A NARRATIVE LITERATURE REVIEW ON FOOD CONSUMPTION DEMAND IN INDONESIA

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ABSTRACT

Household food consumption in Indonesia continues to be dominated by carbohydrate-based staples, while the intake of protein-rich foods remains relatively low despite their importance for achieving adequate nutritional quality. Differences in food prices, household expenditure, and demographic characteristics contribute to varying levels of access to nutritious foods across Indonesian provinces, shaping diverse demand behaviors for carbohydrate- and protein-rich commodities. Although numerous studies in Indonesia have applied demand system approaches such as AIDS to analyze food consumption, existing evidence remains varied in focus and scope, underscoring the need to understand how nutritional demand has been examined across different contexts. This study aims to identify factors that influence food demand systems in Indonesia, with a specific focus on commodities that serve as primary sources of carbohydrates and protein. It seeks to map how previous research has conceptualized and analyzed key determinants of nutritional demand to provide a clearer foundation for further empirical investigation. A narrative literature review with a structured search strategy was conducted to gather Indonesian studies examining household food consumption demand. Searches were carried out across major academic sources using predefined keywords related to food demand, consumption behavior, and economic determinants. Relevant articles were screened based on their analytical focus and methodological approaches, and the final selection was examined comparatively to identify recurring frameworks and determinants influencing nutrient-based food demand. The review found that food demand for carbohydrate- and protein-rich commodities in Indonesia is consistently shaped by prices, household expenditure, and demographic characteristics. The examined studies also indicated variations in responsiveness to economic factors across commodity groups, highlighting notable differences in the sensitivity of carbohydrate staples compared to protein sources. These patterns reveal a set of determinants repeatedly emphasized in the literature, signaling their relevance for guiding subsequent empirical modeling of nutritional food demand.

Keywords: Food Consumption Demand, Nutritional Demand System, Carbohydrate and Protein Commodities, Household Economic Determinants.

INTRODUCTION

Malnutrition remains a major public health concern in Indonesia and continues to hinder the nation's human capital development. Based on the Survei Status Gizi Indonesia (SSGI) 2024, the national prevalence of stunting is still high at 19.8%, accompanied by persistent cases of undernutrition, anemia among women and children, and a growing trend of childhood obesity (Badan Kebijakan Pembangunan Kesehatan, 2025). These conditions reflect Indonesia's ongoing struggle with the "double burden of malnutrition," where nutrient deficiencies coexist with overweight and obesity. Despite improvements in food availability at the national level, household dietary patterns remain far from ideal. Most families continue to rely heavily on carbohydrate-based staples—particularly rice—while intake of nutrient-rich foods such as animal proteins, fruits, vegetables, and sources of essential vitamins and minerals remains insufficient. Economic constraints, price fluctuations, limited nutrition literacy, and disparities in food access between urban and rural regions further exacerbate these imbalances.

These persistent nutritional gaps carry significant long-term consequences for both individual and national well-being. Chronic undernutrition in early life is strongly associated with impaired cognitive development, reduced school performance, weakened immunity, and increased vulnerability to infectious diseases. At the macro level, inadequate dietary quality leads to lower labor productivity, reduced economic competitiveness, and substantial losses in national income due to diminished human capital potential. Global evidence highlights those poor dietary patterns remain one of the most influential factors driving preventable mortality and developmental delays in low- and middle-income countries (FAO et al., 2020; Victora et al., 2008). Thus, improving dietary diversification and strengthening nutrition-sensitive policies remains an urgent priority to address Indonesia's ongoing nutritional challenges.

Variations in access to nutritious foods across Indonesia are shaped by a complex interplay of economic, geographic, and demographic factors. Differences in food prices, household expenditure patterns, and socioeconomic characteristics create substantial disparities in dietary quality among population groups (Maliani *et al.*, 2021). Rural households, in particular, face structural limitations such as lower purchasing power, limited market diversity, and higher transportation costs that increase the price of nutrient-rich foods. As a result, many rural families rely predominantly on rice and other carbohydrate-dense staples, while the consumption of animal protein, vegetables, and fruits remains relatively low (Yulida & Karim, 2021). In contrast, urban households often benefit from better access to modern markets, greater food availability, and more varied dietary options, which contribute to comparatively higher intake of nutritious foods.

