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Sensory Evaluation of Skinless Longganisa Made from Milkfish (Chanos chanos)

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Abstract. This study aimed to evaluate the acceptability of Milkfish Skinless Longganisa as a new variety of longganisa in terms of appearance, aroma, taste, and texture. The research was conducted with three different treatment combinations: Treatment 1 (100% pork), Treatment 2 (100% milkfish), and Treatment 3 (50% pork and 50% milkfish). A sensory evaluation was performed by 30 respondents, including milkfish vendors, longganisa vendors, and consumers, to assess the acceptability of each treatment. The data were analyzed using descriptive statistics and one-way ANOVA to determine significant differences between treatments. The results showed that both Treatment 1 and Treatment 2 were rated as "extremely acceptable" in all attributes, with Treatment 1 receiving the highest mean score. In contrast, Treatment 3 was rated as "moderately acceptable." The one-way ANOVA revealed significant differences in acceptability levels among the treatments, with Treatment 3 having a significantly lower mean compared to Treatments 1 and 2. The findings suggest that Milkfish Skinless Longganisa has the potential to meet the needs of health-conscious consumers and can serve as a viable alternative to traditional pork-based longganisa. This study contributes to the development of sustainable food options by promoting the use of milkfish as a protein source in the Philippine culinary tradition. Future research is recommended to further explore the nutritional content, shelf life, and overall marketability of milkfish skinless longganisa.

Keywords: Alternative protein; Food product development; Sensory Evaluation; Milkfish; Skinless longganisa

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1. Introduction

The growing demand for alternative protein sources in recent years reflects consumers' increasing health and environmental concerns. The shift toward plant-based and fish-based products is particularly notable due to their lower levels of saturated fat and greater sustainability compared to traditional animal products. Among the many fish species available, milkfish (Chanos chanos), a widely cultivated and affordable marine species, offers an excellent opportunity to diversify Filipino cuisine by introducing it into traditional products such as longganisa, a popular Filipino sausage. However, there is limited research exploring the potential of milkfish as a primary ingredient in processed meat products like longganisa (Abad, 2021; Manalo & Dorado, 2017).

This study aims to evaluate the acceptability of milkfish skinless longganisa by examining its appearance, aroma, taste, and texture compared to the more conventional pork-based and mixed pork and fish versions. The goal is to explore the potential of milkfish as a primary ingredient for a new type of skinless longganisa, offering a healthier alternative to traditional pork-based variants while contributing to the diversification of protein sources in Filipino cuisine (Nelson, 2009; Malle, 2019).

Milkfish, locally known as "bangus," is the national fish of the Philippines and the only member of the family Chanidae (Manalo & Dorado, 2017). It thrives in salty water, marine, and freshwater environments, with the majority of its production in the Philippines being directed toward domestic consumption (Abad, 2021). Milkfish is a rich source of protein, healthy unsaturated fats, vitamins, and minerals, making it a healthful option in various culinary applications (Uwajimaya, 2023). Its incorporation into longganisa not only supports the growing demand for sustainable, nutritious food but also addresses the health concerns of consumers, such as high blood pressure, while providing a suitable alternative for religious dietary restrictions, like those of Muslims or vegetarians (Malle, 2019; Leech, 2019).

The introduction of milkfish skinless longganisa in the market could provide consumers with a healthier, sustainable alternative to pork-based longganisa, contributing to the nation's evolving food culture. Through sensory evaluation and consumer feedback, this study seeks to assess the commercial viability and consumer acceptance of this innovative product, paving the way for further

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research into its nutritional benefits, shelf life, and market potential (Navarro, 2020).

This research aims to support local milkfish vendors by finding innovative ways to utilize surplus milkfish, thus benefiting both the local economy and consumer health (Aquino et al., 2009). By offering an alternative flavor profile in longganisa, this study contributes to the diversification of Filipino food products and promotes healthier food choices.

