IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 5, May 2024

DOI: 10.17148/IARJSET.2024.11524

Formulation, Analysis and Acceptability of Brown Rice Chips with Herbs

Aprilyn Geronimo De Juan

Capiz State University-Main Campus Roxas City, Capiz, Philippines

Abstract: The study formulated the brown rice chips with herbs (basil, onion laves, parsley), specifically to evaluate its sensory qualities and acceptability in terms of appearance, aroma, color, taste and crispiness. The method used in this study was developmental-experimental method of research. In the developmental research, this method used for formulation of brown rice chips with herbs for potential development and commercialization while in the experimental method attempted to investigate the proportion of brown rice chips with herbs using three treatments. This used the Completely Randomized Design: one (1) was tested by panel of evaluators and second (2) for final processes for consumer's preference evaluation. Score cards with the Nine (9) Points Hedonic Scale was used to obtain the data. The mean and Analysis of Variance (ANOVA) were used to analyze the data into alpha level set at 0.01 alpha. Findings on the sensory evaluation of the brown rice chips with herbs showed that (onion leaves) was the best quality attributes. When the general acceptability was considered in terms of appearance, aroma, color, taste, and crispiness. The brown rice chips with herbs was safe for human consumption as the results of microbial analysis of the product and based on the BFAD standard for microorganism test for products belonging Snack Foods category.

Keywords: Brown Rice, Herbs

I. INTRODUCTION

Background of the Study

Brown rice is some traditional health food rich in various active substances, which have effective preventive and therapeutic effects on many diseases. Besides basic nutrients, brown rice also contains a variety of bioactive ingredients, suchas phytosterols,GABA, oryzanol, vitamins,minerals,dietaryfiber,functional lipids, phenolicacids, tocopherols, flavo noids, anthocyanins, proanthocyanins, and essential amino-acids and phytic acid.

It has anti-oxidation property, lipid-lowering functions, and shows potential in anti-diabetes, anti-inflammation, and enhanced immune activity (Ravichanthiran et al. 2018). A product can only be referred to as organic food if it has been produced, stored, and processed without adding synthetic fertilizers, chemicals, and additives.

Organic foods and products are made from organically produced ingredients that are processed primarily via biological, mechanical, and physical means. Therefore, this study endeavors to address this gap by investigating the acceptability of brown rice chips enhanced with herbs among consumers.

Objectives of the Study

1. the sensory qualities of brown rice chips with herbs in terms of appearance, aroma, color, taste, and crispiness;
2. determine the general acceptability of the product among three treatments

Significance of the Study

The study of brown rice chips with herbs can benefit various stakeholders across different sectors and the key beneficiaries include consumers, food industry, health and wellness sector, agriculture sector, public health organization.

Scope and Limitation of the Study

This study was solely focused on making brown rice chips with herbs, this included experimenting with different ingredient ratios and cooking methods to achieve the desired flavor, texture, and nutritional profile, explored various options for sourcing high-quality brown rice and fresh herbs to ensure the chips were made with wholesome and natural ingredients.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 5, May 2024

DOI: 10.17148/IARJSET.2024.11524

II. METHODOLOGY

This chapter presents the research tools, equipment, ingredients, procedures, experimental design, treatment proportions and statistical analysis of the study.

The method used in this study was the developmental-experimental method of research. The developmental research was the methodical investigation of design, development and evaluation of instructional program products and processes that must meet informal consistency and efficacy criteria (Richey and Klein 2014). Thus, this method was used for the formulation of Brown Rice Chips with Herbs (Basil, Onion leaves, parsley), for potential product development and commercialization. Experimental method focuses the study in the future (what will be) when the variables or the study are carefully controlled or manipulated (Coleman & Steele, 2018).

After that the researcher conduct sensory evaluation sessions with a panel of trained tasters to assess the flavor, texture, aroma, and overall acceptability of prototype chips in a sensory evaluation tests to gather feedback on the sensory attributes of the brown rice chips with herbs.

The researcher uses descriptive analysis methods to evaluate the appearance, aroma, color, taste, and crispiness. Consider employing trained sensory panels or consumer taste tests to assess preferences and acceptance of different chip formulations. The researcher design and administer evaluation sheet to gather data on consumer preferences in the appearance, aroma, color, taste, and crispiness of the product. The statistical tools **u**tilized was analysis of variance (ANOVA) to identify the significant difference in three (3) experimental trials.

