CGIAR INITIATIVE ON Asian Mega-Deltas

Diet Composition and Dietary Diversity in the Cambodian Mekong Delta: Evidence from a Rural Household Survey

Phay Sokcheng

October 2024

CGIAR

INITIATIVE ON

Asian Mega-Deltas

Contents

Executive Summary

This study is based off of a rural household survey conducted in mid-2023 in Cambodia's Lower Mekong Delta. The purpose of the survey was to explore current dietary practices and food security under the CGIAR Initiative on Securing the Food Systems of Asian Mega-Deltas for Climate and Livelihood Resilience (AMD). On average, a household spends 9,000 KHR (2.25 USD) daily per adult on food, but households in the Identification of Poor Households Programme (IDPoor) spend only 8,000 KHR (2 USD). Overall, approximately 46% of total household expenditures in the region are spent on food. However, IDPoor and female-headed households spend a higher share (48%) on food than do non-IDPoor and male-headed households (45%). Additionally, 12% of total food expenditures are spent on food away from home (FAFH).

In terms of quantity, daily food composition per adult consists of rice (34%), vegetables (22%), fruits (11%), meat (9%), fish (9%), spices and condiments (6%), beverages (8%), and edible oil (1%). Of total food expenditures, 78% is spent on purchased food, while the rest comes from home production, especially rice and fruits. Non-IDPoor households allocate a larger portion of their budget to daily food consumption compared to IDPoor households. Nearby local markets, mobile vendors, stationary vendors/stalls, and external markets all play a crucial role in providing food access to rural households.

Overall, more than three-quarters of people in the three age groups of the study achieve high and medium dietary diversity: (1) mothers of children under 2 years old, (2) women aged 14–49, and (3) men aged 14-49. However, looking further into the food groups that people consume, quality of diet remains a big concern, as it is high in carbohydrate and sugar from condiments and sugary beverages.

The household food insecurity and access score index for the region suggests varying levels of food insecurity among half of households, ranging from severe (8%), to moderate (22%), and mild (20%). The other 50% of households are food secure. IDPoor households and female-headed households have a higher level of food insecurity, at 18% and 16%, respectively, compared to their counterparts.

Higher consumption of sweetened drinks or energy drinks and FAFH has transformed the diet of rural people in the Lower Mekong Delta. Further interventions should focus on raising awareness of the health risks associated with excessive consumption of fats, sugars, and processed foods while promoting the importance of fruits, vegetables, and aquatic foods. Fish and aquatic animals should be used to promote a healthier diet in rural communities. Interventions should further strengthen producer groups and integrate home gardens, such as rice–fish systems with homestead ponds, to improve the diversity of consumption and increase household income. Future policies and interventions should focus on approaches targeted to the most vulnerable groups, including IDPoor households, female-headed households, and households with children under 1,000 days old.

1. Introduction

1.1. Background

The One CGIAR Initiative on Securing the Food Systems of Asian Mega-Deltas for Climate and Livelihood Resilience (AMD) is a 3-year project that supports the development of resilient, inclusive, and productive deltas. The Initiative also addresses critical issues such as nutrition security, financial investment, gender equity, and social inclusion. This has been achieved by establishing strong policy–science partnerships, collaborating with key stakeholders, and aligning their efforts toward shared objectives.

The Initiative contains five main Work Packages (WPs): WP1 on adapting deltaic production systems, WP2 on nutrition-sensitive deltaic agri-food systems, WP3 on de-risking delta-oriented value chains, WP4 on joined up, gender-equitable, inclusive deltaic systems governance, and WP5 on evidence-based delta development planning.

WP2 acknowledges the fact that food systems in the Mekong Delta are undergoing rapid transformation, driven by multiple demand and supply factors, resulting in changing consumption and production practices. This has led to positive and negative nutrition outcomes that are highly disaggregated by social and income status. These outcomes are not well understood because an inadequate knowledge base and limited policy coherence hinder the design of nutrition-sensitive actions that can effectively alleviate negative nutrition and draw opportunities for positive change. In the context of this rapid transformation, AMD-WP2 attempts to (i) ensure that the food systems in the delta are sustainable and (ii) strengthen nutrition security inclusively. The fundamental requirement of constructing appropriate nutrition-sensitive interventions is to be aware of the characteristics of these systems and their socially disaggregated nutrition implications.

1.2. Objective

This study examines the current livelihood activities of local communities in the Lower Mekong region of Cambodia, with a focus on food consumption patterns, dietary diversity, food acquisition, and food security. Using descriptive data, the study analyzes the quantity and value of food consumed across different food groups and investigates the share of food sourced from home production versus food purchased. Additionally, the study emphasizes food insecurity and individual dietary diversity. It also explores food acquisition to better understand the role of markets and various agents in food supply and access.

This study provides valuable insights to policymakers, development partners, project designers, practitioners, and other stakeholders on dietary intake and food security in the Lower Mekong region. The report is structured as follows: Section 2 reviews policies on food security and nutrition, along with trends in food consumption and insecurity. Section 3 outlines the survey data and methodology, while Section 4 presents the descriptive results. Finally, Section 5 discusses the findings and draws conclusions.

2. Literature

2.1. Policies on Food Security and Nutrition

The Royal Government of Cambodia has made significant efforts to reduce food insecurity and improve the nutritional status of its population, as demonstrated by the development of key policies and strategies.

The National Action Plan for the Zero Hunger Challenge in Cambodia (2016–2025) seeks to eliminate hunger and malnutrition by 2025. Its primary goal is to ensure equitable access to sufficient, nutritious, and affordable food, particularly for the poor and vulnerable. The plan outlines key strategies, including promoting sustainable agricultural and overall food systems, improving access to land and water for the disadvantaged, creating rural employment opportunities with a gender-sensitive approach, strengthening maternal and child nutrition services, and enhancing water, sanitation, and hygiene ractices (CARD, 2016).

The Second National Strategy for Food Security and Nutrition 2019–2023 aimed to ensure that all Cambodians have access to sufficient, safe, and nutritious food. The strategy focused on several key objectives, including strengthening the food environment and consumer behavior to promote healthier food choices, particularly during the first 1,000 days of life. It also sought to promote diversified, nutritious, and sustainable food production, including crops, horticulture, fish, and livestock; improve nutrient absorption and reduce disease through better access to safe drinking water, improved hygiene, and sanitation; and strengthen community-led nutrition programs. Additionally, the strategy aimed to protect food security and nutrition from shocks, including those linked to climate change; reduce inequalities in access to nutritious food, especially among women and children; enhance the quality and use of nutrition-related health services; and foster effective governance and capacity-building to integrate food security and nutrition into local development plans (CARD, 2019).

Cambodia's Roadmap for Food Systems for Sustainable Development 2030 aims to transform the country's food systems to ensure food security and sustainable development for all Cambodians by 2030. Its vision is: "By 2030, all Cambodians will have access to healthy diets and safe food, with a focus on women and children to break the cycle of malnutrition." The roadmap prioritizes healthy diets for all by improving access to nutritious and safe food, promoting diverse and sustainable agricultural practices, and enhancing food safety and hygiene. It also emphasizes the empowerment of youth, women, and vulnerable groups by involving them in food systems transformation and decision-making processes. Additionally, the plan aims to build resilient livelihoods and food systems by strengthening the capacity of smallholder farmers and food systems to withstand shocks, including those related to climate change. Finally, it promotes inclusive governance by enhancing coordination and dialogue among stakeholders to create a more inclusive and responsive food system (CARD, 2021).

2.2. Livelihood Transformation, Dietary Practices, and Quality Diets among the Cambodian Population

Before the COVID-19 pandemic, Cambodia experienced a steady annual economic growth rate of 7%. The economy is now recovering from the pandemic-induced slowdown, with a projected real gross domestic product growth of 4.8% in 2022. The national poverty rate decreased significantly, from 33.8% in 2009 to 17.8% in 2019–2020, driven largely by economic growth and structural changes, such as a shift from agriculture to manufacturing and services. However, the pandemic reversed some of these gains, exposing economic vulnerabilities and leading to an increase in poverty rates (World Bank, 2022b). Additionally, rising food prices are contributing to inflation, which disproportionately impacts poor and vulnerable households. For these households, inflation is particularly troubling, as it forces them to cut back on consumption and shift to cheaper, lower-quality goods (World Bank, 2022a).

Cambodian households traditionally follow a staple-based diet, with rice as the foundation. Carbohydrates are supplemented by animal protein, primarily sourced from freshwater fish, along with flavor-enhancing condiments such as fish sauce and soy sauce. Although fruit consumption remains relatively stable, there has been a concerning decline in vegetable intake, signaling a shift in dietary patterns (WFP, UNICEF, & CARD, 2023; CDRI, 2023). For example, the typical diet for women and preschool children consists mainly of a rice–vegetable–fish combination, with 76% of the diet coming from plant sources, 23% from animal sources, and 1% from condiments and spices (IFReDI, 2015). For women, cereals and cereal products contribute significantly to energy (60.9%), protein (30.9%), carbohydrate (77.1%), and iron (43.08%). Vegetables are a key source of vitamin A. Fish, other aquatic animals, and their products provide substantial amounts of protein (48.9%), fats (28.4%), iron (25%), zinc (27.8%), calcium (39.6%), and vitamin A (24.9%). In fact, fish and aquatic animal products supply about 80% of the total animal protein intake (IFReDI, 2015).

