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Evaluating Food Safety and Profitability Challenges in the Dayok Production Chain in General Santos City

Eujeny Marie Lapinig[1*], Renjil Ayoc[1], Judith Adol[1]
[1]*Department of Marketing Management, Mindanao State University, General Santos City, Philippines*

Abstract—This case study analyzed the challenges and opportunities regarding food safety and profitability in the Dayok production chain in General Santos City. Using a descriptive quantitative research approach, which is based on surveys from Dayok producers and retailers, the analysis has detected key factors affecting production practices, market performance, and income generation. The results show that producers face problems related to sanitation, the absence of standardized methods of processing, and limited access to appropriate facilities. Additionally, fluctuations in market prices have also challenged the production environment. Retailers experience problems maintaining product quality and ensuring safety while generating profits due to tough competition and uncertainty of supply. Opportunities for improved hygiene practices, value addition, training, government regulatory reforms, and increased government support have been indicated. The study has emphasized the need for teamwork among producers, retailers, and local authorities in order to enhance the safety, profitability, and sustainability of the Dayok industry in General Santos City.

***Index Terms*—Dayok, food safety, production chain, profitability challenges, General Santos City.**

1. Introduction

Dayok is a traditional Filipino fermented fish condiment made primarily from tuna entrails, commonly produced in Calumpang, General Santos City—the "Tuna Capital of the Philippines." This indigenous product, deeply rooted in the culinary traditions of Mindanao and the Visayas, is prepared by fermenting fish intestines (excluding the heart and bile sac) with salt and, at times, rice wine and herbs [1]. It is cherished as an appetizer or savory condiment that complements grilled meats, fish, and native dishes. Beyond its gastronomic appeal, *Dayok* reflects the resourcefulness of local communities that maximize tuna by-products, thereby contributing to waste reduction and local livelihood [3].

Globally, the increasing demand for fishery products underscores the importance of ensuring their safety and quality. According to the Food and Agriculture Organization [5], world fish production reached approximately 179 million tons in 2018, with a value of about US $401 billion. In the Philippines, the tuna fishery sector remains a vital contributor to national income and employment [6]. However, the safety of processed and fermented fish products continues to be a significant concern, as microorganisms play a crucial role in spoilage and the formation of toxic compounds such as histamine [13].

The World Health Organization [16], reports that foodborne diseases affect about 600 million people and cause 420 000 deaths annually. Among the primary risk factors for these illnesses are inadequate hygiene practices, poor temperature control, and improper handling of raw materials [14], [15]. Studies further emphasize that food handlers' knowledge and hygiene practices are central to preventing foodborne outbreaks [7], [9], [12].

Fermented fish products like *Dayok* are susceptible to histamine formation—a toxic compound produced by spoilage bacteria acting on the amino acid histidine. Tuna species, such as *Thunnus albacares*, have high histidine content, making them prone to histamine accumulation during fermentation if salt levels and temperature are not properly controlled [2]. Their study demonstrated that *Dayok* fermented at low salt concentrations [10 %/] exceeded the U.S. FDA's histamine limit of 50 ppm, while higher salt levels [> 17 %] effectively minimized histamine formation.

Despite its cultural and economic value, many *Dayok* producers in General Santos City operate informally and under limited technical supervision. Inadequate sanitation, inconsistent fermentation practices, and lack of standardized packaging increase both spoilage and contamination risks. These food safety issues not only threaten consumer health but also hinder the product's competitiveness and marketability.

Small-scale *Dayok* producers are primarily micro and small enterprises (MSEs) that rely on local tuna by-products as their raw materials. These enterprises play an important role in poverty alleviation, employment generation, and cultural preservation [8]. However, they face persistent challenges such as limited market access, inconsistent pricing, competition with larger commercial brands, and insufficient marketing literacy [10]. The additional burden of complying with food-safety regulations—often requiring capital investment and technical knowledge—further constrains their profitability.

As the demand for safe and high-quality food increases, the inability of small-scale *Dayok* producers to meet safety

*Corresponding author: eujenymarie.lapinig@msugensan.edu.ph

standards may restrict their access to broader markets, including institutional buyers and potential export opportunities. Addressing both the food-safety and economic dimensions of *Dayok* production is therefore crucial for ensuring the sustainability of this indigenous enterprise.

