

A STUDY REGARDING THE NUTRITIONAL VALUE OF THE YOGURT WITH GERMINATED WHEAT AND ITS IMPORTANCE IN THE RATIONAL DIET OF THE HUMAN BEINGS

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Abstract

The nutritional value of a certain food product is attributed to its nutritive substances composition (proteins, glucides, lipids, vitamins and mineral salts) to the ratio that there is between these components, to their quality, their degree of digestive processing and using, and to the way in which the product satisfies the necessities of the organism. The dairy products due to their chemical composition and high degree of assimilation play an important role in the human diet being one of the most accessible sources of animal originated proteins. The consumption of one liter of milk covers the daily lipid necessary for a mature human: phosphorus, calcium, proteins, vitamins a, b, c, and 26% from the necessary of energy. The cereals nutritional value, strongly depends not only on the mineral salts content, especially phosphorus, calcium and iron but also on the numerous microelements, the cereals generally being an important source of these nutrients for the body during the human beings evolution.[2] The germinated wheat is superior to the ungerminated one for it contains the maximum of necessary substances for the human body (proteins, glucides, lipids, enzymes, vitamins, vegetal hormones) in the perfect ratios. During this complex biological process it happens the passing of the seed from the inactive to the active state the seed itself substantially increasing like this its nutritional value. In the same way, the mineral substances that cannot be used by the body, for when found in the seed complex are unabsorbable, become available through germination and can be absorbed.[3]

Keywords: yogurt, germinated wheat, yogurt with cereals, acidity, fat, determination

1. INTRODUCTION

The yogurt contains a series of compounds that come from the milk used as a raw material, but that differ from the quality and quantity point of view due to the microbiological transformations that take place during the lactic fermentation. [1]

The simple yogurt has been obtained from 100ml cow milk of 2.6% fat in which there were added selected cultures of: Streptococcus termophilus and Lactobacillus bulgaricus. It was preserved in the thermostat for 4 h at 42°C. for the yogurt sample with germinated wheat

there were obtained 4 types of yogurts: two with 5% cereals and two with 8% cereals. The yogurt was obtained from 400ml of milk to which it was added germinated wheat (5gr and respectively 8gr of germinated wheat). For the same samples there were also added selected cultures of Streptococcus termophilus and Lactobacillus bulgaricus being then maintained for 4h at 42°C.[4]

The wheat germination was realized by letting it between 2 filter moisturized sheets of paper for 24h until it germinated and it was grinded.

Table 1. Methods of determination for the quality indicators of the yogurt used in the experiments

Quality indicators	Method of determination
Organoleptic examination	STAS 6345-74
Acidity, degrees of acidity/100 g	STAS 6353-68
Fat content	STAS 6352-1-73
Saccharose determination	STAS 6356-61
pH determination	STAS 8201-68

2. MATERIALS AND METHODS

- Streptococcus termophilus and Lactobacillus bulgaricus
- Glass blades and blinds
- Fuxin
- Cedar oil

- Microscope
- Glass electrode for measuring the pH

3. RESULTS AND DISCUSSION

3.1. Organoleptic properties

Table 2. Organoleptic properties

Organoleptic properties	Simple yogurt	Yogurt with 8% cereals
Appearance	- creamy - slightly synaeresis - at breaking it has an porcelain appearance	- creamy - slightly synaeresis - at breaking it has an porcelain appearance
Taste	- pleasant, sourish, characteristic for yogurt - no strange taste	- sweetish taste, characteristic for yogurt with cereals
Colour	- slightly yellow	- white-brownish due to the germinated cereals
Smell	- pleasant characteristic for yogurt	- pleasant characteristic for yogurt and cereals
Consistency	- without gas or air bubbles	- without gas or air bubbles
Coag	- homogeneous and compact	- homogeneous and compact

3.2. Glucidic determination

It can be said that the human being's diet is characterized by a pronounced glucidic orientation. The necessary of glucides of the body is between 4-5g/ kg in 24 hours and it depends on the intensity of the energy consumption.

That is way when establishing the necessary of glucides for different persons it is taken into account firstly the quantity of energy consumed for 51-59% of this must be ensured by the glucides.

In the table below there are shown the results of the glucidic concentration using a quantity of $\text{Na}_2\text{S}_2\text{O}_2$ 0.1N following the Schoorl method.

