

Reviewer 4:

Introduction: Provide a concise overview of the importance and relevance of the topic, including the potential benefits of incorporating raspberry, blueberry, and elderberry by-products into cheese production.

Authors response: Authors are thankful for comment, information was highlighted:

Industrial processes, such as juice and wine production, greatly contribute to BIB production. These kinds of residues are generally thrown away in form of leftover and used as feedstock or are composted. However, they are a great source of bioactive compounds (polyphenols, vitamins, minerals, *etc.*) [8], which are used not efficiently so far. In this research study, we hypothesized that raspberries (Ras), blueberries (Blu) and elderberries (Eld) production by-products can be employed in high-added value (better antioxidant properties, higher sensory acceptability, due to a higher variety of volatile compounds, *etc.*) U-CC preparation.

Reviewer 4:

Research Objectives: Clearly define the research objectives or hypotheses of the study. State what you aim to achieve and the specific questions you seek to answer through your research.

Authors response: Authors are thankful for comment, we would like to explain, that the hypotheses of the study was included:

Industrial processes (juice, wine, *etc.* production) greatly contribute to BIB production, which, till now, are used not enough efficient [8]. In this research study, we hypothesized that raspberries (Ras), blueberries (Blu) and elderberries (Eld) production by-products can be employed in high-added value (better antioxidant properties, higher sensory acceptability, due to a higher variety of volatile compounds, *etc.*) U-CC preparation.

as well as the aim:

Finally, the aim of this study was to apply BIB for U-CC enrichment. To implement such a goal, a two stages experiment was performed. During the first stage, antimicrobial properties of the BIBs were tested and the effects of the immobilization technology on BIBs antioxidant properties and color coordinates were evaluated. During the second stage, non-immobilized (_{NI}) and agar-immobilized (_{AI}) BIBs were applied for U-CC enrichment, and their influence on U-CC acidity parameters, color characteristics, moisture content, VC and FA profiles, biogenic amine (BA) concentration, sensory properties, induced emotions for consumers and microbiological characteristics during the storage were analyzed.

Reviewer 4:

Methodology: Sufficient

Authors response: Authors are thankful for evaluation.

Reviewer 3:

Experimental Design: Provide details on the replication of experiments and any randomization or blinding procedures implemented.

Authors response: Authors are thankful for comment, in Section 2.5. is included:

.... (for BIB antimicrobial properties and physicochemical parameters, n = 3; for U-CC physicochemical and microbiological parameters, n = 3; for U-CC overall acceptability and emotions induced for consumers, n = 10).

..... The normal distribution of data was checked using Descriptive Statistics tests. In order to evaluate the influence of the different type of BIBs and immobilization on the analyzed U-CC parameters, data were evaluated by the multivariate analysis of variance (ANOVA) procedure, and Tukey's honestly significant difference (HSD) procedure as post-hoc tests.

Additionally in section 2.4.6. exclusion criteria are described:

.... Ten judges were recruited internally (Institute of Animal Rearing Technologies and Department of Food Safety and Quality, Lithuanian University of Health Sciences, Kaunas, Lithuania): 5 females and 5 males, from 25 to 50 years old [34,35]. Individuals who were familiar with this study were excluded from the panel. The previous training of the judges was based on descriptive analysis [36–38]. Selected judges were non-smokers, interested in sensory analysis and motivated to participate.

Reviewer 4:

Analysis and Results: Sufficient material

Authors response: Authors are thankful for evaluation.

Reviewer 4:

Discussion and Interpretation: Discuss any significant findings, trends, or relationships observed. Compare your results with existing literature and explain how your study contributes to the field.

Authors response: Discussion was improved (marked in yellow). However, authors would like to explain that to the best of our knowledge, unripened curd cheese with berry by-products such as those included in our study has not been widely tested by other researchers. Therefore, we believe that all available research data was discussed and obtained results were compared with existing ones in this manuscript. Our study provides beneficial data on berry by-product applications for functional unripened cheese manufacture in a sustainable manner.

Reviewer 4:

Limitations and Future Directions: Suggest avenues for future research that could build upon your findings and address any limitations.

Authors response: Authors are thankful for comment, information was included:

Finally, this study showed that BIBs are prospective ingredients for U-CC enrichment in sustainable manner. However, further research is needed to evaluate possible contamination of the BIBs, to avoid non-desirable changes during the U-CC production, including microbial contamination and BA formation. Also, future research can be applied to the more detailed analysis of the broader spectrum of BIBs, with the aim to use these valuable by-products in dairy industry.

Reviewer 4:

Conclusion: Provide a concise and well-summarized conclusion that emphasizes the key findings of your study. Highlight the implications and potential applications of your research in the context of the cheese industry. Remember to proofread your paper for grammar, spelling, and clarity. Ensure that your writing is concise, logical, and flows smoothly from one section to another

Authors response: Authors are thankful for Reviewer comment, conclusions were corrected:

This study confirmed that the raspberry, blueberry, and elderberry BIBs possess desirable antimicrobial and antioxidant activities and the addition of these by-products to the main U-CC formula increased the TPC content and DPPH-radical scavenging activity of the U-CC. Also, despite that predominant FAs in U-CC were saturated, addition of BIBs led to lower saturated FAs content in the final product. As well as, BIBs increased the number of VCs in U-CC, and these changes are associated with the higher intensity of emotion “happy” induced for consumers by the tested product. However, after 10 days of storage, the highest total enterobacteria number was found in C-Bl_{UNI} samples. Finally, this study showed that BIBs are prospective ingredients for U-CC enrichment in sustainable manner. However, further research is needed to evaluate possible contamination of the BIBs, to avoid non-desirable changes during the U-CC production, including microbial contamination and BA formation. Also, future research can be concentrated to more detailed analysis of the broader spectrum of BIBs, with the aim to use these valuable by-products in dairy industry.