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# Evaluation of the quality of some assortments of milk and dairy products marketed in Iasi county

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***Abstract***
*The complexity of the composition of the food products and the diversity of the qualitative characteristics that must be followed in order to define the quality determine the use of appropriate methods of analysis, of those methods that best reflect the concept of quality.The quality of a product is possible provided that both domestic and international standards are respected, and quality assurance must comply with the requirements of the European Union. The investigations regarding the quality of milk and some dairy products marketed in Iasi county were carried out in the period 2018-2019, on samples collected from the commercial network of Iasi county. The collected samples were pasteurized milk 3.5% G, pasteurized milk 1.5% G, UHT milk 3.5% G and UHT milk 1.5% G. Samples of acid dairy products, namely yogurt, kefir, healthy and fermented cream samples with 12% G, 20% G and 32% G were also taken. The investigations focused on these dairy products taking into account the consumer's requirements and the significant increase in consumption of these products, representing in the diet of people products that are frequently purchased and consumed in a fairly short time. The investigations were carried out to establish the degree of freshness, integrity and we determined a series of physico-chemical parameters of dairy products. The processing of the samples was done in the Food Control Laboratory of the Faculty of Veterinary Medicine Iași, where a number of 28 milk samples, 30 samples of acid dairy products and 30 tests of fermented cream were processed. Following the analysis of the samples, a number of 18 milk were physically and chemically non-conforming, and all the examined samples were organoleptic conforming. When examining the samples of acid dairy products a number of 25 samples were non-conforming for the physico-chemical parameters, and organoleptic 8 samples were non-conforming. The determination of the physical and chemical parameters at the cream revealed a total of 17 non-conforming samples and 8 organoleptic samples were non-conforming.*
***Keywords****: milk, sour milk products, cream, quality control*

## Introduction

The complexity of the composition of the food products and the diversity of the qualitative characteristics to be followed in order to define the quality determine the use of appropriate methods of analysis, of those methods that are in accordance with the technical progress and the quality requirements (3,5).

The increase in the consumption of dairy products in recent years requires special attention to their quality from the producer but also from the authorities in the field of food safety. The variety of dairy product assortments is very varied and their production technology is advanced, however there are deficiencies in the delivery of quality products and in respect of quality parameters (1,4,6).

The analytical methods used are standardized methods, but the organoleptic examination continues to play a major role, being used by the consumer as the sole assessment of the product (2,3,5).

The organoleptic and aesthetic value is what gives the impulse to buy a product determines its appearance. Organoleptic properties constitute for the ordinary buyer the first criterion for quality assessment, influencing the selection and acceptability of food products that most often have a high degree of subjectivity. Modeling the psychosensory value of food represents at the

present time the essential condition for obtaining salable foods (4,5). If the interests of the consumer's health were taken into consideration, they should be prioritized in a healthy, nutritious and pleasant order. Although the safety and nutritional value of a food are essential conditions for life and health (2,4).

Due to the particularly strong impact on the population of the advertisements on food products, influencing consumers in the purchase of food, it has been reached to exaggerate the qualitative characteristics or even to attribute the unfounded characteristics of the product. At present, these advertisements of food products have as a principle the sale of the product and are not educational in nature (1).

**Material and method**

The investigations regarding the quality of milk and some dairy products marketed in Iași county were carried out between 2018 and 2019, on samples collected from the commercial network of Iași county from different supermarkets, selecting the most purchased and consumed products by the population. The collected samples were pasteurized milk 3.5% G, pasteurized milk 1.5% G, UHT milk 3.5% G, UHT milk 1.5% G. Samples of acidic dairy products, namely yogurt, kefir, health and fermented cream samples with 12% G, 20% G and 32% G were also taken. The processing of the samples was done in the Food Control Laboratory of the Faculty of Veterinary Medicine Iași, where a number of 28 milk samples, 30 samples of acid dairy products and 30 samples of fermented dementia were processed. The investigations were carried out to establish the degree of freshness, integrity and we determined a series of physico-chemical parameters of dairy products, respectively acidity and fat.

The organoleptic characteristics followed some criteria relevant for both the freshness of the products and their quality, these being the appearance and the consistency, the taste, the smell and the color (3,6).

The principle of the acidity method of milk and milk products consists in neutralizing the acidity of milk with a solution of NaOH n / 10, in the presence of phenolphthalein as an indicator (2,3).

Determination of the fat content - the butyrometric method with the specific butyrometer of each product, and the principle of the method consists in the dissolution and mineralization of the protein substances and the calcium phosphates in milk with the help of sulfuric acid; release of fat by breaking the protein shell of the globules with the help of isoamyl alcohol and separating the liquid fat in the column by centrifugation (2,3,6).

