

# Agribusiness Student's Perseption of Pili Products at Central Bicol State University of Agriculture, Pili, Camarines Sur, Philippines

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**Abstract:** This study aims to assess Agribusiness students' perceptions of pili-based products at Central Bicol State University of Agriculture, Pili, Camarines Sur, Philippines. Perceptions were measured using a five-point Likert scale focusing on product quality, product health, food safety, and price. The study employed a quantitative descriptive approach with a sample of 32 Agribusiness students selected through purposive sampling. Data were analysed using descriptive statistics and Spearman correlation analysis. The results indicate that students demonstrate positive perceptions across all variables, with food safety emerging as the most influential factor, showing strong correlations with product quality, product health, and price. Pili products are generally perceived as nutritious, safe for consumption, reasonably priced, and possessing strong market potential among young consumers. However, improvements in packaging attractiveness and product innovation are still necessary to enhance competitiveness.

**Keywords:** Consumer perception, agribusiness students, pili products

## 1. Introduction

Pili (*Canarium ovatum*) is a high-value indigenous crop that plays a significant cultural, economic, and agricultural role in the Bicol Region of the Philippines, where it is considered one of the most important specialty commodities. Over the years, pili nuts and their derived products such as candies, roasted kernels, pastries, and processed oils have gained increasing recognition in both domestic and international markets due to their unique sensory qualities, nutritional value, and potential for value-added commercialization. As consumer preferences evolve and the food sector becomes more competitive, understanding how young, educated consumers perceive and engage with pili products becomes essential for guiding product development, marketing strategies, and agribusiness innovation (Dumandan et al., 2022).

In academic institutions such as the Central Bicol State University of Agriculture, Agribusiness students represent an important consumer group whose perceptions and awareness may influence future market trends, entrepreneurial ventures, and value-chain improvements. Their background in agricultural systems, food enterprise management, and socio-economic analysis positions them as informed evaluators of local products, including pili-based goods. Examining their perception and awareness provides insights into how pili products are valued in terms of familiarity, quality, packaging, sensory attributes, cultural identity, and market potential. Furthermore, assessing awareness helps determine the extent of students' knowledge regarding the production, processing, nutritional benefits, and commercial applications of pili products (G., et al., 2025).

Consumer perception research consistently highlights the roles of product familiarity, branding, sensory characteristics, and packaging in shaping acceptance and purchase intentions. Studies on indigenous food commodities also emphasize that awareness particularly in terms of health benefits, sustainability, and cultural significance is a key determinant of consumer interest and preference. In the case of pili, whose commercialization continues to expand, understanding perception and awareness contributes to identifying gaps that may hinder broader acceptance, especially among younger demographics (Gonzales & Nunez, 2020).

Despite the growing literature on consumer behavior toward local food products, research focusing specifically on Agribusiness students' perception and awareness of pili products remains limited. This gap highlights the need for

empirical investigation that focuses on academic institutions within regions where pili is both culturally and economically significant. Such research may assist in strengthening local agribusiness enterprises, supporting product development initiatives, and informing training programs related to food innovation and entrepreneurship (Akinola et al., 2020).

This study thus aims to examine the perception and awareness of Agribusiness students toward pili products at Central Bicol State University of Agriculture. By assessing students' levels of product quality, product health, food safety, and price, the study intends to contribute to a deeper understanding of consumer behavior toward indigenous commodities. The findings may serve as a baseline for future agribusiness initiatives, value-chain interventions, and product development strategies that seek to enhance the competitiveness and market presence of pili products in the Philippines and beyond.

## 2. Literature Review

One of the Philippine products that need special attention is the Pili (*Canarium ovatum*) which is popularly known as the "Tree of Hope". Pili is endemic in the Bicol region particularly in Albay, Sorsogon, and Samar, making these places the center of its genetic diversity and major producers of Pili products (Funa et al., 2022).

Consumer perception of a product is influenced by several internal and external factors. Perception is a process by which a person selects, organizes, and interprets information input to create an image (Leonara, 2018). Product quality is something that can be done satisfy the wants and needs offered to the market so that they can be had, noticed, used or consumed (Aghitsni & Busyra, 2022). Healthy food or healthy food is assessed in terms of its nutritional. Healthy food is prescribed from how food is prepared and combined. That is, food will can be said to be healthy depending on how a food ingredient is processed and then its nutrition The final portion contained in the processed product is served (Wungu, 2024).

