



The antimicrobial capacity of the fruits powders added to fortify the spreadable cream cheese

Grigor Maria¹, Voşgan Zorica¹, Dumuţa Anca¹, Mihalescu Beatrice¹

¹Technical University of Cluj-Napoca, North University Center of Baia Mare, Faculty of Sciences, Department of Chemistry and Biology, 76 Victoriei Street, 430122 Baia Mare, Romania

Abstract: The spreadable cream cheese obtained from cow's milk has been fortified by fruit powders additions (aronia, sea buckthorn, rose hips, hawthorn) to improve the quality characteristics and increase the degree of preservation. The physical-chemical properties after preparation and the microbiological ones at intervals of one, three, and ten days of refrigerated storage were analyzed. The results showed a slight increase in acidity, a decrease in moisture and fat content in all samples with fruit powders, compared to the control sample. The antimicrobial capacity was indicated by the decrease in the number of bacteria reaching at the end of the 10 days monitorization that the microbial count ($\log_{10}$ CFU g⁻¹) of TCP to decrease by 19.25-21.80% compared to the control sample; also, EC was not detected at all in the samples with added powders, and CPS were reduced by 46.44-100%. Forest fruit powders can be used in the production of dairy products as natural ingredients, offering resistance to contamination and consumer safety.

• Introduction

The integration of functional ingredients from vegetable sources in the cheese manufacturing process could be an effective strategy for improving the overall quality of these products (Difonzo et al. 2023).

• Material and method

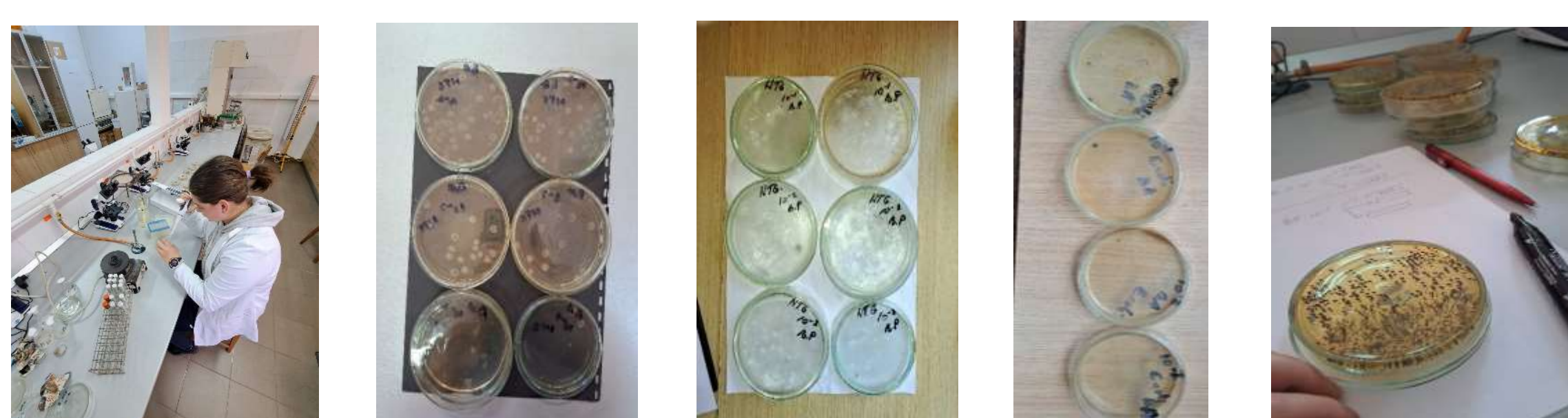
Samples of spreadable cream cheese obtained from cow's cheese and fortified with fruit powders are:



- CS - control sample
- Ar-SCC – with aronia powder
- SB-SCC- with sea buckthorn powder
- RH-SCC – with rose hips powder
- Ha-SCC – with hawthorn powder



The work methods were based on physical-chemical analyzes (titratable acidity, °T, moisture %, fat in dry mater, %), after preparation and microbiological analyzes, such as total plate count (TPC), β -glucuronidase-positive *Escherichia coli* count (EC) and Coagulase-Positive *Staphylococci* (CPS), *Staphylococcus aureus* and other species at 1 day, 3, and 10 days of refrigerated storage (4°C).



