COMPARISON OF DIFFERENT ENZYME INACTIVATION METHODS FOR OVOMUCIN AND FUNCTIONAL PROPERTIES OF THE DERIVED PEPTIDES

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ABSTRACT

Ovomucin is considered as a protein with various important functions. This study was carried out to compare different enzyme inactivation methods for ovomucin and the functional properties of peptides produced from different inactivation methods for protease from *Bacillus licheniformis* (> 2.4 U/mg). Ovomucin was dissolved (20 mg/ml) and hydrolyzed with α-amylase (1:100) to check the effect of carbohydrates attached to the peptides. As shown with 15% SDS-PAGE, no difference was observed with and without α-amylase. Then the pH of ovomucin solution was adjusted to 3.5 and protease from *Bacillus licheniformis* (> 2.4 U/mg) were added (1:100) to hydrolyze the protein. Different inactivation methods, heating for 100 °C for 15 min (HT) and adjusting pH to 10.0 (PT), were used at 0, 3, 6, 9, 12 and 24 hrs of incubation, and the antimicrobial and metal chelating activities of the hydrolysates were determined. Antimicrobial activities were determined using the Agar-well diffusion technique. Locally isolated *Escherichia coli* and *Salmonella* sp. were used, and Augmentin^{XR} (0.001 ppm) and distilled water were used as a positive and as a negative control, respectively. The results indicated that none of the hydrolysates suppressed the microbes at any given concentrations. All PT treatments showed high iron-binding capacity (70-80%). With HT treatments, 3 hr-incubation showed the highest iron-binding activity (76%) with protease. The Copper-chelating activity was opposite to the iron-binding activity: copper was released instead of binding to the peptides in all treatments. 24 hr heat treatment showed anti-oxidant activity with papain. According to the results the peptides derived from the treatments did not have any effect on microbial activity, but metal-chelating activity was different. Further studies are needed to confirm this result by analyzing the peptides and their structures.

Keywords: Antimicrobial, Enzymes hydrolysates, Metal chelating, Ovomucin