Overall, food consumption levels in Cambodia, as reflected by the food consumption score, are generally adequate, with most households meeting the minimum requirements for both the quantity and variety of food. The average food consumption score is consistently higher in urban areas than in rural areas, suggesting better access to food in cities. However, food consumption in female-headed households in 2019–2020 was consistently lower than the national average, even falling below that of IDPoor households (WFP, UNICEF, & CARD, 2022). Approximately one-third of Cambodian women do not meet the minimum standards for dietary diversity, which increases their risk of inadequate micronutrient intake.

Furthermore, only 42% of children aged 6 to 23 months receive a diet that meets the minimum dietary diversity recommendations (WFP, UNICEF, & CARD, 2023).

Despite advancements in providing access to nutritious foods, many Cambodians still suffer from poor diets. Across the country, the demand for and consumption of healthy, nutritious diets remain suboptimal throughout all life stages, contributing to various forms of malnutrition and increasing the risk of non-communicable diseases. Nearly 80% of the population's calorie intake comes from rice and sugar, with insufficient consumption of nutrient-dense foods. The intake of food groups such as fruits, vegetables, legumes, nuts, and whole grains is below the recommended minimum. One-third of adult women eat unhealthy foods, and nearly two-thirds drink sweetened beverages, while children as young as 6 to 11 months consume sweetened beverages and unhealthy foods daily (WFP, UNICEF, & CARD, 2023).

Additionally, production and availability of unhealthy ultra-processed foods high in fat, salt, and sugar are increasing (WFP, UNICEF, & CARD, 2023). Among children under 2 years of age, there is a high frequency of unhealthy commercial food and beverage (UCFB) consumption, beginning during older infancy and tracking into early childhood. A 6-month longitudinal cohort study suggests that nearly half of children either maintained (45.7%) or developed (43.5%) a UCFB consumption pattern, and only 10.8% of children maintained or transitioned into a healthy consumption pattern (Hinnouho et al., 2023).

2.3. Economic Vulnerability and Food Security

Food expenditures are often used as a proxy to estimate household economic vulnerability to food insecurity. On average, Cambodian households spend about 48.7% of their income on food, while IDPoor or female-headed households spend up to 50% (CDRI, 2023) and 60% (WFP, UNICEF, & CARD, 2022), respectively. This is significant because households with share of high food expenditures might struggle to meet their food and nutrition needs during price or income shocks (WFP, UNICEF, & CARD, 2022).

Although many households can afford nutritious diets, some are still being left behind or are at risk of falling behind. On average, 16% of households cannot afford a nutritious diet. Nationally, an estimated 8% of households cannot afford the least expensive nutritious diet, with subnational variations ranging from 1% to 18% (WFP, UNICEF, & CARD, 2023).

There was a slight reversal in some food and nutrition security indicators in Cambodia in 2019–2020 compared to 2017, including food consumption, dietary diversity, and micronutrient intake (vitamin A and heme iron). Around 75% of households in Cambodia were food secure, while 25% were vulnerable to or experienced food insecurity in 2019–2020, primarily due to persistently low economic capacity. In rural areas, the figure rose to 30% of households (WFP, UNICEF, & CARD, 2022).

3. Data and Methodology

3.1. Methodology

In May and June 2023, WorldFish collaborated with the Royal University of Phnom Penh on a household survey in the rural Low Mekong area. It covered the provinces of Kandal, Prey Veng, Svay Rieng, and Takeo, as well as the province of Kampong Thom in the Tonle Sap delta, as it is connected to the Lower Mekong River. The survey collected information on the following:

- current livelihood activities of local people in the Lower Mekong area of Cambodia
- food production systems, such as land ownership, key commodities, investment models, labor, inputs, and harvests
- current food consumption patterns and dietary diversity, food acquisition, and food security
- how local people deal with climate shocks and the coping strategies that they use.

The sampling strategy was as follows: Two districts from each province were selected to capture and compare two sets of farming systems: (1) rice-intensive versus subsistence and (2) irrigated (or other water sources) versus rainfed. The target districts were selected based on clusters of agricultural cooperatives and businesses representing those farming systems and also to align the survey area under WP1, WP3, WP4, and WP5. Random sampling was done in communes and villages: one commune from each district and two villages from each commune. In total, 20 villages were selected for the household survey. Households were randomly selected in each selected village based on a household registry obtained from the village chief or commune council. The sample was targeted at 100 households per province. For reservation purposes, a total sample of 518 households was achieved (Table 1). For these reasons, the results of this study are an overview of the livelihood and production practices of the selected villages with no attempt to extrapolate to the general rural areas of Cambodia or the Lower Mekong region.

Table 1. Sample size, by province.

Province	District	Commune	Village	Households
Kampong Thom	Santuk	Kakaoh	Tboung Krapeu	24
			Chi Meakh	29
	Prasat Ballangk	Sala Visai	Bos Sramaoch	24
			Ou Krouch	28
Prey Veng	Ba Phnum	Theay	Theay	36
			Angkal	18
	Sithor Kandal	Pnov Ti Muoy	Banlich Svay	15
			Pnov	36
Svay Rieng	Kampong Rou	Khsaetr	Khsetr	24
			Prey Sangkae	28
	Rumduol	Pong Tuek	Prey tayoun	26
			Trapeang Ph'av	25
Kandal	S'ang	Tuek Vil	Preaek Ta Ra	17
			Preaek Reang Ka	33
	Khsach Kandal	Preah Prasab	Preaek Ta Baen	39
			Tep Montrei	16
Takeo	Treang	Sambuor	Trapeang Ponluh	20
			Tnaot Chum	28
	Prey Kabbas	Ban Kam	Sedthei	19
			Pontong	33
Total sample				**518**

3.2. Data and Questionnaire

The household interviews deployed a structured questionnaire to record information on household members, occupations, migration, asset ownership, land ownership, agriculture and livestock production, agricultural inputs, household non-food and 7-day food consumption, 24-hour food consumption recall to construct individual dietary diversity scores for nutrients, food insecurity, food acquisition, disability, illness and chronic disease, and lastly climate shocks. The questionnaire was programmed in KoboToolbox, which allowed for real-time quality checks and feedback.

The 7-day food consumption module captured the quantity and expenses of food consumption in the 7 days prior to the survey according to food purchased, produced at home, and obtained from other sources, such as gifts, hunting, begging, etc. The information detailed 254 food items in total, which were classified into 12 food groups: cereals, pulses (nuts and legumes), edible oil, vegetables, meat, eggs and milk (including dairy products), fruit, fish, spices and condiments, drinks and beverages, other foods, and FAFH.

In Cambodia, cereals include rice, rice flour, cassava flour, different types of noodles, and maize. Rice is the most commonly consumed item in the cereals group. The consumption of pulses, specifically beans, peas, and other pulses, is not common in Cambodia. Edible oils include animal fat, vegetable oil, sunflower oil, sesame oil, and olive oil. Vegetable oil and animal fat (pork) are primarily used for cooking in Cambodia. Vegetables include green leafy vegetables, orange vegetables, aquatic vegetables, tuber vegetables, and other non-green or orange vegetables, with green leafy vegetables being most consumed. Fruit include mangos, bananas, orange fruits, and other fruits. Fish and other animal proteins were purposively separated to understand the significant role of fish and other aquatic animals as a main source of protein in rural household diets. Fish includes small and large fish and other aquatic animals consumed fresh, fermented, or dried. Traditionally, fish is the most common component of Cambodian meals, especially for rural households, who raise and/or catch fish from rivers, ponds, lakes, and rice fields. Animal protein includes beef, buffalo, pork, chicken, duck, eggs (duck, chicken, fish), organ meats, dairy products, insects, and reptiles. Spices (herbs and lemon grass) and condiments (salt, MSG, pepper, soy sauce and fish sauce) are commonly used by households in Cambodia to add flavor to the food they consume. Drinks and beverages consist of soft drinks, energy drinks, beer, wine, and other traditional juices and alcohols. Other food refers to all forms of sweetening products, such sugar, honey, coffee, and tea.

The FAFH category contains 54 items in a combination of meals or snacks, fresh food, traditionally processed or ultra-processed food, sweet versus savory dishes, fried versus unfried food, and vegetable- versus meat-based or mixed dishes. This information is different from previous surveys conducted in the country that captured the aggregate value of FAFH, which was prone to underestimates. Breaking the category down into smaller components enabled more precision in the calculation of food consumption and expenditures on FAFH.

The individual dietary module covered household members in four different age groups: children under 2 years old, mothers of children under 2 years old, females aged 14–49, and males aged 14–49. They were asked about the food they ate or drank in the 24 hours prior to the survey, both at home and outside home. If any household members in these age groups were present during survey, the enumerator then interviewed the individual directly, except for children under 2 years old, which required the mother or caretaker to do the interview on their behalf. We also permitted proxy interviews, but only when the members were not at home during the survey and only when the respondent was aware of what the members consumed the day before.

The food acquisition module inquired about how households collect, manage, and preserve food items for household consumption in the month prior to the survey. The items were classified into rice, wheat, maize, pulses, edible oil, vegetables, fruits, meat, eggs, milk, fresh fish, dried/salted/fermented fish, condiments and spices, tea/coffee, drinks and beverages, snacks, and full meals. Places where household access to these foods are from the farm or home include village markets within own village, village markets outside own village, city markets, vendors, restaurants, school gates, and mobile vendors. Food storage facilities include fridges, freezers, cupboards, buckets, Tupperware/plastic containers, vegetable racks, ice boxes, or a neighbor's friend's house.

