

Diet Quality Questionnaire (DQQ) Indicator Guide

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DQQ Overview

The **Diet Quality Questionnaire (DQQ)** is a standardized tool to collect indicators of **dietary adequacy**, including the minimum dietary diversity for women (MDD-W) indicator¹, and All-5, as well as indicators of **protection of health against noncommunicable diseases (NCDs)**, including NCD-Protect, NCD-Risk, and the global dietary recommendations score (GDR).² The DQQ was developed to enable population-level diet quality monitoring. It was not developed to assess dietary intake of individuals. The DQQ can be used to assess dietary patterns and trends in the general population; separate companion questionnaires are designed for infants and young children under age 2 years.

Purpose of this Indicator Guide

This analytical guide defines indicators that can be derived from the diet quality questionnaire (DQQ) and shows how to calculate the indicators from DQQ data. These indicators are valid at population level.

¹ Martin-Prevel Y, Arimond M, Allemand P, Wiesmann D, Ballard TJ, Deitchler M, Dop MC, Kennedy G, Lartey A, Lee WTK, and Moursi M on behalf of the Women's Dietary Diversity Project (WDDP) Study Group. (2017). Development of a Dichotomous Indicator for Population-Level Assessment of Dietary Diversity in Women of Reproductive Age. *Current Developments in Nutrition*, 1(12) cdn-117. <https://doi.org/10.3945/cdn.117.001701>
See also: FAO. 2021. Minimum dietary diversity for women (MDD-W). Rome. <https://www.fao.org/documents/card/en/c/cb3434en>

² Herforth, A. W., Wiesmann, D., Martínez-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), nzaa168. <https://doi.org/10.1093/cdn/nzaa168>

DQQ Food Groups

1. Foods made from grains
2. Whole grains
3. White roots, tubers, and plantains
4. Pulses
5. Vitamin A-rich orange vegetables
6. Dark green leafy vegetables
7. Other vegetables
8. Vitamin A-rich fruits
9. Citrus
10. Other fruits
11. Baked / grain-based sweets
12. Other sweets
13. Eggs
14. Cheese
15. Yogurt
16. Processed meats
17. Unprocessed red meat (ruminant)
18. Unprocessed red meat (non-ruminant)
19. Poultry
20. Fish and seafood
21. Nuts and seeds
22. Packaged ultra-processed salty snacks
23. Instant noodles
24. Deep fried foods
25. Fluid milk
26. Sweet tea / coffee / cocoa
27. Fruit juice and fruit-flavored drinks
28. Soft drinks (sodas, energy drinks, sports drinks)
29. Fast food

Indicators

Indicators are positive (higher score is better), except where marked with (-) (higher score is worse).

Main DQQ diet quality indicators

1. MDD-W (0/1) / Dietary Diversity Score (DDS) (0-10)
2. All-5 (0/1): Consumed all five recommended food groups: at least one vegetable, at least one fruit, at least one pulse, nut or seed, at least one animal-source food, and at least one starchy staple.
 - a. At least one vegetable
 - b. At least one fruit
 - c. At least one pulse, nut, or seed
 - d. At least one animal-source food (ASF)
 - e. At least one starchy staple
3. NCD-Protect³ (0-9)
4. NCD-Risk⁴ (0-9) (-)
5. Global Dietary Recommendations (GDR) Score (-9- 9, or transformed to 0-18)

Diet quality indicators for the general population aligned with WHO and UNICEF indicators for infant and young child feeding

Binary; expressed as proportion of population

6. Zero vegetable or fruit consumption (-)
7. Animal-source food consumption
8. Sweet beverage consumption (-)
 - a. Soft drink consumption (-)
9. Sweet foods consumption (-)
10. Salty or fried snack consumption (-)

Indicators of individual WHO recommendations

Binary; expressed as proportion of population

Note: other indicators undergoing validation for: fiber, fruits and vegetables, salt, and free sugars

11. Whole grain consumption
12. Pulse consumption
13. Nuts/seeds consumption
14. Processed meat consumption (-)

Other binary indicators

15. % consuming each food group or combinations of food groups
 - a. At least one vegetable or fruit
 - b. Packaged ultra-processed salty snacks, instant noodles, or fast food
 - c. Meat, poultry, or fish
 - d. Dairy

³ Formerly published as “GDR-Healthy”

⁴ Formerly published as “GDR-Limit”

Main DQQ Diet Quality Indicators

1. MDD-W & Dietary Diversity Score (DDS)

An indicator of micronutrient adequacy

Minimum Dietary Diversity for Women of Reproductive Age (MDD-W) is achieved when ≥ 5 out of 10 specific food groups are consumed by an individual over the course of a day. Women in low- and middle-income countries who do not meet the MDD-W are at higher risk of inadequate micronutrient intakes.

