**Development of nutritious low fat vacuum fried snacks from yellow fleshed cassava root: process design, product characterization and economic implications**

Sobukola, Olajide1,\*, Sanni, Ajoke2, Henshaw, Folake1, Bodunde, Goke3, and Agbonlahor, Mure4

1)Department of Food Science and Technology, Federal University of Agriculture, P.M.B. 2240, Abeokuta, Nigeria, 2)Department of Nutrition and Dietetics, Federal University of Agriculture, P.M.B. 2240, Abeokuta, Nigeria, 3)Department of Horticulture, Federal University of Agriculture, P.M.B. 2240, Abeokuta, Nigeria and 4)Department of Agricultural Economics and Farm Management, Federal University of Agriculture, P.M.B. 2240, Abeokuta, Nigeria.

Vacuum frying technology was used to design the process, characterize the products and determine the economic implications in the development of nutritious and healthy fried snacks from yellow fleshed cassava roots (YFCR). Three YFCR (TMS-01-1368, TMS-01-1412 and TMS-01-1371) varieties were fried under different vacuum frying conditions to optimize the process based on superior quality attributes. The optimized vacuum fried samples were then compared with the common atmospheric deep fat frying based on the equivalent thermal driving forces. Vacuum frying conditions such as frying temperature, frying time as well as vacuum pressure significantly (p<0.05) affected the major quality attributes of fried chips in decreasing order. In terms of the optimization conditions based on desirability concept, vacuum frying conditions varied among the varieties with IITA/TMS 01-1368, IITA/TMS 01-1371 and IITA/TMS 01-1412 having frying temperature, vacuum pressure and frying time of 122oC, 14.49 cmHg and 8 min; 129oC, 9.91 cmHg and 9.75 min; and 122oC, 9.91 cmHg and 9.95 min, respectively. Irrespective of the variety used, the optimized vacuum fried yellow fleshed cassava chips had higher carotenoid retention, lower oil content, lower breaking force (more crispier) and lighter than atmospheric fried samples. Based on the economic analysis presented above, the processing cost structure and profit per processing cycle resulted in total processing cost, net profit per month and return on investment per month of $793, $1,091.91 and 137%, respectively while processing cost structure and profit per processing cycle using VF 5.0 vacuum fryer resulted in total processing cost, net profit per month and return on investment per month of $727.5, $1157.6 and 159%, respectively.