DEVELOPMENT OF NUTRIENT DENSE BEAN BASED COMPOSITE FLOUR FOR SOUP

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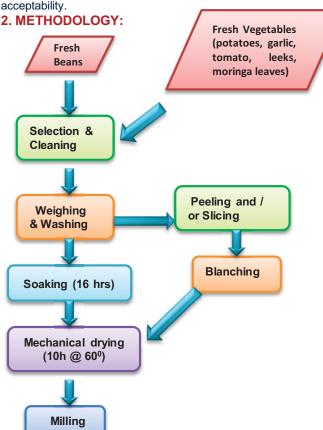3. Department of Food Technology & Nutrition, MAK, Uganda

1. INTRODUCTION:

Several research studies have linked beans *(Phaseolus vulgaris)* with health that reveals it dietary importance (Uebersax, 2006; Papanikolaou Y, Branen, L., 2009). Beans constitute one of the main staple crops in Rwanda and is among the highest producer and consumers. However, the processing methods are still traditional and unimproved; using long hours (3-4 hours) of boiling on charcoal even among city dwellers. There also exists a big problem of increased post-harvest losses due to the lack of safe storage systems and lack of knowledge on appropriate handling techniques. Hence, the production and use of bean flour, which is quite unknown, in diverse products will help to break the monotonous food consumption in the country. Since, it was found through a CRSP Bean study in 2009 that several vegetables too were incorporated into cooked bean, it was felt that new product could be developed. This led to the processing of the bean based composite flour using moringa leaves, potatoes, tomatoes, carrots, leeks, and garlic and determine its nutrient content and consumer acceptability.

2. METHODOLOGY:

2.1 Composite flour development

The milled bean and vegetable flours were mixed in different proportions so as to obtain 4 different combinations. The mix was termed **"CRSP - KIST - PANAMIX"**. They were prepared as soup and subjected to sensory evaluation. The accepted combinations were subjected to lab analysis for nutrients and functional properties.

2.2 Sensory Analysis

The composite flour was prepared into a soup. 100g of the flour was poured into 750ml boiling water to which 15ml oil and salt to taste was added and boiled for 7 to 10 min until it thickened. The soup was served to 15 panellists who assessed its acceptability.

2.3 Analysis of nutritive value

Carbohydrates, proteins, fats, ash, moisture content, calcium fiber & energy were analyzed using standard AOAC (2005) methods.

2.4 Analysis of functional property

Oil & water absorption, bulk density, wettability & pH were determined using standard methods.

3. RESULTS & DISCUSSION:

Two out of 4 combinations were accepted through sensory analysis of the soup developed. The combinations of beans, moringa leaves, potato, tomato, carrots, leeks & garlic were in the ratio of **70:10:8:4:4:2:2** for Sample A & **60:20:8:4:4:2: 2** for Sample B. Sample characteristics (appearance, aroma, taste, texture and overall acceptability) were found to be statistically not significant at 1% and the overall acceptability was found to be statistically significant at 5%.
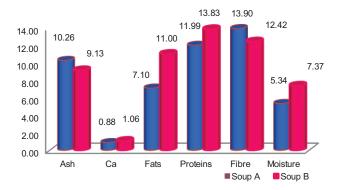

Fig 1: Important nutrients in the bean based soup flour

Other nutrients determined was β-carotene, carbohydrate & total energy. They were 79.12 mg/100 g, 51.40%, 317.47 Kcal/g, respectively, for Soup A. While for Soup B they were 173.56 mg/100g, 46.26%, 339.34 Kcal/g, respectively. B was higher in β-carotene, calcium, crude fat, crude protein and total energy. Final sensory evaluation revealed no significant difference between soups ($p < 0.05$).
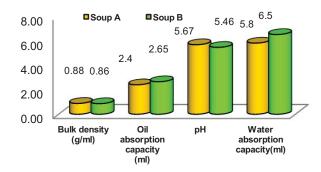

Fig 2: Functional properties of the soup flour

4. CONCLUSION:

Soup made from beans was acceptable with high nutritional value.

5. REFERENCES:

Papanikolaou Y, Branen, L., 2009. Bean Briefs- Emerging Research News as Reported by the Nutrition/Medical Journals. Bean briefs journal, Publication of the US Dry bean Council Health and Promotion Committee, summer 2009
Uebersax A.M., 2006. Dry Edible Beans: Indigenous Staple and Healthy Cuisine, © Forum on Public Policy, MSU (USA).