



Hungarian University of Agriculture and Life Sciences

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Food Engineering Bachelor's

Development of fermented and non-fermented beverages by Buttermilk

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Budapest

2024

Abstract:

This thesis explores the possibility of using buttermilk, a nutrient-dense dairy industry by-product, as a sustainable foundation for creating functional drinks. Buttermilk offers a chance to develop value-added goods that satisfy contemporary customer tastes with the rising need for environmentally sustainable and health-conscious food solutions. This study investigates how the quality and consumer appeal of buttermilk-based beverages are affected by fermentation and the inclusion of inulin, a prebiotic fiber that is good for gut health. Three varieties of beverages were created: plain, apricot-flavored, and strawberry-flavored. They were made using both fermented and non-fermented processes, and their inulin contents ranged from 0% to 2%.

A thorough evaluation of the beverages' sensory and physical attributes was part of the research technique. Quality criteria including dry matter content, pH, color, rheology, and sensory qualities were assessed to determine how inulin concentration and fermentation affect the final product. Mesophilic cultures were used to initiate fermentation, which improved shelf life, flavor, and texture. To determine consumer preferences for taste, texture, color, and general acceptability, a panel of volunteers performed sensory evaluations.

The findings demonstrated that adding inulin to the beverages continuously raised their dry matter content, with both the plain and flavored varieties having the maximum dry matter at 2% inulin concentration. On the other hand, fermentation decreased the dry matter content as microbes ate some sugars and carbohydrates. It also decreased pH and increased acidity, which improved the beverages' flavor stability. Because apricot and strawberry fruits are naturally acidic, their pH values were slightly lower than those of plain liquids, which had the highest pH values.

According to color studies, inulin at 1% concentration helped achieve the best brightness and vibrancy, especially improving the appearance of apricot and strawberry drinks. This effect was especially noticeable in fermented samples, which showed appealing natural colors that matched customer demands for products that were colorful and fresh. According to rheological testing, viscosity was improved by fermentation and higher inulin concentrations, particularly in beverages with apricot flavors, giving them a desired thick texture. According to sensory analysis, the fermented drinks with 1% inulin were the most popular since they had a pleasing flavor, a smooth texture, and a pleasing hue.

In summary, this thesis highlights the potential of buttermilk as a sustainable component for creating nutrient-dense, health-conscious drinks that creatively use dairy by-products. Inulin and fermentation together can turn buttermilk into a functional beverage that meets customer desires for wholesome, attractive, and ecologically friendly products, according to the study. It was out that the fermented beverage with 1% inulin was the best combination of texture, flavor, and nutrients. By experimenting with different inulin concentrations, fermentation times, and prebiotic fibers, future studies could improve the beverage formulas. A cyclical approach to resource utilization in the dairy industry is demonstrated by this work, which transforms a by-product into a high-value, useful food item, offering important insights into sustainable beverage production.

The use of inulin not only improves the beverage's texture and appearance, but it also satisfies consumer desire for goods that promote digestive health. By lowering the environmental impact of dairy production and prolonging the life cycle of dairy resources, this strategy supports a circular economy. Future advancements in buttermilk-based beverage production may extend into more varied flavor profiles and incorporate more useful components, increasing the product's marketability and appeal to a wider range of consumers. This study establishes the foundation for a wider use of by-products in the food sector by showing that functional drinks produced from them may satisfy contemporary requirements for sustainability, flavor, and health advantages.