RESEARCH ARTICLE

Consumer Acceptability of Empanada stuffed with Rabbit meat (Lapanada) Using Baking and Frying Method of Cooking

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Abstract

This study aimed to develop a healthier version of the empanada by using rabbit meat (lapan) and to determine its consumer acceptability through empanada stuffed with rabbit meat (lapanada). An experimental research design was used to evaluate the product using a 9-category Hedonic scale method to be selected by thirty (30) semi-trained panelists from Bulacan Agricultural State College. Deep fat frying and baking methods were used in the development of the product, with three (3) different percentages of lapan meat being used as the main ingredient of "lapanada". The study revealed that in terms of crust, the baking method was slightly more acceptable than deep-fat frying. In terms of meat filling, 50% of lapan meat was the most acceptable. Analysis of variance on attributes of fillings in terms of appearance has no significant difference with the methods used. However, in terms of aroma, savory, and mustiness, the fillings were significant and highly significant to the baked method of cooking "lapanada." Also, in terms of texture, the results showed that there was no significant difference with its methods used. The result of the study was a product pioneer or bearer of BASC when it comes to utilizing rabbit meat (lapan) as the main ingredient of the food product. Standard procedures for Lapanada processing were subjected to intellectual property protection to ensure secrecy of the process and trade product. It is recommended to conduct further studies for the shelf-life test and nutrient analysis of "lapanada" to establish the credibility of the product in terms of microbiological characteristics and nutritive value. Market research must be conducted to establish empirical data as a benchmark for future improvements.

KEYWORDS:
acceptability, empanada, rabbit meat, baking and frying

1 | INTRODUCTION

The meat quality concept is continuously changing and, nowadays, the consumer is very interested in the healthiness of meat, hedonistic quality, sensory properties, cooking easiness and swiftness, and price (Zotte, 2002). Hathwar et al. (2012) suggest that awareness of health and nutrition has led to the development of functional foods, which is a new approach to achieving healthier status, thus reducing the risk of diseases. Meat has been highly exploited as a functional food in recent years, wherein it has either been modified or incorporated into nonmeat products.

Petrescu et al. (2018) stated that rabbits are one of the most versatile livestock species, responding successfully to bio-economic principles that promote the clever use of resources and their conversion into added-value products. It was also found to have excellent nutritive and dietetic properties, justifying its use as a functional food. Para et al. (2015) revealed that rabbit meat is flavorful, easily digested, with high dietary and dietetic properties and contains 20–21% of proteins, unsaturated fatty acids (oleic and linoleic; 60% of all fatty acids), potassium, phosphorus, and magnesium. It has a low concentration of fat, cholesterol, and sodium.

According to Li et al. (2018), manufacturing rabbit meat into processed products describes a more promising processing technology for raw meat materials to obtain added-value (marinated, formed, emulsified, coated, etc.) by exploiting rabbit meat's intrinsic characteristics, such as high protein/low-fat content coupled with a balanced n-6 to n-3 PUFA ratio, low cholesterol, and heme-iron content. Wyatt (2019) states the first trend is "ingredient phenomenon: snacking with well-being benefits," tapping directly into "better-for-you" product development. Furthermore, Escriba-Perez (2019) stated that rabbit meat's nutritional and dietary properties make it ideal for children, as recommended by the World Health Organization. The main reasons why children (intended as people under 18 years old) do not consume rabbit meat are the fact that they do not like it (40.9%) and that it was not bought or eaten at home (30.9%). The approach proposed the development of functional foods for babies and children, such as rabbit meat enriched with omega 3 and docosahexaenoic acid. The improvement of meat tenderness and adapting rabbit meat presentations for children (burgers, nuggets, sausages, marinades, and converting them into convenience products for parents) develop communication strategies on the nutritional value of rabbit meat aimed at both children and parents. Promoting rabbit meat consumption among the under-18s has several consequences, as in the future, they will oversee household purchases or share this responsibility. On the other hand, Veneracion (2017) mentioned that although rabbits have long been part of many Philippine households, the lingering reluctance and perceived taboo on eating rabbit meat is the greatest hindrance to widespread rabbit production. Filipinos have forgotten that rabbits were brought to the country after World War II by the US Peace Corps and some religious missionaries to help alleviate the problem of food scarcity brought about by the devastation of war. Instead, rabbits have come to be cared for as pets instead of being produced as meat sources. Rabbit meat was listed by the USDA as being among the healthiest meats available to mankind. It is low in fat, bad cholesterol, and calories while having high protein levels. Miraflor (2021) revealed that, based on a study published by the University of the Philippines, Los Baños (UPLB), the high pork prices now, while painful and unfavorable to consumers, are an opportunity for the country to start exploring alternative protein sources. Amid high pork and chicken prices, the Philippine government must now find a way to boost the production of alternative protein sources such as rabbit meat and plant-based food.

