

Enzymatic bioactive peptides from sonicated whey proteins of camel milk: Impacts of nano peptides on structural properties, antioxidant activity and Inhibitory activity of alpha-amylase and ACE

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Abstract:

This study was carried out to investigate the biological properties of bioactive peptides derived from digestive enzymatic hydrolysis for nano scaled protein particles from camel whey proteins. The hydrolysates were tested for aromatic content, antioxidant activity, α -amylase inhibitory and angiotensin converting enzyme (ACE) activities. The sonicated camel whey protein particles showed sizes less than 100 nm and were distributed in a 75% volume with a relatively stable -23.1 mV zeta potential value. Sonication enhanced the total aromatic ring content in the hydrolysates generated by combined trypsin and chymotrypsin treatment. A decrease in antioxidant activity was shown following trypsin and chymotrypsin hydrolysis that was inhibited by whey protein sonication. Pepsin hydrolysis improved aromatic content, ACE and α -amylase inhibitory activities, and antioxidant activity. An increase in antioxidant activity of the pepsin-derived hydrolysates was seen with sonicated whey proteins. Overall, the findings demonstrate the utility of the application of enzymatic hydrolysis and/or ultrasonication of camel whey proteins to enhance their antioxidant, anti-hypertensive and anti-diabetic properties.



Biography:

Dr. Sana' Gammoh is a highly accomplished academic and food scientist with extensive expertise in food biosciences, food safety, and nutrition. She earned her Ph.D. in Food Biosciences from the University of Reading, United Kingdom (2006), where her research focused on the implementation of HACCP systems in camel milk production—a pioneering study that succeeded in developing pasteurized camel milk and white cheese products for the first time worldwide.

She also holds a Master's degree in Community Medicine and Public Health (a joint MOH/WHO program, 2000) and a B.Sc. in Food Technology and Nutrition from the University of Jordan (1983).

Over the course of more than three decades, Dr. Gammoh has made significant contributions to Jordan's food safety and nutrition systems. She participated efficiently with her expertise in the fields of food biosciences in the establishment of Jordan Food and Drug Administration. She has served in several leadership roles, including Deputy Director General of the JFDA, Director of Food and Drug Laboratories, and Deputy Director of the Food Safety Directorate. Earlier in her career, she led the Food Standards, Studies, and Research Division at the Ministry of Health, where she played a key role in developing and implementing national food safety policies and standards.

Dr. Gammoh has been a faculty member at the Jordan University of Science and Technology (JUST) since 2011, where she lectures in advanced food safety, food microbiology, dairy technology, and food

chemistry. She has also contributed to training programs for food inspectors, health professionals, and public health students at multiple institutions, including the Ministry of Health, the Jordan Institute of Public Administration, and Princess Alia College.

Her international engagement includes collaboration with the World Health Organization (WHO) and the Food and Agriculture Organization (FAO), where she served as a temporary advisor on food safety and HACCP systems. She has represented Jordan at numerous global conferences, including the World Food Summit (Rome, 1996) and multiple Codex Alimentarius (WHO/FAO) meetings.

Dr. Gammoh's research has been widely published in peer-reviewed international journals, addressing diverse topics such as camel milk composition, food microbiology, food processing, and the biofunctional properties of natural food compounds. Her work continues to advance the fields of nutrition, food safety, and food technology, making her one of the leading figures in Jordan's scientific and academic community.