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PURCHASING ORIENTATION, FISHERY PRODUCT PREFERENCES, AND CONSUMPTION FREQUENCY PATTERNS: AN ONLINE SURVEY OF RESPONDENTS IN INDONESIA

ANALISIS ORIENTASI PEMBELIAN, PREFERENSI PRODUK PERIKANAN, DAN POLA FREKUENSI KONSUMSI PADA RESPONDEN SURVEI DARING DI INDONESIA

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ABSTRACT

Fish consumption reflects affordability, product-quality cues, and market context, yet purchasing orientations have rarely been assessed alongside demographic and attitudinal correlates of ordered consumption frequency in Indonesian online samples. This study aimed to describe fish preferences and examine adjusted associations with weekly fish-consumption frequency. An exploratory cross-sectional survey recruited 200 adults through voluntary online participation in Indonesia (October 7–22, 2025). Internal consistency was assessed using item–rest correlations and Cronbach's alpha (α); purchasing indicators were summarized by parallel analysis and varimax-rotated principal component analysis; associations were estimated using partial proportional-odds regression. Fresh fish (95.0%) and traditional markets (91.5%) predominated. Health and sociocultural item sets had alpha values of 0.819 and 0.713, versus 0.348 for pooled purchasing items. Rural residence (OR = 2.06; 95% CI: 1.09–3.87) and quality-local orientation (OR = 1.74; 95% CI: 1.23–2.47) were positively associated with higher consumption-frequency categories; price-promotion sensitivity was inversely associated (OR = 0.63; 95% CI: 0.46–0.85). The associations were directionally stable in sensitivity analyses. These findings suggest that quality-local attributes, affordability orientation, and residential market context warrant joint investigation. The nonprobability sample and cross-sectional design preclude population or causal inference.

Keywords: purchasing orientation, fish preferences, consumption frequency, consumer behavior, local quality.

ABSTRAK

Konsumsi ikan mencerminkan keterjangkauan harga, indikator kualitas produk, serta konteks pasar. Studi eksploratif dengan desain potong lintang ini bertujuan untuk mengkaji preferensi produk dan faktor-faktor yang berkaitan dengan frekuensi konsumsi ikan mingguan pada 200 orang dewasa yang berpartisipasi dalam survei daring sukarela di Indonesia. Indikator pembelian direduksi menggunakan parallel analysis dan analisis komponen utama dengan rotasi varimax; hubungan yang telah disesuaikan diestimasi menggunakan model partial proportional-odds. Responden umumnya menunjukkan preferensi terhadap ikan air tawar, ikan segar, serta saluran pembelian melalui pasar tradisional. Domisili perdesaan berhubungan dengan peluang kumulatif yang lebih tinggi untuk memiliki frekuensi konsumsi ikan yang lebih sering (OR = 2,06; 95% CI: 1,09–3,87), demikian pula dengan orientasi terhadap kualitas dan aspek lokal produk (quality-local orientation) (OR = 1,74; 95% CI: 1,23–2,47). Sebaliknya, sensitivitas terhadap harga dan promosi berhubungan secara negatif dengan frekuensi konsumsi (OR = 0,63; 95% CI: 0,46–0,85). Hubungan tersebut tetap konsisten pada berbagai pengujian, termasuk pemeriksaan kualitas data, metode bootstrap, dan alternatif ekstraksi faktor. Temuan ini menunjukkan bahwa orientasi terhadap keterjangkauan harga, atribut kualitas-lokal, serta konteks pasar perdesaan perlu dikaji lebih lanjut dalam memahami permintaan pangan akuatik. Namun demikian, penggunaan sampel nonprobabilitas membatasi kemampuan untuk melakukan generalisasi terhadap populasi yang lebih luas.

Kata kunci: orientasi pembelian, preferensi ikan, frekuensi konsumsi, perilaku konsumen, kualitas-lokal.

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INTRODUCTION

Aquatic foods can contribute protein and micronutrients to diverse food systems, although the conditions under which fish reaches consumers differ across locations and households (Golden et al., 2021). Indonesian studies document heterogeneity in household demand, dietary practices, and access to fisheries resources (Arthatiani et al., 2018; Gibson et al., 2020, 2021; Henggu et al., 2021; Suryana et al., 2019). Explanations of fish-consumption frequency therefore need to extend beyond the nutritional properties of fish to the purchasing settings in which consumers confront price, availability, and product information.

