

Acceptability and marketability of *pan de okra* with okra / lady's fingers as ingredient

Elvie S. Estrada

Faculty of the Food and Service Management Department, Master of Arts in Teaching Major in Food Technology, Marikina Polytechnic College, Marikina City, Philippines

ARTICLE INFORMATION

Article History:

Received 01 June 2014

Received in revised form 14 August 2014

*Corresponding author: elviesestrada@gmail.com

ABSTRACT

This study evaluates the level of acceptability and marketability of Pan de sal with okra/lady's fingers as ingredient. It utilized okra or lady finger due to the many health benefits that people can get from it. Equally, the research wanted to remedy some problems on undernutrition correlated to poverty based on the survey conducted established in 2008 by the Food and Nutrition Research Institute (FNRI) (3) groups of respondents participated in the study: Teens, Young Adults and Adults.

Using the experimental method of research it involved 90 respondents selected through purposive sampling and grouped into three, Pan de okra with three different proportions of okra powder was evaluated using 9-Point

Hedonic Rating Scale. The data were personally gathered and statistically treated using the weighted mean, and one factor ANOVA. The groups assessed the Pan de okra with three different proportions of 15 grams, 20 grams and 25 grams of okra powder are very acceptable in terms of appearance, sound/crunchiness, taste and texture. Also its level of marketability, of the pan de okra as perceived by the respondents, is very acceptable as well.

In sum, the three (3) different proportions of okra powder utilized in the preparations of Pan de okra are all very acceptable. Furthermore, the three groups of respondents positively accepted the use of okra powder as ingredient in making Pan de sal. The study recommend that: (1) A further experimental study be conducted to determine the exact nutritive value within each product, the profitability and shelf life of Pan de sal with okra powder ; (2) A study be done utilizing okra powder in making food products.

Keywords

Product Innovation, Good Food, Great Health

Introduction

Food consumption and utilization is directly related to one's physical nourishment. A well-balanced diet and suitable nutrition practices promote good health (Tanchoco, 2011). In the Philippines, a wholesome meal plan, as suggested by the Food and Nutrition Research Institute (FNRI), varies according to the needs of the five age group, namely, ages 1-6, 7-12, teen, adult and elderly, and individuals with special needs, like pregnant and lactating mothers (DST/ Food and Nutrition Research Institute, 2008). A recommended "Pinggang Pinoy" according to the institute, comprises of the energy giving (GO), body building (GROW), and body

regulating (GLOW) food in its right food proportion. This includes a wide array of nutrition sources starting from grains and crops, meats and other poultry products, to vegetables and fresh fruits. Coupled with proper hygiene and active lifestyle, an individual, without a diagnosed illness, will likely attain good health.

The access to different food and nutrition sources, however, is anchored not only on the food availability in the region, but also in the individual's financial capability and the family. According to the World Food Programme-Philippines in 2011, a high estimate of poor access to food remains in the country, especially in the rural areas

(Fernandez, 2012). This is further supported by the National Nutrition Survey (NNS) conducted by the FNRI in 2008, which states that undernutrition still remains a health concern in the country as correlated in the poverty in the Philippines (NFRI Conducts the National Nutrition Survey, 2013). In a study conducted by the Philippine Statistics Authority (PSA) through the National Statistical Coordination Board (NSCB), an amount of Php 5, 513.00 every month is needed to meet the basic food needs of a family of five; and an amount of Php 7, 890 every month is necessary for the food and non-food needs, and to stay on top of the poverty threshold, in the year 2012. The amount provided, however, is still out of a very poor family's reach. In the same research, a poor Filipino family's income falls short of 26.2 percent of the poverty threshold (Despite rise in the number of families, extreme poverty among families remains steady at 1.6 million in 2012—NSCB - See more at: http://www.nscb.gov.ph/pressreleases/2013/NSCB-PR-20131213_povertypress.asp#sthash.Cqy49XB8.dpuf, 2013).

For this reason, most Filipino families hardly meet the standard and proportional food intake. There is a great imbalance of consumption between the energy giving (GO) food and the other food groups, body building (GROW), and body regulating (GLOW) food. These insufficient levels of food consumption may be likely traced to the Filipino family's inability to access the right amount of food, not on the availability of food (Tanchoco, 2011).

