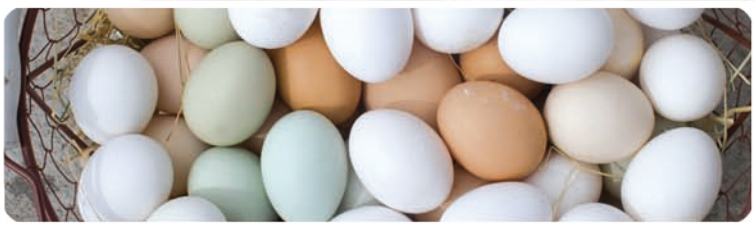
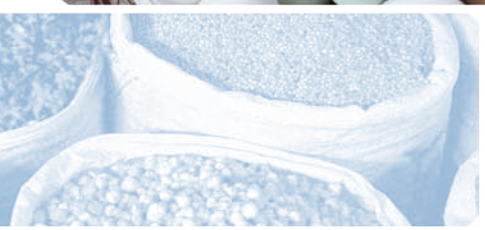
Guidelines for measuring household and individual dietary diversity





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Guidelines for Measuring Household and Individual Dietary Diversity

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Introduction

Obtaining detailed data on household food access or individual dietary intake can be time consuming and expensive, and requires a high level of technical skill both in data collection and analysis. Dietary diversity is a qualitative measure of food consumption that reflects household access to a variety of foods, and is also a proxy for nutrient adequacy of the diet of individuals. The dietary diversity questionnaire represents a rapid, user-friendly and easily administered low-cost assessment tool.

Scoring and analysis of the information collected with the questionnaire is straightforward. The dietary diversity scores described in these guidelines consist of a simple count of food groups that a household or an individual has consumed over the preceding 24 hours. The guidelines describe the use of the dietary diversity questionnaire at both the household and individual level, for which calculation of the score is slightly different in each case. The data collected can also be analyzed to provide information on specific food groups of interest.

The household dietary diversity score (HDDS) is meant to reflect, in a snapshot form, the economic ability of a household to access a variety of foods. Studies have shown that an increase in dietary diversity is associated with socio-economic status and household food security (household energy availability) (Hoddinot and Yohannes, 2002; Hatloy *et al*., 2000).

Individual dietary diversity scores aim to reflect nutrient adequacy. Studies in different age groups have shown that an increase in individual dietary diversity score is related to increased nutrient adequacy of the diet. Dietary diversity scores have been validated for several age/sex groups as proxy measures for macro and/or micronutrient adequacy of the diet. Scores have been positively correlated with adequate micronutrient density of complementary foods for infants and young children (FANTA, 2006), and macronutrient and micronutrient adequacy of the diet for non breast-fed children (Hatloy *et al.,* 1998; Ruel *et al.,* 2004; Steyn *et al.,* 2006; Kennedy *et al.,* 2007), adolescents (Mirmiran *et al*., 2004) and adults (Ogle *et al*., 2001; Foote *et al*., 2004; Arimond *et al*., 2010). Some of these validation studies refer to only one country while others have attempted to validate dietary diversity scores for several countries. Nevertheless, research is ongoing and there is currently no international consensus on which food groups to include in the scores at the individual level for different age/sex groups.

The rationale for these guidelines is to provide a standardized questionnaire of universal applicability from which various dietary diversity scores can be calculated. As such it is not culture, population, or location specific and therefore, prior to using it in the field, it will be necessary to adapt it to the local context.

This is a revised version of the guidelines for measuring dietary diversity. The main changes in this version are i) the proposal for a new individual dietary diversity score based on results of the Women's Dietary Diversity Project (Arimond *et al*., 2010) and ii) an annex on classifying food items into food groups. Guidance is provided on how to calculate the HDDS and the Women's Dietary Diversity Score (WDDS), but users can also calculate scores obtained from the standardized questionnaire for individuals from other age/sex groups according to the needs of the study.

The guidelines describe how to adapt and use the dietary diversity questionnaire, how to calculate each of the scores and how to create other indicators of interest from dietary diversity data.

2

Description of the questionnaire

The questionnaire can be used at the household or individual level according to the purpose of the survey. It has been adapted for ease of data collection from the FANTA Household Dietary Diversity Score Indicator Guide (Swindale and Bilinsky, 2006).

DIETARY DIVERSITY QUESTIONNAIRE

Please describe the foods (meals and snacks) that you ate or drank yesterday during the day and night, whether at home or outside the home. Start with the first food or drink of the morning.

Write down all foods and drinks mentioned. When composite dishes are mentioned, ask for the list of ingredients.

When the respondent has finished, probe for meals and snacks not mentioned.

Breakfast	Snack	Lunch	Snack	Dinner	Snack

[Households: include foods eaten by *any member of the household*, and *exclude* foods purchased *and* eaten outside the home]

When the respondent recall is complete, fill in the food groups based on the information recorded above. For any food groups not mentioned, ask the respondent if a food item from this group was consumed.

Question number	Food group	Examples	YES=1 NO=0
1	CEREALS	corn/maize, rice, wheat, sorghum, millet or any other grains or foods made from these (e.g. bread, noodles, porridge or other grain products) + *insert local foods e.g. ugali, nshima, porridge or paste*	
2	WHITE ROOTS AND TUBERS	white potatoes, white yam, white cassava, or other foods made from roots	
3	VITAMIN A RICH VEGETABLES AND TUBERS	pumpkin, carrot, squash, or sweet potato that are orange inside + *other locally available vitamin A rich vegetables (e.g. red sweet pepper)*	
4	DARK GREEN LEAFY VEGETABLES	dark green leafy vegetables, including wild forms + *locally available vitamin A rich leaves such as amaranth, cassava leaves, kale, spinach*	
5	OTHER VEGETABLES	other vegetables (e.g. tomato, onion, eggplant) + *other locally available vegetables*	
6	VITAMIN A RICH FRUITS	ripe mango, cantaloupe, apricot (fresh or dried), ripe papaya, dried peach, and 100% fruit juice made from these + *other locally available vitamin A rich fruits*	
7	OTHER FRUITS	other fruits, including wild fruits and 100% fruit juice made from these	
8	ORGAN MEAT	liver, kidney, heart or other organ meats or blood-based foods	
9	FLESH MEATS	beef, pork, lamb, goat, rabbit, game, chicken, duck, other birds, insects	
10	EGGS	eggs from chicken, duck, guinea fowl or any other egg	
11	FISH AND SEAFOOD	fresh or dried fish or shellfish	
12	LEGUMES, NUTS AND SEEDS	dried beans, dried peas, lentils, nuts, seeds or foods made from these (eg. hummus, peanut butter)	
13	MILK AND MILK PRODUCTS	milk, cheese, yogurt or other milk products	
14	OILS AND FATS	oil, fats or butter added to food or used for cooking	
15	SWEETS	sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies and cakes	
16	SPICES, CONDIMENTS, BEVERAGES	spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages	
Household level only	Did you or anyone in your household eat anything (meal or snack) OUTSIDE the home yesterday?		
Individual level	Did you eat anything (meal or snack) OUTSIDE the home yesterday?		

2.1 DIFFERENCES BETWEEN HOUSEHOLD AND INDIVIDUAL LEVELS

The dietary diversity questionnaire can be used to collect information either at household or individual level. The decision on which level to collect information depends in part on the purpose and objectives of the survey. If assessment of the nutrient adequacy of the diet is of primary concern, it is best to collect information at the level of the individual.

Another important consideration for the choice between household and individual is the frequency of meals/snacks purchased and consumed outside the home. If meals/snacks are purchased and consumed outside the home on a regular basis by one or more family members, administering the questionnaire at the individual level is more appropriate as it is not possible to capture accurately meals/snacks purchased and eaten outside the home at household level.

Table 1 describes the main differences between use of the questionnaire at household and individual level.

Table 1: Comparison of use of the questionnaire and construction of the score for household or individual level

	Household level questionnaire		**Individual level questionnaire**
What the tool measures	Household economic access to food (dietary energy)		Quality of the individual's diet[1]; for women probability of micronutrient adequacy of the diet
Respondent	Person responsible for food preparation for the household on the previous day		Women aged 15-49 years or individuals in other age/sex groups
Target of interest	The household (all persons living under the same roof who share meals)		The respondent
Included and excluded foods	Includes foods	Does not include foods	Includes
	Prepared in the home and consumed in the home or outside the home; or Purchased or gathered outside and consumed in the home	Purchased outside the home **and** consumed outside[2]	**All** foods eaten by the individual of interest, consumed inside or outside the home, irrespective of where they were prepared.
Number of food groups included in the score	12 groups included in the HDDS		9 groups included in the WDDS

[1] There is some evidence that women's dietary diversity also reflects household economic access to food.

[2] Those foods are not included because the respondent may not know which other household members purchase and eat outside the home.

Box 1: Special note for indicators for children 6-23 months of age

If an important target population group is young children 6-23 months of age, then the Guidelines on *Indicators for assessing infant and young child feeding practices* should be consulted as there are several specific indicators developed for this special age group.

These guidelines are available online (WHO, 2010). Available at: http://www.who.int/nutrition/publications/infantfeeding/9789241596664/en/index.html

2.2 ADDITIONAL CONSIDERATIONS

• Reference period

FAO uses a reference period of the previous 24 hours. Using one 24-hour recall period does not provide an indication of an individual's habitual diet, but it does provide an assessment of the diet at the population level and can be useful to monitor progress or target interventions (Savy *et al.,* 2005). There are various other valid timeframes for recall, such as the previous 3 or 7 days, and in the case of some foods, the previous month. The recall period of 24 hours was chosen by FAO as it is less subject to recall error, less cumbersome for the respondent and also conforms to the recall time period used in many dietary diversity studies (Kennedy *et al.,* 2007*;* Ruel *et al.,* 2004; Steyn *et al.,* 2006; Savy *et al.,* 2005; Arimond *et al*., 2010). Moreover, analysis of dietary diversity data based on a 24-hour recall period is easier than with longer recall periods.