2. Materials and Methods

1) The study employed a descriptive research design. This was chosen to collect, describe, and analyze data systematically. The seller and the producer.
2) In this study, the vendors of "Dayok" in General Santos City were selected based on their direct involvement in selling Dayok, ensuring firsthand knowledge and experience relevant to the research objectives. Data collection was conducted through face-to-face (FTF) surveys. A structured questionnaire served as a guide during the interviews, ensuring consistency and completeness in the data collected.
3) The instrument used in the study was a structured survey questionnaire designed to gather information from Dayok vendors in General Santos City. The questionnaire had two sections: the profile of the respondents and the assessment items using a Likert scale. The first section collected factual information pertaining to age, sex, and years of selling Dayok, while the second section contained statements related to the vendors' practices, challenges, and perceptions. The instrument had undergone content validation by subject-matter experts to ensure clarity, relevance, and accuracy.
4) Microsoft Excel was utilized to analyze collected data. Specifically, mean and percentage calculations were performed to summarize the responses. Pivot tables were employed to analyze and interpret the data, providing insights into the trends and patterns observed among the Dayok sellers.
5) Each respondent was informed of the purpose of the study and what their participation in the survey would entail prior to data collection. Participation was strictly voluntary, and the respondents were asked for verbal consent before answering the survey questions. Their right to decline or withdraw at any point in the process was clearly explained. The researchers assured the participants that their personal information would be kept confidential and that their names and identities would not appear in any part of the study. Data were handled with respect for privacy to maintain ethical research standards.

3. Results

Table 1
Gender distribution

Gender	Frequency	Percentage
Female	13	41.94%
Male	18	58.06%

Table 1 presents the distribution of respondents according to sex. The majority of the respondents are males, accounting for 58.06% (n=18) of the total participants. Meanwhile, 41.94% (n=13) of the respondents are females.

Table 2
Age distribution

Age	Frequency	Percentage
18-24 years old	3	9.68%
25- 34 years old	4	12.90%
35-44 years old	9	29.03%
45-54 years old	10	32.26%
55 and above	5	16.13%

Table 2 shows the profile of the respondents in terms of age. Most of the respondents are middle-aged adults with ages ranging from 45–54 years old, accounting for 32.26% (n=10) of the total respondents. On the other hand, 29.03% (n=9) of the respondents are early middle-aged adults with ages ranging from 35–44 years old. Furthermore, 16.13% (n=5) of the respondents are older adults aged 55 and above, while 12.90% (n=4) and 9.68% (n=3) belong to the younger age groups of 25–34 years old and 18–24 years old, respectively.

Table 3
Civil status distribution

Civil Status	Frequency	Percentage
Single	9	29.03%
Married	20	64.52%
Widow	2	6.45%

Table 3 presents the profile of the respondents in terms of civil status. Most of the respondents are married, comprising 64.52% (n=20) of the total population. On the other hand, 29.03% (n=9) of the respondents are single, while only 6.45% (n=2) are widowed.

Table 4
Educational attainment distribution

Education Attainment	Frequency	Percentage
No formal education	0	0.00%
Elementary Graduate	3	9.68%
High School Graduate	13	41.94%
College Level	5	16.13%
College Graduate	8	25.81%
Vocational	1	3.23%

Table 4 presents the profile of the respondents in terms of educational attainment. Most of the respondents are high school graduates, comprising 41.94% (n=13) of the total respondents. This is followed by college graduates, accounting for 25.81% (n=8), and those who reached college level but did not finish, representing 16.13% (n=5). Meanwhile, 9.68% (n=3) of the respondents are elementary graduates, and only 3.23% (n=1) have vocational education. Notably, none of the respondents reported having no formal education.

Table 5
Respondents' years in selling Dayok

Years in selling	Frequency	Percentage
Less than a year	1	3.57%
1-3 years	8	28.57%
4-6 years	11	39.29%
7 years above	8	28.57%

Table 5 presents the profile of the respondents in terms of years in selling. Most of the respondents have been engaged in selling for 4–6 years, comprising 39.29% (n=11) of the total

respondents. This is followed by those who have been selling for 1–3 years and 7 years and above, both accounting for 28.57% (n=8) each. Meanwhile, only 3.57% (n=1) of the respondents have been selling for less than a year.

