

Diet Quality Monitoring in Lao PDR

Global Diet
Quality Project



Diet Quality Monitoring in Lao PDR



Global Diet Quality Project

Methods, adaptation and results from the **Diet Quality Questionnaire – Lao PDR**

Prepared by the Global Diet Quality Project & UNICEF

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List of Abbreviations and Acronyms

DHS	Demographic and Health Surveys
DQQ	Diet Quality Questionnaire
FAO	Food and Agriculture Organization of the United Nations
FBDGs	Food-based dietary guidelines
GDRs	Global Dietary Recommendations
HFSS	High in Fat, Salt and Sugar
ILO	International Labour Organization
IYCF	Infant and young child feeding
MDD-W	Minimum dietary diversity for women
MICS	Multiple Indicator Cluster Surveys
NCDs	Non-communicable diseases
PDR	People's Democratic Republic
UN	United Nations
UNICEF	United Nations Children's Fund
USD	United States dollar
WFP	World Food Programme
WHO	World Health Organization



Executive Summary

This report describes new diet quality data for the population in Lao PDR, collected in a nationally-representative survey of adults aged 15 and older from August to December 2021 in the Gallup World Poll. The data were collected using the Diet Quality Questionnaire (DQQ) as a tool for gathering routine monitoring data. The DQQ was carefully adapted for Lao PDR, in partnership with UNICEF, to provide a feasible means of monitoring diet quality in the population. The indicators derived from the questionnaire include minimum dietary diversity for women (MDD-W) and several indicators reflecting dietary risk factors for non-communicable diseases (NCDs). Additional indicators collected in the adult population are aligned with the new indicators of unhealthy feeding practices for IYCF (infant and young child feeding) defined by the World Health Organization and UNICEF, on sugar-sweetened beverage consumption, unhealthy food consumption, and zero fruits and vegetables (WHO and UNICEF 2021). These indicators, with harmonized food list adaptations, allow consistent diet data collection across the life course.

DQQ data from Lao PDR provide insights into positive dietary patterns as well as other dietary factors that may put the population at increased risk of various forms of malnutrition. Diet quality in this country is characterized by a high proportion of people consuming vegetables, fruit, and animal-source foods, and relatively high dietary risk factors for NCDs. Three-fourths (73 per cent) of women of reproductive age consume diets that meet MDD-W (at least five of 10 food groups), which means that more than a quarter (27 per cent) of women have a lower probability of micronutrient adequacy from their diet. About 27 per cent of adults consume all five food groups typically recommended in food-based dietary guidelines. The food groups most likely to be missing are pulses, nuts, or seeds (32 per cent) and whole grains (16 per cent). In contrast, the food groups most commonly consumed in addition to staple foods are animal-source foods (91 per cent) and vegetables (91 per cent). Related to dietary risk factors for NCDs, 42 per cent of the population consume processed meats, sweets (42 per cent) and instant noodles (27 per cent). Soft drinks are another area of concern, more prevalent in urban (42 per cent) than rural (28 per cent) areas.

Previous evidence shows that while prevalence of hunger is low in Lao PDR (5 per cent), food insecurity was reported by 32 per cent of the population, and the majority of Laotians (80 per cent) cannot afford healthy diets that meet dietary guidelines (FAO, IFAD, UNICEF, WFP and WHO, 2022). This evidence reveals that although Lao PDR has demonstrated political commitment to tackle malnutrition through a number of existing policies, strategies, action plans and initiatives, access to healthy diets remains a critical challenge in the country.

Actions to reinforce and protect current positive dietary patterns, and to curb and reverse those associated with increased risk of various forms of malnutrition, are needed. Because dietary diversity is fairly high despite low affordability of a healthy diet, it may be important to increase consumed quantities of diverse nutrient-rich foods and reduce reliance on starchy staple grains. Dietary improvements can also come from increased consumption of whole grains, legumes, nuts and seeds. Action is needed to reduce consumption of ultra-processed food including soft drinks, deep fried foods, salty packaged snacks and instant noodles, especially in urban areas. These foods are known to displace nutrient-rich foods in the diet and are also associated with elevated NCD risk. The results of this diet quality survey can serve as a starting point to further refine needed actions and a point of comparison to track progress over the coming years.

Diet Quality and Nutrition

Diet, the food people eat, is a central component of wellbeing. It reflects the sum of what society provides and an individual's circumstances, which either support or hamper the consumption of nourishing food. This centrality of diet to wellbeing is reflected in health statistics: poor diet and malnutrition are estimated to be the two top risk factors within the global burden of disease (Afshin et al, 2019). No country is immune from the public health impact of poor-quality diets: dietary inadequacy and diet-related NCDs occur across national income levels (Global Nutrition Report, 2021).

Yet, most countries lack routine, current, comparable data on what people eat. Situations such as the recent COVID-19 pandemic show how vitally useful it is to have routinely collected data on what people are eating, and how their diets might shift because of shocks and over time. A healthy diet helps promote health and prevent disease, in providing adequacy without excess of essential nutrients and avoids health-harming substances, while poor diets are estimated to be among the top risk factors driving the global burden of disease (Global Burden of Disease study, 2021).

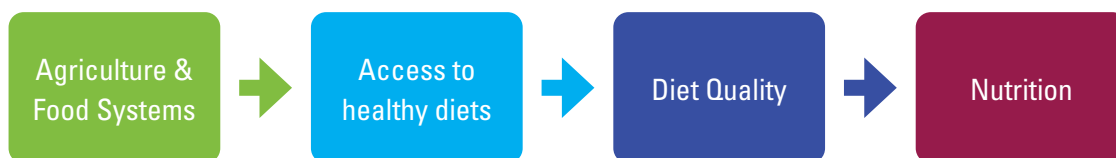
According to the 2021 Global Nutrition Report, 33.1 per cent of children in Lao PDR are stunted and 5.3 per cent face undernourishment, while obesity affects 5.2 per cent of Laotian adults (Global Nutrition Report, 2021). Almost a third (32 per cent) of Laotians face moderate to severe food insecurity, and more than three-quarters (80 per cent) of the population cannot afford a healthy diet. Lack of access to healthy diets can increase vulnerability to malnutrition in all its forms – including undernutrition and nutrient deficiencies, as well as diet-related NCDs such as cardiovascular disease, diabetes, and certain cancers.

Understanding dietary patterns and trends in populations is the first step to inform actions to support and improve diet quality and track progress over time.

Linking Diet Patterns to Food Systems: Improving Agriculture and Food Environments to Support Healthy Diets

One of the important uses of diet quality data is to help connect food systems to diet and nutrition outcomes. The primary way that agriculture affects nutrition is by improving access to healthy diets and diet quality (Figure 1). If this pathway is to be realized, or others such as social protection, programming, or nutrition education for improved dietary behaviours, data on what people are eating will be helpful. Such data can help guide actions to improve access to healthy diets, or curb intake of foods to limit.

Figure 1. Measuring diet quality is essential for tracking the impact of agriculture and food system change on nutrition



Some actions to improve access to healthy diets may be needed in agriculture and food systems. This is especially relevant in Lao PDR where many people are not only consumers, but also directly involved in food production. The country has a relatively high share of employment in agriculture, with 32 per cent of the working population engaged in agricultural production. Despite many Laotians depending on farming for their livelihoods, national agricultural efficiency remains low as reflected by an agricultural infrastructure index (11/100) ranking lower than the rest of the region (43/100) and individual productivity (value added per worker) seeing little improvement in recent years (World Bank, 2015). While cereal yields have increased (from 4.2 metric tonnes per hectare in 2013, to 4.5 in 2017), the supply of vegetable crops is diminishing across Lao PDR (from 8.9 million tonnes in 2013, to 8.2 in 2019) (FAO, 2019; FAO, 2017).

Diet Quality Monitoring

Lao PDR has previously conducted a national dietary survey, with the most recent data from the 2016 National Dietary Intake Survey of three representative regions – Northern lowlands, Central-southern highlands and the Mekong corridor – and collected data from two provinces in each region, two districts within each province, and two villages in each district.¹ However, since 2016, the country context has been influenced by a number of dynamic factors. The COVID-19 pandemic, supply chain shocks and inflation have been compounded by intensifying impacts of climate change and weather patterns that could affect food supply and policy shifts that could impact food environments or social protection. All such changes may have influenced diet patterns.

While large-scale data collection efforts – like the Lao PDR 2016 National Dietary Intake Survey – can be informative, diet quality monitoring is needed to provide a frequent and rapid complement to national quantitative surveys.

¹ This food consumption survey relied on the 24-hour dietary recall method and sampled 2,045 individuals, across an age range of 0.3-89 years. The survey randomly sampled 42 households in each village and chose one representative per household to report food intake. Portion sizes were estimated using various tools such as photo books (demonstrating portion sizes) and calibrated milk bottles (to understand the quantity of human milk consumed by infants and young children).

For the purposes of triggering or inspiring action to improve diets, diet quality monitoring data should be collected in a way that allows it to be disaggregated by gender, region, income level and season. Lao PDR is a lower middle-income country where 18.3 per cent of the population lives under the poverty line (World Bank, 2020). The last measured GINI Index (2018) in Lao PDR is 38.8, up several points from previous years (36 in 2012), signaling that income inequality may be rising, similar to neighbouring countries (World Bank, 2017). Thus, it is increasingly important to be able to monitor differences in diet quality trends and risks by income.

DQQ: a Tool for Diet Quality Monitoring

The **Diet Quality Questionnaire** (DQQ) is a low-burden, country-adapted tool designed for monitoring diet quality indicators in a population and changes over time, including during shocks like the COVID-19 pandemic or other food security and economic challenges. It was adapted for use in Lao PDR by the Global Diet Quality Project² in partnership with UNICEF in Lao PDR, with funding from the European Union.