• Eating outside the home

Even in developing countries it is an increasingly common practice to consume meals and snacks outside the home. The last question of the questionnaire asks if anyone in the household at the household level, or the respondent at the individual level, ate anything outside the home. This question is included to capture information on the purchase and consumption of meals and snacks prepared outside the home. In situations where eating outside the home is very common, application of the questionnaire at the individual level may be preferred over the household level.

• Atypical consumption

Consumption patterns can be atypical during festive periods. It is recommended not to use the questionnaire during national holidays/celebrations or during periods such as Ramadan, in which it is likely that food consumption does not reflect a typical diet. Questions related to atypical days can be added to the questionnaire either to screen out households or individuals, or to use in analysis as appropriate for the purposes of the survey.

A question of this type can be worded in the following way "Was yesterday a celebration or feast day where you ate special foods or where you ate more, or less than usual?"

• Primary source of food procurement

Sometimes it is advantageous to know the primary source of food procurement for the entire diet or for certain food groups (cereals, fruits or vegetables). If it is desirable for the purpose of the survey to collect this type of information, the following type of question and coded responses can be added to the questionnaire:

"Could you please detail the primary source for obtaining food (the below responses can be listed for each food group of interest) for your household" *(example codes below)*

1= Own production, gathering, hunting, fishing
2= Purchased
3= Borrowed, bartered, exchanged for labour, gift from friends or relatives
4= Food aid
5= Other

• Consumption of fortified foods

Fortified foods are not taken into consideration in the questionnaire. However, it can be useful to obtain information on the local availability and use of fortified foods, particularly those fortified with iron or vitamin A.

• Nutrition and food biodiversity

Food biodiversity is defined as the diversity of plants, animals and other organisms used as food, covering the genetic resources within species, between species and provided by ecosystems (FAO, 2010). Information on food biodiversity can be collected by expanding one or more of the dietary diversity food groups of the questionnaire.

3

When to measure dietary diversity

The optimal time of year to measure dietary diversity of households or individuals depends on the objective of the survey or monitoring activity. The following table describes several scenarios to assist potential users in planning surveys.

Table 2: When to measure dietary diversity

Objective	Timing	
Assessment of the typical diet of households/ individuals	In rural, agriculture-based communities	In non agriculture-based communities
	When food supplies are still adequate[3] (may be up to 4-5 months after the main harvest). ► *Looking at dietary diversity at different points in the agricultural cycle is one way of investigating seasonality of food security[4].* *In many areas there are important seasonal differences in dietary patterns. For a more complete assessment of usual diet, dietary diversity should be measured during different seasons*	Any time of the year (if seasonality is not an issue)
Assessment of the food security situation in rural, agriculture-based communities	During the period of greatest food shortage, such as immediately prior to the harvest or immediately after emergencies or natural disasters. ► *This may also serve as a baseline for monitoring change due to an intervention or for investigating seasonality[5]*	
Assessment of the food security situation in non-agricultural communities	At the moment of concern to identify a possible food security problem. ► *May also serve as a baseline for monitoring changes due to an intervention*	
Monitoring of food security/nutrition programmes or agricultural interventions such as crop and livelihood diversification	Repeated measures to assess impact of the intervention on the quality of the diet, conducted at the same time of year as the baseline (to avoid interference due to seasonal differences).	

[3] In this case, the best time should be determined through interviews with key informants.

[4] Availability of wild foods may vary according to the traditional seasonal agricultural cycle, for example, wild food availability may be greatest during the rainy season, which occurs before harvest of main cereal crops

[5] One study in Burkina Faso found women had higher dietary diversity during the 'hungry' season due to harvest of wild foods (Savy *et al.*, 2006).

4

Activities to undertake before beginning data collection

Prior to beginning data collection the questionnaire needs to be adapted to the local survey context and a series of decisions need to be made by the survey planners or survey team members.

4.1 TRANSLATION AND ADAPTATION STEPS

The standard English version of the questionnaire is not intended to be translated literally and used directly. Appropriate translation into local languages and adaptation of the food lists to reflect locally available foods is necessary. It is also necessary to agree on a common meaning and translation of terms used to describe key concepts (such as household, meal and snack).

Below is a list of the main steps that were included in adaptation and field-testing exercises in Mozambique, Malawi and Kenya[6] for the dietary diversity questionnaire.

The following steps should be undertaken by the survey team prior to beginning data collection.

a. Basic translation

The questionnaire is translated literally from English into the most appropriate major language as a starting point.

b. First review

The translated questionnaire is reviewed by the survey team, including the interviewers conducting the fieldwork. The team should agree on the appropriate wording of the questions and fill in the food group lists with all locally available foods, translated into commonly used, locally recognized names for each. Italicized phrases in the questionnaire should be replaced by the names of locally available foods. If questions arise about how to categorize a certain food or whether it is considered, for example, a "vitamin A rich food"[7], it may be necessary to consult food composition tables or nutrition experts. Guidance on assigning individual foods to food groups is also provided in Annex 2 of this manual.

It is very important that the team discuss definitions of key terms such as "household", "meal" and "snack", and then decide on the most appropriate local terms to reflect a consistent meaning. In most cases, the most appropriate term for

[6] Mozambique in March 2006, Malawi in July 2006, and Kenya in August 2006. Activities were implemented within the EC/FAO Programme "Food Security Information for Action".

[7] Vitamin A rich fruits, vegetables and tubers contain at least 120 Retinol Equivalent / 100 g (60 RAE / 100g) where 1RE = 6 µg β-carotene and 12 µg of all other provitamin A carotenoids.

"household" should be sought to reflect a group of persons living under the same roof and sharing the same food pot.

c. Key informant and community meetings to refine the food lists and translations
The survey team should organize a series of meetings with key informants in each survey locality.

Typical key informants:

- Experts at national level if the work is not restricted to a single locality.
- Community leaders, agricultural or health extension workers at community level.
- Women in the community who are responsible for food planning and preparation for the household.

This phase of adaptation is used to gather several critical pieces of information, including to:

- Review and add locally available food items to the food groups.
- Identify appropriate local terms for "food" and "meal".
- Discuss issues of food availability (such as season for consuming a particular fruit, insect or other food item) during the season when the questionnaire will be administered.
- Identify availability of red palm oil or palm nuts.
- Gather information on ingredients used in local dishes, and local meal customs and terminology; for instance it will be useful to know if a dish is usually prepared with oil so that the respondent can be prompted for this ingredient if he/she did not mention it spontaneously.

Box 2: Use of local names for foods (reproduced from WHO, 2010)

Use local names for food items and foods commonly consumed in the area.

Examples of local names for cereals and products made from cereals:

- Corn/Maize (*ugali, nsima/nshima, posho, sadza, mealies*, tortilla when made from maize)
- Teff (*injera*)
- Wheat (*chapatti, roti,* tortilla, noodle, pasta, *seitan*)

Local names for staple foods can refer to foods with different main ingredients (e.g. tortilla can be made from maize or wheat flour, and noodle can be made from wheat or rice flour) and yet belong in the same food group. In other cases, the item can belong to a different group, depending on the ingredient.

Example 1
Nsima (stiff porridge) can be made from maize (cereals group) or from cassava (roots/tubers group). In this case, the cereals group can include "*nsima* made from maize" and the roots/tubers group can include "*nsima* made from cassava".

Example 2
Clear/glass/cellophane noodles can be made from mung bean, rice or potato tuber starch.
"Noodles made from mung" bean would be included in the food group of legumes, nuts and seeds; "rice noodles" would be included in the cereals group, and "noodles made from potato starch" would be included in the food group of white roots and tubers.

This information will be very useful for the interviewers to help facilitate respondent recall. It will also supply context for interpreting the results across locations where customs may differ.

Information can also be obtained from the community on the frequency with which people eat meals/snacks outside the home, and which household members are more likely to do so. This will help the team to decide whether it is appropriate to use the household level.

d. Final translation of the questionnaire

A final version of the questionnaire in the official national language should be created once key informants from each locality have been visited, the food group lists have been completed and appropriate terminology has been agreed on.

This final version of the questionnaire in the official national language should then be translated into local dialects. It is recommended that the survey enumerators do not translate "on the spot" from one language to another, but that the questionnaire is translated and printed for each local language to be used.

4.2 TECHNICAL ISSUES TO DISCUSS PRIOR TO BEGINNING DATA COLLECTION

There are a few technical issues that the team should discuss prior to beginning data collection.

- **Minimum quantities**: the team will have to decide prior to data collection, whether or not to include foods consumed in very small quantities.

When information is collected at the household level, there is no need to set minimum quantities below which foods are not considered, so even small amounts of foods (for example, a very small portion of meat included in a mixed dish) will be counted. This is because the score is designed to reflect economic access to food, and therefore even small quantities of a food item reflect some ability to purchase that item.

For women aged 15-49 years, dietary diversity scores were more strongly correlated with micronutrient adequacy of the diet when food quantities of approximately one tablespoon or less (<15g) were not included in the score (Arimond *et al*., 2010). For example, a dash of milk just to lighten the coffee may be considered too small an amount to include in the "milk and milk products" group, or a small amount of fish

powder added to the cooking pot for flavouring should not be counted in the "fish and seafood" food group.

- **Individual food items that could be classified into more than one food group**: the team will have to decide on the most appropriate food group classification for foods which can be classified into more than one food group.

Some common examples of food items that can be classified in more than one food group are hot pepper, which could be classified as "other vegetables" or "spices, condiments and beverages", and fish powder, which could be classified as either "fish and seafood" or "spices, condiments and beverages".