In this group, the staple and most accessible to most Filipino families is the energy giving group. Aside from the common knowledge that Filipinos eat rice for each meal of the day, bread, especially Pandesal, is also part of a Filipino family's dining table. In fact, Senate Bill 457 proposed by Senator Jinggoy Estrada, cited "the enrichment of bread and other bakery products" as a practical strategy to combat malnutrition and hunger among youth in the country. The bill expounded on the nutritional values one gets

with a good proportion of bread in his/her diet which includes *thiamin*, *riboflavin*, *niacin* and *Vitamin D*. This has been acted upon and later known as, "National Bakery Act of the Philippines." No wonder bakers in the country devised ways on further enriching the benefits of *Pandesal* and successfully produced products that make the "nutritious" even more nutritious. Available in the market today are products like *malunggay Pandesal*, *garlic Pandesal*, *pandan flavored Pandesal* and other variations. Notably, these nutritious additional ingredients to the regular *Pandesal* are readily available in any marketplace and grocery store in the country, or better yet, found in most families' backyard.

Okra (Lady Fingers), another nutritious vegetable powerhouse is not foreign in most Filipino delicacies, since it is used in most popular Filipino dishes like, *Sinigang*, *Pinakbet*, *Laswang Gulay* and *Diningding*. This vegetable, with immense nutritional benefits is not only a star in most Filipino dish, but is also considered as an important alternative in herbal medicine. According to Akruti , in 2014, okra or lady's fingers contains many health benefits that are good for our body. Among these are the following: (1) High fiber content that aids in the process of digestion; (2) Helps in the prevention of diabetes; (3) Foliates present in okra reduce the neural tube defects in a new born baby;(4) Vitamin K benefits that aid in blood clotting; (5) People diagnosed with asthma are strongly suggested to consume okra; (6) Adding okra to meals ensures prevention of constipation and colon cancer; (7) Regular usage of okra avoids obesity to a great content; (8) This vegetable ensures lesser absorption of cholesterol, dominant content in the body that triggers obesity and heart diseases.

Okra and *Pandesal* will surely be a perfect union that definitely give the teens, young adults and adults a reason to enjoy eating bread and vegetable at the same time. Thus, the purpose of this study.

The Research Questions

This study aimed to determine the level of acceptability and marketability of Pan

de Okra with Okra/Lady's Fingers as ingredient.

Specifically, this study sought answers to the following questions:

1. What is the evaluation of teenagers, young adults, and adult respondents of *Pan de Okra* with 15 grams, 20 grams, and 25 grams of powdered okra pods in terms of the following criteria? Appearance, Crunchiness, Taste and Texture
2. Are there any significant differences in the evaluation of the three groups of evaluators of the *Pan de Okra* with *Okra* powder according to proportions?
3. What is the level of marketability of *Pan de Okra* with the apportioned grams of powdered okra in terms of the given criteria, as perceived by the respondents?
4. What suggestions do the respondents offer to further improve the product?

Selected Literature Reviews

Health Guide.com described Okra (*Abelmoschus esculentus* Moench, *Hibiscus esculentus* Linn), known in many English-speaking countries as lady's fingers or gumbo, edible green seed pods in tropical, subtropical and warm temperate climates. Okra is a hardy plant that can grow even with less water and in hot conditions. Okra is somewhat related to cotton and hollyhock. It can grow up to 9 feet in height with heart shaped leaves that is palmate with 5 to 7 lobes. Okra flowers are large with 5 petals colored white or yellow and sometimes with a reddish-purple base. Its seed pods are 3 to 10 inches in length about ½ to 1 inch wide. Its fruit or pod is usually green in color with a new red variety. It is tapering in shape with ribs along its length. Okra fruit is valued as vegetable, harvested while young and has mucus-like juice that is used to thicken stews (gumbo). Okra is also known for its nutritional value and offers varieties of health benefits (<http://www.medicalhealthguide.com/herb/okra>).

According to Barrett (2013), okra is a nutritional powerhouse used throughout

history for both medicinal and culinary purposes. Once loved by the Egyptians and still used in many dishes today (such as the famous gumbo dish), this pod – producing, tropical vegetable dates back over 3500 years ago. But still today, many are enjoying both okra health benefits and the vegetable's edible delight.

Duke (1993). described *Okra* as an annual subshrub cultivated for the young tender pods used to thicken soups and stews, or eaten baked, boiled or fried. The leaves and seeds are Latin American folk remedies for tumours and the decoction of fresh fruits are taken for fevers, catarrhal ailments, irritability of the genitor-urinary canal, chronic dysentery and boiled in milk when used for coughs.