Dietary data using the DQQ was collected in August-December 2021 by the Gallup World Poll.³ This report describes the data collection methods, results, and recommendations for priority actions in the food system to improve healthy diets. The DQQ is freely available for use in Lao PDR, and is a standard tool for diet quality monitoring harmonized with adapted tools for more than 100 countries.

Background & Methodology

The DQQ includes 29 food groups (see Figure 2) selected for their relationship to nutrition and health, sustainability, national food-based dietary guidelines (FBDGs), and alignment with United Nations indicators and recommendations (Afshin et al., 2019; Willett et al., 2019; Mozaffarian, 2016; Monteiro et al., 2019; Willett et al., 2019; Springmann, 2019; Herforth et al., 2019; FAO, 2021; WHO and UNICEF, 2021; WHO, 2018; WHO, 2018; World Cancer Research Fund, 2018; Herforth et al., 2020).

² The Global Diet Quality Project is a collaboration between Gallup, Harvard Department of Global Health and Population, and the Global Alliance for Improved Nutrition (GAIN). The project aims to collect dietary quality data in the general adult population across countries worldwide, and to provide the tools for valid and feasible diet quality monitoring within countries.

³ <https://www.gallup.com/178667/gallup-world-poll-work.aspx>

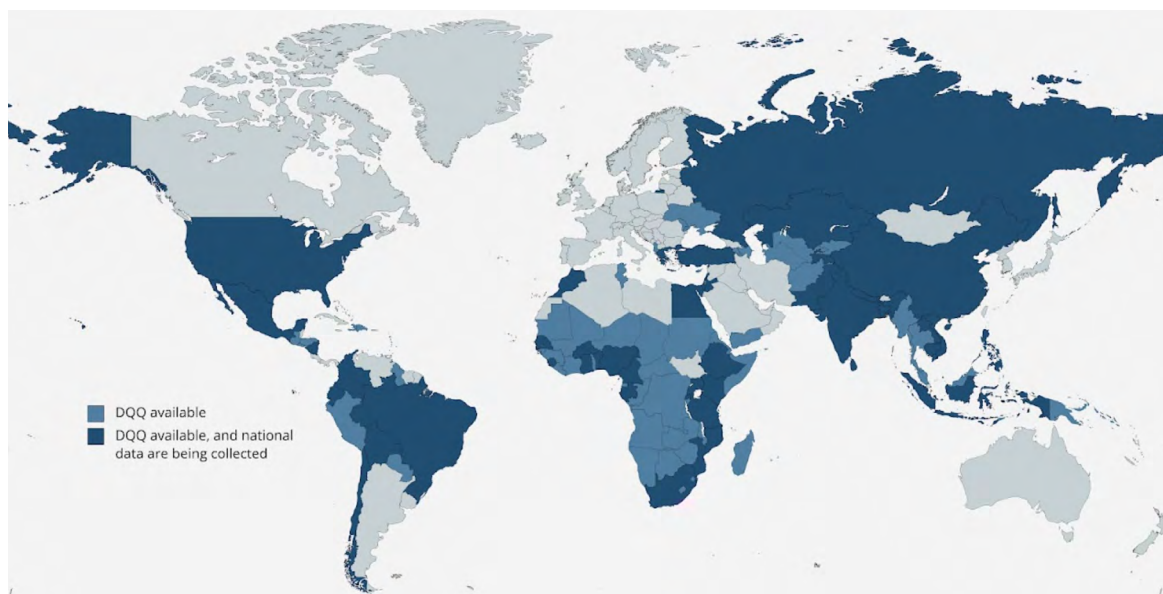
Figure 2. Food groups captured by the DQQ

PLANT FOODS	ANIMAL-SOURCE FOODS	FOODS TO LIMIT
<ul style="list-style-type: none"> • Foods made from grains • Whole grains • White roots/tubers • <ul style="list-style-type: none"> • Legumes • Nuts and seeds • <ul style="list-style-type: none"> • Vitamin A-rich orange vegetables • Dark green leafy vegetables • Other vegetables • Vitamin A-rich fruits • Citrus • Other fruits 	<ul style="list-style-type: none"> • Eggs • Fluid milk • Cheese • Yogurt • Processed meats • Unprocessed red meat (ruminants) • Unprocessed red meat (non-ruminant) • Poultry • Fish and seafood 	<ul style="list-style-type: none"> • Baked sweets • Other sweets • Sodas, energy drinks, sports drinks • Fruit juice and fruit -flavored drinks • Sweet tea/coffee/cocoa • <ul style="list-style-type: none"> • Packaged ultra-processed salty snacks • Instant noodles • Deep fried foods • Fast food

The DQQ takes approximately five minutes to conduct and breaks down two key barriers to diet quality monitoring: (1) nutrition expertise and (2) cost. Pre-adapted with national expertise and global consistency, the DQQ requires no further expertise by the user. By front-loading the nutrition expertise built into the adaptation, the tool can simply be read as is, enabling data collection in agriculture projects. Collecting national DQQ monitoring data in a national sample in the Gallup World Poll costs approximately USD 30,000, which is <5 per cent of the cost of a typical national quantitative dietary intake survey. A validation study from Ethiopia, the Solomon Islands and Viet Nam shows that food group consumption data collected from DQQ was comparable to a 24-hour multiple pass dietary recall (Uyar et al., 2023).

Ready-to-use country-adapted questionnaires are available to download for more than 100 countries, as shown in Figure 3, at www.dietquality.org. The low-burden DQQ generates indicators that enable accurate, population-level diet quality monitoring and has produced comparable diet quality data collection across a large number of countries for the first time (Global Diet Quality Project, 2022).

Figure 3. Available DQQ country adaptations, and data collection status (2022)

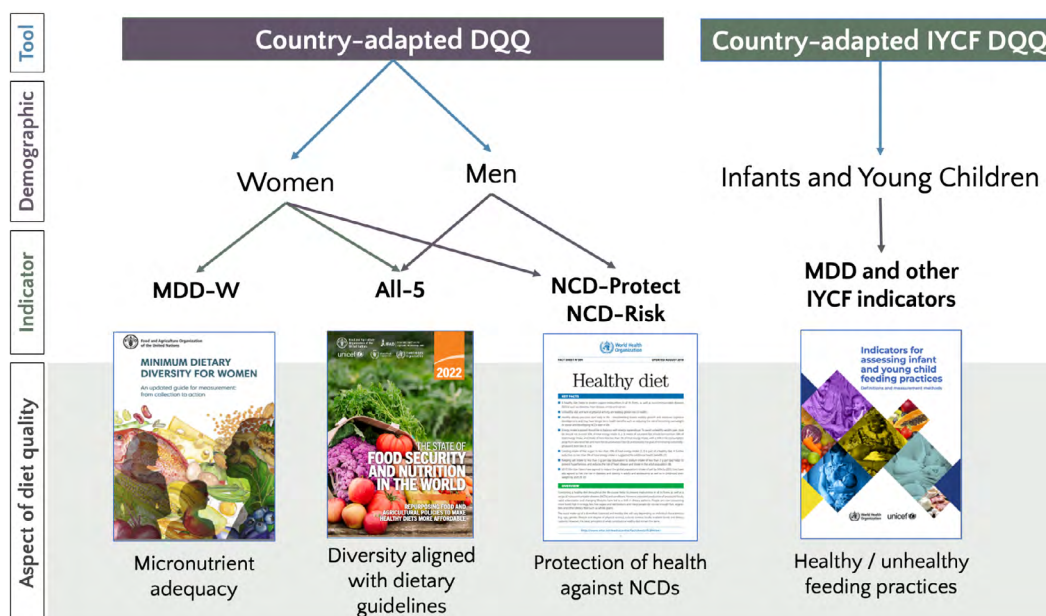


Note: See dietquality.org for current coverage.

Indicators

When implemented, DQQ food groups can be used to construct indicators of nutrient adequacy and dietary risk factors for NCDs. These include the MDD-W score for women, three scores for all adult populations (see Figure 4): (1) Food Group Diversity Score, (2) consumption of all five recommended food groups (All-5), and (3) Global Dietary Recommendations (GDR) score, which sums NCD-Protect and NCD-Risk (referred to as the GDR-Healthy score and GDR-Limit score in Herforth et al. 2020). There is a companion survey for infant and young child feeding (IYCF DQQ), which is an additional standardized tool available for collecting data to calculate IYCF indicators (WHO and UNICEF 2021). It is aligned with food group consumption data collected for the DQQ from adults and the general population.

Figure 4. Main indicators that can be derived from DQQ and companion IYCF DQQ



Notes: NCD-Protect and NCD-Risk are indicators to track WHO guidance on healthy diets. Herforth, A. W., Wiesmann, D., Martinez-Steele, E., Andrade, G., & Monteiro, C.A. (2020). Introducing a Suite of Low-Burden Diet Quality Indicators that Reflect Healthy Diet Patterns at Population Level. *Current developments in nutrition*, 4(12).

Reports pictured: FAO 2021; FAO, IFAD, UNICEF, WFP and WHO, 2022; WHO 2018; WHO and UNICEF 2021.

The DQQ and the indicators it enables are closely aligned with diet quality work of UN organizations and governments.

