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Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide

VERSION 2

September 2006

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I. Introduction

All Title II programs have improvements in food security as their core objective. As defined by USAID, food security has three components - availability, access, and utilization.¹ Title II programs focus on the access and utilization components. Utilization, in the context of food security, refers to the individual's biological capacity to make use of food for a productive life. Consensus on the measurement of the utilization component has centered on various measures of nutritional status (anthropometric measurement) of children. Household food access is defined as the ability to acquire sufficient quality and quantity of food to meet all household members' nutritional requirements for productive lives. Given the variety of activities implemented by Cooperating Sponsors (CSs) to improve household food access and the significant challenges most CSs face in measuring household food access for reporting purposes, there is a need to build consensus on appropriate household food access impact indicators. This guide provides an approach to measuring household dietary diversity as a proxy measure of household food access.

In light of the need to build consensus on household food access impact indicators, two strategic objective level indicators of household food access - HDDS and months of inadequate household food provisioning (MIHFP) - were identified during the development of USAID Office of Food for Peace (FFP)'s FY05-08 strategy, through a process of consultation and discussion with CSs, researchers, and other technical groups. Inputs from the FAM M&E Working Group and the FFP Performance Management Plan (PMP) Working Group were particularly critical.

These two indicators focus on the desired outcome of improved food access - - improved household food consumption. All new Title II Multi-Year Assistance Programs (MYAP) with improved household food access as an objective will be required to include these indicators in their results frameworks. In addition, a Household Food Insecurity Scale (HFIS) to measure the experience of household food insecurity is being tested for future inclusion as an indicator.²

Household dietary diversity - the number of different food groups consumed over a given reference period - is an attractive proxy indicator for the following reasons.³

- A more diversified diet is an important outcome in and of itself.
- A more diversified diet is associated with a number of improved outcomes in areas such as birth weight, child anthropometric status, and improved hemoglobin concentrations.

¹ USAID defines food security as, "when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life." Three distinct variables are essential to the attainment of food security: 1) Food Availability: sufficient quantities of appropriate, necessary types of food from domestic production, commercial imports or donors other than USAID are consistently available to the individuals or are within reasonable proximity to them or are within their reach; 2) Food Access: individuals have adequate incomes or other resources to purchase or barter to obtain levels of appropriate food needed to maintain consumption of an adequate diet/nutrition level; 3) Food Utilization: food is properly used, proper food processing and storage techniques are employed, adequate knowledge of nutrition and child care techniques exist and is applied, and adequate health and sanitation services exist. (USAID Policy Determination, Definition of Food Security, April 13, 1992).

² See FANTA's *Measuring Household Food Insecurity Workshop Report* (2004) for information on efforts to develop a generic, universally applicable measurement instrument that can be used to construct an experiential HFIS in a range of country and cultural contexts. As viewed at www.fantaproject.org/publications/mhfi_2004.shtml.

³ Hoddinott, John and Yisehac Yohannes. *Dietary Diversity as a Household Food Security Indicator*. Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington, D.C. 2002. As viewed at www.fantaproject.org/publications/dietdiversity1.shtml.

- A more diversified diet is highly correlated with such factors as caloric and protein adequacy, percentage of protein from animal sources (high quality protein), and household income. Even in very poor households, increased food expenditure resulting from additional income is associated with increased quantity and quality of the diet.
- Questions on dietary diversity can be asked at the household or individual level, making it possible to examine food security at the household and intra- household levels.
- Obtaining these data is relatively straightforward. Field experience indicates that training field staff to obtain information on dietary diversity is not complicated, and that respondents find such questions relatively straightforward to answer, not especially intrusive nor especially burdensome. Asking these questions typically takes less than 10 minutes per respondent.

To better reflect a quality diet, the number of different *food groups* consumed is calculated, rather than the number of different *foods* consumed. Knowing that households consume, for example, an average of four different food groups implies that their diets offer some diversity in both macro- and micronutrients. This is a more meaningful indicator than knowing that households consume four different foods, which might all be cereals. The following set of 12 food groups is used to calculate the HDDS:⁴

A. Cereals	G. Fish and seafood
B. Root and tubers	H. Pulses/legumes/nuts
C. Vegetables	I. Milk and milk products
D. Fruits	J. Oil/fats
E. Meat, poultry, offal	K. Sugar/honey
F. Eggs	L. Miscellaneous

An example of an expanded set of food groups that disaggregates certain groups in order to determine the consumption of program-promoted foods such as Vitamin A-rich fruits and vegetables is outlined in Appendix 1. The expanded questions can provide programs with additional specific data on the impact of program activities. When generating the household dietary diversity score (HDDS), however, the expanded set should be combined back into the original 12 food groups so that the total HDDS is based on the same 12 food groups.