These disparities are further exacerbated by vulnerability to food price inflation and demographic pressures, highlighting how economic constraints directly shape household food choices. Rising prices of protein-rich foods such as chicken, eggs, and fish disproportionately affect low-income families, leading to reduced dietary diversity and increased reliance on cheaper, less nutritious staples (Badan Pangan Nasional, 2025). Additionally, demographic

variables (such as household size, education level, and age composition) also influence food consumption patterns, where larger or less-educated households may prioritize energy-dense but nutrient-poor foods due to budget limitations. This combination of economic and demographic stressors underscores the need for targeted food and nutrition policies that improve affordability, accessibility, and dietary literacy across diverse regions of Indonesia.

Socioeconomic factors also play an essential role in shaping household food consumption behavior in Indonesia. Education is one of the most influential determinants because it affects nutritional awareness, decision-making, and the likelihood of adopting more diverse and balanced diets (Behrman & Deolalikar, 1988). Households with higher levels of education are generally more informed about the importance of dietary quality and are better able to interpret nutritional information. In contrast, limited purchasing power and fluctuating food prices make low-income households more vulnerable to relying on cheaper and less nutritious carbohydrate-rich foods, which meet energy needs but do not provide adequate micronutrients (Babatunde & Qaim, 2010). These constraints contribute to persistent dietary gaps between socioeconomic groups and highlight the need for interventions that address both economic barriers and knowledge limitations.

In response to these challenges, the Indonesian government has introduced several initiatives aimed at improving access to affordable, nutritious foods. Programs such as *Gerakan Pangan Murah* (GPM), the *B2SA* dietary diversification campaign, and the expansion of *Cadangan Pangan Pemerintah* (CPP) are designed to stabilize prices, promote healthier food choices, and increase the availability of nutrient-dense commodities across regions (Badan Pangan Nasional, 2025). The effectiveness of these interventions depends heavily on how households respond to changes in food prices and income levels, which reinforces the importance of understanding food demand elasticity. Studies have shown that the responsiveness of households to economic changes varies by food group, income level, and region, making elasticity analysis a crucial tool for designing evidence-based policies that can effectively improve dietary quality and reduce nutritional disparities (Faharuddin *et al*., 2017).

Evidence from Indonesian studies shows that income elasticity for nutrient-dense foods, particularly protein and fats, is generally higher than for carbohydrate staples (Faharuddin et al., 2017). When prices of protein sources such as chicken, fish, or eggs rise, low-income households tend to reduce their consumption and shift toward cheaper staples (Babatunde & Qaim, 2010). Inadequate intake of essential protein increases the risk of childhood stunting, demonstrating the critical role of dietary composition in child growth outcomes (Semba et al., 2016). These findings highlight the need for policies that not only ensure food availability but also account for household economic behavior in food consumption.

Taken together, these conditions highlight the urgency of identifying the factors that influence food demand systems in Indonesia, particularly for key carbohydrate- and protein-based food commodities. Understanding how previous studies have conceptualized and analyzed these

determinants is essential for establishing a strong conceptual basis for subsequent empirical investigation (Faharuddin *et al*., 2017; Maliani *et al*., 2021).

LITERATURE REVIEW

Consumer demand theory explains how households allocate resources across food commodities based on prices, income, and preferences (Varian, 2010). Engel's Law highlights that as income rises, the share of food expenditure declines while diet quality improves (Houthakker, 1957). In Indonesia, lower-income households rely heavily on rice and other staples, whereas higher-income groups diversify toward nutrient-dense foods including animal protein, vegetables, and fruits (Deaton & Muellbauer, 1980). This income-driven diversification is strongly linked to improvements in nutritional status, making demand theory central to understanding dietary patterns.

Elasticity measures further refine this understanding. Own-price elasticity captures the sensitivity of consumption to price changes, with staples such as rice typically showing inelastic demand, while protein-rich foods like fish or beef tend to be more elastic. Cross-price elasticity reveals substitution patterns, such as shifts between poultry and fish, especially during price shocks. Income elasticity distinguishes inferior, normal, and luxury goods, helping identify which foods respond most strongly to changes in purchasing power (Green & Alston, 1990). These measures are crucial for designing nutrition-sensitive policies, such as subsidies for protein foods or income support for low-income households (FAO *et al*., 2020).