In addition, Nelz (2021) reported that in Pampanga, residents are now using rabbit meat as an alternative due to the soaring prices of pork products amid the African swine fever. Over the past few months, the price of pork products has continued to increase due to the shortage of supply caused by the African swine fever. Meat vendors and consumers are already struggling with the current crisis. Many Filipino consumers are already looking for an alternative due to the rising prices of pork products. The Department of Agriculture has already proposed rabbit meat as an alternative to pork meat.

In the Philippines, empanadas are snacks that usually contain ground beef, pork, or chicken, potatoes, chopped onions, and raisins, like the Cuban picadillo, wrapped in a slightly semi-sweet wheat flour crust, either baked or flaky fried ones (Blanza, 2019). Adamson (2004) traced the origins of the empanada to Galicia and Portugal, with fillings that included tuna, sardines, chorizo, as well as cod or pork loin. An empanada is a filling encased in starchy dough—the word empanada literally translates to "wrapped in bread." Tomky (2018).

The conduct of this study aimed to develop a unique and healthy version of the empanada using rabbit meat or lapan as the main ingredient for its filling (lapanada) in different percentages. This study was able identify the most acceptable method of cooking "lapanada," either by baking or deep frying. Consumer acceptability was also determined in terms of appearance, taste, aroma, and texture using the Hedonic scale method.

2 | METHODOLOGY

The researchers utilized a scientific discipline that applies principles of quantitative research design and statistical analysis with the use of human senses (sight, smell, taste, and touch) to introduce a unique and healthy version of empanada by utilizing rabbit meat as the alternative main ingredient. The discipline required panels of product evaluators to be selected based on their specific personal attributes and potential capabilities in performing specific sensory tasks. They performed and repeated the task

with consistent results. The panel members were free from taste and odor perception disorders, color blindness, denture defects, frequent allergies, and not consuming medications that affect sensory functions.

The evaluators consisted of 30 selected semi-trained in-house panelists, which included 10 faculty members, 10 non-teaching staff members, and 10 students from Bulacan Agricultural State College. The selection of sensory evaluators was based on the study of Geetika (2008), in which semi-trained individuals can discriminate differences and communicate their reactions. It normally consists of about 25 to 30 members and is used as a preliminary screening program to select a few products for large-scale consumer trials.

In gathering the data, they adopted a standardized sensory evaluation questionnaire using the 9-Point Hedonic Scale, where 9 stood for "Extremely Acceptable" and 1 was "Extremely Not Acceptable" to evaluate the different treatments in terms of appearance, taste, aroma, and texture of the acceptability of empanada using rabbit meat. Letters seeking permission from the Deans/Officers in Charge of the selected offices where the evaluators will come from were given before the conduct of the study. The sensory evaluation is scheduled, followed by three repetitions to establish and determine the most accepted treatment sample of the "lapanada." Orientation on answering the sensory evaluation questionnaire was done, explaining the different parts of the survey form before the actual taste test.

The six (6) different treatments were presented using a three-digit code in small disposable serving containers to avoid confusion or bias. Each respondent was provided with a glass of water, which he/she would drink between samplings. The score sheets were collected, tabulated, and computed based on the statistical tools.

The data collected was presented based on the responses of the respondents. Analysis of Variance (ANOVA), Weighted Mean, and Percentage Distribution Method. The analysis of variance (ANOVA) was used in analyzing and interpreting the data collected to determine if there is a significant or no significant difference in the methods of cooking and food attributes.

3 | RESULTS AND DISCUSSION

In the results illustrated in Table 1 , the level of acceptability of the crust of lapanada in terms of appearance, taste, aroma, and texture, was slightly more acceptable than fried rabbit empanada (lapanada). These findings implied that the panelists preferred the baked rabbit empanada (lapanada) based on its appearance and texture because of its firmness but soft texture every time they took a bite of it, and because it is not oily. While the taste and aroma of the baked crust are more flavorful and aromatic to eat.

