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CULTURAL NARRATIVES OF SEAFOOD CONSUMPTION: INTERPRETING PUBLIC PERCEPTION OF WILD AND FARMED GROUPER IN SABAH, MALAYSIA

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ABSTRACT

Understanding consumer perception is critical for the sustainable expansion of aquaculture sector. This study assessed public perception of wild and farmed grouper in Kota Kinabalu, Sabah, Malasyia focusing on knowledge, attitudes, food safety perception, purchasing behavior, and economic value. A cross-sectional survey of 385 respondents was conducted using a structured questionnaire. Descriptive and inferential analyses revealed high awareness of farmed grouper (73.5%), but limited understanding of its aquaculture production (52.5%). Although overall perception was positive (87.3%), willingness to try the product remained low (35.6%), indicating a gap between perception and behavioral intention. Freshness (76.1%) and quality (71.4%) were the primary drivers of purchasing decisions, while affordability was identified as a major constraint, with 72.5% perceiving farmed grouper as expensive. Respondents demonstrated moderate confidence in food safety (64.4%) but expressed concerns regarding farm hygiene and environmental monitoring. Trust was highest toward local certification systems. The findings suggest that consumer acceptance is influenced by a combination of perceived quality, economic factors, and trust in production practices. Enhancing transparency, certification, and consumer education is essential to strengthen market acceptance and support sustainable aquaculture development in Sabah.

KEYWORDS: Cultural Narratives, Public Perception, Seafood Consumption, Groupers.

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1. INTRODUCTION

The rapid acceleration of global demand for aquatic protein, coupled with the stagnation and decline of wild fish stocks, has turned aquaculture as an important food production section (Verbeke et al., 2007). However, public perception particularly in Asia often seen with great scepticism on farmed fish mainly due to concerns about its hormone and antibiotic usage, which has impeded its societal acceptance and consumption (López- Mas et al., 2023). Such scepticism often leads to consumers to prefer wild caught fish, despite scientific evidence frequently indicating comparable safety and nutritional profiles between wild and farmed fish (López- Mas et al., 2020).

Seafood consumption in societies is not solely determined by their availability or nutritional value, but is highly influenced within cultural narratives, traditional knowledge systems, and socio-economic structures (Naylor et al., 2021). In regions such as Sabah, Malaysia, fish particularly high-value species like grouper are both economic and cultural significance, shaping consumer perceptions beyond their nutritional or functional value.

Globally, aquaculture has expanded rapidly as a response to declining wild fish stocks and increasing demand for animal protein (Samy-Kamal, 2026). Technological advancements, including production of the fast growth grouper have enhanced production efficiency, biosecurity, and yield stability (Ching et al., 2018). However, despite these advancements, consumer acceptance of farmed fish remains uneven. The major challenge lies in the persistent dichotomy between wild-caught and farmed seafood, often framed within cultural narratives that associate wild fish with freshness and naturalness, , while farmed fish may be perceived as artificial or less reliable (Presenza & Armelin, 2024). This reflects the urgency for evidence-based interventions to bridge the perception gap between wild and farmed seafood, thereby enhancing consumer acceptance and supporting the sustainable development of the aquaculture sector.

Various research in aquaculture has focused on biological performance, feed efficiency, and disease management (Yusof et al., 2024, Choong et al., 2026). Yet, factors such as food safety concerns, environmental awareness, economic considerations, and cultural trust is seldom been studied (Oken et al., 2012, Maesano et al., 2020).

Therefore, this study aims to interpret public perception of wild and farmed grouper within the cultural context of Sabah. By integrating socio-cultural aspects with aquaculture development, this study contributes to a more holistic understanding of consumer behaviour and supports sustainable seafood consumption in the region.

2. MATERIALS AND METHODS

2.1. Determination Of Sample Size

The questionnaire was distributed to 385 respondents in Kota Kinabalu, Sabah. The sample size was determined using population data from the Department of Statistics Malaysia and later calculated with the Raosoft sample size calculator, considering margin of error (5%), confidence level (95%), population size, and response distribution (50%).