While the individual dietary diversity score (IDDS) is used as a proxy measure of the nutritional quality of an individual's diet, the HDDS is used as a proxy measure of the socio-economic level of the household. The differences in the list of food groups used to construct the HDDS and IDDS (e.g. for women or children) reflect these different objectives. Appendix 2 contains information on the use of IDDS as a measure of the nutritional quality of children's diets.⁵

⁴ This set of food groups is derived from the U.N. Food and Agriculture Organization (Food and Agricultural Organization. Food Composition Table for Africa. Rome, Italy, 1970. As viewed at www.fao.org/docrep/003/X6877E/X6877E00.htm.

⁵ For a more thorough discussion of the differences between measures of dietary diversity from the socio-economic compared with the nutritional perspective, see Ruel, Marie. *Is Dietary Diversity an Indicator of Food Security or Dietary Quality? A Review of Measurement Issues and Research Needs*. FCND Discussion Paper 140, International Food Policy Research Institute, Washington, DC. 2002. As viewed at www.ifpri.org/divs/fcnd/dp/papers/fcndp140.pdf

II. Collecting the Data

This guide provides guidance on the specific data collection needs for the HDDS indicator. It assumes that these questions will be part of a population-based survey instrument and will be applied to all the households in the sample.

When to collect the data: To accurately capture changes in HDDS over time, data should be collected during the period of greatest food shortages (such as immediately prior to the harvest). Subsequent data collection (final evaluations, for example) should be undertaken at the same time of year, to avoid seasonal differences.

Recall Period: Information on household food consumption should be collected using the previous 24-hours as a reference period (24-hour recall).⁶ Longer reference periods result in less accurate information due to imperfect recall.

When using the 24-hour recall method, the interviewer should first determine whether the previous 24 hour period was "usual" or "normal" for the household. If it was a special occasion, such as a funeral or feast, or if most household members were absent, another day should be selected for the interview. If this is not possible, it is recommended that another household be selected, rather than conduct the interview using an earlier day in the week.

How to collect the data: Data for the HDDS indicator is collected by asking the respondent a series of yes or no questions. These questions should be asked of the person who is responsible for food preparation, or if that person is unavailable, of another adult who was present and ate in the household the previous day. The questions refer to the household as a whole, not any single member of the household.

The respondent should be instructed to include the food groups consumed by household members in the home, or prepared in the home for consumption by household members outside the home (e.g., at lunchtime in the fields.) As a general rule, foods consumed outside the home that were not prepared in the home should not be included. While this may result in an underestimation of the dietary diversity of individual family members (who may, for example, purchase food in the street), HDDS is designed to reflect *household* dietary diversity, on average, among all members. Including food purchased and consumed outside the household by individual members may lead to overestimating HDDS overall. However, in situations where consumption outside the home of foods not prepared in the household is common, survey implementers may decide to include those foods. Such decisions should be clearly documented, so that subsequent surveys will use the same protocol and to ensure correct interpretation and comparison.

⁶ A single 24-hour recall is usually adequate to quantify performance indicators of a program's overall impact over time, when the indicators are calculated as group averages; that is, the average household dietary diversity of the target population.

III. Questionnaire Format

In order to collect household dietary diversity data, the following questions should be added to the baseline and final surveys. As appropriate, locally available foods should be added into the food groups.

QUESTIONS AND FILTERS	CODING CATEGORIES
<p>1 Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night.</p> <p>READ THE LIST OF FOODS. PLACE A <i>ONE</i> IN THE BOX IF ANYONE IN THE HOUSEHOLD ATE THE FOOD IN QUESTION, PLACE A <i>ZERO</i> IN THE BOX IF NO ONE IN THE HOUSEHOLD ATE THE FOOD.</p> <p>A Any [INSERT ANY LOCAL FOODS, E.G. UGALI, NSHIMA], bread, rice noodles, biscuits, or any other foods made from millet, sorghum, maize, rice, wheat, or [INSERT ANY OTHER LOCALLY AVAILABLE GRAIN]?</p> <p>B Any potatoes, yams, manioc, cassava or any other foods made from roots or tubers?</p> <p>C Any vegetables?</p> <p>D Any fruits?</p> <p>E Any beef, pork, lamb, goat, rabbit wild game, chicken, duck, or other birds, liver, kidney, heart, or other organ meats?</p> <p>F Any eggs?</p> <p>G Any fresh or dried fish or shellfish?</p> <p>H Any foods made from beans, peas, lentils, or nuts?</p> <p>I Any cheese, yogurt, milk or other milk products?</p> <p>J Any foods made with oil, fat, or butter?</p> <p>K Any sugar or honey?</p> <p>L Any other foods, such as condiments, coffee, tea?</p>	<p>A..... __ </p> <p>B..... __ </p> <p>C..... __ </p> <p>D..... __ </p> <p>E..... __ </p> <p>F..... __ </p> <p>G..... __ </p> <p>H..... __ </p> <p>I..... __ </p> <p>J..... __ </p> <p>K..... __ </p> <p>L..... __ </p>

