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# Optimization of Bioactive Peptide Production from Soy Protein Using Recombinant Protease Enzyme: Evaluation of Physicochemical and Functional Properties

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## Abstract

Plant-derived proteins and peptides have garnered significant interest owing to their versatile functional properties, which go beyond their basic nutritional value. The enzymatic hydrolysis of plant proteins is a controlled and cost-effective method for enhancing these properties. Additionally, the enzymatic breakdown of indigestible carbohydrate components in feed improves digestibility and bioavailability. In this study, soybeans were defatted with n-hexane and subsequently processed using an alkaline extraction method to isolate soy proteins. The protein concentration was quantified using the Bradford assay. The extracted protein was subjected to enzymatic hydrolysis using varying concentrations of recombinant protease to produce bioactive peptides. The degree of hydrolysis was measured and the antioxidant properties of the peptides were assessed using ABTS radical scavenging and reducing power assays. The results demonstrated a significant increase in antioxidant activity, with up to 74% ABTS radical scavenging activity and a reducing power value of 0.347 at 700 nm. These findings suggest that soy-derived proteins and peptides have the potential to enhance the functional properties of both human and animal feeds. These bioactive components can potentially contribute to the nutritional value and functional performance of both human and animal feeds by improving the bioavailability of essential nutrients, offering protective effects against oxidative stress, and enhancing the overall health and growth performance of livestock.





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**Key words:** Recombinant protease, Soy protein, Bioactive peptides, Antioxidant activity, Reducing power, Enzymatic hydrolysis

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