2. Methodology

This study aimed to evaluate the acceptability of milkfish skinless longganisa by assessing its appearance, aroma, taste, and texture. The milkfish skinless longganisa was developed by substituting pork with milkfish (Chanos chanos), which was cleaned, deboned, and minced. The minced fish was mixed with traditional longganisa ingredients such as garlic, salt, pepper, sugar, and spices. Two other variants were prepared for comparison: a traditional pork-based longganisa and a mixed pork and milkfish longganisa. Sensory evaluation was conducted with a panel of 30 participants, including faculty, students, and local consumers. The panelists assessed the products using a 9-point hedonic scale for each sensory attribute. Data were collected through structured questionnaires and analyzed using descriptive statistics. A one-way ANOVA was conducted to identify significant differences in the sensory attributes among the variants, with post-hoc Tukey's test used for further analysis. Ethical considerations were adhered to, with informed consent obtained from participants. This methodology follows standard sensory evaluation procedures, with modifications to incorporate milkfish as the primary ingredient in the longganisa recipe (Esteban et al., 2016).

2.1. Sampling Procedure

The sampling procedure for this study involved a purposive sampling technique, targeting participants who were familiar with traditional Filipino longganisa and open to trying a new variation. A total of 30 participants were selected from a pool of faculty members, students, and local consumers. The participants were chosen based on their willingness to participate in the sensory evaluation process and their prior knowledge of longganisa. This sample size was deemed sufficient for sensory testing and was representative of the target market for longganisa products. Participants were grouped into a single panel to assess

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the three variants of longganisa: milkfish-based, pork-based, and mixed pork and milkfish. The sensory evaluation was conducted in a controlled environment to minimize bias, ensuring that each participant tasted the products under similar conditions. Prior to the evaluation, all participants were briefed on the purpose of the study and the evaluation criteria. Consent was obtained from each participant, and ethical guidelines were followed throughout the sampling and data collection process.

2.2. Respondents

A total of 30 respondents participated in the sensory evaluation, selected through purposive sampling to ensure familiarity with Filipino longganisa. These respondents included faculty members, students, and local consumers with prior knowledge of the product. They were asked to assess the appearance, aroma, taste, and texture of three longganisa variants: milkfish-based, pork-based, and mixed pork and milkfish. Informed consent was obtained from each participant, ensuring ethical standards were maintained throughout the study. The diverse respondent group helped gather a broad range of feedback on the acceptability of the milkfish longganisa variant.

2.2.1 Research Site

The study was conducted at the Public Market in Barangay Suklayin, Baler, Aurora, and the Food Technology Laboratory at Aurora State College of Technology (ASCOT). The Public Market provided access to fresh milkfish for longganisa production, while ASCOT's laboratory facilitated the preparation and evaluation of the product for sensory testing. These sites enabled a thorough assessment of the product's feasibility from production to consumer acceptance.

3. Results and Discussion

3.1. Acceptability of the Three Treatments Based on Appearance, Aroma, Taste, and Texture

The study aimed to assess the sensory acceptability of skinless longganisa made from milkfish (Chanos chanos), in comparison to traditional pork-based skinless longganisa and a hybrid version containing both pork and milkfish. The sensory evaluation focused on four key attributes: appearance, aroma, taste, and

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texture. The evaluation was conducted by milkfish vendors, longganisa vendors, and consumers using a structured sensory evaluation score sheet.

As presented in Table 1, the sensory attributes of the three treatments were evaluated. Treatment 1 (pork skinless longganisa) received the highest weighted mean of 8.31, indicating an "Extremely Acceptable" rating. Treatment 2 (milkfish skinless longganisa), with a weighted mean of 8.19, was also rated "Extremely Acceptable." Treatment 3 (half pork and half milkfish skinless longganisa) received a lower weighted mean of 6.91, resulting in a "Moderately Acceptable" rating.

