Microbiological Analysis on Romanian Dairy Products Obtained from Buffalo Milk

Gheorghe ȘTEȚCA¹, Nicolae MOCUȚA², Vasile CHINDRIȘ³, Teodora Emilia COLDEA¹*, Adriana MOREA⁴

¹ Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine, Manastur Str., No. 3-5, 400372, Cluj-Napoca, Romania
² Laboratory of Food Control Salaj County, Romania
³ The Sanitary Veterinary and Food Safety Authority Salaj County, Romania
⁴ Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine, Manastur Str., No. 3-5, 400372, Cluj-Napoca, Romania
*Corresponding author, e-mail: teodora.coldea@usamvcluj.ro

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ABSTRACT

Raw milk hygiene, expressed mainly by the chemical composition and microbiological stability, has an influence on the quality of the dairy products. The major hazard is the microbial contamination, related to the content in pathogens such as as verotoxin-producing *Escherichia coli* (VTEC) and enterohemorrhagic *Escherichia coli*, *Listeria monocytogenes* and *Salmonella* spp. The present research aimed the microbiological analysis of dairy products obtained from buffalo milk. Research consisted on the evaluation of coliform bacteria, yeast and mold number and the pathogen germs of *Salmonella* and *Stafilococcus*. The obtained results permitted the classification of samples according to Regulation. High contamination with coliform bacteria, yeast and mould was recorded in almost all analyzed products. No *Salmonella* contamination was detected. The improper microbiological content was related to unsatisfactory hygiene standards in the production process and due to a possible recontamination after pasteurization.

Keywords: buffalo dairy products, telemea, microbiological analysis.

INTRODUCTION

Buffalo milk products have a tradition of hundreds of years in Romania, being extremely appreciated both in terms of sensory, and nutritional aspects. Since manufacturers are not territorial restricted to sale these products, the risk of contamination occurs during the transfer to the market.

Hygienic quality of dairy products refers to the microbiological and nutritional aspects. Factors influencing the microbiological quality of dairy products are multiple (Verraes *et al*., 2014). The main causes that adversely affect the bacteriological quality of dairy products are classical pathogens found in the raw milk (Ștețca *et al*., 2014a,b) and the emergence of new pathogens in the field.

Lately milk processing is made by several manufacturers with different habits, using inadequate conditions, without prior and proper training.

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AIMS AND OBJECTIVES

The present research aimed the microbiological analysis of dairy products obtained from buffalo milk.
MATERIALS AND METHODS
The samples studied in this research consisted of buffalo milk products from food markets and milk processing units in five Counties of Transylvania, Romania - Salaj, Cluj, Maramures, Bihor and Satu-Mare. The methods of analysis consisted of standardized methods for quality and safety of milk and dairy products and an adapted method previously described by Apostu et al., 2014. Coliform bacteria count, E.coli count, Staphylococcus coagulase-positive, Salmonella count and total combined yeast and mold count were evaluated. All the analyses were conducted in triplicate and the mean results were evaluated.

RESULTS AND DISCUSSION
Cottage cheese registered values in accordance with the regulation for all the microbiological parameters. A high contamination with coliform bacteria was determined in the majority of samples of sour cream, salted and unsalted matured cheese (Romanian denomination is telemea for both salted and unsalted assortments) (Tab. 1). Salmonella test was negative in all the buffalo dairy products. It can be observed that the percentage of the samples out of the regulation regarding the coliform bacteria count exceeds 50% (sour cream - 69%; salted matured cheese – 79%; unsalted matured cheese – 56%). E. coli was recorded above the limits in 67 % of the unsalted matured cheese, 42 % in salted matured cheese, and 31 % in sour cream. The maximum sample contamination with Staphylococcus coagulase-positive was recorded in salted matured cheeses, of 21 %. Only 2 samples of sour cream had yeast and mold count above the regulation limit.

CONCLUSION
Improper bacteriological quality of buffalo dairy products found at local markets is the consequence of the failure to comply with hygiene rules starting from the processing unit and recontamination on the flow to sale. Even though the most important remains the quality of raw milk, an essential role in dairy technology, regarding the aspect of assuring the food safety, returns to technological operations such as pickling, maturing, refrigeration, where some of the germs are destroyed.

REFERENCES

Tab. 1. Results of microbiological analysis on the four types of buffalo dairy products (sour cream, salted and unsalted matured cheese and cottage cheese)

<table>
<thead>
<tr>
<th>Dairy product (No. of samples)</th>
<th>Coliform bacteria count</th>
<th>E.coli count</th>
<th>Staphylococcus coagulase-positive count</th>
<th>Salmonella count</th>
<th>Total combined yeast and mould count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Sour cream (13)</td>
<td>4</td>
<td>9</td>
<td>9</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Salted matured cheese (telemea) (19)</td>
<td>4</td>
<td>15</td>
<td>11</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Unsalted matured cheese (18)</td>
<td>8</td>
<td>10</td>
<td>6</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Cottage cheese (2)</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: A – number of samples in the standard limits; B – number of samples out of the standard limits.