Table 6
Respondents' monthly income

Monthly Income	Frequency	Percentage
0-5,000	11	36.67%
5,001 -10,000	11	36.67%
10,001 - 20,000	4	13.33%
20,000 - 30,000	3	10.00%
30,000 - 40,000	1	3.33%
Above 40,000	0	0.00%

Table 6 presents the profile of the respondents in terms of monthly income. The majority of the respondents earn between ₱0–₱5,000 and ₱5,001–₱10,000, both comprising 36.67% (n=11) of the total respondents. This is followed by those earning ₱10,001–₱20,000, accounting for 13.33% (n=4), and ₱20,001–₱30,000, representing 10.00% (n=3). Meanwhile, only 3.33% (n=1) of the respondents earn ₱30,001–₱40,000, and none of the respondents reported earning above ₱40,000.

Table 7
Respondents source of capital

Source of Capital	Frequency	Percentage
Self	15	48.39%
Family	12	38.71%
Loans	4	12.90%
Govt. Monetary Support	0	0.00%

Table 7 presents the profile of the respondents in terms of source of capital. The majority of the respondents sourced their capital themselves, accounting for 48.39% (n=15) of the total respondents. This is followed by those who received capital from their family, comprising 38.71% (n=12), and respondents who obtained capital through loans, representing 12.90% (n=4). Notably, none of the respondents reported receiving government monetary support.

Table 8 presents the storage and safety practices employed by respondents in relation to Dayok products. The data reveals strong consensus among respondents, as indicated by the high mean scores for all listed practices. Respondents strongly agree with the overall mean 4.44 that they guarantee the safety of Dayok, properly store it to maintain quality, regularly clean display areas, protect products from sunlight or heat, and implement a FIFO stock rotation system. This demonstrates a high level of compliance with recommended practices among vendors.

Table 9 reveals factors influencing the profitability of Dayok sellers. Respondents agree (overall mean = 4.26) that perceived safety and cleanliness boost customer trust (Mean = 4.48), and they effectively manage supplier price changes (Mean = 4.29). Customer loyalty and relationships significantly impact sales (Mean = 4.42), highlighting the importance of these elements in their Dayok businesses

Table 10 addresses the quality of Dayok, with respondents generally disagreeing (Overall Mean = 1.76) with the presented statements. They do not frequently need to educate customers about Dayok compared to other fermented products (Mean = 1.74), customers rarely return Dayok due to quality concerns

Table 8
Storage and safety practices

Questions	Mean	Verbal Description
I can guarantee that the Dayok products I sell are safe for consumers' health.	4.42	Strongly Agree
I store Dayok properly to maintain its quality before selling.	4.45	Strongly Agree
The place or area for display of Dayok products are cleaned and sanitized.	4.42	Strongly Agree
I keep the Dayok products consistently away from direct sunlight or heat sources during storage and display.	4.45	Strongly Agree
I have a clear system for rotating my Dayok stock (First-In, First-Out or FIFO) to ensure older products are sold first.	4.45	Strongly Agree
Overall Mean	**4.44**	**Strongly Agree**

Table 9
Market profitability

Questions	Mean	Verbal Description
I am satisfied with my income from selling Dayok.	4.13	Agree
I am satisfied with the selling price of Dayok I get from the suppliers.	4.10	Agree
I consistently offer promotional deals (e.g., bulk discounts, special bundles) for Dayok to attract more customers.	4.13	Agree
The perceived safety and cleanliness of my selling area significantly contribute to customer trust and repeat purchases.	4.48	Agree
I successfully manage the price fluctuations from my supplier without significantly decreasing my profit margin.	4.29	Agree
Customer loyalty (suki) and personal relationships strongly affect my business's overall sales and income.	4.42	Strongly Agree
Overall Mean	**4.26**	**Agree**

