PROCESS OPTIMIZATION AND PHYSICOCHEMICAL CHARACTERIZATION OF PROTEIN HYDROLYSATE SOUP FROM BUK-SIAM MAEJO HYBRID CATFISH USING ENZYMATIC AND THERMAL PROCESSING

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Abstract

This study focused on the development and process optimization of a protein hydrolysate essence soup from Buk-Siam Maejo hybrid catfish using enzymatic and thermal processing. The raw material, containing 38.29% protein and 7.66% fat, was considered suitable for high-protein product formulation; however, conventional processing often results in undesirable physicochemical properties, including turbidity, high viscosity, and off-flavor. Enzymatic hydrolysis using Aspergillus oryzae-derived protease (Prote AX) was applied, and key processing parameters, including enzyme concentration, hydrolysis time, and temperature, were optimized to maximize the degree of hydrolysis (%DH) and product yield. The optimal condition was identified at 0.10% (w/w) enzyme concentration, 50 °C, and 3 h, achieving a degree of hydrolysis of 32.30% and a yield of 72.00%. Subsequently, thermal sterilization was performed using a retort system at 117 °C for 17 min ($F_0 \approx 9$ min) to ensure microbial safety and product stability. The combined process significantly improved physicochemical characteristics, resulting in reduced viscosity, enhanced clarity, light-yellow appearance, and absence of sedimentation. The results demonstrate that the integration of enzymatic hydrolysis and controlled thermal processing is an effective approach for improving the quality and stability of protein hydrolysate soup, providing a feasible basis for industrial-scale production.

Keyword: Buk-Siam Maejo hybrid catfish, Protein hydrolysate, Enzymatic hydrolysis, Process optimization, Retort sterilization,Physicochemical properties, Hybrid catfish