Use of Turmeric (Cúrcuma longa) flour as a natural ingredient in fresh pasta of whole grain wheat flour

Isabela Vilar (IC), Adriana Lucia Wahanik (PG), Mária Herminia Ferrari Felisberto (PG), Gláucia Maria Pastore (PQ), Iramaia Angelica Neri-Numa (PQ), Maria Teresa Pedrosa Silva Clerici (PQ).

Abstract
In this work we proposed the use of turmeric flour in fresh pasta of whole grain wheat flour in order to bring beneficial health effects and benefit the small farmer. The project was carried out starting four formulations, one of the control (M0) consists of white flour and whole grain flour and the other three (M1, M2 and M3) with grades 3, 6 and 9% of turmeric, respectively.

Key words: Fresh pasta, turmeric, wheat flour.

Introduction
The whole wheat fresh pasta presents dark color and characteristic flavor which may be enhanced by the use of natural products such as turmeric (Cúrcuma longa Linn.), which presents yellow color, pleasant taste, Curcumin and other bioactive compounds. In this study we evaluate the technological effects of adding turmeric flour in whole wheat fresh pasta.

Results and Discussion
In this study we evaluate the technological effects of adding turmeric flour in whole wheat fresh pasta. The raw materials: turmeric flour (TF) (obtained by Cooperaçafrão), refined wheat flour (RWF) and whole grain wheat flour (WGWF), obtained using a Brabender experimental mill, were characterized chemically and for their rheological parameters. Formulations of whole wheat fresh pasta with 51 % of WGWF and substitution of RWF by TF in three levels were prepared as following: Control (RWF 49 %), M1 (RWF 46% and 3 % TF), M2 (43 % RWF and 6 % TF) and M3 (40 % RWF and 9 % TF). The whole wheat fresh pasta was evaluated by technological parameters such as color (L*, a*, b*, ΔE*), firmness from raw and cooked pasta and specific analyses such as solids in water, yield and optimal cooking time (s), all of them were performed in triplicate, and the means of experimental data were compared by Tukey test (p < 0.05). An increase of the cooking time (49.8 to 180 sec), yield (from 124.40 to 155.84 g/100g), loss of solids in water (3.09 to 11.12 g/100g) and firmness (2.17 to 1.83 N) was observed with an increase of TF on the formulations of whole wheat fresh pasta. All pasta formulations with turmeric showed ΔE* above two comparing with control. The M2 formulation, which showed technological characteristics similar to M0, was compared to this in relation to the antioxidant capacity. The M2 formulation increased significantly Total Phenolic values (0.57 µg Gallic Acid equivalent/mg from sample in dried mass), ABTS (12.21 µmol Trolox equivalent/mg from sample in dried mass) and DPPH (5.74 µg Trolox equivalent/mg from sample in dried mass) comparing to M0 values.

Image 1. Pasta Processing.

Conclusions
This study showed that it is possible to add turmeric flour in pasta made with whole grain wheat flour, due to the improvement on pasta color, texture and yield, but the solubility of the turmeric pigment in the cooking water indicates that this type of product can be more suitable for soups, for increasing consumption of turmeric bioactive compound.

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Reference