The food security module used the Household Food Insecurity Access Scale (HFIAS)[1]. The questionnaire included nine occurrence-based questions designed to capture varying levels of food insecurity. These questions assessed perceptions of food vulnerability or stress and explored behavioral responses to food insecurity. Following each occurrence question, respondents were asked how frequently the condition occurred, although they could skip the question if the condition was not experienced during the previous 4 weeks (30 days). The questions applied to all household members, without differentiating between adults, children, or adolescents, and focused on experiences and behaviors over the previous month.

The analysis is disaggregated by poverty status (IDPoor vs. non-IDPoor), gender of the household head, province, and irrigated vs. non-irrigated land coverage, where differences are statistically significant. The variable for irrigation access is based on the proportion of households reporting whether their agricultural plots are entirely rainfed or use different water sources for irrigation. If more than half of the households in a given village reported having irrigation, the entire village was assumed to be under some form of irrigation system.

[1] Coates, J., Swindale, A., & Bilinsky, P. (2007). Household Food Insecurity Access Scale (HFIAS) for measurement of food access: Indicator guide: version 3. Food and Nutrition Technical Assistance Project, Academy for Educational Development. https://www.fantaproject.org/sites/default/files/resources/HFIAS_ENG_v3_Aug07.pdf

4. Results

4.1. Household Characteristics

Table 2 shows household characteristics in the surveyed area disaggregated by poverty status and gender of the household head. The average household size was five. Around three household members were of working age, and the dependency ratio was high, at 81%. The average household head was 53 years old, and the household members, meaning the head of the household and its members, were 36 years old, on average, and 20% of the households were female-headed. In line with national statistics, 17% of the surveyed households had an IDPoor card, given by the government through its IDPoor identification program. Additionally, IDPoor households had a higher dependency ratio (110%), and a higher share were female-headed (40%). Compared to male-headed households, female-headed households had fewer household members (4), fewer working age members (2), a higher dependency ratio (100%), an older household head (56), and a higher poverty rate (31%).

The education of the household head is reported as completed levels of education. Approximately 47% of household heads finished primary education and around 29% completed secondary education, while 6% completed higher secondary school and only 1% completed tertiary level. This indicates that low education attainment among household heads in rural areas remains prevalent. Noteworthy, compared to non-IDPoor households, household heads classified as IDPoor had lower levels of secondary education, at 31%, but higher rates in primary education, at 58%. The pattern is similar to female-headed households, where the rate of informal education was higher (52%), but lower in secondary (14%) and tertiary (1%) education.

Table 2. Household characteristics.

Item	Number	All	Non-IDPoor	IDPoor	Male-headed	Female-headed
Average number of household members	518	5	5	5	5	4**
Average number of working-age household members	518	3	3	3	3	2***
Average household dependency ratio (%)	518	0.8	0.8	1.1***	0.8	1.0***
Average age of household head	518	53	53	54	52	56***
Average age of household members	518	36	36	35	36	36
Female-headed household (%)	518	0.2	0.17	0.4***		
Household has IDPoor card (%)	518	0.17			0.13	0.31***
Educational level of household head (%)						
Informal education	518	0.17	0.16	0.23	0.14	0.3***
Primary	518	0.47	0.44	0.58**	0.45	0.52
Secondary	518	0.29	0.31	0.17*	0.32	0.14**
Higher Secondary	518	0.06	0.07	0.02	0.08	0.02***
Tertiary	518	0.01	0.01	0***	0.01	0.01

Note: t-tests were used to test if the variables of interest are significantly different between the groups (non-IDPoor households versus IDPoor households, male-headed households versus female-headed households).

** mean statistically significant at 10%; ** mean statistically significant at 5%; *** mean statistically significant at 1%.*

4.2. Household Food Expenditures

On average, each household spent 9,123 KHR (2.25 USD) daily per adult on food; however, IDPoor households spent significantly less than others, only 8,000 KHR (2 USD). Male-headed and female-headed households did not show any significant difference in aggregate daily food expenditures.

Daily household food expenditures per adult equivalent[2] is presented in Table 3. Approximately 46% of total household expenditures were spent on food. IDPoor and female-headed households had a higher share (48%) than non-IDPoor and male-headed households (45%). This finding corresponds to studies using data from the Cambodia Socio Economic Survey (CSES), where the share is 48.7% (WFP, UNICEF, & CARD, 2022) and 46.8%, respectively (CDRI, 2023).

The share of food expenditures is often used as a key indicator to assess a household's vulnerability to food insecurity, offering valuable insights into how families prioritize and manage their limited resources. A higher proportion of income spent on food typically signals a greater risk of food insecurity and economic hardship. Households that allocate a larger share of their budget to food are more

[2] Waid, J. L., Bogard, J. R., Thilsted, S. H., & Gabrysch, S. (2017). Estimates of average energy requirements in Bangladesh: Adult Male Equivalent values for use in analysing household consumption and expenditure surveys. Data in Brief, 14, 17. https://doi.org/10.1016/j.dib.2017.07.022

susceptible to fluctuations in food prices or changes in household income, as they have less financial flexibility to adjust other spending. This can make it more challenging to meet basic needs and maintain economic stability, particularly in times of economic downturn or price volatility.

Additionally, 12% of total food expenditures among households in the study were spent on FAFH, on average. This figure remains the same across different specifications, which is higher than CDRI (2023), at 9.15%, using the CSES (2021). The difference can arguably be attributed to the detailed FAFH items introduced in this study.

Table 3. Household food expenditures.

	All	Non-IDPoor	IDPoor	Male-headed	Female-headed
Daily food expenditure per adult equivalent per day (KHR)	9,123	9,348	8,027**	9,106	9,193
Percentage spent on food	46%	45%	48%*	45%	48%*
Percentage spent on food prepared away from home	12%	12%	11%	12%	12%

Note: t-tests were used to test if the variables of interest are significantly different between groups (non-IDPoor households versus IDPoor households, male-headed households versus female-headed households).

** mean statistically significant at 10%; ** mean statistically significant at 5%; *** mean statistically significant at 1%.*

4.3. Frequency and Quantity of Daily Consumption of Different Food Groups

Staples, vegetables, and spices and condiments were the commodities that rural households consumed the most in the previous 7 days. Interestingly, non-IDPoor households consumed FAFH more frequently, while male-headed households drank beverages and alcohol more often.

Table 4 provides an overview of food consumption patterns in the 7 days prior to the survey, offering insights into the dietary habits of rural households. According to the table, all survey households reported consuming staples such as rice, maize, and other cereals. Additionally, 90% used edible oils, such as vegetable oil and animal fat, primarily for cooking. A high proportion also consumed vegetables (99%), leafy greens (98%), and spices/condiments, like sugar and flavor enhancers (98%). Fish, including small and large fish as well as aquatic animals, was consumed by 97% of households. Meat, which includes various animal-source proteins, insects, eggs, and dairy products, was consumed by 94%. However, only 70% of households consumed fruits, including orange-colored varieties. About 69% reported drinking beverages and alcohol, including sugary and energy drinks, while 80% ate FAFH, which includes various types of breakfast items, snacks, traditional cakes, cooked meals with rice, and beverages like coffee and tea.

Similarly, there is no significant difference in food intake patterns between IDPoor and non-IDPoor households, except in the category of FAFH. Although 83% of non-IDPoor households reported consuming FAFH, only 69% of IDPoor households had access to this food group. When comparing male-headed and female-headed households, a noticeable difference emerges: 72% of male-headed households drank beverages and alcohol, compared to just 56% of female-headed households.

Table 4. Consumption by food group in the 7 days prior to the survey.

Item	All	Non-IDPoor	IDPoor	Male-headed	Female-headed
Staples (rice)	100%	100%	100%	100%	100%
Edible oil	90%	91%	88%	91%	90%
Vegetables	99%	99%	99%	100%	98%
Meat	94%	94%	97%	95%	92%
Fish	97%	97%	97%	97%	98%
Fruit	70%	71%	66%	72%	66%
Spices, sugar, condiments	98%	98%	98%	98%	98%
Beverages and alcohol	69%	70%	64%	72%	56%***
FAFH	80%	83%	69%***	82%	75%

Note: t-tests were used to test if the variables of interest are significantly different between groups (non-IDPoor households versus IDPoor households, male-headed households versus female-headed households).