- DQQ standardizes the collection of the MDD-W indicator, following FAO guidance (FAO, 2021).
- DQQ measures adherence to WHO healthy diet recommendations, (WHO, 2018; Herforth et al., 2020) dietary risk factors for NCDs and nutrition transition trends including ultra-processed foods (Monteiro et al., 2019).
- DQQ aligns with WHO and UNICEF indicators for young child feeding, allowing coherent measurement of diet quality across the life-cycle (WHO and UNICEF, 2021) (Figure 5).
- Demographic and Health Surveys (DHS) use DQQ questions for women and children.
- DQQ can measure general adherence to national FBDGs (Herforth et al., 2022). For example, almost all countries recommend their citizens consume fruits and vegetables in abundance, as well as include starchy staples, animal-source foods, and legumes in their diets (Herforth et al., 2019). DQQ can measure the proportion of people consuming all five of these recommended food groups (All-5): a minimal standard of where diet quality in the population stands relative to recommendations (Global Diet Quality Project, 2022).⁴

⁴ If a country recommends a different set of food groups (e.g. dairy, nuts and seeds, dark green leafy vegetables, fish, etc.), these too are captured by the DQQ. Countries can use the food group data to measure general adherence to their own national FBDGs.

The DQQ and IYCF DQQ were developed to enable collection of harmonized food group data and diet quality indicators across the life cycle, in addition to IYCF indicators specific to the age range of 0–23 months (see Figure 5). DQQ can be used to assess dietary patterns and trends in the general population, and is asked of individuals to report their own consumption. The DQQ for IYCF is designed for infants and young children aged under two years and is asked of the primary caregiver of the infant or young child. These questionnaires enable population-level diet quality monitoring. They are not designed for clinical assessment of individuals.

Figure 5. DQQ indicators that enable continuum of data collection across the life course

Indicators shaded orange are published by WHO and UNICEF (2021)

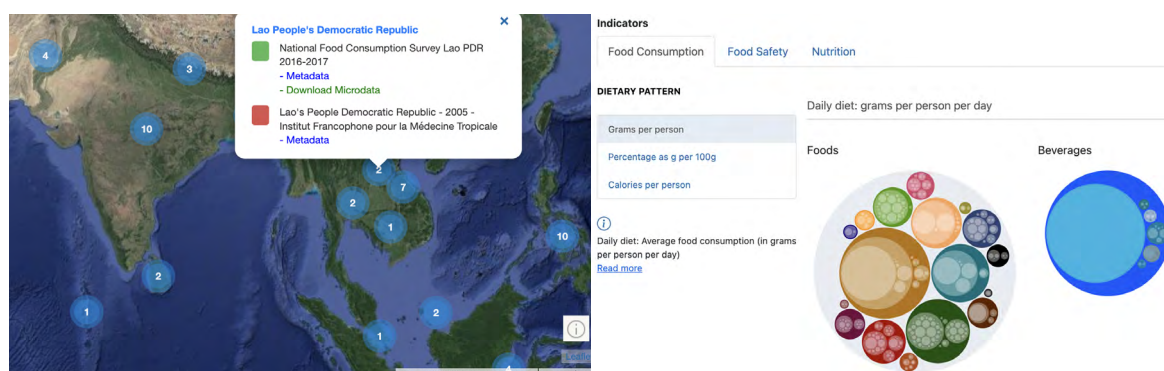
IYCF indicator (age 6-23 months)	Adult indicator (age 15+)
Minimum dietary diversity 6-23 months (MDD)	MDD-W* (0/1)
Egg and/or flesh food consumption 6-23 months (EFF)	Animal-source food consumption (egg, flesh, or dairy)
Sweet beverage consumption 6-23 months (SwB) (-)	Soda, energy drinks, or sports drinks consumption (-)
Unhealthy food consumption 6-23 months (UFC) (-)	Unhealthy food consumption** (-)
a. Sweet food consumption 6-23 months (-)	a. Sweet food consumption** (-)
b. Savory and fried snack consumption 6-23 months	b. Savory and fried snack consumption** (-)
Zero vegetable or fruit consumption 6-23 months (ZVF) (-)	Zero vegetable or fruit consumption (-)
All-5. In addition to breastfeeding or milk feeding, consumed all five food groups recommended in the general population: at least 1 vegetable, at least 1 fruit, at least 1 pulse, nut or seed, egg and/or flesh food consumption, and at least 1 starchy staple	All-5. Consumed all five food groups recommended in the general population: at least 1 vegetable, at least 1 fruit, at least 1 pulse, nut or seed, at least 1 animal-source food, and at least 1 starchy staple
Whole grain consumption 6-23 months	Whole grain consumption
Processed meat consumption 6-23 months (-)	Processed meat consumption (-)

Notes: Calculation of all adult indicators can be found in the DQQ Indicator Guide, available at dietquality.org. Indicators marked with (-) are negative indicators (higher score is worse). *MDD-W has been validated only for women aged 15-49 years. All other indicators can be calculated for the total population. **These indicators can be calculated but may not be very meaningful among people over age 2 years, because in contrast to infants, in older populations moderation is more important than total avoidance of sweet and fried snacks.

Methods: DQQ Adaptation for Lao PDR

The Diet Quality Questionnaire was adapted to Lao PDR's context in 2020 by the Global Diet Quality Project adaptation team, with funding from UNICEF and the European Union. The questionnaire adaptation was done in two parts: first, a literature review of studies and previous surveys was conducted to identify foundational material on commonly consumed foods in Lao PDR, and then a series of key informant interviews were done to consult with local experts and finalize the “sentinel food” lists for each food group. **Sentinel foods** are commonly consumed foods that capture **the majority** of the population consuming the food group. During the desk review, several local studies and resources were used, including the 2016–2017 National Food Consumption Survey in **Lao PDR**, and the “Nutrient Dense Food Crops” book, co-developed with **Lao PDR's** Ministry of Health and the World Food Programme in 2020 (Figure 6).

Figure 6. Lao PDR Diet Quality Questionnaire - Desk Review Materials



Source: The FAO and WHO Global Individual Food consumption Tool (GIFT) was leveraged to analyze and visualize data from the 2016-2017 National Food Consumption Survey in Lao PDR.

Next, through a consultation process where six key informants representing different food systems-related disciplines in Lao PDR were interviewed, sentinel foods were identified and used to create country-specific questions for the country-adapted questionnaire. The key informants had backgrounds and expertise in general nutrition, community nutrition, maternal nutrition, infant and young child feeding and held positions in different institutions: WFP, UNICEF, Mahidol University, SNV (Netherlands Development Organization), and USAID. Among the key informants, two were nutrition experts from UNICEF who provided detailed feedback and confirmation on the inclusion/exclusion of common foods in Lao PDR. Later in the process, a larger UNICEF team supported translation of the final questionnaire to ensure accuracy of common terms.

As a tropical country in Southeast Asia, Lao PDR's domestic agriculture and food production experiences considerable changes across its distinct wet and dry seasons – especially as it pertains to fresh foods. In adapting the DQQ, testimonies from key informants helped build sentinel food lists that remain relevant year-round and applicable across different geographic zones. Country-adapted DQQ tools include foods commonly consumed in different regions and seasons within each country.

As a final step in the adaptation, harmonization was conducted with neighbouring countries in Southeast Asia to understand patterns and anomalies in terms of common foods identified. The harmonization process can identify any missed or forgotten food items by comparing country-specific sentinel foods with other lists in the region. Follow-up interviews and emails were conducted to determine whether to add any missing foods, or to exclude any anomalous foods.

The adaptation process in Lao PDR brought to light several country-specific anomalies, where local expertise steered decision-making on what should be included, and ensured foods were categorized correctly. Several foods were excluded from the Lao PDR DQQ as they are habitually consumed in amounts less than 15 grams. Examples included “sesame seeds” that are frequently used as garnish, fermented fish “paa deek” commonly employed as a condiment and herbs like basil or coriander that Laotians use to add flavour to dishes. While these foods may be consumed in amounts greater than 15 grams, they are most commonly consumed in smaller amounts and therefore were excluded from the DQQ to avoid inflation of food group consumption data. The 15-gram cutoff arose from validation of MDD-W, showing that food group-based indicators have greater validity when amounts below that cutoff are excluded (FAO 2021).

For several local foods, classification into correct food groups required deliberation on how people view and consume the products in question. For example, while “glass noodles” are technically made from legumes, the Lao PDR DQQ groups them with “other noodles” under the **foods made from grains** category. Key informants clarified they are not a product of processed beans (like tofu). Instead, the noodles are made from starch, which is industrially extracted from mung beans and devoid of nutrients and fiber present in other legumes and legume products. Another example is “mung beans,” categorized with **other vegetables** because they are consumed in the form of sprouts, not as mature legumes (see Figure 7). “Sesbania” is listed in two categories, but carefully specified in different ways in each: the leaves are **dark green leafy vegetables**, while the flowers are **other vegetables**. Some terms mentioned by key informants, such as “forest vegetables”, were not included because wording was considered too broad, captured different but inconsistent food items, and was unlikely to be understood the same way by all survey participants.

DQQ questions include seven items or fewer in most cases to ensure cognitive validity of questions, as respondents have difficulty remembering more items. For categories with substantial diversity, however, multiple questions can be asked for the same food group, each including up to seven items (one-three questions depending on the range of local products). In Lao PDR, the adaptation process found remarkable diversity in the **other vegetables** category, where key informants suggested more than 20 commonly consumed vegetables. Using three questions enabled inclusion of locally relevant items such as gourds, flowers, shoots and sprouts.

Figure 7. Differentiating mung beans vs. mung bean sprouts (different food groups)



Sources: Photo of mung beans (left) was sourced from “Five Seasons TCM” website. Photo of mung bean sprouts was sourced from “Cookpad” website.

In early 2021, the Lao PDR Diet Quality Questionnaire (DQQ) was finalized in English and Lao languages and shared with the Gallup World Poll team, who worked with local teams to provide additional expertise on the food list, and ensure that all terms and translations are correct and recognizable by local populations. The questionnaire was made publicly available on the Global Diet Quality Project website in late 2021, and can be downloaded from www.dietquality.org, along with a guide for practitioners on how to implement the DQQ, and how to calculate aforementioned indicators using data from the Lao PDR DQQ. The DQQ is included in this report (Supplementary Material 1). A full “dictionary” of foods used in the Lao PDR Diet Quality Questionnaire catalogues global descriptions of all common and translated terms (Supplementary Material 2, [Lao PDR DQQ Dictionary](#)).