Kotz (2013). mentioned that the federal government's dietary guidelines for Americans recommend that adults and children consume three cups per day of fat-free or low-fat milk or reduced-fat dairy products, with milk getting the same positive emphasis as fruits and vegetables and whole-grains. But according to Dr. David Ludwig, a Boston Children's Hospital paediatrician who co-authored the commentary with Dr. Walter Willett, a nutrition researcher at the Harvard School of Public Health, those recommendations may have been influenced by the US Department of Agriculture's strong relationship with the dairy industry.

Adults with nutritious diets who get calcium from non-dairy sources such as sardines, kale, calcium-fortified orange juice, and white beans might not benefit much from milk, according to Ludwig. In fact, in countries where people consume no dairy products, osteoporosis rates don't appear to be higher than in the United States, possibly because residents get bone-building calcium and vitamin D from plant sources and, for vitamin D, adequate sunlight.

Related Studies. Several studies relevant to the present study were read and analyzed to gain ideas on how to complete the project. Those which are closely related to the study are presented hereunder.

In a study conducted by *V. Sabitha (2011)*, entitled “Anti diabetic and antihyperlipidemic potential of *Abelmoschus esculentus* (L.) Moench. In streptozotocin-induced diabetic rats”, suggests that extracts from okra could be developed as a prospective phytomedicinal plant against diabetes mellitus. The results have shown that by administration of okra extracts to diabetic rats, there was a significant reduction in blood glucose level and the lipid profile level also have normalized. This study resembles the present study for the researchers both used okra/Lady’s Fingers in their study.

The study conducted by *Sunilson et al. (2008)*, entitled “Antioxidant and hepatoprotective effect of the roots of *Hibiscus esculentus* Linn” of the Department of Pharmacognosy, School of Pharmacy, Master skill University College of Health Sciences, Selangor, Malaysia, showed that (*H. esculentus*) okra root ethanol extract has vitro free radical scavenging activity comparable with Silymarin. Okra contains flavanoids that may have anti-oxidant and hepatoprotective activities. The present study further suggests that phenolic compounds of the roots *H. esculentus* provide a good source of antioxidants that could offer potential protective effects against lipid oxidation and which could be exploited to make a hepato protective formulation. This study relates to the present study because it stresses the health benefits that okra offers.

A study published in *International Journal of PharmTech Research (2009)* suggests that the extracted mucilage of *Abelmoschus esculentus* is nontoxic and has the potential as a suspending agent even at lower concentration (4%w/v) and can be used as a pharmaceutical adjuvant. In view of these properties, mucilage of *Abelmoschus esculentus*

can be employed as stabilizer and thickener of choice when high viscosity’s desired, especially in cosmetic, pharmaceutical and food industries.

Bijkerk (2013) analyses the partial effect of fruit and vegetable consumption on psychological well-being, using data on 2,805 different individuals from the National Health and Nutrition Examination Survey in the United States. The regression is performed on eleven different variables for psychological well-being and includes repressors for fruit, salads, beans, other vegetables and the combination of these variables. The results show that there is a positive relation between the consumption of fruit and vegetables on four out of eleven variables; number of days feeling anxious, tense or worried, feeling bad about oneself, feeling down, depressed or hopeless and having little interest in doing things.

The results for the other seven variables are insignificant. The variable for salad is significant in four out of eleven dependent variables where beans are only significant for one out of eleven, and other vegetables are in significant for any of the dependent variables.

The results for the fruit variable are significant for three out of eleven variables, while total vegetable consumption is not significant for any of the variables. In sum, future research is needed to analyze the effect of fruit and vegetable consumption on psychological well-being, also focusing on the different aspects of fruits and vegetables. Further research recommendations are to conduct a controlled trial research.

Conceptual Framework

The conceptual model which guided the researcher in conducting this study is shown in Figure 1.

Fig. 1 preparation of the pan de okra using okra powder.

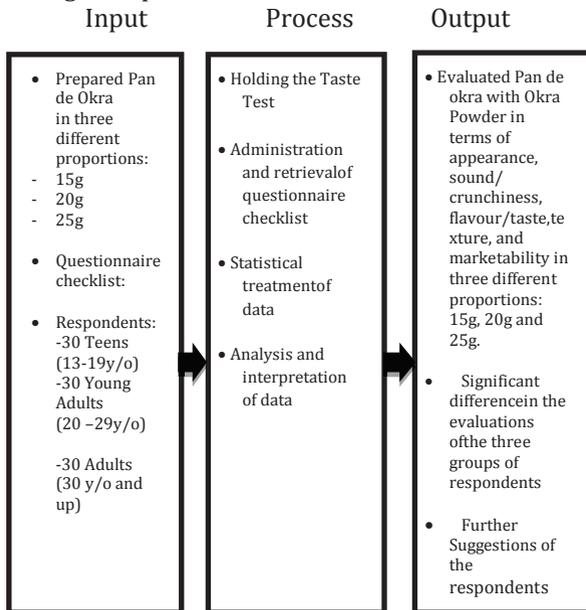


Figure 1. Conceptual Model for the Evaluation of the Level of Acceptability and Marketability of Pan de Okra

The input consists of the prepared pan de Okra in three different proportions, the questionnaire and the respondents.