A score of 5 or more indicates higher likelihood of adequate micronutrient intake for women of reproductive age (age 15–49 years). MDD-W is expressed as a binary score (1/0), and can therefore be used to identify the percentage of a population who is meeting the MDD-W. This indicator is only validated for women age 15–49 years in low- and middle-income countries.

When these food groups are applied to the general population, the indicator is called the **Dietary Diversity Score (DDS)**. It is not validated as an indicator of nutrient adequacy for the general population, but gender equity of food group diversity can be assessed. The DDS is a semi-continuous score (0–10), expressed as the average score out of 10 for the population.

A YES response to ANY of the question numbers confers a YES response to the MDD-W / DDS food group. For example, if a respondent answered YES to **any or all** of three questions (question 1, question 2, or question 3), their response is scored as 1 point.

Dietary Diversity Score (DDS)

1 point for each “YES” answer to the following food groups:

MDD-W Food group	DQQ Question numbers	Possible points
<i>Grains, white roots and tubers, and plantains</i>	1, 2, 3	1
<i>Pulses (beans, peas and lentils)</i>	4	1
<i>Nuts and seeds</i>	21	1
<i>Dairy</i>	14, 15, 25	1
<i>Meat, poultry and fish</i>	16, 17, 18, 19, 20	1
<i>Eggs</i>	13	1
<i>Dark green leafy vegetables</i>	6*	1
<i>Other vitamin A-rich fruits and vegetables</i>	5, 8	1
<i>Other vegetables</i>	7*	1
<i>Other fruits</i>	9, 10*	1
TOTAL		SUM (0-10)

*Note that these groups may be asked in two or more questions (e.g. 6.1 and 6.2).

MDD-W (0/1)

Validated as a proxy indicator for micronutrient adequacy for women age 15–49 years.

<i>TOTAL DDS (see table just above)</i>		
	<i>If score ≥ 5</i>	1
	<i>If score <5</i>	0

2. All-5: Consumed all five recommended food groups

An indicator of food group adequacy

Proportion of the total population consuming all five food groups typically recommended for daily consumption in food-based dietary guidelines around the world: fruits; vegetables; pulses, nuts, or seeds; animal-source foods; and starchy staples. A score of 5 indicates minimal adherence to dietary guidelines, because people who did not consume the food groups definitely did not meet dietary guidelines. (It is therefore a minimum bar, because many people who consumed all five food groups still may not have met dietary guidelines in terms of quantities consumed.)

Variants of this indicator can be adopted for specific national food-based dietary guidelines with different food group requirements.

A score of less than 5 indicates that not all five recommended food groups were consumed (binary score: 1/0). All-5 is expressed as the percent of the population consuming all five recommended food groups the previous day or night.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Starchy staples</i>	1,2,3	1
<i>Vegetables</i>	5,6*,7*	1
<i>Fruits</i>	8,9,10*	1
<i>Pulses, nuts and seeds</i>	4, 21	1
<i>Animal-source foods</i>	13,14,15,16,17,18,19,20,25	1
<i>TOTAL</i>		SUM (0-5)
	<i>If score = 5</i>	1
	<i>If score <5</i>	0

*Note that these groups may be asked in two or more questions (e.g. 6.1 and 6.2).

Each food group component of this score may be useful to examine separately:

a. At least one vegetable

A score of 1 indicates that at least one vegetable was consumed, and is expressed as the percent of the population consuming this food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Vegetables</i>	5,6*,7*	1
<i>TOTAL</i>		SUM (0-1)

*Note that these groups may be asked in two or more questions (e.g. 6.1 and 6.2).

b. At least one fruit

A score of 1 indicates that at least one vegetable was consumed, and is expressed as the percent of the population consuming this food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Fruits</i>	8,9,10*	1
<i>TOTAL</i>		SUM (0-1)

*Note that these groups may be asked in two or more questions (e.g. 6.1 and 6.2).

c. At least one pulse, nut or seed

A score of 1 indicates that at least one pulse, nut or seed was consumed, and is expressed as the percent of the population consuming this food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Pulses, nuts and seeds</i>	4,21	1
<i>TOTAL</i>		SUM (0-1)

d. At least one animal-source food (ASF)

