FOOD AND NUTRITION TECHNICAL ASSISTANCE

Measuring Household Food Consumption: A Technical Guide

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2004 Revised Edition

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ABOUT THIS SERIES

This series of Title II Generic Indicator Guides was developed by the Food and Nutrition Technical Assistance Project, and its predecessors (IMPACT, LINKAGES), as part of USAID's support for its Cooperating Sponsors in the development of monitoring and evaluation systems for use in Title II programs. The guides are intended to provide the technical basis for the indicators and recommended methods for collecting, analyzing, and reporting on the generic indicators developed in consultation with PVOs during 1995/1996. The guides are available on the project website http://www.fantaproject.org.

Below is the list of available guides:

- *Agricultural Productivity Indicators Measurement Guide* by Patrick Diskin
- *Anthropometric Indicators Measurement Guide* by Bruce Cogill
- *Food for Education Indicator Guide* by Gilles Bergeron and Joy Miller Del Rosso
- *Food Security Indicators and Framework for Use in the Monitoring and Evaluation of Food Aid Programs* by Frank Riely, Nancy Mock, Bruce Cogill, Laura Bailey, and Eric Kenefick
- *Household Food Consumption Indicators Measurement Guide* by Anne Swindale and Punam Ohri-Vachaspati
- *Infant and Child Feeding Indicators Measurement Guide* by Mary Lung'aho
- *Sampling Guide* by Robert Magnani
- *Water and Sanitation Indicators Measurement Guide* by Patricia Billig, Diane Bendahmane and Anne Swindale

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1. INTRODUCTION

Many private voluntary organizations (PVOs) are engaged in projects aimed at improving food security and household nutrition worldwide. The U.S. Agency for International Development (USAID) supports many of these projects through the provision of Title II food aid to PVOs designated as "Cooperating Sponsors." Increasingly Cooperating Sponsors (CS) are being asked to monitor and evaluate the impact of their interventions, and USAID is generating materials to help them in this process. USAID Missions, in collaboration with PVOs and technical staff from Regional and Central USAID Bureaus have identified a set of generic impact indicators for household food consumption, to facilitate the monitoring and reporting process.

This technical guide was developed to systematize this information. It is based around the three impact indicators defined by the PL480 Title II program: increased number of eating occasions, increased dietary diversity and increased percentage of households consuming minimum daily caloric requirements. This guide demonstrates how to measure and quantify this information.

The guide describes the process and procedures for collecting the information to assess the food-intake requirements of a household and a step-by-step analysis of the nutritional impact of the food consumed. The process begins with the design of a questionnaire; a model is provided here, but is subject to modification depending on the particular information that a given CS seeks to reveal. Filling in the questionnaire involves detailed interviews with a "respondent"(the household member responsible for food preparation) to obtain data on household composition and food consumption. The latter is gathered using a "24-hour recall" methodology, according to which the respondent is asked to recall the ingredients of each dish prepared during the previous day and the amount of that dish consumed by the household. The guide provides ideas for approximating the size of different dishes and their weight or volume and defining who is a "household member."

Once the basic information has been gathered, the methodology requires fairly complex data processing and analysis to convert information on household composition and consumption into standard formats that can be compared across households. Detailed information about analyzing household food consumption data is available in the Appendices. Topics covered in the Appendices include: sample ingredient codes, caloric requirement tables and sample activities grouped by activity level for males and females.

2. IMPACT INDICATORS FOR IMPROVED HOUSEHOLD NUTRITION

The three PL 480 Title II impact indicators developed to measure improvements in household food consumption[1] are:

- Increased number of eating occasions per day
- Increased number of different foods or food groups consumed (dietary diversity)
- Increased percentage of households consuming minimum daily caloric requirements.

[1]See Appendix, Section 26, Summary of P.L. 480 Generic Title II Performance Indicators.

The suitability of a given indicator depends on the program objectives, environment, and technical and financial capacity of the PVO executing the program. Advantages and disadvantages can be cited for each indicator with regard to both collecting the data and interpreting the results.

2.1. Increased Number of Eating Occasions

The number of daily eating occasions is a proxy indicator for gauging the adequacy of household macronutrient (calories and protein) intake. An advantage in selecting this as an indicator of household food security is that data are relatively easy and inexpensive to collect. Data on the size and composition of meals are not required to calculate indicator values.

However, while the number of eating occasions may be a good indicator of household strategies to cope with transitory food insecurity, it is less sensitive as an indicator of changes in situations of chronic food insecurity or of micronutrient imbalances in the diet.

Moreover, interpreting data derived from this indicator is often complicated by cultural factors. In cultures where consumption of three meals per day is customary, household rationing in the face of food shortages can take the form of a reduction in the number of meals consumed. However, in cultures where households consume one primary meal per day, the *volume*, rather than the *frequency*, of meals tends to decline as food shortages develop. Thus measuring only the number of eating occasions will not yield significant information on household food consumption.

Another complication inherent in this indicator is the definition of a "meal," which often varies across cultures. For some, a meal is defined according to the volume and type of food consumed. For others, the time of day it is consumed is important in defining a meal. While using the term "eating occasions" helps to eliminate difficulties caused by different definitions of "meal," the term still requires careful attention to cultural factors when interpreting results. The same is true of attempts to make cross-cultural comparisons of results. Because of these complicating factors, it is recommended that the "eating occasions" indicator be used in conjunction with the dietary diversity indicator described below.

2.2. Increased Number of Different Foods or Food Groups Consumed

The number of different foods or food groups consumed in a household provides a measure of the quality of the diet by reflecting *dietary diversity*, thus serving as an important complement to the eating occasions indicators. To accurately capture dietary diversity, this indicator should be evaluated in terms of the *variety of food groups* (meats, milk, fruits, and vegetables) consumed, rather than by simply totaling all types of foods consumed. The division of food into different groups should focus on those nutrients stressed in a PVO's program strategy.

As a food-security indicator, dietary diversity is usually 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 can serve to increase the quantity and quality of the diet. Calculating dietary diversity requires only marginally more detailed information than is required to assess the

number of daily eating occasions. Therefore, the data are still relatively easy and inexpensive to collect and analyze.

2.3. Increased Percentage of Households Consuming Minimum Daily Caloric Requirements

The wording of the indicator included in the list of Title II Core Indicators is "increased percent of households consuming minimum daily caloric requirements." This indicator needs to be defined more sharply to accurately measure the nutrient of focus in a particular PVO program. The primary interest is generally *calories*. Thus this guide describes the processes required to gather information to measure average caloric intake at the household level, as well as rough estimates of protein adequacy. PVO programs aiming to improve household intake of other nutrients, such as Vitamin A or iron, should consult either the Micronutrient Operational Strategies and Technologies (MOST) Project or the International Vitamin A Consultative Group[2] for specialized methodologies.