Empirical studies link seafood selection to income and price (Luhur et al., 2020; Onumah et al., 2020), product origin and traceability (Rodríguez-Salvador & Calvo Dopico, 2023), product attributes and willingness to pay (Menozzi et al., 2020; Mitra et al., 2021), and familiarity with seafood preparation (Engle et al., 2023). In Swedish point-of-purchase research, familiar species, packaging, and price competed with sustainability information for shoppers' attention (Costa et al., 2024). Separate evidence indicates that enjoyment and sensory expectations are associated with more frequent and varied seafood consumption (Collier et al., 2024). These studies suggest that orientations toward quality and price may reveal heterogeneity not captured by demographics or stated health consciousness alone.

However, findings from international retail settings do not translate automatically to Indonesia. Geographic mapping identifies uneven Indonesian fish consumption and expenditure (Virgantari et al., 2022) while spatial research on mangrove-linked fisheries and pandemic-period consumer research in West Nusa Tenggara illustrate context-specific consumption settings (Ickowitz et al., 2023; Partelow et al., 2023). Consumer studies further document rural–urban differences and the influence of family preferences (Rahmawaty et al., 2021; Sari & Muflikhati, 2018). Whether product-oriented attitudes add information after adjustment for residence, socioeconomic characteristics, and health-related attitudes remains an empirical question to be examined in a voluntary Indonesian online survey.

This study offers a deliberately bounded methodological and empirical contribution. Rather than presenting an online sample as nationally representative or treating purchasing items as a single validated scale, it (i) examines the exploratory structure of heterogeneous purchasing indicators, (ii) combines the resulting quality-local and price-promotion dimensions with demographic and attitudinal covariates, and (iii) estimates their associations with ordered weekly consumption frequency while relaxing the proportional-odds restriction for age when indicated by diagnostics. The novelty lies in assessing these joint, adjusted associations in the observed sample, not in claiming the discovery of universal consumer types or causal determinants.

The objectives were to describe product and channel preferences; evaluate item–rest correlations, internal consistency, and exploratory purchasing dimensions; examine bivariate differences across consumption-frequency categories; and estimate adjusted associations using an ordinal specification and sensitivity checks. The Authors expected quality-local orientation and

sociocultural orientation to be positively, and price-promotion sensitivity to be inversely, associated with more frequent consumption. Results are interpreted as sample-specific associations that generate testable hypotheses for seafood marketing and distribution.

RESEARCH METHODS

Study Design, Recruitment, and Inferential Scope

An exploratory cross-sectional survey was conducted using a self-administered questionnaire hosted on Kuesio.com from October 7 to 22, 2025. A survey invitation link was shared through WhatsApp, Facebook, and Instagram; respondents chose whether to open and complete it. Eligibility required age ≥18 years, residence in Indonesia, informed consent, and a complete questionnaire. All 200 eligible complete records were analyzed, with no missing or out-of-range codes in the analytic file. There was no sampling frame, probability selection, prespecified sample-size target, or interviewer-administered component. A pretest involving 30 university students checked clarity, question order, and online functionality; those responses were excluded.

This was nonprobability voluntary-response sampling. Invitation reach, nonparticipant characteristics, regional coverage, duplicate-access controls, and selection probabilities were not sufficiently documented to calculate a response rate or assess selection bias during recruitment. The questionnaire pretest and post-collection checks of completion time and invariant Likert responding assessed clarity and response quality; they did not remedy online undercoverage or volunteer selection. A sensitivity analysis excluded four flagged records, but neither that analysis nor covariate adjustment or low variance inflation factor (VIF) can establish representativeness. No benchmark data or probability reference sample was available for valid calibration weighting (Cornesse et al., 2020; Kocar & Baffour, 2023). Consequently, the adjusted odds ratios (ORs) are conditional associations among participating respondents and may differ in direction or magnitude in the wider population if participation relates jointly to purchasing attitudes and consumption.