These decisions are best made after taking into consideration the particular local context, including the typical amount of the food consumed. For example, many cultures use hot pepper as a spice or condiment added to meals. Depending on the context, this may mean that one small spoonful of dried hot pepper flakes is added to an entire dish, or that several spoonfuls of fresh hot pepper are eaten as an accompaniment to the meal. In the first case, the dried pepper is best included in the "spices, condiments and beverages" food group, while in the second case, as a larger quantity of fresh hot peppers is consumed, it is more appropriate to include this in the "other vegetable" food group.

Once the decisions have been made, each individual food item for which there was uncertainty can be listed under the most appropriate group so that all enumerators are consistent in assigning this food item to the agreed upon food group.

- **Mixed dishes**: the team will need to agree on a way to disaggregate mixed dishes in order to record all of the individual components in their respective food groups.

As a rule, some basic foods are listed only under their main ingredient. For example, bread is put into the cereals group even if oil, eggs or sugar are added in small amounts during the making. However, many cultures commonly prepare and eat mixed dishes (such as casseroles or sauces that accompany a staple). Particular attention should be given to certain ingredients that may not be spontaneously recalled, such as added fats or oils, or secondary ingredients such as small amounts of meat or vegetables. Prior to beginning data collection the team should identify commonly consumed mixed dishes and practise probing for and recording all ingredients in the mixed dish.

Fasolada, pancit and seafood stew are examples of some traditional mixed dishes which contain ingredients belonging to different food groups. For these types of dishes, it is necessary to ask the respondent for information on the ingredients that went into the dish, in order to record correctly all of the food groups represented in the dish.



- **Red palm oil**: Another important issue to monitor in the community, area or country where the survey is taking place is whether ***red palm oil*** or palm nuts are consumed, as these are extremely good sources of vitamin A. When these foods are part of the culture, even if only used by a small percentage of persons, it is important to ask about them. The following line should be inserted into the questionnaire in areas where red palm products are available:

Question number	Food group	Examples	YES=1 NO=0
	RED PALM PRODUCTS	Red palm oil, palm nut or palm nut pulp sauce	

4.3 TRAINING SURVEY INTERVIEWERS

Once translation and adaptation of the questionnaire are completed, interviewers should be trained to conduct the interviews in the households. This includes classroom instruction, discussion and field practice. This will allow the interviewers to familiarize themselves with the food groups and the individual foods in each group in order to place recalled food accurately into the correct food groups. Role playing is an ideal method for familiarizing interviewers with the procedure for completing the questionnaire in simulated circumstances.

Time should also be set aside as part of a field testing day for a debriefing session to answer any final questions and discuss any problems with the questionnaire. Supervisors should always check over the questionnaires with the interviewers to ensure that all concepts covered during training are understood.

5

Instructions for administering the questionnaire

The approach for collecting information on dietary diversity described in these guidelines is a qualitative 24-hour recall of all the foods and drinks consumed by the respondent (individual level) or the respondent and/or any other household member (household level).

Individual level
To administer the questionnaire at individual level, the population of interest (for example, a woman of reproductive age) should be chosen prior to the start of the data collection. The respondent is asked about all foods he/she consumed the previous day, inside and outside the home.

Household level
If the questionnaire is administered at household level, the respondent should be the person who was responsible for meal preparation for the household the previous day. The respondent is asked about all foods eaten inside the home during the previous day and night, by ANY[8] member of the household.

It was found through fieldwork in three countries that the most effective way to elicit the information on dietary diversity was to allow the respondent to freely recall what was eaten the previous day[9]. This can be done as described below:

- Ask the respondent to mention all the foods (meals and snacks) eaten yesterday during the day and night. Start with the first food/drink consumed the previous morning. Record these items in the spaces provided at the top of the questionnaire.
- After the respondent recalls all the foods and beverages consumed, underline the corresponding foods in the list under the appropriate food group and write "1" in the column next to the food group if at least one food in this group has been underlined. If the food is not listed in any group, write it in the margin and discuss it with the supervisor.
- Probe for snacks eaten between main meals.
- Probe for special foods given to children or lactating/pregnant women.
- Probe for added foods such as sugar in tea, oil in mixed dishes or fried foods.

[8] In this questionnaire food consumed by only one member of the household and not by the others is still recorded. For example if a child was given a piece of fruit to eat as a snack, this is recorded as 'yes' for fruit even if no other members of the household ate fruit.

[9] For an example of this method see Savy *et al.* (2006).

- If a mixed dish was eaten, ask about and underline all the ingredients of the dish.
- Once the recall is finished, probe for food groups where no food was underlined. It is not necessary to read out to the respondent the exact name of the food group, but simply ask (for example) about fruits, vegetables or tubers if these groups were not previously indicated. Write "0" in the right hand column of the questionnaire when it is certain that no foods in that group were eaten.

There are several advantages of the recall method compared with reading out all the foods in each group from the questionnaire and asking the person if these foods were eaten:

1) It takes less time.
2) It is less tedious for the respondent rather than having to saying Yes or No to each food.
3) It actively involves the respondent in the interview process.
4) It facilitates consideration of the ingredients used in mixed dishes.

6

Analyzing dietary diversity data

The data collected with the dietary diversity questionnaire can be analyzed in several ways. A dietary diversity score can be created, which is the sum of the different food groups consumed. The scores for different sub-populations, such as urban or rural, can then be analyzed to provide more information on the diets of sub-populations with different demographic or economic characteristics. The population can be stratified according to an indicator of vulnerability, such as categories of a wealth index, and the scores of each group compared.

It also useful to focus on individual food groups of interest in addition to using the information as a score. For example, the proportion of households or individuals consuming vitamin A rich fruits and vegetables can be calculated. Information on consumption of individual food groups can also be used to investigate dietary patterns. For example, the population can be divided into quantiles for an indicator of interest (e.g. wealth) or by quantile of the dietary diversity score (e.g. tertiles or quintiles) to identify different dietary patterns across the population subgroups.

6.1 THE DIETARY DIVERSITY SCORES

The proposed numbers of food groups to be included in the HDDS and WDDS are based on synthesis of currently available research results. The HDDS is based on the food groups proposed by FANTA (Swindale and Bilinsky, 2006). There is no international consensus on which food groups to include in the scores and the results of new research could justify changing the groups proposed in theses guidelines.

The HDDS and WDDS are calculated based upon different numbers of food groups because the scores are used for different purposes. The HDDS is meant to provide an indication of household economic access to food, thus items that require household resources to obtain, such as condiments, sugar and sugary foods, and beverages, are included in the score. Individual scores are meant to reflect the nutritional quality of the diet. The WDDS reflects the probability of micronutrient adequacy of the diet and therefore food groups included in the score are tailored towards this purpose.

Previous research has shown that the fats and oils food group does not contribute to the micronutrient density of the diet and this food group is not part of the WDDS. However, it is important to calculate the proportion of individuals consuming fats and oils as a separate indicator because oil is an important contributor to energy density and improves the absorption of plant source carotenoids and fat-soluble vitamins.

Twelve food groups are proposed for the HDDS, while nine food groups are proposed for the WDDS. The food groups used to calculate HDDS and WDDS are listed in Table 3 and Table 4. For both scores certain food groups in the questionnaire are aggregated.

Table 3 Aggregation of food groups from the questionnaire to create HDDS

Question number(s)	Food group
1	Cereals
2	White tubers and roots
3,4,5	Vegetables[1]
6,7	Fruits[2]
8,9	Meat[3]
10	Eggs
11	Fish and other seafood
12	Legumes, nuts and seeds
13	Milk and milk products
14	Oils and fats
15	Sweets
16	Spices, condiments and beverages

[1] The vegetable food group is a combination of vitamin A rich vegetables and tubers, dark green leafy vegetables and other vegetables.
[2] The fruit group is a combination of vitamin A rich fruits and other fruits.
[3] The meat group is a combination of organ meat and flesh meat.

Table 4 Aggregation of food groups from the questionnaire to create WDDS

Question number(s)	Food group
1,2	Starchy staples[1]
4	Dark green leafy vegetables
3,6 and red palm oil if applicable	Other vitamin A rich fruits and vegetables[2]
5,7	Other fruits and vegetables [3]
8	Organ meat
9,11	Meat and fish [4]
10	Eggs
12	Legumes, nuts and seeds
13	Milk and milk products

[1] The starchy staples food group is a combination of Cereals and White roots and tubers.
[2] The other vitamin A rich fruit and vegetable group is a combination of vitamin A rich vegetables and tubers and vitamin A rich fruit.
[3] The other fruit and vegetable group is a combination of other fruit and other vegetables.
[4] The meat group is a combination of meat and fish.

Note for Tables 3 and 4: Some food groups in the dietary diversity questionnaire are combined into a single food group to create the HDDS and WDDS. The potential score range is 0-12 for HDDS and 0-9 for WDDS (not 0-16 which is the number of questions in the questionnaire before aggregation into groups to create each score).

The food groups considered in the score for the WDDS put more emphasis on micronutrient intake[10] than on economic access to food. A score based on nine food groups was chosen (see Box 3).

Box 3: The Women's Dietary Diversity Project

The Women's Dietary Diversity Project tested the ability of simple dietary diversity scores to predict micronutrient adequacy of diets of women of reproductive age. This was carried out in 5 diverse settings:

- urban areas of Burkina Faso and Mali,
- rural areas of Bangladesh and Mozambique and
- an urban/peri-urban area in the Philippines.

Four different food group combinations (6, 9, 13 or 21 food groups) were tested[1].

The conclusion of the validation study was that all dietary diversity scores were significantly correlated with micronutrient adequacy of the diet. However, the more disaggregated indicators, particularly 21 food groups performed best in several countries.