The findings are justified with the statement of Blazes (2019), who emphasizes that baked empanadas have a tender dough that tends to soak up the flavor of the filling, making them even more delicious the day after they are baked. The dough is less flaky than pie crust, and it's very simple to make.

Based on the comments of the panelist, the fried crust is said to be oily. The crust becomes hard when it is no longer hot or freshly cooked, whereas with baked crust, even if it is no longer hot or freshly cooked, the crust is still firm and soft.

TABLE 1 Sensory Acceptability Level of Rabbit Empanada (Lapanada) in terms of Crust

Methods of Cooking	Appearance	Taste	Aroma	Texture	Total Mean	Verbal Description
Fried	5.91	4.98	5.96	5.73	5.65	Slightly Acceptable
Baked	5.99	5.14	5.95	5.84	5.73	Slightly Acceptable

Table 2 shows that the level of acceptability of the rabbit empanada (Lapanada) in terms of filling, Treatment B, got the highest computed mean of 5.98. The characteristics of Treatment B are that all the ingredients were balanced, and it does not stink or have a strange smell because the percentage of rabbit meat is just right. The findings are justified according to the study conducted by Maigida et al. (2018). Respondents liked rabbit meat and declared it to taste good and palatable, which may be attributed to its excellent organoleptic properties of tenderness, juiciness, and flavor as reported by Zotte et al. (2014). Tenderness, juiciness, and flavor are the main quality attributes for consumers' choice of meat (Grunert, 1997). Linda Schneider (2017) said that the rabbit meat tastes a bit like chicken (though with a slightly stronger, meatier, earthier flavor), and it can be prepared similarly to chicken.

TABLE 2 Sensory Acceptability Level of Rabbit Empanada (Lapanada) in terms of Fillings

Attributes	Appearance	Taste	Aroma	Texture	Total Mean	Verbal Description
Treatment A (fried)	5.84	5.34	5.56	5.91	5.66	Slightly Acceptable
Treatment B (fried)	6.20	5.72	5.88	6.12	5.98	Slightly Acceptable
Treatment C (fried)	5.97	5.73	5.53	5.92	5.79	Slightly Acceptable
Treatment D (baked)	5.79	5.52	5.40	5.85	5.64	Slightly Acceptable
Treatment E (baked)	5.70	5.48	5.14	5.83	5.54	Slightly Acceptable
Treatment F (baked)	5.96	5.84	5.54	6.12	5.87	Slightly Acceptable

Table 3 reveals that there was no significant difference existed between the six treatments as regards the pastry fillings in terms of appearance at a 0.05 level of significance. Based on the results, the fillings of the six treatments looked the same because they were cooked according to the standardized recipe that was formulated by the researchers.

The findings are justified by Egan (2015). A standardized recipe is a set of written instructions used to consistently prepare a known quantity and quality of food for a specific location. A standardized recipe will produce a product that is close to identical in taste and yield every time it is made, no matter who follows the directions.

TABLE 3 Analysis of Variance of rabbit empanada (lapanada) Fillings in terms of Appearance

Attributes	Fried Fc	Fried Ft	Baked Fc	Baked Ft	Verbal Description
Appetizing	3.84	6.94	0.84	6.94	No Significant
Dry	0.77	6.94	0.98	6.94	No Significant
Greasy	5.86	6.94	0.31	6.94	No Significant
Moist	1.98	6.94	0.25	6.94	No Significant
Grained	0.04	6.94	0.20	6.94	No Significant

Table 4 illustrates that there is no significant difference between rancidity, aromatic and mildness attributes among the six treatments. The results on "mustiness" show significant differences between samples. It can be gleaned from the table that in terms of the attribute "savory", there are highly significant differences in the samples at a 0.05 level of significance.

As stated by Hedrick (2017), it's often described as a meaty flavor, which makes sense since it indicates the presence of protein (specifically, the amino acid glutamate). Other common descriptors of a savory taste are: "full of flavor," "delicious," and "tasty," which show that it's hard to quantify what savory tastes like.

Those engaged in food processing and storage may on occasion encounter an organoleptic entity of foodstuff called "mustiness," a moist loam odor, or an earthy odor. Mustiness may occur in eggs, fish, grains, potatoes, nut meats, milk, butter, cheese, veal, lamb, pork, and poultry meats as mentioned by Jensen (1948).