Table 3. The results of the glucidic concentration using a quantity of $\text{Na}_2\text{S}_2\text{O}_2$ 0.1N

Reagent's name	Simple yogurt	Yogurt with 5% cereals	Yogurt with 8% cereals
Tio sulphate solution $\text{Na}_2\text{S}_2\text{O}_2$ 0,1N	-	9 ml	14 ml
Results: Inverted sugar mg	1,0 glucides	33.4 % glucides	50, 8 % glucides

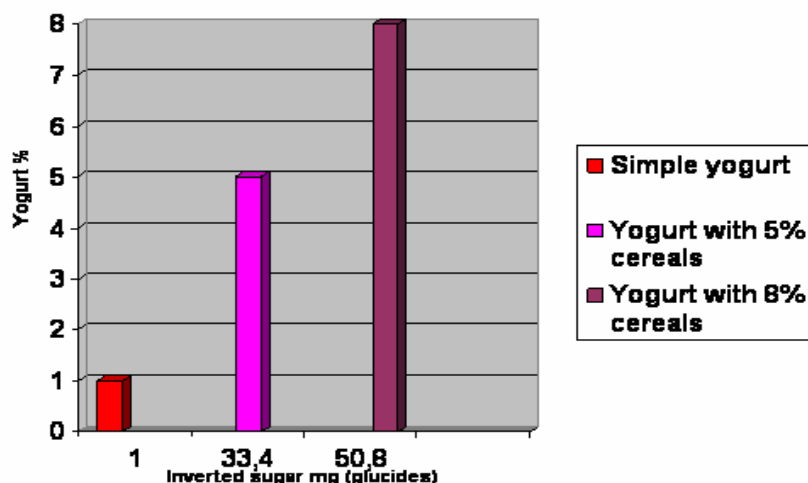


Figure 1. Sugars' content

The sugars are found in a higher percent in the yogurts with 5% and 8% cereals due to presence in the cereals of the maltose which is a disaccharide resulted from the starch and dextrins hydrolysis fact that generally leads to the increasing of glucides concentration in the yogurt.

3.3. Acidity's determination

Table 4. The acidity of the yogurt grades

	Simple yogurt	Yogurt with 5% cereals	Yogurt with 8% cereals
Sodium hydroxide (NaOH 0,1 N)	15 ml	15 ml	15 ml
°T	150° T	145° T	140° T

The acidity of the simple yogurt is of 150° T, and at the yogurt with 5% and 8% germinated wheat it can be observed a slightly decreasing of it due to the pH increasing. The slightly decreased values at the yogurt with cereals are

mostly to the added cereal grind that slowed down the acidifying process of the product.

3.4. pH's determination

Table 5. The pH's determination

	Simple yogurt	Yogurt with 5% cereals	Yogurt with 8% cereals
Temperature	25,7°C	26,2°C	24,1°C
pH	3,66	3,85	4,02

It can be observed in the above table a slightly increase of the pH due to the amine groups after the proteins hydrolysis. Through these lab analysis it was targeted the underlining of the acidity's and pH's evolution in the yogurt with cereals in the same way as for any other diary acid product.

The pH's increasement is shown by the following graphic:

