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FAOSTAT ANALYTICAL BRIEF 82

Food and diet

Statistics on dietary data

>> FAO Statistics Division

HIGHLIGHTS

→ FAO is launching under the Food and diet domain a set of four subdomains featuring different types of dietary data that users can easily access.

→ Statistics on nutrient supply, elaborated from FAO supply utilization accounts, are available for 186 countries from 2010.

→ Statistics on apparent nutrient intake are based on 38 household consumption and expenditure surveys conducted in 30 countries between 2010 and 2021.

→ Five nationally representative individual quantitative dietary intake surveys from four countries provide information on nutrient intake.

→ Statistics based on the minimum dietary diversity for women (MDD-W) indicator are sourced from ten individual qualitative dietary surveys in nine countries.

→ At the global level, the daily per capita availability of fat and riboflavin (vitamin B2) showed the largest increases between 2010 and 2021, with a rise of 13 percent and 12 percent, respectively, while that of carbohydrate (excluding fibre) and thiamin (vitamin B1) increased the least, with a rise of 3 percent and 5 percent, respectively.

→ At the household level, people from the lowest income quintile had a lower apparent at-home protein intake from animal sources than people from the highest income quintile.

→ At the individual level, data from the Mexico National Health and Nutrition Survey of 2012 showed that cereals and meat contributed more to the daily food intake of males compared to females while milk, vegetables and fruits contributed more to the daily food intake of females compared to males.

→ Also at the individual level, the percentage of women reaching minimum dietary diversity varied across surveys, ranging from 13 percent in Uganda (in 2020) to 80 percent in Tajikistan (in 2017). In six out of ten surveys, 50–60 percent of women of reproductive age achieved MDD-W at the national level.

FOOD AND DIET

BACKGROUND

One of the main obstacles towards a healthy diet for all is the insufficiency of available data and statistics on food and nutrition to support effective evidence-based policies. Despite the increasing availability of data, policymakers are often not aware of their existence or their relevance, and consequently these data are not used properly or to their full potential (HLPE, 2023). An added challenge is the scattered location of such data and statistics, and the lack of a centralized structure to house harmonized statistics on food and nutrition from different types of dietary data.

As a result of this, five teams from three divisions[1] of the Food and Agriculture Organisation of the United Nations (FAO) joined forces to produce and publish harmonized food and nutrient statistics from different types of dietary data by creating an integrated food and diet (F&D) domain available through FAOSTAT (FAO's comprehensive statistical database on food, agriculture, fisheries, forestry, natural resources management and nutrition).

The F&D domain is the first centralized location for the sharing of statistics on all forms of dietary-related data. The domain provides energy, macro- and micro-nutrient statistics and is composed of four subdomains presenting availability based on FAO supply utilization accounts (SUA) data, for 186 countries from 2010; apparent intake[2] based on 38 household consumption and expenditure surveys (HCES) conducted in 30 countries between 2010 and 2021; intake based on five nationally representative individual quantitative dietary data surveys from four countries; and statistics related to the Minimum Dietary Diversity for Women (MDD-W) indicator from ten individual qualitative dietary surveys conducted in nine countries.

The statistics are presented at the national level for all data sources, by geographic level for all data sources except SUA, and by sex-age groups for individual quantitative dietary data. The statistics by food groups are based on the nutrition-sensitive food group classification, previously developed within the framework of the FAO/ World Health Organization (WHO) Global Individual Food consumption data Tool (FAO/WHO GIFT) (FAO and WHO, 2023a), with a minor adaptation for HCES and SUA data.[3] Statistics on supply, apparent intake and intake are presented for energy, protein, fat, dietary fibre, calcium, iron, magnesium, phosphorus, potassium, zinc, vitamin A,[4] thiamin, riboflavin and vitamin C. While statistics on available carbohydrate (i.e. excluding fibre) are presented for supply and apparent intake, statistics on total carbohydrate are presented only for intake. Statistics on vitamin B6 and vitamin B12 are presented for apparent intake, intake and supply from aquatic products only. Finally, statistics for copper, selenium, total saturated fatty acids, total monounsaturated fatty acids, total polyunsaturated fatty acids, docosahexaenoic acid n-3 (DHA) and eicosapentaenoic acid n-3 (EPA) are presented for supply from aquatic products only.

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[1] The Nutrition Assessment team from the FAO Food and Nutrition Division (ESN); the Food Security and Nutrition Statistics team, the Crops, Livestock and Statistics team and the FAOSTAT team from the FAO Statistics Division (ESS); and the Statistics team from the FAO Fisheries and Aquaculture Division (NFI).

[2] Statistics from HCES are usually labelled as “apparent consumption” (Fiedler, 2013); however, in welfare analyses, the term “consumption” may refer to food and non-food expenditures, hence the use of the term “apparent intake”.

[3] For the detailed food grouping, please refer to the food group classification document that can be found in the right-hand side section of the F&D domain pages.

[4] Data for vitamin A are presented in retinol equivalents (RE) and retinol activity equivalents (RAE).

The SUA provide a picture of the food availability from the agriculture, fisheries and aquaculture sectors in a given country in a given calendar year (FAO, 2023a). They refer to individual products and their quantities, and cover around 500 food items, of which 90 percent correspond to crops and livestock food products and 10 percent to fisheries and aquaculture products. The statistics on nutrient supply are based on a new global nutrient conversion table (NCT) created specifically for the SUA data (Grande *et al.*, forthcoming). The uses of the SUA data include (a) building the food balance sheets, and consequently, the global monitoring of the prevalence of undernourishment; and (b) analysing/assessing dietary patterns in food supply in terms of quantities and nutrients, both within a country and between countries.

The HCES label is an umbrella term for household-level surveys developed to inform economic policies, such as household budget surveys, household income and expenditure surveys, and living standard measurement surveys. These surveys collect information on household characteristics (e.g. region and urban-rural status), household member characteristics (e.g. sex, age, education, food and non-food expenditures) and food quantities consumed and/or acquired during a reference period. These surveys have been widely used to assess the access dimension of food security (Russell *et al.*, 2018). The HCES microdata were downloaded from the World Bank Data Catalog (World Bank, 2023) and national statistical websites. In cases where the microdata were not available online, the data owners granted access to the data and permission to upload the statistics. The statistics on apparent nutrient intake are based on survey-specific nutrient conversion tables prepared by the Food Security and Nutrition Statistics team in the FAO Statistics Division.

Individual quantitative dietary data provide sex- and age-disaggregated data on food consumption, which are key for developing evidence-based policies and programmes for food, agriculture and nutrition. FAO/WHO GIFT (FAO and WHO, 2023b) was used as the source for individual quantitative dietary data. The datasets were screened for inclusion in the F&D domain, and surveys that were statistically representative of the surveyed population at the national level were selected for inclusion. The statistics on nutrient intake are based on food consumption information already matched to food composition values by the data owning institutions.

MDD-W is a food group diversity indicator developed by FAO and its partners that reflects one key dimension of diet quality: dietary diversity (FAO, 2021). It is used as a proxy for micronutrient adequacy. MDD-W is a simple dichotomous indicator of whether women 15 to 49 years of age have consumed at least five out of ten defined food groups in the previous 24 hours. The higher the proportion of women in the sample who reach this threshold, the higher the chance that women in the population are consuming micronutrient-adequate diets. MDD-W can be used for assessing dietary diversity at the population level, evaluating the impact of programmes, informing policies and setting targets. Because women are often the household members most at risk of malnutrition, MDD-W focuses on this particularly vulnerable group, and therefore, follows a gender-sensitive approach to provide a proxy measurement of minimum dietary diversity. Data sources for MDD-W-related statistics included in the F&D domain are nationally representative surveys from the demographic and health survey (DHS) programme country reports, the living standards measurement study from the World Bank, and retroactively calculated statistics from individual quantitate dietary data from FAO/WHO GIFT.