These guidelines base the WDDS on the 9 food groups tested in the validation study because making decisions on assigning individual foods to food groups can become cumbersome as the list of food groups increases. For example, the scores in the validation study based on 13 and 21 food groups require knowledge of both the vitamin A and vitamin C content of all fruits and vegetables available in the area. Depending on the purpose or location of the survey, users could also choose to base the score on either 13 or 21 food groups - doing so would require modification of the questionnaire on page 8.

[1] Full reports of the validation study for each individual country can be accessed at http://www.fantaproject.org/focus/women.shtml and a summary of results from all five sites is available from Arimond et al. (2010).

6.2 HOW TO CREATE DIETARY DIVERSITY SCORES

Dietary diversity scores are calculated by summing the number of food groups consumed in the household or by the individual respondent over the 24-hour recall period.
The following steps are included in creating either the HDDS or WDDS:

1. Create new food group variables for those food groups that need to be aggregated[11].
   For example in the WDDS the food group "Starchy staples" is a combination of "Cereals" and "White roots and tubers". A new variable termed "Starchy

[10] Research in infants and young children showed that the fats and oils food group did not contribute to the micronutrient density of the diet. Based on this, the WDDS also excludes fats/oils from the score, but for many projects it will be important to continue to monitor consumption of items in this food group.

[11] The number of food groups included in each score differs from the total number of food groups in the questionnaire.

staples" should be created by combining the answers to "Cereals" and "White roots and tubers". This can be done using the following type of logical syntax:

Starchy staples = 1 if q1 (Cereals) =1 or q2 (White roots and tubers) = 1
Starchy staples = 0 if q1 (Cereals) = 0 and q2 (White roots and tubers)=0

As a check, run a "frequencies" test on all newly created variables and make sure that all values are either 0 or 1. There should be no values > 1 for the newly created variable.

2. Create a new variable termed either HDDS or WDDS.
3. Compute values for the dietary diversity variable by summing all food groups included in the dietary diversity score (either 12 food groups for household or nine for women - see above for food group definitions).

   As a check on the creation of the variables, all scores should be within the following range:

   • HDDS (0-12)
   • WDDS (0-9)

6.3 USING AND INTERPRETING HDDS AND WDDS

There are no established cut-off points in terms of number of food groups to indicate adequate or inadequate dietary diversity for the HDDS and WDDS. Because of this it is recommended to use the mean score or distribution of scores for analytical purposes and to set programme targets or goals.

Box 4: Example of setting programme targets or goals using dietary diversity

In Mozambique HDDS was stratified using a wealth scale. The mean HDDS in the lowest wealth tertile was 3.9, while the mean HDDS in the highest wealth tertile was 5.0.

For a project with interventions to improve food access and household food security, the mean HDDS of the wealthiest tertile could be used to set the HDDS target level.

A more detailed discussion on use of the mean dietary diversity score for definition of target levels can be found in the FANTA publication: Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide, VERSION 2, 2006, (*http://www.fantaproject.org/focus/household.shtml*).

Looking at the percentage of households or individuals consuming individual food groups is another important analytical strategy. Dietary diversity scores and percent households consuming each food group can be used as a one-time measure or for on-going monitoring.

Dietary diversity scores can be used to assess changes in diet before and after an intervention (improvement expected) or after a disaster such as crop failure (decline expected). The mean dietary diversity score allows comparison of sub-populations; for example, communities undergoing a nutrition intervention compared with control communities, or HIV-affected households compared with others.

When interpreting the dietary diversity score, it is important to keep in mind that:

- The dietary diversity score does not indicate the quantity of food consumed.
- Diet varies across seasons and some foods can be available in large quantities and at low cost for short periods.
- There may be urban/rural differentials in dietary diversity. Variety is often much greater in urban and peri-urban centres where food markets are adequately supplied and easily accessible.

6.4 CREATING INDICATORS OF SPECIAL INTEREST FROM SPECIFIC FOOD GROUPS

At the population level, proportions of households or individuals who consume food groups that are good sources of individual micronutrients, such as vitamin A or iron can be calculated. It is also useful at the individual level to include an indicator on percentage of individuals consuming fats/oils as this food group is not part of the women's dietary diversity score.

Table 5 itemizes key food groups of interest when investigating consumption of vitamin A[12] or haem-iron rich foods.

Table 5: Micronutrients of interest and corresponding food groups in the dietary diversity questionnaire

Micronutrient	Question number & food group
Vitamin A	**Plant-based food groups:** *question number 3:* vitamin A rich vegetables or tubers *question number 4:* dark green leafy vegetables *question number 6:* vitamin A rich fruits (e.g. mangos, apricots) *food group* with red palm oil or products made from red palm oil if appropriate
	Animal-based food groups: *question number 8:* Organ meat *question number 10:* Eggs *question number 13:* Milk and milk products
Iron	*questions number 8:* Organ meat *question number 9:* Flesh meat *question number 11:* Fish and seafood

[12] The term vitamin A is used in this section for simplicity. It indicates foods containing retinol and foods of plant origin that contain retinol precursor carotenoids

The following indicators can be derived for consumption of vitamin A rich food groups:

- Percentage of individuals/households consuming plant foods rich in vitamin A (vitamin A rich vegetables and tubers, dark green leafy vegetables, or vitamin A rich fruits).
- Percentage of individuals/households consuming vitamin A rich animal source foods (organ meat, eggs or milk and milk products).
- Percentage of individuals/households consuming either a plant or animal source of vitamin A (vitamin A rich vegetables and tubers or dark green leafy vegetables or vitamin A rich fruits or organ meat, or eggs, or milk and milk products).

The following indicator can be derived for consumption of haem-iron rich food groups:

- Percentage of individuals/households consuming organ meat, flesh meat, or fish[13].

The indicators above are calculated by summing the number of households or individuals who consumed ANY of the food groups listed in the questionnaire and then dividing by the total sample size of the survey.

Example: The percentage of households or individuals that consumed plant foods rich in vitamin A during the last 24 hours is calculated using the following formula:

$$\frac{\text{Number of households/individuals that consumed vitamin A rich vegetables and tubers } \textbf{OR} \text{ dark green leafy vegetables } \textbf{OR} \text{ vitamin A rich fruits}}{\text{Total number of respondents}} \times 100$$

Using qualitative dietary diversity data it is not possible to establish thresholds below which populations do not consume sufficient vitamin A or iron. In general, low percentages of households or individuals consuming food groups containing these micronutrients on a given day may be indicative of seriously inadequate diets that lead to morbidity related to micronutrient deficiencies.

As with the dietary diversity mean score, percentages of those consuming micronutrient rich food groups can be used as one-time measures of a population or sub-populations, for ongoing monitoring or to assess changes in diet such as before and after an intervention. Sub-groups can also be compared, for example communities undergoing a nutrition intervention compared with control communities.

6.5 ASSESSING DIETARY PATTERNS AT DIFFERENT LEVELS OF DIETARY DIVERSITY SCORES

In addition to calculating mean dietary diversity scores, it is also important to know which food groups are predominately consumed at different levels of the scores. This provides information on the foods that are eaten by those with the lowest dietary

[13] These three food groups all contain food sources of haem iron, which is more bioavailable than non-haem iron and also enhances the absorption of non-haem iron present in the same meal. Organ meats are the richest source of haem iron.

diversity, and which foods are added by those with a higher score. Dietary patterns are analyzed in this example by looking at the food groups consumed by at least 50% of households in each tertile. Table 6 shows what diets look like in central Mozambique during the mango season.

Table 6: Food groups consumed by ≥50% of households by dietary diversity tertile in central Mozambique

Lowest dietary diversity (≤ 3 food groups)	Medium dietary diversity (4 and 5 food groups)	High dietary diversity (≥ 6 food groups)
Cereals	Cereals	Cereals
Green leafy vegetables	Green leafy vegetables	Green leafy vegetables
Vitamin A rich fruit	Vitamin A rich fruit	Vitamin A rich fruit
	Oil	Oil
		Other vegetables
		Fish
		Legumes, nuts and seeds

Source: FAO, 2006

Dietary patterns can also be used for comparisons across countries. The example in the table below comes from results of the Women's Dietary Diversity Project in Bangladesh (Arimond *et al.,* 2009), Mozambique (Wiesmann, Arimond and Loechi, 2009) and the Philippines (Daniels, 2009).

Table 7: Food groups (based on the nine used for the WDDS in these guidelines) consumed by ≥50% women

Bangladesh	Mozambique	Philippines
Starchy staples	Starchy staples	Starchy staples
Meat, poultry or fish	Legumes/nuts	Meat, poultry or fish
Other vitamin A rich fruits and vegetables	Other vitamin A rich fruits and vegetables	Other fruits and vegetables
Dark green leafy vegetables	Other fruits and vegetables	

7

Conclusions

Dietary diversity as a measure of household food access and food consumption can be triangulated with other food-related information to contribute towards providing a holistic picture of the food and nutrition security status in a community or across a broader area.

Dietary diversity questionnaires are increasingly included in food and nutrition security surveys to provide indicators of household food access or individual dietary quality.

Some examples of where dietary diversity questionnaires could be included in the context of food and nutrition security assessment are:

- Baseline and impact assessment in the framework of nutrition and food security programmes.
- National surveys.
- Surveillance systems.
- Monitoring and evaluation[14] of programmes and policies.
- Emergency or routine food security analyses.
- Phase classification for identifying emergencies.

[14] In the case of evaluation of a programme, dietary diversity will be used as an outcome indicator. Examples of programmes where dietary diversity questionnaires could be used are those that aim to improve crop diversity or market availability of certain foods, and nutrition education projects to improve dietary quality.