Methods: Lao PDR National Data Collection in 2021

The Global Diet Quality Project implemented the country-adapted DQQ among a nationally representative sample⁵ of 1,000 women and men aged 15 year and older⁶ from 30 August to 14 December 2021 in the Gallup World Poll. Data were collected with funding from UNICEF and the European Union. The DQQ was conducted via face-to-face interviews covering a range of topics and each lasting approximately one hour in total, although the DQQ module takes only about five minutes. The identities of respondents remained confidential.

5 The Gallup World Poll is administered in representative samples of the entire resident population aged 15 and older. The coverage area is the entire country including rural areas, and the sampling frame represents the entire civilian, non-institutionalized adult population of the country. Exceptions include areas where the safety of the interviewing staff is threatened and scarcely populated islands in some countries. More information about GWP methods and sampling here: <https://www.gallup.com/178667/gallup-world-poll-work.aspx>

6 Excluded Xaisomboun province, Xayaboury province and some communes that are unreachable and/or have security considerations. In addition, during fieldwork, Attapu and Houaphan were also excluded due to COVID-19 (COVID-19 red zones). The excluded areas represent approximately 14 per cent of the population.

The Gallup World Poll conducts regular surveys in more than 150 countries and areas, representing more than 98 per cent of the world's adult population (Gallup 2022). It is the only survey that covers countries across all income levels (lower middle- and high-income) and regions. Gallup measures key indicators such as law and order, food and shelter, job creation, migration, financial life, personal health, civic engagement and evaluative wellbeing that are related to other world development indicators. It has collected data on food security in collaboration with FAO, financial inclusion in collaboration with the World Bank, and modern slavery in collaboration with the ILO. Data across countries globally on each of these topics was critical for them to become Sustainable Development Goal indicators (FAO et al., 2021).

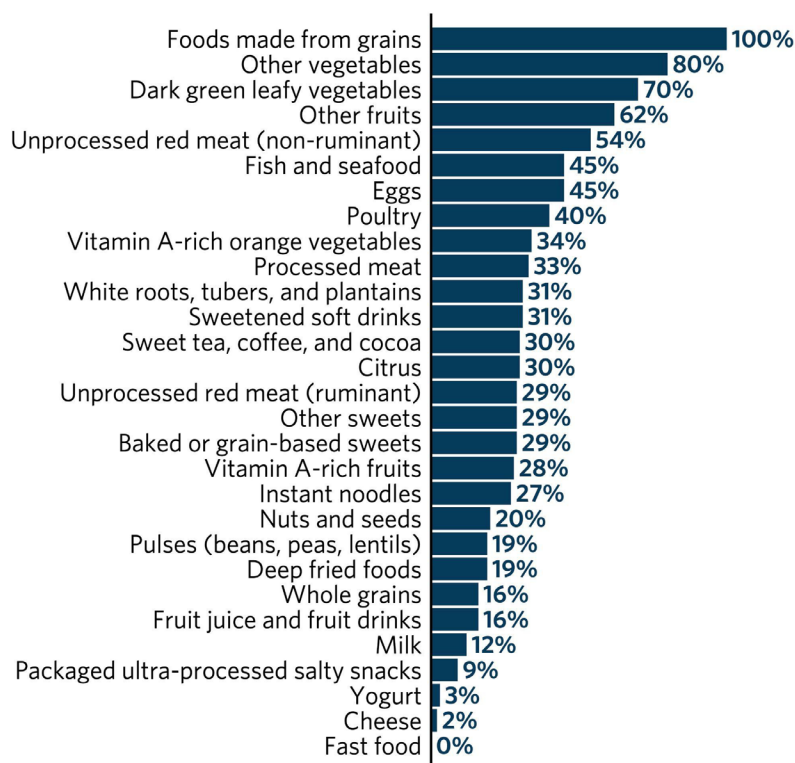
Gallup World Poll uses randomly selected, nationally representative samples. Gallup typically surveys 1,000 individuals in each country or area, using a standard set of core questions that has been translated into the major languages of the respective country. In some regions, supplemental questions are asked in addition to core questions. The coverage area is the entire country including rural areas, and the sampling frame represents the entire civilian, non-institutionalized, aged 15 and older populations.

Results: Lao PDR National Data Collection in 2021

Consumption across the 29 food groups is shown in Figure 8. The five most commonly consumed food groups, by more than half of the population each, are foods made from grains (100 per cent), other vegetables (80 per cent), dark green leafy vegetables (70 per cent), other fruits (68 per cent), and non-ruminant unprocessed red meat, such as pork (54 per cent). Dairy products have very low consumption, comprising three of the five least-consumed food groups: milk (12 per cent), yogurt (3 per cent), and cheese (2 per cent). Packaged ultra-processed salty snacks like chips (9 per cent) and fast food (0 per cent) were also rarely consumed.

Health-protective food groups most consumed are fruits and vegetables, while health-protective food groups least consumed are whole grains (only 16 per cent consuming), pulses (19 per cent), and nuts and seeds (20 per cent). Foods to limit which are associated with risk factors for NCDs include processed meat, consumed by a third (33 per cent) of people in Lao PDR, and sweetened soft drinks, consumed by nearly a third (31 per cent).

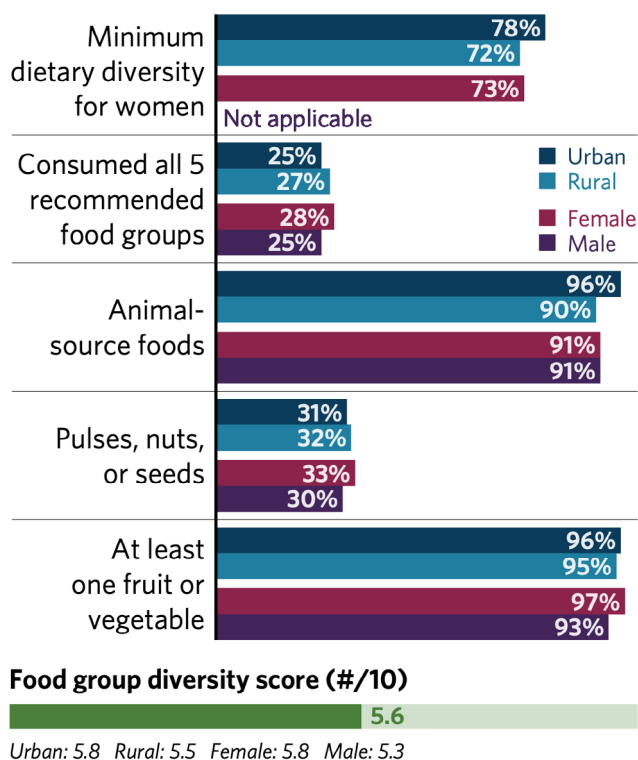
Figure 8. DQQ Lao PDR results by food group, as collected by Gallup World Poll (2021)



Diet Quality Findings in Lao PDR

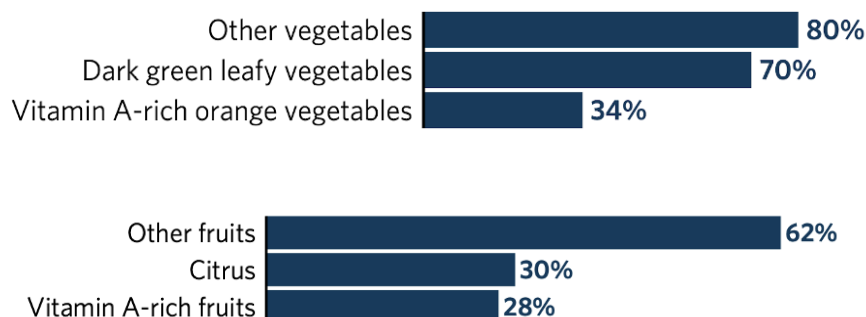
In Lao PDR, diet quality is adequate in some ways, but not others. Most women (73 per cent) meet MDD-W, which is associated with a higher probability of micronutrient adequacy. However, the majority of the population does not consume all recommended food groups. Only 27 per cent of adults consume all five food groups typically recommended in food-based dietary guidelines, including vegetables; fruit; pulses, nuts or seeds; animal-source foods and staple foods (Figure 9). The recommended food group most likely to be missing from diets is “pulses, nuts, or seeds”, consumed by only about one-third of the population. These are protein-rich and micronutrient-rich foods, and missing these food groups may be a risk factor for nutrient inadequacy.

Figure 9. Dietary adequacy in Lao PDR



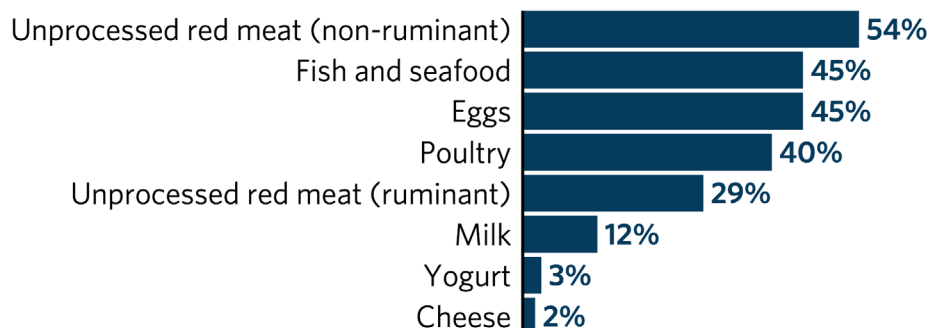
Most Laotians are consuming at least one fruit or vegetable (Figure 9). Looking further into this aggregated food group, the highest consumption falls in the large diverse groups of “other vegetables”, “dark green leafy vegetables” and “other fruits”, each of which are asked using more than one question. Approximately a third of Laotians also consume citrus fruits (30 per cent), and vitamin A-rich orange vegetables and fruits (34 and 28 per cent, respectively). Overall this suggests high fruit and vegetable consumption, although the DQQ does not measure quantities, so food group consumption could reflect either small or large quantities of consumption. In Lao PDR, 63 per cent of people consumed at least three out of the six fruit and vegetable groups, which in other countries was an indicator associated with meeting the WHO minimum recommendation of 400g of fruits and vegetables per day, although this indicator has not been validated globally (Herforth et al., 2020).