The percentage of minimum daily calorie requirements consumed provides a good indication of overall household food security. This indicator can also be used in conjunction with a measure of dietary diversity, which can be easily calculated using data collected on caloric consumption.

Despite these advantages, measuring the "caloric requirements indicator" is more costly than using other indicators, as it requires a much higher level of technical expertise and more time to collect and analyze data. While it is ideal for measuring food security, a host of factors such as the difficulties in calculating food quantities and potential changes in consumption behavior due to the presence of an interviewer make the caloric requirements indicator difficult to use in practice.

For most PVOs, a preferred alternative might be to estimate the household's consumption of minimum daily requirements, based on the ingredients of each eating occasion during the previous 24 hours, and then calculate the number of eating occasions and food diversity indicators using this detailed information. Section Three offers a suggested methodology for carrying out such a survey.

3. COLLECTING AND ANALYZING THE DATA

The first phase of information collection calls for familiarity with local consumption patterns, to ensure that the survey tool developed is appropriate. Informal, exploratory approaches are the most useful at this stage. Information should be gathered on traditional forms and frequencies of eating occasions, standard ingredients, and household and market measuring units. Customary behavior should be identified, as should typical *variations* in behavior, particularly among targeted or food-insecure groups. With this information, the survey team can develop a set of

[2]Micronutrient Operational Strategies and Technologies (MOST), International Science and Technology Institute, Inc., 1820 North Fort Myer Dr., Suite 600, Arlington, VA 22209; International Vitamin A Consultative Group (IVACG), The Nutrition Foundation, 1126 16th St., NW, Washington, D.C. 20036.

appropriate interviewer aids, including code lists for common dishes, tools for direct measurement, and food models. Once the survey tool is complete, interviewers must be trained in the techniques described below.

Information on household food consumption should be collected using the previous 24-hour period as a reference (24-hour recall). Lengthening the recall period beyond this time often results in significant error due to faulty recall. Subsequent data collection (mid-term and final evaluations, for example) should be undertaken at the same time of year, in order to avoid conflicting results due to seasonal differences. To most accurately capture improvements in household food security, a Cooperating Sponsor (CS) should collect food consumption information during the season of greatest food shortages (such as immediately prior to the harvest).

A single 24-hour recall is usually adequate to quantify performance indicators of a program's impact overtime, when the indicators are calculated as group averages; that is, the average number of eating occasions of the recipient population. However, information from several days is necessary to obtain robust estimates of household-level consumption patterns. If the CS seeks to correlate household consumption with other household variables, as well as to analyze consumption patterns and their determinants, at least four days of recall per household are recommended.

When using the 24-hour recall method, the interviewer should first ascertain whether the previous day 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 better to select another household rather than conduct the interview using an earlier day in the week.

The first few steps for collecting information on the nutrient adequacy indicator provide the data necessary for other indicators, namely the number of food groups and frequency of eating occasions. Information for these indicators can also be collected using a simplified methodology, which appears below.

3.1. Increased Number of Daily Eating Occasions

In order to simplify data collection for this indicator, survey implementers can predefine up to seven eating occasions and ask the respondent whether or not food was consumed during these periods. An example of this method appears below.

Interviewer: During the previous 24-hour period, did you or anyone in your household consume...

Eating Occasion	Yes	No
Any food before a morning meal	1	0
A morning meal	1	0
Any food between morning and midday meals	1	0
A midday meal	1	0
Any food between midday and evening meals	1	0
An evening meal	1	0
Any food after the evening meal	1	0

The sum of "yes" responses quantifies the indicator for each household, which can then be averaged over the population of interest. Because the sum is actually the total of all household members' eating occasions, the sum will probably be larger than the number of eating occasions for any individual household member. For example, a household may report five eating occasions, whereas each individual household member may have eaten no more than three times that day.

An alternative, perhaps simpler, way of analyzing this indicator, is to calculate the percentage of households that eat "x" or more times a day. The numerator would represent the sum of households with "x" or more "yes" responses, and the denominator would represent the total number of households. This indicator can easily be modified to reflect the different number of meals consumed within a given cultural context; for example the percentage of households eating two or more times a day. The indicator should always correspond to the specific cultural context of the project.

3.2. Increased Number of Different Foods or Food Groups Consumed

For ease of analysis, the number of different *food groups* consumed should be calculated, rather than the number of different *foods*. 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 U.N. Food and Agriculture Organization (FAO) uses the following set of food groups in its food balance sheets:

1. Cereals
2. Root and tubers
3. Pulses/legumes
4. Milk and milk products
5. Eggs
6. Meat and offal
7. Fish and seafood
8. Oil/fats
9. Sugar/honey
10. Fruits
11. Vegetables
12. Miscellaneous

These groups can be adapted to the local context to reflect both cultural and economic patterns in food selection (e.g., "high" and "low" status foods). The list can also be expanded to specify foods of particular nutritional value, such as those high in Vitamin A or iron. The groups used for a particular survey should be meaningful with respect to the CS's program objectives and project-level interventions. For example, while the addition a soft drinks group to the list may not indicate improved nutritional status, it may be associated with increased income. This would be important to measure if the project goal is "improved food security through increased income." Nonetheless, the total number of groups included in this indicator should not be too large, as interpretation of results becomes difficult.

Fine-Tuning Indicators

Based on dietary patterns in Honduras, where corn and sorghum constitute the basic, grain-based starch sources and rice, bread, and other grains are added as incomes increase, an indicator could separate the "cereals" group into "basic grains" (corn and sorghum.) and "other cereals" (rice, wheat, and the remaining cereals).

In programs where increased consumption of Vitamin A-rich fruits and vegetables is encouraged, an appropriate diversity indicator could separate fruits and vegetables high in Vitamin A to form another group.

Once the set of food groups has been defined, data for the "number of food groups" indicator can be collected by asking each respondent a series of yes-or-no questions. This allows the interviewer to list the predominant products from each food group consumed by the respondent's household, and thus provide relevant examples for each of the food groups.

The respondent should 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), the indicator is designed to measure *household* diversity, on average, across all members. Including food purchased and consumed outside the household by individual members increases the risk of overestimating the dietary diversity of household members overall. However, in situations where consumption outside the home of foods not prepared in the household is very common, survey implementers may decide to include those foods when measuring this indicator. Such decisions should be clearly documented, so subsequent surveys can use the same method.

The following is an example of data collection for number of food groups:

Interviewer: "Yesterday, did you or anyone in your household consume..."