Citations

Arimond, M., Wiesmann, D., Becquey E., Carriquiry, A., Daniels, M., Deitchler, M., Fanou-Fogny, N., Joseph, M., Kennedy, G., Martin-Prevel, Y. & Torheim, L.E. 2010 Simple food group diversity indicators predict micronutrient adequacy of women's diets in 5 diverse, resource-poor settings. *Journal of Nutrition (forthcoming).*

Arimond, M., Torheim, L.E., Wiesmann, D., Joseph, M. & Carriquiry A. 2009. Dietary Diversity as a Measure of the Micronutrient Adequacy of Women's Diets: Results from Rural Bangladesh Site. Washington (DC): Food and Nutrition Technical Assistance II Project, Academy for Educational Development; 2009. (available at http://www.fantaproject.org/downloads/pdfs/WDDP_Bangladesh_Dec09.pdf)

Daniels, M. 2009. Dietary diversity as a measure of the micronutrient adequacy of women's diets: Results from Metropolitan Cebu, Philippines Site. Washington (DC): Food and Nutrition Technical Assistance II Project, Academy for Educational Development, (available at http://www.fantaproject.org/downloads/pdfs/WDDP_Philippines_Dec09.pdf).

FANTA. 2006**.** *Developing and Validating Simple Indicators of Dietary Quality and Energy Intake of Infants and Young Children in Developing Countries: Summary of findings from analysis of 10 data sets.* Working Group on Infant and Young Child Feeding Indicators. Food and Nutrition Technical Assistance (FANTA) Project, Academy for Educational Development (AED), Washington, D.C.

FAO. 2010. *Expert Consultation on Nutrition Indicators for Biodiversity 2. Food consumption.* FAO. Rome, Italy (available at http://www.fao.org/infoods/biodiversity/index_en.stm)

FAO. 2006. *Baseline Survey Report Protecting and Improving Household Food Security and Nutrition in HIV/AIDS Affected Areas in Manica and Sofala Province*, Maputo, Mozambique. (available at http://www.foodsec.org/tr/nut/baseline_june07.pdf)

Foote, J., Murphy, S., Wilkens, L., Basiotis, P. & Carlson, A. 2004. Dietary variety increases the probability of nutrient adequacy among adults. *Journal of Nutrition* 134: 1779-1785.

Hatloy, A., Hallund, J., Diarra, M.M. & Oshaug, A. 2000. Food variety, socioeconomic status and nutritional status in urban and rural areas in Koutiala (Mali). *Public Health Nutrition* 3: 57-65.

Hatloy, A., Torheim, L. & Oshaug, A. 1998. Food variety--a good indicator of nutritional adequacy of the diet? A case study from an urban area in Mali, West Africa. *European Journal of Clinical Nutrition* 52(12):891-8.

Hoddinott, J. & Yohannes, Y. 2002. *Dietary diversity as a food security indicator*. FANTA 2002, Washington DC. (available at http://www.aed.org/Health/upload/dietarydiversity.pdf)

Hunt, J. 2001. *How important is dietary iron bioavailability? American Journal of Clinical Nutrition* 73: 3-4.

Kennedy, G., Pedro, M.R., Seghieri, C., Nantel, G. & Brouwer, I. 2007. Dietary diversity score is a useful indicator of micronutrient intake in non breast-feeding Filipino children. *Journal of Nutrition* 137: 1-6.

Latham, M. 1997. Human Nutrition in the Developing World. Food and Agriculture Organization of the United Nations. Rome, Italy.

Mirmiran, P., Azadbakht, L., Esmaillzadeh, A. & Azizi, F. 2004. Dietary diversity score in adolescents- a good indicator of the nutritional adequacy of diets: Tehran lipid and glucose study. *Asia Pacific Journal of Clinical Nutrition* 13(1): 56-60.

Ruel, M., Graham, J., Murphy, S. & Allen, L. 2004. *Validating simple indicators of dietary diversity and animal source food intake that accurately reflect nutrient adequacy in developing countries.* Report submitted to GL-CRSP.

Savy, M., Martin-Prevel, Y., Traissac, P., Emyard-Duvernay, S. & Delpeuch, F. 2006. Dietary diversity scores and nutritional status of women change during the seasonal food shortage in rural Burkina Faso. *Journal of Nutrition* 136: 2625-2632.

Savy, M., Martin-Prevel, Y., Sawadogo, P., Kameli, Y. & Delpeuch, F. 2005. Use of variety/ diversity scores for diet quality measurement: relation with nutritional status of women in a rural area in Burkina Faso. *European Journal of Clinical Nutrition* 59: 703-716.

Steyn, N.P., Nel, J.H., Nantel, G., Kennedy, G. & Labadarios, D. 2006. Food variety and dietary diversity scores in children: are they good indicators of dietary adequacy? *Public Health Nutrition* 9(5): 644-650.

Swindale A. & Bilinsky, P. 2006. *Household dietary diversity score (HDDS) for measurement of household food access: indicator guide, Version 2.* Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington, D.C.

Tseng, M., Chakraborty, H., Robinson, D., Mendez, M. & Kohlmeir, L. 1997. Adjustment of iron intake for dietary enhancers and inhibitors in population studies: Bioavailable iron in rural and urban residing Russian women and children. *Journal of Nutrition* 127: 1456-1468.

WHO. 2010. Indicators for assessing infant and young child feeding practices. Part 2 Measurement. Geneva; WHO. Available at: http://www.who.int/nutrition/publications/infantfeeding/9789241596664/en/index.html

Wiesmann, D., Arimond, A. & Loechi, C. 2009. Dietary diversity as a measure of the micronutrient adequacy of women's diets: Results from rural Mozambique site. Washington (DC): Food and Nutrition Technical Assistance II Project, Academy for Educational Development, (available at: http://www.fantaproject.org/downloads/pdfs/WDDP_Mozambique_Dec09.pdf)

ANNEX 1

Reference note on deriving indicators for iron intake

Dietary iron is found in both plant and animal foods. Haem iron, found only in animal source foods is absorbed more easily into the body than non-haem iron, which is found in both animal and plant foods (Tseng, M. *et al*., 1997). There are several dietary factors that influence the uptake of iron by the body. Consuming vitamin C, or a haem iron source increases the bioavailability of non-haem iron consumed in the same meal. Conversely, phytate (found in grains and legumes), polyphenols (found in coffee and tea), calcium and egg have an inhibiting effect on non-haem iron uptake when consumed during the same meal (Latham, M., 1997). However, recent studies established that individual iron status has a much more profound effect on iron uptake than dietary inhibitors and enhancers of iron (Hunt, J., 2001).

The choice of indicators recommended for reporting purposes is driven by the following main factors: i) the questionnaire does not collect information at the level of the meal, where the effect of iron inhibitors and enhancers occurs, therefore it is not possible to take into consideration these effects ii) the unknown iron status of the individual has a larger effect on iron absorption than do any dietary factors.

ANNEX 2

Guidance on assigning individual foods to food groups[15]

CEREALS

Include products and foods derived from cereal crops. Any staple dishes or products such as breads *(e.g.* bagels, rolls, scones, *chapatti, roti,* tortillas), savoury biscuits *(*buttermilk biscuits, cheese biscuits*),* porridge *(ugali, nsima/nshima, posho, sadza, mealies, dalia, muesli, papilla, grain fufu),* and noodles *(*pasta, *soba,* spaghetti, vermicelli) made from the grains listed below, and from flours of these grains, should be included in this category. Local names should be used (see Box 2). Sweet biscuits and cakes should not be included.

Common name (*Regional common names*)	***Binomial name or genus***	**Family**	**Edible part of the plant**
Amaranth (*kiwicha*)	*Amaranthus*	Amaranthaceae	Seed
Barley	*Hordeum vulgare*	Poaceae	Seeds
Buckwheat	*Fagopyrum esculentum*	Polygonaceae	Seeds
Corn (maize)	*Zea mays*	Poaceae	Seeds
Fonio	*Digitaria exilis*	Poaceae	Seeds
Kamut	*Triticum turanicum*	Poaceae	Wheat-like seeds
Kañiwa (*cañihua, ca*ñiwa)	*Chenopodium pallidicaule*	Amaranthaceae	Seeds
Millet	*Pennisetum typhoides*	Poaceae	Seeds
Oats	*Avena sativa*	Poaceae	Seeds
Palmer's grass	*Distichlis palmeri*	Poaceae	Wheat-like seeds
Quinoa (*quinua*)	*Chenopodium quinoa*	Amaranthaceae	Seeds
Rice	*Oryza sativa*	Poaceae	Seeds
Rye	*Secale cereale*	Poaceae	Seeds
Sorghum	*Sorghum bicolour*	Poaceae	Seeds
Spelt	*Triticum spelta*	Poaceae	Wheat like seeds
Teff	*Eragrostris abyssinica*	Poaceae	Seeds
Triticale (cross between wheat and rye)	*Triticosecale*	Poaceae	Seeds

[15] This section is adapted with permission from *Indicators for assessing infant and young child feeding practices Part 2: Measurement (WHO, 2010).*

WHITE ROOTS AND TUBERS

Include non-pigmented items mainly providing carbohydrate. This group includes all non-grain-based starchy staples. Any staple dishes/casseroles and pastes made from roots, tubers, and plantains should also be included in this category.

