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Enzyme-Assisted Extrusion Cooking of High Fibre Expanded Snacks of Whole-Grain Cowpea

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Abstract

When compared to refined grains, whole-grain foods are high in dietary fibre, vitamins, minerals, and bioactive compounds, all of which have been linked to their protective effects. Regular consumption of whole grains and whole-grain products has been related to a lower risk of chronic diseases such as cardiovascular disease, type 2 diabetes, and some cancers in epidemiological studies. The addition of dietary fibres to extruded expanded starchy foods is a significant development in the food industry in response to market demand for healthier alternatives. However dietary fibre produces extruded expanded products with poorer texture, colour, and digestibility. Cowpea is an edible grain legume that helps millions of small-scale farmers and residents in developing and underdeveloped countries achieve food security and environmental protection. They have a high lysine content and are low in sulphur-containing amino acids. Protease inhibitors, non-starch polysaccharides (NSP), pectins, and phenolic compounds reduce protein content and nutrient digestibility. Pancreatic enzymes including trypsin and chymotrypsin are inhibited by protease inhibitors. The mature cotyledon cell walls of pulses usually contain 25-30 % cellulose, 15-24 % hemicellulose, 0.4-0.6 % lignin, 28-41 % pectin, and 1–5% structural protein. Legume grains contain complex polysaccharides such as celluloses, hemicelluloses, pectins, and gums. A combination of enzyme treatment and extrusion cooking can be used to disrupt the sorghum bran and cowpea seed coat, increasing soluble fibre content, and thereby improving extrudate properties. Pretreatment of seed coat from cowpea is expected to have better expansion during extrusion cooking as the fibre will be disintegrated and form more soluble ones.

Biography: Charles Antwi

Charles Antwi is a PhD student from the Consumer and Food Sciences Department, University of Pretoria. He has his Honours and Diploma in Science Education from the University for Development Studies, Tamale-Ghana and University of Education, Winneba-Ghana respectively. The MSc also was obtained from Wageningen University and Research, the Netherlands.