Table 10
Challenges

Questions	Mean	Verbal Description
Sometimes, the Dayok I receive from my supplier has quality issues or spoilage upon delivery.	1.90	Disagree
I experience significant competition from locally made or homemade Dayok sold by other vendors, which often results in price undercutting.	2.03	Disagree
I do not have adequate storage space or cooling area to keep the packaged Dayok in good condition before selling.	1.81	Disagree
I experience losses due to spoilage or poor quality of Dayok.	1.84	Disagree
I frequently need to educate customers on what Dayok is and how it differs from more popular fermented products (Ginamos, Alamang).	1.74	Disagree
Customers often return Dayok or complain about its quality (taste, texture, saltiness) after purchase.	1.65	Disagree
The fact that Dayok is made from tuna intestines makes it a difficult product to market to potential new customers.	1.55	Disagree
My sales are significantly affected by the strong, established market presence and preference for Ginamos over Dayok.	1.55	Disagree
Overall Mean	**1.76**	**Disagree**

(Mean = 1.65), the tuna intestine ingredient isn't a major deterrent for new customers (Mean = 1.55), and sales aren't significantly impacted by the preference for "ginamos" over Dayok (Mean = 1.55).

4. Discussion

The finding of this study points to vital features and practices among food vendors selling Dayok at General Santos City. Most of these Dayok vendors are male, married, and fall into the middle-aged category, which implies that Dayok vending can be an activity done by adults taking responsibility for their families' well-being. The lack of reliance on capital sourced externally could mean that Dayok vendors lack access to capital or other resources that would limit their expansion or improvement of Dayok; however, it can be inferred that these Dayok vendors know how to handle Dayok given their moderate years of experience regardless of only having elementary education or high school at best.

One of the important observations made was the vendors' good practice of safety and storage principles. The vendors' ability to stick to cleanliness principles, adequate protection from heat, and the First In First Out system shows how devoted they are to ensuring product quality. This is especially important given that Dayok is fermented and must therefore be handled carefully for safety and freshness purposes.

Although there are only minimal quality problems, it can still be observed that vendors face problems with market visibility and awareness among consumers. Apparently, consumers know less about Dayok than other fermented foods like ginamos. The main reason for this could be because there are fewer efforts at promoting or educating consumers about the importance of Dayok products. Thus, vendors encounter fewer returns or complaints about their products but they only operate with fewer consumers too.

On the whole, it could be concluded that while the vendors of Dayok practice responsible selling conduct, they face challenges related to low product visibility and underdeveloped markets.

5. Conclusion

This study concludes that Dayok vendors in General Santos City demonstrate strong adherence to proper handling, storage, and safety practices, reflecting their commitment toward producing safe, good-quality fermented products. Their continuous application of cleanliness and FIFO methods minimizes customer complaints and indicates professionalism, considering that a great majority of them have limited formal education and financial resources.

However, the industry is plagued by low consumer awareness, limited market visibility, and a lack of promotional support. Dayok is less known than other fermented products, and this lessens customer preference for this kind of product.

Enhancing the Dayok industry will be aligned with a number of SDGs; it will help attain SDG 1 (No Poverty) since Dayok vending provides a livelihood for many small vendors, SDG 8 (Decent Work and Economic Growth), since their income opportunities would improve, SDG 12 (Responsible Consumption and Production) since safe food-handling practices are enhanced, and SDG 9 (Industry, Innovation, and Infrastructure) since marketing and product development are improved.

Market development can be enhanced by strengthening marketing initiatives, increasing consumer education, and providing institutional support to make the product more culturally significant and marketable, promoting sustainable local economic development in the process.

6. Recommendations

Based on the findings of the present study, the following recommendations are proposed to support and enhance the livelihood of Dayok vendors in General Santos City

1) Enhancing Product Marketing and Visibility

SDG 8 – Decent Work & Economic Growth

It is also important that the city government and other businesses support promotional campaigns, trade fairs, and product showcases to raise consumer awareness and increase demand for Dayok.

2) Train on Food Safety, Branding, and Packaging

SDG 12 – Responsible Consumption and Production

Moreover, product quality and competitiveness can be improved through workshops on improved packaging, labeling, and safe fermentation techniques.

3) Enhancing Access to Financial Support

SDG 1 – No Poverty

Microfinance, low-interest loans, and grants should be accessible for helping vendors expand operations, upgrade equipment, and invest in better storage facilities.