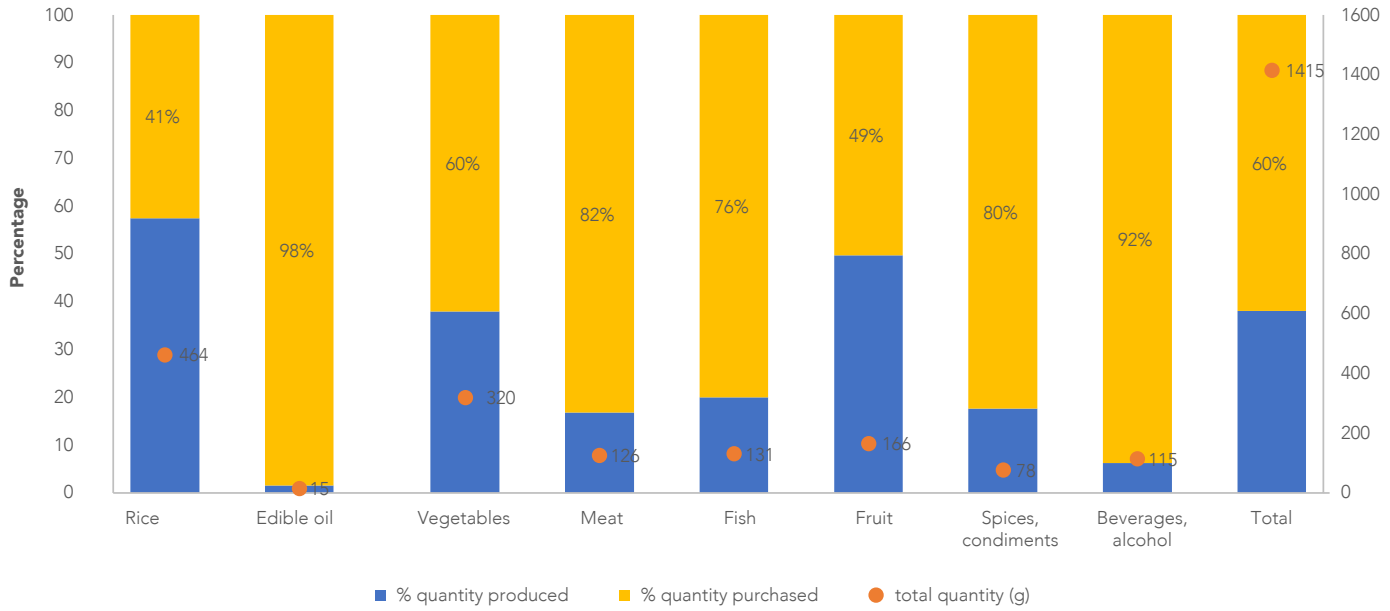
** mean statistically significant at 10%; ** mean statistically significant at 5%; *** mean statistically significant at 1%.*

In terms of quantity, daily food consumption was primarily composed of rice (34%), vegetables (22%), and animal-sourced protein (meat 9% and fish 9%). In terms of food sourcing, 60% of the consumed food was purchased, while the rest came from home production. Rice, fruits, and vegetables were the main commodities sourced through home production.

Figure 1 illustrates the daily quantity of food consumed per adult equivalent, measured in grams, across different food groups, along with the share of food sources (purchased and home-produced, including other sources like gifts, collections, or hunting) in the 7 days prior to the survey. On average, each adult consumed 1,563 g of food per day, excluding FAFH, as the quantity for this category was not possible to capture. Of this total, rice made up 529 g (34%), vegetables accounted for 350 g (22%), meat contributed 138 g (9%), fish 144 g (9%), fruits 177 g (11%), spices and condiments 87 g (6%), edible oils 17 g (1%), and beverages 123 g (8%).

Understanding the sources of consumed foods, whether purchased or home-produced, and how they contribute to household dietary intake in rural settings is crucial. In terms of quantity, households sourced 60% of their food through purchases and the rest through home production. Notably, only 41% of the rice and 49% of the fruits consumed were purchased. The top-three commodities sourced from home production were rice (59%), fruits (51%), and vegetables (40%). This suggests that, despite 70% of households being engaged in farming, many chose to sell their harvests for income rather than retain the produce for consumption. As a result, they purchased food for later consumption. Fruits, in particular, are not considered essential in the Cambodian household diet, with households typically consuming only what is grown at home and rarely purchasing fruits regularly. In contrast, households purchased the majority of certain food items: 87% of edible oils, 61% of vegetables, 80% of meat, 79% of fish, 79% of spices and condiments, and 63% of beverages and alcohol.

Figure 1. Quantity of consumption per food group.



Note: adult equivalent per day in grams and KHR.

Non-IDPoor households exhibit significantly higher consumption of edible oils and fruits compared to IDPoor households. For example, non-IDPoor households consumed 16 g of edible oil and 172 g of fruits, while IDPoor households consumed only 11 g of edible oil and 134 g of fruits. In terms of food consumption by household type, male-headed households consumed a larger quantity of rice (448 g) and spices/condiments (75 g), whereas female-headed households consumed more rice (524 g) and spices/condiments (88 g) (Table 5).

Table 5. Quantity of consumption per food group, by poverty status and gender.

	Non-IDPoor	IDPoor	Male-headed	Female-headed
Food				
Rice	462	469	448	524***
Edible oil	16	11**	15	16
Vegetables	327	286	312	351
Meat	128	116	129	114
Fish	134	117	128	143
Fruit	172	134*	164	173
Spices, condiments	78	81	75	88**
Beverages, alcohol	118	99	119	98
Total	**1,436**	**1,314**	**1,391**	**1,507**

Note: adult equivalent per day in grams and KHR.

Note: t-tests were used to test if the variables of interest are significantly different between groups (non-IDPoor households versus IDPoor households, male-headed households versus female-headed households).

** mean statistically significant at 10%; ** mean statistically significant at 5%; *** mean statistically significant at 1%.*

In terms of food consumption through purchase, there is no significant difference between IDPoor and non-IDPoor households. However, female-headed households consumed a larger amount (933 g) compared to male-headed households (830 g). On the other hand, non-IDPoor households consumed a larger total amount of food daily, with no significant difference in home-produced food consumption between male- and female-headed households.

Table 6 compares the quantity of food consumed through purchase and home production based on poverty status and the gender of the household head. On average, IDPoor and non-IDPoor households consumed a similar total amount of food daily through purchase. However, IDPoor households purchased a larger quantity of rice, averaging 264 g, while non-IDPoor households purchased more oil (16 g) and fish (105 g). Additionally, female-headed households consumed a higher quantity of rice (270 g) and spices/condiments (70 g) through purchase compared to male-headed households.

In terms of food acquired through home production, non-IDPoor households produced a larger quantity for daily consumption, with similar levels of home production across male- and female-headed households. Non-IDPoor households consumed more total food daily (548 g) and more rice (275 g) through home production compared to IDPoor households, who consumed 404 g and 180 g, respectively. Additionally, male-headed households consumed a larger amount of meat (24 g) than female-headed households (8 g) through home production.

Table 6. Quantity of consumption per food group (purchased vs. home production).

	All	Non-IDPoor	IDPoor	Male-headed	Female-headed
Food purchased					
Rice	192	176	264***	171	270***
Edible oil	15	16	11**	15	16
Vegetables	192	195	176	189	202
Meat	103	105	94	103	102
Fish	100	105	80**	97	111
Fruit	81	85	62	82	80
Spices, condiments	63	62	65	61	70**
Beverages, alcohol	105	109	89	112	82
Total	**851**	**853**	**841**	**830**	**933***
Food produced					
Rice	259	275	180***	264	239
Edible oil	0	0	0	0	0
Vegetables	117	121	98	113	134
Meat	21	22	17	24	8***
Fish	25	25	27	26	22
Fruit	80	84	64	78	90
Spices, condiments	13	14	13	13	15
Beverages, alcohol	7	8	5	6	12
Total	**523**	**548**	**404 *****	**524**	**521**

Note: adult equivalent per day in grams and KHR.

Note: t-tests were used to test if the variables of interest are significantly different between groups (non-IDPoor households versus IDPoor households, male-headed households versus female-headed households).

** mean statistically significant at 10%; ** mean statistically significant at 5%; *** mean statistically significant at 1%.*

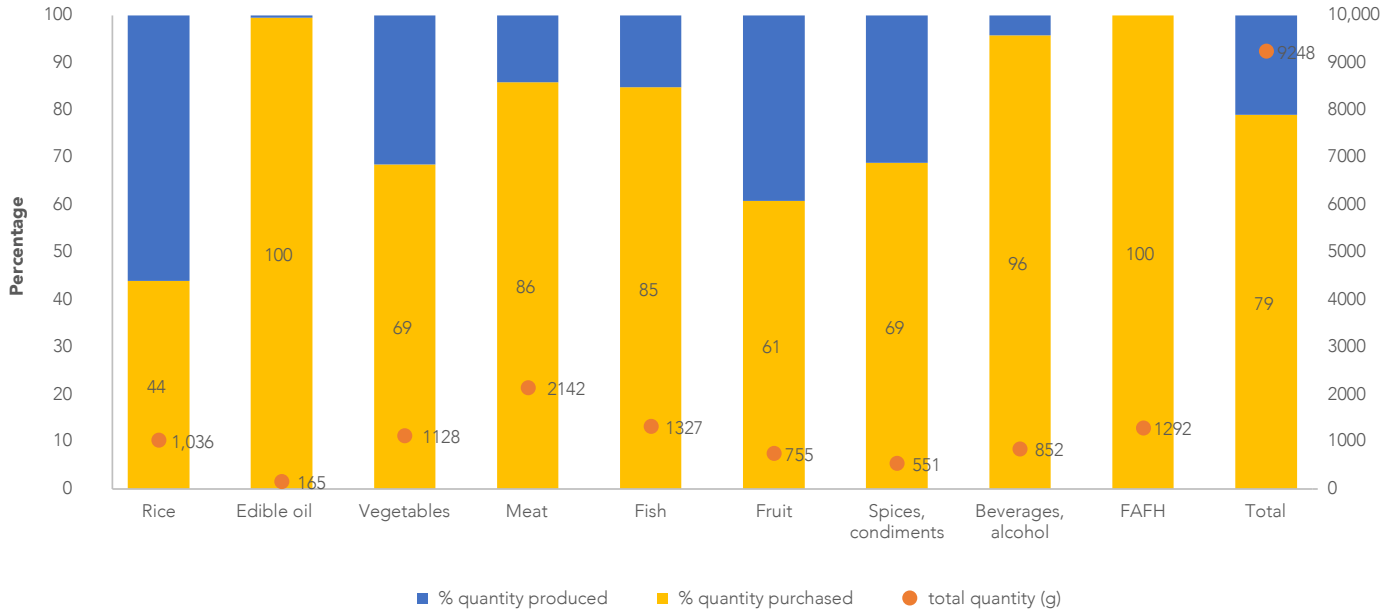
4.4. Value of Daily Consumption per Food Group

In general, a large proportion of daily food intake in the households came from purchases. On average, daily food consumption amounted to 9,248 KHR (2.31 USD) per adult equivalent, with 79% of this spending dedicated to purchased food and only 21% to home-produced food. Meat (23%), fish (14%), and FAFH (14%) accounted for nearly half of the household food budget.