From the nutritional perspective, adequate diets must satisfy diversity, balance, and nutrient adequacy. Essential nutrients—including amino acids, vitamins, fats, carbohydrates, minerals, and electrolytes—are derived from a combination of plant and animal sources (Gibney *et al*., 2013; Harper, 1999). Animal-source foods such as fish, poultry, and eggs provide high-quality protein, while vegetables, fruits, and dairy contribute key micronutrients (Abadi *et al*., 2023). National guidelines such as B2SA reinforce the need for diversified diets to prevent malnutrition and improve population health (Badan Pangan Nasional, n.d.). WHO recommends daily minimums of 2,100 kcal and 70 grams of protein, underscoring the role of adequate food intake in preventing stunting and other nutrition-related conditions (WHO, 2023).

Price dynamics remain a dominant determinant of food consumption. Households are vulnerable to food price increases, which reduce access to nutritious foods and heighten the risk of undernutrition (Timmer, 2010). Income constraints also interact with demographic and socioeconomic factors such as education, household size, age, and urban–rural location. Educated households tend to diversify diets more effectively, while rural households often face limited access to diverse food markets, reinforcing consumption gaps across regions (Behrman & Deolalikar, 1988; Ruel *et al*., 2018).

The intersection of food demand and public health highlights the importance of evidence-based policies. High price elasticity of nutrient-rich foods justifies interventions such as subsidies or market stabilization, whereas strong income elasticity supports cash

transfers or food voucher programs targeting vulnerable groups (Alderman *et al.*, 2006). Addressing geographic disparities requires investment in logistics and local markets to reduce rural–urban gaps in food access (Banerjee & Duflo, 2011). Overall, the literature demonstrates that understanding demand patterns, elasticity structures, and nutritional needs is fundamental for designing policies that enhance dietary quality, reduce stunting, and strengthen national food and nutrition security.

RESEARCH METHODS

This study adopts a Narrative Literature Review (NLR) approach to explore the determinants of household food demand in Indonesia, particularly for carbohydrate- and protein-rich commodities. Consistent with the methodological guidelines of Ferrari (2015), the NLR design provides flexibility to integrate diverse empirical findings while maintaining sufficient methodological structure to ensure transparency and rigor. This design is suitable for synthesizing heterogeneous studies that employ different datasets, modeling strategies, or regional scopes within the broader field of food consumption demand.

The review applies a structured search strategy to minimize bias and enhance reproducibility. Keywords related to *food demand*, *carbohydrate and protein consumption*, *AIDS/LA-AIDS*, *household expenditure*, and *nutritional economics* were used across major academic databases, including Google Scholar and ScienceDirect. Search terms were combined using Boolean operators to capture studies relevant to food consumption behavior in Indonesia.

The search process followed three steps:

1. Identification: retrieving potentially relevant articles using predefined keywords.
2. Screening: applying inclusion criteria (Indonesian context, quantitative or mixed-method food demand studies, focus on carbohydrates/proteins, use of elasticity or demand system modeling) and exclusion criteria (non-food topics).
3. Eligibility and Selection: assessing full texts for conceptual relevance to food demand determinants.

Studies were included in this review if they examined food consumption or demand in Indonesia, analyzed determinants related to prices, income or household expenditure, or demographic characteristics, focused on commodities that serve as primary sources of carbohydrates or protein, and employed quantitative demand modeling such as AIDS, LA/AIDS, or expenditure elasticity estimation. Studies were excluded if they were purely descriptive, unrelated to food consumption, lacked empirical modeling, or were conducted outside the Indonesian context.

The selected studies were analyzed using a concept-driven synthesis in which each article was coded to extract essential information, including the types of food commodities examined, the empirical methods applied (such as AIDS, LA/AIDS, QUAIDS, or elasticity models), the main determinants influencing demand, and the magnitude and direction of price, income, and demographic effects. Following the methodological guidance of Ferrari (2015), the synthesis was organized into thematic clusters that facilitated comparison across studies, enabling

the identification of recurring patterns, areas of convergence, and points of inconsistency. This approach provided a structured basis for understanding how previous research conceptualized the food demand system in Indonesia and for determining the demand determinants most consistently emphasized in the literature. A total of thirteen studies were ultimately identified and reviewed, encompassing both demand system models and elasticity-based analyses relevant to food consumption behavior in Indonesia. These studies provided the empirical foundation for synthesizing key determinants of carbohydrate- and protein-based food demand in line with the objectives of this paper.