2.2. Development Of Questionnaire

The questionnaire was adapted from Agyeman et al. (2025) with slight modification to investigate consumer perception factors such as taste, health, environment, and economy factors, which are commonly identified in aquaculture studies. It comprised six sections: (1) demographics, (2) general fish consumption and preferences, (3) taste and organoleptic attributes, (4) health concerns, (5) environmental concerns, and (6) economic factors.

2.3. Distribution Of Questionnaire

The questionnaire was distributed via both physical and online platforms to improve accessibility and response rates. Respondents included restaurant customers, general consumers, university students and lecturers, domestic and international tourists. Eligible participants were aged ≥18 and must consumed seafood before. This mixed approach enabled a diverse sample and supported more representative insights into consumer perceptions.

2.4. Data Collection

Upon completion of data collection, responses were compiled and systematically organised for analysis. Raw data were entered into Microsoft Excel for preliminary processing and visualisation. Data cleaning procedures were applied, including the removal of incomplete entries and outliers, to ensure dataset reliability and integrity.

2.3. Statistical Analysis

Survey data were analysed using SPSS (v21.0) at $p < 0.05$. Descriptive statistics summarised respondent characteristics. Reliability of Likert-scale items was confirmed using Cronbach's Alpha (≥0.7), following a pilot test (n = 10) to refine the

questionnaire for Kota Kinabalu. Inferential analyses included Chi-square tests for associations between categorical variables and one-way ANOVA with Tukey's post-hoc test for group comparisons. Results are presented as mean ± standard error (S.E.).

3. RESULTS

3.1 Demography

A total of 385 respondents from Kota Kinabalu were surveyed. Gender was relatively balanced (53.5% male; 46.5% female) with no significant effect ($p > 0.05$) (Table 1). Most were aged 25–34 (30.4%, n=117) and 35–44 (30.1%, n=116), followed by 18–24 (26.5%, n=102); while age significantly different ($p < 0.05$), with younger groups more engaged. Respondents were generally well educated (Bachelor's: 30.1%, n=116), with education significantly affecting awareness, perception, and food safety knowledge ($p < 0.05$). Over 60% earned ≤RM3,000 (35.6% RM1,500–3,000; 28.1% <RM1,500), and income significantly influenced perception and purchasing ($p < 0.05$). Most were employed (private 28.8%, government 26.8%), with employment significantly affecting awareness and purchasing behaviour ($p < 0.05$).

3.2. General Knowledge on Grouper

Study reveals a total of 73.5% of respondents had heard of farmed grouper, with awareness significantly influenced by age ($p < 0.001$), education ($p = 0.042$), and employment ($p = 0.002$), but not gender or income ($p > 0.05$) (Figure 1). Knowledge of farmed grouper was lower, with only 52.5% aware, indicating a gap in technical understanding. Awareness of market availability was moderate (59.5%), significantly influenced by age ($p = 0.021$) and employment ($p = 0.002$). Knowledge of species diversity (55.6%) and grouper's commercial popularity (57.4%) remained moderate, with no significant demographic differences ($p > 0.05$). Overall, while general awareness is high, knowledge of production and species diversity is limited, highlighting the need for improved public education on aquaculture.

3.3. Attitude And Perceptions

Among 385 respondents in Kota Kinabalu, perception of farmed grouper was largely positive (87.3% positive; 12.7% negative), significantly influenced by age ($p = 0.019$) and education ($p = 0.003$). (Figure 2). However, willingness to try was lower, with 64.4% unwilling and 35.6% willing, affected by age ($p = 0.005$) and employment ($p < 0.001$). Despite this, 66.0% preferred to consumed farmed grouper, with no significant demographic effects.