**Results and discussions**

Milk and dairy products, due to their chemical composition and high degree of assimilation, occupy an important place in the rational nutrition of humans, being one of the most accessible sources of animal protein. Currently, the appreciation of milk is made, depending on the fat content and quality, the parameters that will surely influence, the price that the consumer will pay for the product (1). Many of the products obtained in the milk industry can be considered as physiologically functional foods. Dairy products such as drinking milk, sour milk, cream are an excellent source of protein, calcium and phosphorus and some vitamins. In a number of countries with a "western type" diet, milk and dairy products provide 60-75% of the total calcium needed by the body.

The organoleptic properties of pasteurized milk and UHT with 3.5% G and 1.5% G corresponded to the evaluation criteria for all samples examined (Table 1).

Table 1. Organoleptic characteristics of pasteurized milk and UHT with 3.5% G and 1.5% G

| **Indices** | **Characteristics Pasteurized milk or UHT 3.5%** | **Characteristics Pasteurized milk or UHT 1.5% G** |
|---|---|---|
| Appearance and consistency | Homogeneous, opaque, matte appearance | Homogeneous, low opacity |
| Taste and smell | Pleasant, sweet, specific, taste and smell of boiled milk | Pleasant, sweet, specific, taste and smell of boiled milk |
| Color | White with a slight yellowish hue | White with a light blue hue |

The investigations regarding the parameters for acidity and fat are relevant for the milk sputtering 3,5% G, 1 test non-conformity to acidity and 5 samples non-conforming to fat from the total of 8 samples examined. Similar results were obtained for pasteurized milk with 1.5% G, the total of samples examined being also 8 samples (Table 2).

Table 2. Investigations on the physico-chemical parameters of pasteurized milk and UHT with 3.5% G and 1.5% G

| **The product** | **Number of samples analyzed** | **Physico-chemical parameters (Acidity)** | | **Physico-chemical parameters (Fat)** | |
|---|---|---|---|---|---|
| | | C | N | C | N |
| Pasteurized milk 3.5% G | 8 | 7 | **1** | 3 | **5** |
| | | 87,5% | 12,5% | 37,5% | 62,5% |
| Pasteurized milk 1.5% G | 8 | 7 | **1** | 3 | **5** |
| | | 87,5% | 12,5% | 37,5% | 62,5% |
| UHT milk 3.5% G | 6 | 6 | **0** | 2 | **4** |
| | | 100 | 0 | 33,3% | 66,6% |
| UHT milk 1.5% G | 6 | 6 | **0** | 2 | **4** |
| | | 100 | 0 | 33,3% | 66,6% |

The UHT milk did not present any non-conforming sample for the acidity parameter, falling within the limits of 19 -21$^0$T, but the fat parameter presented 4 non-compliant samples out of the total of 6 examined for each assortment.

Yogurt, health and kefir are the main assortments of acidic dairy products that are currently produced in larger quantities in our country and are obtained through the controlled fermentation of milk, due to the seeding with selected lactic acid bacteria cultures, consisting of streptococci and milk bacilli. In the case of kefir, some yeast species also contribute.

Although the energy value of dairy products is about the same as raw material (milk), however, the nutritional value is improved due to: changes in protein.

Yogurt is a product with nutritional and dietary value. It contains all the nutrients of the milk, but in a more easily assimilable form due to the changes that take place during the manufacturing technology. The fineness of the particles of the yogurt shell increases the contact surface with the gastric juices, thus making it easier to digest (3).

Sensory properties were examined according to the specificity of each milk product examined. Appearance and consistency: the compact shell has a fluid consistency, homogeneous, without gas bubbles, without the elimination of whey, with a porcelain appearance when breaking (admits between 2% whey and maximum 5% in fat and weak).

The color for all products is uniformly white and the taste and smell is pleasant, sour, aromatic (Table 3).

Table 3. Organoleptic characteristics of acid dairy products

| **Indices** | **Characteristics Yogurt Fat 2.8% G** | **Characteristics Sana 3.6% G** | **Characteristics Kefir 3.3% G** |
|---|---|---|---|
| **Appearance and consistency** | Consistently creamy shell, breaking porcelain appearance | Fluid consistency of fresh cream | Fine, homogeneous shell with fine gas bubbles |
| **Taste and smell** | Specifically sour | Pleasant characteristic, sour | Pleasant characteristic, sour, slightly pungent, refreshing |
| **Color** | White with a slight yellowish hue | White uniform, milk | White, uniform |

The organoleptic investigations for each assortment of acid dairy products revealed 2.8% G of the 10 yogurt samples examined, 2 non-compliant samples, the healthy product 3.6% G of the 10 samples examined 3 non-compliant samples. and in kefir 3.3% G out of 10 samples examined 3 non-compliant samples (Table 4).