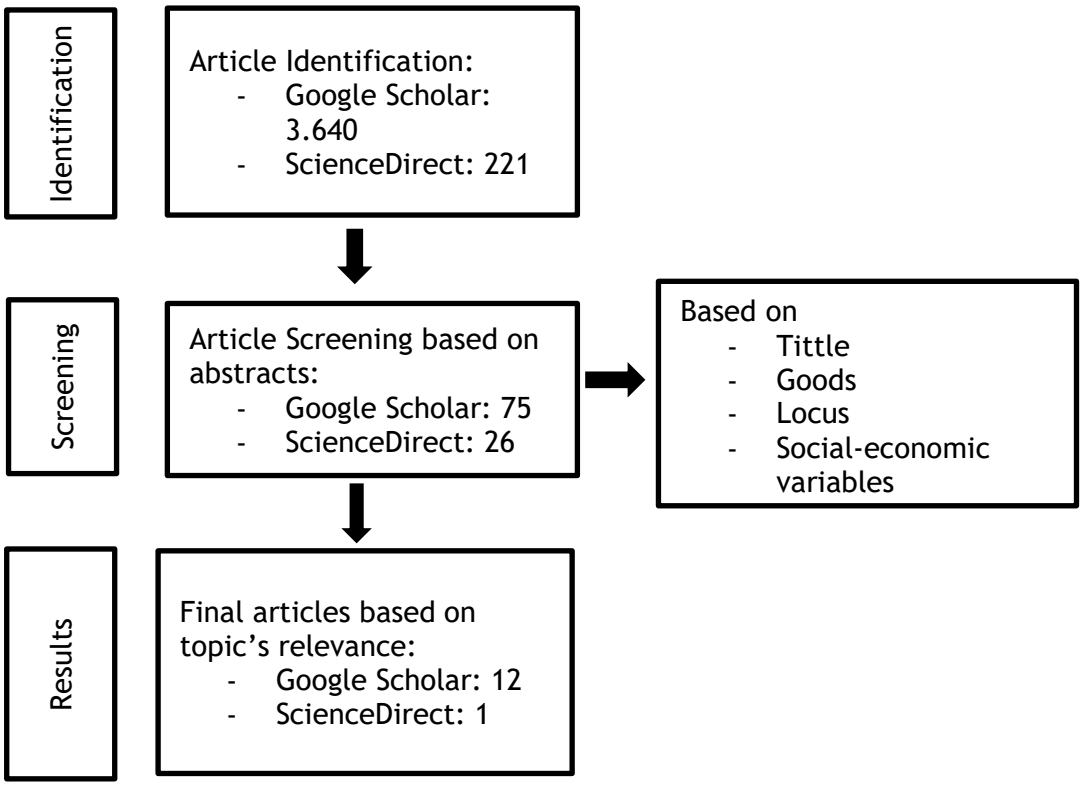

Figure 1. PRISMA Flow Diagram

The PRISMA flow diagram summarizes the structured process used to identify, screen, and select studies for this *narrative* literature review. The identification stage involved a broad search across two major databases, yielding 3,640 articles from Google Scholar and 221 from ScienceDirect. Titles and abstracts were then screened to determine relevance to the topic of food consumption, demand analysis, and nutrition-related economic behavior. This screening process narrowed the pool to 75 articles from Google Scholar and 26 from ScienceDirect.

A full-text eligibility assessment was conducted to evaluate the conceptual and methodological relevance of each study. Based on criteria such as the type of food commodity analyzed, geographic coverage, and the inclusion of socioeconomic variables, a final set of 12 articles from Google Scholar and 1 from ScienceDirect was selected for

review. These studies formed the empirical foundation for synthesizing the key determinants of household food demand in Indonesia.