Food Group	Yes	No
Cereals	1	0
Roots/tubers	1	0
Legumes	1	0
Milk/milk products	1	0
Eggs	1	0
Meat/offal	1	0
Fish/seafood	1	0
Oil/fat	1	0
Sugar/honey	1	0
Fruits	1	0
Vegetables	1	0
Other (spices, sodas, etc.)	1	0

The sum of the "yes" responses quantifies the indicator for each household, which can then be averaged over the target population.

For a sample among three households (A, B, and C), the responses might look something like those in the box below. An answer of "yes" takes the value of 1; a "no"answer takes the value of 0.

Food Group	A		B		C	
	Yes	No	Yes	No	Yes	No
Cereals	1		1		1	
Roots/tubers	1			0		0
Milk/milk products		0	1		1	
Eggs	1			0	1	
Meat/offal	1			0	1	
Fish/seafood		0	1		1	
Oil/fat	1			0	1	
Sugar/honey	1			0	1	
Fruits	1		1		1	
Vegetables		0		0	1	
Other (spices, sodas, etc)		0		0	1	
TOTAL	**7**		**4**		**10**	

In this example, household C has the greatest dietary diversity, with a score of 10; household B has the least diversity, with a score of 4. The average diversity of the sample is (7+4+10) divided by 3, or 7. (See also Appendix 27, "Setting Food Diversity Targets.")

3.3. Increased Percentage of Households Consuming Minimum Daily Caloric Requirements

Two data components are necessary to quantify household caloric adequacy: *intake* and *minimum requirements*. The caloric intake estimate is obtained through recall of consumption of all significant sources of calories during the previous day (24-hour recall). This includes data on exactly what was consumed and who consumed it. An estimate of caloric requirements is calculated based on the age, sex, physiological status, and activity levels of household members consuming the calories.

3.3.1. 24-Hour Recall of Food Intake

The 24-hour recall gathers information on:

- Eating occasions (definition of meals/snacks or time food was consumed)
- Household members present at each meal
- Visitors consuming each dish
- Type of dish
- Ingredients of dish
- Quantities prepared of foods that are a significant source of calories
- Quantities of food not consumed by household members or guests
- Source of each ingredient (home production, purchase, gift)

If it is of interest to the CS, the 24-hour recall method can also provide information on the intake of individual household members, for example, for gender-disaggregation purposes. This requires estimating individual consumption through individual portion sizes. This guide does not provide detailed instructions for measuring individual intake.

A 24-hour recall of food consumption collects information on food intake over the previous 24-hour period. The household member responsible for food preparation is the preferred survey respondent. Others rarely know what food was consumed by individual household members. Nor are others likely to be able to identify or recall the ingredients used in meal preparation. For ease and accuracy of data collection and analysis, the reference period for 24-hour recalls should be the day before the interview. This provides the respondent with a clearly defined beginning and end of the reference period. The interviewer should ask about all foods consumed in the household the previous day, beginning when the first person in the household woke up, and using that as a reference point to start the day's recall. The respondent is then asked about all foods prepared and/or consumed until the last person in the household went to bed.

Sample Interview (I = Interviewer, R = Respondent)

I: Who was the first person in the household to wake up yesterday?
R: I was.
I: After you woke up, what was the first thing prepared or consumed in the household?
R: I always make coffee first.
I: Did you make coffee yesterday?[3]
R: Yes.
I: At what time?
R: At about 5 a.m.
I: Did you consume the coffee with something else or only had the coffee?
R: Alone.
I What were the ingredients in the coffee?
R: Coffee and sugar.
I: Do you sweeten all the coffee at once, or does each person sweeten their own cup?
R I sweeten the whole thing.
I: What was the next thing prepared or consumed after the coffee?
R: I made breakfast: plantains and eggs.
I: (Asks for and writes down all the ingredients of each dish consumed at breakfast). Was there any beverage with breakfast?[4]
R: No.
I: What was the next thing prepared or consumed after breakfast?
R: Lunch.
I: Did anyone in the household eat anything between breakfast and lunch? For example, a fruit or cracker or milk for the baby?
R: Oh yes, the kids ate mangoes.
I: (After requesting information on the ingredients of each dish after lunch). What was the next thing prepared after lunch?
R: We had rice and beans for dinner.
I: (Notes all the ingredients of each dish consumed at dinner) Was any beverage served with dinner?
R: No.
I: Did anyone in the household eat or drink anything after dinner? For example, a cup of coffee or a piece of fruit or milk for the baby?
R: No, we just went to bed.
I: Did you all go to bed at the same time, or did some household members stay up later than others?
R: I am the last one to go to bed.
I: Did you eat or drink any last thing before going to bed?
R: No.

The interviewer will first lead the respondent through the entire day, recording the dishes and ingredients consumed. This permits the respondent to follow a logical memory sequence all the

[3]Always remember that the information being gathered refers to the day before the interview, i.e., yesterday. There is a tendency for respondents to speak in terms of what is usually, commonly, or even ideally consumed. Interviewers must continually remind respondents that the period of reference is yesterday.
[4]Note that the interviewer did not ask about a specific meal (e.g., breakfast), which would imply that the respondent ate that meal. This can embarrass respondents when the household was not served three meals. Once a respondent mentions a meal, the interviewer can refer to it.

way through the day, without constantly changing focus from *what* was consumed to *how much* was consumed. Then the interviewer will return to the beginning of the 24-hour period to obtain information on the *quantity of the ingredients that are important contributors of calories*.

3.3.2. Filling in the Questionnaire

Figure 1 presents a sample questionnaire for recording 24-hour food consumption recall information. Detail is provided in this section on how to fill in the various columns of the questionnaire.

Column 1: Eating occasions are recorded in Column 1. The information is used to identify household members present during the time the food was consumed. An eating occasion is identified when food is prepared for, or distributed to, one or more household members for their consumption. Eating occasions are numbered consecutively, starting with 1, regardless of whether they were a "meal" or "snack" and of how many people were present. If a pot of porridge was prepared at 6 a.m., and the first household members were served at 6 am, another at 6:30, and the final member at 7:30, this should be recorded as *one* eating occasion.

Column 2: Columns 2 through 8 list information on the people who did, or did not, consume the food served at each eating occasion. Column 2 lists the codes of those household members *not present* during the eating occasion. The cell of column 2 corresponding to a specific eating occasion can contain multiple household ID codes. These codes *should not* be entered vertically, (one per row); accounting for multiple codes takes place at data entry. If a household member was present during the meal, but did not eat, or did not eat all dishes served, that member's code is *not* recorded in Column 2. If a household member was not present, but took food to consume outside the home, that person's code is *not* recorded in Column 2.