IV. HDDS Indicator Tabulation Plan

Tabulation of the HDDS is a relatively simple matter that can be done by hand or with the aid of computer software such as a database or spreadsheet. First, the HDDS *variable* is calculated for each household. The value of this variable will range from 0 to 12.

HDDS (0-12)	<p>Total number of food groups consumed by members of the household. Values for A through L will be either “0” or “1”.</p> <p>Sum (A + B + C + D + E + F + G + H + I + J + K + L)</p>
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Second, the average HDDS *indicator* is calculated for the sample population.

Average HDDS	<p>Sum (HDDS)</p> <hr/> <p>Total Number of Households</p>
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V. Setting HDDS Targets

An increase in the average number of different food groups consumed provides a quantifiable measure of improved household food access. In general, any increase in household dietary diversity reflects an improvement in the household's diet. In order to use this indicator to assess improvements in food security in a performance reporting context, the changes in HDDS must be compared to some meaningful target level of diversity. Unfortunately, normative data on 'ideal' or 'target' levels of diversity are usually not available.

Two options are available to determine appropriate targets. Both of these options have the advantage that the target set represents a level of dietary diversity that is demonstrably achievable by the sample population.

- First option - The dietary diversity patterns of wealthier households can be used as a target, under the assumption that poorer households will diversify their food expenditures as incomes rise, and thereby mirror the consumption patterns of wealthier households. Because projects using the HDDS indicator usually include interventions aimed at increasing household income, baseline surveys generally collect some income or economic status information, in addition to the dietary data. If income data are available, the sample could be divided into three income groups (terciles of income), and the average dietary diversity calculated for the richest income tercile. The average HDDS in the richest 33 percent of households can then serve as a guide for setting the target level of HDDS for the purpose of performance monitoring. Where income data are not available, income groups can be defined using proxies, such as possession of assets or other items found to be highly correlated with income in the project population.
- Second option - In the absence of income or economic data from the baseline survey, a HDDS target can be established by taking the average diversity of the 33 percent of households with the highest diversity (upper tercile of diversity).

VI. References

Hoddinott, John and Yisehac Yohannes. Dietary Diversity as a Household Food Security Indicator. Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington, D.C. 2002.

Magnani, Robert. Sampling Guide. Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington, D.C. 1999.

Ruel, Marie. "Is Dietary Diversity an Indicator of Food Security or Dietary Quality? A Review of Measurement Issues and Research Needs" IFPRI FCND Discussion Paper 140, November 2002.

Swindale, Anne and Punam Ohri-Vachaspati. Measuring Household Food Consumption: A Technical Guide. Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington, D.C. 1999.

Appendix 1. Expanding the Questionnaire to Capture Program-Specific Objectives: An Example

Many Title II programs have activities that encourage the consumption of specific foods or food groups. The questions developed for the dietary diversity score can be expanded to track the increased consumption of these specific foods or food groups. For example, home gardens are a common intervention that aims to increase consumption of Vitamin A-rich fruits and vegetables and increase income through the sale of produce. In an expanded questionnaire format, specific fruits and vegetables that can be grown in home gardens and that are known to have high Vitamin A content are included as separate food groups.

Expanded Questionnaire Format: An Example

QUESTIONS AND FILTERS	CODING CATEGORIES
<p>1. Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night.</p> <p>READ THE LIST OF FOODS. PLACE A <i>ONE</i> IN THE BOX IF ANYONE IN THE HOUSEHOLD ATE THE FOOD IN QUESTION, PLACE A <i>ZERO</i> IN THE BOX IF NO ONE IN THE HOUSEHOLD ATE THE FOOD.</p>	
A Any [INSERT ANY LOCAL FOODS, E.G. UGALI, NSHIMA], bread, rice noodles, biscuits, cookies, or any other foods made from millet, sorghum, maize, rice, wheat, or [INSERT ANY OTHER LOCALLY AVAILABLE GRAIN]?	A __
B Any pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside?	B __
C Any white potatoes, white yams, manioc, cassava or any other foods made from roots or tubers?	C __
D Any dark, green, leafy vegetables such as cassava leaves, bean leaves, kale, spinach, pepper leaves, taro leaves, and amaranth leaves?	D __
E Any other vegetables?	E __
F Any ripe mangoes, ripe papayas or [INSERT ANY OTHER LOCALLY AVAILABLE VITAMIN A-RICH FRUIT]?	F __
G Any other fruits?	G __
H Any beef, pork, lamb, goat, rabbit wild game, chicken, duck, or other birds, liver, kidney, heart, or other organ meats?	H __
I Any eggs?	I __
J Any fresh or dried fish or shellfish?	J __
K Any foods made from beans, peas, or lentils?	K __
L Any cheese, yogurt, milk or other milk products?	L __

