

RESEARCHES REGARDING THE MICROBIOLOGICAL AND TOXICOLOGICAL ANALYSIS OF THE SOUR CREAM AND BUTTER

Bara Camelia

University of Oradea, Faculty of Environmental Protection, 26 General Magheru St., 410048
Oradea, Romania, e-mail: cameliabara@yahoo.com

Abstract

The researches regarding the microbiological and toxicological analysis of the sour cream and butter are the following: from a physical-chemical point of view it presents an acidity ranging between 18.5 – 20⁰T and a fat percent with values ranging between 34 – 37%.; microbiologically, the sour cream has a number of coliform bacteria with an average value ranging between 9 – 12 bacteria /1 g product. From a physical-chemical point of view the butter presents acidity with average values ranging between 2.5 – 2.7⁰A, a fat percent with average values of 64 – 65% and a water quantity with average values ranging between 34 – 35%. From a microbiological point of view, the butter ranges in the quality norms having the number of coliform bacteria ranging between 12 – 16/1 g product, the number of yeasts between 6500 – 9000/1 g product and the number of molds ranging between 900 – 1400/1 g product.

Key words: microbiological, toxicological analysis, sour cream, butter

INTRODUCTION

Since the old times, altogether with the domestication of the first species of farm animals, the man started to use the animal products which due to their content have nutritive substances that contributed through other factors to the development of the nervous system and. At present, the great diversity of activities made by the human beings, the stress of the urban agglomerations lead implicitly to a great nervous consumption, fact that imposes the supplementation of the animal protein needs in the human food. The demographic boom in the last decades, the population's demands that are higher and higher, with respect to the living standard, generates increasing needs of good quality foodstuff.

In the case of the modern civilization, the milk consumption per capita represents a very important indicator of the living standard, milk and the dairy products being indispensable for the youth feeding, as well as for other age categories.

Altogether with the improvement of the milk processing techniques in products, their diversity increased being capable to satisfy the requests of the consumer's alimentation.

The assessment with respect to the hygienical quality of milk has a complex character and a large content that involves the investigation of some elements, such as: organoleptic features, nutritive value, salubrity.

MATERIAL AND METHOD

The physical-chemical analysis includes the determination of the fat, water and acidity content, as well as the control reactions for the pasteurization of the sour cream and for their degree of freshness.

The determination of the water content in butter was determined with the help of Lacta balance, by the flame drying method.

The determination of the pH was made to the finite product and on the following stages of the technological process: sour cream as raw material, after pasteurization, at the end of the biochemical maturation and at the end of the physical maturation, before whipping. The measurement of the pH was made with the help of the pH-meter.

The acidity of the butter is expressed in acidity degrees that indicate the number of ml of caustic soda solution n used at the titration of 100 g per product.

The microbiological analysis was made with the aim of determining the presence or absence of pathogenic germs and of the number of coliform bacteria, molds and yeasts.

RESULTS AND DISCUSSIONS

As a consequence of the undertaken research upon the quality of the sour cream as raw material, it was noticed that the acidity of the sour cream has average values ranging between 18.5 and 0⁰T. The fat percent in the sour cream has average values that range between 34 and 37%. The number of the coliform bacteria has the average value ranging between 9 and 13 germs/g product (Table 1).

In general, the quality of the raw material for the achievement of the butter is good from a physical-chemical point of view, as well as from a microbiological point of view. However, there are some situations in which these parameters have been exceeded, for example the acidity of 21⁰T.

Table 1

Results of the lab test for sour cream as raw material

No. of sample	Quantities of sour cream	Acidity (⁰ T)		Fat (%)		No. of coliform bacteria	
		Limits	Average	Limits	Average	Limits	Average
1	700	18-20	19	32-38	35	5-17	12
2	800	19-20	19.5	34-38	36	5-15	10
3	750	19-21	20	36-38	37	5-13	9
4	900	18-21	19.5	36-40	38	6-14	10
5	1000	19-20	19.5	32-38	35	6-18	12
6	950	19-21	20	34-36	35	5-19	13
7	800	18-22	20	34-38	36	6-12	9
8	850	18-21	20.5	35-37	36	6-14	10
9	750	19-21	20	33-37	35	5-15	10
10	1000	19-20	19.5	33-39	36	5-17	11
11	850	19-21	20	35-37	36	6-14	10
12	900	18-20	19	34-36	35	6-12	9
13	980	18-21	19.5	32-38	35	5-15	10
14	775	19-21	20	34-38	36	5-17	11
15	820	19-21	20	33-39	36	5-19	12
16	650	18-21	20.5	36-38	37	6-14	10
17	675	18-20	19	36-38	37	6-16	11
18	800	19-20	19.5	32-38	35	6-12	9
19	750	19-21	20	32-40	36	5-15	10
20	700	19-21	20	36-38	37	5-17	11

As a consequence of the lab analysis, for the finite butter, the following physical-chemical parameters of the butter were noticed: water percent of 34.5 – 35%, fat percent of 64 – 65%, acidity of 2.5 – 2.7⁰A and non-fat substance of 1.0 – 1.7%. (Table 2)

