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Whey Valorization in Beer Production: A Functional and Nutritional Approach

Lupu M.I.[1]
[1] *Transilvania University of Brasov, Food and Tourism Faculty, Castelului 148, 500014, Brașov, Romania; lupu.mirabela@unitbv.ro*

Abstract: *This paper investigates the potential for enhancing the nutritional profile of beer by incorporating whey—a dairy industry by-product—into the brewing process. The research involved the experimental addition of sweet whey to beer wort at three different concentrations (10%, 15%, and 20%) prior to fermentation. A series of physicochemical and sensory analyses were conducted on four beer samples, including a control, both on the day of preparation and after a seven-day fermentation period at 18°C. Key parameters assessed included alcohol content, extract concentration, caloric value, density, Brix, cryoscopy point, and protein content.*

• Introduction

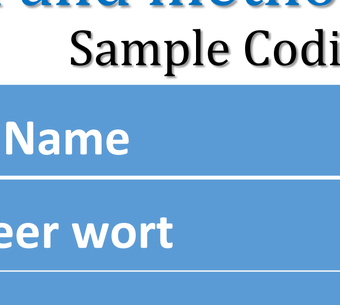
Recent studies have explored the integration of whey into beer production, aiming to utilize its nutritional components and reduce environmental impact. For instance, Pasta et al. (2024) investigated the use of scotta, a deproteinized whey by-product from ricotta cheese production, in brewing artisanal beers. Their findings demonstrated that incorporating scotta could replace portions of water and sugar in beer recipes, resulting in products that align with traditional sensory profiles while enhancing sustainability.

• Material and method

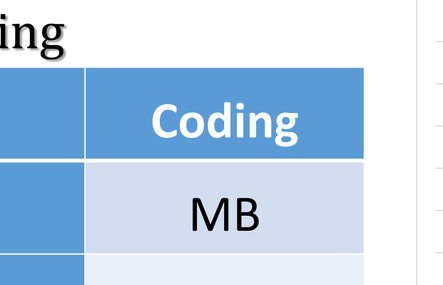
Sample Coding

Name	Coding
Beer wort	MB
Whey	Z
Beer wort without whey	PM
Beer wort + 10% whey	P1
Beer wort + 15% whey	P2
Beer wort + 20% whey	P3

