±0.02	2.44	1.59	1.69
President		Max. 3	5	1.36±0.02	3.10	1.29	1.4

Regarding the water content for Năsal cheese, the calculated average value was  $29.33 \pm 0.07\%$ , the variation limits being between 29.13% and 29.55%. For this parameter, the manufacturer indicates a maximum value of 49%. Regarding the studied character, it presented a very good homogeneity, the value of the coefficient of variation being 0.51%. The difference up to 100% was represented by the dry matter content where the average value was  $70.67 \pm 0.07\%$ . For this parameter the

variation limits ranged between 70.45% and 70.87%. The studied character presented in this case a very good homogeneity, its value being 0.21%.

Another parameter determined was the protein content for which the manufacturer indicates a minimum value of 18%. For the samples analyzed by us, the minimum value was 18.78% and the maximum value of 18.98%, the average being at a level of  $18.90 \pm 0.04\%$ .

For the fat/DM content the average value calculated by us was  $48.49 \pm 0.02\%$ . A last parameter was represented by the salt content of the Năsal type cheese where the producer

indicates a maximum value of 2.5%. The average value obtained by us was  $2.45 \pm 0.02\%$ , the variation limits being between 2.4% and 2.49% (maximum value) (Table 8).

Table 8 Physico-chemical characteristics of Năsal cheese

Producer	Specification	Standard value	Statistical estimators				
			N	$\bar{X} \pm s_{\bar{X}}$	V%	Min.	Max.
Napolact	Water (%)	Max. 49	5	$29.33 \pm 0.07$	0.51	29.13	29.55
	D.M (%)	Min. 48	5	$70.67 \pm 0.07$	0.21	70.45	70.87
	Proteins (%)	Min. 18	5	$18.90 \pm 0.04$	0.42	18.78	18.98
	Fat (%)	Min. 25	5	$25.35 \pm 0.04$	0.34	25.21	25.44
	Fat/D.M (%)	Min. 45	5	$48.49 \pm 0.02$	0.09	48.43	48.55
	Salt (%)	Max. 2.5	5	$2.45 \pm 0.02$	1.57	2.4	2.49

## CONCLUSIONS

Sensory analysis involved assessing the appearance, color, appearance in section, consistency, taste and smell. The characteristics were in line with the norms imposed by the quality standard, obtaining for all assortments the grade "very good", the lowest score being for Brie cheese from the President - 18.51 points, and the highest score being recorded to the Romanian Năsal cheese assortment - 19.38 points.

Following the physico-chemical analyzes performed for the assortments that were the object of this study, the average values obtained for all the analyzed parameters were within the values stipulated by the standard.

Regarding Năsal cheese, the protein level was higher by 0.90% compared to the minimum value indicated in the standard and for fat the average value calculated by us was 0.35% higher compared to the minimum indicated.

As a final conclusion, all the analyzed assortments are of very good quality, meeting the sensory characteristics and physico-chemical parameters.

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