III. RESULTS AND DISCUSSION

Sensory Qualities of Brown Rice Chips with Herbs

The sensory evaluation of brown rice chips infused with varying amounts of herbs (basil, onion leaves, and parsley) was conducted by a panel of experts, assessing key attributes such as appearance, aroma, color, taste, and crispiness, as presented in Table 1. In general, the sensory evaluation results suggest that while all variations of brown rice chips infused with basil, onion leaves, and parsley offer appealing sensory attributes, preferences may vary based on individual taste preferences and the specific herb content.

Regarding appearance, brown rice chips containing 30 g of herbs received high ratings across all three herb varieties, with mean scores ranging from 7.30 to 7.90, indicating a generally strong appeal in terms of visual presentation. Similarly, the aroma of these chips was deemed very pleasant, with mean scores ranging from 7.30 to 7.60, reflecting the enticing fragrance imparted by the herbs.

In terms of color, chips containing 30 g of onion leaves and parsley were rated as very authentic, while those with basil were deemed moderately authentic. This suggests that onion leaves and parsley contribute more significantly to the chips' color authenticity compared to basil.

Moving on to taste, chips with 30 g of basil received a rating of moderately delicious, while those with onion leaves and parsley were deemed very delicious. This indicates a preference for the taste profile imparted by onion leaves and parsley over basil.

Furthermore, all variations of the brown rice chips, irrespective of the herb content, were found to be very crispy, indicating a desirable textural characteristic that adds to the overall sensory experience.

According to the study of Carbonell-Capella et al. (2014) the sensory qualities of chips, whether they are potato chips, tortilla chips, or brown rice chips, can be influenced by a variety of factors. This was the type and quality of ingredients used in chip production play a significant role in determining their sensory qualities.

For example, the variety of potato used in potato chips, the type of corn used in tortilla chips, or the addition of herbs and spices in flavored chips can all impact taste, aroma, and texture. Then the methods used to process and manufacture chips can affect their sensory attributes. Factors such as slicing thickness, frying temperature, frying duration, and oil composition can influence the texture, crispiness, color, and flavor profile of the chips.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 5, May 2024

DOI: 10.17148/IARJSET.2024.11524

Table 1. Sensory qualities of brown rice chips with herbs

TREATMENTS		BASIL		ONION		PARSLEY	
Product	**Quality Attributes**	**Mean**	**AD**	**Mean**	**AD**	**Mean**	**AD**
30 g	**Appearance**	7.80	VMA	7.30	VMA	7.90	VMA
	Aroma	7.30	VMP	7.60	VMP	7.50	VMP
	Color	6.90	MA	7.40	VMA	7.80	VMA
	Taste	7.00	MD	7.50	VMD	7.70	VMD
	Crispiness	7.50	VMC	7.80	VMC	7.50	VMC
40 g	**Appearance**	7.50	VMA	7.70	VMA	7.90	VMA
	Aroma	7.90	VMP	7.70	VMP	7.60	VMP
	Color	7.80	VMA	7.60	VMA	7.50	VMA
	Taste	7.40	VMD	7.70	VMD	7.20	MD
	Crispiness	7.70	VMC	7.80	VMC	7.60	VMC
50 g	**Appearance**	7.60	VMA	7.90	VMA	7.20	MA
	Aroma	7.60	VMP	7.50	VMP	7.40	VMP
	Color	7.90	VMA	7.70	VMA	7.20	MA
	Taste	7.30	VMD	8.10	VMD	6.70	MD
	Crispiness	8.00	VMC	8.00	VMC	8.00	VMC

Legend: ***Adjectival Description (AD)***

Score	***Appearance***	***Aroma***	***Color***
8.12 – 9.00	*Extremely Appealing (EA)*	*Extremely Pleasant (EP)*	*Extremely Authentic (EA)*
7.23 – 8.11	*Very Much Appealing (VMA)*	*Very Much Pleasant (VMP)*	*Very Much Authentic (VMA)*
6.34 – 7.22	*Moderately Appealing (MA)*		*Moderately Authentic (MA)*

Score	***Taste***	***Crispness***
8.12 – 9.00	*Extremely Delicious (ED)*	*Extremely Crispy (EC)*
7.23 – 8.11	*Very Much Delicious(VMD)*	
6.34 – 7.22	*Moderately Delicious (MD)*	

General

Acceptability of Brown Rice Chips with Herbs

The results underscore the considerable appeal of brown rice chips infused with herbs among consumers, with onion leaves emerging as the most preferred option, closely followed by parsley and basil.

