

# Monitoring the titration acidity as one of the most important parameters for yogurt quality

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## 1. Introduction

In many modern societies, fermented dairy products make up a large percentage of total daily food intake. It has also long been believed that consuming such products has many health benefits (Metchnikoff, 1901).

Yogurt is a fermented milk product that is used as part of the human diet or as a refreshing drink. It is a nutritionally balanced product that contains almost all the nutrients present in milk, but in a much more accessible form. It is obtained by lactic-acid fermentation of milk as a result of the action of added starter cultures *Streptococcus thermophilus* and *Lactobacillus bulgaricus* (Addlsson et al. 2004).

Yogurt is considered a healthy food due to its easy digestibility and high nutrient content, and is also recommended for people who are lactose intolerant, have gastrointestinal problems and for people who need to control their weight, (Lourens and Vlijoen 2001; Mckinley, 2005). It is an excellent source of protein, calcium phosphorus, riboflavin (vitamin B2), thiamine (vitamin B1) and vitamin B12, it also has folic acid, niacin, magnesium and zinc.

## 2. Materials and Methods

The aim of this study was to investigate 10 samples of yogurt, purchased from a small sales network with a different percentage of fat. The yogurt was opened on the first day of the research just before the start of the analysis and then stored at a temperature of 0-4°C. Analyses were performed in duplicates every day until the fifth day of opening the yogurt.

The titration acidity (°SH) was performed by the Soxhlet Henkel method (Trajkovska, 2017). 20g of yogurt, 20ml of water and 2 ml of 2% phenolphthalein (indicator) are being titrated with 0.1 M NaOH until the appearance of a pale pink color.

Microsoft Office Excel version 2017 (Microsoft Office Corporation, USA) was used for statistical analysis of the obtained results.



## 3. Results and Discussion

Depending on the composition of the milk, the technological process and storage conditions (Ezeonu et al. 2016), the quality of yogurt and its physicochemical properties vary from manufacturer to manufacturer (Younus S. et al. 2002).

Titration acidity is among the most important parameters that are analyzed in yogurt and which can easily and simply determine the quality, i.e. the shelf life and acceptability of the same (Al-Kadarny et al. 2002).

Table no. 1 - Table of the results obtained from the analysis of the titration acidity of yogurt

Number of samples	Titration acidity (°SH)				
	Day 1	Day 2	Day 3	Day 4	Day 5
Sample 1	37.4	39.4	39.4	39.2	39.2
Sample 2	37.2	40.2	39.9	39.5	40
Sample 3	36.6	41.9	42	42.3	41.7
Sample 4	38.4	41	40.4	40.4	41.2
Sample 5	36.8	37.8	36.2	36.4	37
Sample 6	41.6	44	42.3	42.2	42.5
Sample 7	45.2	44.3	43.5	43.3	43.5
Sample 8	37	40.4	39.2	41.5	41.8
Sample 9	51.6	56.2	55	56.4	56.3
Sample 10	48.6	50.8	49.7	49.8	52.1

\*t<sub>5,9</sub> > 0.05

From the obtained results shown in table no 1 we can observe that the storage period (5 days) at T=0-4°C that there is no effect on the increase in titration acidity (Younus S. et al. 2002), i.e. the statistical difference between the obtained values from the first and fifth day is >0.05. In addition, according to research by Adam (2008), the period of storage of yogurt under appropriate conditions does not lead to significant changes in its composition. In addition, the increase in titration acidity is followed by a sharp and sour taste which is one of the indicators of reduced quality of yogurt (Al-Kadarny et al. 2002).

Out of the total of 10 analyzed samples, an increase in titration acidity above the allowable value (55 °SH) was observed only in sample 9 (56.2 °SH) on the second day after opening, but the same sample has initially higher titration acidity than other products. According to Vucic (2014), increased titration acidity may be the result of postacidification or metabolic activity of starter cultures that leads to a change in sensory properties and a decrease in viability or microbiological contamination during storage (Alkali et al. 2007).

## 4. Conclusions

Titration acidity is one of the most important parameters for determining the quality of yogurt. The results of the research conducted to monitor the change in the titration acidity of yogurt over a period of five days from the opening day indicate, that the time and storage conditions have a significant impact on the qualitative properties of yogurt. Nine out of ten examined samples had a satisfactory degree of acidity, while the observed variations were considered to be the result of postacidification. However, no statistical significance (> 0.05) was observed between the samples during the study period.

