Chien-Hui Wu et al., J Fisheries Livest Prod 2017, 5:2 (Suppl)
http://dx.doi.org/10.4172/2332-2608-C1-009

Evaluation of chromium-binding activity of collagen peptides prepared from tilapia scale

Chien-Hui Wu, Yu-An Chen and Jen-Min Kuo
National Kaohsiung Marine University, Taiwan

Thousands of tilapia fish scales are wasted without valuable utilization. Tilapia scale is rich in collagen that is hydrolyzed by enzyme digestion. The hydrolysate collagen peptides has antioxidant, anti-cancer, anti-anemia, immune regulation, anti-bacterial, hormonal regulation, inhibition of angiotensin transferase activity, prevention of arthritis, osteoporosis and other bioactive functions. Studies indicated that fish scale collagen protein hydrolysates has a well-binding capacity for calcium, iron, and copper, enhancing the biological activity of the fish scale collagen protein. The chromium content in human body significantly reduces as age increases. There have been studies indicated that trivalent chromium can regulate insulin function and maintain homeostasis of blood glucose, and improve the glucose tolerances of type II diabetes patients. Therefore, the aim of this study is to exploit the metal chelating ability of collagen hydrolysates by mixing low molecule weight fraction of collagen hydrolysates from tilapia scale with trivalent chromium (referred as C-Cr). The data showed that low molecule weight fraction of tilapia scale collagen hydrolysates can bind with 123 ppm trivalent chromium ions, forming collagen-organic chromium complex at pH 3 and 60°C maintained for 1 hr. Then addition of 50%, 100% and 200% of 750 mM chromium chloride to the collagen peptide hydrolysates was done respectively. The optimized condition was when 100% 750 mM chromium chloride was added to collagen peptide hydrolysates which can bind to 175 ppm chromium ions. In the feature, we hope to develop a functional food material with hypoglycemic activity by C-Cr components.

Biography

Chien-Hui Wu has his expertise in evaluation and development in function food material. Recently, his research were focusing on 2 ways, one is evaluating the metal-binding activity of collagen peptides from fish scale by enzyme digestion. On the other hand, the development of fermented food with gama-aminobutyric acid (GABA) by lactic acid bacteria isolated from aquatic animals. Now, he is teaching at the Department of Seafood Science, National Kaohsiung Marine University in Taiwan.

chwu@webmail.nkmu.edu.tw

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