Price sensitivity was evident, as 58.7% were unwilling to pay more (41.3% willing), with no significant demographic influence. Confidence in safety was moderate (64.4% confident; 35.6% not), also showing no demographic differences ($p > 0.05$). Overall, while perception and acceptance are high, willingness to try and pay remains constrained by cost concerns and residual hesitation.

3.4. Food Safety

Respondents showed strong confidence in regulatory safety including compliance with standards (75.1%) and approved feed use (75.8%) (Table 2). However, confidence was low for water quality monitoring (21.3%) and sanitation practices (13.2%), indicating concerns over farm hygiene and environmental control.

Trust was highest for independent certification bodies (64.2%) and farmers (60.3%), but lowest for international agencies (17.9%). For improvements, respondents suggest prioritised stricter enforcement (70.9%) and farmer training (63.4%), while transparency was least valued (14.5%). Meanwhile, certification enhanced trust, with HACCP rated highest (63.6%) versus international certificates (23.4%). Overall, confidence is moderate to high, driven by regulatory aspects, but gaps remain in sanitation and monitoring. Significant effects were limited to age (water monitoring, $p < 0.001$) and employment (training, $p < 0.001$), with other factors non-significant ($p > 0.05$).

3.5 Purchasing Behaviour and Preferences

In Kota Kinabalu, farmed grouper is mainly purchased from wet markets (59%), while online channels remain low (16.9%) (Table 3). Purchasing location was significantly influenced by employment ($p = 0.007$). Freshness was the key purchase driver (76.1%), whereas availability had the least influence (27%), with no significant demographic effects ($p > 0.05$). Consumption was mostly occasional (68.3%), with fewer weekly purchases (22.9%), significantly affected by age and employment ($p < 0.001$).

Fillets were most preferred (63.9%), compared to belly (35.3%), with no demographic differences. Increased consumption was driven by better quality (76.4%), while information had minimal impact (18.4%). Overall, purchasing behaviour is quality-driven and centred on traditional markets, with freshness and product form as the main determinants.

3.6. Economic Value

Most of the respondents were aware of farmed grouper prices (76.1%), with no demographic differences ($p > 0.05$). (Figure 3). However, affordability was low with only 27.5% considered it affordable, while 72.5% viewed it as expensive which significantly influenced by income and employment ($p < 0.001$). Despite this, expected demand remained high (75.8%), consistent across all groups ($p > 0.05$). Awareness of economic benefits was moderate, with only 41.3% recognising its contribution, significantly influenced by education ($p < 0.001$) and income ($p = 0.005$).

Support for global promotion was strong (73.8%), with no demographic effects. Overall, while awareness and demand are high, affordability is the main constraint, and understanding of economic benefits remains limited.

4. DISCUSSIONS

The respondents were predominantly educated, middle-income young adult males, reflecting the dynamics of seafood purchasing in Kota Kinabalu. The higher participation of men may be attributed to their traditional roles in seafood procurement, market negotiation, and the selection of high-priced fish such as grouper (Nordhagen et al., 2023, O'Neill et al., 2019). These cultural narratives align with the empirical findings, wherein respondents exhibited a stronger preference for wild-caught fish due to perceived superior taste, freshness, prestige, and nutritional quality. Conversely, cultured fish were associated with affordability, accessibility, and food security. This indicates that seafood consumption behaviour in Sabah is influenced not only by economic factors but also by cultural perceptions and long-standing dietary traditions.

The concentration of respondents aged 25–34 indicates a modern consumer segment that is more adaptable to aquaculture products, consistent with Smith and Lee (2022). Higher education enhances the ability to evaluate food safety and certification, reducing stigma toward farmed fish (Chen et al., 2023). However, middle-income status reinforces price sensitivity (Lee & Park, 2021), while full-time employment drives preference for convenience-based products such as fillets (Patel & Singh, 2023). Collectively, this demographic represents a transitional group shifting from traditional wild-catch reliance toward informed, convenience-driven seafood consumption.