TABLE 4 Analysis of Variance of rabbit empanada (lapanada) in terms of Aroma

Attributes	Fried Fc	Fried Ft	Baked Fc	Baked Ft	Verbal Description
Rancidness	2.72	6.94	2.41	6.94	No significant
Aromatic	0.29	6.94	1.59	6.94	No significant
Mustiness	3.39	6.94	10.88	6.94	Significant
Savory	1.31	6.94	25.53	6.94	Highly significant
Mildness	0.24	6.94	1.30	6.94	No significant

The ANOVA result shows in Table 5 that there is a significant difference in the mustiness of the samples. The post-hoc results show that the treatment of Fried B is significantly different from the treatment of Baked D.

It is justified in the statement of Hwang and Winkler-Moser (2016) that fried foods are highly susceptible to oxidation during transport and storage. It is mainly the volatile compounds formed during auto-oxidation during storage that cause off-flavors and odors that shorten the shelf life of fried foods.

TABLE 5 t-test Result of rabbit empanada (lapanada) in terms of Aroma (Mustiness).

Treatment	Mean	Summary
Fried A vs Baked D	5.00 = 5.01	No significant
Fried B vs Baked E	5.31 > 4.58	Significant
Fried C vs Baked F	4.61 = 4.59	No significant

As seen in Table 6 , in terms of taste, under the attribute of savory, Treatment B is highly significant compared to Treatment E. As mentioned by Joachim and Schloss (2021) in their article on fine cooking, the method of heat transfer is the same whether there's just a little fat in the pan (sautéing), the fat comes partway up the sides of the food (shallow frying), or the fat completely envelops the food (deep-frying). When food is added to hot oil (usually 350 °F to 375 °F), its surface dehydrates. Meanwhile, through a series of Maillard reactions (named after the chemist Louis Camille Maillard), its sugars and proteins break down to create a complex flavor and golden-brown color.

TABLE 6 t-test Result of rabbit empanada (lapanada) in terms of Aroma (Savory).

Treatment	Mean	Summary
Fried A vs Baked D	4.59 = 5.01	No significant
Fried B vs Baked E	5.31 = 4.58	Highly significant
Fried C vs Baked F	4.61 = 4.59	No significant

As seen in Table 7 , there is no significant difference among the six treatments in terms of texture as perceived by the respondents. Responses made by the panelists in terms of the texture of the fillings show no sign of differences.

According to Chen and Rosenthal (2015), the term "food texture" has a strong inclusion of sensory experience. Ingredient interactions and food processing and preparation are the most important industrial approaches for food texture (or food structure) creation or modification. Moisture content and fat content are the two key determining factors for texture creation. The content of air, as expressed by structural openness, is also important in texture creation. Using these parameters as three dimensions, foods can be conveniently grouped for their textural properties.

According to Moeller, S.J., et al. (2010), among the many parameters of meat quality, one of the most important is its texture, consisting of shear force, hardness, chewiness, cohesiveness, and springiness.

4 | CONCLUSIONS AND RECOMMENDATIONS

Rabbit empanada (lapanada) can be produced either by deep fat-frying or baking methods of cooking. As perceived by the panelists, the baked crust was slightly more acceptable than the deep-fat fried crust because of the good quality in terms of appearance, taste, aroma, and texture.

There were no significant differences in the total acceptability level in terms of filling between the six treatments in all attributes. But it appears that Treatment B has the highest total mean of 5.98. Panelists thought Treatment B's filling (fried with 50 percent rabbit meat) had the most appealing flavor to them. Overall, the acceptability of the study was slightly acceptable,

TABLE 7 Analysis of Variance of rabbit empanada (lapanada) in terms of Aroma

Attributes	Fried Fc	Fried Ft	Baked Fc	Baked Ft	Verbal Description
Dryness	3.86	6.94	1.03	6.94	No significant
Chewiness	0.25	6.94	6.62	6.94	No significant
Moistness	0.89	6.94	1.00	6.94	No significant
Tenderness	1.75	6.94	5.34	6.94	No significant
Grained	0.08	6.94	4.48	6.94	No significant

*No significant difference at =0.05

which proves that consumption of rabbit meat is not a problem anymore. Through the preparation of rabbit empanada (lapanada), it is possible to assure that more people will open their minds and accept rabbit meat for their daily intake.

