


SOUTH AFRICAN ASSOCIATION FOR
FOOD SCIENCE & TECHNOLOGY
**CONGRESS
2021**

Welcome to SAAFoST's
24th Biennial International
Virtual Congress

20 - 22 September 2021



Cooking Qualities & Nutritional Properties of Gluten-Free Maize – Orange-Fleshed Sweet Potato Pasta by Extrusion Process

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Abstract

Introduction: The diversification of diet through the inclusion of orange-flesh sweet potato is a useful approach for alleviating vitamin A deficiency in vulnerable people groups such as children and pregnant women. The effect of orange-fleshed sweet potato flour addition to maize flour to produce gluten-free pasta on the cooking quality and the effect of the extrusion cooking process on the beta carotene and antioxidant properties of resulting pasta were determined.

Methods: Maize and orange-fleshed sweet potato composite (100:0, 50:50, 70:30, 80:20) flours were extruded into pasta using a twin-screw extruder. Cooking qualities (cooking time, cooking loss, and water absorption capacity), textural properties (firmness, stickiness, and fracturability), and nutritional qualities of the pasta were assessed.

Results and Discussion: Increase in addition of OFSP flour increased the cooking loss and decreased cooking time and water absorption capacity of pasta. The dietary fibre in the OFSP flour caused a loosening of the compact structure of the pasta, disrupting the compact protein-starch matrix of maize resulting in higher cooking loss and sticky pasta. The pre-gelatinized starch of the extruded pasta caused faster and greater water absorption during cooking resulting in lower cooking time. Extruded pasta samples had lower beta-carotene content possibly due to cis-trans isomerization, fragmentation, and oxidative decomposition; but the pasta showed higher antioxidant properties possibly due to Maillard reaction and caramelization products with reducing properties.

Conclusion: As an important source of beta-carotene, OFSP has the potential to be composited with maize flour and extruded to produce quality gluten-free pasta with health-promoting properties.

Biography: Rose Baah

Rose Otema Baah is currently pursuing a doctoral study in Food Science at the University of Pretoria. I had my master and undergraduate study in university of Pretoria and university of Ghana respectively. I love good food. So i study the science in coming up with a good food for good health.