

Yam flour (*Dioscorea alata* L.) in fresh pasta of whole grain wheat flour

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Abstract

The consumption of whole grain products grows every day and it is of great importance to the diet because of their higher nutritional quality than non-whole grain products. However, whole fresh pasta has a dark color that makes them not being acceptable by consumers. The addition of yam flour influences on the color of fresh pasta providing lighter product pasta, besides improving the quality such as the antioxidant activity.

Key words: *fresh pasta, whole grain wheat flour, yam.*

Introduction

Tubers like yam are a source of income for small farmers, which sell the tubers in natura in fairs and supermarkets. An appreciation of this tuber could be the production of stabilized flour for use in high value-added products, like fresh pasta. Despite its high value-added product, Brazil does not produce high quality wheat for this kind of product, generating an import demand. The purpose of this work was to produce and evaluate fresh pasta prepared with whole grain wheat flour and partial replacement of refined wheat flour by yam flour, in order to explore the beneficial properties of whole wheat and enable the use of yam flour in this kind of product.

Results and Discussion

Formulations of pastas were prepared according to Table 1 (YF: Yam Flour, RWF: Refined Wheat Flour and WGWF: Whole Grain Wheat Flour). The fresh pastas were evaluated for their technological parameters of quality and all analyzes were performed in triplicate, using Tukey test for average means comparison ($p < 0.05$).

Table 1 - Formulations of fresh pasta.

Formulations	% YF	% RWF	% WGWF
M0 (control)	0	49	51
M1	5	44	51
M2	10	39	51
M3	15	34	51

The raw materials had similar chemical composition to that specified in literature. RWF and WGWF presented strong rheological properties suitable for use in pasta. Results indicate that the addition of YF to pasta significantly increased the brightness of all evaluated formulations, both raw and cooked pasta, and reduced yellowness as increased YF content. The increase of the YF content caused a decrease of moisture and cooking yield. An increase in loss of solids in the water was caused because of the reduced amount of RWF and, consequently, reduced the content of proteins forming gluten, which consists in a three-dimensional viscoelastic mass that provides the physical and rheological characteristics of plasticity, viscosity and elasticity to the dough. The decrease in gluten provides a mass with lower water absorption therefore reducing the yield and the performance when handling solids,

which are lost in the water. The increase of the YF content also caused an increment in the firmness of uncooked pasta (3995.92 to 6758.60 N) and cooked pasta (1432.49 to 1979.37 N) compared to M0 due to the higher retrogradation of starch which increases the peak force. The addition of YF also caused even greater antioxidant activity for pasta, which were analyzed by the cation radical scavenging capacity and ABTS scavenging activity of free radical solution using DPPH.

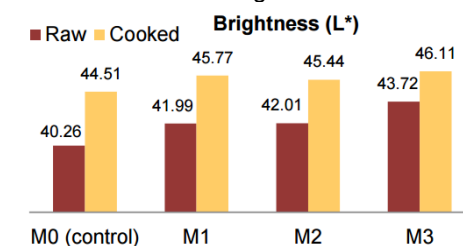


Image 1 - Color parameters of fresh pasta

Conclusions

It can be concluded that the use of YF to replace up to 15% of the RWF in the fresh pasta prepared from WGWF contributes to a lighter weight and higher antioxidant capacity in the pasta. These results point to future applications of YF in higher value-added products with the purpose of valorization of this culture in the agribusiness.

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