

DEVELOPMENT AND ACCEPTABILITY OF RADISH (*Raphanus sativus*) BACON

Edna E. Hermida, MAT
edna.e.hermida@gmail.com

Fely A. Habla, Ed.D.
SORSOGON STATE UNIVERSITY
Graduate Studies
Sorsogon City

ABSTRACT

This study focuses on the development and acceptability of radish bacon. The descriptive developmental method was used in this study. The respondents of this study were the 30 sensory panelists who were given samples of each treatment. The respondents were grouped according to age and gender. A 9-point Hedonic Scale checklist was utilized in this study. Weighted mean was used to get the acceptability level of the product in terms of color, aroma, taste, and texture.

Based from the data gathered, the following findings were revealed: 1. The processes involved in developing the radish bacon were as follows: washing the radish, peeling, cutting, pat-drying, measuring, brining, chilling, pan frying, draining oil, and cooling. 2. Along with the development of radish bacon, there were three treatments made. The radish, soy sauce, brown sugar, and Knorr seasonings were the ingredients that varied with the three treatments in this study. 3. The level of acceptability of the radish bacon along the identified variables shows that Treatment 2 of radish bacon was preferred by the evaluators. 4. The data collected represented by level of assessment of the evaluators when grouped according to age and sex. The data was grouped according to age, 19 years old and below, and 20-29 years old like very much the treatment 2 (T2) while the 30 years old and above like very much the treatment 2 (T2), and treatment 3 (3). In terms of sex, male respondents like very much the treatment 3 (T3) and female respondents like very much the (T2). 5. The products of the most accepted treatment (T2) contains 93.10g of calories per 100g servings. The total fat has 2.14g and 3.29% of daily value, sodium has 468.05 mg and 19.50% of daily value. The potassium has 253.11 mg and 7.23% of daily value, for the carbohydrates it has 18.38g and 6.13% of daily value, fiber 1.45 g and 5.79% of daily value. The sugar contains 16.36g and protein has 1.11g per 100g servings. The products has high vitamin C 17.13% of daily value, calcium has 3.17% and iron has 2.93% of daily value.

Based on the findings, the following conclusions are drawn: 1. The process used in the development of radish bacon focus on the brine solution. 2. Along with the development of radish bacon, there were three treatments made to come up with the most accepted product. 3. The level of acceptability of the radish bacon along the identified variables shows that Treatment 2 of radish bacon was preferred by the evaluators. 4. The level of assessment of the evaluators when group according to age and sex along with the color, aroma, texture and taste. For the data group according to age, treatment 2 (T2) has the highest mean for the age group of 19 years old and below and 20 to 29 years old. For the age group of 30 years old and up, treatment 2 (T2) and treatment 3 (T3) has the highest mean. 5. The products of the most accepted treatment (T2) contains calories, fat, sodium, potassium, carbohydrates, fiber, sugar, protein, vitamin C, calcium, iron within the recommended level.

In view of the conclusion drawn by this study, the following are recommended: 1. Another study may be conducted to use a different process of drying and brining solution. 2. The product may be subjected to laboratory testing to identify its shelf life and storability. 3. A consumer test maybe done to strengthen the level of acceptability of the product. 4. Vacuum packaging with labels that is suited to the product may be used in the conduct of future study. 5. Another study may be conducted to determine the physicochemical properties, and microbial and nutrient contents of the product.

KEY WORDS: *DEVELOPMENT, ACCEPTABILITY, RADISH, BACON, LEVEL OF ASSESSMENT*

INTRODUCTION

Manufactured food presents an opportunity to assist with sustainability issues and improve health and disease, but with some rigor around nutrient targets like those in place in the UK, a need for product development may encourage further support and longevity for the category. In comparison to similar animal meat products, plant-based meat substitutes may have the appearance of being a healthful option but on closer inspection, care and some guidance may be needed to provide to consumers about how to construct plant-based diets.

Curtain, et al. (2019) stated that the demand for plant-based meat substitutes is growing globally for nutritional and environmental reasons. Australia is the third-fastest growing vegan market worldwide. Plant protein is on trend and growing globally. This overview of plant-based meat substitutes demonstrates sodium is an issue for these products and this nutrient is the leading dietary factor in terms of the global burden of disease.

Overall, the product lacks equivalence with similar meat products which is a limitation for vegetarians/vegans and meat consumers alike who may fall short of key nutrients. Balanced messages about not needing to be entirely meat-free may be necessary from both a sustainability and nutritional point of view. The category presents an opportunity to meet whole grain targets and increase the consumption of legumes in a convenient food form with known acceptability among consumers.

