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Abstract

STUDY ON THE OPTIMIZATION OF HYDROLYSIS CONDITIONS FOR POULTRY BONE

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China leads the world for the production of poultry and livestock. Although the resource of bones is abundant, the utilization of this high quality and nutritional substance is less emphasized. Every year, tons of bones from livestock and poultry are treated as industry materials and animal food with low value. The protein and other nutritional elements of the bones are not be fully utilized. Enzymatic hydrolysis is an effective way to utilize the bones properly with a procession that will change collagen protein of bones into peptide and L-amino acid in normal temperature and a short time. Enzymatic hydrolysis will improves the nutritional value and functional characteristic of bones, which facilitates the effective utilization of bones rather than treating as wastes. Better and more complete utilization of bones from these animals can perhaps reduce the economic loss of enterprise and bring more dollars back to the producers. The objective of the present study was to optimized the hydrolysis conditions for protein of poultry bones with enzyme Alcalase using a quadratic rotation perpendicular regressive design with three factors and five levels. According to the F-test and T-test, the model reflected theoretically intrinsic law on protein hydrolysis of poultry bone. The results obtained from this pattern coincided in the actual experiment results and reflected the intrinsic relationship of hydrolysis process. With the design of rotation regression, three factors, namely E/S, pH-value and temperature were confirmed to be the main factors that affected the hydrolysis of the protein of poultry bone with Alcalase. The contributions of the three factors to nitrogen recovery ratio were: temperature > pH-value > E/S. The optimal hydrolysis conditions of hydrolyzing the protein of poultry bone with Alcalase were: concentration of enzyme (E/S)=3.33%, pH=8.54, hydrolyzing temperature=58°C, hydrolysis time=90 min and NR>75%.