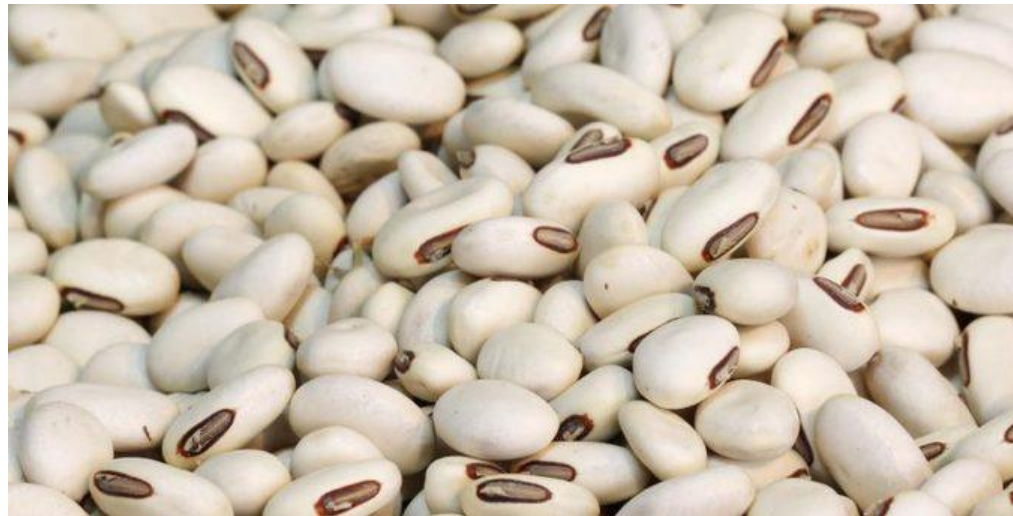


SENSORY CHARACTERISTICS AND ACCEPTABILITY OF NAVY BEANS (*Phaseolus vulgaris*) POWDER AS BUTTERSCOTCH

Julie Ann G. Feliciano
Mydee O. Gervacio - *Presenter*
Quirino State University
Diffun, Quirino
Region 2
Philippines



Navy beans (*Phaseolus vulgaris*) are small, pea-sized beans that are creamy white in color. They are mild-flavored beans that are dense and smooth. Like other common beans, navy beans are one of 13,000 species of the family of legumes, or plants that produce edible pods.

Combined with whole grains such as rice, navy beans provide virtually fat-free high quality protein. The navy bean got its current popular name because it was a staple food of the United States Navy in the early 20th century. These small white beans are perfect for making baked beans (Queiroz, 2012).

Rationale

Objectives

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Results and Discussion

Summary

Conclusion

Recommendation

Rationale

Navy beans are an excellent source of cholesterol-lowering fiber, as are most other beans. In addition to lowering cholesterol, navy beans' high fiber content prevents blood sugar levels from rising too rapidly after a meal, making these beans an especially good choice for individuals with diabetes, insulin resistance or hypoglycemia.

Rationale

When combined with whole grains such as brown rice, navy beans provide virtually fat-free high quality protein. Navy beans are a very good source of folate and manganese and a good source of protein and vitamin B1 as well as the minerals phosphorus, copper, magnesium and iron (Wood, 2008).

Rationale

Thus, this study was conceptualized to develop products made of navy beans to address its high risk for wastage and increase its demand because this plant is found in all seasons and it is cost efficient. Moreover, this is to enrich the nutritional value of butterscotch by using navy bean flour as a substitute of wheat flour in the preparation of the product.