Figure 1. Sample Questionnaire Layout

(1) Eating occasion	(2) ID of household Members not present & not eating	Visitors: Adults 18 yrs (3) male	Adults 18 yrs (4) female	Adolescents 12-17 yrs (5) male	Adolescents 12-17 yrs (6) female	Children either sex (7) 5-11 yrs	Children either sex (8) 0-4 yrs	(9) Dish #	(10) Dish	(11) Dish code	(12) Ingred-ient	(13) Ingred. code
									See list 1		See list 2	

(14) Total prepared quantity	(15) Unit of measure	(16) Unit code	(17) Leftover quantity	(18) Source	(19) Source Code
9999 = don't know	See list 2		9999 = don't know	01. Purchase 02. Home consumption 03. Gift 04. Govt. program 05. Wild food 06. Other 07. Leftovers from same day 08. Leftovers from previous day 99. Don't know	

Notes:

1) Due to space limitations, this sample questionnaire has been split into two parts. In an actual questionnaire the information in each row would be continuous across all columns.

2) If possible, codes should be included at the bottom of the relevant column. The codes in Figure 1 are an example. The appropriate list of codes is determined by the thematic interests of the survey designers and should be refined during the pre-tests. Long lists of codes, such as dish/ingredient, and unit of measure, should be referenced at the bottom of the appropriate columns, and made available in a separate document.

All of the following examples are cases in which a household member should be considered "present and eating" during the eating occasion. In other words, the member's code *should not* appear in Column 2.

- Household member 01 takes a home-prepared lunch to the fields, and member 02 takes a lunch to school. Remaining members consume the same (or different) dishes at lunchtime at home. Neither member 01 nor 02 should be noted in Column 2 when the dishes served at lunch to the remaining members at home are recorded. The food prepared for 01 and 02 in the morning is recorded, the food prepared at lunch is recorded, and the total amount of food is divided among all household members.
- Household member 02 is sick at home and does not eat any lunch.
- Household member 02 doesn't like eggs and only eats tortillas and beans at breakfast.
- Each household member eats a separately prepared breakfast at different times during the morning. For example, member 02 eats breakfast at 7:00 am and leaves for school, member 03 eats at 8:00 am and leaves for work, and member 01 breakfasts at 8:30 am. Therefore all members breakfasted; all were present and ate, even though at different times. The breakfasts are all considered as the *same eating occasion*.

Columns 3 - 8 list the number of *visitors* in each age/sex category who ate each dish. While household members are recorded by eating occasion or meal, visitors are recorded by *dish*. Visitors are broken down into age/sex categories that cover a range of adult equivalents. During data analysis, a weighted "average adult equivalent" will be assigned to each of these categories.[5]

Columns 9 - 11: The name of each dish prepared is recorded in Column 10 and coded in Column 11. A "dish" can either be a cooked combination of ingredients or an uncooked food (in the latter case, the dish is essentially equivalent to the ingredient). Dishes for which a liquid is mixed with a solid before serving (such as milk and bread, broth and rice, milk and tortilla) should be noted as a single dish; the liquid and the solid are listed as ingredients. This will facilitate the measurement of leftovers. For ease of subsequent data analysis, dishes are numbered consecutively in Column 9.

Columns 12 and 13 repeat the dish and its code. A measure of the total quantity of the dish is recorded in the same row. The ingredients of the dish are then recorded under the dish name in consecutive rows down Column 12, leaving two spaces between the last ingredient of one dish and the first ingredient of the next dish listed. When the dish and the ingredient are the same, it is not necessary to repeat the ingredient, unless precise information on the weight of the food would be lost if it were not repeated as an ingredient.

A four-digit coding scheme is used for dishes and ingredients, allowing for greater flexibility in determining the easiest and most accurate method of measurement. A given ingredient may pass through several stages before being cooked. For example, it may start out raw, then be soaked, then ground, then boiled. An estimate of the quantity prepared may be obtained at any stage, although it may be easiest to estimate quantity when the ingredient is raw or after it has been

[5]The adult equivalent used for each age/sex range will be an average of the age and sex specific adult equivalents, weighted by the proportion of the population in each age/sex range.

ground. The first digit of the four-digit code corresponds to the state in which the quantity estimate was obtained, not to how the ingredient was ultimately prepared. The next three digits are used to identify the ingredient.

Survey implementers must determine the appropriate items to include under "form of preparation." If more than nine forms are listed, a five-digit code can be used, of which the first two digits should be for coding the form of preparation.

Sample: Form of Preparation Codes

Code	Form	Code	Form	Code	Form
0	Raw	3	Stewed	6	Ground
1	Boiled	4	Broiled	7	Juice
2	Fried	5	Baked	8	Soup

Sample: Ingredients Codes

Code	Food	Code	Food	Code	Food
001	Dry white corn kernel	080	Potato	160	Veg. shortening
002	New white corn kernel	081	Sweet potato	161	Lard (pig)
003	White corn tortilla	082	Cassava	162	Vegetable oil
004	White corn on the cob	083	Squash whole	170	Refined white sugar
005	White corn unhusked	084	Squash sliced	171	Refined brown
006	1st quality rice	100	Liquid whole milk	172	Raw sugar
007	2nd quality rice	101	Powdered whole milk	220	Garlic
008	3rd quality rice	102	Powdered baby formula	221	Onion

Coding Different Ingredients

Corn provides a good example of the issues involved in codifying forms of preparation and measuring quantity. The corn used to make tortillas passes through several stages. Generally, dried corn kernels are cooked, and then ground into a crude cornmeal. It may be easiest to estimate the quantity of dried kernels the respondent took from a sack, or the quantity of cooked kernels taken to the mill, or the quantity of ground corn made into tortillas. For example, 450 ml. of dried corn expands to 1300 ml. after cooking, then reduces to 700 ml. after grinding. The survey respondent can demonstrate the amount of any of these forms, depending on which is easiest to measure. In all cases, the interviewer will record the dish as "tortilla" and the ingredient as "corn." What will vary is the coding of the ingredient, to indicate the form in which it was measured.

(10) Dish	(11) Dish code	(12) Ingredient	(13) Ingred. code	(14) Quantity	(15) Unit of measure	(16) Unit code
Tortilla	1003	Tortilla	1003	35	B2	19
		Dry white corn	0001	450	ml	06
Tortilla	1003	Tortilla	1003	35	B2	19
		Cooked white corn	1001	1300	ml	06
Tortilla	1003	Tortilla	1003	35	B2	19
		Ground cooked white corn	6001	700	ml	06

Another example of the intricacies of coding is soup. Broth from soup is a common weaning food. Nutrition education programs often encourage mothers to thicken the consistency of the soups they serve their infants. If a child is served soup or broth at a separate eating occasion[6], the interviewer must verify whether the soup served to a child included solid ingredients, or just broth. The soup form of preparation code (8) should be reserved for soup with solid ingredients. A separate dish/ingredient code should be identified for broth (See Appendix 2: Sample Ingredient Form Codes, code 406).