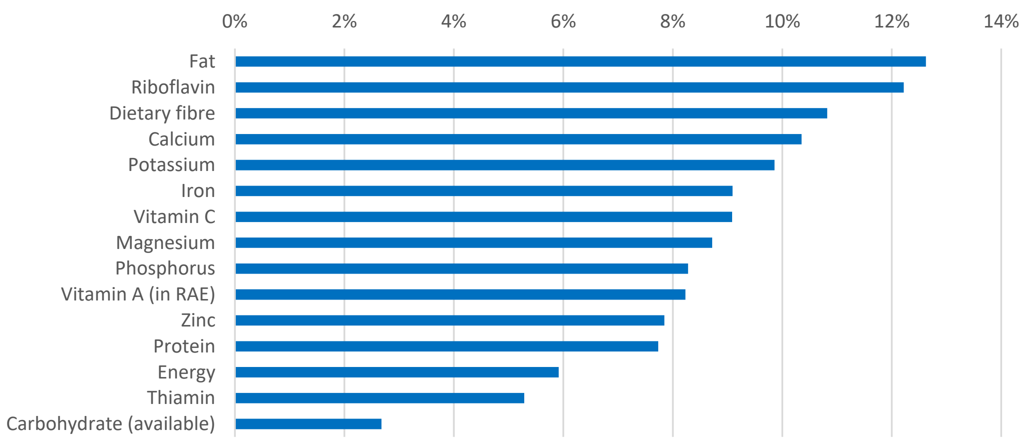
The four F&D subdomains, along with their respective FAOSTAT metadata, are presented in English, French and Spanish. Statistics will be updated and expanded as new data become available and are processed.

AVAILABILITY FROM SUPPLY UTILIZATION ACCOUNTS DATA

The F&D domain presents nutrient statistics derived from the "Food" variable of the SUA data (which include crops, livestock and aquatic products). These statistics show the nutrients' supply per capita per day available for human consumption, disaggregated by 20 food groups.[5] The dataset covers 186 countries, from 2010 onwards. Energy and 15 selected nutrients are presented for all items, while nine additional nutrients are presented for aquatic products only.

Figure 1 shows that the global supply of energy and the selected nutrients has increased between 2010 and 2021, although the rate of increase differed from nutrient to nutrient. The global availability of fat and riboflavin (vitamin B2) showed the strongest increases, with a 13 percent and 12 percent increase, respectively, followed by dietary fibre (11 percent) and calcium (10 percent). Carbohydrate (available, i.e. excluding fibre) and thiamin (vitamin B1) increased the least by 3 percent and 5 percent, respectively.

Figure 1: Change in the global daily per capita availability of energy and nutrients from all food groups between 2010 and 2021



Note: RAE = retinol activity equivalents

Source: FAO. 2024. Availability (Supply utilization accounts). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/SUA

Figure 2 shows that the global iron supply was mainly provided in 2021 by cereals (37 percent); vegetables (22 percent); pulses, seeds and nuts (10 percent); meat (9 percent); and roots, tubers and plantains (6 percent). Together, these five food groups accounted for 84 percent of the total daily per capita iron supply.

Each food group contributes differently to the global supply of a given nutrient. For example, milk made the largest contribution to the global calcium supply (35 percent of the total), while it represented only 1 percent of the global vitamin C supply. In general, cereals and vegetables made the largest contributions to the availability of energy and each of the 15 nutrients at the global level.

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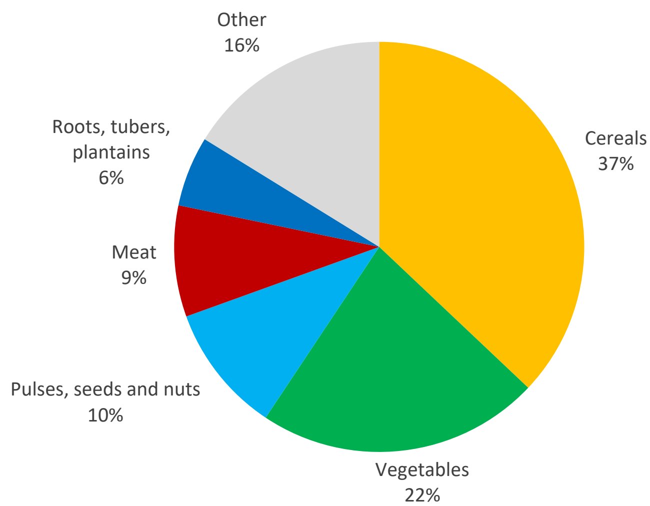
[5] In the Availability, Apparent intake and Intake sections, the following food groups also include the products derived from the main commodity: cereals; roots, tubers and plantains; pulses, seeds and nuts; milk; eggs; fish and shellfish; meat; insects and grubs; vegetables; and fruits. The full name of the food groups are indicated in figures and tables.

For aquatic products,[6] nine additional nutrients (such as omega-3 fatty acids) were calculated due to their relevance. It is hoped that this information will be updated and expanded to other SUA items in the future. The daily per capita combined eicosapentaenoic acid n-3 (EPA) and docosahexaenoic acid n-3 (DHA) available for human consumption at the global level, sourced only from aquatic products in 2021, is estimated at 0.22 g/cap/day, up from 0.20 g/cap/day in 2010. However, considerable differences exist across countries. For example, in Denmark, the availability of EPA and DHA sourced only from aquatic products was estimated at 3.41 g/cap/day in 2021 compared with 0.05 g/cap/day in Kazakhstan (Figure 3).

Figure 2: Global iron supply by food group (2021)

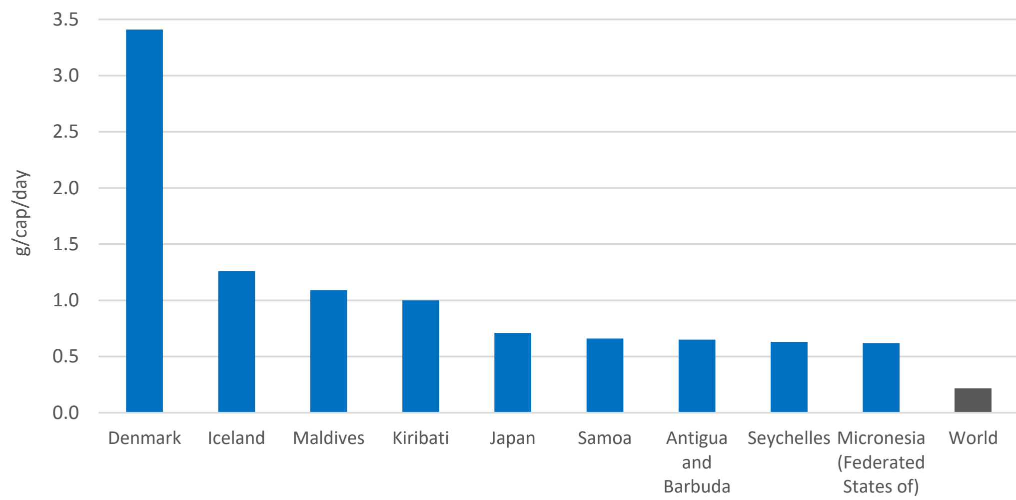


Note: Other includes (in descending order) spices and condiments; fruits; eggs; fish, shellfish; sweets and sugars; milk; beverages; miscellaneous; foods for particular nutritional uses; and fats and oils.

Source: FAO. 2024. Availability (Supply utilization accounts). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/SUA

[6] Aquatic products are distributed across four of the 20 food groups, namely fish and shellfish, vegetables (for aquatic plants), meat (for aquatic mammal meat), and fats and oils (for fish oil).

Figure 3: Supply of EPA and DHA sourced only from aquatic products, top countries and world average (2021)



Source: FAO. 2024. Availability (Supply utilization accounts). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/SUA

APPARENT INTAKE FROM HOUSEHOLD CONSUMPTION AND EXPENDITURE SURVEY DATA

Statistics on food consumption, apparent intake of energy and 17 nutrients are presented, along with confidence intervals, for 38 household consumption and expenditure surveys conducted in 30 countries from 2010 onwards. The statistics are not presented for all nutrients for all surveys given the lack of available information on specific nutrients (mainly vitamins C, B6 and B12, and retinol and carotenes needed to compute vitamin A in RE and RAE), in the food composition tables/databases (FCTs) used. The statistics are presented for the geographic areas that have survey representativeness and by income quintile groups when aggregated values for income[7] were available in the microdata.[8]

Statistics on vitamin B12 were computed for 24 countries. Fish and shellfish were the main providers of vitamin B12, for at-home intake, in 15 out of the 24 countries. The United Republic of Tanzania (in 2018) had the highest vitamin B12 apparent intake from fish and shellfish due to the high apparent consumption of dried fish (Table 1).