RESEARCH RESULT

Included Studies

Table 1. The Main Characteristics of Included Studies

Author, Year (Location)	Purpose	Methods	Results
Hamidah *et al*., 2020 (Padang, Indonesia)	To analyze the demand pattern of red chili in Padang and identify key factors influencing its consumption.	Price elasticity estimation; demand analysis.	Red chili demand is highly sensitive to own-price and substitute-price changes, while income shows no significant effect.
Isnawati *et al*., 2022 (Indonesia)	To examine rice consumption stability during the COVID-19 pandemic under price-control interventions.	Descriptive analysis; policy evaluation.	Rice consumption remained stable due to government price control and anti-hoarding measures.
Sunaryati, 2016 (Central Kalimantan, Indonesia)	To assess factors affecting rice demand in Central Kalimantan.	Single-equation demand model; price and population analysis.	Rice demand is significantly influenced by price and population growth; low-income households reduce consumption when prices rise.
Farras *et al*., 2021 (Malang, Indonesia)	To analyze household demand for animal protein in Malang using a demand system.	Almost Ideal Demand System (AIDS).	Price, income, and socio-demographics significantly affect protein demand; substitution occurs when chicken prices rise.
Azizah, et al., 2020 (Indonesia)	To evaluate cross-price relationships among major animal protein commodities.	AIDS demand system.	Beef, chicken, and eggs show negative own-price elasticities; strong substitution when beef prices increase.
Arthatiani *et al*., 2018 (Indonesia)	To examine fish consumption patterns across Indonesia.	Income elasticity estimation; consumption analysis.	Consumption varies by region; high-income groups prefer marine fish, while low-income households consume

			freshwater fish or shrimp.
Adi *et al*, 2017 (Mempawah, Indonesia)	To analyze broiler chicken demand in Mempawah Regency.	Price elasticity analysis.	Broiler chicken demand is price-inelastic, indicating its role as a staple protein source.
Silitonga and Salman, 2014 (Pekanbaru, Indonesia)	To assess determinants of organic vegetable demand in Pekanbaru.	Price elasticity model; demand behavior analysis.	Demand is highly price-sensitive; increases in price significantly reduce purchase despite known health benefits.
Darmawan and Darmawan, 2012 (Bekasi, Indonesia)	To analyze factors influencing iodized salt consumption in Bekasi.	Behavioral consumption analysis; education-driven model.	Knowledge of health benefits strongly predicts consumption; price and income have limited roles.
Umaroh and Vinantia, 2018 (Indonesia)	To evaluate substitution patterns among meat and fish products using a demand system.	AIDS model; cross-price elasticity.	Significant cross-substitution between meat and fish depending on price changes and household preferences.
Mayasari *et al.*, 2018 (East Java, Indonesia)	To examine food consumption patterns in East Java by income level.	Linear Approximation AIDS (LA/AIDS).	Income has a stronger influence than price on protein consumption; higher-income groups shift to higher-quality protein.
Suryana *et al.*, 2019 (NTB and NTT, Indonesia)	To estimate animal protein demand elasticities across urban and rural areas in NTB & NTT.	Price & income elasticity estimation.	Urban households show higher price responsiveness compared to rural households.
Faharuddin *et al.*, 2017 (Indonesia)	To estimate nutrient elasticities for calories, protein, and fat in Indonesia.	QUAIDS model; Susenas microdata.	Income elasticities for nutrients are higher in rural areas, indicating stronger consumption response to income changes.

DISCUSSION

Price as a Primary Determinant of Food Demand

The majority of the reviewed studies demonstrate that price remains the most influential factor determining food demand in Indonesia. Price elasticity estimates consistently show that both carbohydrate- and protein-based commodities respond significantly to changes in their own prices. For example, Hamidah *et al*. (2020) and Silitonga and Salman (2014) highlight strong price sensitivity for commodities such as red chili and organic vegetables, where even moderate price increases lead to substantial reductions in consumption.

In protein-based commodities, AIDS and LA/AIDS models used by Azizah, et al. (2020), Farras *et al*. (2021), and Umaroh and Vinantia (2018) reveal negative own-price elasticities and clear substitution effects. When beef prices rise, households shift consumption toward chicken or eggs, indicating high cross-price elasticity among protein sources. Staple foods, especially rice, also show significant price responsiveness among low-income households, as documented by Sunaryati (2016), reflecting the vulnerability of essential foods to price fluctuations. Overall, price plays a central role in shaping both the quantity and composition of household food demand.

Income and Expenditure Effects on Nutritional Choices

Income or household expenditure emerges as a critical driver of dietary quality. Studies using demand system models, including Mayasari *et al*. (2018) and Faharuddin *et al*. (2017), demonstrate that income elasticities for protein-rich foods are consistently higher than those for carbohydrate-based staples. As income increases, households tend to diversify their diets by adding higher-quality protein sources, such as chicken, fish, or eggs, moving beyond the dominant carbohydrate-heavy patterns.