A score of 1 indicates that at least one animal-source food (dairy, eggs, or flesh foods) was consumed, and is expressed as the percent of the population consuming this food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Animal-source foods</i>	13,14,15,16,17,18,19,20,25	1
<i>TOTAL</i>		SUM (0-1)

e. At least starchy staple

A score of 1 indicates that at least one starchy staple was consumed, and is expressed as the percent of the population consuming this food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Starchy staples</i>	1,2,3	1

TOTAL		SUM (0-1)
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3. NCD-Protect score

previously published as “GDR-Healthy”

An indicator of dietary factors protective against NCDs (articulated by WHO):

- At least 400g of fruits and vegetables per day
- Whole grains, pulses, and nuts or seeds
- At least 25g of fiber per day

The NCD-Protect score is a score with a range from 0 to 9. It is a sub-component of the GDR score, and reflects adherence to global dietary recommendations on healthy components of the diet. The NCD-Protect score is based on food consumption from 9 healthy food groups during the past day and night. A higher score indicates inclusion of more health-promoting foods in the diet, and correlates positively with meeting global dietary recommendations. It is expressed as the average score for the population.

1 point for each “YES” answer to the following food groups:

Food group	DQQ Question numbers	Possible points
Whole grains	2	1
Pulses	4	1
Nuts and seeds	21	1
Vitamin A-rich orange vegetables	5	1
Dark green leafy vegetables	6*	1
Other vegetables	7*	1
Vitamin A-rich fruits	8	1
Citrus	9	1
Other fruits	10*	1
TOTAL		SUM (0-9)

*Note that these groups may be asked in two or more questions (e.g. 6.1 and 6.2).

4. NCD-Risk score (-)

previously published as “GDR-Limit”

An indicator of dietary factors for NCDs (articulated by WHO and derived from WHO International Agency for Research on Cancer):

- Less than 10% (ideally less than 5%) of total energy from free sugars
- Less than 10% of total energy from saturated fat, and less than 30% from total fat
- Less than 5g of salt per day
- Little if any processed meat, and red meat limited to no more than 350–500g per week.

The NCD-Risk score is also a proxy for ultra-processed food intake. A higher NCD-Risk score is closely related to higher ultra-processed food consumption.

The NCD-Risk score is a score with a range from 0 to 9. It is a sub-component of the GDR score, and reflects adherence to global dietary recommendations on components of the diet to limit or avoid. A higher score indicates higher consumption of foods and drinks to avoid or limit, and correlates negatively with meeting global dietary recommendations. The NCD-Risk score is based on food consumption from 8 food groups to limit or avoid during the past day and night (one food group, processed meat, is double weighted). This is a negative indicator, and is expressed as the average score for the population.

1 point for each “YES” answer to the following food groups, except processed meats receive a double weight:

Food group	DQQ Question numbers	Possible points
<i>Soft drinks</i>	28	1
<i>Baked / grain-based sweets</i>	11	1
<i>Other sweets</i>	12	1
<i>Processed meat</i>	16	2
<i>Unprocessed red meat</i>	17, 18	1
<i>Deep fried food</i>	24	1
<i>Fast food & Instant noodles</i>	23, 29	1
<i>Packaged ultra-processed salty snacks</i>	22	1
TOTAL		SUM (0-9)

5. Global Dietary Recommendations (GDR) score

The GDR score is a score with a range from 0 to 18 that indicates adherence to global dietary recommendations, which include dietary factors protective against non-communicable diseases. (**See Annex 1**). The higher the GDR score, the more recommendations are likely to be met. The GDR score is based on food group consumption during the past day and night.

The GDR score is calculated as follows: **NCD-Protect - NCD-Risk + 9 = GDR score**
It is expressed as the average score for the population.

Diet quality indicators for the general population that are aligned with WHO and UNICEF indicators for infant and young child feeding⁵

6. Zero vegetable or fruit consumption (-)

This indicator reflects the proportion of the population who did not consume vegetables or fruits in the previous day, let alone meeting the recommendation to consume 400 grams of fruits and vegetables daily.

A score of 0 indicates that no fruit or vegetable was consumed. This is a negative indicator, and is expressed as the percent of the population not consuming these food groups.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Fruits and Vegetables</i>	5,6*,7*, 8,9,10*	1
TOTAL		SUM (0-1)

*Note that these groups may be asked in two or more questions (e.g. 6.1 and 6.2).