The value of daily food consumption through home production or other sources is estimated by calculating the average unit price of the same food items consumed and purchased by different households within the same village or commune. Figure 2 shows that the average daily food expenditures per adult equivalent, including both purchased and self-produced food, was 9,248 KHR (2.31 USD). Specifically, one adult spent an average of 1,036 KHR (11%) on rice, 165 KHR (2%) on edible oil, 1,128 KHR (12%) on vegetables, 2,142 KHR (23%) on meat, 1,327 KHR (14%) on fish, 755 KHR (8%) on fruits, 551 KHR (6%) on spices and condiments, 852 KHR (9%) on beverages and alcohol, and 1,292 KHR (14%) on FAFH.

The adults allocated most of their food budget to various food types, with the exception of rice and fruits, which were primarily sourced through home production. On average, 79% of total food consumption was purchased, while 21% came from home production. Specifically, households purchased 44% of their rice, 87% of edible oil, 67% of vegetables, 83% of meat, 81% of fish, 38% of fruits, 73% of spices and condiments, 80% of beverages and alcohol, and 100% of FAFH.

Figure 2. Value of consumption per food group.



Note: adult equivalent per day in grams and KHR.

Note: t-tests were used to test if the variables of interest are significantly different between groups (non-IDPoor households versus IDPoor households, male-headed households versus female-headed households).

** mean statistically significant at 10%; ** mean statistically significant at 5%; *** mean statistically significant at 1%.*

Table 7 compares the value of food consumption between households of different poverty statuses and the genders of household heads. In general, non-IDPoor households had higher average daily food expenditures, with male- and female-headed households showing similar spending levels. Specifically, non-IDPoor households spent an average of 9,502 KHR (2.38 USD) on food, while IDPoor households spent 8,027 KHR (2 USD). Non-IDPoor households had higher food expenditures across all food groups, with significant differences observed for edible oils (174 KHR), meat (2,204 KHR), fish (1,367 KHR), and beverages and alcohol (910 KHR). However, there are no significant differences in food expenditures between male- and female-headed households.

Table 7. Value of consumption per food group, by poverty status and gender.

	Non-IDPoor	IDPoor	Male-headed	Female-headed
Food				
Rice	1,040	1,016	1,016	1,112
Edible oil	174	121**	161	181
Vegetables	1,158	984	1,121	1,154
Meat	2,204	1,845*	2,199	1,923
Fish	1,367	1,131*	1,310	1,391
Fruit	794	567*	742	807
Spices, condiments	549	562	537	605
Beverages, alcohol	910	576**	890	708
FAFH	1,305	1,226	1,286	1,313
Total	**9,502**	**8,027****	**9,263**	**9,193**

Note: adult equivalent per day in grams and KHR.

Note: t-tests were used to test if the variables of interest are significantly different between groups (non-IDPoor households versus IDPoor households, male-headed households versus female-headed households).

** mean statistically significant at 10%; ** mean statistically significant at 5%; *** mean statistically significant at 1%.*

The value of both purchased and home-produced food was higher for non-IDPoor households, although there was no significant difference between male- and female-headed households. Table 8 shows that non-IDPoor households spent an average of 7,504 KHR (1.88 USD) on food purchases, compared to 6,355 KHR (1.59 USD) for IDPoor households. Non-IDPoor households spent more on edible oil (174 KHR), fish (1,180 KHR), fruits (491 KHR), and beverages/alcohol (870 KHR), while IDPoor households spent more on rice (610 KHR). In terms of gender, female-headed households allocated more of their budget to rice (585 KHR) and spices/condiments (422 KHR), while male-headed households spent more on meat, beverages, and alcohol. However, the differences between male- and female-headed households are not statistically significant.

Through home production, non-IDPoor households consumed 1,998 KHR (0.50 USD) of food daily, compared to 1,673 KHR (0.42 USD) for IDPoor households. For example, non-IDPoor households spent more on rice (617 KHR) and vegetables (371 KHR). Although the overall value of home-produced food was similar between male- and female-headed households, male-headed households allocated more to home-produced meat (348 KHR) compared to female-headed households (126 KHR).

Table 8. Value of consumption per food group, by poverty status and gender.

	All	Non-IDPoor	IDPoor	Male-headed	Female-headed
Food purchased					
Rice	455	423	610***	422	585**
Edible oil	164	174	121**	160	181
Vegetables	773	787	703	773	773
Meat	1,840	1,892	1,590	1,852	1,796
Fish	1,126	1,180	869 ***	1,100	1,229
Fruit	460	491	309 *	460	458
Spices, condiments	380	381	371	369	422*
Beverages, alcohol	816	870	557**	858	655
FAFH	1,292	1,305	1,226	1,286	1,313
Total	**7,306**	**7,504**	**6,355****	**7,279**	**7,412**
Food produced					
Rice	581	617	406***	595	527
Edible oil	1	1	–	1	–
Vegetables	355	371	282*	349	381
Meat	302	312	255	348	126***
Fish	200	188	262	210	161
Fruit	296	303	258	282	350
Spices, condiments	172	168	191	169	182
Beverages, alcohol	36	40	19	31	54
FAFH	–	–	–	–	–
Total	**1,942**	**1,998**	**1,673***	**1,984**	**1,781**

Note: adult equivalent per day in grams and KHR.

Note: t-tests were used to test if the variables of interest are significantly different between groups (non-IDPoor households versus IDPoor households, male-headed households versus female-headed households).

** mean statistically significant at 10%; ** mean statistically significant at 5%; *** mean statistically significant at 1%.*

4.5. Food Acquisition

Local markets within household premises, mobile vendors (vehicles selling a variety of foods, from fresh vegetables and meat to cooked meals and processed snacks), stationary vendors, and external markets outside the village all play a significant role in providing rural households with access to food.

According to Table 9, most people in the survey accessed food from the local village market (70%), where a wide variety of foods are available. This is followed by mobile vendors (18%), stationary vendors or stalls (4%), external markets (3%), home (3%), and city markets (2%). More specifically, 75% of households purchased cereals, particularly rice, from the local market, while 9% bought rice from markets outside their village and 7% from mobile vendors. Approximately 85% of households purchased edible oils from the local market, 6% from stationary vendors/stalls, and 4% from external markets. Over half of the households (61%) bought fresh vegetables and fruits from the local market, with 27% purchasing from mobile vendors. Around 69% and 20% of households purchased meat and eggs from the local market and mobile vendors, respectively. Similarly, 64% of households bought fish from the local market, while 27% purchased it from mobile vendors. In terms of spices and condiments, 86% of households bought them from the local market, with 5% purchasing from stationary vendors/stalls. Lastly, 65% of households accessed FAFH at the local market, 16% from mobile vendors, and 12% from stationary vendors/stalls.

Table 9. Household access to food.

	Cereals	Oil	Veg/fruit	Meat/eggs	Fish	Spices	FAFH	All
Home	3%	3%	3%	3%	4%	4%	2%	3%
Market within village	75%	84%	61%	69%	64%	86%	65%	70%
Market outside village	9%	4%	4%	3%	2%	3%	2%	3%
City market	3%	1%	3%	1%	1%	1%	2%	2%
Stationary vendor/stall	3%	6%	3%	4%	2%	5%	12%	4%
Restaurant	0%	0%	0%	0%	0%	0%	1%	0%
Mobile vendor	7%	2%	27%	20%	27%	2%	16%	18%
Other	0%	0%	0%	0%	0%	0%	0%	0%

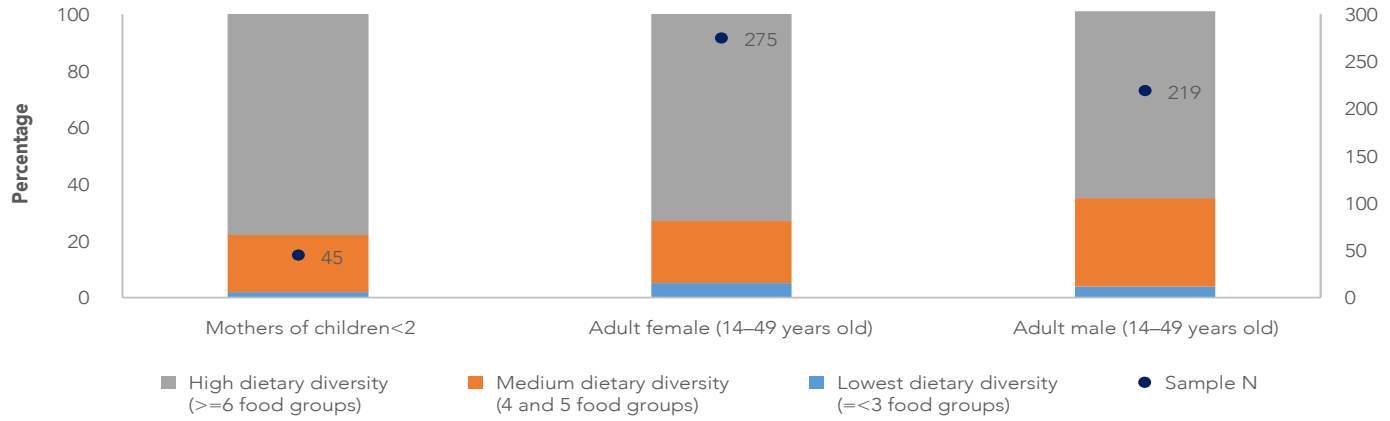
4.6. Individual Dietary Diversity and Household Food Insecurity

To construct the dietary diversity score, the survey collected information on the foods consumed by individual household members on the day prior to the survey. The foods were then categorized according to the Food and Agriculture Organization's definitions into the following groups: cereals, white roots or tubers, vegetables, fruits, meat, eggs, fish, legumes, milk, oils, sweets, spices, and formula. Household members were also categorized into the following age groups: children under 2 years old, mothers of children under 2, adult females (ages 14–49), and adult males (ages 14–49). Since the dietary needs of children under 2 years old differ from those of adults, the analysis focuses on the two adult and maternal age groups.

