

Monitoring the quality of yogurt during storage

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Introduction

Yogurt is a fermented dairy product produced by fermentation of lactic acid through the action of *Streptococcus salvarius* subsp. *thermophilus*, *Lactobacillus delbrueckii* subsp. *bulgaricus*. The quality and composition of the applied bacterial cultures affect the quality of the yogurt obtained as a result of the fermentation processes of the milk. Yogurt is the most commonly used dairy product in the diet due to its favorable Ca/Na ratio and it belongs to the group of functional food that fulfills the nutritional and immune needs of the human body. In the group of the most commonly parameters for analyzing the quality of yogurt are included: titration acidity, viscosity and water holding capacity (WHC).

Materials and methods

Five of the examined samples were taken on the day of filling, while the remaining five were stored in a refrigerator at a temperature of 4-6 °C.

Samples for analysis were opened on the day of analysis (1st day) and stored at a temperature of 4-6 °C until the fifth day (5th day) when the second analysis was made.

The titration acidity of the yogurt was examined by the Soxhlet Henkel method (20g yogurt, 20 ml water and 2 ml 2% phenolphthalein (indicator) were titrated with 0.1 M NaOH until the appearance of a pale pink color).

The viscosity of the yogurt was measured using a viscometer ThermoScientific HAAKE Viscotesters at a temperature of 20 °C with a constant spindle speed of 50 rpm.

The examination of the water holding capacity (WHC) was performed according to the Parnell-Clunies method with the help of centrifugation, after which the mass of the separated whey was measured.

The aim of the study was:

To investigate the quality of yoghurt during cold storage, for that purpose ten samples of yogurt packed in a 1 liter tetrapack were taken.

Results

Table 1 –Table of values obtained from the analysis of yogurt samples (N=10)

Sampling time for analysis	On the day of filling	After 1 month
Titration acidity (°SH)		
1st day	39.02 ^a	42.44 ^b
5th day	40.50 ^a	46.62 ^c
Viscosity (mPas)		
1st day	693.50 ^a	1197.53 ^b
5th day	701.90 ^a	1253.35 ^b
WHC (%)		
1st day	11.83 ^a	10.71 ^b
5th day	11.10 ^a	9.90 ^a

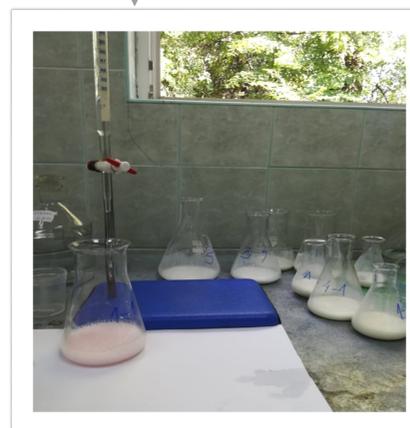
Differences in values with different superscripts in the same group are statistically significant at the level: a: b, a: c, b: c p <0.05*

According to the Table 1, all samples show an increase in parameters (titration acidity, viscosity and water holding capacity).

An increase in titration acidity is followed by decreased activity due to improper storage conditions and possible microbiological contamination.

In general, continuous viscosity or its minimal increase during the storage period of open yogurt is the result of the addition of a stabilizer in its production.

Yogurt with a higher percentage of protein would have higher WHC as a result of the interaction of casein and whey protein and the newly formed porous gel who can absorb more amount of water.



Conclusions

Monitoring the quality of yogurt is an inevitable segment if we want it to retain its characteristic properties. Depending on the remaining term, storage period and conditions as the most viable parameters in yogurt are: titration acidity, viscosity and water holding capacity. As a result of the storage period, the samples analyzed on the day of filling had lower titration acidity, compared with those stored in the refrigerator for one month. After the opening of the yogurt, the increase in the titration acidity was significant in the samples that were stored in the refrigerator for one month.

The increase in viscosity was observed on the first day of analysis in samples that were stored in the refrigerator for one month and no significant differences were recorded during the analysis. The decrease in WHC as a result of the storage period was observed in the samples that were stored in the refrigerator for one month and the same was followed in the both types of yogurt during the analysis.