Questionnaire, Validity, and Reliability Checks

The instrument recorded sex, age, education, occupation, income, rural or urban residence, weekly consumption frequency, product and purchasing-channel preferences, and socioeconomic, health, sociocultural, and purchasing attitudes. Most attitudinal items used a five-point agreement scale. Item content was informed by work on seafood attributes, health, origin, and purchasing contexts (Aminizadeh et al., 2024; Engle et al., 2023; Krešić et al., 2022; Rodríguez-Salvador & Calvo Dopico, 2023). The pretest assessed usability only. None of the following was established: expert content validation, cognitive interviewing, criterion validity, or confirmatory construct validation.

Weekly-frequency response options were “never”, “1–2”, “3–4”, and “≥5” times/week; no respondent selected “never”, leaving three observed ordered categories (n = 91, 85, and 24). No separate “less than once per week” option was offered. Thus, genuinely infrequent consumers could have been omitted or forced into another response, and the lower reference category cannot

represent the full low-frequency population. Such unknown outcome misclassification may distort the first cumulative contrast (≥3–4 vs 1–2 times/week) and its adjusted ORs and no defensible direction or size of bias without additional data. Fish-type questions allowed multiple answers and mixed habitat categories with processed-product form; related percentages are nonexclusive.

Four predefined item sets were screened: socioeconomic (Q17–Q20), health (Q21–Q25), sociocultural (Q26–Q29), and purchasing (Q14–Q16, Q30–Q33). Corrected Pearson item–rest correlations ($r \geq 0.30$ used for exploratory screening), two-sided p-values, alpha-if-deleted, and raw-score Cronbach's alpha (approximately ≥0.70 for internal consistency) assessed homogeneity, not instrument validity (Tavakol & Dennick, 2011). The full item-level diagnostics are provided separately in Supplementary Table S1. Health ($\alpha = 0.819$) and sociocultural ($\alpha = 0.713$) item means were standardized; socioeconomic ($\alpha = 0.591$) and pooled purchasing ($\alpha = 0.348$) items were not pooled as single scales.

Kaiser–Meyer–Olkin (KMO) and Bartlett's tests assessed factorability. Seven standardized purchasing indicators underwent correlation-matrix principal component analysis (PCA); parallel analysis retained components whose observed eigenvalues exceeded the 95th percentile of random-data eigenvalues (Horn, 1965). Varimax-rotated component scores were standardized and labeled quality-local orientation and price-promotion sensitivity according to dominant loadings. KMO = 0.597 indicates limited shared variance, and one item cross-loaded; these components are provisional summaries rather than confirmed latent constructs.

Statistical Analysis and Robustness Checks

Counts and percentages described responses. Pearson chi-square tests and Cramér's V evaluated bivariate associations; contingency tables with sparse expected counts were confirmed with 5,000 Monte Carlo replications. These unadjusted tests were not substitutes for multivariable analysis. An ordered cumulative-logit model was considered because weekly frequency was ordinal. A Brant-style Wald test rejected global proportional odds ($\chi^2 = 17.43$, $df = 9$, $p = 0.042$), particularly for age ($p = 0.0016$). Therefore, a partial proportional-odds model used distinct age slopes across the two cumulative thresholds (≥3–4 vs 1–2 times/week and ≥5 vs ≤3–4 times/week) but common slopes for other predictors (Williams, 2016). Common-slope ORs are the exponentiated coefficients and describe adjusted cumulative odds, not causal effects.

Covariates were sex, age (ordered categories), education, income, rural residence, standardized health and sociocultural means, and both purchasing component scores. Coding demographics into one-category assumes equal adjacent log-odds increments. Occupation was evaluated bivariately and in a multinomial sensitivity model but excluded from the primary model to limit parameters given 24 respondents in the highest-frequency category. Maximum VIF = 1.48. Residual confounding remains plausible. Proportional-odds, partial proportional-odds, and multinomial specifications were compared using likelihood ratio (LR) tests and Akaike/Bayesian Information Criterion (AIC/BIC); the partial model improved over standard proportional odds (LR $\chi^2 = 9.08$, $df = 1$, $p = 0.0026$).

Sensitivity checks excluded four quality-flagged responses (n = 196), used 500 nonparametric bootstrap resamples, substituted principal-axis-factor scores for PCA scores, and compared alternative links or specifications. Bootstrap intervals held full-sample component scores fixed and did not incorporate component-extraction uncertainty. Adjusted ORs and 95% confidence intervals are reported; two-sided $p < 0.05$ was used descriptively, not as causal proof. Analyses used Python 3.13.5 (SciPy 1.17.0, scikit-learn 1.8.0, statsmodels 0.14.6) and custom maximum-likelihood routines for partial proportional odds.