Food safety as a condition and effort to maintain a quality of food to prevent contamination and foodborne illnesses. Contamination is a condition in which food has occurred contaminated and dangerous for humans to consume. Food can be contaminated at any stage of the food pathway from farm to table. Sources of contamination can come from soil, air, air, plants, animals and man. Therefore, prevention and control must start from food is accepted until the food is served. (Setiawan et al., 2015). Price perception is price information that can be understood by consumers and the price can determine the meaning of the product (Fajrul et al., 2024)

## 3. Method

This research was conducted in October-November 2025 and its scope included perceptions of pili products among agribusiness students at Central Bicol State University of Agriculture, Pili, Camarines Sur, Philippines. Distribution of questionnaires was carried out using an online system. Respondents were selected agribusiness students with a total sample of 32 respondents who had consumed pili products.

### 3.1 Data Analysis

#### 3.1.1 Data Types and Sources

This research uses two types of data, namely primary data and secondary data. Primary data was collected by distributing questionnaires to respondents at their respective locations using online methods. Secondary data was collected through literature studies including other mass media, books, journals, the internet with previous research, and other data relevant to the research.

#### 3.1.2 Purposive Sampling

Data gathered through the survey questionnaire were organised, coded, and analysed using descriptive statistical techniques. Since the study employed purposive sampling, analysis focused on interpreting responses from participants who were intentionally selected based on their relevance to the research objectives. Purposive sampling is appropriate when the researcher aims to obtain insights from a specific group with particular characteristics in this case, Agribusiness students who possess academic exposure to agricultural commodities, including Pili

The data were processed using Microsoft Excel and IBM SPSS Statistics. Descriptive statistics, such as frequency, percentage, mean, and standard deviation, were computed to summarise respondents' demographic characteristics and quantify their perception and awareness of Pili products. The perception items were measured using a five-point Likert scale, with responses interpreted based on established criteria: (Abirin, 2023).

1.00–1.79 = Very Low

1.80–2.59 = Low

2.60–3.39 = Moderate

3.40–4.19 = High

4.20–5.00 = Very High

#### 3.1.3. Data Analysis and Processing Methods

##### a. Validity Test

Before administering the questionnaire as the primary data collection instrument, validity and reliability tests were conducted to ensure the quality of the measurement tool. Validity testing was performed to determine whether the questionnaire items were capable of accurately measuring the intended constructs. In this context, the measurement

instrument refers to the individual statements included in the questionnaire. The validity test was carried out using data obtained from 32 respondents and was analysed with IBM SPSS Statistics employing the Pearson product moment (bivariate) correlation method. The calculated correlation coefficients for each item were compared with the critical value of the correlation coefficient ( $r\text{-table} = 0.349$ ). Questionnaire items were considered valid if the calculated correlation value ( $r\text{-count}$ ) exceeded the  $r\text{-table}$  value and invalid if the  $r\text{-count}$  was lower than the  $r\text{-table}$  value (Janna & Herianto 2021), criteria namely:

- 1) If  $r\text{ count} \geq r\text{ table}$  then the measuring instrument or questionnaire is declared valid.
- 2) If  $r\text{ count} \leq r\text{ table}$  then the measuring instrument or questionnaire is declared invalid

#### b. Reability Test

Reliability testing was conducted to assess the consistency and stability of the measurement instrument. An instrument is considered reliable when repeated measurements under similar conditions yield consistent results. In this study, reliability was evaluated using Cronbach's Alpha coefficient, which is commonly applied to assess the internal consistency of questionnaire items. A measurement instrument was deemed reliable if the Cronbach's Alpha value exceeded 0.60, indicating an acceptable level of reliability. The results of the reliability analysis showed that all measured variables (X1, X2, X3, and X4) met the required threshold and were therefore classified as reliable (Dewi & Sudaryanto, 2020).

#### c. Descriptive test and inference test

This study uses descriptive and inference tests to determine the results of the study. Descriptive statistics are data analysis by describing or depicting data that has been collected without intending to make conclusions that apply generally or generalizations. Some of the data in the questionnaire use a Likert scale as the weight of the questions with a value range of 1 - 5. Respondents' answers from each indicator with a Likert scale of 1-5 will be averaged after weighting (Sugiyono, 2014). The following formula for the range of values states the level of perception:

$$\text{Range of values} = \frac{\text{Highest value} - \text{Lowest value}}{N \text{ scale}}$$

Inferential Test used to analyze the relationship of each question to the questionnaire results. The inferential test used is the Spearman Rank correlation test to measure variables that have an ordinal scale. Measurement of the relationship is carried out on consumer characteristics variables with perception, consumer characteristics with preferences, and perception and preference. The following is the Spearman Rank correlation formula:

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

Information:

$r_s$  : Spearman correlation coefficient value;  
 $d$  : Difference in value of two sets of variables; and  
 $n$  : Total variables.

