

ANTIOXIDANT ACTIVITY OF PROTEIN HYDROLYSATES FROM NILE TILAPIA PROCESSING RESIDUES

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Categoria de apresentação | Presentation type:

Pôster

Eixo temático | Track category:

Alimentos Funcionais: Compostos Bioativos (AC)

Palavras-chave | Keywords:

antioxidant activity
fish by-products
protein hydrolysates

Resumo (Texto Científico) - Máximo 300 palavras | Abstract (Scientific Text) - (Maximum 300 words):

Introduction: In recent decades there is an increasing demand for fish processing by-products, due to the high amount produced, intrinsic nutritional value, and low cost of the raw material. Objective: To produce protein hydrolysates using by-products from the filleting process of Nile tilapia and to evaluate its antioxidant activity. Methods: Heads and carcasses of eviscerated tilapia were milled and mixed with 20% water and 0.2% Alcalase® enzyme (*Bacillus licheniformis* protease) in an industrial reactor. The hydrolysis reaction was carried out for 240 min at 60 ° C. Six samples were collected at different reaction times: A-40 min; B-80 min; C-120 min; D-160 min; E-200 min; and F-240 min. Thermal inactivation of the enzyme was performed at 90 °C for 2 min for each aliquot, followed by filtration to remove the remaining bones. Subsequently, all samples were lyophilized and analyzed for total protein, degree of hydrolysis, and antioxidant activity by the oxygen radical absorbance capacity (ORAC), ferric reducing antioxidant power (FRAP), and free radical capture ABTS•+ (ABTS). The protein content and the degree of hydrolysis of the samples A to F were 46.82±3.78; 45.95±7.04; 44.45±1.28; 44.96±8.7; 44.2±1.65; and 45.57±2.05%, and 19.5±1.07; 21.52±0.56; 23.53±1.99; 24.85±2.25; 26.13±0.75; and 25.72±1.28%, respectively. With respect to the antioxidant activity determined by the different assays, the values were: ORAC (A:159.46±3.7, B:150.57±21, C:168.43±23, D:151.28±14, E:152.08±18, F:164.26±18 uMTE/g), FRAP (A:21.68±2.29, B:18.89±0.88, C:17.24±0.76, D:19.6±1.39, E:22.66±3.27,

F:22.22±1.3 uMTE/g) and ABTS (A:36.29±5.98, B:31.43±8.02, C:33.63±8.14, D:35.69±5.01, E:36.29±2.69, F:30.69±1.54 uMTE/g). No significant changes were observed in the antioxidant activity of the hydrolysates for the periods studied. The main mechanism of antioxidant activity of the hydrolysate was the hydrogen atom transfer reactions, evidenced by the ORAC assay. Conclusion: It is possible to make a product with high antioxidant activity using by-products from the processing of tilapia fish.