Ethical Statement and Informed Consent

Before accessing the questionnaire, prospective participants were informed of its purpose, expected duration, voluntary participation, confidentiality, and intended data use. Only those affirming consent proceeded; questionnaire submission recorded consent as implemented in the online survey. Names were not used for analysis, and direct identifiers, including submission timestamps, were removed from the analytic file; reporting uses aggregated data. The survey was noninterventional and involved adults without biological or clinical data. At collection, the institution did not have an established research ethics committee, so prospective institutional ethics approval was not obtained. This limitation is disclosed for editorial assessment; an approval number is not claimed.

RESULT AND DISCUSSION

Respondent characteristics and consumption frequency

The median completion time was 6 min (interquartile range 4–7 min; range 1–57 min). A data-quality audit flagged four responses: one questionnaire completed in 1 min and three questionnaires in which the neutral response was selected for all 20 Likert indicators. All 200 responses were retained in the main analysis because they met the eligibility and completeness criteria; a sensitivity analysis repeated the multivariable analysis after excluding the four flagged responses.

Within the responding sample, 54.0% were men, 51.0% had a diploma or higher degree, 44.5% reported a monthly income of IDR 2–5 million, and 53.0% lived in rural areas. Fish consumption 1–2 times/week was reported by 45.5%, 3–4 times/week by 42.5%, and at least 5 times/week by 12.0% (Table 1). These percentages describe the voluntary online sample and should not be interpreted as prevalence estimates for Indonesian adults.

Table 1. Respondent Characteristics and Fish Consumption Frequency (n=200)

Characteristic	Category	n	%
Sex	Men	108	54.0
	Women	92	46.0
Age	18–24 years	40	20.0
	25–34 years	45	22.5
	35–44 years	42	21.0
	45–54 years	53	26.5
	≥55 years	20	10.0
Education	Did not complete primary school	2	1.0
	Primary school	12	6.0
	Junior secondary school	13	6.5
	Senior secondary/vocational school	71	35.5
	Diploma	11	5.5
	Bachelor's degree	60	30.0

Characteristic	Category	n	%
	Master's degree or higher	31	15.5
Occupation	Permanent employee	77	38.5
	Freelance/temporary worker	28	14.0
	Self-employed	32	16.0
	Student	35	17.5
	Not employed	28	14.0
Monthly income	<IDR 2 million	57	28.5
	IDR 2–5 million	89	44.5
	>IDR 5–10 million	35	17.5
	>IDR 10 million	19	9.5
Residence	Urban	94	47.0
	Rural	106	53.0
Fish consumption frequency	1–2 times/week	91	45.5
	3–4 times/week	85	42.5
	≥5 times/week	24	12.0

Source: Primary Survey Data (2025)

Fish Product and Market Preferences

Preferences were concentrated on fresh products and traditional marketing channels. Freshwater fish was selected by 67.5% of respondents, followed by marine fish (29.0%) and processed fish (27.0%). Because the fish-type item permitted multiple responses and mixed habitat categories with a product-form category, these percentages are descriptive and do not sum to 100%. Fresh fish was preferred by 95.0% of respondents, 91.5% usually obtained fish from traditional markets, 84.0% reported fish markets as the purchase location, and 96.5% consumed fish after cooking (Table 2).

Table 2. Fish Product, Source, Purchase Location, and Preparation Preferences

Preference dimension	Category	n	% of respondents
Fish type/category*	Freshwater fish	135	67.5
	Marine fish	58	29.0
	Processed fish	54	27.0
	No specific preference	26	13.0
Product form	Fresh fish	190	95.0
	Frozen fish	1	0.5
	No specific preference	9	4.5
Usual source	Traditional market	183	91.5
	Supermarket/modern market	4	2.0
	Other source	13	6.5
Purchase location	Fish market	168	84.0
	Mobile vendor	14	7.0
	Directly from fisher/farmer	13	6.5
	Supermarket	5	2.5
Preparation/consumption	Cooked	193	96.5
	Prepared as another dish/product	5	2.5
	Ready-to-eat	2	1.0