The process involves the holding of taste test, administration and retrieval of the checklist, statistical treatment of data and the analysis and interpretation of statistical results were part of the process.

The output includes the evaluated Pan de Okra in terms of appearance, sound/crunchiness, flavour/taste, texture and marketability and the significant difference in the respondents evaluation of in three different proportions of the product.

Research Hypotheses

There are no significant differences among the evaluation of the three groups of respondents on the acceptability and level of marketability of Pan de Okra according to proportion in grams.

Method

With the experimental method of research the researcher deemed it

appropriate, since okra powder was used in the preparation of Pan de Okra. It sought to determine the acceptability and marketability of okra powder as ingredient of Pan de okra in terms of appearance, crunchiness, taste and texture.

According to Lodico, in (2010), the experimental method of research is a method or procedure designed to determine the cause-effect relationships. Purposely, it uses numbers to describe pre-existing groups or to determine whether a relationship exist between variables.

Sources of Data

The main source of data for the study was the questionnaire-checklist which contained the respondents' responses on the acceptability and marketability of the product based on certain criteria. A total of 90 respondents consisting of teenagers, young adults and adults of *Barangay Holy Spirit, Quezon City* were selected through purposive sampling: They are, as follows: 30 Teenagers (13-19 years old), 30 Young Adults (20-29 years old), and 30 Adult (30 years old and above).

Data Gathering Instrument

Data were gathered through the use of prepared questionnaire checklist that was validated and checked by the experts. The 9-Point Hedonic Rating Scale helped determine the evaluation of the three groups of respondents on Pan de okra with three proportions of Lady's Fingers powder in terms of the criteria on: a) appearance, b) crunchiness, c.) taste and d) texture. Likewise, the Likert's 5-Point Scale was utilized to determine the marketability of Pan de Okra based on the criteria.

Data Gathering Procedure

The data gathering procedure started with the experiment itself. The okra pods were first prepared then utilized as an ingredient of Pan de okra. Much later, the researcher personally administered and

retrieved the questionnaires to ensure high percentage of return. After having gathered the questionnaire, the research tallied, tabulated and statistically treated the data for analysis and interpretation.

Statistical Treatment of Data

The following statistical treatments were used in the study:

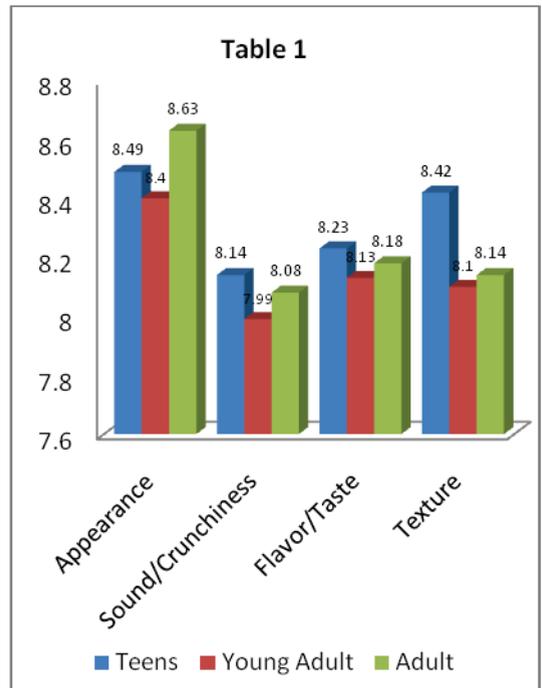
Weighted mean- to determine the rating by the three groups of evaluators as regards the criteria of Pan de Okra using okra powder as ingredient.

One-Factor Analysis of Variance (ANOVA) – to determine the significant differences in the evaluation of the teenagers, young adults and adults, as regards the criteria of Pan de okra using okra powder as ingredient.