More than three-quarters of individuals in the three age groups exhibit high or medium dietary diversity, although the overall quality of their diet remains questionable.

As shown in Figure 3, the number of individuals interviewed for this module is smaller than the total sample of households because of the availability of members during the interview and the restriction on proxy responses, ensuring valid information. As a result, 45 mothers of children under 2 years old, 275 female adults, and 219 male adults were interviewed. Seventy-eight percent of mothers with children under 2 years old had high dietary diversity, 20% had medium diversity, and only 2% fell into the lowest category. Among adult females aged 14–49, 73% had high dietary diversity, 22% fell into the medium category, and 5% into the low category. Lastly, 66% of adult males aged 14–49 achieved high dietary diversity, with 31% in the medium category and 4% in the low category.

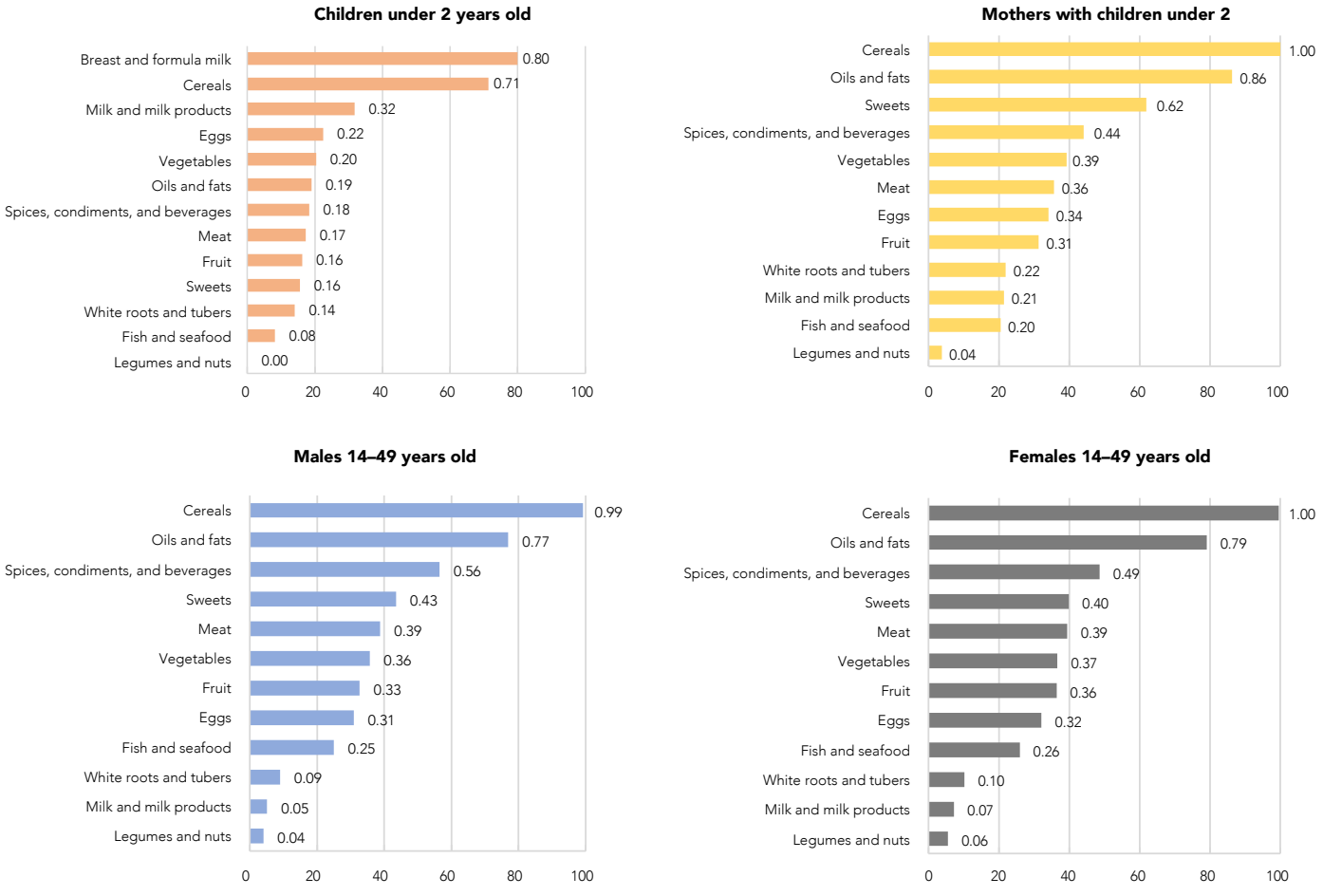
Figure 3. Individual dietary diversity score, by age group (24-hour recall).



The diet of people in each age group was high in carbohydrate derived from rice as well as sugar from condiments and sweetened beverages, according to the 24-hour food recall.

A limitation of the dietary diversity score is that it only counts the number of food groups consumed, without considering the quality of these food groups. To provide more insight into the quality of the diets, the following figure illustrates the specific food groups consumed by each age group on the previous day. According to Figure 4, based on a 24-hour food recall, the diet was heavily carbohydrate-based, with rice and sugar from condiments and sweetened drinks being the main sources. The top-five foods consumed by children under 2 years old were breastmilk and formula (80%), cereals like rice and porridge (71%), milk and milk products (32%), eggs (22%), and vegetables (20%). Mothers of children under 2 years old consumed rice (100%), oils and fats (86%), sweets (62%), spices, condiments, and beverages (44%), and vegetables (39%). Female adults aged 14–49 consumed rice (100%), oils and fats (79%), spices, condiments, and beverages (49%), sweets (40%), and meat (39%). Male adults aged 14–49 consumed rice (100%), oils and fats (77%), spices, condiments, and beverages (56%), sweets (43%), and meat (39%).

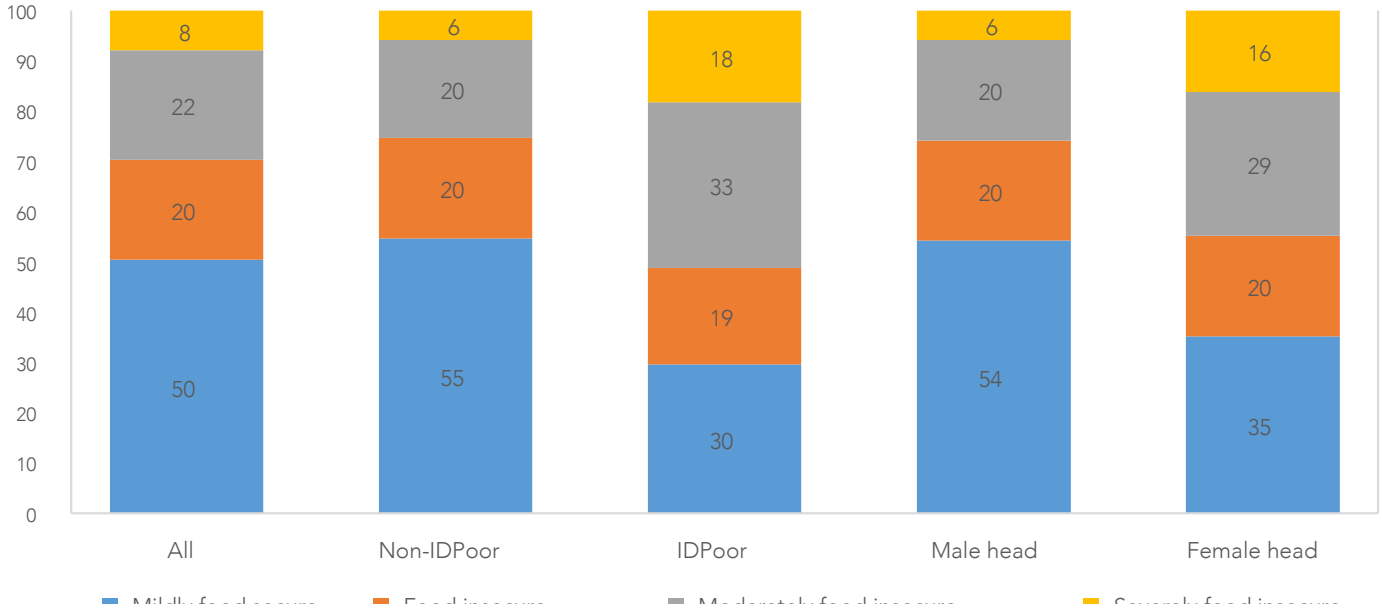
Figure 4. Food consumption in the previous 24 hours, by age group.