7. Animal-source food (ASF) consumption

A score of 1 indicates that at least one animal-source food (dairy, eggs, and/or flesh foods) was consumed, and is expressed as the percent of the population consuming this food group.

Note: the indicator for the IYCF age range excludes dairy, because breastmilk and/or infant formula are a daily part of the IYCF diet and do not count as ASF.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Animal-source foods</i>	13,14,15,16,17,18,19,20,25	1
TOTAL		SUM (0-1)

8. Sweet beverage consumption (-)

A score of 1 indicates that any sweet beverage (soda, energy drinks, sports drinks, fruit drinks, fruit juice, sweetened tea/milk/coffee) was consumed. This is a negative indicator, and is expressed as the percent of the population consuming this aggregate food group.

1 point for each “YES” answer to the following aggregate food groups:

⁵ Indicators for assessing infant and young child feeding practices: definitions and measurement methods. Geneva: World Health Organization and the United Nations Children’s Fund (UNICEF), 2021.

Aggregate Food group	DQQ Question numbers	Possible points
<i>Sweet beverages</i>	26,27,28	1
<i>TOTAL</i>		SUM (0-1)

a. Soft drink consumption (-)

This indicator shows the proportion of the total population who consumed a soft drink (sodas, energy drinks, or sports drinks) in the previous day. Soft drinks are strongly associated with excess sugar consumption and risk of NCDs, and are also a marker of dietary and nutrition transitions. For adults, the indicator excludes sweetened coffee, tea, and milk drinks and fruit juice and fruit drinks. While for children, consumption of any sweet beverage is not recommended, for adults, sweetened tea and coffee are often traditionally consumed and are unlikely to have policy relevance, while consumption of soft drinks reflects ultra-processed beverages and has clear policy relevance related to food environment and diet and nutrition transitions.

A score of 1 indicates that sodas, energy drinks, or sports drinks were consumed. This is a negative indicator, and is expressed as the percent of the population consuming this food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Soft drinks</i>	28	1
<i>TOTAL</i>		SUM (0-1)

9. Sweet foods consumption (-)

A score of 1 indicates that any sweet food was consumed. This is a negative indicator, and is expressed as the percent of the population consuming this aggregate food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Baked / grain-based sweets or Other sweets</i>	11,12	1
<i>TOTAL</i>		SUM (0-1)

10. Salty or fried snack consumption (-)

A score of 1 indicates that any salty or fried snack was consumed. This is a negative indicator, and is expressed as the percent of the population consuming this aggregate food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Salty or fried snack</i>	22,23,24	1
<i>TOTAL</i>		SUM (0-1)

Indicators of individual WHO dietary recommendations

11. Whole grain consumption

A score of 1 indicates inclusion of whole grains as part of the diet, which is a global recommendation. It is expressed as the percent of the population consuming this food group.

1 point if whole grains were consumed

Food group	DQQ Question number	Possible points
<i>Whole grains</i>	2	1
<i>TOTAL</i>		SUM (0-1)

12. Pulse consumption

A score of 1 indicates inclusion of pulses as part of the diet, which is a global recommendation. It is expressed as the percent of the population consuming this food group.

1 point if pulses were consumed

Food group	DQQ Question number	Possible points
<i>Pulses</i>	4	1
<i>TOTAL</i>		SUM (0-1)

13. Nuts & seeds consumption

A score of 1 indicates inclusion of nuts and seeds as part of the diet, which is a global recommendation. It is expressed as the percent of the population consuming this food group.

1 point if nuts & seeds were consumed

Food group	DQQ Question number	Possible points
<i>Nuts and seeds</i>	21	1
<i>TOTAL</i>		SUM (0-1)

14. Processed meat consumption (-)

A score of 1 indicates exceeding the limit on processed meat. Avoiding processed meats is a global recommendation. This is a negative indicator. It is expressed as the percent of the population consuming this food group.

1 point if processed meats were consumed

Food group	DQQ Question number	Possible points
<i>Processed meat</i>	16	1
<i>TOTAL</i>		SUM (0-1)

Other binary indicators

15. Percent (%) consuming each food group

It may be useful and informative to examine the percent of the population consuming each food group, e.g. fish, red meat, DGLV, etc.