Results

Table 1
Summary of the Evaluation of the Three Groups of Respondents on the Prepared Pan de Okra with 15 grams of Okra Powder

Criteria	Mean Scores of the Three Groups of Respondents					
	Teen		Young Adult		Adult	
	WM	VI	WM	VI	WM	VI
Appearance	8.49	VA	8.40	VA	8.63	EA
Sound/ Crunchiness	8.14	VA	7.99	VA	8.08	VA
Flavor/ Taste	8.23	VA	8.13	VA	8.18	VA
Texture	8.42	VA	8.10	VA	8.14	VA
General Weighted Mean	8.32	VA	8.16	VA	8.26	VA



Evaluation of Three Groups of Respondents on Pan de Okra with 15 grams of Okra Powder

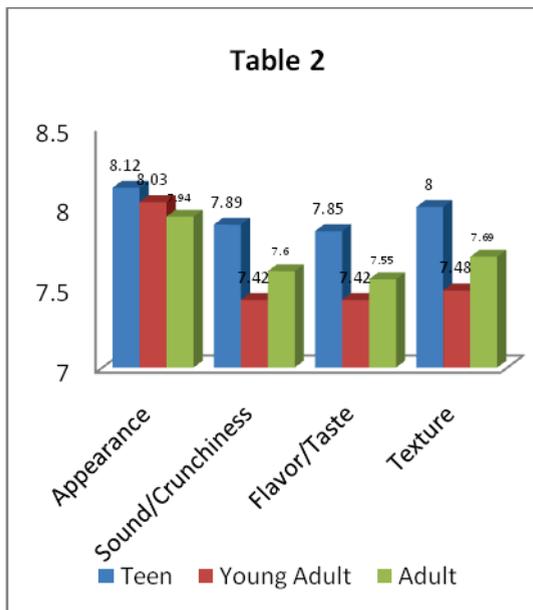
From the table we glean that *Pan de Okra* with 15 grams Okra Powder was rated very acceptable (VA) by the three groups of respondents, as evidenced in the general weighted mean of 8.32 for teens, 8.16 for young adults and 8.26 for adult respondents.

More specifically, the three respondents have rated the appearance of Pan de Okra with 15 grams Okra Powder as very acceptable (VA) for teens and young adults, while extremely acceptable (EA) for adult respondents. Another criterion, “sound/crunchiness”, has been rated very acceptable (VA) by the three groups of respondents. Furthermore, the third criterion on “flavour/taste” has been rated very acceptable (VA) also by the three groups of respondents just as the fourth criterion “texture”

These findings imply that Pan de Okra with 15 grams okra powder was very acceptable (VA) to the three groups of respondents with the highest weighted mean of 8.32.

Table 2
Summary of the Level of Acceptability of the Three Groups Respondents of Pan de Okra with 20 grams of Okra Powder

Criteria	Mean Scores of the Three Groups of Respondents					
	Teen		Young Adult		Adult	
	WM	VI	WM	VI	WM	VI
Appearance	8.12	VA	8.03	VA	7.94	VA
Sound/ Crunchiness	7.89	VA	7.42	MA	7.60	VA
Flavor/ Taste	7.85	VA	7.42	MA	7.55	MA
Texture	8.00	VA	7.48	MA	7.69	VA
General Weighted Mean	7.96	VA	7.59	VA	7.70	VA



Evaluation of Three Groups of Respondents on Pan de Okra with 20 grams of Okra Powder

Table e revealed that Pan de Okra with 20 grams Okra Powder was rated very acceptable (VA) by the three groups of respondents, as evidenced in the general weighted mean of 7.96 for teens, 7.59 for young adults and 7.70 for adult respondents.

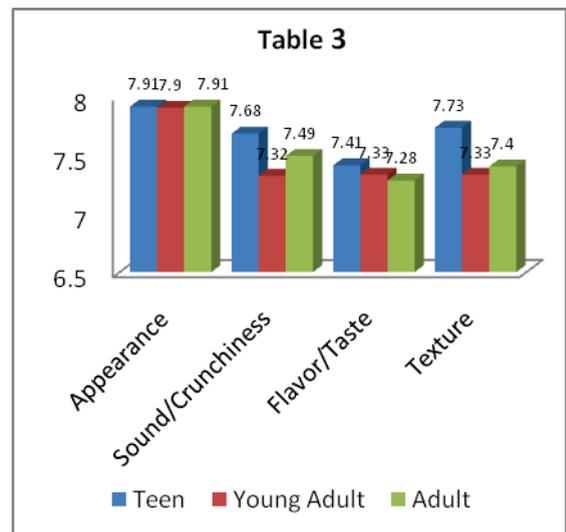
More specifically, the three respondents have rated the appearance of Pan de Okra with 20 grams Okra Powder as very acceptable (VA). Another criterion, "sound/crunchiness", has been rated very acceptable (VA) by teenagers and adult respondents, while the young adults rated the criterion as moderately acceptable (MA).