Figure 10. Consumption of fruits and vegetables in Lao PDR



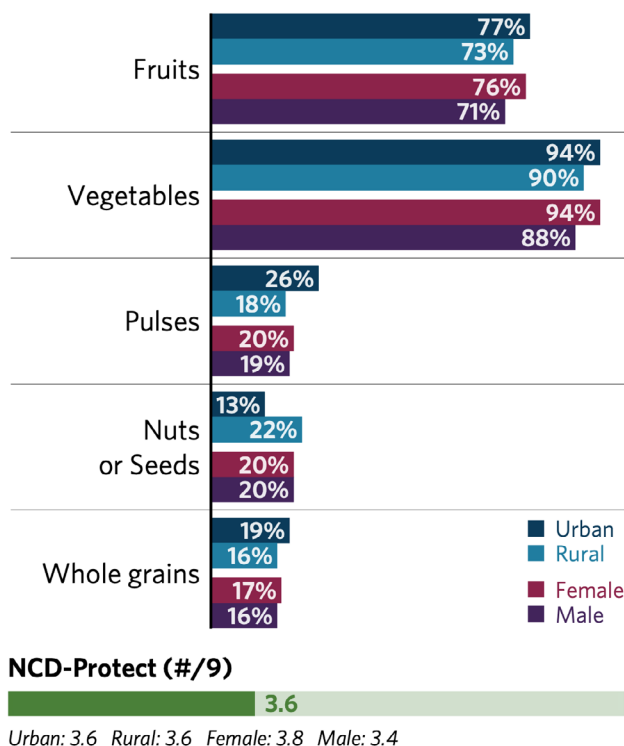
Looking further into the results for animal-source foods, the highest consumption is of unprocessed non-ruminant red meat (pig meat, frog, rabbit, mouse), followed by fish and seafood, eggs, poultry, and less than a third consuming unprocessed ruminant red meat (beef, goat, buffalo). Few Laotians consume any form of dairy (Figure 11).

Figure 11. Consumption of animal-source foods in Lao PDR



Several dietary factors protect against diet-related NCDs such as heart disease, cancer and diabetes. In Lao PDR, the major protective factor against diet-related NCDs is the consumption of fruits and vegetables by most people. Other disease-preventing dietary factors, including pulses, nuts and seeds, and whole grains are not nearly as widely consumed (Figure 12). The NCD-Protect indicator, reflecting global dietary recommendations for factors that protect health and including all of these food groups, is therefore mostly driven by fruit and vegetable consumption in Lao PDR.

Figure 12. Dietary factors that protect against NCDs in Lao PDR



When it comes to negative dietary risk factors for NCDs, these include high consumption of free sugar, salt, total and saturated fats, processed meat, and unprocessed red meat. Several food groups shown in Figure 13 correlate with these risk factors. In Lao PDR, the most highly consumed of these food groups to limit are processed meats (33 per cent), sweet foods (42 per cent), soft drinks (31 per cent), and instant noodles (27 per cent) which drive the combined category “salty snacks, instant noodles or fast food” (Figures 13 and 14). Soft drinks are about equally consumed as sweet tea, coffee or chocolate drinks (Figure 14), but soft drinks are prevalent in urban (42 per cent) versus rural (28 per cent) areas. Other foods to limit have particularly high rates of consumption in urban areas, especially processed meats, and deep-fried foods (Figure 13). The NCD-Risk indicator includes all of these food groups, reflecting global dietary recommendations for dietary factors that increase risk of NCDs, and shows that on average people in Lao PDR are consuming one to three food groups associated with increased NCD risk per day (average score 2.7). Consumption of these foods is higher among urban residents, as compared to their rural counterparts (Figure 13).

Figure 13. Dietary risk factors for NCDs in Lao PDR

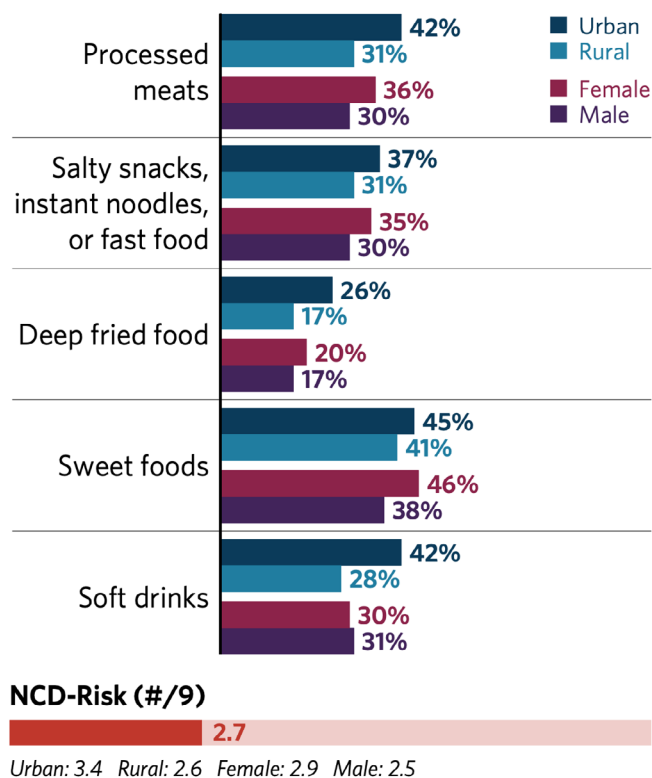
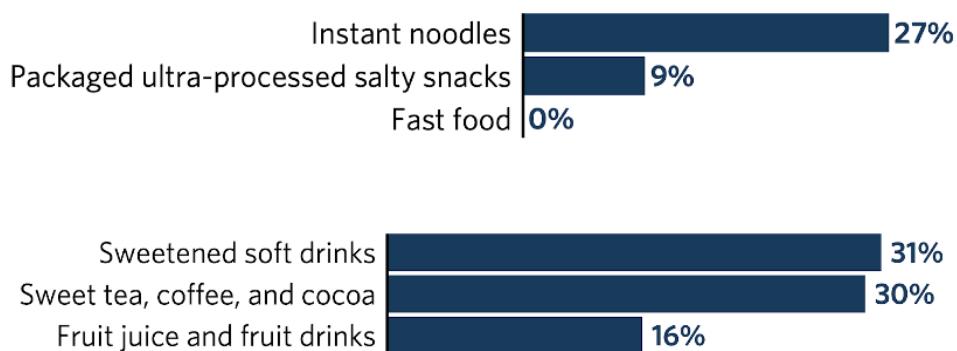


Figure 14. Consumption of salty and fried snacks and sugar sweetened beverages in Lao PDR



Diet Quality Data Across the Life Course

When looking across the life course, Lao PDR data for three IYCF indicators are available from the DHS and MICS surveys (2017; UNICEF global database 2021). Minimum Dietary Diversity (MDD) in IYC (36 per cent, UNICEF) is much lower than for adult women (73 per cent, Gallup DQQ). However, there is high egg and flesh food consumption among IYC (79 per cent), aligned with the adult indicator of animal-source foods in adults (91 per cent), and fairly high intakes of vegetables and fruits among IYC (64 per cent), although not quite as high as adults (95 per cent). These comparisons suggest that IYC diet quality is limited by factors other than adults, including care practices.

We also see coherence with some previous measures of school-going adolescents. In 2015, when 37 per cent reported less than daily fruit consumption (data available at the Food Systems Dashboard⁷), slightly higher than the data point that 27 per cent of adults did not have at least one fruit (Gallup DQQ). For adolescents in 2015, 50 per cent reported daily sugar-sweetened carbonated beverage consumption (data available at the Food Systems Dashboard). In adults aged 15 and older, 51 per cent had any sweet beverages, of which 31 per cent was soft drinks (Gallup DQQ).

Food Production, Food Environment, and Diet Quality in Lao PDR

Dietary outcomes are influenced by different components of the food system, including food supply chains that produce and distribute foods from field to fork, and the food environments where consumers interact with and acquire food items (Food Systems Dashboard, 2020). The dashboard has identified likely challenge areas in food systems for Lao PDR (Figure 15).

The challenge areas identified in the Lao PDR food system include low pulse supply along with consumption (19 per cent). Another challenge area is a high percentage of dietary energy from cereals, roots and tubers, as well as high costs of a healthy diet relative to cost of an energy-sufficient diet consisting of starchy staples.

Cereals, roots and tubers make up a high share of dietary energy in Lao PDR (63 per cent), as compared to neighbouring countries in Southeast Asia (59 per cent) and the global average (50 per cent) (FAO, 2016). While cereal yields in Lao PDR are on par with the region (4.5 tonnes/hectare), vegetable yields are considerably lower (8.2 tonnes/hectare in Lao PDR, versus 12 tonnes/hectare in Southeast Asia). These supply-side factors in the food environment may affect prices and consumption of each type of food.