Columns 14-16 are for listing the quantity of the dish prepared and selected ingredients.[7] If the pot or container in which the dish was prepared is available and empty, estimating the amount of the dish is relatively straightforward. If the pot is unavailable, or the total amount of the dish is too large, the interviewer may ask the respondent to measure the portion served to each individual and estimate the amount remaining in the pot. The interviewer can then add up the individual servings plus leftovers, and enter the sum as the total amount of the dish prepared. The leftover measure would also be entered separately in Column 17.

If large amounts of a dish are prepared for several days at a time, it is impractical to try to measure the total amount of the dish prepared, and then measure the amount remaining in the pot

[6]For estimation of household averages, it does not matter what the child ate during the same eating occasion when the soup was prepared, because individual intake is not being estimated.

[7]Ingredients to be measured include all important sources of calories: grains and grain products, legumes, meats, milk and dairy products, eggs, oils, sugar, roots/tubers/musacea, nuts, fruits with high oil content (such as avocados and coconuts).

after each meal. In this case, the interviewer would not record and measure individual ingredients. Instead, the respondent should be asked to demonstrate the amount of the cooked dish served from the pot to each individual.[8] In this case leftovers are not estimated, since leftovers at the household level refer to leftovers in the pot, not on each member's plate. Given that the objective of the study is to calculate average *household* consumption, obtaining details on individual leftovers is too demanding and time-consuming to be worth the additional precision gained. Clearly, however, individual leftovers should be estimated when individual intake is of interest to the survey implementer.

The quantity of the dish and its ingredients are recorded separately. If the respondent states, "I cooked one pound of rice," the quantity is "1," and the unit of measure is "pounds." The quantity (number of units) is recorded in Column 14, and the unit of measure in Column 15. The unit of measure recorded should correspond to one on the precoded unit-of-measure list. (See Appendix 3 for a sample listing of measurement codes.) Common household units of measure (cup, glass, spoon, recycled can, bottle, bowl, or gourd) should *not* be recorded. For example, if the respondent used a coffee-cup full of sugar to make juice, the interviewer must not record "1 cup of sugar" because the size and shape of coffee cups vary, as do the levels to which a respondent may have filled the cup. The interviewer can determine the volumetric equivalent of the amount of sugar by asking the respondent to fill the same coffee cup with rice to demonstrate the amount of sugar used, and then recording the quantity of milliliters.

It is not necessary to estimate the amount of water in coffee, tea, reconstituted milk/formula, juice, etc. The interviewer need only obtain quantity estimates for ingredients that are significant sources of calories (such as powdered milk, formula, or sugar) and the total amount of the dish.

Column 17 notes the quantity of the dish *not consumed* during the eating occasion. This "leftover" amount may include portions sent to neighbors, fed to animals, or discarded, as well as portions set aside for subsequent consumption by household members. *The measurement of leftovers must always use the same unit of measurement as the dish*. If a different unit of measure is used, the data analyst will not be able to estimate what proportion of each ingredient in the dish was not consumed.

One or more days worth of foods, such as flat breads and rolls, may have been made during the recall period. For example, in Honduras some housewives grind enough corn and make enough tortillas for the entire day at one sitting, while others grind corn and prepare tortillas before each meal. When the whole day's tortillas are prepared at once, it is often difficult for the survey respondent to recall the total number of tortillas prepared. In such cases the interviewer can prepare a matrix (as in the example below); the respondent is more likely to recall how many tortillas were served to each person at each meal. The columns of the matrix can then be added together to provide the total number of tortillas prepared, the amount left over and consumed at subsequent meals, and the amount not consumed that day.

[8]Household, cluster or domain average recipes will be needed to impute the caloric content of dishes measured in this way.

Creating a Matrix

The respondent prepared tortillas for the entire day at breakfast time. All household members ate all meals, and there were no visitors. The interviewer creates a matrix of meals consumed by household members, and asks the respondent to recall how many tortillas each member ate at each meal. The interviewer then asks if any tortillas were eaten as snacks, given to animals, given away, sold, or uneaten (left over).

The respondent recalls that Pedro ate four tortillas at breakfast and dinner and five at lunch. Maria ate two at each meal. Juan ate three at each meal and three for a snack. Elsa ate one tortilla at lunch. Six tortillas were given to the pigs, and 3 tortillas were left over at the end of the day.

	Breakfast	Lunch	Dinner	Snacks	Animals	Leftover	Total
Pedro	4	5	4				
Maria	2	2	2				
Juan	3	3	3	3			
Elsa		1					
Total	9	11	9	3	6	3	41

The interviewer notes the total number of tortillas *prepared* (not the number consumed) at breakfast, which is the sum of the total of all columns in the matrix. The interviewer then records the total number of tortillas *not consumed at breakfast* as leftovers. The difference between the total number prepared and the number left over is the number *consumed.* The interviewer must not record the amount of leftovers again; for each subsequent occasion of tortilla consumption, only the amount *consumed* is recorded.

On the questionnaire, the sum of tortilla quantities from column 14 minus the sum of tortilla quantities should yield the total number of tortillas consumed in the household that day (after subtracting leftovers and animal feed).

(1) Eating Occa-sion	(10) Dish	(11) Dish code	(12) Ingredient	(13) Ingred code	(14) Total prepared quantity	(15) Unit of measure	(16) Unit code	(17) Leftover quantity	(18) Source	(19) Source code
1	Tortilla	1003	Tortilla	1003	41	B1	18	32		
			Dry corn kernel cooked	1001	1200	Ml	06		Home prod	03
2	Tortilla	1003	Tortilla	1003	11	B1	18	-	Leftover same day	07
3	Tortilla	1003	Tortilla	1003	3	B1	18	-	Leftover same day	07
4	Tortilla	1003	Tortilla	1003	9	B1	18	-	Leftover same day	07

Columns 18 and 19 reflect the source and code(s) of food prepared and consumed in the household. The level of detail in the code list depends on the objectives of the study. However, at a minimum, it is useful to use at least five "source" categories: purchased, home produced,

private gifts, government programs, freely gathered, and other. The source of the food also includes leftovers from the same day or previous days. The code "leftover from same day" helps the data analyst identify pre-cooked dishes for which household-specific recipes should be available. Leftovers from other days will have household-specific recipes imputed if available; if not, cluster- or domain-specific recipes will need to be calculated for commonly cooked dishes. Methods for carrying out these calculations are described in Appendix 6.

