

Swedish-Nigerian Extrusion Research: Channel for Traditional Grain Value Addition

Authors : Kalep Filli, Sophia Wassén, Annika Krona, Mats Stading

Abstract : Food security challenge and the growing population in Sub-Saharan Africa centers on its agricultural transformation, where about 70% of its population is directly involved in farming. Research input can create economic opportunities, reduce malnutrition and poverty, and generate faster, fairer growth. Africa is discarding \$4 billion worth of grain annually due to pre and post-harvest losses. Grains and tubers play a central role in food supply in the region but their production has generally lagged behind because no robust scientific input to meet up with the challenge. The African grains are still chronically underutilized to the detriment of the well-being of the people of Africa and elsewhere. The major reason for their underutilization is because they are under-researched. Any commitment by scientific community to intervene needs creative solutions focused on innovative approaches that will meet the economic growth. In order to mitigate this hurdle, co-creation activities and initiatives are necessary. An example of such initiatives has been initiated through Modibbo Adama University of Technology Yola, Nigeria and RISE (The Research Institutes of Sweden) Gothenburg, Sweden. Exchange of expertise in research activities as a possibility to create channel for value addition to agricultural commodities in the region under the 'Traditional Grain Network programme' is in place. Process technologies, such as extrusion offers the possibility of creating products in the food and feed sectors, with better storage stability, added value, lower transportation cost and new markets. The Swedish-Nigerian initiative has focused on the development of high protein pasta. Dry microscopy of pasta sample result shows a continuous structural framework of proteins and starch matrix. The water absorption index (WAI) results showed that water was absorbed steadily and followed the master curve pattern. The WAI values ranged between 250 - 300%. In all aspect, the water absorption history was within a narrow range for all the eight samples. The total cooking time for all the eight samples in our study ranged between 5 - 6 minutes with their respective dry sample diameter ranging between 1.26 - 1.35 mm. The percentage water solubility index (WSI) ranged from 6.03 - 6.50% which was within a narrow range and the cooking loss which is a measure of WSI is considered as one of the main parameters taken into consideration during the assessment of pasta quality. The protein contents of the samples ranged between 17.33 - 18.60 %. The value of the cooked pasta firmness ranged from 0.28 - 0.86 N. The result shows that increase in ratio of cowpea flour and level of pregelatinized cowpea tends to increase the firmness of the pasta. The breaking strength represent index of toughness of the dry pasta ranged and it ranged from 12.9 - 16.5 MPa.

Keywords : cowpea, extrusion, gluten free, high protein, pasta, sorghum

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