Research Article

Organoleptic Evaluation of Banana Pseudo Stem as Longganisa Extender

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ABSTRACT

This study aimed to evaluate the Organoleptic Appeal of Banana Pseudo Stem as Longganisa Extender in terms of appearance, taste and texture. The respondents of the study were purposively selected from longganisa vendors or makers of Kidapawan City, students and faculty members of University of Southern Mindanao- Kidapawan City Campus who were expert in food processing. An Analytical Method of sensory evaluation was used to obtain data for the study. The instrument was based on the Quality Test Likert scale which measure the qualities of the sample product in terms of appearance, taste, and texture, where 5 as the highest and 1 as the lowest. The result of the study revealed that all treatments were rated as "Very Good" in terms of their appearance, taste and texture quality. However, the treatment 1 which is fresh banana pseudo stem produces better quality among the other treatments. But since, the range of their rating are closely associated with each other, still they are more or less comparable in their characteristics. Further, it was found out that there is no significant difference among the three treatments at 0.05 level of significance which the null hypothesis was accepted. And also, it was found out that treatment 1 fresh banana pseudo stem is the best process in preparing the banana pseudo stem as longganisa extender among the treatments.

Keywords: Banana stem; Longganisa; Meat extender; Ground pork

INTRODUION

Longganisa is a very popular food in the Philippines served especially during breakfast time. The flavor of these sausages is heavily influenced by the different regions depending on the local spices present, since each one has its own signature taste and flavouring [1]. It is commonly made up of ground pork and diced pork, fat version of chicken and beef, and sometimes seafood like tuna and milkfish that can be found in some places in the Philippines [2].

According to Rivera 2015, adding extender to meat product can increase the yield and bringing down the cost for competitiveness. A good example of product wizth Textured Vegetable Protein (TVP) extenders is smoked longganisa which is a popular product called 'longsilog' in the market [3]. Textured Vegetable Protein (TVP) and other type of meat extenders are produced by extrusion of vegetables protein from defatted soy flour and soy protein concentrate [4]. It can be added in home cooking to extend its quantity and reduce cost in recipes [5]. It improves the yield of the products and makes it the most viable and interesting approach towards the production of healthier meat products with less environmental impact [6]. Used as materials for paper, furniture and forage [7]. As stated by Aziz 2011, it could be used more in food rather than the feed industry.

The exploitation of waste banana pseudo stems into product could significantly benefit the environment and increase its economic value [8,9].

The center core of banana is edible and is used to prepare dish in the Southern States of India. And it is also used to prepare candies and pickles. According to the experimental study conducted by Raju, Anandababu, Renitta 2019 the stem can be made into flour then added to potato cutlets as extender [10]. Saravanan and Aradhya 2011 stated that, the banana core is used in food and medical drugs because it has potential source of polyphenols which can be used as natural antioxidants in food, Nutraceutical and Pharmaceutical Industry [11].

As stated by Labensky 2010, one of the authors of "On Cooking", one of the major factors that consumers nowadays look for in selecting food is its economical and health value. Therefore, the researcher had come up with the experimental study of making banana pseudo stem as meat extender in making longganisa which can be a more cost efficient and healthier option. Further, the researcher wishes to minimize environmental hazards by utilizing some of the banana waste into a useful and more profitable product [12].

Objectives

The researcher aimed to evaluate the organoleptic appeal of banana pseudo stem as extender in longganisa. Specifically, this research sought to answer the following:

- Determine the product quality of banana pseudo stem as longganisa extender in terms of appearance, taste and texture;

- Find out the significant difference of banana pseudo stem as longganisa extender in terms of appearance;

- Find out the significant difference of banana pseudo stem as longganisa extender in terms of taste;

- Find out the significant difference of banana pseudo stem as longganisa extender in terms of texture; and

- Find out the best process in preparing banana pseudo stem as extender in making longganisa.

Hypotheses

- There is no significant difference on the organoleptic appeal of banana pseudo as longganisa extender in terms of appearance.

- There is no significant difference on the organoleptic appeal of banana pseudo as longganisa extender in terms of taste.

- There is no significant difference on the organoleptic appeal of banana pseudo as longganisa extender in terms of texture.