Common name (*Regional common names*)	***Binomial name or genus***	**Family**	**Edible part of the plant**
Ahipa (*ajipa*)	*Pachyrhizus ahipa*	Fabaceae	Tuberous root
Arracacha (*racacha*, white carrot)	*Arracia xanthorhiza*	Apiaceae	Tuberous root
Arrow root	*Maranta arundinacea*	Marantaceae	Rhizomes
Bread fruit	*Artocarpus*	Moraceae	Starchy fruit
Burdock root	*Artium lappa*	Asteraceae	Taproot
Canna lily (*achira)*	*Canna*	Cannaceae	Starchy rhizome
Cassava (*yucca*, manioc, *mandioca*)	*Manihot esculenta*	Euphorbiaceae	Tuberous root
Chicory root	*Cichorium intybus*	Asteraceae	Tuberous root
Elephant foot yam (white)	*Amorhophallus paeoniifolius*	Araceae	Starchy corm
Green bananas	*Musa*	Musaceae	Starchy fruit
Jicama/Yambean	*Pachyrhizus erosus*	Fabaceae	Tuberous roots
Lotus root	*Nelumbo nucifera*	Nelumbonaceae	Spongy roots
Maca	*Lepidium meyenii*	Brassicaceae	Tuberous root
Mashwa (*mashua*)	*Tropaeolum tuberosum*	Tropaeolaceae	Stem tuber
Mauka	*Mirabilis longiflora*	Nyctaginaceae	Tuberous root
Nopal	*Opuntia*	Cactaceae	Succulent stem
Oca	*Oxalis tuberosa*	Oxalidaceae	Tuberous root
Parsnip	*Pastinacea sativa*	Apiaceae	Tuberous root
Plantains (ripe and green)	*Musa*	Musaceae	Starchy fruit
Potatoes (purple/ blue/ pink/ yellow)	*Solanum tuberosum*	Solanaceae	Stem tuber
Rutabaga	*Brassica napobrassica*	Brassicaceae	Tuberous root
Sweet potato (white/ pale yellow/ blue/purple/red)	*Ipomoea batatas*	Convolvulaceae	Tuberous root
Tannia (*yautia*)	*Xanthosoma sagittifolium*	Araceae	Starchy corms
Taro root (*cocoyam, dasheen, eddo, tannia, colocasia, arbi/arvi*)	*Colocasia esculenta*	Araceae	Starchy corm
Turnip	*Brassica rapa*	Brassicaceae	Tuberous root
Ulloco (*melloco*)	*Ullucus tuberosus*	Basellaceae	Stem tuber
Water Chestnut	*Eleocharis dulcis*	Cyperaceae	Starchy corms
Yam	*Dioscorea*	Dioscoreaceae	Tuberous root

VITAMIN A RICH VEGETABLES AND TUBERS

Include only roots, tubers, and other red/yellow/orange vegetables that are sources[16] of Vitamin A (see Box 1 of this Annex). Several items that are botanically fruits but are typically used as vegetables for culinary purposes are also included here.

Common name	*Binomial name or genus*	Family	Edible part of the plant
Carrot	*Daucus carota*	Umbelliferae	Tuberous root
Pumpkin	*Cucurbita pepo*	Cucurbitaceae	Fruit
Red pepper (sweet)	*Capsicum annuum*	Solanaceae	Fruit
Squash (orange or dark yellow flesh only)	*Cucurbita*	Cucurbitaceae	Fruit
Sweet potato (orange or dark yellow flesh only)	*Ipomoea batatas*	Convolvulaceae	Tuberous root

Annex 2 Box 1: CODEX definitions for foods and liquids as "sources" of vitamin A

For plant foods: Foods providing 120 retinol equivalents (RE) per 100 g are considered sources. This is roughly equivalent to 60 retinol activity equivalents (RAE); food composition tables may report vitamin A content of foods using RE or RAE.

For liquids (e.g. juices): Liquids providing 60 RE or 30 RAE per 100 g are considered to be sources of vitamin A.

DARK GREEN LEAFY VEGETABLES

Include in this category only medium to dark green leafy vegetables that are a source of Vitamin A. Vitamin A values for leafy vegetables vary widely across various food composition tables. In general medium to dark leafy green vegetables will meet the criterion to be considered sources of Vitamin A (see Box 1 of this annex for definition of Vitamin A source).

Common name *(Regional common names)*	*Binomial name or genus*	Family	Edible part of the plant
Alfalfa greens	*Medicago sativa*	Fabaceae	Leaves
Amaranth greens (*bugga, kiwicha, dodo*)	*Amaranthus*	Amaranthaceae	Leaves
Arugula (*rocket, rúcula, oruga)*	*Eruca sativa*	Brassicaceae	Leaves

[16] For definition of "source" refer to: Codex Alimentarius Commission, Guidelines adopted 1997, revised 2004; for definition of Nutrient Reference Values: Codex Alimentarius Commission, Guidelines adopted 1985, revised 1993.

Common name ***(Regional common names)***	***Binomial name or genus***	**Family**	**Edible part of the plant**
Baobab greens	*Adansonia*	Malvaceae	Leaves
Bean greens	*Phaseolus mungo*	Papilinaceae	Leaves
Beet greens (*Swiss chard, silverbeet, perpetual spinach, crab beet, mangold)*	*Beta vulgaris*	Chenopodiaceae	Leaves
Bitter Leaf (*ewuro, ndole, onugbu*)	*Vernonia calvoana*	Asteraceae	Leaves
Broccoli	*Brassica oleracea*	Brassicaceae	Head
Broccoli rabe (*rappi, broccoletti, turnip greens*)	*Brassica rapa*	Brassicaceae	Leaves
Carrot greens	*Daucus carota*	Apiaceae	Leaves
Cassava greens	*Manihot esculenta*	Euphorbiaceae	Leaves
Chicory greens	*Cichorium intybus*	Asteraceae	Leaves
Chili greens	*Capsicum frutescens*	Solanaceae	Leaves
Chinese cabbage (*bok choy, pak choy, snow cabbage*)	*Brassica rapa*	Brassicaceae	Leaves
Chinese kale (*Chinese broccoli, gai-lan, kai-lan)*	*Brassica oleracea*	Brassicaceae	Leaves
Collard greens (spring greens)	*Brassica oleracea*	Brassicaceae	Leaves
Cowpea greens	*Vigna unguiculata*	Paplionaceae	Leaves
Dandelion greens	*Taraxacum*	Asteraceae	Leaves
Drumstick greens	*Moringa oleifera*	Moringaceae	Leaves
Fenugreek greens (*methi*)	*Trigonella foenum*	Fabaceae	Leaves
Fiddle head fern (*dod*)	*Pteridium aquilinum*	Dennstaedtiaceae	Leaves
Garden cress (*pepper grass*)	*Lepidium sativum*	Brassicaceae	Leaves
Kale	*Brassica oleracea*	Brassicaceae	Leaves
Lamb's quarters (*bathua*)	*Chenopodium alba*	Amaranthaceae	Leaves
Lettuce (*bib, romaine*)	*Lactuca sativa*	Asteraceae	Leaves
Malva greens (*mallow*)	*Malva vertcillata*	Malvaceae	Leaves
Mustard greens	*Sinapsis alba*	Brassicaceae	Leaves
Okra greens (*lady's fingers leaves, gumbo leaves)*)	*Abelmoschus esculentus*	Malvaceae	Leaves
Pumpkin greens	*Cucurbita pepo*	Cucurbitaceae	Leaves
Purslane	*Portulaca oleracea*	Portluacaceae	Leaves
Quinoa greens (*quinua*)	*Chenopodium quinoa*	Amaranthaceae	Leaves
Seaweed	*Caulerpa prolifera*	Caulerpaceae	Algae
Spinach	*Spinacia oleracea*	Amaranthaceae	Leaves

Common name ***(Regional common names)***	***Binomial name or genus***	**Family**	**Edible part of the plant**
Sweet potato leaves	*Ipomoea batatas*	Convolvulaceae	Leaves
Tannia greens	*Xanthosoma*	Araceae	Leaves
Taro greens	*Colocasia esculenta*	Araceae	Leaves
Turnip greens	*Brassica rapa*	Brassicaceae	
Watercress	*Nasturtium officinale*	Brassicaceae	Leaves
Water spinach (*swamp cabbage, water morning-glory, kangkung*)	*Ipomoea aquatica*	Convolvulaceae	Leaves
Yau choy	*Brassica napus*	Brassicaceae	Leaves

OTHER VEGETABLES

Common name (***Regional common names***)	***Binomial name or genus***	**Family**	**Edible part of the plant**
Artichoke	*Cynara cardumculus*	Asteraceae	Fleshy bracts
Asparagus	*Asparagus officinalis*	Asparagaceae	Young shoots
Bamboo Shoots	*Bambusa vulgaris*	Poaceae	Young stem
Beans (various) when eaten as fresh pods	*Phaseolus*	Fabaceae	Young pod
Beets	*Beta vulgaris*	Chenopodiaceae	Leafy stems
Bitter melon	*Momordica charantia*	Cucurbitaceae	Fruit
Brussels sprouts	*Brassica oleracea*	Brassicaceae	Fleshy bracts
Cabbage (common and red varieties)	*Brassica oleracea*	Brassicaceae	Leaves
Caigua (*caihua, slipper gourd*)	*Cyclanthera pedata*	Cucurbitaceae	Fruit
Cattail	*Typha*	Typhaceae	Rhizome
Cauliflower	*Brassica oleracea*	Brassicaceae	Head (thalamus and flower buds)
Celery	*Apium graveolens*	Apiaceae	Leaf stalk
Ceylon spinach	*Basella alba*	Basellaceae	Succulent leaves
Chayote (*sayote, tayota, choko, chocho, chow-chow, christophine*)	*Sechium edule*	Cucurbitaceae	Fruit
Corn (fresh, not dried/ flour/meal) (*green maize*)	*Zea mays*	Poaceae	Corn cobs, kernels
Cucumbers	*Cucurbita*	Cucurbitaceae	Fruit
Eggplant (*aubergine, brinjal)*	*Solanum melongena*	Solanaceae	Fleshy fruit