Source: Primary Survey Data (2025)
*Multiple responses allowed; percentages do not sum to 100%

Item-Level Validity Screening and Internal Consistency

Health consciousness items (Q21–Q25; α = 0.819, KMO = 0.791) and sociocultural items (Q26–Q29; α = 0.713, KMO = 0.739) showed acceptable internal consistency. Socioeconomic items (α = 0.591) and pooled purchasing items (α = 0.348) were not suitable as single scales. Bartlett's tests were significant in all four sets ($p < 0.001$; Table 3). These results assess homogeneity and factorability, not confirmatory validity.

Table 3. Internal Consistency and Factorability Diagnostics by Questionnaire Item Set (n = 200)

Item Set	Items (k)	Cronbach α	KMO	Bartlett χ^2	df	p
Socioeconomic (Q17–Q20)	4	0.591	0.599	103.52	6	<0.001
Health consciousness (Q21–Q25)	5	0.819	0.791	395.48	10	<0.001
Sociocultural (Q26–Q29)	4	0.713	0.739	146.48	6	<0.001
Purchasing (Q14–Q16; Q30–Q33)	7	0.348	0.597	135.71	21	<0.001

Source: Data Processing Results (2025)

For health consciousness items, corrected item–rest correlations ranged from 0.474 to 0.725, and for sociocultural items from 0.407 to 0.568; all exceeded 0.30. Only Q18 and Q20 met that screening guideline in the socioeconomic set, and only Q16 and Q31 in the pooled purchasing set. Among purchasing indicators, Q14 was near zero (r = 0.041) and Q32 was negative (r = −0.113). The pattern supports exploratory dimension reduction rather than a validated purchasing scale (see Supplementary Table S1 for all item-level statistics).

Parallel Analysis and Rotated Principal Component Analysis

The purchasing set had weak pooled internal consistency (α = 0.348) and only marginal sampling adequacy (KMO = 0.597), although Bartlett's test was significant (χ^2 = 135.71, df = 21, p < 0.001). Parallel analysis retained two components: observed eigenvalues 1.776 and 1.595 exceeded random 95th percentiles 1.372 and 1.226; the third eigenvalue (1.034) did not exceed 1.125. Therefore, the rotated solution is descriptive and warrants replication, not confirmatory interpretation (Table 4).

After varimax rotation, quality-local orientation loaded most on preservative-free choice (0.760), local over imported fish (0.625), and inversely on processed over fresh fish (−0.634). Price-promotion sensitivity loaded on discounts (0.780), price attention (0.665), and affordability despite lower quality (0.645); the last cross-loaded negatively on quality-local (−0.437). The two components explained 25.21% and 22.94% of variance (48.15% combined; Table 4).

Table 4. Varimax-Rotated PCA Loadings for Purchasing-Orientation Items

Purchasing Item	PC1: Quality-local	PC2: Price-promotion
Q14 Preservative-free	0.760	-0.043
Q15 Certification/environment	0.367	0.208
Q16 Price attention	0.261	0.665
Q30 Affordable despite lower quality	-0.437	0.645
Q31 Promotion/discount	0.019	0.780
Q32 Processed over fresh	-0.634	0.127
Q33 Local over imported	0.625	0.279

Source: Data Processing Results (2025)

Bivariate Associations

Age group and occupation were associated with reported consumption frequency in bivariate tests (Monte Carlo p = 0.040 and 0.003, respectively; Table 5). Other demographic comparisons were not statistically distinguishable at p < 0.05. These marginal associations do not determine the adjusted model results.

Table 5. Bivariate Associations Between Respondent Characteristics and Fish Consumption Frequency

Variable	χ^2	df	Pearson p	Cramér's V	Monte Carlo p
Sex	5.392	2	0.068	0.164	-
Age group	16.064	8	0.042	0.200	0.040
Education	10.969	12	0.532	0.166	0.547
Occupation	23.839	8	0.002	0.244	0.003
Income	10.067	6	0.122	0.159	0.125
Residence	2.260	2	0.323	0.106	-

Source: Data Processing Results (2025)

Partial Proportional-Odds Regression and Robustness

The partial proportional-odds model had LR $\chi^2 = 43.02$ (df = 10, $p < 0.001$), McFadden pseudo-$R^2 = 0.110$ and maximum VIF = 1.48. Allowing separate age slopes improved fit over proportional odds (LR $\chi^2 = 9.08$, df = 1, p = 0.0026); AIC/BIC were 371.53/411.11 for the partial model, 378.61/414.89 for proportional odds, and 381.78/447.75 for the adjusted multinomial comparison.