Data are representative for urban and rural areas in 27 countries out of 30, and it was possible to compute vitamin A statistics for 26 of them. Urban areas had a higher daily per capita apparent vitamin A intake (in mcg of RAE) than rural areas in 21 out of the 26 countries (Table 2). Importantly, vitamin A apparent intake cannot be compared across countries because in some countries the nutrient content of specific foods (e.g. infant food, cereal flours and oils) included fortified food items. These items were

[7] When the survey does not collect information on income, total consumption expenditure is used as a proxy for income.
[8] For more information on data processing and comparability of the statistics please refer to the technical notes on FAOSTAT and the explanatory notes in this document.

included in the survey-specific HCES nutrient conversion tables only when the food label in the food composition table included the country's name or when the food label in the survey stated fortified.[9]

Table 1: Apparent vitamin B12 at-home intake for animal source foods with the 95 percent confidence level

	Eggs and its products	Fish, shellfish and their products	Meat and its products	Milk and its products
	Average [lower bound, upper bound] in daily micrograms per capita			
Argentina - 2018	0.11 [0.07, 0.15]	0.10 [0.04, 0.16]	3.22 [2.44, 3.99]	0.65 [0.44, 0.85]
Armenia - 2021	0.37 [0.35, 0.39]	0.22 [0.19, 0.24]	1.16 [1.08, 1.24]	0.65 [0.62, 0.69]
Benin - 2019	0.04 [0.04, 0.04]	1.77 [1.69, 1.84]	0.44 [0.39, 0.49]	0.18 [0.17, 0.20]
Bolivia (Plurinational State of) - 2015	0.10 [0.09, 0.11]	0.25 [0.21, 0.28]	1.71 [1.59, 1.83]	0.50 [0.46, 0.53]
Burkina Faso - 2019	0.01 [0.01, 0.01]	1.88 [1.76, 2.01]	0.20 [0.17, 0.22]	0.05 [0.04, 0.06]
Costa Rica - 2019	0.20 [0.18, 0.21]	0.32 [0.30, 0.34]	1.27 [1.17, 1.37]	0.69 [0.66, 0.72]
Côte d'Ivoire - 2019	0.05 [0.05, 0.06]	1.54 [1.48, 1.59]	1.01 [0.92, 1.10]	0.07 [0.06, 0.07]
Ethiopia - 2019	0.03 [0.02, 0.03]	0.01 [0.00, 0.01]	0.06 [0.05, 0.08]	0.20 [0.16, 0.23]
Guatemala - 2014	0.17 [0.16, 0.17]	0.12 [0.11, 0.14]	0.89 [0.85, 0.94]	0.25 [0.23, 0.27]
Guinea-Bissau - 2019	0.03 [0.03, 0.04]	1.47 [1.36, 1.57]	0.45 [0.39, 0.50]	0.07 [0.06, 0.07]
Kenya - 2016	0.08 [0.07, 0.08]	1.81 [1.67, 1.95]	0.59 [0.54, 0.65]	0.97 [0.94, 1.00]
Kiribati - 2020	0.01 [0.01, 0.01]	4.76 [4.40, 5.11]	0.47 [0.42, 0.51]	0.12 [0.10, 0.14]
Malawi - 2020	0.06 [0.06, 0.06]	2.04 [1.92, 2.15]	0.20 [0.19, 0.21]	0.05 [0.04, 0.05]
Mali - 2019	0.02 [0.02, 0.02]	1.54 [1.43, 1.65]	0.50 [0.46, 0.54]	0.20 [0.19, 0.21]
Mexico - 2020	0.30 [0.29, 0.30]	0.17 [0.16, 0.18]	1.02 [1.00, 1.04]	0.62 [0.61, 0.63]
Niger - 2019	0.01 [0.01, 0.01]	0.07 [0.06, 0.08]	0.44 [0.37, 0.50]	0.11 [0.10, 0.11]
Nigeria - 2019	0.06 [0.05, 0.06]	1.81 [1.76, 1.87]	0.30 [0.29, 0.31]	0.06 [0.06, 0.06]
Samoa - 2018	0.05 [0.04, 0.05]	1.76 [1.60, 1.93]	0.86 [0.81, 0.92]	0.13 [0.11, 0.15]
Senegal - 2019	0.03 [0.03, 0.03]	3.95 [3.78, 4.11]	0.40 [0.36, 0.44]	0.17 [0.16, 0.18]
Solomon Islands - 2013	0.02 [0.01, 0.03]	4.29 [3.30, 5.29]	0.09 [0.06, 0.12]	0.00 [0.00, 0.00]
Togo - 2019	0.03 [0.02, 0.03]	1.64 [1.54, 1.74]	0.29 [0.25, 0.32]	0.07 [0.06, 0.08]
Tonga - 2016	0.08 [0.07, 0.10]	3.31 [2.66, 3.95]	1.53 [1.45, 1.62]	0.16 [0.14, 0.18]
United Republic of Tanzania - 2018	0.01 [0.01, 0.01]	11.4 [10.6, 12.3]	0.42 [0.38, 0.47]	0.16 [0.13, 0.19]
Uruguay - 2017	0.14 [0.13, 0.15]	0.20 [0.18, 0.22]	2.96 [2.85, 3.07]	1.27 [1.24, 1.30]

Source: FAO. 2024. Apparent intake (Household consumption and expenditure surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/HCES

[9] The surveys including at least one food matching with a vitamin A fortified food include: Benin (2018), Burkina Faso (2018), Costa Rica (2019), Côte d'Ivoire (2018), Guinea-Bissau (2018), Kenya (2016), Malawi (2020), Mali (2018), the Niger (2018), Nigeria (2019), Senegal (2018), United Republic of Tanzania (2018) and Togo (2018).

Table 2: Apparent vitamin A intake in urban and rural areas with the 95 percent confidence level