Common name (*Regional common names*)	***Binomial name or genus***	**Family**	**Edible part of the plant**
Endive	*Cichorium endivia*	Asteraceae	Leaves
Fennel	*Foeniculum vulgae*	Apiaceae	Bulb, stem, leaves
Garlic	*Allium sativum*	Liliaceae	Bulb
Green pepper	*Capsicum annuum*	Solanaceae	Fruit
Jicama (*yam bean*)	*Pachyrhizus erosus*	Fabaceae	Tuberous root
Kohlrabi (*German turnip*)	*Brassica oleracea*	Brassicaceae	Stem
Leek	*Allium ampeloprasum*	Alliaceae	Stem/leaf sheaths
Lettuce (light green)	*Lactuca sativa*	Asteraceae	Leaves
Luffa (*ridged gourd*)	*Luffa acutangula*	Cucurbitaceae	Fruit
Mushroom	*Agaricus bisporus*	Agaricaceae	Stem and cap
Nakati (*mock tomato*)	*Solanum aethiopicum*	Solanaceae	Leaves
Okra (*lady's fingers, gumbo)*	*Abelmoschus esculentus*	Malvaceae	Green fruit
Onion	*Allium cepa*	Liliaceae	Bulb
Palm hearts (*palmito, chonta, swamp cabbage*)	*Bactris gasipaes*	Arecaceae	Inner core
Parwal (*pointed gourd*)	*Trichosanthes dioica*	Cucurbitaceae	Fruit
Peas[17], green, when eaten as fresh pod	*Pisum sativum*	Fabaceae	Young pod
Radish	*Raphanus sativus*	Brassicaceae	Tuberous root
Rutabaga greens	*Brassica napobrassica*	Brassicaceae	Leaves
Shallot (*eschallot, eeschalotte*)	*Allium oschaninii*	Alliaceae	Bulb
Snake gourd (*serpent gourd, chichinga, and padwal*)	*Trichosanthes cucumerina*	Cucurbitaceae	Fruit
Squash (Summer and other light coloured squash)	*Cucurbita maxima*	Cucurbitaceae	Fruit
Tomato (red, yellow, green, not orange)	*Solanum lycopersicum*	Solanaceae	Fruit
Winter melon (*white gourd, ash gourd*)	*Benincasa hispida*	Cucurbitaceae	Fruit
Zucchini	*Cucurbita pepo*	Cucurbitaceae	Fruit

[17] Various varieties of young bean pods are eaten as vegetables. All the varieties of bean and pea consumed as a young pod should be included in the group "Other vegetables". When mature seeds are eaten (mainly as dried) they should be listed under group "Legumes, nuts and seeds".

VITAMIN A RICH FRUITS (DARK YELLOW OR ORANGE)

Include locally available dark yellow or orange fruits that are sources of Vitamin A (see Box 1 for definition of Vitamin A source).

Common name ***(Regional common names)***	***Binomial name or genus***	**Family**	**Edible part of the plant**
Apricots (fresh and dried)	*Prunus armeniaca*	Rosaceae	Fruit
Cantaloupe melon (ripe)	*Cucumis melo*	Cucurbitaceae	Fruit
Hog plum	*Spondias mombin*	Anacardiaceae	Fruit
Loquat	*Eriobotrya japonica*	Rosaceae	Fruit
Mango (ripe, fresh and dried)	*Mangifera indica*	Anacardiaceae	Fruit
Musk melon	*Cucumis melo*	Cucurbitaceae	Fruit
Papaya (ripe, fresh and dried)	*Carica papaya*	Caricaceae	Fruit
Passion fruit (ripe)	*Passiflora edulis*	Passifloracceae	Fruit
Peaches (dried or raw)	*Prunus persica*	Rosaceae	Fruit
Persimmon (ripe)	*Diospyros kaki*	Ebenaceae	Fruit
Pitanga (S*urinam cherry, Brazilian cherry*)	*Eugenia uniflora*	Myrtaceae	Fruit
Tree tomato (*Tamarillo*)	*Solanum betaceum*	Solanaceae	Fruit

OTHER FRUITS

This group includes various parts of a plant; leaves, stem, fruit and flowers.

Common name ***(Regional common names)***	***Binomial name or genus***	**Family**	**Edible part of the plant**
Acerola (*West Indian cherry)*	*Malpighia glabra*	Malpighiaceae	Fruit
Apple	*Malus domestica*	Rosaceae	Fruit
Avocados	*Persea americana*	Lauraceae	Fruit
Banana	*Musa indica*	Musaceae	Fruit
Baobab pulp	*Adansonia*	Malvaceae	Fruit
Blackberry	*Rubus fruticosus*	Rosaceae	Fruit
Blackcurrant	*Ribes nigrum*	Grossulariaceae	Fruit
Blueberry	*Vaccinium*	Ericaceae	Fruit
Cactus pear	*Opuntia*	Cactaceae	Succulent stem
Cape gooseberry	*Physalis peruviana*	Solanaceae	Fruit
Cashew nut fruit (*cashew apple, tupi)*	*Anacardium occidentale*	Anacardiaceae	Fruit

Common name ***(Regional common names)***	***Binomial name or genus***	**Family**	**Edible part of the plant**
Cherries (*cornelian*)	*Corneus*	Cornaceae	Fruit
Coconut flesh	*Cocos nucifera*	Arecaceae	Fruit
Cranberry	*Vaccinium*	Ericaceae	Fruit
Custard apple (bullock's heart, bull's heart)	*Annona reticulata*	Annonaceae	Fruit
Dates (fresh and dried)	*Phoenix dactylifera*	Arecaceae	Fruit
Durian	*Durio*	Malvaceae	Fruit
Elderberry	*Sambucus*	Adoxaceae	Fruit and flowers
Figs (*sycamore*)	*Ficus*	Moraceae	Fruit
Gooseberries	*Ribes*	Grossulariaceae	Fruit
Grapefruit	*Citrus paradisi*	Rutaceae	Fruit
Grapes	*Vitis vinifera*	Vitaceae	Fruit
Ground cherry (*Cape gooseberries, poha)*	*Physalis*	Solanaceae	Fruit
Guava	*Psidium*	Myrtaceae	Fruit
Guinep (*chenette, genip*)	*Mamoncillo/Mellicoccus*	Sapindaceae	Fruit
Huckleberry	*Vaccinium*	Ericaceae	Fruit
Indian Gooseberry (*amla*)	*Ribes crispa*	Grossulariaceae	Fruit
Jackfruit (*kathal*)	*Artocarpus heterophyllus*	Moraceae	Fruit
Jujuba	*Ziziphus jujuba*	Rhamnaceae	Fruit
June Plum (*Jew plum, golden apple*)	*Spondias dulcis*	Anacardiaceae	Fruit
Kiwi	*Actinidia deliciosa*	Actinidiaceae	Fruit
Lemon	*Citrus limon*	Rutaceae	Fruit/juice
Litchi	*Litchi chinensis*	Sapindaceae	Fruit
Honeydew melon	*Cucumis melo*	Cucurbitaceae	Fruit
Mulberry	*Morus nigra*	Moraceae	Fruit
Nectarine	*Prunus persica*	Rosaceae	Fruit
Olive	*Olea europea*	Olecaceae	Fruit
Peach	*Prunus persica*	Rosaceae	Fruit
Pear	*Pyrus communis*	Rosaceae	Fruit
Pineapple	*Ananas*	Bomeliaceae	Fruit
Plum	*Prunus*	Rosaceae	Fruit
Pomegranate (*anar*)	*Punica granatum*	Luthraceae	Fruit
Pomerac (*Malay apple*)	*Syzygium malaccense*	Myrtaceae	Fruit
Prune	*Prunus domesticus*	Rosaceae	Fruit
Quince	*Cydonia oblongata*	Rosaceae	Fruit

Common name *(Regional common names)*	***Binomial name or genus***	**Family**	**Edible part of the plant**
Raisin	*Vitis*	Vitaceae	Dried grapes
Rambutan	*Nephelium lappaceum*	Sapindaceae	Fruit
Raspberries	*Rubus*	Rosaceae	Fruit
Sapodella (*naseberry*)	*Manikara zapota*	Sapotaceae	Fruit
Soursop (*guanábana, graviola*)	*Annona muricata*	Annonaceae	Fruit
Star fruit (*kamrakh*)	*Averrhoa*	Oxalidaceae	Fruit
Strawberry	*Prunus*	Rosaceae	Fruit
Sweetsop (*sugar apple, custard apple*)	*Annona squamosa*	Annonaceae	Fruit
Tamarind	*Tamarindus indica*	Fabaceae	Fruit
Tangerine	*Citrus tangerina*	Rutaceae	Fruit
Watermelon	*Citrullus lanatus*	Cucurbitaceae	Fruit
Yacon	*Smallanthus sonchifolius*	Asteraceae	Fruit

ORGAN MEAT

This group includes different types of red organ meats that are usually rich in haem iron. Any processed/cured products made from these organ meats should also be included in this group.

- Liver, kidney, heart, gizzard, lung, blood-based foods such as blood pudding

FLESH MEAT

This group includes flesh foods. Any processed/cured products made from the meats listed below (sausages, salamis, etc.) should also be included in this group.

- Beef, goat, lamb, mutton, pork, rabbit, yak, deer, antelope, buffalo, or other large wild (bush meat) or domesticated mammals
- Chicken, duck, goose, guineafowl, turkey, pigeon, or other wild or domesticated birds.
- Cane rat, guinea pig, rat, agouti, opossum, cat, dog, anteater, or other small wild (bush meat) or domesticated mammals
- Frogs, snakes, and other reptiles
- Insects are included in this group

EGGS

This group includes all kinds of bird eggs.

- Chicken eggs
- Duck eggs
- Guinea fowl eggs
- Quail eggs

FISH AND SEAFOOD

This group includes all types of fish and seafood. Any processed food made from these should also be included in this category.