QUESTIONS AND FILTERS	CODING CATEGORIES
M Any foods made with oil, fat, or butter?	M __
N Any sugar or honey?	N __
O Any other foods, such as condiments, coffee, tea?	O __

HDDS Indicator Tabulation Plan

In this example of an expanded version of the questionnaire, the HDDS variable is calculated by combining the disaggregated vegetable and fruit food groups to form two summary food groups, one for vegetables and the second for fruit. This results in same 12 food groups as in the standard questionnaire for HDDS.

The vegetable food group will include B “any pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside”, D “any dark, green, leafy vegetables” and E “any other vegetables”. The fruit food group will include F “any vitamin-A rich fruits” and G “any other fruits.”

HDDS (0-12)	<p>1st step: Combine the disaggregated vegetable and fruit groups into summary vegetable (P) and fruit (Q) food groups. P and Q will take the value of 1 if any of the disaggregated food groups were consumed; they will take the value of 0 if none of the disaggregated food groups were consumed.</p> <p>Compute P=0.</p> <p>If (B=1 or D=1 or E=1) then P=1.</p> <p>Compute Q=0.</p> <p>If (F=1 or G=1) then Q=1.</p> <p>2nd step: Compute total number of food groups consumed by members of the household.</p> <p>Sum [A + C + H + I + J + K + L + M + N + O + P + Q]</p>
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In addition to the HDDS, another indicator, “Percent of households that consume Vitamin-A rich vegetables or fruits,” can be calculated to quantify the proportion of households that are consuming these specific foods.

% of Households that consume Vitamin A-rich vegetables or fruits	<p>Number of Households with B, D <u>or</u> F = 1</p> <p>_____ X 100</p> <p>Total Number of Households</p>
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Appendix 2. Children's Dietary Diversity Score Indicator Food Groups

Individual Dietary Diversity Score (IDDS) is often used as a proxy measure of the nutritional quality of an individual's diet. This use is different from the use described in this guide – HDDS as a proxy measure of household access to food. While the questions used to collect data on dietary diversity for both uses are similar, there are some important differences that are reflective of the different objectives. For example, “sugar/honey” is included as a food group for HDDS. As an indicator of socio-economic change, the inclusion of sugar or honey in a household's diet tells us something about their ability to access/purchase food. In contrast, sugar and honey are not included as a food group in the list of food groups included in an IDDS indicator for children, because this food group is not an important contributor to the nutritional quality of a child's diet.

The table below provides a comparison of the food groups included in the HDDS indicator and the IDDS (children). Note first of all that the range for each measure is different (0-12 vs. 0-8). Secondly, while the IDDS (children) includes a smaller number of food groups, the questionnaire (see below, KPC 2000+) itself includes a great deal more detail that is eventually combined into the 8 food groups when calculating the IDDS (children) indicator.

HDDS Food Groups (Score: 0-12)	IDDS (Children) Food Groups (Score: 0-8)
Cereals	Grains, roots or tubers
Roots and tubers	Vitamin A-rich plant foods
Vegetables	Other fruits or vegetables
Fruits	Meat, poultry, fish, seafood
Meat, poultry, offal	Eggs
Eggs	Pulses/legumes/nuts
Fish and seafood	Milk and milk products
Pulses/legumes/nuts	Foods cooked in oil/fat
Milk and milk products	
Oils/ fats	
Sugar/honey	
Miscellaneous	

If a program wished to collect data on HDDS and IDDS in the same instrument, data collection may become confusing because of the similarities of the questions. It is important to train the interviewers to help the respondent to transition from thinking about food groups consumed by the household to thinking in greater detail about the food groups consumed by their child.

The Knowledge, Practice and Coverage survey (KPC 2000+) contains a module for collecting data on infant and young child feeding behaviors, including dietary diversity. The instrument, interviewer instructions and tabulation plan for the KPC 2000+ Module 2: Breastfeeding and Infant/Child Nutrition may be found at www.childsurvival.com/kpc2000/kpc2000.cfm.