

The Acceptability of Yellow Corn (*Zea mays*) Flour as the Main Ingredient in Making an Energy-Rich Food Bar (Corn Bar)

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ABSTRACT

Corn is the world's most important grain, based on the production volume. In 2016-2017, a production level around 1.07 metric tons of corn was achieved (Shahbandeh, 2017). Isabela province is the top corn producer in the country peaking its production at 1, 049, 954 metric tons. The most produced corn in the country came from the City of Ilagan and because of this it was hailed as the "Corn Capital of the Philippines". Due to the high supply of corn in the City and the limited product produced out of corn, the researchers developed an Energy Rich Corn Bar using Yellow Corn flour as the main ingredient in the development of the product. The general objective of the study is to develop a healthy snack bar which can be served both as a snack and a dessert using corn flour as the main ingredient. The researchers tried different proportions of corn flour: T1 (100% yellow corn flour), T2 (70% yellow corn flour) and T3 (50% yellow corn flour) and baked in an electric oven. They got an overall grand mean of 4.26 and gave a qualitative description of "Highly Acceptable". It indicates that the Corn Bar is generally "Highly Acceptable" by the evaluators. Therefore, making corn bars using corn flour is possible and acceptable.

Keywords: Acceptability, baking, yellow corn, flour, healthy

INTRODUCTION

People have used corn for numerous purposes. It is often used as feed, industrial starch and bio-based plastics. It also has a lot of health benefits, some of these are prevention of various cardiovascular diseases, lower risk of colon cancer, increases bone strength, boosts immune system, prevents anemia, reduces cholesterol absorption in the body, controls diabetes and hypertension (Meenakshie Nagdeve, 2019). The nutrients found in corn are 29% Dietary, Fiber, 25% Carbohydrates, and 19% Protein. Vitamins are 31% B6, 26% Thiamin, and 18% Niacin. 32% Minerals and Magnesium. 24% Manganese and 22% Selenium.

Corn flour is a flour powder made of finely ground corn meal. It is usually used for breading and also combined with other flours in baked goods. Corn flour could be blended with wheat flour to lower gluten for pastries. It is used as binder, filler and thickener in pastry, cookie and meat industries.

Yellow corn flour, made by grinding dried yellow corn kernels into a powder finer than corn meal. It contains a number of essential nutrients, these are Zinc, Iron, Carotenoids, Vitamin A, and Fiber. (Sylvie Tremblay)

The researchers would like to develop a healthy product out of yellow corn flour. Making a bar out of yellow corn flour is uncommon to people's ears, but has a lot

of health advantages. In some way, the study can help improve the nutritional status of Ilagueno's who do not get to eat their breakfasts, in addition to that it can also serve as a corn product for the City of Ilagan.

The study was conducted to find out the acceptability of energy rich food bars using yellow corn flour as the main ingredient. Specifically, it sought to answer the level of acceptability of corn bars in terms of taste, texture, appearance and aroma.

METHODOLOGY

I. Project Design

Corn bar ingredients are yellow corn flour, all-purpose flour, butter, condensed milk, fresh eggs, grated cheese. Treatment 1 used 100% yellow corn flour; Treatment 2 used 70% yellow corn flour and 30% all-purpose flour; and Treatment 3 used 50% of yellow corn flour and all-purpose flour.

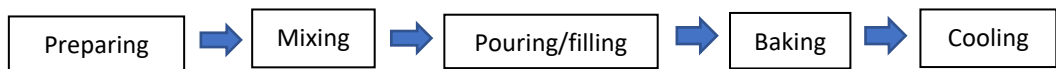
Below are the steps in making an Energy Rich Food Bar (Corn Bar)

1. Prepare the necessary supplies, tools and equipment.
2. Preheat oven to the desired temperature (250 deg. F.)
3. Soften butter and add sugar, eggs and condensed milk. Mix using a creaming method.
4. Gradually add yellow corn flour and all-purpose flour.
5. Mix well until well combined.
6. Pour into the prepared baking pan and spread the mixture evenly.
7. Add grated cheese on top of the mixture.
8. Bake in a preheated oven for 30 minutes.
9. Cool and slice in small portions.