Milkotester

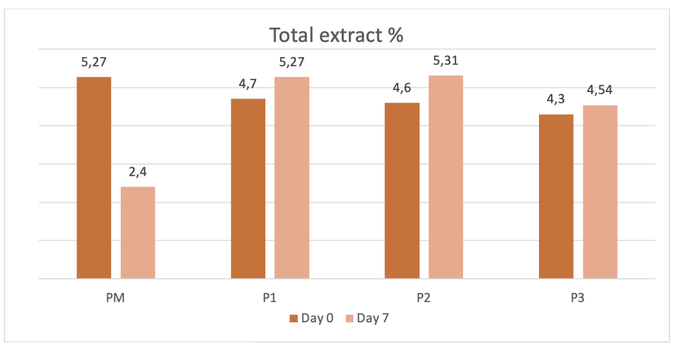


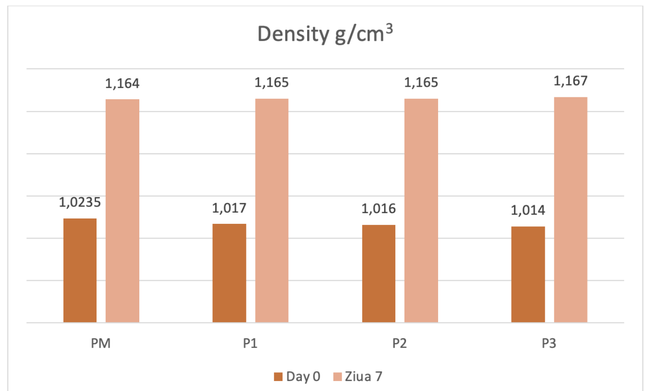
FermentoStar

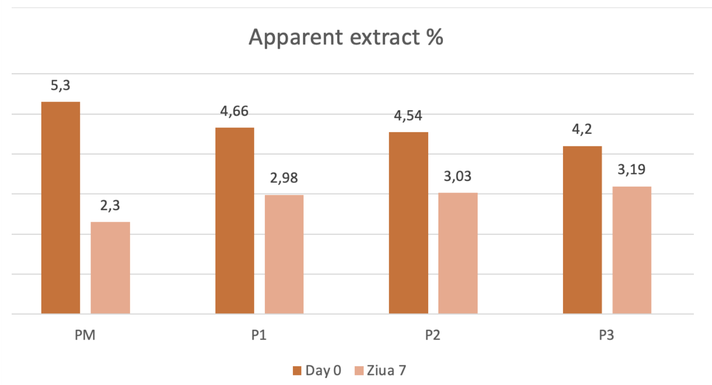


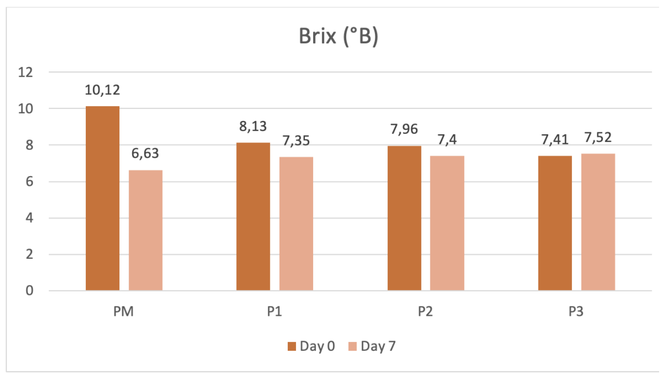
Protein

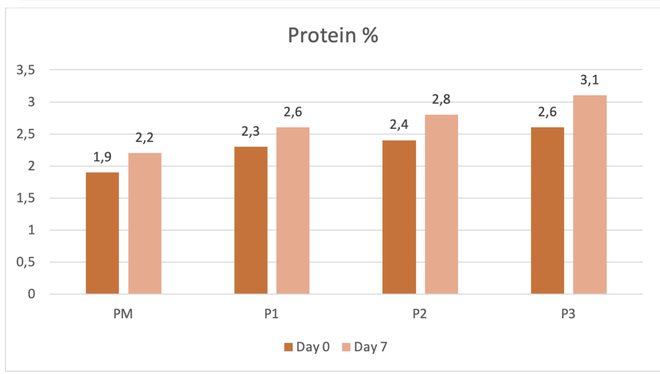
• Results and discussions

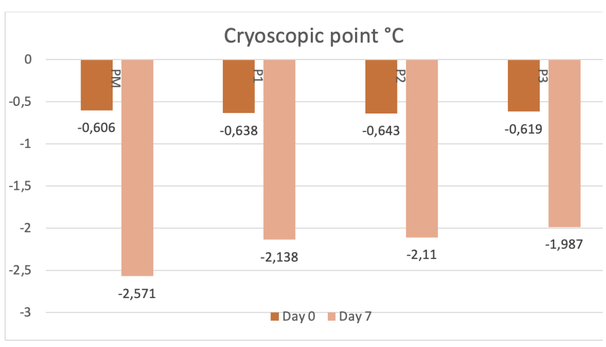


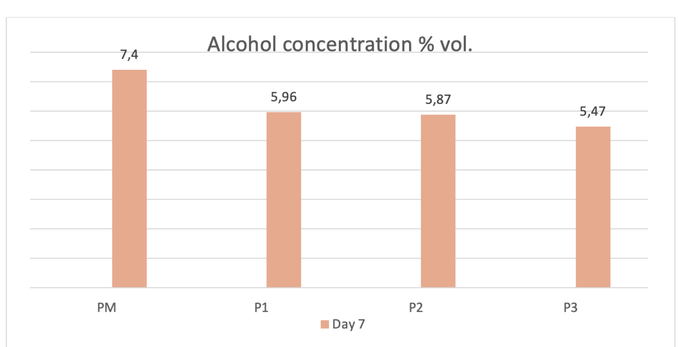












Conclusions

Adding whey to the beer wort prior to fermentation can significantly improve the nutritional profile of the final product, increasing the protein content and caloric value of the beer. The best results were obtained at a whey concentration of 20% (P3), where the highest increases in protein and alcohol content were observed. These findings suggest that whey can be successfully used in the beer industry to create innovative products with enhanced nutritional benefits