Table 1 Acceptability of the Three Treatments Based on Appearance, Aroma, Taste, and Texture

Treatment Level	Weighted Mean	Verbal Interpretation	Acceptability
Treatment 1 (Pork Skinless Longganisa)	8.31	Like Extremely	Extremely Acceptable
Treatment 2 (Milkfish Skinless Longganisa)	8.19	Like Extremely	Extremely Acceptable
Treatment 3 (Half Pork and Half Milkfish Skinless Longganisa)	6.91	Like Moderately	Moderately Acceptable

The results indicate that both pork skinless longganisa and milkfish skinless longganisa were perceived as highly acceptable by the evaluators, with the former slightly outperforming the latter in terms of overall sensory attributes. Treatment 3, the hybrid version, was considered moderately acceptable, suggesting that the combination of pork and milkfish might not have resonated as strongly with the evaluators as the individual variants. These findings align with the study's objective to evaluate the sensory acceptability of milkfish skinless longganisa as a viable alternative to traditional pork-based longganisa, showing promise for its potential in the market.

The introduction of milkfish as an alternative protein source in longganisa was positively received, especially in terms of its appearance and taste, as reported by similar studies on sausages and alternative protein products (Corrêa, 2023). This suggests that milkfish skinless longganisa could be a suitable

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substitute for pork, catering to consumers seeking alternatives to traditional meat products.

3.2. Significant Difference Among the Three Treatments of Skinless Longganisa

Table 2. presents the results of a one-way ANOVA to assess if there were significant differences among the three treatments. The p-value of less than 0.05 indicates that there were significant differences between the treatments. A post-hoc test revealed that Treatment 3 (half pork and milkfish) had a significantly lower mean score compared to Treatment 1 (pork) and Treatment 2 (milkfish). This implies that the hybrid version did not perform as well as the individual treatments, reinforcing the preference for pure pork or pure milkfish longganisa.

Table 2 Significant Difference Among the Three Treatments of Skinless Longganisa (ANOVA)

Source of Variation	*SS*	*Df*	*Ms*	*F*	*P-value*	*F crit*
Between Groups	35.99212963	2	0.133333	54.03045965	5.5806E-16	3.101295757
Within Groups	28.97731481	87	0.755556			
Total	64.96944444	89				

These findings are consistent with similar research, such as Lizada (2024), which evaluated the acceptability of veggie-based longganisa. In that study, chicken-veggie-based longganisa was the most preferred in terms of appearance and taste, while pork-veggie-based longganisa was preferred for aroma and texture. This further supports the conclusion that milkfish skinless longganisa is a promising alternative, but the combination of pork and milkfish may require additional refinement to meet consumer preferences fully.

The results of this study confirm that milkfish skinless longganisa is an acceptable alternative to traditional pork skinless longganisa, showing strong potential in terms of appearance, taste, aroma, and texture. The hybrid version of milkfish and pork, however, requires further development to achieve higher consumer acceptance. The study aligns with the growing interest in alternative protein sources and highlights the viability of incorporating milkfish into

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traditional Filipino processed meats like longganisa. These findings provide valuable insights for future product development and consumer preferences for alternative meat products.

Conclusions

The study successfully evaluated the sensory acceptability of milkfish skinless longganisa as a new alternative to traditional pork-based skinless longganisa. The results demonstrated that both milkfish skinless longganisa and pork skinless longganisa were rated as "extremely acceptable," indicating that milkfish can be a viable alternative protein source in the production of longganisa. On the other hand, the hybrid version (a combination of milkfish and pork) received a "moderately acceptable" rating, suggesting that while the concept has potential, it requires further refinement to meet consumer preferences effectively.

This research contributes to the growing interest in alternative protein sources in the Filipino food industry, particularly for those seeking healthier or more sustainable options. Milkfish, as an alternative to traditional pork, shows promise not only in sensory attributes but also as a potential product for local food markets. The findings indicate that further exploration into the formulation of hybrid products could enhance their sensory appeal, making them more competitive in the market.

Overall, the study's findings underscore the importance of sensory evaluation in developing new food products and provide valuable insights for the future development of milkfish-based longganisa in the context of Filipino food processing and innovation.

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