Furthermore, the third criterion which is "flavor/taste" has been rated very acceptable (VA) by the teenagers, while both young adults and adults have rated the criterion as moderately acceptable (MA). The fourth criteria "texture" was rated very acceptable (VA) by the teenagers as well, but the two remaining groups have given this criterion a moderately acceptable (MA) mark.

These findings imply that Pan de Okra with 20 grams okra powder was still very acceptable (VA) to the three groups of respondents with the highest weighted mean of 7.96.

Table 3
Summary of the Level of Acceptability of the Three Groups Respondents of Pan de Okra with 25 grams of Okra Powder

Criteria	Mean Scores of the Three Groups of Respondents					
	Teen		Young Adult		Adult	
	WM	VI	WM	VI	WM	VI
Appearance	7.91	VA	7.90	VA	7.91	VA
Sound/ Crunchiness	7.68	VA	7.32	MA	7.49	MA
Flavor/ Taste	7.41	VA	7.33	MA	7.28	MA
Texture	7.73	VA	7.33	MA	7.40	MA
General Weighted Mean	7.68	VA	7.47	MA	7.57	VA



Evaluation of Three Groups of Respondents on Pan de Okra with 20 grams of Okra Powder

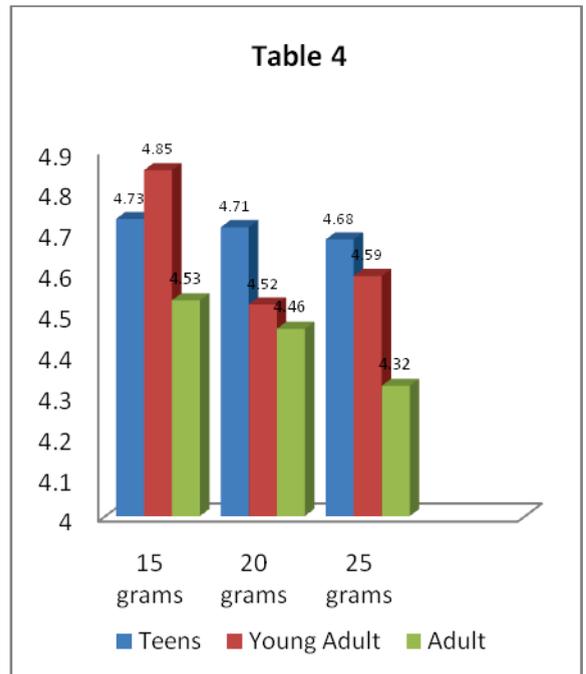
It can be seen in the table that Pan de Okra with 25 grams Okra Powder was rated very acceptable (VA) by the two groups of respondents, as evidenced in the general weighted mean of 7.68 for teens and 7.57 for adults, while the young adults rated it as moderately acceptable (MA) with the weighted mean of 7.47.

More specifically, the three respondents have rated the appearance of Pan de Okra with 25 grams Okra Powder as very acceptable (VA). Another criterion, "sound/crunchiness", has been rated very acceptable (VA) by teenagers, while young adults and adult respondents rated the criterion as moderately acceptable (MA). Furthermore, the third criterion which is "flavor/taste" has been rated moderately acceptable (MA) by the three groups of respondents. The fourth criterion "texture" was rated very acceptable (VA) by the teenagers, but the two remaining groups has given this criterion a moderately acceptable (MA) mark.

These findings imply that Pan de Okra with 25 grams okra powder was still very acceptable (VA) to the three groups of respondents with the highest weighted mean of 7.68.

Table 4
Summary of Level of Marketability of the Pan de Okra as Perceived by the Respondents

Marketability	Mean Scores of the Three Groups of Respondents					
	Teen		Young Adult		Adult	
3 Proportions of Okra Powder in Pan de Okra	WM	VI	WM	VI	WM	VI
a) 15 grams	4.73	VHM	4.85	VHM	4.53	VHM
b) 20 grams	4.71	VHM	4.52	VHM	4.46	HM
c) 25 grams	4.68	VHM	4.59	VHM	4.32	HM
General Weighted Mean	4.71	VHM	4.65	VHM	4.44	HM



Gleaned from the table are the three groups of respondents rating the marketability of Pan de sal with 15 grams Okra Powder as Very High Marketability (VHM), as evidenced by the weighted mean of 4.73 for teenagers, 4.85 for young adults and 4.53 for adult respondents.

