

Dietary Diversity as a Household Food Security Indicator

Household food security is an important measure of well-being. Although it may not capture all dimensions of poverty, the inability of households to access enough food for a productive healthy life is an important indication of their level of poverty. In this context, devising an appropriate measure of household food access is useful in order to:

- identify the food insecure;
- assess the severity of their food shortfall;
- characterize the nature of their food insecurity;
- monitor changes over time; and,
- assess the impact of interventions.

However, obtaining detailed data on household food access - such as 24-hour recall data on food intakes - can be time consuming, expensive, and requires a high level of technical skill both in data collection and analysis. The Food and Nutrition Technical Assistance (FANTA) project is carrying out a set of activities aimed at developing user-friendly, cost-effective approaches to measure changes in dietary quantity and quality at the household and individual level. A recent FANTA analysis¹ shows that dietary diversity is a good indicator of the access dimension of household food security.

¹ John Hoddinott and Yisehac Yohannes, *Dietary Diversity as a Household Food Security Indicator*. Washington, D.C.: Food and Nutrition Technical Assistance Project, Academy for Educational Development, 2002.

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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:

- **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.**
- **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.**
- **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.

Dietary Diversity as an Indicator of Food Security

Dietary diversity - the number of individual foods or food groups consumed over a given period - is an attractive indicator for four reasons. First, a more varied diet is a valid outcome in its own right. Second, a more varied diet is associated with a number of positive outcomes such as improved birthweight and child anthropometric status, improved hemoglobin concentrations and reduced risk of mortality from cardiovascular disease and cancer. Third, 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. Fourth, 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, and not especially burdensome. Asking dietary diversity questions typically takes less than 10 minutes per respondent.

Results of the Analysis of Dietary Diversity in Existing Data Sets

The analysis included data from ten countries: Bangladesh, Egypt, Ghana, India, Kenya, Malawi, Mali, Mexico, Mozambique, and the Philippines. Most of the data sets are not national; they cover a specific region of a country. These data sets contain data from poor and middle income countries, rural and urban areas, different seasons of the year, and data on caloric availability collected using different methods and recall periods. The analysis used regression analysis techniques to determine the relationship of dietary diversity to household per capita consumption and caloric availability.

Table 1: Range of the Mean of Variables

Variable	Range of the Mean for 10 Data Sets
Dietary Diversity (# of individual foods)	8-48
Household per capita consumption (PPP dollars ²)	8-56
Household per capita caloric availability	1539-3746
Household per capita caloric availability from staples	1002-2656
Household per capita caloric availability from non-staples	283-1776

The analysis found that a change in dietary diversity is positively associated with change in household per capita consumption and household per capita caloric availability. Changes in dietary diversity are also associated with changes in the household per capita availability of

calories from staples and non-staples, with the magnitude of this association being higher in non-staples. These associations are observed in both rural and urban locations and across seasons. The associations are strong whether dietary diversity is measured as the number of individual foods (e.g. rice, maize, bananas, sugar) or the number of food groups (e.g. basic staple grains, legumes, dairy) consumed.³ The results are not dependent on the methods used to measure association nor on the methods used to collect the dietary data (24-hour versus 7-day recall periods), although the magnitude of the association differs.

Table 2: Results of the Analysis; Percent Change in Key Variables given a 1% Change in Dietary Diversity

Variable	Mean	Range
Household per capita consumption	1.00	0.65-1.11
Household per capita caloric availability	0.7	0.37-0.73
Household per capita caloric availability from staples	0.5	0.31-0.76
Household per capita caloric availability from non-staples	1.4	1.17-1.57

This analysis shows that dietary diversity is a good proxy indicator of household per capita consumption and household per capita caloric availability, which are measures of the access component of household food security. Hence, dietary diversity can be used to identify the food insecure, monitor changes over time as well as assess the impact of interventions on household food access.

² Purchasing power parity (PPP) is a theory of exchange rate determination. PPP estimates and compares the buying power of local currency between countries.

³ Note, however, that the variable of the number of food groups was generated by grouping the data on individual food items consumed; both variables are based on the same basic set of detailed food consumption data. Namely, this analysis did not compare indicators based on a recall of individual food items consumed with indicators based on recall of food groups (the latter data being clearly easier and quicker to collect).

Implications for Food Security Programming

The analysis clearly establishes that dietary diversity can act as an indicator of household food access in a variety of settings including poor and middle-income countries, rural and urban areas and across seasons. This has significant implications for food security programming. Dietary diversity is a simple indicator, which uses data that is easier and less costly to collect in terms of time and money. It is also less intrusive and does not impose burdensome demands on time or recall of respondent. The burden is particularly lightened when foods are grouped on the survey questionnaire.

The next question is to determine how, in a given context, a targeted change in dietary diversity translates into an expected change in household food access. This is necessary for developing guidance for setting program targets and evaluating the performance of interventions. The analysis presents a range of expected increases in common indicators of household food access, given an increase in dietary diversity. The lower estimates are more appropriate in populations with relatively low levels of caloric availability (more food insecure); higher estimates are more appropriate in populations with higher levels of caloric availability. Therefore, exactly where in this range a specific population falls would need to be estimated.

Since these estimates do not directly translate into targets for specific populations, one approach to setting targets would be to base them on the average dietary diversity of the richest 25% of households in the program population. Alternatively, targets can be set based on the average dietary diversity of the top 25% of households with the greatest dietary diversity. The advantage of setting a target using either of these approaches is that the targeted level of dietary diversity is demonstrably achievable in the population.

For further information

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



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This publication was made possible through the support provided to the Food and Nutrition Technical Assistance (FANTA) Project by the Office of Health, Infectious Disease and Nutrition of the Bureau for Global Health at the U.S. Agency for International Development, under terms of agreement No. HRN-A-00-98-00046-00 awarded to the Academy for Educational Development (AED). The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the U.S. Agency for International Development.

Recommended citation:
Food and Nutrition Technical Assistance (FANTA) Project. *Dietary Diversity as a Household Food Security Indicator*. Washington, DC: Food and Nutrition Technical Assistance Project, Academy for Educational Development, 2002.