Table 2

Results of the physical-chemical test for the achieved butter

No. of sample	Water (%)		Fat (%)		Acidity (⁰ A)		Non-fat substance	
	Limits	Average	Limits	Average	Limits	Average	Limits	Average
1	34-36	35	62-66	65	2.5-2.9	2.7	1.4-1.8	1.6
2	33-36	34.5	63-65	64	2.4-2.6	2.5	1.6-1.8	1.7
3	32-36	34	62-66	64	2.3-2.7	2.5	1.5-1.7	1.6
4	33-35	34	63-66	64.5	2.6-2.8	2.7	1.6-1.8	1.7
5	33-36	34.5	64-66	65	2.4-2.6	2.5	1.6-1.8	1.7
6	34-36	35	64-66	65	2.4-2.8	2.6	0.5-1.3	0.9
7	33-37	35	64-66	65	2.5-2.7	2.6	0.7-1.3	1.0
8	32-36	34	63-65	64	2.3-2.7	2.5	0.9-1.3	1.2
9	33-37	35	62-66	64	2.2-2.8	2.5	1.1-1.3	1.2
10	33-36	34.5	64-65	64.5	2.2-2.8	2.5	1.3-1.5	1.4
11	34-36	35	64-66	65	2.4-2.8	2.6	1.6-1.8	1.7
12	33-36	34.5	63-67	65	2.4-2.6	2.5	1.6-1.8	1.7
13	34-36	35	64-66	65	2.5-2.9	2.7	1.4-1.6	1.5
14	32-36	34	64-66	65	2.3-2.7	2.5	1.3-1.7	1.5
15	33-37	35	64-66	65	2.4-2.6	2.5	1.5-1.7	1.6
16	32-36	34	62-68	65	2.2-2.8	2.5	1.4-1.8	1.6
17	34-36	35	63-67	65	2.5-2.7	2.6	1.1-1.3	1.2
18	33-36	34.5	64-66	65	2.5-2.9	2.7	1.6-1.8	1.7
19	34-36	35	64-66	65	2.4-2.6	2.5	1.5-1.7	1.6
20	34-36	35	64-66	65	2.3-2.7	2.5	1.4-1.6	1.5

In the case of the microbiological parameters of butter, their average values were: the number of coliform bacteria of 12 – 15/ 1 g product, number

of yeasts of 6500 – 8000/ 1 g product and the number of molds was of 900 – 1200/ g products (Table 3).

As a conclusion, the quality of the butter as a finite product is good from a physical-chemical point of view, as well as from a microbiological point of view.

Table 3

Results of the microbiological test of the achieved butter

No. of sample	Coli (1 g/product)		Yeasts (1 g/product)		Molds (1 g/product)	
	Limits	Average	Limits	Average	Limits	Average
1	10-20	15	5000-8000	6500	800-1200	1000
2	10-14	12	5000-8000	6500	800-1400	1200
3	11-17	14	6000-10000	8000	700-1300	1000
4	11-15	13	5000-10000	7500	700-1700	1400
5	10-18	14	5000-10000	7500	800-1000	900
6	10-16	13	6000-10000	8000	800-1200	1000
7	11-15	13	6000-12000	9000	700-1300	1000
8	11-17	14	4000-12000	8000	700-1100	900
9	10-18	14	5000-10000	7500	800-1400	1200
10	11-19	15	5000-12000	8500	800-1200	1000
11	11-21	16	4000-14000	9000	750-1250	1000
12	10-14	12	6000-10000	8000	700-1400	1050
13	11-19	15	5000-8000	6500	800-1200	1000
14	11-17	14	5000-10000	7500	800-1400	1200
15	11-15	13	4000-12000	8000	800-1000	900
16	10-20	15	5000-8000	6500	700-1300	1000
17	10-22	16	6000-10000	8000	700-1500	1100
18	11-19	15	6000-10000	8000	800-1400	1200
19	11-15	13	5000-8000	6500	800-1000	900
20	10-20	15	6000-10000	8000	750-1250	1000

CONCLUSIONS

The following conclusions were drawn at the end of this study:

✓ The sour cream as a raw material used in the production corresponds from a physical-chemical and microbiological point of view. From a physical-chemical point of view it presents an acidity ranging between 18.5 – 20⁰T and a fat percent with values ranging between 34 – 37%. Microbiologically, the sour cream has a number of coliform bacteria with an average value ranging between 9 – 12 bacteria /1 g product;

✓ The butter as a finite product, examined on the lots under study corresponds from a physical-chemical and microbiological point of view. From a physical-chemical point of view the butter presents acidity with average values ranging between 2.5 – 2.7⁰A, a fat percent with average values of 64 – 65% and a water quantity with average values ranging between 34 – 35%.

✓ From a microbiological point of view, the butter ranges in the quality norms having the number of coliform bacteria ranging between 12 – 16/1 g product, the number of yeasts between 6500 – 9000/1 g product and the number of molds ranging between 900 – 1400/1 g product.

REFERENCES

1. Bara V. – Tehnologia preparării produselor agricole. Editura Academis Pres Cluj-Napoca, 2002.
2. Bara V. – Tehnici de practică agroalimentară. Editura Academis Pres Cluj-Napoca, 2002.
3. Bara C., Tonț C., Ionescu C. – Microbiologia și controlul calității laptelui și a produselor lactate. Editura Universității din Oradea, 2001.
4. Costin G. – Principii și procedee moderne în industria untului. Universitatea Galați 1998.
5. Laslo C. – Igiena instalațiilor și a unităților din industria alimentară. Tipografia Agronomia Cluj – Napoca, 1996.