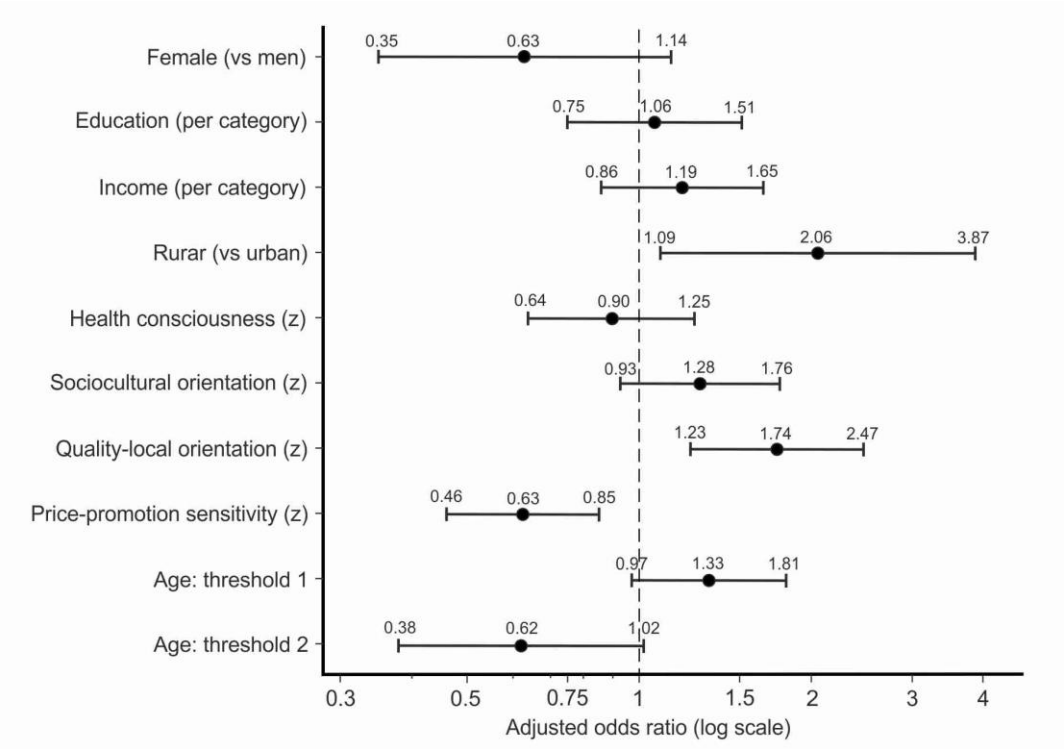
Within this responding sample, rural residence (OR = 2.06, 95% CI 1.09–3.87, p = 0.025) and quality-local orientation (OR = 1.74, 95% CI 1.23–2.47, p = 0.002) were associated with higher reported frequency, whereas price-promotion sensitivity showed an inverse association (OR = 0.63, 95% CI 0.46–0.85, p = 0.003; Table 6; Figure 1). Age had threshold-specific estimates of 1.33 (0.97–1.81) and 0.62 (0.38–1.02), both imprecise, although their slopes differed (Wald p = 0.0027). Other covariates had 95% CIs including 1.

Table 6. Partial Proportional-Odds Logistic Regression of Weekly Fish-Consumption Frequency

Predictor	Slope/Contrast	OR (95% CI)	p
Women (ref. men)	Common	0.63 (0.35-1.14)	0.124
Education (one-category increase)	Common	1.06 (0.75-1.51)	0.733
Income (one-category increase)	Common	1.19 (0.86-1.65)	0.302
Rural (ref. urban)	Common	2.06 (1.09-3.87)	0.025
Health consciousness (z)	Common	0.90 (0.64-1.25)	0.516
Sociocultural orientation (z)	Common	1.28 (0.93-1.76)	0.124
Quality-local orientation (z)	Common	1.74 (1.23-2.47)	0.002
Price-promotion sensitivity (z)	Common	0.63 (0.46-0.85)	0.003
Age (one-category increase)	Threshold 1	1.33 (0.97-1.81)	0.074
Age (one-category increase)	Threshold 2	0.62 (0.38-1.02)	0.058