These findings provide valuable insights into consumer preferences, which can inform product development efforts aimed at optimizing the sensory appeal and market acceptance of herb-infused brown rice chips.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 5, May 2024

DOI: 10.17148/IARJSET.2024.11524

The findings presented in Table 4 shed light on the overall acceptability of brown rice chips infused with herbs (basil, onion leaves, parsley) as perceived by a group of consumers, focusing on sensory qualities associated with the 30 g component composition of these herbs within the chips. Notably, Treatment B, featuring onion leaves, emerged as the most favored option across all evaluated sensory attributes, garnering impressive mean scores of 8.51 for appearance, 8.35 for aroma, 8.38 for color, 8.51 for taste, and 8.62 for crispiness.

These high ratings collectively led to treatment B being described as "Liked Extremely" for all five sensory qualities, indicating a robust level of general acceptability among consumers.

According to the study of Barbu et al., (2023) chips with organic herbs can be influenced by several factors. that may affect the perception of the respondents these were the herb type and flavor profile in which it was identify that **t**he type of herb used in the chips can significantly impact their acceptability. Different herbs have distinct flavor profiles that may appeal to different tastes and preferences. For example, organic and non-organic each contribute unique flavors to the chips, which can influence consumer preference. The sensory qualities of the brown rice chips, including appearance, aroma, color, taste, and crispiness, play a crucial role in determining their acceptability. Consumers may prefer chips that have an appealing appearance, pleasant aroma, attractive color, satisfying taste, and desirable crispiness.

Table 2. General acceptability of brown rice chips with herbs

Treatments	A (Basil)		B (Onion Leaves)		C (Parsley)	
Quality Attributes	*Mean*	*AD*	*Mean*	*AD*	*Mean*	*AD*
Appearance	7.60	LVM	8.51	LE	8.12	LE
Aroma	7.59	LVM	8.35	LE	7.93	LVM
Color	7.69	LVM	8.38	LE	8.09	LVM
Taste	7.24	LVM	8.51	LE	8.02	LVM
Crispiness	7.87	LVM	8.62	LE	8.11	LVM
Acceptability	7.60	LVM	8.47	LE	8.05	LVM

Legend: ***Adjectival Description (AD)***

Score	***General Acceptability***
8.12 – 9.00	*Liked Extremely (LE)*
7.23 – 8.11	*Liked Very Much (LVM)*
6.34 – 7.22	*Liked Moderately (LM)*
5.45 – 6.33	*Liked Slightly (LS)*

IV. CONCLUSION

Brown rice can be utilized as the main ingredients in making chips. Based on the sensory evaluation and general acceptability, this decision considered factors such as sensory qualities, and consumer acceptability to ensure that the chosen product represents the highest quality and safety standards.

V. RECOMMENDATION

It is suggested that more experiment with different formulations and concentrations of herbs to optimize flavor balance while maintaining product integrity and consider incorporating additional herbs or spices to offer a wider variety of flavor options and cater to diverse consumer preferences then explore alternative cooking methods or ingredient combinations to enhance the overall sensory experience of the chips.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 5, May 2024

DOI: 10.17148/IARJSET.2024.11524

REFERENCES

[1]. Burlando, B.; Cornara, L. (2014). Therapeutic properties of rice constituents and derivatives (Oryza sativa L.): A review update. Trends Food Sci. Technol., 40, 82–98.

[2]. Barbu, A., Ion, V.A., Frîncu, M., Defta, N. Lagunovschi-Luchian, V., and Bădulescu, L.A. (2023). Organic Vegetable Chips: Exploring Romanian Consumers' Preferences in Relation to Socio-Demographic Factors Retrieved from https://doi.org/10.3390/foods12183374

[3]. Cao, Y. et al. (2018) Phytochemical properties and nutrigenomic implications of yacon as a potential source of prebiotic: Current evidence and future directions. Foods, 7, 59.

[4]. Carbonell-Capella, et al. (2014). Snacks of chips and derived product, study market. Acceptance in a healthy diet. DOI:10.14642 RENC.20.3.5020

[5]. Eshun Naom. et al. (2015). Amino acid profiles of some varieties of rice, soybean and groundnut grown. J. Food Process. Technol., 6, 420.

[6]. Go, A.S. et al. (2017). Phytochemical profiles and antioxidant activity of brown rice varieties. Food Chem., 227, 432–443.

[7]. Goufo, P. et al. (2014). Rice antioxidants: Phenolic acids, flavonoids, anthocyanins, proanthocyanidins, tocopherols, tocotrienols, gamma-oryzanol, and phytic acid. Food Sci. Nutr., 2, 75–104.