- Fresh or dried fish
- Canned fish (anchovies, tuna, sardines)
- Shark, whale
- Roe/fish eggs
- Clam, crab, lobster, crayfish, mussels, oysters, shrimp, or other shellfish
- Octopus, squid
- Sea snails

LEGUMES, NUTS, SEEDS

Include beans, dried peas, lentils, nuts, or seeds, and also products made from these. Seeds should not be included on the list if they are used in very small quantities or if chewed as a digestive; in these cases seeds should be listed as condiments. Include seeds here if they represent a substantial ingredient in mixed dishes, or if they are eaten as a substantial snack or side dish.

Pulses, legumes, beans

Common name ***(Regional common names)***	***Binomial name or genus***	**Family**	**Edible part of the plant**
Adzuki bean	*Vigna angularis*	Fabaceae	Seed
Bambara groundnut (*jugo bean)*	*Vigna subterranea*	Fabaceae	Seed
Broad bean (*fava bean, faba bean, horse bean, field bean, tic bean*)	*Vicia faba*	Fabaceae	Seed
Chickpea (*chana dal*)	*Cicer arietinum*	Fabaceae	Seed
Cluster bean (*guar*)	*Cyamopsis tetragonoloba*	Fabaceae	Seed
Coral bean (*Cherokee bean*)	*Erythrina herbacea*	Fabaceae	Seed
Cowpea (*black-eyed pea, catjang, yardlong bean, southern pea*)	*Vigna unguiculata*	Fabaceae	Seed
Horse gram	*Macrotyloma uniflorum*	Fabaceae	Seed
Hyacinth bean	*Lablab purpureus*	Fabaceae	Seed
Jackbean	*Canavalia*	Fabaceae	Seed
Lentil (*dal, pulses*)	*Lens culinaris*	Fabaceae	Seed
Lima beans	*Phaseolus limensis*	Fabaceae	Seed
Lupin (*tarwi, tarhui, chocho*)	*Lupinus mutabilis*	Fabaceae	Seed
Moth bean	*Vigna aconitifolia*	Fabaceae	Seed
Mung bean (*green gram*)	*Vigna radiata*	Fabaceae	Seed

Common name ***(Regional common names)***	***Binomial name or genus***	**Family**	**Edible part of the plant**
Pea	*Pisum sativum*	Fabaceae	Seed
Peanut (*groundnut*)	*Arachis hypogaea*	Fabaceae	Seed
Pencil yam	*Vigna lanceolata*	Fabaceae	Seed
Pigeon pea	*Cajanus*	Fabaceae	Seed
Rice bean	*Vigna umbellata*	Fabaceae	Seed
Soybean (*soya bean*)	*Glycine max*	Fabaceae	Seed
Sweet pea	*Lathyrus odoratus*	Fabaceae	Seed
Urad bean (*black gram*)	*Vigna mungo*	Fabaceae	Seed
Velvet bean (*cowitch*)	*Mucuna pruriens*	Fabaceae	Seed
Winged bean (*Goa bean*)	*Psophocarpus tetragonolobus*	Fabaceae	Seed

Tree nuts

Common name ***(Regional common names)***	***Binomial name or genus***	**Family**	**Edible part of the plant**
Almond	*Prunus dulcis*	Rosaceae	Nut
Cashew	*Anacardium occidentale*	Anacardiaceae	Nut
Chestnut	*Castanea*	Fagaceae	Nut
Filbert	*Corylus maxima*	Betulaceae	Nut
Hazelnut	*Corylus avellana*	Betulaceae	Nut
Macadamia	*Macadamia*	Proteaceae	Nut
Pecan	*Carya illinoinensis*	Juglandaceae	Nut
Pistachio	*Pistacia vera*	Anacardiaceae	Nut
Walnut family	*Juglans*	Juglandaceae	Nut

In addition to the legumes, nuts and seeds in the tables above, this group also includes:

- Sprouted pulses
- Seeds and kernels (sesame, sunflower, pumpkin, pine nut).
- Soy products (edamame, tofu, tempeh, soy paste, soy milk, texturized vegetable protein, soy cheese, soy yogurt, frozen soy yogurt)
- Other pulse products (hummus)
- Nut and seed products (peanut butter, tahini paste, "milks" made from nuts and seeds)

MILK AND MILK PRODUCTS
Include all food items in this group that are made from dairy, with the exception of butter and sour cream. Due to their high fat content and most typical culinary uses, these are classified with fats and oils.

- Whole, low-fat and skimmed milk
- Infant formula
- Custard (milk based)
- Hard cheese (cheddar, Swiss, parmesan)
- Soft cheese (ricotta, mozzarella, cottage, paneer)
- Processed cheese
- Ice-cream (dairy-based)
- Kiefer
- Yogurt/Curd

OILS AND FATS
Include all food items in this group that have visible fat. Do not include vitamin A rich red palm oil.

- Butter
- Ghee
- Lard, suet, tallow (animal fats)
- Margarine
- Mayonnaise
- Palm oil (not red palm oil)
- Shortenings
- Sour cream
- Vegetable/nut oils (made from almond, avocado, canola, coconut, cottonseed, groundnut, maize, olive, rapeseed, safflower, sesame, soybean, sunflower, walnut, etc.)

SWEETS
Include food items with a high content of different sweetening agents (for example, sugar, corn syrup, other syrup, honey, molasses, or jaggery, sweetened beverages).

- Baklava
- Biscuits (sweet) or cookies
- Cakes
- Candies
- Chocolates
- Halwa
- Hard candies
- Honey
- Jam or marmalade
- Pastries, pie
- Sweetened sodas, sweetened fruit juice and sugary drinks
- Any other sweets

SPICES, CONDIMENTS AND BEVERAGES

Include items commonly used in small quantities and mainly used to enhance the flavour of the dish. This list may include many additional items, including various flavouring pastes and seeds, depending on local knowledge of their uses. Include beverages such coffee, tea and alcoholic beverages.

Some examples of condiments, spices and beverages:

- Chilies
- Fish powder, fish sauce
- Ketchup, mustard
- Herbs
- Maggi cubes
- Soya sauce
- Spices
- Tea, coffee
- Beer, wine, hard spirits

ANNEX 3

Example of a completed questionnaire

DIETARY DIVERSITY QUESTIONNAIRE

Please describe the foods (meals and snacks) that you ate or drank yesterday during the day and night, whether at home or outside the home. Start with the first food or drink eaten in the morning.

Write down all food and drinks mentioned. When composite dishes are mentioned, ask for the list of ingredients. When the respondent has finished, probe for meals and snacks not mentioned.

Breakfast	**Snack**	**Lunch**	**Snack**	**Dinner**	**Snack**
Tea Millet porridge (ground millet, water and sugar)	Groundnuts	Rice Sauce with greens (cassava leaves, onion, oil)	Mango	Rice Pumpkin sauce (pumpkin, oil, fish powder, tomato)	Tea

[Household level: consider foods eaten by *any member of the household*, and *exclude* foods purchased *and* eaten outside the home]

When the respondent recall is complete, fill in the food groups based on the information recorded above. For any food groups not mentioned, ask the respondent if a food item from this group was consumed.

Question number	Food group	Examples	YES=1 NO=0
1	CEREALS	corn/maize, rice, wheat, sorghum, millet or any other grains or foods made from these (e.g. bread, noodles, porridge or other grain products) + *insert local foods e.g. ugali, nshima, porridge or pastes or other locally available grains*	1 (millet porridge and rice)
2	VITAMIN A RICH VEGETABLES AND TUBERS	pumpkin, carrots, squash, or sweet potatoes that are orange inside + *other locally available vitamin A rich vegetables (e.g. red sweet pepper)*	1 (pumpkin)
3	WHITE ROOTS AND TUBERS	white potatoes, white yams, white cassava, or other foods made from roots	0
4	DARK GREEN LEAFY VEGETABLES	dark green/leafy vegetables, including wild ones + *locally available vitamin A rich leaves such as amaranth, cassava leaves, kale, spinach etc.*	1 (cassava leaves)
5	OTHER VEGETABLES	other vegetables (e.g. tomato, onion, eggplant), including wild vegetables	1 (onion and tomato)
6	VITAMIN A RICH FRUITS	ripe mangoes, cantaloupe, apricots (fresh or dried), ripe papaya, dried peaches + *other locally available vitamin A rich fruits*	1 (mango)
7	OTHER FRUITS	other fruits, including wild fruits	0
8	ORGAN MEAT	liver, kidney, heart or other organ meats or blood-based foods	0
9	FLESH MEATS	beef, pork, lamb, goat, rabbit, wild game, chicken, duck, or other birds	0
10	EGGS	chicken, duck, guinea fowl or any other egg	0
11	FISH	fresh or dried fish or shellfish	0
12	LEGUMES, NUTS AND SEEDS	beans, peas, lentils, nuts, seeds or foods made from these	1 (groundnuts)
13	MILK AND MILK PRODUCTS	milk, cheese, yogurt or other milk products	0
14	OILS AND FATS	oil, fats or butter added to food or used for cooking	1 (oil in sauce from lunch and dinner)
15	SWEETS	sugar, honey, sweetened soda, sweetened juice or sugary foods such as chocolates, candies, cookies and cakes	1 (sugar in tea)
16	SPICES, CONDIMENTS, BEVERAGES	spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages or *local examples*	1 (fish powder and tea)
Household level only	Did you or anyone in your household eat anything (meal or snack) OUTSIDE the home yesterday?		
Individual level only	Did you eat anything (meal or snack) OUTSIDE the home yesterday?		1

Example of calculation of WDDS for this individual:

Starchy Samples	DGLV	Other VitA f/v	Other f/v	Organ meat	Flesh meat	Eggs	Legumes/ Nuts	Milk	WDDS
1	1	1	1	0	0	0	1	0	5

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