⁷ <https://www.foodsystemsdashboard.org/>

The availability of fruits and vegetables in the Laotian food supply chain is a likely precursor to the high prevalence of consumption seen in Gallup World Poll data. In Lao PDR, the supply of vegetables is 603 grams per day, while supply of fruit is 404 g/day (FAO, 2018). This is relatively high compared to the global (386 g/day of vegetables, 210 g/day of fruit) and regional averages (198 g/day of vegetables, 198 g/day of fruit). However, the cost of adequate fruits and vegetables was USD 1.63 (PPP) in 2017, 39 per cent of daily per capita household food expenditures (FAO, IFAD, UNICEF, WFP and WHO 2022). Lack of affordability can present a significant barrier to consumption of healthy diets by restricting financial access to nutritious food.

These indicators point to the likelihood that the proportion of starchy staples in the diet is high, and quantities of other diverse foods are low. This could help to explain why most women achieve MDD, while a healthy diet meeting all recommendations (including adequate quantities) is unaffordable for many.

Figure 15. Likely challenge areas across food system components in Lao PDR



Notes: from the “FSD Diagnose” tool, created for the Food Systems Dashboard https://alexandrabellows.shinyapps.io/FSD_Diagnose/

Actions to Improve Diet Quality in Lao PDR

Data collection through DQQ has provided insights about diet quality challenges in Lao PDR, which can be leveraged to identify relevant actions for improving dietary adequacy among Laotians and providing protection against NCDs.

Actions to reinforce and protect current positive dietary patterns, and to curb and reverse those associated with increased risk of various forms of malnutrition, are needed. Previous evidence shows that while prevalence of hunger is low in Lao PDR (5 per cent), food insecurity is a concern for almost 32 per cent of the population, and the majority of Laotians (80 per cent) cannot afford healthy diets that meet dietary guidelines (FAO, IFAD, UNICEF, WFP and WHO 2022). This evidence reveals that although Lao PDR has demonstrated political commitment to tackle malnutrition through a number of policies, strategies, action plans and initiatives—including the National Nutrition Strategy (2016-2025)—access to healthy diets remains a critical challenge in the country (Lao PDR Ministry of Health et al. 2015).

The data from Lao PDR provide insights into positive dietary patterns as well as other dietary factors that may put the population at increased risk of various forms of malnutrition. On the positive side, the majority of Laotians (91 per cent) consume at least one vegetable – especially women – which helps to provide dietary adequacy and protect against NCDs, and many Laotians also consume fruit (74 per cent). The majority also consume animal-source foods (91 per cent). There do not appear to be significant gender disparities in overall diet quality, although women have a higher amen, reflecting higher risk factors for NCDs among women (see Figure 13).

Dietary improvements can come from increased consumption of whole grains, pulses, nuts, and seeds. The majority cannot afford a healthy diet—creating an urgent need to improve access and affordability of diverse nutrient-rich foods and reduce reliance on starchy staple grains. Action is also needed to reduce consumption of food groups that pose dietary risks—including processed meats, sweet foods, soft drinks, deep fried foods, and instant noodles, especially in urban areas. These foods are known to displace nutrient-rich foods in the diet and are also associated with elevated NCD risk.

The results of this diet quality survey can serve as a starting point to further refine needed actions and as a point of comparison to track progress over the coming years.

There are several policies and actions with potential to get food systems working for improved diet quality and widespread access to healthy diets. Given the likely challenge areas faced by food environments and citizens in Lao PDR, there are several measures that could be further developed and customized to suit the Laotian context (see Figure 16).

Figure 16. Relevant policies and actions for Lao PDR

Priority (for Lao PDR)	Action	What impact could the action have?
High	Deliver agricultural extension programmes, infrastructure and education to support farmers to grow and market nutritious foods	Increase availability and affordability of nutritious foods to local populations
High	(Re)design agricultural development programmes intended to increase food producers' income to also focus on producing, and accessing markets for, nutritious crops and providing nutrition education	Increase availability and affordability of nutritious foods to local populations
High	Provide women with agricultural assets, training and support to increase agriculture productivity and output, and access to markets to sell nutritious foods	Increase availability and affordability of nutritious foods to local populations
High	Design trade policies to prioritize the supply of nutritious foods over those manufactured high in fats, sugars and salt, taking account of the benefits of local and international supply chains in different contexts, protection smallholder farmers, and availability of complementary policies	Increase availability and affordability of nutritious foods and reduce availability and affordability of foods high in fats, sugars and salt and increase to all populations
High	Provide inputs and training to develop and maintain home gardens along with nutrition education	Increase availability, access, affordability and appeal of nutritious foods to populations with access to home gardens (i.e., cultivated plots around or close to people's homes)
Medium	Provide low-income households, including women, with support for animal husbandry and training for animal rearing, safety management and processing along with nutrition education	Increase the availability, affordability and appeal of animal-source foods to producer households
Medium	Deliver (peri-)urban agriculture programmes which provide land and other inputs, support local market development and deliver training and nutrition education	Increase availability, access, affordability and appeal of nutritious foods to urban populations
Medium	Restrict all forms of marketing, advertising and in-store promotions of HFSS foods, particularly to children	Reduce appeal foods high in fat, sugar and salt to children
Medium	Launch engaging and compelling mass media and behaviour change communication campaigns about foods and diets	Increase appeal of nutritious foods and reduce appeal of foods high in fats, sugars and salt to all populations
Low	Research and develop alternative proteins sources and share the research in the public domain	Increase availability, affordability and appeal of alternative micronutrient-rich protein sources and reduce appeal of red meat to high red-meat consumers
Low	Build and improve roads, transportation, storage, cold chain and logistical distribution infrastructure to enable the delivery of safe, perishable nutritious foods to urban and rural markets.	Increase availability, affordability and safety of nutritious foods in markets serving local populations.

Source: Hawkes, C., Walton, S., Haddad, L., Fanzo, J. 2020. 42 policies and actions to orient food systems towards healthier diets for all. London: Centre for Food Policy, City University of London.

Summary, Key Recommendations & Conclusion

In summary, the diet data collected in Lao PDR in 2021 outlines diet patterns for the season of August-December. The results suggest that a high proportion of the population consumes fruits and vegetables, which is important to support as a positive attribute of diets. Most people also consume animal-source foods, also helpful for diet quality. On the other hand, diets in Lao PDR include risk factors for NCDs which include consumption of sodas and deep-fried foods that is higher in urban than rural areas, while instant noodles are equally highly consumed in rural and urban areas.

Three key recommendations for actions to improve diet quality in Lao PDR are:

1. Maintain high vegetable and fruit demand and inclusion in diets, encouraging quantity of consumption of at least 400 grams per day.
2. Maintain animal-source foods in diets, which deliver micronutrients and balance, while avoiding overconsumption.
3. Curb growth in ultra-processed food consumption, especially in sugar-sweetened beverages, deep fried foods and instant noodles.

Encouraging healthy diets includes improving quantities of non-staple foods for adequacy, and limiting the conditions for high or increasing consumption of unhealthy foods.



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Supplementary Materials

Supplementary Material 1. Lao PDR Diet Quality Questionnaire

Read: Now I'd like to ask you some yes-or-no questions about foods and drinks that you consumed yesterday during the day or night, whether you had it at home or somewhere else.

First, I would like you to think about yesterday, from the time you woke up through the night. Think to yourself about the first thing you ate or drank after you woke up in the morning ... Think about where you were when you had any food or drink in the middle of the day ... Think about where you were when you had any evening meal ... and any food or drink you may have had in the evening or late-night... and any other snacks or drinks you may have had between meals throughout the day or night.

I am interested in whether you had the food items I will mention even if they were combined with other foods.

Please listen to the list of foods and drinks, and if you ate or drank ANY ONE OF THEM, say yes.