3.3.3. General Measurement Techniques

Food intake can be estimated in four different ways:

1. Recorded Weight
2. Volume
3. Two-dimensional Food Models
4. Linear Dimensions

Each of these methods has an important and specific role to play, and different foods are measured differently. Methods 1 and 2 are preferable, but not always feasible. Method 3 uses preselected, pretested models that reflect the local context in terms of the types of foods available and the form in which they are generally acquired and consumed. Success in implementing these techniques in the field is highly dependent on the quality and depth of interviewer training.

Recorded Weight

Ideally, the interviewer will be able to record the weight of the food prepared or consumed. This will be easiest when the respondent purchased a pre-measured amount of a food and prepared it in its entirety during the recall period. For example, the respondent bought one-half pound of sugar and used it all to make lemonade, or bought a 350-gm. bag of rice and cooked it all at once. The respondent may know the exact weight or volume of a product if it was pre-packaged, or if it was bought by the pound and weighed on a scale at the time of purchase. If a product was purchased prepackaged, but the respondent does not know the weight, the interviewer should ask to see the package. Cans and bags are often kept for reuse. If the package or container is no longer available but was purchased at a local retail outlet, the interviewer can visit the store after the interview, identify the same brand and price, and directly ascertain the weight of the product. If the net weight on the can or container includes water (such as canned peas), the weight from the container should not be used. Instead, the interviewer should estimate the volume of the drained product (see next section).

In many countries respondents may imply that products have been weighed, when in fact they have not. For example, in the Dominican Republic beans are commonly sold in the market by the canful. Sellers use a can to measure the beans, which is commonly referred to as "one pound." Samples taken of the measure, however, averaged only three-quarters of a pound. In Honduras people commonly refer to a prepackaged bag of rice as "1 pound," even though the package clearly states the weight as 350 grams. Thus when respondents provide an oral account

of the weight of a product, interviewers should always ask if the product was actually weighed. It is important that these types of distortions be identified during questionnaire design and pre-testing and highlighted during training.

Many other factors may prevent respondents from providing reliable information on the weight of a food prepared or consumed. For example, if the food: (a) came from the household's own agricultural production; (b) was bought without being weighed; (c) was a gift of raw or cooked food; (d) was purchased by weight, but not prepared or consumed in its entirety; or (e) is a cooked dish or an individual portion, then the interviewer must estimate the amount prepared or consumed. Several techniques are available to do so. They require that interviewers carry with them aids such as rice, clay, beakers with graduated measurements, and in some cases, cardboard models.

Volume

To convert household measures to volume, the respondent is first asked to demonstrate the amount of the product prepared or consumed using the household measure (cup, spoon) she actually used. Then water or rice is used to substitute for the product. The interviewer will carry four or five pounds of rice to be used to demonstrate the amount of dry ingredients, especially those that tend to mound when measured (such as flour, powdered milk, and sugar). Rice can also be used to estimate portions of an already-cooked, non-liquid dish; for example, if a neighbor sent over a plate of rice and beans, or if leftover porridge from a previous day was consumed. Water can be used to substitute for all liquid ingredients, as well as ingredients measured with a level surface (such as a level teaspoon of sugar or liquid milk).[9] The total amount prepared can also usually be estimated by volume.

After the respondent replicates the amount prepared or consumed in the container used, the interviewer transfers the rice or water to a measuring beaker. The beaker should always be the smallest possible, because smaller beakers tend to have finer gradations (by 5 or 10 ml., instead of 25 or 50 ml.), so the amount can be read with greater precision.[10] After placing the beaker on a level surface, at eye level, the interviewer reads the volume and records the amount in milliliters.

[9]The interviewer uses rice and water to substitute for the ingredients, rather than the ingredients themselves, for hygienic and practical reasons, and to minimize the imposition on respondents. Respondents may become reluctant to participate in the study if they are constantly asked to use their own food to demonstrate quantities.
[10]Ideally, interviewers should have a set of 5 beakers: 1000, 500, 250, 100, and 50 ml.

Measuring the Volume of Coffee and Sugar

The respondent has a sack of sugar and a small cup that she uses to remove sugar from the sack before adding it to coffee. The interviewer asks the respondent to demonstrate using the same cup and rice for the amount of sugar she used yesterday in the morning coffee. The respondent fills the cup with rice to where it was filled with sugar; the interviewer empties the rice into a beaker and records the quantity in milliliters.

Then the interviewer asks the respondent to fill the coffeepot used yesterday with water to the level it was filled with coffee. This amount is measured in the beakers and recorded as the total amount of the dish prepared. The interviewer asks if any coffee was left in the pot after everyone had been served; if so, the respondent is asked to demonstrate by placing water to the level of leftover coffee in the coffeepot. The interviewer records this amount in the total dish leftover column.

(10) Dish	(11) Dish code	(12) Ingredient	(13) Ingred. Code	(14) Total prepared quantity	(15) Unit of measure	(16) Unit code	(17) Leftover quantity
Coffee	1220	Coffee	1220	1050	Ml	06	200
		Coffee	0220				
		White sugar	0170	240	Ml	06	

Another example comes from a study in Honduras, where vegetable shortening (*manteca*) is commonly used for cooking. The product is usually squeezed from a plastic tube into the frying pan, then heated. In this case, respondents were asked to estimate the amount of *manteca* after it had melted in the pan by adding water to the empty pan until the quantity replicated the amount of melted *manteca*. The water was measured in the beaker, and milliliters of *manteca* recorded on the questionnaire. This technique can be used with any solid fat that is melted before cooking.

Another way to measure volume is by *water displacement*. This is particularly useful when the ingredient or dish prepared or consumed is measured in individual units, such as a roll, piece of meat, or block or slice of cheese. Interviewers request that respondents use clay to model the shape and size of the food. Then the interviewer fills a beaker with water to a level high enough to cover the modeled product, and notes the level of water in milliliters. Finally, the interviewer places the clay model in the water, and notes the new water level. The difference between the two levels is recorded in millileters on the questionnaire.

Measuring the Volume of Cheese by Water Displacement

If a respondent purchased a portion of cheese but did not serve all of it yesterday, the interviewer can estimate the amount of cheese consumed by asking the respondent to make a clay model similar to the size and shape of the cheese when originally purchased. Having filled a 1000-ml. beaker up to the 600 ml. mark, the interviewer places the clay model in the beaker and notes that the water level has risen to 850 ml. Thus the volume of the original portion of cheese was 250 ml. The interviewer then asks for a model demonstrating the amount of cheese not served. Making sure that the beaker still has 600 ml. (the water level may drop as the clay models are removed), the unconsumed cheese model is placed in the water, which rises to the 700 ml. mark, allowing the interviewer to calculate the amount of cheese consumed the previous day.