Objectives of the Study

Generally, this envisions to develop butterscotch using navy beans (*Phaseolus vulgaris*). Specifically it aims to:

1. Determine the acceptability of the sensory characteristics of butterscotch prepared from navy beans prepared in the different methods as follows:
 - 1.1. Dried
 - 1.2. Roasted
 - 1.3. Baked

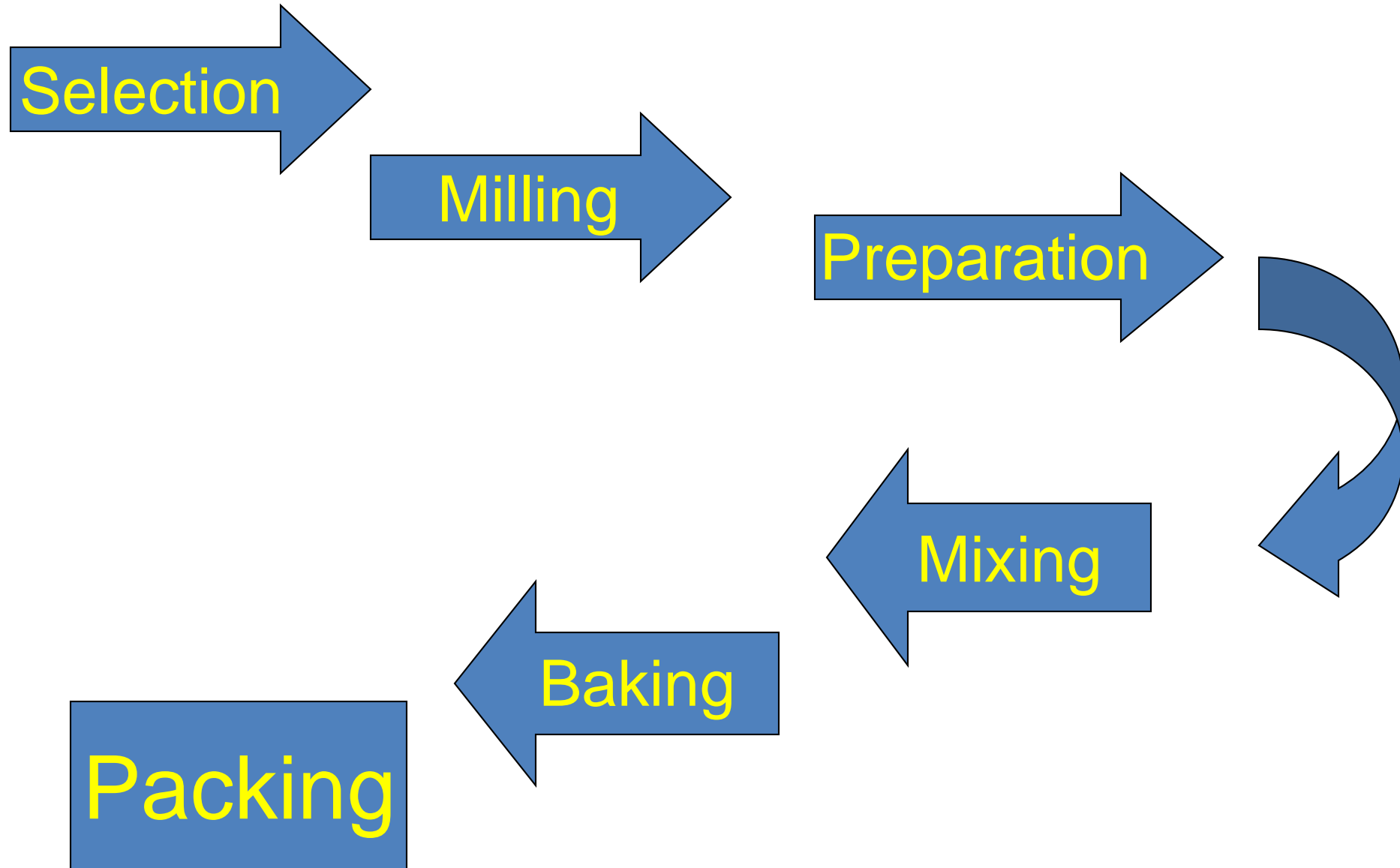
Objectives of the Study

2. Determine the overall acceptability of navy beans powder as butterscotch.
3. Assess the existence of significant differences on the mean evaluation of the different treatments in terms of appearance, texture, aroma, taste, color and overall sensory evaluation.