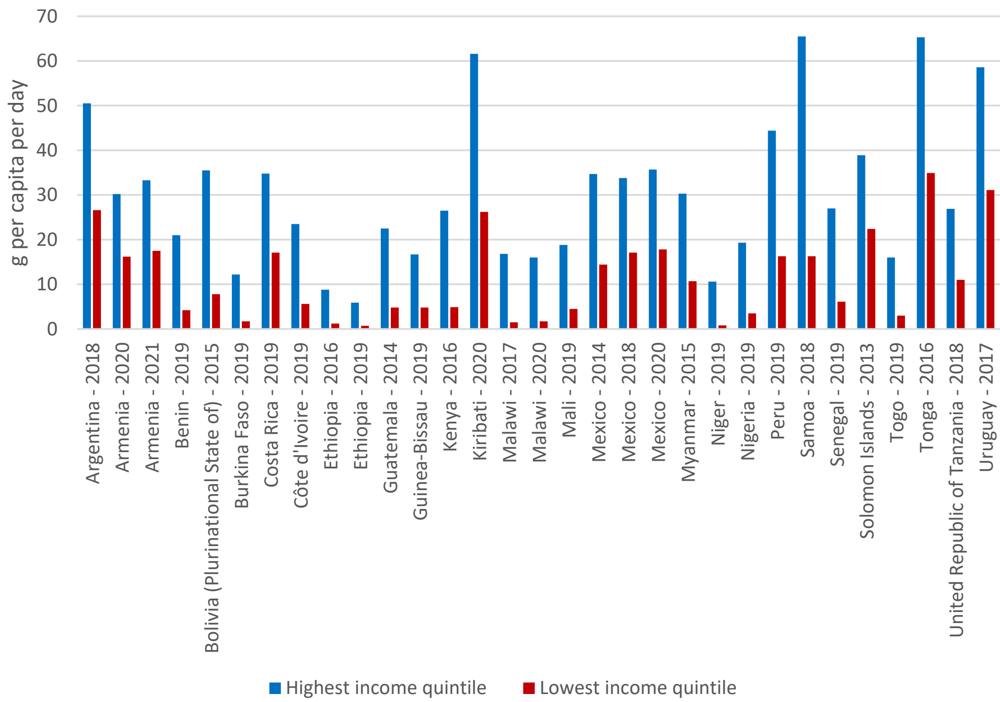
	Rural	Urban
	Average [lower bound, upper bound] in daily micrograms of retinol activity equivalents per capita	
Afghanistan - 2020	207 [197, 217]	227 [212, 242]
Armenia - 2021	393 [368, 418]	413 [400, 426]
Bangladesh - 2016	295 [281, 309]	269 [263, 275]
Benin - 2019	1 430 [1 364, 1 495]	1 444 [1 394, 1 494]
Burkina Faso - 2019	267 [246, 287]	468 [424, 511]
Costa Rica - 2019	364 [340, 389]	485 [462, 509]
Côte d'Ivoire - 2019	488 [469, 506]	754 [716, 792]
Ethiopia - 2019	128 [110, 146]	211 [191, 232]
Guatemala - 2014	404 [382, 427]	628 [599, 657]
Guinea-Bissau - 2019	1 240 [1 149, 1 331]	1 312 [1 251, 1 373]
India - 2012	307 [302, 312]	259 [256, 262]
Kenya - 2016	559 [525, 593]	362 [350, 373]
Kiribati - 2020	238 [217, 258]	240 [194, 285]
Malawi - 2020	393 [377, 410]	485 [448, 523]
Mali - 2019	409 [379, 439]	692 [635, 749]
Mexico - 2020	335 [329, 342]	434 [429, 439]
Myanmar - 2015	267 [254, 280]	296 [278, 315]
Niger - 2019	284 [266, 301]	740 [686, 794]
Nigeria - 2019	453 [443, 462]	512 [499, 526]
Pakistan - 2019	257 [252, 262]	279 [273, 285]
Samoa - 2018	304 [284, 324]	329 [296, 361]
Senegal - 2019	667 [637, 697]	1 094 [1 065, 1 123]
Solomon Islands - 2013	355 [328, 382]	323 [305, 340]
Togo - 2019	750 [711, 788]	971 [934, 1008]
Tonga - 2016	487 [446, 528]	653 [548, 756]
United Republic of Tanzania - 2018	249 [227, 270]	179 [170, 188]

Source: FAO. 2024. Apparent intake (Household consumption and expenditure surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/HCES

Statistics by income group were computed for the 26 countries out of 30 for which the HCES data include information on income,[10] aggregated at the household level (Figure 4). In these countries, people from the lowest income quintile had a lower apparent at-home protein intake from animal sources than people from the highest income quintile. The gap in the apparent daily per capita intake between both groups, measured in relative terms was smallest in Solomon Islands (in 2013), at 42 percent, and largest in the Niger (in 2019), at 92 percent.

[10] Total consumption expenditure was used as a proxy for income when no information on income was collected.

Figure 4: At-home protein apparent intake from animal source foods by income group



Source: FAO. 2024. Apparent intake (Household consumption and expenditure surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/HCES

INTAKE FROM INDIVIDUAL QUANTITATIVE DIETARY DATA

Five individual quantitative dietary surveys conducted in four countries (Brazil, Equatorial Guinea, Mexico and Tunisia) between 1997 and 2014 and available through FAO/WHO GIFT were used to compute statistics included in the F&D domain that complement the original material. For each survey available in the F&D domain, nationally representative statistics on the percentage of consumers, most consumed foods,[11] and average consumption in terms of quantity, energy and 16 nutrients by sex, age and geographic level are provided.

Data from the Mexico National Health and Nutrition Survey (2012) show that the most consumed food groups were cereals, milk, vegetables, fruits and meat. Cereals and meat contributed more to the daily food intake of males (24 percent and 10 percent, respectively) compared to females (20 percent and 9 percent, respectively) while milk, vegetables and fruits contributed more to the daily food intake of females (22 percent, 13 percent and 12 percent, respectively) compared to males (20 percent, 12 percent and 11 percent, respectively), as shown in Figure 5.

[11] Some foods are consumed daily or nearly daily by most people (e.g. cereals and their products); however, others are consumed less frequently (e.g. fish, shellfish and their products). Therefore, the average intake of foods can be expressed for all subjects (i.e. considering consumers and non-consumers) or by consumers only.

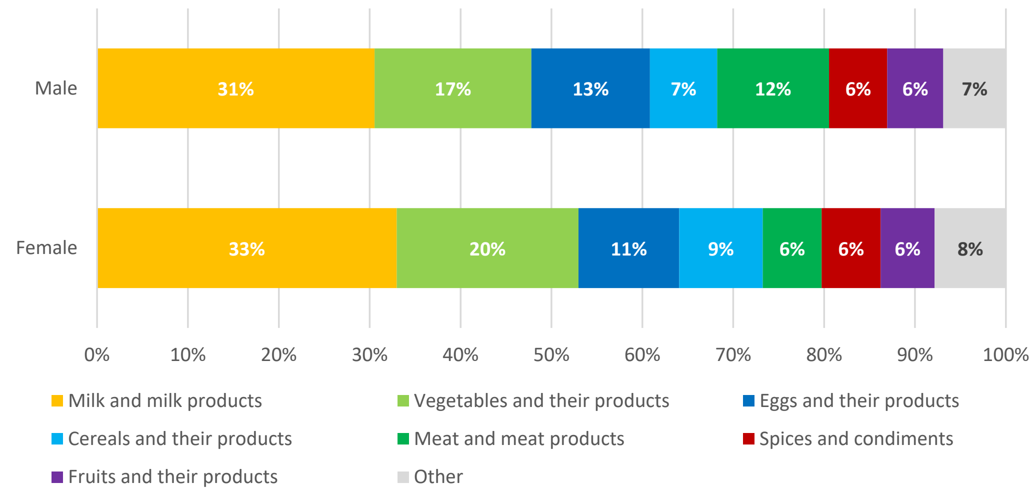
Figure 5: Percentage contribution of food groups to the average daily intake per capita by sex in the Mexico National Health and Nutrition Survey (2012)

Note: The food groups beverages and insects, grubs and their products are not presented in the figure. Survey sample size n = 10 685.

Source: FAO. 2024. Intake (Individual quantitative dietary surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/FDIQ

The Mexico survey also shows that the share of milk, vegetables and cereals in the daily vitamin A intake was higher for females (33 percent, 20 percent and 9 percent, respectively) than for males (31 percent, 17 percent and 7 percent, respectively). The share of eggs and meat in the daily vitamin A intake was higher for males (13 percent and 12 percent, respectively) than for females (11 percent and 6 percent, respectively) (Figure 6).

Figure 6: Percentage contribution of food groups to the average daily intake of vitamin A (in retinol activity equivalents) per capita by sex in the Mexico National Health and Nutrition Survey (2012)

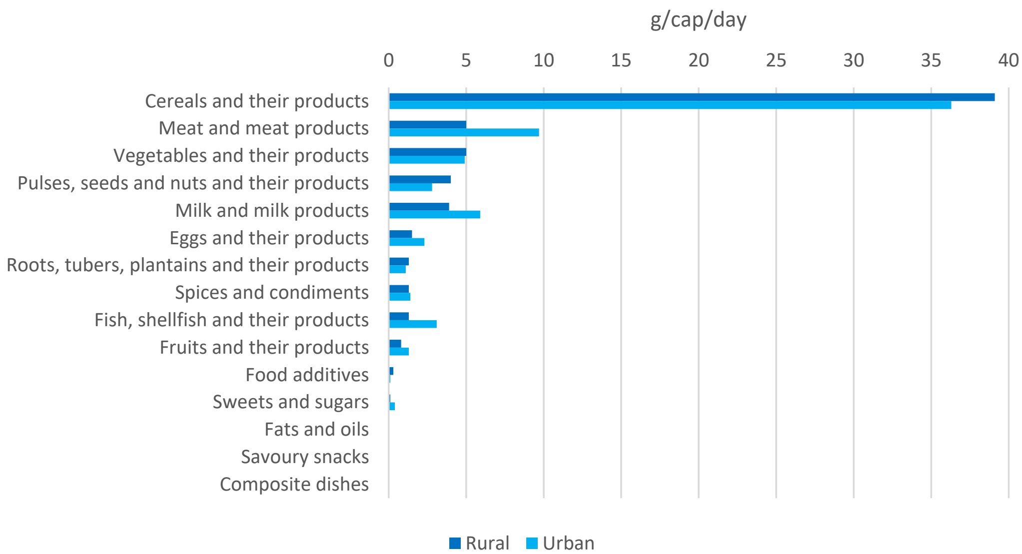


Note: "Other" includes (in descending order) sweets and sugars; foods for particular nutritional uses; roots, tubers, plantains; fish, shellfish; fats and oils; composite dishes; pulses, seeds and nuts; food supplements and similar; insects, grubs; food additives; and savoury snacks. The food group beverages is not presented in the figure. Survey sample size n = 10 685.