METHODOLOGY

Research design

The study used Quasi-Experimental Research to evaluate the organoleptic appeal of banana pseudo stem as extender in longganisa in terms of appearance, taste and texture. The preparation of banana pseudo stem was used as the experimental group which undergone fresh preparation, cooking and dry process. There would be 5% processed banana pseudo stem added as substitute of the commercial meat extender. The ingredients and procedure in making longganisa were followed and constant, except for the meat extender which substituted by banana pseudo stem. The sample product was evaluated in 3 replications in order to attain the validity and reliability of the data.

Research respondents

The respondents of the study were 30, purposively selected from Longganisa vendors or makers of Kidapawan City, students and faculty members of University of Southern Mindanao- Kidapawan City Campus who were expert in food processing. Every group was composed of 10 members. The sample product was rated in 3 replications.

Research instruments

The researcher used analytic method of sensory evaluation in determining the product quality level of banana pseudo stem as extender in making longganisa in terms of the following qualities such as appearance, taste and texture, and find out the best process in preparing the banana pseudo stem. It was done by using Quality Test Likert Scale where 5 as the highest and 1 as the lowest. The sensory evaluation score was validated by 3 food experts. The table below showed the descriptions of each quality (Tables 1-3).

Table 1: Likert scale on the organoleptic appeal of banana pseudo stem as extender in longganisa in terms of appearance.

Rating	Range	Verbal description	Interpretation
5	4.24-5.00	Very appealing	The product has natural attractive red-pink color when raw. Compact and hold its shape when cooked.
4	3.43-4.23	Appealing	The product has natural light red-pink color when raw. Compact but slightly out of shaped when cooked.
3	2.62-3.42	Moderately appealing	The product has slightly uneven red-pink color when raw. Not so compact and slightly loose when cooked.
2	1.81-2.61	Slightly not appealing	The product has dulled red-pink color when raw. It is not compact and very loose when cooked.
1	1.00-1.80	Not appealing	The product is very dull color when raw. Very loose, has no shape and falls apart when cooked.

Table 2: Likert scale on the organoleptic appeal of banana pseudo stem as extender in longganisa in terms of taste.

Rating	Range	Verbal description	Interpretation
5	4.24-5.00	Very tasty	The product has well balanced sweet and savory taste. Extender has no effect on the taste.
4	3.43-4.23	Tasty	The product has slightly balance sweet and savory taste. The extender added is not noticeable in terms of taste.
3	2.62-3.42	Moderately tasty	The product's sweet and savory taste is slightly not balance. Extender added is noticeable but still pleasant to the taste.
2	1.81-2.61	Slightly not tasty	The product's sweet and savory taste is overpowered by the off flavor of the extender.
1	1.00-1.80	Not tasty	The product has a very off flavor and unbalance taste due to the extender added.

Table 3: Likert scale on the organoleptic appeal of banana pseudo stem as extender in longganisa in terms of texture.

Rating	Range	Verbal description	Interpretation
5	4.24-5.00	Very appealing	The product has a very firm outside texture. Very juicy, soft inside. Even meat grain and not lumpy
4	3.43-4.23	Appealing	The product has a firm outside texture. Juicy, soft inside. Slightly even meat grain and not lumpy
3	2.62-3.42	Moderately appealing	The product has a slightly firm outside texture. Slightly juicy, soft inside. The extender added is slightly not lumpy

| 2 | 1.81-2.61 | Slightly not appealing | The product's outside texture is slightly not firm. It is not juicy, dry inside and slightly lumpy |
| 1 | 1.00-1.80 | Not appealing | The product is not firm and juicy. It is lumpy and very dry inside. |

Sampling procedure

In selecting the respondents for this study, purposive sampling method was applied. It was done by identifying and selecting respondents who had knowledge and expertise in making longganisa within Kidapawan City. The researcher made a letter addressed to the University of Southern Mindanao- Kidapawan City Campus, and the respondents located at Mega Market and area of Alim and Villamarzo Street asking permission and cooperation for the conduct of the study. She administered a sensory evaluation by providing score sheet for the selected respondents to rate the sample products according to their preference.

Statistical treatment

The data from 30 respondents who rated the sample product in terms of appearance, taste and texture were tallied, computed and analyzed. The statistical tool used to describe and analyze the data was weighted mean and One- way Analysis of Variance (ANOVA).