Findings also reveal awareness of farmed grouper is higher, but detailed knowledge of production methods and species diversity remains limited, supporting the notion that recognition does not equate to technical understanding (Nguyen et al., 2021, Altintzoglou et al., 2020). Variations across age, education, and employment suggest unequal exposure to information. Moderate familiarity with product diversity highlights the need for clearer labeling and communication strategies. Limited technical knowledge may reduce consumer confidence and delay adoption, emphasizing the role of education in strengthening trust (Budhathoki et al., 2022, Smith & Lee, 2022, Wongprawmas et al., 2022). Enhancing visibility through marketing, retail presence, and experiential learning can bridge the gap between awareness and informed consumption among consumers in Kota Kinabalu.

Despite high awareness, consumer attitudes toward farmed grouper remain cautious due to limited technical understanding and strong cultural preference for wild-caught fish. This "wait-and-see" mindset reflects uncertainty about production practices, which directly affects trust and purchase intention (Santos et al., 2021). Market visibility further shapes perception, with farmed grouper not yet achieving strong retail presence (Wang et al., 2022, McShane et al., 2025). Demographic differences also influence attitudes, as younger consumers respond to sustainability narratives while older groups rely on traditional cues. Hence, cultural narratives also vary across demographic groups, as younger consumers are generally more receptive toward sustainability and aquaculture-related narratives, whereas older consumers continue to rely on traditional perceptions and long-established consumption practices

Consumer confidence in farmed grouper safety is largely anchored in trust toward regulatory frameworks and approved practices (Zhao et al., 2020). The findings also highlight the influence of cultural perceptions on consumer trust in aquaculture products. Respondents exhibited a preference for local certification, perceiving it as more accountable and pertinent to local seafood practices compared to international standards. Empirical evidence further indicated that consumers prioritized stricter enforcement, transparent farming practices, and farmer competency as critical indicators of seafood safety and quality (Brown & Kim, 2024; Wang et al., 2022). This suggests that consumer confidence is shaped not only by regulatory measures but also by cultural perceptions and trust in visible and reliable farming practices.

Wet markets remained the primary seafood purchasing channel, reflecting cultural perceptions that direct physical inspection is closely associated with freshness, authenticity, and product quality.

Freshness and sensory quality were the main factors influencing purchasing behaviour. Empirical findings also showed that premium seafood such as grouper is commonly preferred for special occasions, highlighting the continued influence of cultural perceptions, traditional food practices, and local consumption patterns Xu et al., 2021). Hence, ensuring consistent product quality and availability in traditional retail settings is therefore critical for increasing consumption frequency.

Consumers demonstrate high price awareness but low perceived affordability, positioning farmed grouper as a premium or luxury product. Despite this, strong optimism toward market growth suggests positive long-term demand potential. Limited understanding of the industry's economic contribution indicates a disconnect between consumption and socio-economic awareness (Lee & Park, 2021, Budhathoki et al., 2022, Johnson et al., 2024). At the same time, strong support for global promotion reflects local pride and confidence in Sabah's aquaculture potential. Bridging the gap between affordability and perceived value through pricing strategies and improved communication of economic benefits is essential for sustainable market expansion.

5. CONCLUSIONS

The present study concludes that public awareness regarding farmed grouper in Kota Kinabalu is substantial; however, consumer acceptance remains tentative due to cultural preferences favoring wild-caught fish. Purchasing decisions are predominantly influenced by factors such as freshness, safety, and perceived quality. The findings reflect significant policy implementation for industry stakeholders, particularly emphasizing the necessity to enhance public education, increase farm transparency, improve certification visibility, and ensure product quality assurance.