## 4. Discussion

### 4.1 Respondent Characteristics

The study involved 32 Agribusiness students enrolled at the Central Bicol State University of Agriculture, Pili, Camarines Sur, Philippines. The respondents represented a mix of demographic backgrounds relevant to understanding their perception and awareness of Pili products. Regarding age, most respondents fell within the range of 19 to 29 years, corresponding to the typical age bracket of undergraduate students in the Philippines. This age group is commonly associated with openness to new agricultural products and technologies (Halicka et al., 2025).

The respondents also varied in their year level, with participants coming from first year to fourth year Agribusiness classes. Such diversity allowed for perspectives from students with different levels of academic exposure to agriculture and commodity related topics. Higher-year students, in particular, may possess more advanced knowledge due to their coursework in agribusiness management, marketing, and commodity systems. In terms of exposure to Pili products, many respondents reported having prior experience with consuming or encountering Pili-based goods, given the crop's cultural and economic significance in the Bicol Region. This familiarity is reflective of previous studies indicating that proximity to local agricultural commodities enhances awareness and consumer connection (Bouwman et al., 2024).

Overall, the respondents' demographic profile reflects a young, academically engaged, and regionally connected group conditions favourable for evaluating perceptions and awareness of Pili products. Their educational background and local context contribute to meaningful insights into how future agribusiness professionals view the potential of Pili as a commercial and culturally relevant commodity.

### 4.2 Consumer Perception of Product Quality, Product Health, Food Safety, and Price

#### 4.2.1 Consumer Perception of Product Quality

The following table 1 presents an overview of Consumer Perception of Product Quality, illustrating consumers' evaluations of product quality based on several predefined indicators. The data provide insights into consumers' overall perceptions and serve as a basis for analyzing customer satisfaction and trust in the product.

**Table 1.** Consumer perception of product quality

No	Statement	Percentage (%)					Mean	Information
		1	2	3	4	5		
1	Pili is guaranteed to have good nutritional and nutritional content	0	0	3,125	37,5	59,375	4.56	Very high
2	Visually, pili processed products have an attractive appearance	0	3,125	6,25	3,125	37,5	4.25	Very high
3	In my opinion, the shelf life of pili is quite long	0	3,125	18,75	46,875	31,25	4.06	High
4	In my opinion, the size and weight of the pili suits my taste.	0	0	12,5	62,5	25	4.13	High
5	In my opinion, pili is a practical snack	0	6,25	31,25	50	12,5	3.69	High
6	I think pili can help meet my nutritional intake	0	3,125	31,25	40,62	25	3.88	High
7	In my opinion, the taste of processed pili products is delicious and unique	0	0	6,25	43,75	50	4.47	Very high
8	In my opinion, the texture of processed pili products is crunchy and easy to consume	0	0	18,75	46,875	34,375	4.13	High
	Quantity						37.51	
	Average						4.15	High

Overall, Agribusiness students demonstrated a high perception of pili product quality, with an average mean score of 4.15. This indicates that pili products are generally perceived as high-quality food items among respondents. The findings show that students strongly perceive pili products as nutritious, tasty, and sensory appealing, particularly in terms of nutritional content and unique taste, which received very high ratings. Other quality attributes such as appearance, texture, shelf life, practicality, and portion suitability were also evaluated positively, falling within the high category. In conclusion, the results suggest that pili products meet students' expectations regarding product quality and possess strong potential to be positioned as competitive local snack products for young consumers (Petrescu et al., 2020)

#### 4.2.2 Consumer Perception of Product Health

The following table 2 presents an overview of Consumer Perception of Product Health, which reflects consumers' evaluations of the health aspects of the product based on several predetermined indicators. This information is used to assess how consumers perceive the product in terms of its health benefits and to support further analysis in the discussion section.