	Yesterday, did you eat any of the following foods:	(circle answer)
1	Rice, sticky rice, fresh noodles, Chinese noodles, other noodles, porridge, or bread? ເຂົ້າ, ເຂົ້າໜຽວ, ເຝີເສັ້ນຂາວ, ເຝີເສັ້ນເຫຼືອງ, ເຝີຊະນິດອື່ນໆ, ເຂົ້າປຽກ, ເຂົ້າຈີ່?	YES or NO
2	Maize grain, sweet corn, Job's tears, or black rice? ເມັດສາລີ, ເມັດສາລີຫວານ, ໝາກເດືອ, ເຂົ້າກ້າ?	YES or NO
3	Potato, jicama, cassava, sweet potato, taro, tapioca, wing yam, or mankeyo? ມັນຝະລັ່ງ, ມັນເຜົາ, ມັນຕົ້ນ, ມັນດ້າງ, ເຜືອກ, ເມັດສາຄູທີ່ເອັດຈາກມັນຕົ້ນ, ມັນອອນ, ມັນແກວ?	YES or NO
4	Broad beans, kidney beans, black beans, peas, tofu, or soymilk? ຖົ່ວປາກອ້າ, ເມັດຖົ່ວແດງ, ເມັດຖົ່ວດຳ, ຖົ່ວລົ້ນເຕົາ, ເຕົ້າຮຸ້, ຖົ່ວເຫຼືອງ?	YES or NO
	Yesterday, did you eat any of the following vegetables:	
5	Carrots, pumpkin, or sweet potatoes that are yellow or orange inside? ກາລິດ, ໝາກອີ, ມັນດ້າງ?	YES or NO
6.1	Morning glory, mustard greens, amaranth, ivy gourd leaves, pumpkin leaves, or bitter melon leaves? ຜັກບັ້ງ, ຜັກກາດຊອມ, ຜັກຫຸມ, ໃບຕຳນິນ, [pumpkin leaves], [bitter melon leaves], ບອກກາລີ?	YES or NO
6.2	Choi sum, Chinese kale, pak wan, acacia, water mimosa, Sesbania leaves, or moringa leaves? ຜັກກາດວາງຕຸງ, ຜັກກາດນາ, ຜັກຫວານ, ໃບກະຖິນ, ຜັກກະເສດ, [Sesbania leaves], ໃບມະລຸມ?	YES or NO
7.1	Bamboo shoots, eggplant, cabbage, lettuce, mung bean sprouts, long beans, or winged beans? ໜົມໄມ້, ໝາກເຂືອ, ກະລໍ່າປີ, ຜັກສະລັດ, ຖົ່ວງອກ, ໝາກຖົ່ວຂຽວຜັກຍາວ, [winged beans]?	YES or NO
7.2	Wax gourd, sponge gourd, bottle gourd, ridge gourd, bitter melon, chayote, or cucumber? ໝາກໂຕ່ນ, ໝາກບວບ, ໝາກນ້ຳ, ໝາກໜອຍ, ໝາກມະລະ, ໝາກຊູ, ໝາກແຕງ?	YES or NO
7.3	Cauliflower, mushrooms, tomatoes, banana flower, Sesbania flower, green papaya, or green mango? ກະລໍ່າດອກຂາວ, ເຫັດ, ໝາກເລັ່ນ, ໝາກປີ, dok kae, ໝາກຮຸ່ງດິບ, ໝາກມ່ວງດິບ?	YES or NO
	Yesterday, did you eat any of the following fruits:	
8	Ripe mango, ripe papaya, passionfruit, or local apricots? ໝາກມ່ວງສຸກ, ໝາກຮຸ່ງສຸກ, ໝາກໜອດ, ໝາກແອັບພິຄອດ?	YES or NO
9	Orange, grapefruit, pomelo, or mandarin? ໝາກກ້ຽງ, ໝາກລາແຊງ, ໝາກສົ້ມໄອ, ໝາກຂາມ?	YES or NO
10.1	Banana, watermelon, melon, apple, guava, sapodilla, or grapes? ໝາກກ້ວຍ, ໝາກໂມ, ໝາກແຕງ, ໝາກແອັບໄປໄ, ໝາກສິດາ, [sapodilla], [grapes]?	YES or NO
10.2	Custard apple, pineapple, jujube, jackfruit, dragonfruit, young coconut, langsat, longan or rambutan? ໝາກຄຽບ, ໝາກນັດ, ໝາກກະຫັນ, ໝາກໝີ່, ໝາກມັງກອນ, ໝາກຟ້າວອ່ອນ, ໝາກລຳໃຍ?	YES or NO
	Yesterday, did you eat any of the following sweets:	
11	Cakes, kanom kai, donuts, cookies, cassava cake, sticky rice with banana, or sticky rice with mango? ເຄັກ, ຂະນົມໄຂ່, ໂດນັດ, ຄຸກກີ້, ຂະໜົມມັນຕົ້ນ, ເຂົ້າໜຽວໜ້າໝາກກ້ວຍ, ເຂົ້າໜຽວໜ້າໝາກມ່ວງ?	YES or NO
12	Candy, chocolates, ice cream, nam wan, kanom ta koh, kanom tuay, or kanom san? ຂະນົມອົມ, ຊອກໂກແລກ, ກະແລມ, ນ້ຳຫວານ, ຂະນົມໂຄກ, ຂະໜົມຕັດ, ຂະນົມຊິ້ນ?	YES or NO
	Yesterday, did you eat any of the following foods of animal origin:	
13	Eggs? ໄຂ່?	YES or NO
14	Cheese? ເນີຍ?	YES or NO

Supplementary Material 1. Lao PDR Diet Quality Questionnaire (cont.)

15	Yogurt? ໂຍເກີດ?	YES or NO
16	Sausages, hot dogs, meatballs, or dried meat? ໃສ່ກອກ, ຮອດດອກ, ລູກຊີ້ນ, ຊີ້ນແຫ້ງ?	YES or NO
17	Cow meat, goat meat, or buffalo meat? ຊີ້ນງົວ, ຊີ້ນແປ້, ຊີ້ນຄວາຍ?	YES or NO
18	Pig meat, frog, rabbit, field mouse, or wild animals? ຊີ້ນໝູ, ກົບ, ກະຕ່າຍ, ໝູ, ສັດປ່າ?	YES or NO
19	Chicken, duck, or wild birds? ໄກ້, ເປັດ, ສັດປີກ?	YES or NO
20	Fish from the sea, freshwater fish, or seafood? ປາທະເລ, ປານ້ຳຈືດ, ອາຫານທະເລ?	YES or NO
Yesterday, did you eat any of the following other foods:		
21	Peanuts, sunflower seeds, pumpkin seeds, or watermelon seeds? ຖົ່ວ, ເມັດດອກຕະເວັນ, ເມັດໝາກອຶ, ເມັດໝາກໂມ?	YES or NO
22	Chips or crisps such as Lays? ແຜ່ນມັນຝະລັ່ງທອດສາເລັດຮູບ ເຊັ່ນວ່າ ຍີ່ຫໍ້ເລ?	YES or NO
23	Instant noodles? ໝີ່ຫໍ້ສາເລັດຮູບ?	YES or NO
24	Fried potato, fried chicken, fried pork, fried fish, fried banana, kanom eun or kholo, patankoh or kanumku? ມັນຝະລັ່ງທອດ, ທອດໄກ້, ທອດໝູ, ທອດໄກ້, ຈີ້ນກວ້ຍ, ຂະນົມໄຂ່ອີງ, ຂະໝົມຄູ່ ຫຼື ປາຕັງໂກ?	YES or NO
Yesterday, did you have any of the following beverages:		
25	Dairy milk or powdered milk? ນົມ, [powdered milk]?	YES or NO
26	Sweetened coffee, sweetened tea, drinking tea, smoothie, flavored milk, Milo or Ovaltine? ກາເຟຫວານ, ນ້ຳຊາຫວານ, ນ້ຳຊາ, ນ້ຳປັ້ນ, ນົມສາເລັດຮູບ, ໄມໂລ, ໂອວັນຕິນ?	YES or NO
27	Fruit juice or fruit drinks? ນ້ຳໝາກໄມ້?	YES or NO
28	Soft drinks such as Pepsi, Coca-Cola, or Mirinda? ນ້ຳອັດລິມ ເຊັ່ນວ່າ ແປບຊີ, ໂຄຄາໂຄລາ, ມິລິນດາ?	YES or NO
Yesterday, did you get food from any place like...		
29	KFC, Pizza Company, Swensen Pizza, Lotteria, BKL, or other places that serve burgers or pizza? ເຄເອຟຊີ, ພິດຊາ, ພິດຊາ, [Lotteria], [BKL], [or other places that serve burgers or pizza]?	YES or NO

Adapted by the Global Diet Quality Project, www.dietquality.org. 2021. Supported by UNICEF Laos, the EU and BMZ (through GIZ), USAID, The Rockefeller Foundation, and SDC.



INSTRUCTIONS:

- 1) Read the DQQ exactly as written. Do not include additional dialogue or probing. Further instructions on how to use the DQQ can be found at: dietquality.org/dqq
- 2) Do not change the questions in any way. Do not add or remove foods. Changing the questions will invalidate the DQQ. The Creative Commons license (ND) does not allow modification.
- 3) If you desire to collect information on additional food items, additional food groups, or additional diet-related topics, they must be new questions and analyzed independently of the DQQ. Further information on how to analyze the DQQ to generate diet quality indicators can be found at: dietquality.org/indicators

Supplementary Material 2. Lao PDR Diet Quality Questionnaire - Term Dictionary

#	GROUP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Staple grains	Rice	sticky rice	fresh noodles	Chinese noodles	other noodles	porridge	bread										
1	Staple grains	ເຂົ້າ	ເຂົ້າໜຽວ	ເປີເສັ້ນຂາວ	ເປີເສັ້ນເຫຼືອງ	ເປີຊະນິດອື່ນໆ	ເຂົ້າປຽກ	ເຂົ້າຈີ່										
1	Staple grains	rice	sticky rice	fresh noodles	dry noodles	other noodles	porridge	bread										
2	Whole grains	Maize grain	sweet corn	Job's tears	black rice													
2	Whole grains	ເມັດສາລີ	ເມັດສາລີຫວານ	ໝາກເດືອ	ເຂົ້າກ້າ													
2	Whole grains	maize grain	sweet corn	adlay millet [Coix lacryma-jobi]	black rice													
3	White roots	Potato	jicama	cassava	sweet potato	taro	tapioca	wing yam	mankeyo									
3	White roots	ມັນຝະລັ່ງ	ມັນເຜົາ	ມັນຕົ້ນ	ມັນດ້າງ	ເຜືອກ	ເມັດສາລູທີ່ເຮັດຈາກມັນຕົ້ນ	ມັນອອນ	ມັນແກວ									
3	White roots	potato	yam bean/jicama [oelania]	cassava	white or purple sweet potato	taro	tapioca	wing yam	wild tuber									
4	Legumes	Broad beans	kidney beans	black beans	peas	tofu	soymilk											
4	Legumes	ຖົ່ວປາກອ້າ	ເມັດຖົ່ວແດງ	ເມັດຖົ່ວດຳ	ຖົ່ວລົ້ນເຕົາ	ເຕົ້າຊຸ້	ຖົ່ວເຫຼືອງ											
4	Legumes	broad beans	kidney beans	black beans	peas	tofu	soymilk											
5	Vit A veg	Carrots	pumpkin	sweet potatoes that are yellow or orange inside														
5	Vit A veg	ກາລິດ	ໝາກອີ	ມັນດ້າງ														
5	Vit A veg	carrots	pumpkin	sweet potatoes that are yellow or orange inside														
6	DGLV	morning glory	mustard greens	amaranth	ivy gourd leaves	pumpkin leaves	bitter melon leaves	broccoli	choi sum	Chinese kale	pak wan	acacia	water mimosa	Sesbania leaves	moringa leaves			
6	DGLV	ຜັກບັ້ງ	ຜັກກາດຊອມ	ຜັກຫຼຸມ	ໃບຕຳນິນ	[pumpkin leaves]	[bitter melon leaves]	ບອກກາລີ	ຜັກກາດກວາງຖຸງ	ຜັກກາດນາ	ຜັກຫວານ	ໃບກະຖິນ	ຜັກກະເສດ	[Sesbania leaves]	ໃບມະລຸມ			
6	DGLV	water spinach (Ipomoea aquatica)	mustard greens	amaranth	ivy gourd leaves	pumpkin leaves	bitter melon leaves	broccoli	Chinese cabbage	Chinese kale	Melientha suavis	acacia leaves (Senegalia pennata)	water mimosa	Sesbania leaves	moringa leaves			

Supplementary Material 2. Lao PDR Diet Quality Questionnaire - Term Dictionary (cont.)