Weinrich (2019) stated that meat substitutes are still far from being established on a large scale. There are many possibilities to promote consumption, be it at the research or corporate or political level. Consumption patterns with high meat rates are far from being sustainable. Thus, a more sustainable diet should include less meat consumption. The perception of taste and appearance are the most crucial factors for the successful adoption of meat substitutes by consumers. Easy availability and compatibility with local food are essential for long-term success.

The researcher came across different vegetables in Filipino cuisine and noticed that most of the abundant vegetables locally produced are underrated. Vegetables from the locals have limited recipes to serve at the table of the Filipinos. Most of these vegetables are not appealing when food is being prepared. Radish (*Raphanus sativus*) or labanos in Tagalog term is one of the less valued vegetables on the table. The vegetable commonly picked or cooked along with the famous Filipino dish “sinigang” and most of the time left after the meal because it is not as appealing as other vegetables in a dish.

The Radish (*Raphanus sativus*) is a widely known vegetable in the market. It is crisp when eaten raw and has a pungent flavor. It can be soft and sweet when cooked and tastes like peppery. There are limited ways of utilizing radish in the Philippines limiting its capability to be widely consumed compared to other vegetables. The researcher objectifies to deliver a way of consuming the vegetable to make it marketable and profitable to local farmers and the consumers as well.

The Department of Agriculture, Bureau of Plant Industry, (2008) explained that radish (*Raphanus sativus*) is one of the major vegetable crops in the Philippines. Radish produces a good yield of seed under a temperate climate with less humidity especially during the reproductive stage. The most popular variety grown in the country is the “60 days” variety. Most of the variety can be cultivated all year round.

Radish can offer many health benefits. It also acts as a powerful detoxifier that improves the blood and eliminates toxins and waste. Similarly, it also helps with the urinary disorder. It is also an aid for weight loss since it caters to low digestible carbohydrates, high in roughage, and contains a lot of water. The vegetable is also a good source of anthocyanin, reducing the occurrence of cardiovascular diseases, and is also high in fiber that promotes regular excretory patterns and relieves the symptoms of constipation. (What’s in a radish, 2015)

In Bicol Region, Sorsogon City is one of the contributors to agricultural economy. From the 2018 data of Philippine Statistics Authority, the province of Sorsogon has three major products namely coconut, banana, and abaca. Portion of their agricultural production comes with varieties of vegetables and root crops.

Relatively, the government of Sorsogon City also supports the production of vegetables for its people’s consumption as well as a source of income. The office of the City Agriculturist from the government of Sorsogon City provides seed distribution to the local farmers, semi-commercial farmers, and backyard growers. The seeds are given free after the procedure of assessment. The agriculturist of the office conducts ocular inspection and provides professional advice and instruction for cropping of their seeds. All of the services given free to their beneficiaries of the project.

In 2018, the Philippine Statistics Authority come up with the data of vegetables and root crops production. Most of the harvests intended for home consumption and supply for the local market. The radish production in Sorsogon City are not widely produced compared to the other region in the Philippines. There were available data on the status of radish in terms of agricultural perspective from the countryside report of the Philippine Statistics Authority - the province of Sorsogon in the year 2018. It stated that the loss of 1 hectare in the harvest area since

2016 has led the production of radish to decrease by about 3 metric tons each year (2016-2017). The rate of production per area is increasing since 2014 along with most other crops. With the piled-up data of the researcher, the study would pave its way to provide an opportunity to the radish growers in Sorsogon City for an innovation that will make a difference.

During the pandemic in the year 2020 where people are placed in lock down at the comfort of their home several food recipes were scattered all over the internet. Around April of 2020, Brown (2020) shared her recipe of vegan bacon made from carrots and it spread all over the internet. This news led to the idea of utilizing radish as meat alternative.

The Philippine Statistics Authority (2021) provides market prices of selected commodities in Metro Manila. Whole sale prices were collected twice a week. The latest data was on January 28, 2021. The price of fully dressed whole chicken was raised to 126 to 179 pesos per kilo, pork ranges from 330 to 510 pesos per kilo, and beef ranges from 360 to 580 per kilo.

Calderon (2021) reported that in February 2021, pork supply tightens amidst of price freeze. The current President Rodrigo Duterte's executive order mandating a price ceiling on pork and chicken due to the limited supply in the market. Pork price soared because of the cut from the hog raisers and intermediary before the product reach the market. Behind this cut was the loss of the hog raisers from the high mortality rate of hogs due to the African swine fever.

Now, since meat as one of the main sources of protein of every Filipino always has price increase, the conduct of alternative for the daily protein in each meal responds to the challenge. Meal planning is essential in building each meal hence substituting meat into protein-rich vegetable and meat alternatives are the closest resolution at this time of meat price increase.