*The yellow corn was crushed, soaked and drained ready for pulverizing at the public market to become flour.

II. Project Development

Energy Rich Food Bar (Corn bar) is easy to prepare and the ingredients are locally available. Thus, anyone can make this kind of product.



III. Operation and Testing

To generate the needed data for this study, the researchers used a questionnaire as the major instrument. This was used by the researchers because it was easier for the respondents to answer and to the researchers to determine and tabulate the responses of the respondents.

IV. Evaluation Procedure

Several steps were used by the researchers to develop the needed instrument

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to bring the most desired results.

Permission from TESDA-Isabela School of Arts and Trades faculty and staff, students and children were sought by the researchers. After the permission granted, the researchers personally administered the questionnaire to the respondents.

Finally, the questionnaires were gathered and the data were tallied and tabulated. Concerning the acceptability of Energy Rich Food Bar (Corn Bar) with respect to the taste, texture and appearance. The range with its corresponding qualitative description is shown in Table 1.

Table 1

Scale range and qualitative description

Range	Qualitative Description
4.21 - 5.00	Highly Acceptable
3.41 - 4.20	Moderately Acceptable
2.16 - 3.40	Acceptable
1.81 - 2.15	Slightly Acceptable
1.00 - 1.80	Not Acceptable

Statistical Tool Used

To determine the level of acceptability of Corn Bar (N), arithmetic mean was applied:

$$X = \frac{\sum x}{N}$$

where X = mean
x = scores
N = No. of cases

RESULTS AND DISCUSSION

I. Project Description

The desired characteristics of energy rich bar (corn bar) when it comes to its texture, it is moist, smooth not grainy and not crumbles when sliced; the color is evenly golden brown; the taste is not so sweet, not so creamy, flavor of corn is not overpowerd and has noticeable taste of corn.

II. Project Structure

Figure 2 to 4 shows the three treatments in the development of the Corn bar. Treatment 1 has 100% yellow corn flour; Treatment 2 has 70% yellow corn flour; and Treatment 3 has 50% of yellow corn flour and all-purpose flour.

Figure 2
Treatment 1



Figure 3
Treatment 1



Figure 4
Treatment 1



III. Project Capabilities and Limitations

The study made researchers think about how to make a nutritious energy rich food bar that can help farmers by giving them an idea on how to produce a food out of their own crop. The Corn bar is high in carbs and packed with fiber, vitamins and minerals. It's also relatively low in protein and fat that makes it healthier compared to the ordinary snack bar. Furthermore, there are many existing snack bars in the market but are not using yellow corn flour which makes the research differ from other studies

IV. Project Evaluation

As reflected in Table 5, the overall grand mean of 4.28 gave a qualitative description of "Highly Acceptable". It indicates that corn bars are generally acceptable by the evaluators. The table below presents the analysis and interpretation of the data gathered on the acceptability of Energy rich food bars. Data are presented to shed light on the study.

A. Respondent's Acceptability of the Taste of Corn Bar

The respondent acceptability of the taste of Corn Bar is reflected in Table 2. As shown in the table, the acceptability rating of the energy rich food bar with yellow corn flour when subjected to three treatments such as (T1)100% yellow corn flour; (T2)70% yellow corn flour and 30% all-purpose flour; and (T3)50% of yellow corn flour and all-purpose flour with mean score of 4.28 respectively. Furthermore, the computed overall mean score of 4.28 implies further that the respondents rated "Highly Acceptable" the taste of Corn Bar. This shows that the taste is much preferred by the respondents.

Furthermore, the computed overall mean score of 4.38 implies that the respondents rated "Highly Acceptability" the taste of Corn bar. This shows that Treatment 2 is much preferred by the respondents.

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Table 2

Acceptability of corn bar in terms of taste as evaluated by the respondents

Treatment	Range	Qualitative Description
(T1) 100% Yellow Corn Flour	4	Moderately Acceptable
(T2) 70% Yellow Corn Flour and 30% All-purpose Flour	4.78	Highly Acceptable
(T3) 50% Yellow Corn Flour and 50% All-purpose Flour	4.21	Highly Acceptable
Grand mean	4.33	Highly Acceptable

B. Respondent's Acceptability of the Texture of Corn Bar

It can be seen from Table 3 that the (T1) gave a mean score of 4.11 "Moderately Acceptable"; (T2) gave a mean score of 4.48 "Highly Acceptable"; and (T3) gave a mean score of 4.21 "Highly Acceptable". This goes to show that Treatment 2 has the best texture among the three treatments.