Source: FAO. 2024. Intake (Individual quantitative dietary surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/FDIQ

According to the Tunisian National Nutrition Survey (1996–1997), the daily protein intake per capita was higher in urban areas (69.3 g/cap/day) than in rural areas (63.6 g/cap/day). All animal sources contributed more to the daily protein intake per capita in urban areas than in rural areas: meat (9.7 g/cap/day in urban areas compared with 5 g/cap/day in rural areas), milk (5.9 g/cap/d versus 3.9 g/cap/day), fish and shellfish (3.1 g/cap/day versus 1.3 g/cap/day), and eggs (2.3 g/cap/day versus 1.5 g/cap/day). Conversely, protein from most plant-based sources contributed more to the daily protein intake per capita in rural areas than in urban areas: cereals (39.1 g/cap/day in rural areas versus 36.3 g/cap/day in urban areas) and pulses, seeds and nuts (4 g/cap/day versus 2.8 g/cap/day) (Figure 7).

Figure 7: Average daily protein intake per capita by food group and geographic level in the Tunisian National Nutrition Survey (1996–1997)

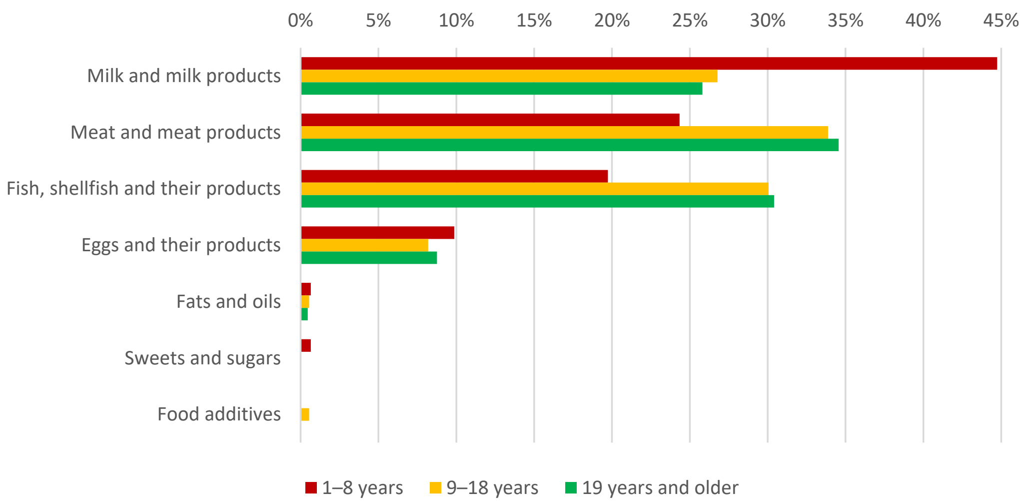


Note: The food groups beverages; insects, grubs; foods for particular nutritional uses and food supplements and similar are not presented in the figure. Survey sample size n = 6 441.

Source: FAO. 2024. Intake (Individual quantitative dietary surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/FDIQ

The Tunisia survey also shows that 45 percent of the daily vitamin B12 intake for the youngest (1–8 years old) comes from milk, while for adolescents (9–18 years old) and adults (19 years and older) meat is the first source of the daily vitamin B12 intake (34 percent and 35 percent, respectively), followed by fish and shellfish (30 percent for both age groups). Eggs are the fourth main source of vitamin B12, accounting for 8–10 percent of the daily intake of all age groups (Figure 8).

Figure 8: Average contribution of food groups to the daily intake of vitamin B12 per capita by age group in the Tunisian National Nutrition Survey (1996–1997)



Note: The food groups beverages; cereals; vegetables; fruits; roots, tubers, plantains; pulses, seeds and nuts; insects, grubs; composite dishes; spices and condiments; savoury snacks; and foods for particular nutritional uses and food supplements and similar are not presented in the figure. Survey sample size n = 6 441.

Source: FAO. 2024. Intake (Individual quantitative dietary surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/FDIQ

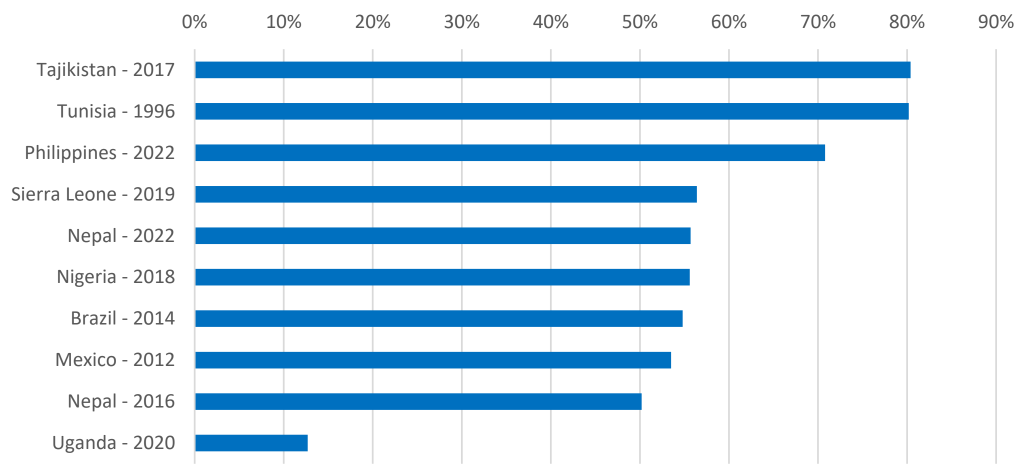
Additional background information on individual quantitative dietary data can be found in FAO and WHO (2023b) and Leclercq *et al.* (2019).

DIVERSITY (MINIMUM DIETARY DIVERSITY FOR WOMEN INDICATOR)

The Minimum Dietary Diversity for Women (MDD-W) indicator is a population-level food group-based indicator that captures dietary diversity, a key component of diet quality. There is no standardized cut-off for a “high” or “low” prevalence of MDD-W. Instead, MDD-W is rather used for setting targets in a country or region, and for assessing the dietary impacts of large-scale nutrition-sensitive interventions. Therefore, these statistics provide a baseline for future national interventions. Additional background information on MDD-W can be found in FAO (2023b) and FAO (2021).

Data on the attainment of MDD-W among women from ten nationally representative surveys are presented for nine countries (Nepal is featured twice, as it has surveys for years 2016 and 2022). In most surveys included in the F&D domain, MDD-W is achieved (i.e. at least five out of ten predefined food groups were consumed) by 50–60 percent of women at the national level. Notably, in Tajikistan (2017), Tunisia (1996), and the Philippines (2022), more than 70 percent of women attain MDD-W, indicating a higher probability of micronutrient intake adequacy. Conversely, Uganda (in 2020) shows the lowest prevalence of MDD-W (Figure 9).