OBJECTIVES

This study aimed to develop radish (*Raphanus sativus*) as a meat alternative and determine its acceptability. Specifically, it sought answers to the following questions:

1. What are the processes in the conduct of the developed product?
2. What are the treatments applied in the developed food product?
3. What is the level of acceptability of the radish bacon based on sensory qualities along:
 - a. Color,
 - b. Aroma,
 - c. Taste, and
 - d. Texture?
4. What is the level of assessment of the evaluators when grouped according to age and sex?
5. What are the nutritional facts of the most accepted radish bacon treatment?

METHODOLOGY

This study determined the development and acceptability of radish bacon (*Raphanus sativus*). The researcher used a descriptive developmental method of research. The descriptive method is defined as a purposive process of gathering, analyzing, classifying, and tabulating data about prevailing conditions, practices, beliefs, processes, trends, and cause-effect relationship and then making an adequate and accurate interpretation about such data with or without the aid of statistical methods. (Calderon and Expectacion 2006).

It is descriptive since the studies describe the level of acceptability of the developed food product. The study was also considered as developmental because its output is an innovation utilizing radish (*Raphanus sativus*) as the main ingredient.

The study documented and presented the processes in conduct of the developed product. There are three treatments applied in the developed food product. The level of acceptability of the radish bacon base on sensory along with the identified variables: color, aroma, taste, and texture are measured in this study. The level of assessment of the evaluators when group according to age and sex are also measured in this study. The nutritional facts of the most accepted treatment were also presented.

The study has 30 sensory evaluators who were given samples of each treatment. The 30 sensory evaluators of the study were composed of 15 students from Sugod Senior High School and 15 teachers from Lydia D. Martinez

Memorial High School. The evaluators were grouped in three age bracket and sex. First were 19 years old and below in male and female, second were 20 to 29 years old in male and female and last were 30 years old above in male and female.

A 9-point Hedonic Scale checklist (Modified from Gatchalian and de Leon) for the acceptability of the radish bacon was utilized in this study.

Furthermore, weighted mean was the statistical tool used in the study to measure the level of acceptability of the radish bacon base on sensory qualities as well as the level of assessment of the evaluators when group according to age and sex.

RESULT AND DISCUSSION

FINDINGS:

Based from the data gathered, the following findings were revealed:

1. The processes involved in developing the radish bacon include washing the radish, peeling, cutting, pat-drying, measuring, brining, chilling, pan frying, draining oil, and cooling.
2. Along with the development of radish bacon, there were three treatments made. The radish, soy sauce, brown sugar and Knorr seasonings were the ingredients that vary with the three treatments in this study.
3. The level of acceptability of the radish bacon along the identified variables shows that Treatment 2 of radish bacon was preferred by the evaluators.
4. The data collected represented by level of assessment of the evaluators when group according to age and sex. The data was grouped according to age, 19 years old and below and 20-29 years old like very much the treatment 2 (T2) while the 30 years old and above like very much the treatment 2 (T2) and treatment 3 (3). In terms of sex, male respondents like very much the treatment 3 (T3) and female respondents like very much the (T2).
5. The products of the most accepted treatment (T2) contains 93.10g of calories per 100g servings. The total fat has 2.14g and 3.29% of daily value, sodium has 468.05 mg and 19.50% of daily value. The potassium has 253.11 mg and 7.23% of daily value, for the carbohydrates it has 18.38g and 6.13% of daily value, fiber 1.45 g and 5.79% of daily value. The sugar contains 16.36g and protein has 1.11g per 100g servings. The product has high vitamin C 17.13% of daily value, calcium has 3.17% and iron has 2.93% of daily value.

CONCLUSIONS:

Based on the findings, the following conclusions are drawn:

1. The process used in the development of radish bacon gave emphasis on the brine solution.
2. Along with the development of radish bacon, there were three treatments made to come up with the most accepted product.
3. The level of acceptability of the radish bacon along the identified variables shows that Treatment 2 of radish bacon was preferred by the evaluators.
4. The level of assessment of the evaluators when group according to age and sex along with the color, aroma, texture and taste.
For the data grouped according to age, treatment 2 (T2) has the highest mean for the age group of 19 years old and below and 20 to 29 years old. For the age group of 30 years old and up, treatment 2 (T2) and treatment 3 (T3) have the highest mean.
5. The products of the most accepted treatment (T2) contains calories, fat, sodium, potassium, carbohydrates, fiber, sugar, protein, vitamin C, calcium, and iron within the recommended level.

RECOMMENDATIONS:

In view of the conclusion drawn of this study, the following are recommended:

1. Another study may be conducted to use a different process of drying and brining solution.
2. The product may be subjected to laboratory testing to identify its shelf life and storability.
3. A consumer test maybe done to strengthen the level of acceptability of the product
4. Vacuum packaging with labels that is suited to the product may be used in the conduct of future study.

5. Another study may be conducted to determine the physicochemical properties, and microbial, and nutrient content of the product.

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