



Identification and Characterization of *Enterococcus* spp. from White Cheese Facility and Their Fermentation in Whey Media

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Introduction

This study focuses on the identification and characterization of *Enterococcus* species isolated from a white cheese production facility and their fermentation performance in whey-based media. The aim was to explore the potential of these isolates for biotechnological applications while promoting the sustainable use of whey, a major dairy by-product.

Materials and Methods

Samples were collected from various points in a small-scale white cheese facility in Ilgaz Mountain, Kastamonu, Türkiye. Standard microbiological methods, phenotypic tests, and molecular techniques such as 16S rRNA sequencing were employed for the identification and characterization of *Enterococcus* isolates. Among the isolates, *E. faecalis* HUF19ZN7M1039 was selected for fermentation trials in whey-based media (WP1 and WP2), UHT milk, and a control medium. Fermentation parameters such as pH reduction, cell growth, specific growth rate, and protein hydrolysis were evaluated.

Results

Results revealed a diverse population of *Enterococcus* species, including *E. faecium* and *E. faecalis*. The selected *E. faecalis* strain showed superior performance in whey-based media compared to UHT milk and the control. WP2 demonstrated the highest specific growth rate (0.84 h⁻¹) and shortest doubling time (0.83 minutes), while WP1 exhibited the highest protein hydrolysis (56.48±3.00% at 48 hours). These findings highlight the efficiency of whey-based media in enhancing bacterial growth, acid production, and proteolytic activity.

Conclusion and Discussion

In conclusion, whey-based media, particularly WP1 and WP2, are effective substrates for fermentation, supporting the sustainable valorization of whey in the dairy industry and demonstrating the potential of *E. faecalis* for biotechnological applications.

Keywords: *Enterococcus* spp., 16S rRNA sequencing, fermentation, whey-based media

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