(10) Dish	(11) Dish code	(12) Ingredient	(13) Ingred. code	(14) Quantity	(15) Unit of measure	(16) Unit code	(17) Leftover quantity
Fresh cheese	0104	Fresh cheese	0104	250	ml	06	100
		Fresh cheese	0104	1	lb	01	

Note: Strictly speaking, repeating fresh cheese on the second line is not necessary, because the conversion factor for milliliters to grams for fresh cheese would be available from secondary data or survey implementer calculations. However, when exact and direct information is available, for example, on the weight of the 250 ml. of cheese purchased by the household, it is preferable to record it for subsequent use by data managers in calculating a household-specific conversion factor of milliliters to grams.

Conversion factors for all foods measured by volume will need to be obtained. Some such factors are available from nutrient composition tables that list, for example, the volume of a standard 8-ounce measuring cup: the standard 8-oz. cup contains 236.6 ml. The weight of one cup of the product divided by 236.6 will give the conversion factor to grams for one milliliter of volume of the product. Some volumetric conversion factors for common foods in Honduras, used in a 1994 survey, are included in Appendix 4. For conversion factors of foods not included in nutrient composition tables or in Appendix 4, survey implementers will need to calculate survey-specific conversion factors. To do so, the implementers should purchase a sample of different weights of the product of interest. The volume of each sample should be measured, using the most appropriate technique (directly for dry or liquid ingredients, water displacement for solid ingredients, if possible). The volume-to-gram conversion factor for each sample is then averaged to obtain a milliliter-to-gram conversion factor for the product.

Two-dimensional Food Models

Some foods are consumed unweighed, and cannot be easily measured through volumetric conversion or clay models. In such cases, a two-dimensional cardboard model can serve as a measurement tool. A common example is bananas; two-dimensional models are necessary for

most fruits, vegetables, roots, tubers, and some meat and dairy products. Two-dimensional cardboard models should be developed for these foods prior to initiation of the field activities.

A cardboard model is created for each of a series of common sizes and shapes of a given product, and each interviewer is given a full set. When the models are made, the gross and net weight of the edible portion of a sample of each food model must be calculated for data-processing purposes. For example, in the case of bananas, five to ten bananas are selected that are the same shape and size as the models. Each banana is weighed with skin, and the gross weight noted. Then each banana is peeled and weighed without skin to measure the weight of the edible portion. Finally, the gross weight and edible portion weights are averaged and recorded for use during data analysis.

When the interviewer determines that models are necessary, he or she will demonstrate the range of models available for the particular food item, and ask the respondent to indicate which size best corresponds to the amount of the food prepared or consumed.

Most food models are two-dimensional; that is, they show the length and width of the product, but not its thickness. It is possible, however, to develop cardboard food models to measure thickness. Flatbreads, such as tortillas, may vary widely in both diameter and thickness in different regions of a country. Using cardboard that is approximately as thick as the thinnest commonly observed bread, survey implementers can create a set of models covering several different thicknesses. Interviewers can then ask respondents to indicate both the *size* of bread or tortilla and the *thickness*, using the different cardboard models. Model sizes can be coded using letters, and the number of models coded by number. For example, if a respondent selects two thicknesses of model size B, the interviewer would record “B2” with the corresponding code for the list of units of measure. These food models should be included on the unit of measure code list (see the series of tortilla models listed in Appendix 3).

Roots and tubers, such as cassava, pose a special challenge. They are often obtained from the household’s own agricultural production, so the respondent does not have a reliable weight to report. Moreover, the size and shape of roots varies enormously, and it may be difficult to produce a sufficient range of food models to cover all possibilities. Finally, when prepared, the root may be cut into several pieces of varying shapes and sizes, and individuals may eat varying number of these pieces.

Food models for roots and tubers should be developed to cover three-to-five sizes and one-to-three shapes. To estimate the *quantity* of the ingredient, the respondent is asked to select the size and shape closest to that prepared. The respondent may select several models to demonstrate the range of shapes and sizes prepared. The respondent is then asked how many pieces each root was cut into, the sum of which is recorded as the total amount of the dish. Individual portions will then be defined as the number of pieces. When the data is analyzed, the total weight of the sum of the food models (ingredients) is divided by the total number of pieces to calculate an average weight per piece.

Estimating the Quantity of Cassava Consumed

The respondent prepared four cassava roots, two of which correspond to the large food model, and one to the medium model; the fourth root was approximately half again as big as the medium food model (i.e., 1.5 medium). She cut each root into six pieces and then into 24 smaller pieces before cooking. Two pieces were fed to the pigs.

(10) Dish	(11) Dish code	(12) Ingredient	(13) Ingred. Code	(14) Total prepared Quantity	(15) Unit of measure	(16) Unit code	(17) Leftover quantity
Boiled cassava	1082	Boiled cassava	1082	24	piece	08	2
		Cassava	0082	2	large	11	
		Cassava	0082	2.5	med.	10	

Linear Dimensions

The amount of some foods—most commonly already cooked square or rectangular foods received as gifts or purchased—can be estimated using their dimensions. One Latin American example is the tamale. The respondent can be asked to draw a rectangle to estimate the length and width of the food, and to indicate the height with the distance between two fingertips. The interviewer records the information as "cubic centimeters."

However, if the respondent prepared tamales in the home during the reference period, it is not be necessary to estimate the dimensions of the finished tamales in this manner. Rather, the interviewer should record all the ingredients and their respective quantities. To obtain the total amount of the dish, the interviewer records the total *number* of tamales made, using the slice/piece unit-of-measure code.

3.4. Recording Household Composition

Caloric requirements of household members are based on their gender, height, weight, physiological status, and level of activity. For the purposes of quantifying the Title II caloric adequacy indicator, average heights and weights for the country should be used. Figure 2 presents the layout of a sample questionnaire for collecting the additional information required to calculate caloric requirements for each household member.

Figure 2. Sample Questionnaire for Household Composition

Member			**Age**		**Physiological status**	**Activity**	**Current**
ID (1)	Name (2)	Sex (3)	Number (4)	Unit (5)	(women 14-60 yrs only) (6)	level (7)	Resident of household ? (sleeping/ eating) (8)
1.							
2.							
3.							
Etc.							
		1. Male 2. Female		1. Years 2. Months (children < 1 year only)	1. Not pregnant or lactating 2. Pregnant 3. Breastfeeding (child under 6 mo.) 4. Breastfeeding (child 6 mo. or older) 5. Pregnant and breastfeeding (child under 6 mo.) 6. Pregnant and breastfeeding (child 6 mo. or older)	1. High 2. Medium 3. Light	1. Yes 2. No

3.4.1. Age

For the purposes of the caloric adequacy indicator, age in years completed is collected for all household members over one year of age. Age in months is needed for children younger than one year.[11]

3.4.2. Gender

The gender of each household member is recorded. Females do not need to be identified here as pregnant or lactating, as this is recorded in the column on physiological status.