In general, 8% of the households experienced severe food insecurity. When comparing by poverty status and gender of the household head, IDPoor households and female-headed households faced higher levels of food insecurity, at 18% and 16%, respectively, compared to their counterparts.

According to the HFIAS, 8% of households were severely food insecure, 22% moderately food insecure, 20% mildly food insecure, and 50% food secure (Figure 5). Specifically, more than half of non-IDPoor households (55%) were food secure, followed by 20% experiencing mild or moderate food insecurity, and only 6% were severely food insecure. In contrast, only 30% of IDPoor households were food secure, 19% mildly food insecure, 33% moderately food insecure, and 18% severely food insecure. Among male-headed households, 54% reported being food secure, with 20% mildly or moderately food insecure, and just 6% severely food insecure. For female-headed households, 35% were food secure, 20% and 29% were mildly and moderately food insecure, respectively, while 26% experienced severe food insecurity.

Figure 5. Food insecurity and access score, by poverty status and gender.



5. Conclusion

The survey data indicates that on average, a household spent 9,000 KHR (2.25 USD) per adult per day on food; however, IDPoor households spent significantly less, at only 8,000 KHR (2 USD). A significant portion of household expenditures was allocated to food, highlighting economic vulnerability, especially for IDPoor and female-headed households, which faced higher levels of food insecurity. Approximately 46% of total household expenditures were spent on food, with IDPoor and female-headed households spending 48% and non-IDPoor and male-headed households spending only 45%. Households often relied more on FAFH, much of which is high in sugar, fat, and salt. In particular, 12% of total food expenditures were spent on FAFH.

Quantity of daily food composition per adult consisted of rice (34%), edible oil (1%), vegetables (22%), meat (9%), fish (9%), fruits (11%), spices and condiments (6%), and beverages (8%). Approximately 78% of daily food consumption was purchased and 22% was produced at home, where rice and fruits were the main items. The 24-hour food recall suggests the quality of the diets remains a big concern, containing high levels of carbohydrate and sugar from condiments and sugary beverages. Although their diets may have been diverse, nutritional quality remains a concern because of the high consumption of processed foods and expensive animal-based products, which are nutrient-rich but costly.

Interventions should focus on educating people about the health risks of excessive fats, sugars, and processed foods, while promoting healthier alternatives like fruits, vegetables, and aquatic foods, especially fish, in rural communities. Strengthening local producer groups and encouraging sustainable practices, such as rice–fish systems and home gardens, could enhance both dietary diversity and household income.

Future policies should prioritize vulnerable groups, including IDPoor households, female-headed households, and families with children under 1,000 days old. Research should explore sustainable fish production methods, improved preservation techniques, and the impact of climate change on food consumption and nutrition. National-level data on fish consumption and its nutritional value is needed to better understand the potential to meet key dietary requirements.

References

Cambodia Development Resource Institute (CDRI). (2023). *Assessing changes in food consumption and nutrition intake in Cambodia*. https://cdri.org.kh/project/asian-mega-deltas-from-risk-to-resilience

Council for Agricultural and Rural Development (CARD). (2016). *National Action Plan for the Zero Hunger Challenge in Cambodia 2016–2025*. https://faolex.fao.org/docs/pdf/cam173301.pdf

Council for Agricultural and Rural Development (CARD). (2019). *National Nutrition Plan 2019–2023*. https://www.wfp.org/operations/kh02-cambodia-country-strategic-plan-2019-2023

Hinnouho, G-M., Ferguson, E. L., MacDougall, A., Kroeun, H., Sophonneary, P., Chea, M., & Pries, A. M. (2023). High consumption of unhealthy commercial foods and beverages tracks across the complementary feeding period in rural/peri-urban Cambodia. *Maternal & Child Nutrition*, *19*(1), e13485. https://doi.org/10.1111/mcn.13485

Inland Fisheries Research and Development Institute (IFReDI), Fisheries Administration, & University of Connecticut. (2015). *Enhancing food security and household nutrition vulnerability of women and children: Focus on nutrient-dense commonly consumed fish from capture fisheries and aquaculture in Cambodia*. https://aquafishcrsp.oregonstate.edu/sites/aquafishcrsp.oregonstate.edu/files/13pdv01uc_fir_tr2.pdf

Nurhasan, M., Sok, D., Thilsted, S. H., Nguon, S., James, D., Ritz, C., Sok, S., Chhoun, C., & Roos, N. (2023). Impact of Mekong River biodiversity on the food culture of women and children in Prey Veng, Cambodia. *Aquatic Ecosystem Health & Management*, *25*(3), 82–93. https://doi.org/10.14321/aehm.025.03.82

Waid, J. L., Bogard, J. R., Thilsted, S. H., & Gabrysch, S. (2017). *Estimates of average energy requirements in Bangladesh: Adult Male Equivalent values for use in analyzing household consumption and expenditure surveys*. *Data in Brief*, *14*, 17. https://doi.org/10.1016/j.dib.2017.07.022

World Bank. (2022). *Cambodia economic update, December 2022: Navigating global economic headwinds*. https://www.worldbank.org/en/country/cambodia/publication/cambodia-economic-update-december-2022-navigating-global-economic-headwinds

World Bank. (2022). *Cambodia poverty assessment 2022: Toward a more inclusive and resilient Cambodia*. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099155111222239793/p1735940c0e8b508d0b80e0c7375c89d9c0

World Food Programme, UNICEF, & Council for Agricultural and Rural Development (CARD). (2023). *Fill the nutrient gap, Cambodia*. https://www.wfp.org/publications/fill-nutrient-gap-cambodia

World Food Programme, UNICEF, & Council for Agricultural and Rural Development (CARD). (2022). *Report of food and nutrition security trend analysis 2014–2019/20*. https://www.fao.org/publications/home/fao-flagship-publications/the-state-of-food-security-and-nutrition-in-the-world/2022/en

List of Figures

List of Tables

Appendix

Table 10. Household characteristics.

Item	Number	All	Kampong Thom	Kandal	Prey Veng	Svay Rieng	Takeo
Average number of household members	518	4.54	4.91	4.48	4.10	4.44	4.76
Average number of working-age household members	518	2.75	3.13	2.66	2.23	2.83	2.88
Average household dependency ratio	518	81%	75%	85%	94%	65%	84%
Average age of household head	518	53	49	53	55	54	55
Average age of household members	518	36	31	35	38	39	35
Educational level of household head							
Informal	518	17.0	29.5	9.7	19.0	14.6	11.8
Primary	518	46.7	42.9	45.6	43.8	47.6	53.9
Secondary	518	28.8	18.1	41.7	29.5	28.2	26.5
Higher secondary	518	6.4	9.5	2.9	6.7	7.8	4.9
Tertiary	518	1.2	0.0	0.0	1.0	1.9	2.9
Female-headed household (%)	518	20.3	24.8	20.4	21.9	14.6	19.6
IDPoor household (%)	518	17.0	15.2	20.4	21.9	12.6	14.7

Figure 6. Household food expenditures.

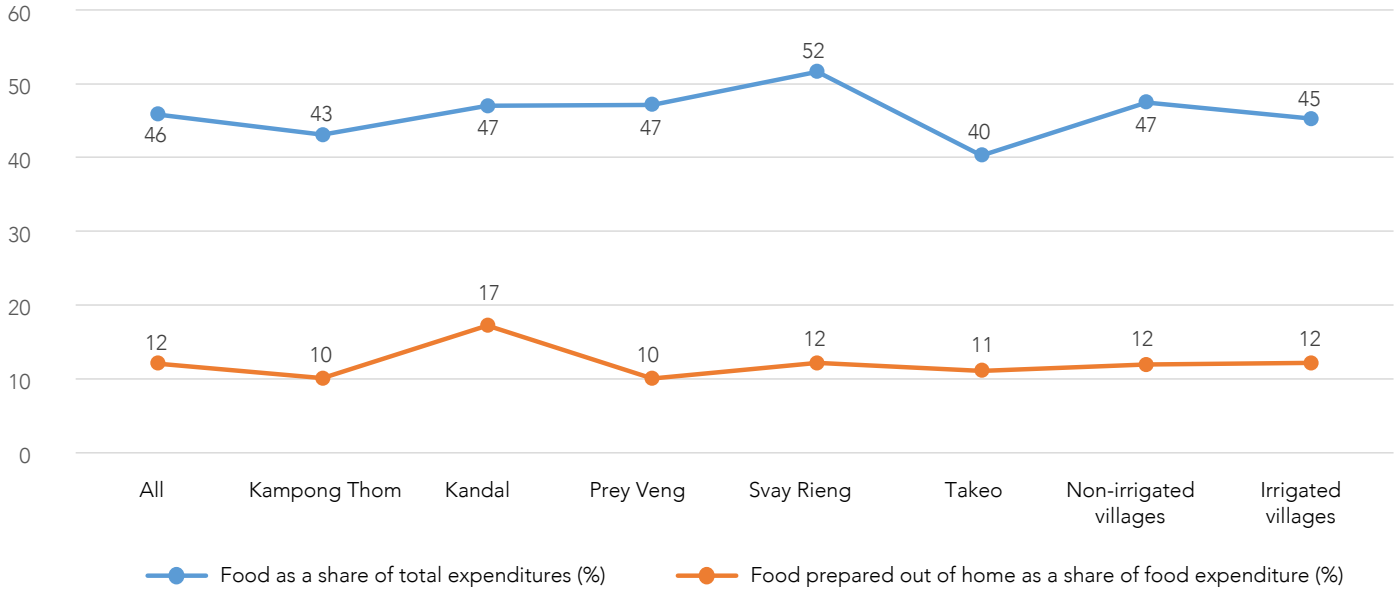


Table 11. Share of consumption per food group in the previous 7 days.