It is recommended to ensure the process's secrecy and the product's trade secret, standard rabbit empanada (lapanada) processing procedures must be subjected to intellectual property protection. Conduct further study for the shelf-life test and nutrient analysis of rabbit empanada (lapanada) to establish the credibility of the product in terms of microbiological characteristics and nutritive value. Market research must also be conducted to establish empirical data as a benchmark for future improvements.

References

Aujero-Blanza, M. G. (n.d.). The development of high value empanada with darag native chicken (gallus gallus domesticus) filling.

Blanza, Ma.Gerlia. (n.d.). The Development of High Value Empanada with Darag Native Chicken (Gallus gallus domesticus) Filling. , 234–247. Retrieved from `https://www.researchgate.net/profile/Magerlia_Blanza/publication/334558838`

Committee, B. C. A., et al. (2015). *Basic kitchen and food service management*.

Escribá-Pérez, C., Baviera-Puig, A., Montero-Vicente, L., & Buitrago-Vera, J. (2019). Children's consumption of rabbit meat. *World Rabbit Science*, *27*(3), 113–122.

Geetika. (n.d.). Selection and training of sensory panelists and methods of sensory evaluation. Retrieved from `https://egyankosh.ac.in/bitstream/123456789/9636/1/Unit-10.pdf`

Hathwar, S. C., Rai, A. K., Modi, V. K., & Narayan, B. (2012). Characteristics and consumer acceptance of healthier meat and meat product formulations—a review. *Journal of food science and technology*, *49*(6), 653–664.

Jensen, L. B. (1948). Food Science, Mustiness in Foods First Edition. Retrieved from `https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2621.1948.tb16598`

Jianshe, & Rosenthal. (2015). Modifying Food Texture, 1st Edition: Novel Ingredients and Processing Techniques. Retrieved from `https://www.sciencedirect.com/topics/food-science/food-texture`

Joachim, D and Schloss, A. . (n.d.). Fine Cooking #121. , 38–39. Retrieved from `https://www.finecooking.com/article/the-science-of-frying`

Kilcast, D. (2013). *Instrumental assessment of food sensory quality: A practical guide*. Elsevier.

Li, S., Zeng, W., Li, R., Hoffman, L. C., He, Z., Sun, Q., & Li, H. (2018). Rabbit meat production and processing in china. *Meat Science*, *145*, 320–328.

Maigida R., Kabir M.S., Jibir M. . (n.d.). The International Journal of Engineering and Science (IJES). Retrieved from `http://www.theijes.com/papers/vol7-issue9/Version-1/B0709010812.pdf`

Miraflor, Madeline B. . (2021). PH gov't told to boost rabbit meat production. Retrieved from `https://mb.com.ph`

Moeller, S., Miller, R., Edwards, K., Zerby, H., Logan, K., Aldredge, T., . . . Box-Steffensmeier, J. (2010). Consumer perceptions of pork eating quality as affected by pork quality attributes and end-point cooked temperature. *Meat Science*, *84*(1), 14–22.

Nelz, Jay. (2021). . Pampanga Residents Use Rabbit Meat Used as Alternative to Pork Products in Pampanga. Retrieved from `https://philnews.ph/`

Ovchinnikova, T., Khorev, A., Bezrukova, T., Salikov, Y., & Byhonova, N. (2015). Innovation manifestations of competition in contemporary concept of marketing. *Mediterranean Journal of Social Sciences*, *6*(3 S6), 53.

PARA PA, G. S., Wakchaure, R., Sharma, R., Mahajan, T., & Praveen, P. (2015). Rabbit meat has the potential of being a possible alternative to other meats as a protein source: A brief review. *Int J Phar Biomedi Res*, 2, 17–19.

Petrescu, D., & Petrescu-Mag, R. (2018). *Consumer behaviour related to rabbit meat as functional food. world rabbit sci., 26: 321-333.*

Schneider, Linda, . (2010). Why eat rabbits? Retrieved from `https://www.tastecooking.com/whyeatrabbit/#:~: text=The%20at%20tastes%20a%20bit,be%20prepared%20similarly%20to%20chicken`

Tomky, Naomi . (2018). Meet the Empanadas of Latin America. Retrieved from `https://www.seriouseats.com/types -of-empanadas-saltenas-corn-flour-plantain-viento-latin-american-food`

Veneracion, Angie,. (2017). An Overview of the Rabbit Industry in the Philippines. Retrieved from `https://www .agriculture.com.ph/2017/11/21/an-overview-of-the-rabbit-industry-in-the-philippines/`

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