

CHEMICAL QUALITY AND MICROBIOLOGICAL COMPLIANCE OF BUTTER AVAILABLE ON THE CROATIAN MARKET



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INTRODUCTION

Butter is a traditional dairy product of considerable nutritional value, making regular monitoring of its chemical quality and microbiological safety essential.



AIM

The aim of this study was to evaluate the chemical and microbiological quality indicators of five butter samples produced by different manufacturers and available on the Croatian market.

MATERIALS & METHODS

Samples



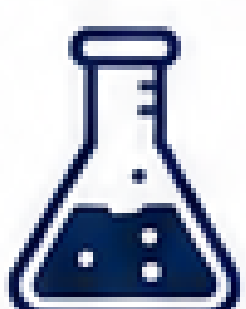
Five butter samples (S1–S5) from different manufacturers available on the Croatian market.

Storage



Samples were stored at 4 °C and analyzed the next day.

Chemical analyses



- Water content (drying at 105 ± 2 °C to constant mass)
- Milk fat content (ISO 17189:2003)
- Non-fat dry matter (calculated: $100\% - \text{fat}\% - \text{water}\%$)

Microbiological analyses



- Salmonella* spp.
- Listeria monocytogenes*
- Escherichia coli*
- Coagulase-positive staphylococci
- Yeasts and molds

Analyses were performed using standard methods in accordance with:

- Guide for Microbiological Criteria for Food (2011)
- Food Hygiene Act
- Microbiological Criteria for Food (NN 83/22)

RESULTS

CHEMICAL QUALITY INDICATORS

Sample	Milk fat (%)	Water (%)	Non-fat dry matter* (%)
S1	84	14	2
S2	82	16	2
S3	83	15	2
S4	85	14	1
S5	85	13	2
LEGAL REQUIREMENTS (for butter)	min. 82	max. 16	max. 2

* Calculated: $100\% - \text{fat}\% - \text{water}\%$

MICROBIOLOGICAL RESULTS

Microorganism	Results (all samples)	Legal requirements (for butter)
<i>Salmonella</i> spp.	Not detected in 25 g	Absent in 25 g
<i>Listeria monocytogenes</i>	Not detected in 25 g	Absent in 25 g
<i>Escherichia coli</i>	< 10 CFU/g	max. 10^2 CFU/g
Coagulase-positive staphylococci	< 10^2 CFU/g	max. 10^3 CFU/g
Yeasts	< 10^2 CFU/g	max. 10^4 CFU/g
Molds	< 10^2 CFU/g	max. 10^4 CFU/g

CFU/g – colony forming units per gram

CONCLUSION



The results showed that all analyzed butter samples complied with the legal requirements.

- Milk fat content ranged from 82 % to 85 %.
- Water content ranged from 13 % to 16 %.
- Non-fat dry matter content ranged from 1 % to 2 % (four samples contained 2 %, one sample contained 1 %).
- No pathogenic bacteria were detected, and the counts of other microorganisms were within the permitted limits.

All analyzed samples were found to be microbiologically safe and suitable for human consumption.