However, only two groups respondents, the teens and young adults, rated the marketability of Pan de sal with 20 grams okra powder as Very High Marketability (VHM), while the adult respondents gave the mark of High Marketability (HM).

Also, the two groups of respondents, the teens and young adults, rated the marketability of Pan de sal with 25 grams okra powder as Very High Marketability (VHM), while the adult respondents again, gave the mark of High Marketability (HM).

These findings imply that only two groups of respondents agreed that the marketability of Pan de sal with okra powder has a Very High Marketability (VHM), while the adult respondents perceived that Pan de okra has a High Marketability (HM).

Table 5
Result of the Analysis of Variance among the Evaluations of the Respondents on Pan de sal with 15 grams of Okra Powder

Source of Variation	Sum of Squares	Df	Mean Squares	F-Computed Value	P-value	F-critical value	Decision
Between Groups	0.4141	2	0.2071	0.4831	0.6963	3.1013	Do not reject the null hypothesis
Within Groups	24.5564	87	1.0406				
Total	24.9705	89					

The result of the Analysis of Variance among the respondents' evaluation on Pan de sal with 15 grams of *okra powder* is shown in the table above. From calculation of the mean squares between groups over the mean squares within groups, the computed F-value is 0.7336 lesser than the critical F-value of 3.1013. Therefore, the null hypothesis is accepted that there is no significant difference in the evaluation of three groups of evaluators of *pan de okra* according to proportions.

Table 6
Result of the Analysis of Variance among the Respondents Evaluations on Pan de sal with 20 grams of Okra Powder

Source of Variation	Sum of Squares	Df	Mean Squares	F-Computed Value	P-value	F-critical value	Decision
Between Groups	4.3391	2	2.1696	3.0054	0.0547	3.1013	Do not reject the null hypothesis
Within Groups	62.8049	87	0.7219				
Total	67.1441	89					

As shown in table 6, with the computed F-value of 3.0054 less than the critical F-value of 3.1013, the null hypothesis is not rejected.

Table 7
Result of the Analysis of Variance among the Evaluations of the Respondents on Pan de sal with 25 grams of Okra Powder

Source of Variation	Sum of Squares	Df	Mean Squares	F-Computed Value	P-value	F-critical value	Decision
Between Groups	0.7563	2	0.3782	0.3634	0.6963	3.1013	Do not reject the null hypothesis
Within Groups	90.5299	87	1.0406				
Total	91.2863	89					

As yielded in table 7, the computed F-value of 0.3634 from the mean squares, is less than the critical F-value of 3.1013, resulting in to the non-rejection of the null hypothesis.

Discussion

This study aimed to determine the preparation and marketability of Okra/Lady's Fingers as main ingredient for Pan de Okra.

Specifically, this study sought answers to the following questions:

1. What is the evaluation of teenagers, young adults, and adult respondents of the Okra Pan de sal (Pan de Okra) with 15 grams, 20 grams, and 25 grams of powdered okra pods in terms of the criterion: a) Appearance, b) Crunchiness, c) Taste, d) Texture
2. Are there any significant differences in three groups of respondents' evaluation of the Pan de Okra with Okra powder according to proportions?
3. What is the marketability of the Pan de Okra as perceived by the respondents in terms of the given criteria?
4. What suggestions do the respondents offer to further improve the product?

The study used the experimental method of research involving 90 respondents grouped into three selected through

purposive sampling. The *Pan de sal* with three different proportions of okra powder was evaluated using a 9-Point Hedonic Rating Scale. The data were personally gathered and statistically treated using the Weighted Mean and One-Factor ANOVA.