**Table 2.** Consumer perception of product health

No	Statement	Percentage (%)					Mean	Information
		1	2	3	4	5		
1	In my opinion, pili has a good effect on health	0	0	12,5	53,125	34,375	4.25	Very high
2	In my opinion, pili can be a healthy food trend	0	0	9,375	53,125	37,5	4.28	Very high
3	In my opinion, pili can be a menu choice to maintain health and meet the body's nutritional needs	0	0	21,875	50	28,125	4.09	High
	Quantity						12.62	
	Average						4.2	Very high

The results indicate that Agribusiness students have a very high perception of the health aspects of pili products, with an overall mean score of 4.20. This suggests that pili products are widely perceived as beneficial for health and suitable for supporting nutritional needs. Students generally agree that pili has positive health effects, can serve as a healthy food option, and has the potential to follow healthy food trends among young consumers. Overall, these findings imply that the strong health image of pili products enhances their attractiveness and supports their positioning as nutritious and health-oriented local food products (Ali et al., 2023).

#### 4.2.3 Consumer Perception of Food Safety

The following table 3 presents an overview of Consumer Perception of Food Safety, reflecting consumers' evaluations

of food safety aspects based on several predefined indicators. This data is used to understand consumers' perceptions of product safety and to support further analysis in the discussion section.

**Table 3.** Consumer perception of food safety

No	Statement	Percentage (%)					Mean	Information
		1	2	3	4	5		
1	In my opinion, pili processed products can be trusted to have been produced through a safe process	0	0	3,125	53,125	43,75	4.38	Very high
2	In my opinion, pili processed products are safe for consumption	0	0	0	50	50	4.50	Very high
3	In my opinion, the production of processed pili products applies the principle of hygiene	0	0	6,25	62,5	31,25	4.38	Very high
4	I always check the labels of food products before buying them	0	3,125	6,25	43,75	46,875	4.25	Very high
5	In my opinion, the completeness of the packaging label attributes is important to me	0	3,125	3,1125	18,75	75	4.62	Very high
	Quantity						22.13	
	Average						4.43	Very high

The findings reveal that Agribusiness students have a very high perception of the food safety of pili products, as indicated by an overall mean score of 4.43. This demonstrates a strong level of trust among respondents regarding the safety and hygiene of processed pili products. Students generally believe that pili products are produced through safe and hygienic processes, are safe for consumption, and are supported by adequate packaging labels. In conclusion, the high perception of food safety strengthens consumer confidence and positively influences the acceptance of pili products among young consumers (Miftari et al., 2024).

#### 4.2.4 Consumer Perception of Price

The following table 4 presents an overview of Consumer Perception of Price, which reflects consumers' evaluations of the product's price based on several predetermined indicators. This data is used to understand how consumers perceive price fairness, affordability, and value for money, and to support further analysis in the discussion section.

**Table 4.** Consumer perception of price

No	Statement	Percentage (%)					Mean	Information
		1	2	3	4	5		
1	In my opinion, the price of processed pili products is affordable	3,125	3,125	25	40,625	28,125	3.94	High
2	In my opinion, in terms of price, processed pili products are suitable for consumption by teenagers and young adults	0	3,125	21,875	40,625	34,375	4.03	High
3	In my opinion, based on the price offered and the aspects of this pili processed product, it is worth buying	0	3,125	9,375	62,5	25	4.09	High
	Quantity						12.06	
	Average						4.02	High

Price is flexible, meaning that the price can be adjusted quickly according to market desires. The results show that Agribusiness students have a high perception of the price of pili products, with an overall mean score of 4.02. This indicates that the price of processed pili products is generally perceived as reasonable and acceptable among young consumers. Respondents consider pili products to be affordable, appropriately priced for teenagers and young adults, and worth purchasing when compared to their quality and attributes. In conclusion, the favourable price perception supports the competitiveness of pili products and enhances their potential for wider acceptance in the youth market segment.

### 4.3 Consumer Perception Relationship

The following table 5 presents an overview of Consumer Perception of Relationship, which reflects consumers' evaluations of the relationship between the company and its customers based on several predetermined indicators. This data is used to understand consumers' perceptions of trust, communication, and long-term relationship quality, and to support further analysis in the discussion section.

**Table 5.** Correlation of consumer perception of relationship

			Product quality	Product health	Food safety	Price
Spearman's rho	Product quality	Correlation Coefficient	1.000	.596**	.618**	.698**
		Sig. (2-tailed)	.	.000	.000	.000
		N	32	32	32	32
	Product health	Correlation Coefficient	.596**	1.000	.568**	.694**
		Sig. (2-tailed)	.000	.	.001	.000
		N	32	32	32	32
	Food safety	Correlation Coefficient	.618**	.568**	1.000	.775**
		Sig. (2-tailed)	.000	.001	.	.000
		N	32	32	32	32
	Price	Correlation Coefficient	.698**	.694**	.775**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	32	32	32	32