Certain combinations of food groups may also be useful, such as the following examples.

a. Consumed at least one vegetable or fruit

A score of 1 indicates that at least one fruit or vegetable was consumed.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Fruits and Vegetables</i>	5,6*,7*, 8,9,10*	1
<i>TOTAL</i>		SUM (0-1)

*Note that these groups may be asked in two or more questions (e.g. 6.1 and 6.2).

b. Consumed packaged ultra-processed salty snacks, instant noodles, or fast food (-)

A score of 1 indicates that packaged ultra-processed salty snacks, fast food or instant noodles were consumed. This is a negative indicator, and is expressed as the percent of the population consuming this aggregate food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Packaged ultra-processed salty snacks, instant noodles, or fast food</i>	22,23,29	1
<i>TOTAL</i>		SUM (0-1)

c. Consumed meat, poultry, or fish

A score of 1 indicates that at least one meat, poultry, or fish item was consumed, and is expressed as the percent of the population consuming this aggregate food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Meat, poultry, or fish</i>	16,17,18,19,20	1
<i>TOTAL</i>		SUM (0-1)

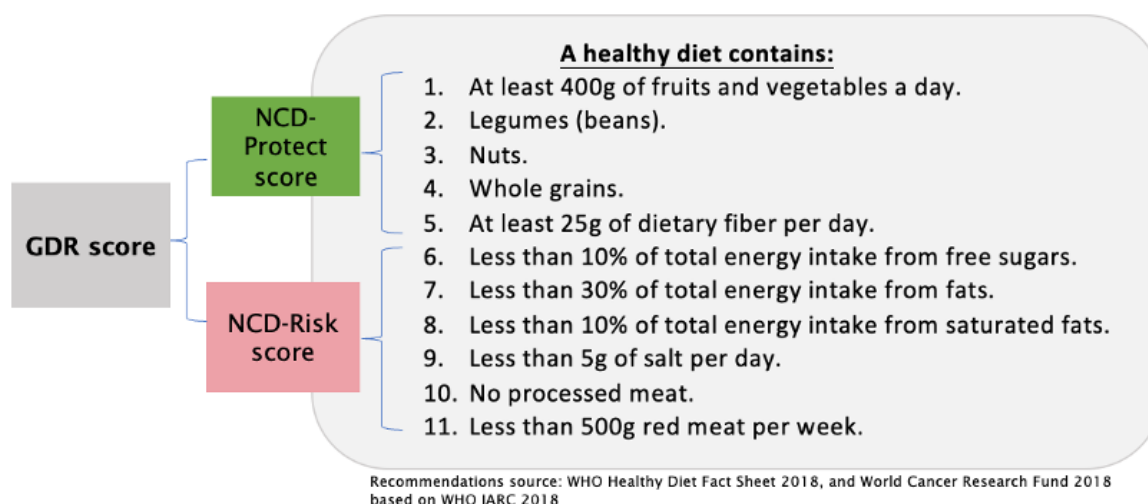
d. Consumed dairy

A score of 1 indicates that at least one dairy item was consumed, and is expressed as the percent of the population consuming this aggregate food group.

1 point for each “YES” answer to the following aggregate food groups:

Aggregate Food group	DQQ Question numbers	Possible points
<i>Dairy</i>	14,15,25	1
<i>TOTAL</i>		SUM (0-1)

Annex 1 Description of how food groups relate to the Global Dietary Recommendations Score, NCD-Protect, and NCD-Risk indicators



GDR Score: positive correlation (~0.6) with meeting the set of 11 global recommendations

- Higher = better
- A score of 10 or more is correlated with meeting at least half of the recommendations.

GDR Score also has a negative correlation (~0.5) with % of energy from ultra-processed foods.

GDR score (range: 0-18)

NCD-Protect score (range: 0-9)

NCD-Risk score (range: 0-9)

Dark green leafy vegetables
Vitamin A-rich orange vegetables, roots and tubers
Other vegetables
Vitamin A-rich fruits
Citrus fruits
Other fruits
Legumes
Nuts & seeds
Whole grains
SSBs
Baked grain-based sweets
Other sweets
Salty packaged snacks
Unprocessed red meat
Processed meat*2
Deep fried foods
Food from a fast food restaurant or instant noodles

Consumption of these food groups correlates positively with meeting the global dietary recommendations for health-protective foods

Consumption of these food groups correlates negatively with meeting the global dietary recommendations on dietary components to limit

Herforth et al. Dec 2020. Current Developments in Nutrition

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1. Herforth, A. W., Wiesmann, D., Martínez-Steele, E., Andrade, G., & Monteiro, C. A. Introducing a Suite of Low-Burden Diet Quality Indicators That Reflect Healthy Diet Patterns at Population Level. *Current Developments in Nutrition*, 2020; 4(12), nzaa168.
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