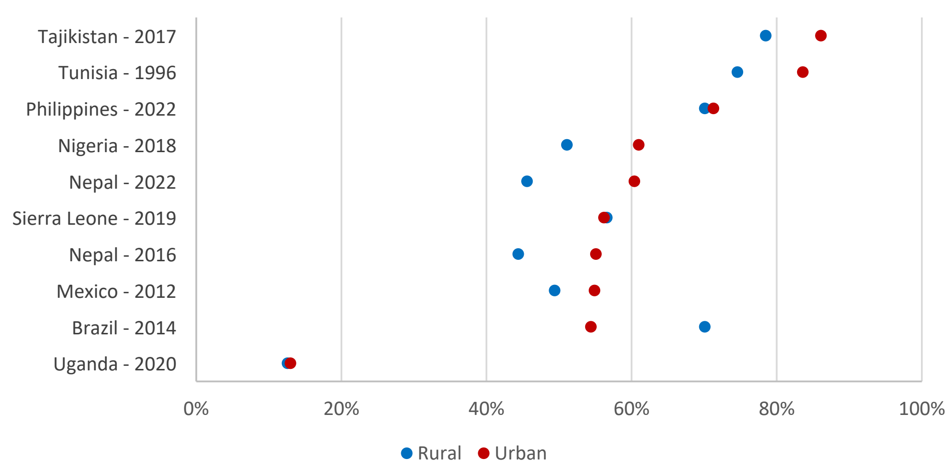
Figure 9: Proportion of women reaching MDD-W by survey



Source: FAO. 2024. Diversity (MDD-W, Individual qualitative dietary surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/MDDW

The State of Food Security and Nutrition in the World 2023 (FAO, IFAD, UNICEF, WFP and WHO, 2023) shows that the prevalence of food insecurity is higher in rural areas than in urban areas across all regions but Northern America and Europe. The MDD-W results also indicate a lower dietary diversity in rural areas compared to urban areas. This pattern was observed in seven out of the ten surveys. Sierra Leone (2019) and Uganda (2020) present similar prevalences for urban and rural areas, while in Brazil (2014), women of reproductive age in urban areas had a lower dietary diversity than in rural areas (Figure 10).

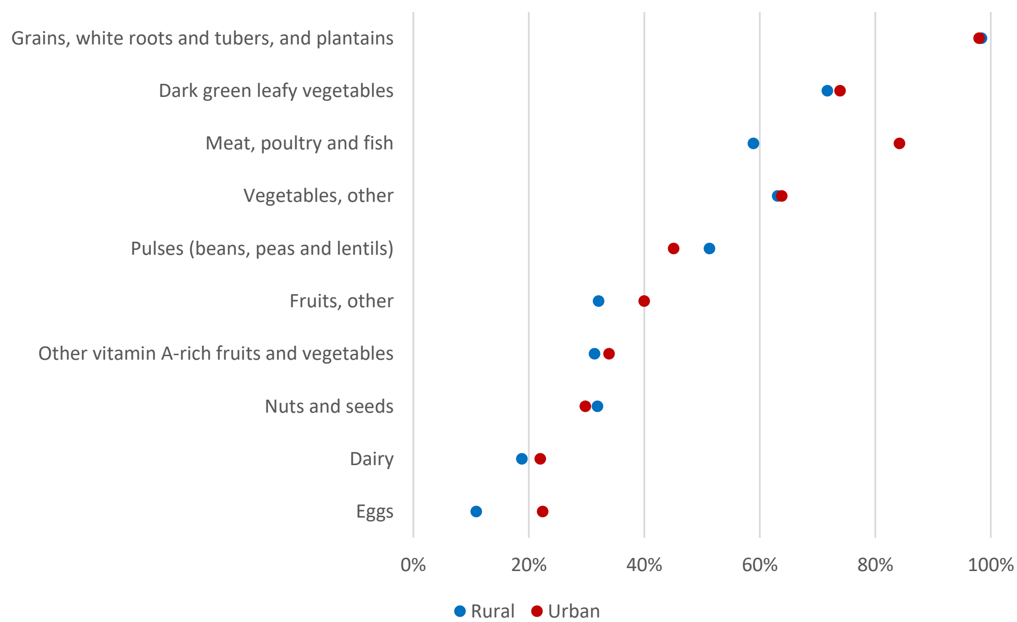
Figure 10: MDD-W prevalence by survey and geographic level



Source: FAO. 2024. Diversity (MDD-W, Individual qualitative dietary surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/MDDW

In addition to the MDD-W prevalence, statistics for MDD-W are disaggregated by the food groups that make up the indicator. The results can be used to identify and highlight underconsumption. For Nigeria in 2018 (Figure 11), women in urban areas consumed seven out of the ten food groups more than women in rural areas. Dairy and eggs were the food groups with the lowest percentage of women consuming them for both urban and rural areas. Grains, white roots and tubers, and plantains were consumed by nearly all women of reproductive age, with no notable differences between urban and rural areas. The gap between rural and urban women was the largest for meat, poultry and fish: 84 percent of urban women consumed this food group compared with 59 percent of rural women.

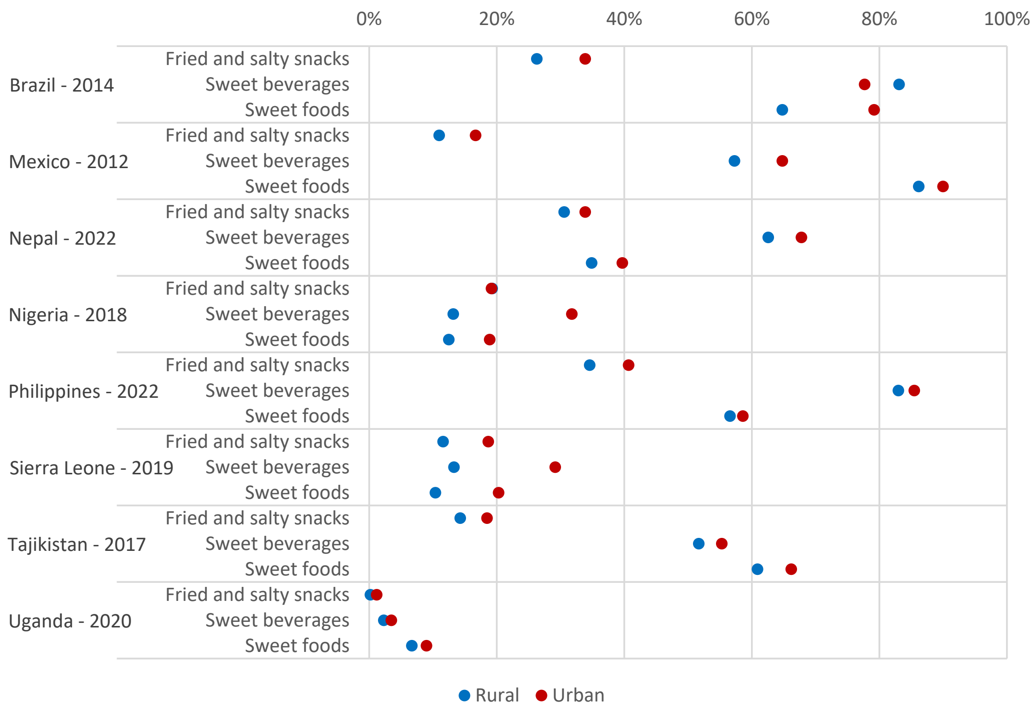
Figure 11: Percentage of women of reproductive age consuming each food group by geographic level in Nigeria (2018)



Source: FAO. 2024. Diversity (MDD-W, Individual qualitative dietary surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/MDDW

While the calculation of MDD-W primarily focuses on ten mandatory food groups, it is strongly advised that survey designers incorporate additional food groups. These additional food groups do not count towards the indicator but may provide important information, such as food groups considered to be unhealthy and of interest in the context of non-communicable diseases. Where available, data for unhealthy food groups are presented for fried and salty snacks, sweet beverages and sweet foods (Figure 12). Unhealthy foods are slightly more frequently consumed in urban areas, with the exception of sweet beverages that are more frequently consumed in rural areas in Brazil. Almost 90 percent of women of reproductive age in Mexico consumed sweet foods, and nearly 85 percent of women of reproductive age in the Philippines drank sweet beverages.

Figure 12: Percentage of women of reproductive age consuming unhealthy foods by food group and geographic level



Note: "Fried and salty snacks" includes deep-fried snacks, such as doughnuts/fried dough and samosas, as well as packaged or prepared salty snacks. "Sweet beverages" includes all sweetened fruit juices and juice drinks, soft drinks/sodas/carbonated or fizzy drinks. "Sweet foods" includes all food items, excluding beverages, with a high content of different sweetening agents.