Source: Data Processing Results (2025)

The three principal associations remained directionally stable after removing four flagged responses (n = 196): rural OR = 2.29 (1.20–4.37), quality-local OR = 1.64 (1.17–2.30), and price-promotion OR = 0.62 (0.45–0.85). Bootstrap 95% intervals and alternative principal-axis-factor scores also did not include 1 for these predictors. This stability does not resolve selection bias, unmeasured confounding, or outcome-category misclassification.



Source: Data Processing Results (2025)

Figure 1. Adjusted Odds Ratio (OR) and 95% Confidence Intervals from the Partial Proportional-Odds Model.

Note: The dashed line denotes OR = 1; age is threshold-specific.

Discussion

This sample-specific analysis indicates that purchasing orientations add information to adjusted descriptions of weekly fish-consumption frequency beyond demographics and general health attitudes. High stated preferences for fresh products and traditional-market channels coexist with positive quality-local and inverse price-promotion associations. The derived components are neither observed market segments nor independently validated traits; the results motivate hypotheses for market research rather than causal or population-wide claims.

Product Attributes and Purchasing Channels in Comparative Perspective

The 95.0% preference for fresh fish and 91.5% usual reliance on traditional markets suggest that product condition, trust, and interaction at point of sale merit study. Point-of-sale observations in Sweden provide complementary evidence that price and labels compete for shopper attention (Costa et al., 2024). In experimental work, Japanese consumers used visual freshness cues but did not always distinguish objective fish freshness accurately (Li et al., 2024); explicit freshness information can also change evaluations and willingness to pay (Sakai et al., 2026). In Pekanbaru, fillet consumers identified freshness and quality among salient decision criteria (S et al., 2025). These findings concern different products and sampling designs, so they are conceptual comparisons rather than external validation of the authors' reports.

Freshwater fish was selected by 67.5% of respondents, but multiple responses and the combination of habitat and processing categories preclude substitution or species-level inference.

From a supply-side perspective, Purbata et al. (2025) identified pangas catfish (*Pangasianodon hypophthalmus*) and catfish (*Clarias gariepinus*) as leading aquaculture commodities in Riau Province based on regional production and competitiveness analyses. Although these findings cannot be directly linked to consumer preferences in the present sample, they highlight the importance of examining the relationship between regional aquaculture production profiles and species-specific consumer demand. Preference studies have distinguished forms, product attributes, and production systems more explicitly (Menozzi et al., 2020; Mitra et al., 2021). Future questionnaires should separately record species, wild-caught or aquaculture origin, product form, and verified points of sale.

Quality-Local Orientation, Affordability, and Consumption

Quality-local orientation (OR = 1.74, 95% CI 1.23–2.47) can be interpreted cautiously through two complementary consumer-behavior concepts. First, freshness cues are observable or communicated signals (appearance, handling, temperature information) from which shoppers may infer quality, but perceived and measured freshness are not identical (Li et al., 2024; Sakai et al., 2026). Second, country-of-origin (COO) effects concern how perceived provenance influences product evaluation; here, preference for local rather than imported fish could act as an origin cue, not proof of origin or a measured COO effect (Rodríguez-Salvador & Calvo Dopico, 2023; Sigurdsson et al., 2025). The component also includes preservative-free preference and an inverse processed-fish loading, while affordability cross-loads; therefore, the adjusted association cannot be attributed to freshness or provenance separately. Future choice experiments should vary verified origin, objective quality signals, and prices independently.

The inverse price-promotion association (OR = 0.63, 95% CI 0.46–0.85) does not establish that discounts suppress consumption. Price attention may reflect constrained budgets, promotion-seeking, or a broader purchasing style; these mechanisms cannot be distinguished with the current questionnaire. Seafood expense and convenience have been reported as constraints elsewhere (Engle et al., 2023). A prospective market study could measure disposable income, unit prices, quantities, and promotion exposure before interpreting price-sensitivity coefficients as economically actionable.