RESULTS AND DISCUSSIONS

Product quality of banana pseudo stem as longganisa extender

The Table 4 shows the weighted mean on the appearance quality of banana pseudo stem as longganisa extender with three replications, where 5 as the highest and 1 as the lowest. Data have shown that all treatments are rated as "Very Good". This means that all the treatments have a natural light red- pink color when raw. The product is compact but slightly out of shaped when cooked. Treatment 1 (fresh pseudo stem) has the highest mean among the three treatments, which is 4.19.

The result has been supported on the idea of Emily 2014 that longganisa is usually tinted red and has an unnaturally red color when raw [13]. It remains the compactness of it and could hold its shape after cooking. On the other hand, banana stem is white to pale green- yellow with a firm and dense consistency. The crisp with a texture similar to jicama and have a mild, sweet- tart, vegetal flavor [14].Based on the study of Preetha et al., 2017 on the Quality characteristics of fresh- cut banana pseudo stem stored in both active and passive modified atmosphere, it is said that the fresh-cut produce has largely driven by increasing consumer demand for healthy, freshly prepared convenient vegetables (Table 4) [15].

Table 4: Appearance quality of banana pseudo stem as longganisa extender.

Treatment	R1	R2	R3	Mean	Verbal description
T1 (fresh)	3.87	4.37	4.33	4.19	Very good
T2(cooked)	3.93	4.17	3.97	4.02	Very good
T3(dry powdered)	4	3.97	3.87	3.95	Very good

Legend		

Scale	Interval	Description
5	4.24-5.00	Excellent
4	3.43-4.23	Very good
3	2.62-3.42	Good
2	1.81-2.61	Fair
1	1.00-1.80	Poor

Table 5 shows the weighted mean on the taste quality of banana pseudo stem as longganisa extender with three replications. The data revealed that all treatments are rated as "Very Good" with the mean of 4.13, 4.01 and 4.12 respectively. This means that all the treatments have a slightly balance sweet and savory taste. The extender added is not noticeable in terms of taste. Although, treatment 1 (fresh pseudo stem) has the highest mean among the three treatments.

According to Tee 2020 the taste of longganisa is describe with recado with the taste of more savory, salty while hamonado has a taste of sweetness. It has a sweeter taste and gives the sausage a great balance between savory and sweet [16]. Moreover, banana stems have a mild flavor that readily absorbs accompanying flavors and ability to complement many different spices, crisp texture and high nutritional properties. Banana stems have a mild flavor that readily absorbs accompanying flavors (Table 5) [14].

Table 5: Taste quality of banana pseudo stem as longganisa extender.

Treatment	R1	R2	R3	Mean	Verbal description
T1 (fresh)	3.67	4.4	4.33	4.13	Very good
T2(cooked)	4.1	4	3.93	4.01	Very good
T3(dry powdered)	4	4.23	4.13	4.12	Very good

Legend		

Scale	Interval	Description
5	4.24-5.00	Excellent
4	3.43-4.23	Very good
3	2.62-3.42	Good
2	1.81-2.61	Fair
1	1.00-1.80	Poor

Table 6 shows the weighted mean on the texture quality of banana pseudo stem as longganisa extender. The data revealed that all treatments are rated as "Very Good" with the mean of 4.18, 4.00, and 4.07 respectively. This means that all the treatments have a firm outside texture. It is juicy and soft on the inside. It has slightly even meat grain and not lumpy. Moreover, treatment 1 (fresh pseudo stem) has the highest mean among the three treatments.

This result has been supported on the definition of longganisa that, longganisa is commonly made with ground meat and has juicy

and firm texture [13,17].Fresh preparation is successfully done by just blending the fresh central core or strain out the fiber before adding lime or perform a simple method of soaking for an hour after chopping into smaller pieces (Table 6) [18,19].

Table 6: Texture quality of banana pseudo stem as longganisa extender.