Source: FAO. 2024. Diversity (MDD-W, Individual qualitative dietary surveys). In: *FAOSTAT*. Rome. [Cited February 2024]. https://www.fao.org/faostat/en/#data/MDDW

EXPLANATORY NOTES

The F&D domain, published on FAOSTAT, presents harmonized statistics from SUA and HCES, in terms of: (a) the selection of high-quality food composition tables or databases (FCTs) based on the FAO/International Network of Food Data Systems (INFOODS) evaluation framework, (b) the selection of the nutrients based on health relevance and their availability in FCTs, (c) the use of standardized components identified by the FAO/INFOODS tagnames, and (d) the use of FAO/INFOODS food matching guidelines. Food group statistics from these data types are further harmonized with those from individual quantitative level data by using the nutrition-sensitive classification, previously developed within the framework of FAO/WHO GIFT (FAO and WHO, 2023a), with a minor adaptation. The additional “Miscellaneous” food group was added to the original FAO/WHO GIFT grouping to include food items that cannot be classified in any of the other 19 groups, and was particularly relevant for HCES and SUA data. For more information on how foods are classified into food groups, please refer to the document “Food group classification” on FAOSTAT.

More than 30 FCTs from different countries and regions were evaluated according to eight screening questions from the FAO/INFOODS evaluation framework to assess the quality of FCTs (Charrondiere *et al.*, 2023). A total of 13 FCTs were selected as the main sources of data for creating a new global nutrient conversion table (NCT) for the SUA and each HCES survey-specific nutrient conversion table. The global NCT for SUA consists of 435 food items for crops and livestock and 95 food items for fish and other aquatic products. The list of components includes energy, fat, protein, available carbohydrate (i.e. excluding fibre), ash, water, dietary fibre, alcohol, six minerals (calcium, iron, magnesium, phosphorus, potassium and zinc) and five vitamins (vitamin A expressed in RE and RAE, thiamin, riboflavin and vitamin C) for all SUA items, and values are expressed per 100 g edible portion on a fresh weight basis. For fish and other aquatic products, data for fatty acids, copper, selenium, vitamin B6 and B12 are also included. Detailed information on specific criteria used to compile the global NCT for SUA will be published with the NCT data (Grande *et al.*, forthcoming).

The criteria for selecting the nutrients included their public health relevance and their data availability in the selected FCTs. All nutrients were compiled from the selected FCTs, except for energy, available carbohydrate by difference and vitamin A, which were calculated for standardization purposes for the SUA and HCES. The standardization of nutrients across the FCTs was made possible with the use of FAO/INFOODS tagnames (i.e. component identifiers) (FAO/INFOODS, 2017).

The SUA food list and each HCES-specific food list were matched to foods in FCTs following FAO/INFOODS guidelines for food matching (FAO/INFOODS, 2012) and a quality code was assigned to each food matching.

The SUA data reflect the new methodology adopted by FAO for the compilation of national SUA/FBS (FAO, 2017). Potential food quantities and monetary value outliers in HCES data were detected using the interquartile range method. Confirmed outliers, based on food monetary values, quantities and unit values, were imputed based on a single, non-parametric and deterministic method. Observations are classified into a homogeneous group (e.g. the combination of region/urban-rural/income decile) and the corresponding group median is used for imputation. The statistics from HCES were based on common variable names and a common data processing methodology (Moltedo *et al.*, 2014). Consistency checks between statistics from SUA and HCES data by food item were done by matching HCES foods with SUA foods, based on the Central Product Classification (CPC) v2.1.

One of the major challenges of bringing together different types of dietary data is contrasting them, what they intend to measure, and the statistics that can be generated from them. The types of data included in the F&D domain measure different dimensions across the food supply chain, from supply through to consumption. Estimations from these sources of dietary data are difficult to compare because they measure different levels of dietary information. While the food and nutrient statistics generated from these data types are not directly comparable, they can be used to understand the relationship between the different levels, which can be important in formulating and evaluating policies. Diets are the core link between food systems and their health and nutrition outcomes and policymakers need to ensure that all parts of the food system work together to deliver high-quality diets and prevent food insecurity and malnutrition. Robust data on food availability, food consumption and diet quality are needed to help explain the diverse forms of malnutrition that can potentially result from food insecurity, as well as to guide food systems policies.

The SUA data provide information on the availability of foods at the country level, without informing how the foods or nutrients are distributed or consumed within the population. The HCES data provide information on access to food by private households, but without information on intra-household food distribution to ascertain individual intake. The individual quantitative dietary data provide information on individuals' food intake, and finally, the MDD-W data provide a qualitative measurement of dietary diversity, a key component of healthy diets, among women of reproductive age within a population. While the SUA include food available for human consumption in schools, hospitals, military, prisons, restaurants and food service, the HCES and the individual quantitative intake surveys account, respectively, for private households and individuals living in private households. Furthermore, the SUA include food waste at the retail and household levels, while HCES do not collect information on wastage, stocked foods and food given to pets, other households or charity. In the case of individual quantitative dietary intake surveys, individuals might not report all eaten foods in the previous 24 hours or misreport portion sizes (Gibson *et al.*, 2017) leading to an underestimation of food consumption. Furthermore, dietary diversity, measured through the MDD-W indicator, may also be at risk of misreporting errors, and does not measure quantities consumed.

The matching of foods from the SUA and the HCES data with food composition data did not account for the cooking of the food, which commonly leads to a loss of nutrients such as water-soluble vitamins, heat-labile nutrients, and fats (Greenfield and Southgate, 2003). Furthermore, while fortification/enrichment and biofortification of crops were excluded from the SUA global NCT, they were included in some exceptional cases in the food matching for HCES. These exceptions were applied when (a) the description of the food clearly stated fortified, (b) the fortified food was listed in a regional FCT with the country's name, or (c) the national FCT included fortified foods. Information on fortified foods used to create HCES specific-NCTs is available in the survey metadata file available for download.

Despite the classification of foods into standardized food groups, the comparison of statistics by food group across the different data types should be undertaken with caution. The SUA data account for food availability over a year, while HCES and individual quantitative intake surveys might be conducted during a shorter period (FAO, 2017) not capturing variation in consumption across seasons, for example for fruits and vegetables. A short survey-reference period might also have an impact on the final statistics if the survey is conducted before or after harvesting, or if it includes events such as religious festivals. Furthermore, HCES might not capture the whole diet when the food consumption data are collected based on a predefined food list as suggested in the guidelines on food data collection in HCES for low- and middle-income countries (FAO and the World Bank, 2018). In the case of SUA data, the data collection may not account for fruit and vegetable production in family and other small gardens, which might constitute an important part of the estimated total production (FAO, 2023c). In the case of HCES, the use of fortified foods in the food matching process impacts on the statistics by food group, especially for the oils and fats group.

Furthermore, the statistics from HCES data are not comparable between countries, and in some cases, not comparable even between different years for the same country, due to differences in survey design, including the methodology for capturing food consumption data. The differences between countries and surveys include (a) the survey reference period, (b) the approach used to collect food information (acquisition vs consumption), (c) the food data reference period (e.g. 7 days, 14 days), (d) the collection method (retrospective data collection using a recall method vs prospective data collection using a diary – with or without predefined food list), (e) the unit of reference (household vs individual), (f) the food list (the number of foods and the food labels), (g) the type of information collected by food source (quantities and/or monetary values), (h) the unit of measurement for food quantities (local vs standard), and (i) additional information collected (e.g. food partakers, guests living in the household). Differences between countries and surveys are also expected for specific micronutrients such as vitamin A, based on the use (or not) of fortified foods when matching the survey food list to foods in FCTs. Most foods in HCES data reported as prepared away from home are classified within the food groups "Composite dishes" and "Miscellaneous", so statistics based on the other groups could be considered as a proxy for at-home apparent intake.