Health consciousness showed no clearly independent association (OR = 0.90, 95% CI 0.64–1.25), although sensory enjoyment has been associated with seafood frequency in another setting (Collier et al., 2024). Indonesian qualitative evidence also highlights concerns about safety and social practices (Anyanwu et al., 2023; Rahmawaty et al., 2021). Different settings and constructs limit direct comparison; future studies should collect sensory experience and preparation practices explicitly.

Residence Effects, Non-Proportional Age, and Interpretation

Rural residence was not significant in the unadjusted table (p = 0.323) but was associated with higher frequency after adjustment (OR = 2.06, 95% CI 1.09–3.87). Marginal and conditional associations can differ without implying that rural residence causes higher intake. Indonesian

evidence suggests spatially heterogeneous fish consumption and ecosystem-linked access (Ickowitz et al., 2023; Virgantari et al., 2022), yet this study collected only a rural or urban indicator and could not examine province, transport, market distance, or supply continuity.

The two age slopes differed, but both individual confidence intervals included 1, precluding a simple age-gradient conclusion. Excluding occupation from the primary model may leave residual confounding. Moreover, self-selection related simultaneously to quality attitudes and fish consumption could bias even adjusted ORs; covariate adjustment, favorable model fit, and stable re-estimates cannot recover the unknown selection mechanism (Kocar & Baffour, 2023).

Testable Marketing and Seafood-Distribution Implications

For fisheries value chains, the findings identify testable coordination opportunities rather than proven interventions. Fishers, landing-site operators, traders, and traditional-market managers could pilot simple source and handling records, clean water and ice access, visible temperature or hygiene information, and traceable handling standards; trials should document costs, spoilage, product prices, seller margins, and actual purchases (Septya et al., 2023; Sigurdsson et al., 2025). Such practices may help market actors communicate credible quality, but their economic returns remain unmeasured in this survey.

Cooperatives and retailers could also compare transparently priced portions, predictable supply, and origin information against usual practice, separately in rural and urban markets. Outcomes should include transaction volume, cost per kilogram, waste, gross margin across value-chain actors, and sustained household consumption, not merely intention or satisfaction. These tests would reveal whether any quality-control investment or affordability option is commercially viable; the observed ORs cannot forecast intervention effects.

Limitations

Voluntary online recruitment limits coverage of offline consumers and creates possible selection and self-report bias. The recruitment denominator, respondent-selection mechanism, provincial coverage, and reference population distributions were unavailable; representativeness and any direction of selection-related OR bias cannot be determined. Completion-time and invariant-response flags were reviewed retrospectively, not during recruitment; deleting four flagged responses did not address coverage or selection. The cross-sectional design precludes causality. The frequency scale omitted “less than once per week”: some infrequent consumers may have been excluded or assigned to “1–2”, potentially changing both the composition of the reference group and the lower cumulative threshold ($\geqslant$3 – 4 versus 1 – 2 times/week). The magnitude or direction of this distortion cannot be quantified without validation or a full response scale. Frequency also lacks serving size or grams/week, so identical categories could reflect different quantities consumed.

The upper frequency category contained only 24 participants. Purchasing-item KMO = 0.597, $\alpha = 0.348$, and cross-loading indicate limited common variance and imperfect item coherence, so a two-component exploratory PCA is not equivalent to scale validation. Instrument refinement should separate perceived freshness, objective handling information, local origin, price attention, and

discount responsiveness; obtain expert content review and respondent cognitive interviews; then evaluate a revised factor structure on an independent sample using exploratory and confirmatory analyses. The bootstrap did not propagate component-extraction uncertainty, residual confounding remains possible, and prospective ethical review was unavailable. These qualifications restrict transfer of the findings beyond the observed sample.

CONCLUSION AND SUGGESTION

Conclusion

In this voluntary online sample, fresh fish and traditional markets predominated. Rural residence and quality-local orientation were positively associated with higher reported consumption frequency, whereas price-promotion sensitivity was inversely associated. These observational findings are not population estimates or causal effects.

Suggestion

Future studies should use more inclusive sampling, validated purchasing measures, and complete frequency categories with portions or grams per week. Market pilots should evaluate freshness assurance, traceable origin, affordability, value-chain costs, and actual purchases.

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