This pattern is further reinforced by findings from Suryana *et al*. (2019), where urban households exhibit greater income sensitivity compared to rural households, suggesting broader market access and higher responsiveness to economic opportunities. Conversely, studies such as Hamidah *et al*. (2020) show that for some commodities, income plays a limited role, particularly in low-income settings where budget constraints severely restrict diversification. Overall, income determines not only the level of consumption but also its nutritional adequacy, making it a pivotal factor for policy interventions related to food affordability and household purchasing power.

Socioeconomic and Behavioral Factors in Food Demand

Beyond price and income, socioeconomic characteristics, particularly education, household size, location, and consumer knowledge, strongly shape food demand behavior. Darmawan and Darmawan (2012) demonstrate that knowledge and awareness significantly predict the consumption of iodized salt, underscoring the role of health literacy in food choices. Similarly, regional studies by Arthatiani *et al*. (2018) and Suryana *et al*. (2019) show that urban–rural disparities, cultural preferences, and local food availability contribute to diverse consumption patterns across Indonesian regions.

Household size and demographic structure also affect demand, especially for staples like

rice and protein-rich foods. Larger households tend to allocate expenditures more conservatively, limiting access to nutrient-dense foods. Meanwhile, education level influences diet diversification, as shown in prior literature such as Behrman and Deolalikar (1988), where higher education increases awareness of nutritional needs and encourages healthier food choices. These findings highlight that food demand in Indonesia is not merely an economic outcome but also a reflection of social conditions and behavioral habits.

Commodity-Specific Patterns: Carbohydrates vs. Protein Sources

The studies reviewed reveal clear differences between demand patterns for carbohydrate-based staples and protein-rich foods. Carbohydrate staples, particularly rice, exhibit lower income elasticity but remain highly responsive to price changes among low-income groups. This aligns with findings from Sunaryati (2016) and Isnawati *et al*. (2022), indicating that rice consumption is relatively stable but vulnerable to shocks in price and population dynamics.

In contrast, protein-rich foods demonstrate higher income elasticity and stronger cross-price substitution. Studies using AIDS and QUAIDS models consistently show that households adjust their protein consumption not only based on price changes but also in response to rising income and improved socioeconomic conditions. For instance, Farras *et al*. (2021) and Azizah, et al. (2020) highlight substitution between chicken, beef, eggs, and fish depending on relative prices. Protein consumption is therefore closely tied to welfare improvements, making it an important indicator of nutritional quality and dietary transition within Indonesian households.

Synthesis: What Drives Food Demand in Indonesia?

Synthesizing the findings across all thirteen studies, three major determinants consistently shape household food demand in Indonesia. Price emerges as the most influential short-run factor, driving both the quantity consumed and the pattern of substitution across commodities, with the strongest effects observed among low-income households. Income or household expenditure plays an equally critical role by determining the degree of dietary diversification, particularly the shift from carbohydrate-based staples toward higher-quality protein sources as purchasing power improves. Socioeconomic characteristics, including education, household size, and the urban–rural context, further influence food choices by affecting nutritional awareness, access to markets, and non-price preferences linked to knowledge and availability. Moreover, the intrinsic nature of the commodities also matters: carbohydrate staples tend to behave as necessity goods with low-income elasticity, while protein sources function more as semi-luxury goods characterized by higher income responsiveness and strong cross-price substitution dynamics. Together, these factors form a coherent structural foundation for modeling household food demand and understanding nutritional behavior in Indonesia.

CONCLUSION

This narrative review highlights that household food demand in Indonesia is shaped by a consistent interplay of price dynamics, income or expenditure capacity, and socioeconomic conditions. Price remains the most

influential short-run determinant, driving both consumption levels and substitution patterns across key food groups, particularly among low-income households. Rising income enables dietary diversification, with stronger responsiveness observed for protein-rich foods that behave as semi-luxury commodities. Socioeconomic factors, such as education, household size, and regional context, further reinforce variations in nutritional choices and access to diverse foods. The distinction between carbohydrate staples as necessity goods and protein sources as higher-elasticity commodities underscores the uneven progression of nutritional quality across population groups. Collectively, these findings provide a conceptual foundation for developing empirical models of food demand and support the need for policies that improve affordability, accessibility, and awareness of nutrient-dense foods to enhance dietary quality in Indonesia.

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