Development of a Cassava (M*anihot esculenta*) Starch Flour based Noodle

M.N.F. Missriya, M.G.P.P. Mahindarathne, S.M.I.P.G. Bandara
Uva Wellassa University, Badulla, Sri Lanka

and

N.S. Rathnayaka
Harischandra Mills PLC, Delkada Road, Matara, Sri Lanka

Introduction

Wheat flour is used as the major gluten source for manufacturing of noodles. But, it is quite expensive and contains less nutritional value. It is important to reduce the dependency on imported wheat flour as a food raw material. Therefore, Sri Lankan food industry must focus on substitution of wheat flour with locally available food raw materials for commercial food manufacturing. Cassava (*Manihotesculenta*) is locally available root crop which gives higher yield during the period of harvesting. Cassava flour can be proposed as a substitute for wheat flour due to closely similar nutritional composition of cassava flour and wheat flour, relatively easy cultivation and high productivity of cassava which results lower price for cassava. This research is an attempt to develop a cassava starch flour based noodles while addressing the specific objectives of determination of the best ration of cassava flour to wheat flour to obtain preferred organoleptic characteristics of the final product, to determine the most suitable time period to steam the selected sample and to determine the chemical composition and to determine the shelf life of the products.

Methodology

The research was designed in three experiments in each according to complete randomized design. In the first experiment, the cassava flour based noodles product was developed after determination of the best ration of cassava and wheat flour from the five different treatments tested. Treatments were prepared incorporating cassava flour in levels 60% (A), 50% (B), 40% (C), 30% (D) and 20% (E) with wheat flour. The best ratio was determined by a sensory evaluation. The organoleptic properties of flavor, odor, texture, color and overall acceptability were evaluated in each treatment based on a five point hedonic scale.

In the second experiment, the selected sample was dipped in 100 ^{0}C boiling water for 1, 2, 3, 4 and 5min to determine the best time period to steam the selected noodles product using a sensory evaluation by thirty semi-trained panelists based on a five point hedonic scale. Same sensory properties were evaluated as in the first experiment. Then, the sensory properties of the selected noodle were compared with control sample prepared only using wheat flour.

In the third experiment, nutrient composition, microbial quality and shelf life analysis were done in the cassava flour based noodles developed according to the findings of the above experiments. Moisture, crude protein, crude fat, crude fiber, total carbohydrate and total ash contents were determined in proximate analysis and gruel content was measured to analyze the chemical composition of the final product. Total plate count was calculated and shelf life analysis was done.

Results and Discussion

Analyzed statistical data of the first experiment revealed that Treatment D (incorporated with 30% cassava flour (D) occupies the outermost boundary for all the sensory attributes tested other than odor (Figure 1). There were significant differences ($P<0.05$) in the sensory attributes. Best selected noodle (30% cassava flour) has the higher preference than control in all the attributes other than texture (Figure 2).

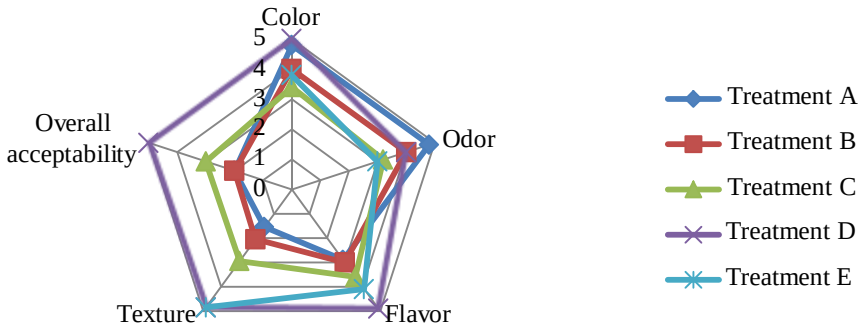

Figure 1. Sensory profile for treatments in sensory evaluation.

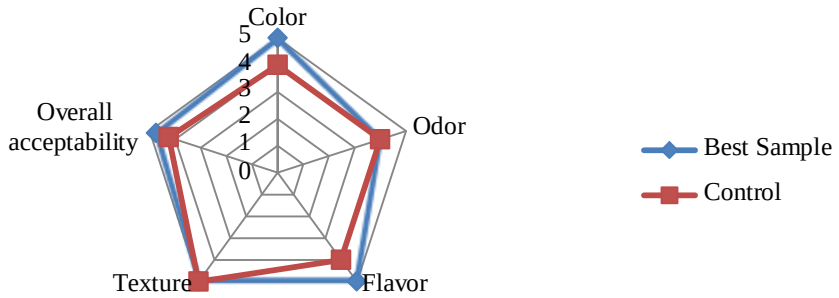

Figure 2. Sensory profile for control and best sample in sensory evaluation.

Results of the second experiment suggested that steaming time period of 4 minutes in 100 ^{0}C boiling water is the best treatment to steaming the selected newly developed noodles. There were significant differences ($P<0.05$) in the sensory attributes tested.

Conclusions

The noodle developed by incorporating 30 % cassava flour is more suitable for consumption among the different treatments tested. The best time temperature combination to cook the final product was 4min at 100 ^{0}C. Carbohydrate and fibre contents are high in cassava based noodles compared to those of control. Results of the total plate count implies that the product was not violated the maximum TPC limit according to the SLSI 420, 1989 standard since the CFU per gram was less than five.

References

Kolawole, O., Falade, J., Akingbala, O., 2008. Improved nutrition and national development through the utilization of cassava in baked foods, In: Robertson, G.L., (Eds) Food science to promote national development, International Union of Food Science and Technology.

Lateef, S.O., Bamgbose, C.A., Sanni S.A., 2004. Production of instant cassava noodles, Journal of Food Technology, 2(2), 83-89.