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Based on Table 5, the results of the Spearman's rho correlation analysis indicate positive and statistically significant relationships among all consumer perception indicators, namely product quality, product health, food safety, and price. The correlation between product quality and product health shows a coefficient of 0.596 ( $p < 0.01$ ), indicating a moderate to strong relationship. This finding suggests that higher perceived product quality is associated with stronger consumer perceptions of product health. Furthermore, product quality is strongly correlated with food safety ( $r = 0.618$ ,  $p < 0.01$ ) and price ( $r = 0.698$ ,  $p < 0.01$ ). These results imply that consumers tend to associate high-quality products with better food safety standards and are more willing to accept higher prices for such products. In this context, price functions as an indicator of perceived quality and safety.

The strongest relationship is observed between food safety and price ( $r = 0.775$ ,  $p < 0.01$ ), indicating that perceptions of food safety play a crucial role in shaping consumers' price acceptance. In addition, product health is significantly correlated with food safety ( $r = 0.568$ ,  $p < 0.01$ ) and price ( $r = 0.694$ ,  $p < 0.01$ ), highlighting the interrelated nature of health and safety perceptions in forming overall product value. Overall, these findings confirm that consumer perceptions are multidimensional and interconnected, where product quality, health attributes, food safety, and price jointly shape consumer evaluations. This provides a strong empirical foundation for further discussion on consumer trust and product competitiveness in the subsequent analysis.

a. Relationship between Product Quality and Product Health

The results indicate a positive and statistically significant relationship between product quality and product health, with a Spearman correlation coefficient of  $r = 0.596$ . This moderate-to-strong relationship suggests that students who perceive pili products as having higher quality also tend to perceive them as healthier. This finding implies that perceived product quality plays an important role in shaping beliefs about the health benefits of pili products.

b. Relationship between Product Quality and Food Safety

A significant positive relationship was found between product quality and food safety  $r = 0.618$ . This strong correlation indicates that products perceived as high in quality are also considered safer for consumption. It suggests that students associate product quality with hygienic processing, proper handling, and compliance with food safety standards.

c. Relationship between Product Quality and Price

The correlation analysis revealed a strong and positive relationship between product quality and price perception, with a correlation coefficient of  $r = 0.698$ . This result indicates that higher perceived quality is associated with greater acceptance of product price. In other words, students are more likely to consider the price of pili products reasonable when the quality meets their expectations.

d. Relationship between Product Health and Food Safety

The relationship between product health and food safety was found to be positive and significant, with a Spearman correlation coefficient of  $r = 0.568$ . This moderate relationship suggests that students' perceptions of the health benefits of pili products are closely linked to their confidence in the safety and hygiene of the products. Products perceived as safe are more likely to be regarded as healthy.

e. Relationship between Product Health and Price

A strong positive relationship was observed between product health and price perception  $r = 0.694$ . This finding indicates that students tend to accept higher prices when they believe that pili products provide tangible health benefits.

Health-related perceptions therefore contribute significantly to perceived value and price acceptance.

f. Relationship between Food Safety and Price

The strongest relationship was identified between food safety and price perception, with a correlation coefficient of  $r = 0.775$ . This very strong and significant relationship suggests that food safety is a critical factor in shaping students' willingness to accept the price of pili products. When products are perceived as safe and hygienic, students are more confident in their purchase decisions despite price considerations.

## 5. Conclusion

This study concludes that Agribusiness students at the Central Bicol State University of Agriculture demonstrate an overall positive perception of pili products in terms of product quality, product health, food safety, and price. Among these dimensions, food safety emerged as the most influential factor, indicating that students place strong importance on hygienic production processes, product safety, and clear labelling when evaluating pili-based products. The findings also reveal that perceptions of price, product quality, and product health are closely interconnected with food safety. Students are more likely to accept the price of pili products when they perceive them as safe, healthy, and of high quality. This interdependence suggests that consumer confidence is built through a combination of trust, value, and perceived benefits rather than a single product attribute. Furthermore, the results highlight that pili products possess strong potential as competitive local food products for young and educated consumers. However, maintaining high safety standards, improving product presentation, and ensuring price consistency are essential to strengthening consumer acceptance and market competitiveness.

Overall, this study provides empirical evidence that strengthening food safety assurance and quality consistency should be prioritised in the development and marketing of pili products. These efforts may enhance consumer trust, support sustainable agribusiness development, and increase the market potential of pili-based products at both local and broader levels.

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## Conflict of Interest

The authors declare no conflicts of interest.

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