Table 3

Acceptability of corn bar in terms of taste as evaluated by the respondents

Treatment	Range	Qualitative Description
(T1) 100% Yellow Corn Flour	4.11	Moderately Acceptable
(T2) 70% Yellow Corn Flour and 30% All-purpose Flour	4.48	Highly Acceptable
(T3) 50% Yellow Corn Flour and 50% All-purpose Flour	4.21	Highly Acceptable
Grand mean	4.26	Highly Acceptable

C. Respondent's Acceptability of the Appearance of the Corn Bar

As shown in Table 4, the acceptability of the appearance based on the evaluation of the respondents is reflected in Table 4. As presented in the table, the result of their evaluation is "Highly Acceptable". (T1) got a mean score of 4.21, then (T2) got a mean score of 4.38 which is the highest score while (T3) got a mean score of 4.21.

As a whole, the overall mean of 4.23 gave a descriptive rating of "Highly Acceptable" this shows that the respondents approved the appearance of corn bar.

Table 4

Acceptability of Corn bar in terms of Appearance as Evaluated by the respondents

Treatment	Range	Qualitative Description
(T1) 100% Yellow Corn Flour	4.21	Highly Acceptable
(T2) 70% Yellow Corn Flour and 30% All-purpose Flour	4.38	Highly Acceptable
(T3) 50% Yellow Corn Flour and 50% All-purpose Flour	4.21	Highly Acceptable
Grand mean	4.23	Highly Acceptable

D. Respondent's Acceptability of the Aroma of Corn Bar

It can be seen from Table 5 that the (T1) gave a mean score of 4.10 "Moderately Acceptable"; (T2) gave a mean score of 4.31 "Highly Acceptable"; and (T3) gave a mean score of 4.23 "Highly Acceptable". This goes to show that Treatment 2 has the best aroma among the three treatments.

Table 5

Acceptability of Corn bar in terms of Aroma as Evaluated by the respondents

Treatment	Range	Qualitative Description
(T1) 100% Yellow Corn Flour	4.10	Moderately Acceptable
(T2) 70% Yellow Corn Flour and 30% All-purpose Flour	4.31	Highly Acceptable
(T3) 50% Yellow Corn Flour and 50% All-purpose Flour	4.23	Highly Acceptable
Grand mean	4.21	Highly Acceptable

E. Respondent's General Acceptability of Corn bar

As reflected in Table 6, the respondents' general acceptability of corn bars is presented. As shown in the table, the general acceptability of the corn bar in terms of taste has the greatest grand mean of 4.33. This implied that the taste of the corn bar is highly acceptable by the respondents. Furthermore, the texture got a grand mean of 4.26; the appearance got a grand mean of 4.23 while aroma got a grand mean of 4.21.

The overall grand mean of the Corn bar is 4.26 which gives a qualitative description of "Highly Acceptable". It indicates that the corn bar is generally "Highly Acceptable" by the evaluators. This goes to show that corn bar is very much preferred as it yielded "Highly Acceptable".

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Table 6

General acceptability of corn bar as evaluated by the respondents

Qualities	Range	Qualitative Description
Taste	4.33	Highly Acceptable
Texture	4.26	Highly Acceptable
Appearance	4.23	Highly Acceptable
Aroma	4.21	Highly Acceptable
Overall Grand Mean	4.26	Highly Acceptable

CONCLUSIONS

It can be concluded that making an energy rich food bar out of corn flour was possible and accepted by the evaluators with a grand mean of 4.26. The study will also promote a healthy snack for any age of consumers.

RECOMMENDATIONS

Based on the conclusions, it is highly recommended that this study can serve as a nutritious and healthy snack bar for anyone. It is also recommended that further study shall be conducted for the improvement of the product.

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