Food group	All	Kampong Thom	Kandal	Prey Veng	Svay Rieng	Takeo
Beverages, alcohol	69	62	74	71	77	62
Fruit	70	54	89	72	72	65
FAFH	80	62	93	79	90	77
Edible oil	90	62	95	99	99	96
Meat	94	82	96	98	99	95
Fish	97	90	100	99	100	97
Spices, condiments	98	92	100	99	100	98
Vegetables	99	98	99	99	100	100
Rice	100	100	100	100	100	100

Table 12. Quantity and value of consumption per food group.

Food group	All	Kampong Thom	Kandal	Prey Veng	Svay Rieng	Takeo
Rice	464	507	395	458	519	440
Edible oil	21	12	22	20	29	20
Vegetables	320	232	370	305	446	243
Meat	126	94	132	126	182	96
Fish	131	109	155	125	154	113
Fruit	166	139	203	157	184	145
Spices, condiments	81	70	80	84	98	75
Beverages, alcohol	117	84	120	98	181	102
Total quantity (g)	**1,426**	**1,246**	**1,477**	**1,373**	**1,793**	**1,235**
Food group						
Rice	1,036	1,142	919	1,019	1,099	1,002
Edible oil	171	99	158	177	228	193
Vegetables	1,128	795	1,338	1,106	1,585	806
Meat	2,144	1,616	2,194	2,200	3,019	1,670
Fish	1,327	949	1,470	1,247	1,585	1,374
Fruit	756	502	958	635	1,109	569
Spices, condiments	552	493	485	556	767	457
Beverages, alcohol	857	611	750	709	1,367	842
FAFH	1,292	895	1,965	960	1,582	1,051
Total value (KHR)	**9,262**	**7,100**	**10,237**	**8,609**	**12,340**	**7,964**

Note: adult equivalent per day.

Table 13. Quantity and share of consumption per food group, by province (purchased and home production).

Food group	Kampong Thom			Kandal			Prey Veng			Svay Rieng			Takeo		
	Total	**Purchased**	**Produced**	**Total**	**Purchased**	**Produced**	**Total**	**Purchased**	**Produced**	**Total**	**Purchased**	**Produced**	**Total**	**Purchased**	**Produced**
Rice	507	250	248	395	316	64	458	109	342	519	106	406	440	180	230
Edible oil	12	12	-	22	21	1	20	19	0	29	29	-	20	20	-
Vegetables	232	153	72	370	236	126	305	183	115	446	228	195	243	158	76
Meat	94	70	21	132	121	8	126	104	18	182	133	48	96	86	9
Fish	109	79	18	155	108	41	125	107	14	154	113	35	113	94	17
Fruit	139	49	89	203	95	104	157	63	88	184	103	73	145	95	47
Spices, condiments	70	59	9	80	67	10	84	62	19	98	78	17	75	62	12
Beverages, alcohol	84	78	6	120	107	9	98	83	10	181	175	6	102	96	5
Total quantity (g)	**1,246**	**750**	**462**	**1,477**	**1,072**	**364**	**1,373**	**731**	**607**	**1,793**	**966**	**780**	**1,235**	**792**	**397**
		% purchased	**% produced**		**% purchased**	**% produced**		**% purchased**	**% produced**		**% purchased**	**% produced**		**% purchased**	**% produced**
Rice		49%	49%		80%	16%		24%	75%		20%	78%		41%	52%
Edible oil		99%	0%		95%	5%		97%	1%		100%	0%		100%	0%
Vegetables		66%	31%		64%	34%		60%	38%		51%	44%		65%	31%
Meat		75%	22%		92%	6%		82%	14%		73%	27%		89%	10%
Fish		72%	16%		70%	26%		86%	11%		73%	22%		83%	15%
Fruit		36%	64%		47%	51%		40%	56%		56%	40%		65%	32%
Spices, condiments		84%	12%		84%	13%		75%	23%		80%	18%		83%	15%
Beverages, alcohol		92%	7%		89%	8%		84%	10%		97%	3%		95%	5%
Total value (KHR)		**60%**	**37%**		**73%**	**25%**		**53%**	**44%**		**54%**	**43%**		**64%**	**32%**

Note: adult equivalent per day.

Table 14. Value and share of consumption per food group, by province (purchased and home production).

Food group	Kampong Thom			Kandal			Prey Veng			Svay Rieng			Takeo		
	Total	**Purchased**	**Produced**	**Total**	**Purchased**	**Produced**	**Total**	**Purchased**	**Produced**	**Total**	**Purchased**	**Produced**	**Total**	**Purchased**	**Produced**
Rice	1,142	538	604	919	772	147	1,019	272	747	1,099	269	830	1,002	432	571
Edible oil	99	99	-	158	154	4	177	177	-	228	228	-	193	193	-
Vegetables	795	596	199	1,338	936	402	1,106	728	378	1,585	996	590	806	603	203
Meat	1,616	1,256	359	2,194	2,089	105	2,200	1,951	249	3,019	2,321	698	1,670	1,572	98
Fish	949	789	159	1,470	1,171	300	1,247	1,159	88	1,585	1,319	266	1,374	1,184	190
Fruit	502	267	234	958	527	431	635	345	290	1,109	737	371	569	419	149
Spices, condiments	493	349	144	485	404	82	556	340	216	767	481	286	457	338	118
Beverages, alcohol	611	587	24	750	712	38	709	647	62	1,367	1,338	29	842	815	27
FAFH	895	895	-	1,965	1,965	-	960	960	-	1,582	1,582	-	1,051	1,051	-
Total quantity (g)	**7,100**	**5,376**	**1,724**	**10,237**	**8,730**	**1,507**	**8,609**	**6,580**	**2,029**	**12,340**	**9,271**	**3,069**	**7,964**	**6,608**	**1,356**
		% purchased	**% produced**		**% purchased**	**% produced**		**% purchased**	**% produced**		**% purchased**	**% produced**		**% purchased**	**% produced**
Rice		47%	53%		84%	16%		27%	73%		24%	76%		43%	57%
Edible oil		100%	0%		98%	2%		100%	0%		100%	0%		100%	0%
Vegetables		75%	25%		70%	30%		66%	34%		63%	37%		75%	25%
Meat		78%	22%		95%	5%		89%	11%		77%	23%		94%	6%
Fish		83%	17%		80%	20%		93%	7%		83%	17%		86%	14%
Fruit		53%	47%		55%	45%		54%	46%		67%	33%		74%	26%
Spices, condiments		71%	29%		83%	17%		61%	39%		63%	37%		74%	26%
Beverages, alcohol		96%	4%		95%	5%		91%	9%		98%	2%		97%	3%
FAFH		100%	0%		100%	0%		100%	0%		100%	0%		100%	0%
Total value (KHR)		**76%**	**24%**		**85%**	**15%**		**76%**	**24%**		**75%**	**25%**		**83%**	**17%**

Note: adult equivalent per day.

Table 15. Food insecurity and access score.

Access	Total	Kampong Thom	Kandal	Prey Veng	Svay Rieng	Takeo
Food secure	50	40	48	47	53	65
Mildly food insecure	20	26	19	22	16	17
Moderately food insecure	22	21	27	24	27	10
Severely food insecure	8	13	6	8	4	9

Table 16. Food insecurity and access score, by poverty status and gender of household head.

Access	All	Non-IDPoor	IDPoor	Male head	Female head
Food secure	50	55	30***	54	35***
Mildly food insecure	20	20	19	20	20
Moderately food insecure	22	20	33***	20	29*
Severely food insecure	8	6	18***	6	16***

Note: t-tests were used to test if the variables of interest are significantly different between groups (non-IDPoor households versus IDPoor households, male-headed households versus female-headed households).

** mean statistically significant at 10%; ** mean statistically significant at 5%; *** mean statistically significant at 1%.*

Citation

This publication should be cited as: Sokcheng, P. 2024. Diet Composition and Dietary Diversity in the Cambodian Mekong Delta: Evidence from a Rural Household Survey. Penang, Malaysia: WorldFish. Report.

Acknowledgments

This work was implemented as part of the CGIAR Initiative on Securing the Food Systems of Asian Mega-Deltas for Climate and Livelihood Resilience (INIT-18), which is carried out with support from funders through their contributions to the CGIAR Trust Fund. For details please visit: *https://www.cgiar.org/funders/*

Design and production

Chua Seong Lee, Thavamaler Ramanathan and Sabrina Chong, WorldFish.

Photo credits

Sean Vichet/WorldFish.

CGIAR is a global research partnership for a food-secure future. CGIAR science is dedicated to transforming food, land, and water systems in a climate crisis. Its research is carried out by 13 CGIAR Centers/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector. *www.cgiar.org*

To learn more about this Initiative, please visit *https://www.cgiar.org/initiative/asian-mega-deltas/*.

To learn more about this and other Initiatives in the CGIAR Research Portfolio, please visit *www.cgiar.org/cgiar-portfolio*

Alliance Bioversity & CIAT

CIP INTERNATIONAL POTATO CENTER

CIMMYT International Maize and Wheat Improvement Center

IRRI

IWMI International Water Management Institute

WorldFish

CGIAR INITIATIVE ON Asian Mega-Deltas