

3rd International Conference and Exhibition on Nutrition & Food Sciences

September 23-25, 2014 Valencia Convention Centre, Spain



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Gluten-free extruded lentil-based snacks rich in dietary fiber and protein

Wheat bran and other fiber-rich cereal ingredients are generally used to increase the fiber content in snacks and breakfast cereal products. However, these ingredients contain gluten, which represents a physiological problem for people who suffer of the celiac disease. This study aimed for the development of novel, expanded extruded snack-type foods rich in protein and dietary fiber, from lentil-based formulations. Extrusion was performed using a co-rotating, twin-screw extruder. Formulations containing selected gluten-free fiber ingredients (GFFIs), were evaluated against formulations with a gluten-containing ingredient, such as wheat bran. In general, the expansion ratio of extrudates from formulations containing GFFIs were greater than extrudates containing wheat bran. The protein content of the extruded lentil-based products was high and range from 16.1 to 18.3 percent. Shelf stability of the developed products was similar to those of dehydrated food products with water activity in the range of 0.44-0.50. Sensory evaluation, using a 7-point hedonic scale, demonstrated that the novel, value-added, and expanded extruded lentil-based snacks fortified with GFFIs had a desirable crunchy texture and were highly acceptable to the sensory panel. This type of products may have a great impact to more than 7,000 people who are diagnosed as allergic to gluten in the USA alone every year, improve the consumption of dietary fiber and pulses by consumers.

Biography

Jose De J. Berrios earned his Ph.D. in Food Science & Technology from the School of Food Science at Washington State University. He is a Research Food Scientist with the USDA-ARS-Western Regional Research Center where he is leading the extrusion food program, conducting experiments and developing processes and formulations to increase legume utilization through the manufacture of novel value added extruded foods and food products with optimized nutritional and functional properties and desirable sensory attributes; pasta products and beverages; high protein and dietary fiber, gluten-free products. Dr. Berrios is author and co-author of more than 100 publications; reviewer for 20 major national and international journals; invited speaker to more than 100 national and international conferences and symposia. Adviser and collaborator for a large number of projects in the USA, Canada, Spain, Brazil, France, Mexico, Ecuador, Colombia and Peru; Chairman of the California Section of AACC-International and Member of the Legume Pulses Approved Methods Committee of AACC-International.

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