The salient findings of the study revealed the following:

1. The three groups of respondents rated the *Pan de sal* with three different proportions of 15 grams, 20 grams and 25 grams as very acceptable.
2. There is no significant difference in the evaluation of the three groups of respondents' teenager, young adult and adult on the preparation and marketability of okra powder as ingredient of *Pan de sal* as regards to criteria.
3. The level of marketability of the *Pan de Okra*, as perceived by the respondents, is very agreeable (VA), as evidenced in Table 20.
4. The comments and suggestions of the respondents are the following:
 - a. Add more sugar to make it a little sweet.
 - b. Lessen the salt.
 - c. Lessen the amount of okra powder.
 - d. Use other flavorings such as vanilla.
 - e. Try to make the *Pan de Okra* softer.
 - f. Delicious

Conclusion

Based on the findings of the study, these conclusions are drawn:

1. The three different proportions of okra powder utilized in preparing of *pan de sal* are all very acceptable.
2. The three groups of respondents positively accepted the use of okra powder as ingredient in making *pan de sal* and has high market potential.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are offered.

1. A further experimental study be conducted to determine the exact nutritive value within each product, the profitability and the shelf life of the *Pan de sal* with okra powder.
2. A study be done utilizing okra powder in making food products such as pastille, tarts, cakes, pies, yema and so on.

References

Books

Ariola, Mariano (2008). **Principles and Methods of Research**. Rex Book Store, Inc. Sampaloc, Manila.

Carino, Celia et. al. (2009). **Experience Baking**. Mind Shapers Company, Inc.

Lodico, Marguerite G. et.al. (2010). **Methods in Educational Research**. John Wiley and Sons, Inc., San Francisco.

Soriano, Nora (2010). **A Guide to Food Selection, Preparation and Preservation**. Rex Book Store. Manila.

Unpublished Materials

Andaya, Jorilyn et al. (2011). **Production of Lotion Out of Okra Pods Extract**. Thesis. Marikina Polytechnic College, Marikina City.

Aliteg, Alma (2013). **Utilization and Acceptability of Saluyot Powder in Making Muffins**. Master's Thesis. Marikina Polytechnic College, Marikina City.

Dolorico, Randy et al. (2010). **Acceptability of Cassava Leaves as Pizza Toppings**. Thesis. Capiz State University Main Campus, Roxas City.

Jason, Sally D. (2013). **Preparation and Evaluation of Watermelon Rind as Main Ingredient of Butter Cake.** Master's Thesis. Marikina Polytechnic College, Marikina City.

Legson, Cathylene (2012). **Utilization and Acceptability Centella Asiatica (Takip kohol) Noodles as Brain Enhancer.** Master' Thesis. Marikina Polytechnic College, Marikina City.

Journals and Publications

Apacionado, Analeneet. al. (2008). **Utilization of Egg Plant in Making Jam.** Laguna State Polytechnic University Research Journal, Vol. 1. pp. 48-53, June 2008.

Ariano, Ma. Regine Margarete C. etc. al. (2008). **The Acceptability of Banana Peel Candy.** Laguna State Polytechnic University Research Journal, Vol. 1, pp.54-58, June 2008.

Gaylon, Belinda et. al. (2008). **Acceptability of Cookies with Powdered Jute Leaves.** Laguna State Polytechnic University Research Journal, Vol. 1. pp.13-18, June2008.

Kotz, Krista (2013). **Dietary Guidelines for Americans.** Journal of the Academy of Nutrition and Dietetics.

Kumar, Ravi (2009). **Evaluation of Abelmoschus Esculentus Mucilage as Suspending Agent in Paracetamol Suspension.** International Journal of PharmTech Research, Vol. 1, No. 3, pp. 658-665, July-Sept. 2009.

Sabitha (2011). **Anti Diabetic and Antihyperlipidemic Potential of AbelmoschusEsculentus (L.) Moench.** Journal of Pharmacy and BioalliedSciences, Jul.-Sep. 2011. Retrieved from <http://www.ncbi.nlm.nih.gov/PMC3178946>

Webliography

Akruti. **The Amazing Benefits of Okra.** Retrieved on 14 July 2014 from www.stylecraze.com/.../okra

Barrette, Mike. **6 Okra Health Benefits.** Retrieved on 11Feb. 2013 from www.naturalsociety.com/6-okra-healthbenefits

Bread. Retrieved on 30 Jan. 2015 from <http://www.en.m.wikipedia.org/Bread>

Department of Science and Technology/Food and Research Institute, 2008. **Pinggang Pinoy.** Retrieved from <http://www.fnri.dost.gov.ph>

Estrada, Jinggoy. **Senate Bill 457.** Retrieved on 2 July 2012 from <http://www.senate.gov.ph/lisdata/466233985! pdf>

Flour. Retrieved from www.food.com/Library/flour-64

Tanchoco, Celeste (2011). **Food-Based Dietary Guidelines for Filipinos: retrospects,** Manila, Philippines. Retrieved from <http://www.google.com.ph/url>