• Conclusions

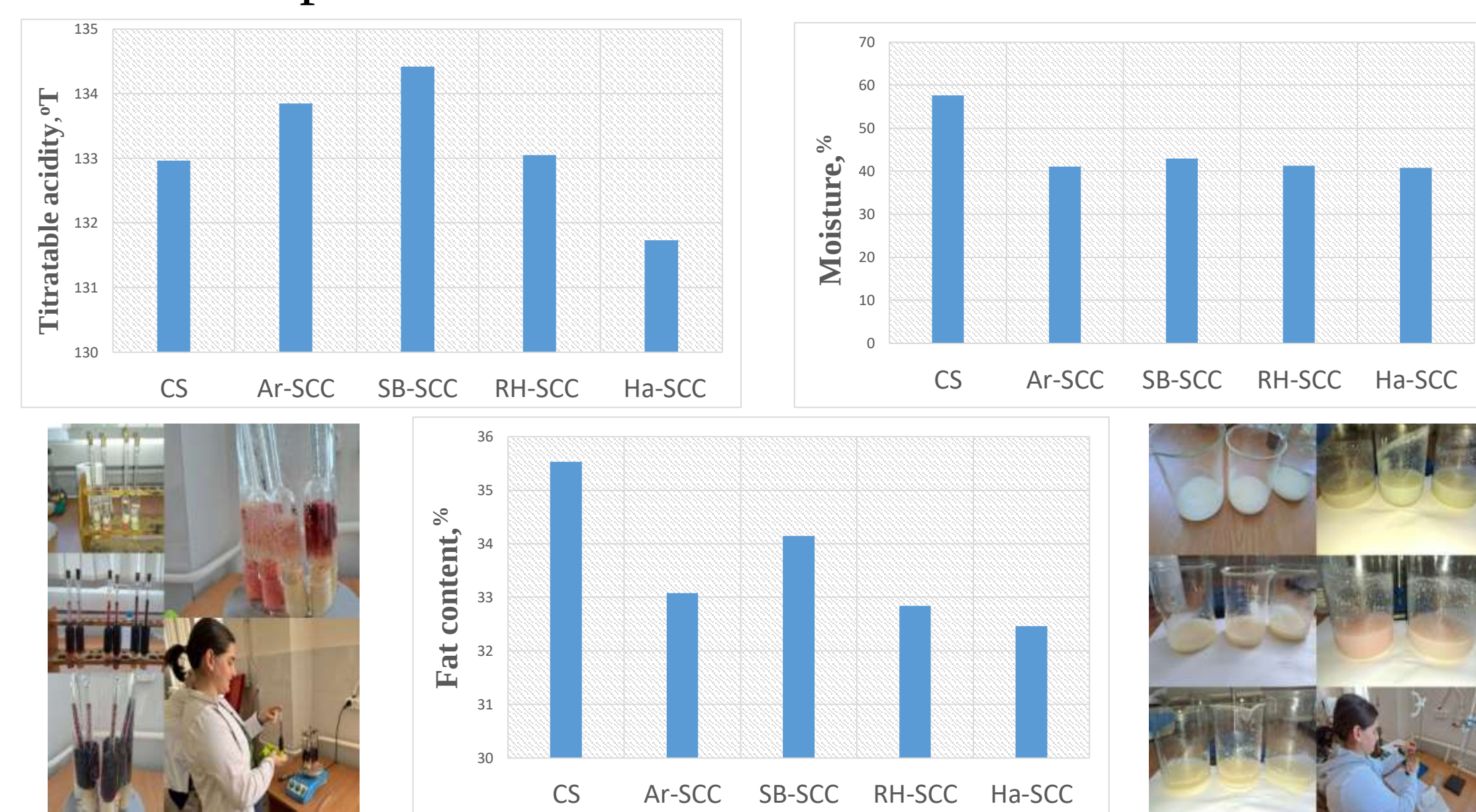
The dairy industry must pay more attention to the reduction of the microbial spoilage, and the use of berries can be an effective alternative in increasing the nutritional value and satisfying consumers needs.

Bibliography

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Kim DH, Kim H, Kim J, Bae D, Song KY, Chon JW, Lee JM, Kim SH, Lim HW, Seo KH. Antibacterial activity of crude *Aronia melanocarpa* (black chokeberry) extracts against *Bacillus cereus*, *Staphylococcus aureus*, *Cronobacter sakazakii*, and *Salmonella Enteritidis* in various dairy foods: Preliminary study. *J. Milk Sci. Biotechnol.* **2018**, *36*:155–163.

• Results and discussions

Titratable acidity increases slightly after adding aronia, sea buckthorn and rose hips powders, compared to the control sample, and the moisture and fat content decreases in all samples with fruit powders, which reduces the possibility of microbial proliferation.



The changes of the microbiological parameters for the spreadable cream cheese assortments, after 1, 3, respectively 10 days of refrigeration storage, are presented in table 1.

Day	Sample	Parameter		
		TPC* $\log_{10}$ CFU g ⁻¹	EC* $\log_{10}$ CFU g ⁻¹	CPS * $\log_{10}$ CFU g ⁻¹
1	CS	3.87±0.12	1.35±0.04	3.25±0.03
	Ar-SCC	3.81±0.03	0.83±0.06	3.19±0.07
	SB-SCC	3.84±0.11	0.56±0.51	3.22±0.04
	RH-SCC	3.85±0.10	0.96±0.15	3.24±0.02
	Ha-SCC	3.83±0.08	0.93±0.11	3.13±0.06
3	CS	3.95±0.04	1.39±0.16	3.29±0.03
	Ar-SCC	3.62±0.05	0.15±0.27	1.98±0.12
	SB-SCC	3.69±0.03	0.1±0.17	2.13±0.02
	RH-SCC	3.77±0.09	0.38±0.35	2.15±0.23
	Ha-SCC	3.66±0.07	0.25±0.23	1.88±0.05
10	CS	4.31±0.08	1.06±0.23	2.39±0.15
	Ar-SCC	3.37±0.05	n.d	0.72±0.62
	SB-SCC	3.45±0.06	n.d	1.05±0.06
	RH-SCC	3.48±0.15	n.d	1.28±0.18
	Ha-SCC	3.42±0.09	n.d	n.d

* mean values ± standard deviation (n=3)
n.d – not detected

The fruit powders proved to have the desired antimicrobial effect in the monitored time interval (10 days), especially for bacterial strains with pathogenic potential. This fact denoted that they could be a useful food supplement as naturally derived additives for maintaining the safety of various dairy products (Kim, 2018).