4) Community-Based Cooperative Systems Development

SDG 9 – Industry, Innovation, and Infrastructure

Cooperative organizations of Dayok vendors could result in strengthened bargaining power, lowered costs for the individual vendors, and shared marketing or production facilities. 5. Initiate Consumer Education Campaigns SDG 4 – Quality Education / SDG 12 Community awareness campaigns on the cultural value, safety, and uses of Dayok will increase demand and appreciation for the product. 6. Support Research and Product Innovation SDG 9 - Industry, Innovation, and Infrastructure It is recommended that higher learning institutions partner with vendors for better ways of improving shelf life, packaging, and flavor profile to modernize Dayok without losing its tradition.

References

[1] N. N. Amuna, *Food Safety Management Practices in the Traditional Fish Processing Sector in Ghana and the Microbiological Safety of Selected Processed Fish Products from Ghana*, MPhil thesis, Univ. of Greenwich, Chatham Maritime, UK, Nov. 2014.

[2] J. R. Besas and E. I. Dizon, "Influence of salt concentration on histamine formation in fermented tuna (Thunnus albacares) viscera (Dayok)," *Food Nutr. Sci.*, vol. 3, no. 2, pp. 201–206, Feb. 2012.

[3] *Dipolog Dayok Product*, Mar. 2012. [Online]. Available: https://dipologdayok.blogspot.com/2012/03/dipolog-dayok-product.html

[4] *Dayok*, Everything Explained, 2023. [Online]. Available: https://everything.explained.today/Dayok/

[5] Food and Agriculture Organization (FAO), *The State of World Fisheries and Aquaculture 2020*, Rome, Italy: FAO, 2020.
[6] F. Kruijssen, P. Roos, F. Bosma, and J. Chopin, "Gender and aquaculture value chains: A review of key issues and implications for research," *Aquaculture*, vol. 493, pp. 328–337, 2018.
[7] X. Luo, J. Liu, and Q. Li, "Knowledge, attitudes, and practices of food handlers toward food safety: A systematic review," *Food Control*, vol. 106, 2019, Art. no. 106712.
[8] M. R. Matias, "The role of livelihood organizations in community development: Marketing challenges and resilience strategies," *Front. Bus. Econ. Manage.*, vol. 6, no. 1, pp. 1–12, 2025.
[9] N. Moreb, A. Priyadarshini, and A. K. Jaiswal, "Knowledge, attitudes, and practices of food handlers in developing countries: A systematic review," *Food Control*, vol. 80, pp. 243–252, 2017.
[10] H. T. Nguyen, "Marketing literacy and growth challenges of micro-enterprises in developing economies," *Asian J. Small Bus. Manage.*, vol. 9, no. 2, pp. 45–57, 2020.
[11] K. Otto, "Market access and sustainability constraints among rural microenterprises," *J. Community Dev. Stud.*, vol. 15, no. 3, pp. 55–72, 2024.
[12] A. Parry-Hanson Kunadu, D. B. Ofosu, E. Aboagye, and J. Trafialek, "Food safety knowledge, attitudes and self-reported practices among food handlers in institutional foodservice in Ghana," *Food Control*, vol. 69, pp. 324–330, 2016.
[13] L. Sheng and L. Wang, "Microorganisms and fish product safety: A comprehensive review," *Compr. Rev. Food Sci. Food Saf.*, vol. 19, no. 6, pp. 3312–3335, 2020.
[14] D. Stratev *et al*., "Food safety and hygiene in small-scale processing: A review," *Food Control*, vol. 78, pp. 112–118, 2017.
[15] M. Tomaszewska, M. Tra, P. Suebpongsang, and W. Kolanowski, "Hygiene practices and foodborne illness risk factors in small-scale food production," *Food Res. Int.*, vol. 107, pp. 466–472, 2018.
[16] World Health Organization (WHO), *Estimates of the Global Burden of Foodborne Diseases*, Geneva, Switzerland: WHO Press, 2015.
[17] J. Wang, "Building business resilience in small enterprises through marketing innovation," *J. Entrepreneurship Dev.*, vol. 8, no. 4, pp. 33–47, 2023.