Table 4. Investigations regarding the organoleptic characteristics and physico-chemical parameters of acid dairy products

| **The products** | **Number of samples analyzed** | **Organoleptic characters** | | **Parameters physicochemical (Acidity)** | | **Parameters physicochemical (Fat)** | |
|---|---|---|---|---|---|---|---|
| | | **C** | **N** | **C** | **N** | **C** | **N** |
| **Fat yogurt 2.8% G** | 10 | 8 | **2** | 6 | 4 | 5 | **5** |
| | | 80% | 20% | 60% | 40% | 50% | 50% |
| **Sana 3.6% G** | 10 | 7 | **3** | 7 | **3** | 6 | **4** |
| | | 70% | 30% | 70% | 30% | 60% | 40% |
| **Kefir 3.3% G** | 10 | 7 | **3** | 5 | **5** | 6 | **4** |
| | | 70% | 30% | 50% | 50% | 60% | 40% |

From table 4 it is shown that for the fat yogurt there were a number of 4 non-conforming samples for acidity and 5 non-conforming samples for the fat parameter, the healthy and the kefir had 3 and 5 non-conforming samples for acidity and 4 samples for each assortment for fat.

The milk product fermented cream was examined in terms of its quality, taking into consideration various assortments of fat fermented cream 12%, 20% and 32%. The organoleptic

characteristics of the assortments examined varied from one product to another, the appearance and consistency being homogeneous and viscous, the taste pleasant, aromatic and the color being white yellow to the assortment with 32% G.

From the total of 12 samples examined from each assortment, a number of 5 non-compliant samples for the cream with 12% G were revealed and a number of 3 non-compliant samples for the cream with 20% G, regarding the organoleptic examination. The assortment of cream with 32% G did not present any non-compliant sample (Table 5).

Table 5. Organoleptic characteristics of fermented cream

| **Indices** | **Characteristics**<br>**Fermented cream 12 %G, 20 %G și 32% G** |
|---|---|
| **Appearance and consistency** | Homogeneous, viscous, free of grease |
| **Taste and smell** | Pleasant, aromatic, slightly sour, lactic fermentation |
| **Color** | Uniform white or yellowish white throughout the meal |

The determinations for the acidity parameter at the 12% G cream, revealed a number of 4 inadequate samples and for 6 fat samples. The determination of the acidity was not suitable for 3 samples in the assortment with 20% G, and in the fat were found 4 non-compliant samples (Table 6).

Table 6. Investigations regarding the organoleptic characteristics and the physico-chemical parameters of the fermented cream

| **The product** | **Number of samples analyzed** | **Organoleptic characters** | | **Parameters physicochemical (Acidity)** | | **Parameters physicochemical (Fat)** | |
|---|---|---|---|---|---|---|---|
| | | C | N | C | N | C | N |
| **Cream 12%G** | 12 | 7 | **5** | 8 | **4** | 6 | **6** |
| | | 58,3% | 41,6% | 66,6% | 33,3% | 50% | 50% |
| **Cream 20%G** | 12 | 9 | **3** | 9 | **3** | 8 | **4** |
| | | 75% | 25% | 75% | 25% | 66,6% | 33,3% |
| **Cream 32%G** | 6 | 6 | **0** | 6 | **0** | 5 | **1** |
| | | 100% | 0 | 100% | 0 | 83,3% | 16,6% |

Of all the assortments examined but the 32% G cream corresponded to all the parameters examined, finding a single non-compliant pan, this showing that a fermented cream the higher the amount of fat, the better the quality parameters.

**Conclusions**

1. The increase of the consumption of dairy products in the last years demands a special attention on their quality from the producer but also from the authorities in the field of food safety.

2. The variety of dairy product assortments is highly diversified and their production technology is advanced, however there are shortcomings in the delivery of quality products and compliance with quality parameters.

3. The methods of analysis used are standardized methods, but the organoleptic examination continues to play a major role, being used by the consumer as the only method of assessment.

4. The investigations focused on these dairy products taking into account the demands of the consumer but also the significant increase in consumption of these products. They represent in the daily life foods that are frequently purchased and consumed in a fairly short time.

5. The benefit of a dairy production company should come not only from the quality of a product but also from the long-term assurance of a constant quality of all the obtained products.

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