Treatment	R1	R2	R3	Mean	Verbal description
T1 (fresh)	3.83	4.33	4.37	4.18	Very good
T2(cooked)	4.03	3.9	4.07	4	Very good
T3(dry powdered)	4	4.27	3.93	4.07	Very good

Legend		
Scale	Interval	Description
5	4.24-5.00	Excellent
4	3.43-4.23	Very good
3	2.62-3.42	Good
2	1.81-2.61	Fair
1	1.00-1.80	Poor

Significant difference of banana pseudo stem as longganisa extender

The Table 7 shows the different qualities of banana pseudo stem as longganisa extender in three different treatments where in appearance has f-value of 1.23 and p-value of 0.36; taste has f-value of 1.10 and p-value of 0.39; and texture has f-value of 0.98 and p-value of 0.42. The data revealed that the p-value is greater than the 0.05 level of significance. Thus, the null hypothesis was accepted. It implied that the three treatments were more or less comparable to each other. The significant differences of f-value compared to 0.05 level of significance of the p-value was more than 0.05, hence, the variables were not significant which means more or less they are comparable.

With the result presented above, such will support the idea of Dayod and Abat 2016 that the tender core of banana stem may avail 13% protein which implies good enough to use as extender in longganisa, since the author found out that at a level of 5% to 15% of meat extender has an improvement in the sensory property and has a best score in overall acceptability in flavor, texture and juiciness [6,20]. In addition, meat extender are non-meat substances with high protein content that can change some of the product's properties such as water-holding capacity, texture, palatability and appearance (Table 7).

Table 7: Test for significant difference of banana pseudo stem as longganisa extender.

Qualities	f-value	P-value
Appearance	1.23	0.36
Taste	1.10	0.39
Texture	0.98	0.42

Best process in preparing the banana pseudo stem as longganisa extender

Table 8 shows the best process in preparing the banana pseudo stem as extender in making longganisa. The data revealed that the treatment 1-fresh banana pseudo stem got the highest mean of 4.16 which means it is the best process among the treatments [21-25]. According to Pando and Pintado 2020, meat extenders based on plant origin had shown improvement in the sensory property and overall acceptability in flavor, texture and juiciness [6]. Banana stem mainly compromises of 90% moisture and it requires proper processing for its standard incorporation in food products to improve its nutritional and sensory aspect [26-30].

The use of meat extenders, non-meat substances with high protein content to partially replace meat, which offers healthier meat products with less environmental impact [6,31-35]. Fresh preparation is successfully done by just blending the fresh central core or strain out the fiber before adding lime or performs a simple method of soaking for an hour after chopping into smaller pieces [18,36-40]. Based on the study of Preetha et al., 2017 on the Quality characteristics of fresh-cut banana pseudo stem stored in both active and passive modified atmosphere, it is said that the fresh-cut produce has largely driven by increasing consumer demand for healthy, freshly prepared convenient vegetables (Table 8) [15,41-43].

Table 8: Best process in preparing the banana pseudo stem as longganisa extender.

	Appearance	Taste	Texture	Mean
Treatment 1 (fresh)	4.19	4.13	4.18	4.16
Treatment 2 (cooked)	4.02	4.01	4.00	4.01
Treatment 3 (dry powdered)	3.95	4.12	4.07	4.05

Summary of findings

This study sought to determine the organoleptic appeal of banana pseudo stem as longganisa extender in terms of appearance, taste and texture. It has 3 treatments namely treatment 1-fresh, treatment 2-cooked and treatment 3-dry powdered pseudo stem. The product was evaluated by the local makers or vendors of Kidapawan, students and faculty members of the University of Southern Mindanao-Kidapawan City Campus using the Sensory Evaluation Score Sheet. However, the treatment 1 which is fresh banana pseudo stem produces better quality among the other treatments. But since, the range of their rating are closely associated with each other, still they are more or less comparable in their characteristics. Further, it was found out that there is no significant difference among the three treatments at 0.005 level of significance which the null hypothesis was accepted. And also, it was found out that treatment 1, fresh banana pseudo stem, is the best process in preparing the banana pseudo stem as longganisa extender among the treatments.

CONCLUSION

Based on the findings of the study, it was concluded that banana pseudo stem can be utilized as extender to longganisa. It produces similar quality to the standard meat extender. Moreover, all treatments could help in improving the product quality of longganisa and can be a good substitute of other known meat extender.

RECOMMENDATIONS

Based on the results, the researcher recommended the following for the betterment of the study:

- Conduct a study on the process of removing itchiness of banana stem.

- Conduct comparative study on the commercial meat extender and banana pseudo stem as extender.

- Conduct study on the process on eliminating the awful taste of fresh banana pseudo stem.

- Conduct an approximate analysis on banana pseudo stem as longganisa extender.

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