Research Methodology

Specific Ingredients	Quantity
➤ Eggs	2 pcs.
➤ Navy bean flour	1.5 cups
➤ Brown sugar	$\frac{3}{4}$ cup
➤ Margarine	$\frac{1}{2}$ cup
➤ Glucose	$\frac{1}{2}$ cup
➤ Peanut	$\frac{1}{2}$ cup
➤ Maple syrup	$\frac{1}{2}$ tbsp
➤ Vanilla extract	$\frac{1}{2}$ teaspoon
➤ Baking powder	$\frac{1}{2}$ cup

Procedures: The schematic procedures of making Butterscotch



The study is experimental in nature with four (4) treatments replicated three (3) times to arrive with twelve (12) experimental units. The treatments are:

- T0 (Control)
- T1 (Use of Dried Milled Navy Beans)
- T2 (Use of Roasted Milled Navy Beans) and
- T3 (Use of Baked Milled Navy Beans).

The 9-point hedonic scale was used to determine and to describe the degree of likeness or dislikeness of the product by the evaluators/tasters. Data gathered were analyzed using the means and Analysis of Variance.

Results and Discussion

Table 1. Mean Sensory Evaluation of Butterscotch in the Different Treatments in terms of Appearance, Texture, Aroma, Taste, and Color

TREATMENTS	APPEARANCE	TEXTURE	AROMA	TASTE	COLOR
T0 (use of All Purpose Flour)	7.45	7.32	7.11	7.31	7.27
T1 (Use of Dried Milled Navy Beans)	8.42	8.43	8.40	8.31	8.29
T2 (Use of Roasted Milled Navy Beans)	8.42	8.42	8.35	8.27	8.31
T3 (Use of Baked Milled Navy Beans)	8.42	8.37	8.35	8.27	8.32

**Table 2. Over all Acceptability of Butterscotch
per Treatment**

TREATMENTS	Mean Evaluation	Description
T0 (use of All Purpose Flour)	7.24	Like Moderately
T1 (Use of Dried Milled Navy Beans)	8.42	Like Very Much
T2 (Use of Roasted Milled Navy Beans)	8.39	Like Very Much
T3 (Use of Baked Milled Navy Beans)	8.35	Like Very Much

Table 3. Analysis of Variance on the Mean Evaluation

Sensory Evaluation	p-value	Decision
Appearance	0.060	Not Significant
Texture	0.730	Not Significant
Aroma	0.701	Not Significant
Taste	0.000	Significant
Color	0.389	Not Significant

Summary

The study was conducted to assess the quality of navy beans powder as butterscotch in terms of appearance, color, aroma, texture, taste and overall acceptability and assess the existence of significant differences in the quality of different treatments in the different sensory evaluations.

The data gathered from the sensory evaluations were analyzed using the mean in accordance of the objectives of this study. The results of the study are as follows:

- T0 (all purpose flour) was evaluated as "Like Moderately" in the sensory evaluation and in the over all acceptability of the product while the rest of the treatments were evaluated as "Like Very Much".
- In the analysis of variance, it appeared that in the sensory parameters taste has significant difference while the rest of the parameters are not significant.

Conclusion

Thus, from the result of the study it is possible to substitute the navy beans flour to all purpose flour in making butterscotch whether be it in dried milled, roasted milled or baked milled navy beans

Recommendation

Based from the sensory evaluation of the product, the following recommendations were made:

1. A second set of evaluation should be done involving more expert evaluators with varied demographic characteristics to validate the result of the evaluation.
2. Future researches on navy beans should include the Cost and Return Analysis (ROI) which are very important input for commercialization purposes.
3. Further researchers in the academe to explore more on other recipes using navy beans.

Thanks for Listening!