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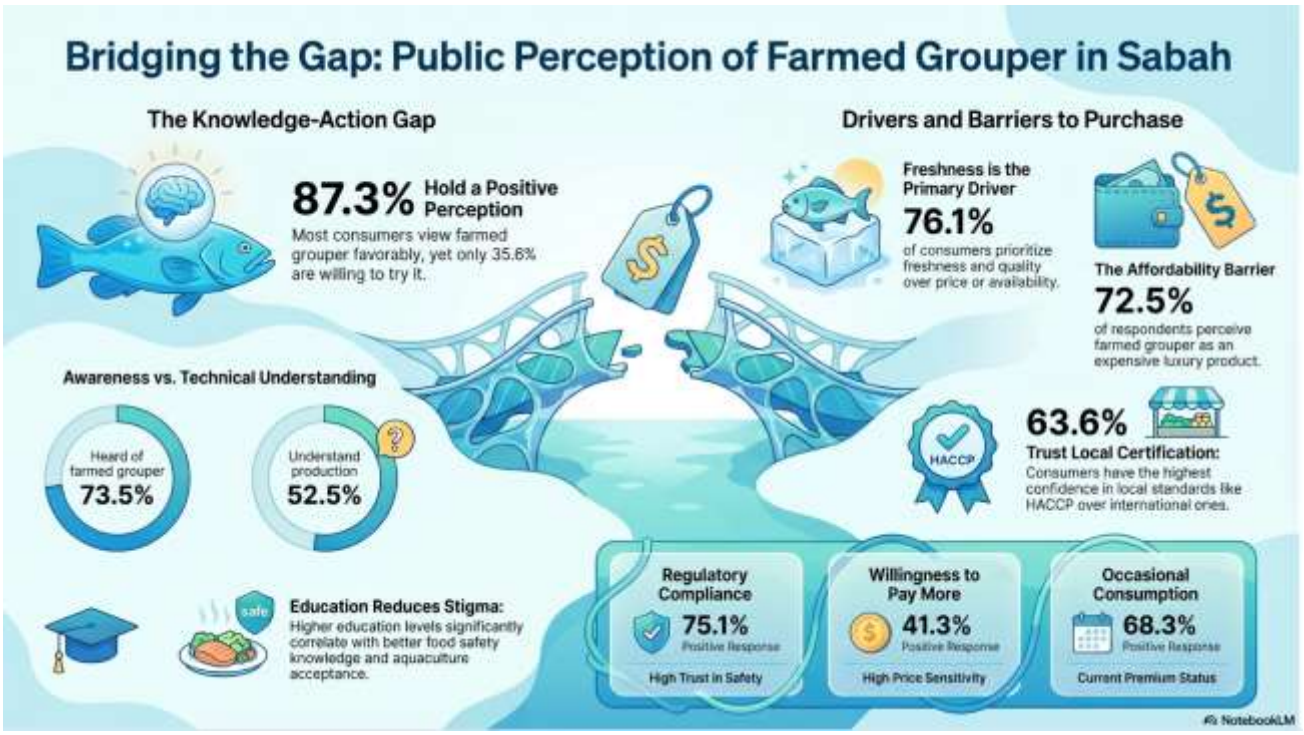
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GRAPHICAL ABSTRACT


Bridging the Gap: Public Perception of Farmed Grouper in Sabah
The Knowledge-Action Gap
87.3% Hold a Positive Perception
Most consumers view farmed grouper favorably, yet only 35.6% are willing to try it.
Drivers and Barriers to Purchase
Freshness is the Primary Driver
76.1%
of consumers prioritize freshness and quality over price or availability.
The Affordability Barrier
72.5%
of respondents perceive farmed grouper as an expensive luxury product.
Awareness vs. Technical Understanding
Heard of farmed grouper 73.5%
Understand production 52.5%
63.6%
Trust Local Certification:
Consumers have the highest confidence in local standards like HACCP over international ones.
HACCP
Education Reduces Stigma:
Higher education levels significantly correlate with better food safety knowledge and aquaculture acceptance.
Regulatory Compliance
75.1%
Positive Response
High Trust in Safety
Willingness to Pay More
41.3%
Positive Response
High Price Sensitivity
Occasional Consumption
68.3%
Positive Response
Current Premium Status
NotebookLM