The statistics from the individual quantitative dietary data benefit from the comprehensive harmonization process undertaken prior to sharing of data through the FAO/WHO GIFT platform. To be inserted in the FAO/WHO GIFT platform, dietary data undergo a process of retrospective harmonization, which comprises several steps, including: (a) the use of the FoodEx2 food description and classification system to harmonize the food list (EFSA, 2023); (b) the disaggregation of mixed dishes into their respective ingredients; (c) formatting data into a standard template; and (d) the execution of data consistency and quality checks. The individual quantitative dietary datasets available in FAO/WHO GIFT are provided by data owning institutions, with the food consumption information already matched to food composition values. No further matching or harmonization of these values other than those listed above was undertaken. It is not possible to draw comparisons across countries because the data used to compute the statistics may be collected in different years and according to different survey methodologies and data collection tools. Due to the limited availability of this very granular and detailed type of dietary data, and the criteria to share statistics through FAOSTAT, only statistics on a small number of surveys (the oldest one carried out in 1996–1997 and the most recent one in 2014) could be shared through the F&D domain. This evidence base provides a foundation on which to understand the food consumption in a given country at a given time, advocate for and demonstrate the added value of this data, and build future research in the area of dietary surveys, identifying data gaps and priority areas for future data collection and sharing. While gaps in the evidence remain for this type of dietary data, an increasing number of national and subnational dietary surveys have been completed in low- and middle-income countries in past decades, in particular from 2000 onwards (de Quadros *et al.*, 2022). It is hoped that this trend continues, together with associated efforts to validate and standardize the methods and tools used in the data collection and the subsequent data harmonization and dissemination to make the data available. The establishment of routine, regularly implemented dietary surveys, with more expansive population and area coverage, together with data sharing and in-depth data analysis, are key to support evidence-based policy and programs for improved nutrition (de Quadros *et al.*, 2022).

The MDD-W statistics have been prepared from diverse sources. The accuracy of all presented statistics can vary depending on the design and data processing methods employed by the original data owners.

Notably, MDD-W statistics were retrospectively calculated from data shared through the FAO/WHO GIFT platform and the World Bank Living Standards Measurement Study. When MDD-W statistics were not retrospectively calculated, they were extracted directly from DHS reports. Retrospective calculations of MDD-W were performed using the FoodEx2 food description and classification system (version 12.0), which may have introduced errors. For these reasons it is not possible to draw comparisons across surveys.

The F&D domain will be further populated with additional statistics as more data become available. Available documents for download include the main "Food group classification" document (which provides a detailed description of the food groups used for the availability, apparent intake and intake subdomains), the "Food group classification for MDD-W" document (for the diversity subdomain), survey metadata and technical notes for each data type.

REFERENCES

Charrondiere, U.R., Stadlmayr, B., Grande, F., Vincent, A., Oseredczuk, M., Sivakumaran, S., Puwastien, P., Judprasong, K., Haytowitz, D. & Gnagnarella, P. 2023. *FAO/INFOODS Evaluation framework to assess the quality of published food composition tables and databases - User guide*. Rome, FAO. https://doi.org/10.4060/cc5371en

de Quadros, V.P., Balcerzak, A., Allemand, P., de Sousa, R.F., Bevere, T., Arsenault, J., Deitchler, M. & Holmes, B.A. 2022. Global Trends in the Availability of Dietary Data in Low and Middle-Income Countries. *Nutrients*, 14(14), 2987. https://doi.org/10.3390/nu14142987

EFSA (European Food Safety Authority). Food classification standardisation – The FoodEx2 system. In: *EFSA*. [Cited 8 December 2023]. https://www.efsa.europa.eu/en/data/data-standardisation

FAO. 2017. *Guidelines for the compilation of Food Balance Sheets*. Rome. http://www.fao.org/3/ca6404en/ca6404en.pdf

FAO. 2021. *Minimum dietary diversity for women. An updated guide for measurement: from collection to action*. Rome. https://doi.org/10.4060/cb3434en

FAO. 2023a. Supply Utilization Accounts (2010-). In: *FAOSTAT*. Rome. [Cited 28 October 2023]. http://www.fao.org/faostat/en/#data/SCL

FAO. 2023b. Nutrition Assessment. In: *FAO*. [Cited 21 November 2023]. https://www.fao.org/nutrition/assessment

FAO. 2023c. Methodology – Crops and Livestock. In: *FAOSTAT*. Rome. [Cited 21 November 2023]. https://www.fao.org/faostat/en/#data/QCL

FAO. 2023d. The Minimum Dietary Diversity for Women (MDD-W) indicator. In: *FAO*. [Cited 28 October 2023]. https://www.fao.org/nutrition/assessment/tools/minimum-dietary-diversity-women

FAO, IFAD, UNICEF, WFP & WHO. 2023. *The State of Food Security and Nutrition in the World 2023. Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum*. Rome, FAO. https://doi.org/10.4060/cc3017en

FAO/International Network of Food Data Systems (INFOODS). n.d. Tagnames for Food Components. In: *FAO*. [Cited 28 October 2023]. http://www.fao.org/infoods/infoods/standards-guidelines/food-component-identifiers-tagnames/en/

FAO/INFOODS. 2012*. Guidelines for Food Matching: Version 1.2*. Rome, FAO. http://www.fao.org/docrep/017/ap805e/ap805e.pdf

FAO & WB (World Bank). 2018. *Food Data Collection in Household Consumption and Expenditure Surveys: Guidelines for Low- and Middle-Income Countries*. Rome. https://www.fao.org/3/ca1561en/CA1561EN.pdf

FAO & WHO (World Health Organization). 2023a. FAO/WHO GIFT - Food groups and sub-groups. In: *FAO*. [Cited 28 October 2023]. http://www.fao.org/gift-individual-food-consumption/methodology/food-groups-and-sub-groups/en/

FAO & WHO. 2023b. FAO/WHO GIFT - Global Individual Food consumption data Tool. In: *FAO*. [Cited 28 October 2023]. https://www.fao.org/gift-individual-food-consumption/en

Fiedler, J.L. 2013. Towards overcoming the food consumption information gap: Strengthening household consumption and expenditures surveys for food and nutrition policymaking. *Global Food Security*, 2(1), 56-63. https://doi.org/10.1016/j.gfs.2012.09.002

Gibson, R., Charrondiere, R. & Bell, W. 2017. Measurement Errors in Dietary Assessment Using Self-Reported 24-Hour Recalls in Low-Income Countries and Strategies for Their Prevention. *Advances in Nutrition*, 8(6), 980-991. https://doi.org/10.3945/an.117.016980

Grande, F., Ueda, Y., Masangwi, S. & Holmes, B. (forthcoming). *A Global Nutrient Conversion Table for the FAO Supply Utilization Accounts*. Rome, FAO.

Greenfield, H. & Southgate, D.A.T. 2003. *Food composition data. Production, management and use*. Second. Ed. Rome, FAO.

HLPE (High Level Panel of Experts). 2023. Data gaps still exist to guide action and inform policymaking. Committee on World Food Security. In: *FAO*. https://www.fao.org/cfs/cfs-hlpe/insights/news-insights/news-detail/data-gaps-still-exist-to-guide-action-and-inform-policymaking/en

Leclercq, C., Allemand, P., Balcerzak, A., Branca, F., Sousa, R.F., Lartey, A., Lipp, M., de Quadros, V.P. & Verger, P. 2019. FAO/WHO GIFT (Global Individual Food consumption data Tool): a global repository for harmonised individual quantitative food consumption studies. *Proc Nutr Soc.*;78(4):484-495. https://doi.org/10.1017/s0029665119000491

Moltedo, A., Troubat, N., Lokshin, M. & Sajaia, Z.M. 2014. Analyzing Food Security Using Household Survey Data: Streamlined Analysis with ADePT Software. Washington, DC, World Bank. https://doi.org/10.1596/978-1-4648-0133-4

Russell, J., Lechner, A., Hanich, Q., Delisle, A., Campbell, B. & Charlton, K. 2018. Assessing food security using household consumption expenditure surveys (HCES): A scoping literature review. *Public Health Nutrition*, 21(12), 2200-2210. doi:10.1017/S136898001800068X

United Nations Statistic Division. 2015. *Central Product Classification (CPC) Version 2.1*. New York, USA. https://unstats.un.org/unsd/classifications/unsdclassifications/cpcv21.pdf

World Bank. 2023. Living Standards Measurement Study (LSMS). In: *The World Bank*. [Cited 28 October 2023]. https://microdata.worldbank.org/index.php/catalog/lsms

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