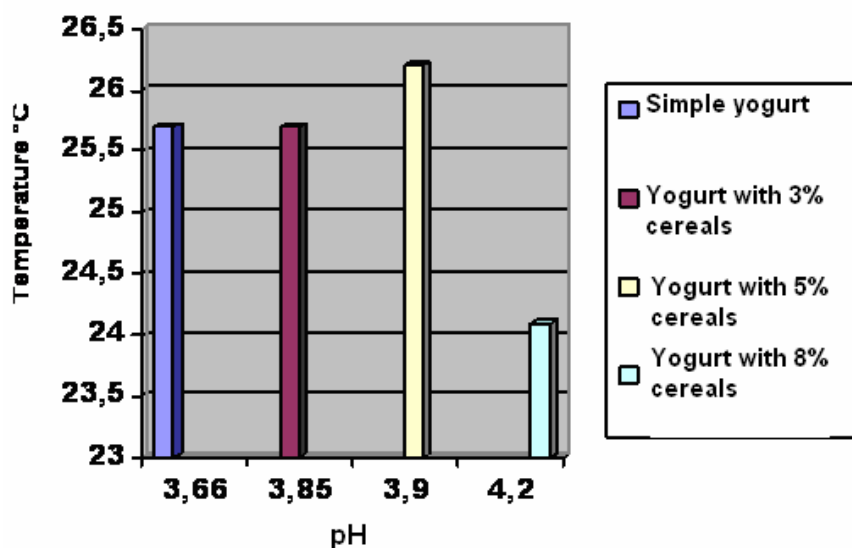


Figure 2. pH's increasing according to the temperature

For each yogurt sample there have been led two consecutive measurements being taken in consideration as a proper result the arithmetical average of the two measurements' results.

3. 5. Fat content determination

The fat content read on the butyrometric scale for yogurt was of 2.6%.

3. 6. The microbiological properties

For to underline the presence of the lactic bacterias we used as a execution technique the smears. The culture used for the yogurt preparation is a mixed culture of two species: Streptococcus thermophilus and Lactobacillus bulgaricus. If Streptococcus thermophilus doesn't raise any kind of problems regarding its identity, the things aren't the same for Lactobacillus bulgaricus. Following the numerical and morphological variations of yogurt's microflora during the fermentation process it was observed the fact that at the beginning Streptococcus thermophilus creates short cross links and then disappears in its place appearing new diplococcal forms. Similar modifications are also suffered by the lacto bacillus at the beginning they appear in cross links of 6 bacillus and then the cross links disappear leaving behind isolated or equilibrated bacillus.

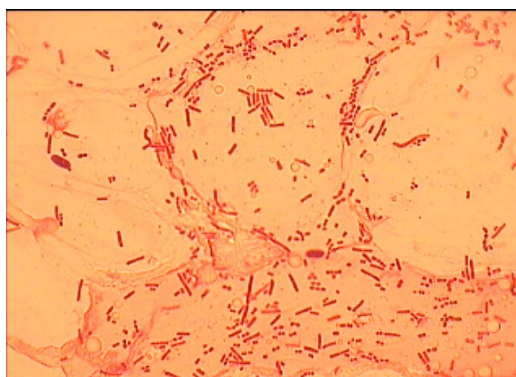


Figure 3. Lactobacillus

Between Lactobacillus bulgaricus and Streptococcus thermophilus there is a symbiotic ratio in the first phase of development later, the inhibition action being exerted by the lactobacillus through the lactic acid that it forms in excess.

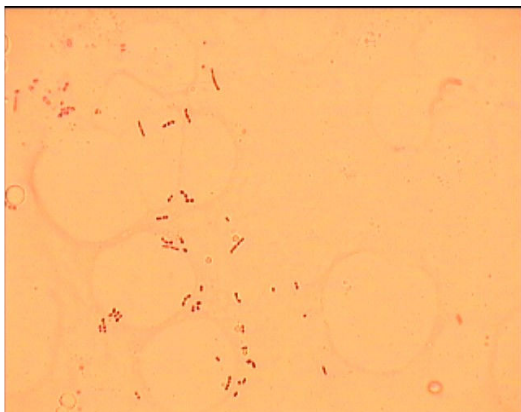


Figure 4. Streptococcus

4. CONCLUSIONS

This study regarding the applications for the research upon the glucidic content, and the determination of acidity, pH and fat content for yogurt proved through the led analysis and obtained results the similarities and differences between the simple yogurt and the one with cereals.

Even though the row material used was the same as that used for any kind of yogurt (the cow milk), the microorganisms culture was identical (starter lyophilized freezed culture, containing *L. bulgaricus* and *S. thermophilus*-specific for the yogurt inoculation) and the thermostatic was led in the same conditions the obtained product was a little bit different. It

had, duet o the cereals added in composition a lower acidity degree that confers generally for the product a longer shelf life. The taste was sweeter, characteristic for the yogurt with cereals, the colour was brown duet o the germinated wheat and the smell was characteristic for yogurt and germinated cereals. Taking into account the things mentioned above it can be said that the addings used in the experimental phase of this study could be used in the acid diary industry for to valorify better a light milk, with low glucidic or proteic content the obtaining of higher taste properties being possible to achieve. [5]

5. REFERENCES

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