#	GROUP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
7	Other veg	Bamboo shoots	eggplant	cabbage	lettuce	mung bean sprouts	long beans	winged beans	wax gourd	sponge gourd	bottle gourd	ridge gourd	bitter gourd	chayote	cucumber	Sesbania flower	green papaya	
7	Other veg	ໝໍໄມ້	ໝາກເຂືອ	ກະລໍ່າປີ	ຜັກສະລັດ	ຖິ້ວງອກ	ໝາກຖິ້ວຂຽວ ຝັກຍາວ	[winged beans]	ໝາກໂຕ່ນ	ໝາກບວບ	ໝາກນໍ້າ	ໝາກໜອຍ	ໝາກມະລະ	ໝາກຊູ	ໝາກແຕງ	dok kae	ໝາກຮຸ້ງດິບ	
7	Other veg	bamboo shoots	eggplant	cabbage	lettuce	mung bean sprouts	long beans	winged beans	wax gourd	sponge gourd	bottle gourd	ridge gourd	bitter gourd	chayote	cucumber	flower of Sesbania grandiflora	green papaya	
8	Vit A Fruit	ໝາກມ່ວງສຸກ	ໝາກຮຸ້ງສຸກ	ໝາກໜອດ	ໝາກແອັບພິດອດ													
8	Vit A Fruit	ripe mango	ripe papaya	passion fruit	local apricots													
8	Vit A Fruit	ripe mango	ripe papaya	passion fruit	local apricots													
9	Citrus	Orange	grapefruit	pomelo	mandarin													
9	Citrus	ໝາກກ້ຽງ	ໝາກລາແຊງ	ໝາກສົ້ມໂອ	ໝາກຂາມ													
9	Citrus	orange	grapefruit	pomelo	mandarin													
10	Other fruit	Banana	watermelon	melon	apple	guava	sapodilla	grapes	custard apple	pineapple	jujube	jackfruit	dragonfruit	young coconut	langsats, longan, or rambutan			
10	Other fruit	ໝາກກ້ວຍ	ໝາກໄມ	ໝາກແຕງ	ໝາກແອັບໄປ້	ໝາກສີດາ	[sapodilla]	[grapes]	ໝາກຄຽບ	ໝາກນັດ	ໝາກກະທັນ	ໝາກໝີ່	ໝາກມັງກອນ	ໝາກຟ້າວອ່ອນ	ໝາກລໍ່າໃຍ			
10	Other fruit	banana	watermelon	melon	apple	guava	sapodilla	grapes	custard apple	pineapple	jujube	jackfruit	dragonfruit	young coconut	langsats, longan, or rambutan			
11	Baked sweets	Cakes	kanom kai	donuts	cookies	cassava cake	sticky rice with banana	sticky rice with mango										
11	Baked sweets	ເຕັກ	ຂະນົມໄຂ່	ໂດນັດ	ຄຸກກີ້	ຂະໝົມມັນຕົ້ນ	ຂ້າໜຽວໜ້າໝາກກ້ວຍ	ຂ້າໜຽວໜ້າໝາກມ່ວງ										
11	Baked sweets	cakes	local cakes (variety)	donuts	cookies	cassava cake	sticky rice with banana	sticky rice with mango										
12	Sugar sweets	Candy	chocolates	ice cream	nam wan	kanom ta koh	kanom tuay	kanom san										
12	Sugar sweets	ຂະນົມອົມ	ຊອກໄກ່ແລກ	ກະແລມ	ນ້ຳຫວານ	ຂະນົມໂຄກ	ຂະໝົມຕັດ	ຂະນົມຊື່ນ										
12	Sugar sweets	candy	chocolates	ice cream	sweet soup	coconut creams	coconut custards	coconut jellies										

Supplementary Material 2. Lao PDR Diet Quality Questionnaire - Term Dictionary (cont.)

#	GROUP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
13	Eggs	Eggs																
13	Eggs	ໄຂ່																
13	Eggs	eggs																
14	Cheese	Cheese																
14	Cheese	ເນີຍ																
14	Cheese	cheese																
15	Yogurt	Yogurt																
15	Yogurt	ໂຍເກີດ																
15	Yogurt	yogurt																
16	Processed meat	Sausages	hot dogs	meatballs	dried meat													
16	Processed meat	ໄສ້ກອກ	ຮອດອກ	ລຸກຊີ້ນ	ຊີ້ນແຫ້ງ													
16	Processed meat	sausages	hot dogs	meatballs	dried meat													
17	Ruminant red meat	Cow meat	goat meat	buffalo meat														
17	Ruminant red meat	ຊີ້ນງົວ	ຊີ້ນແປ້	ຊີ້ນຄວາບ														
17	Ruminant red meat	beef	goat	water buffalo														
18	Non-ruminant meat	Pig meat	frog	rabbit	field mouse	wild animal												
18	Non-ruminant meat	ຊີ້ນໝູ	ກົບ	ກະຕ່າຍ	ໝູ	ສັດປ່າ												
18	Non-ruminant meat	pork	frog	rabbit	field mouse	wild animal												

Supplementary Material 2. Lao PDR Diet Quality Questionnaire - Term Dictionary (cont.)

#	GROUP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
19	Poultry	Chicken	duck	wild birds														
19	Poultry	ໄກ່	ເປັດ	ສັດປີກ														
19	Poultry	chicken	duck	wild birds														
20	Fish & seafood	Fish from the sea	freshwater fish	seafood														
20	Fish & seafood	ປາທະເລ	ປານ້ຳຈືດ	ອາຫານທະເລ														
20	Fish & seafood	fish from the sea	freshwater fish	seafood														
21	Nuts & seeds	Peanuts	sunflower seeds	pumpkin seeds	watermelon seeds													
21	Nuts & seeds	ຖິ້ວ	ເມັດດອກຕະວັນ	ເມັດໝາກອຶ	ເມັດໝາກໂມ													
21	Nuts & seeds	peanuts	sunflower seeds	pumpkin seeds	watermelon seeds													
22	Salty UPF snacks	Chips or crisps	such as	Lays														
22	Salty UPF snacks	ແຜ່ນມັນຝະລັ່ງທອດສ່ຳເລັດຮູບ	ເຊັ່ນວ່າ	ຍີ່ຫໍ້ເລ														
22	Salty UPF snacks	chips or crisps	such as	Lays														
23	Instant noodles	Instant noodles																
23	Instant noodles	ໝີ່ຫໍ້ສ່ຳເລັດຮູບ																
23	Instant noodles	instant noodles																
24	Deep fried	fried potato	Fried chicken	fried pork	fried fish	fried banana	kanom eun or kholo	patankoh or kanumku										
24	Deep fried	ມັນຝະລັ່ງທອດ	ທອດໄກ່	ທອດໝູ່ມ	ທອດໄກ່	ຈື່ນກວັບ	ຂະນົມໄຂ່ອຶງ	ຂະໜົມຄູ່ ຫຼື ປາຕັງໄກ່										
24	Deep fried	French fries	fried chicken	fried pork	fried fish	fried banana	deep fried puffed dough	fried dough										

Supplementary Material 2. Lao PDR Diet Quality Questionnaire - Term Dictionary (cont.)

#	GROUP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
25	Fluid milk	Dairy milk	powdered milk															
25	Fluid milk	ນົມ	[powdered milk]															
25	Fluid milk	dairy milk	powdered milk															
26	Sugar in tea /coffee/cocoa drinks	sweetened coffee	sweetened tea	drinking tea	smoothie	flavored milk	Milo	Ovaltine										
26	Sugar in tea /coffee/cocoa drinks	ກາເຟຫວານ	ນ້ຳຊາຫວານ	ນ້ຳຊາ	ນ້ຳປັນ	ນົມສ່ຳເລັດຮູບ	ໄມໂລ	ໂອວັນຕິນ										
26	Sugar in tea /coffee/cocoa drinks	sweetened coffee	sweetened tea	bottled sweet tea	smoothie	flavored milk	Milo	Ovaltine										
27	Fruit juice/drinks	Fruit juice or fruit drinks																
27	Fruit juice/drinks	ນ້ຳໝາກໄມ້																
27	Fruit juice/drinks	fruit juice or fruit drinks																
28	Soft drinks	Soft drinks	such as	Pepsi	Coca-Cola	Mirinda												
28	Soft drinks	ນ້ຳອັດລົມ	ຊັ້ນວ່າ	ແປບຊີ	ໂຄຄາໂຄລາ	ມິລິນດາ												
28	Soft drinks	Soft drinks	such as	Pepsi	Coca-Cola	Mirinda												
29	Fast food	KFC	Pizza Company	Swensen Pizza	Lotteria	BKL	or other places that serve burgers or pizza											
29	Fast food	ເຄເອຟຊີ	ພິດຊາ	ພິດຊາ	[Lotteria]	[BKL]	[or other places that serve burgers or pizza]											
29	Fast food	KFC	Pizza Company	Swensen Pizza	Lotteria	BKL	or other places that serve burgers or pizza											