[11]If nutritional status or child feeding indicators are also being collected in the survey, the age in months of all children under five will be necessary. Please refer to the appropriate IMPACT indicator guides ("Anthropometry Indicators Measurement Guide and Infant and Child Feeding Indicator Measurement Guide") for a discussion of recording and calculating age for those indicators. Since the level of detail and accuracy of the age calculation is higher for nutritional status and child feeding indicators, those age data requirements should be used, if available, rather than the less detailed requirements for the caloric adequacy indicator detailed in this guide.

3.4.3. Physiological Status of Women of Reproductive Age (14 - 60 years)

Women of reproductive age should be asked whether they are: pregnant but not breastfeeding, breastfeeding but not pregnant, pregnant and breastfeeding, or not pregnant or breastfeeding. A woman may be unaware that she is pregnant, especially during the first trimester. It is not necessary for interviewers to probe further (such as asking the date of the woman's last menstrual period). The level of error that would be introduced by miscoding a pregnant woman as not pregnant, especially in the first trimester, is not significant in relation to the relatively high level of error in this indicator of household average caloric adequacy.

3.4.4. Current Activity Level

Current activity levels of household members 10 years and older are determined by the interviewer, based on each member's daily activities *during the period that 24-hour recall data is being gathered*. Interviewers must not assume a level of activity based on the member's occupation. It cannot be assumed, for example, that all farmers always have high activity levels. The survey may be being implemented during the off-season, when no agricultural activities are taking place and no alternative employment options are available. In this case, farmers may not be engaged in strenuous physical activity. During the week or two that the interviewer is visiting the household, he or she should determine, based on observation and conversation with household members, each individual's activity level during the period. Appendix 5 contains examples of light, moderate, and high activity levels.

3.4.5. Current Household Residents

The information recorded in this column is necessary because household members included in the calculation of average household caloric adequacy should be limited to those who are currently consuming from the household food supply. While ideally only such household members will be mentioned by the respondent, it is not uncommon for respondents to list individuals as household members even when they are not currently residing at home. For example, a respondent may list a daughter who is attending school in the capital city and living with a relative. For the respondent, the daughter is still considered to be a member of the household. Rather than insult a respondent by not recording the daughter's name, the interviewer can record her information, but code her as '2'--not currently residing in the household. If the daughter returns for a visit during the period of interviews, she should be recorded as a "visitor" in the appropriate columns of the questionnaire. Additional motives for collecting household composition data include the need to calculate income per capita or household labor supply. The criteria for listing an individual as "present" or "absent" will differ according to the motive of the survey. For the purposes of calculating caloric adequacy, household members should be included only when currently residing in the household.

4. ANALYZING THE DATA

Calculating the percentage of households meeting the minimum standards of daily nutrient requirements entails significant manipulation of data. This section summarizes the steps to be taken to perform the calculations. A more detailed guide to the SPSS/PC programming

procedures to be followed is provided in the Appendix 6. The procedures have been designed for ease and convenience; nonetheless, the CS will probably have to employ or train staff in SPSS/PC so that programs can be debugged and modified as needed.

Once data on the amount of food consumed and the people consuming the food has been collected, the information must be converted to the two data components necessary to quantify household caloric adequacy: *intake* and *requirements*. Caloric intake is estimated based on the data on consumption of all significant sources of calories during the previous day (see Appendix 6). Caloric requirements for household members are calculated based on their age, sex, physiological status, and activity levels (see Appendices 6, 8 and 9), and the resulting calculation of individual caloric requirements.

Computing caloric adequacy requires a detailed analysis of the composition of each dish consumed by the household, which involves converting ingredients to standard weights; establishing putative recipes for dishes with no recipes; and accounting for leftovers. Using the survey data, the data analyst then proceeds to compute the number of people that consumed each dish and the calories consumed by the household. The average intake of calories is then compared with calorie requirements, to calculate the adequacy of average calorie intake for each household.

APPENDIX 1. SAMPLE INGREDIENT CODES

Basic grains	80. Spaghetti	Eggs
1. Dry white corn kernel	81. Cannelloni	170. Chicken egg
2. New white corn kernel	82. Lasagna	171. Duck egg
3. Tender white corn kernel	83. Macaroni	172. Turtle egg
4. White corn tortilla	84. Shell macaroni	173. Other egg
5. White corn on the cob	85. Wide noodles	
6. Unhusked white corn on cob	86. Honduran pasta	Meat, poultry, fish, seafood
7. Dry yellow corn kernel	87. Elbow macaroni	180. Beef with bone
8. New yellow corn kernel	88. Other cereal	181. Beef without bone
9. Tender yellow corn kernel		182. Beef bone (soup)
10. Yellow corn tortilla	Bananas, roots, tubers	183. Beef ribs
11. Yellow corn on the cob	100. Ripe banana	184. Pork with bone
12. Unhusked yellow corn on cob	101. Green banana	185. Boneless pork
13. Sorghum kernel	102. Butuco banana	186. Pork 'tajo'
14. Sorghum tortilla	103. Datil banana	187. Pork ribs
15. Consumption rice	104. Green plantain	188. Pork chop
16. Parboiled rice	105. Ripe plantain	189. Pig feet
17. Unhusked rice (granza)	106. Potato	190. Liver
18. Other grain	107. Cassava	191. Kidneys
	108. Sweet potato	192. Heart
Legumes	109. Squash (whole)	193. Tongue
40. Beans in general	110. Squash (slice)	194. Tripe with bone
41. Red bean	111. Other roots, tuber, banana	195. Boneless tripe
42. Black bean		196. Chicken (general)
43. Soy bean	Milk, dairy products	197. Chicken breast
44. Cashew nut	130. Liquid whole milk	198. Chicken thigh/leg
45. Other legume	131. Liquid skim milk	199. Chicken giblets
	132. Evaporated milk	200. Patio chicken (general)
Other cereals/cereal products	133. Condensed milk	201. Patio chicken breast
60. Wheat flour	134. Powdered whole milk	202. Patio chicken thigh/leg
61. Wheat tortilla	135. Powdered skim milk	203. Patio chicken giblets
62. Pancake mix	136. Powdered milk for babies	204. Rabbit
63. Whole wheat flour	137. Soy milk for babies	205. Baloney (mortadela)
64. Corn flour	138. Other milk	206. Ham
65. Rice flour	139. Cream cheese	207. Chorizo extremeño (sausage)
66. Other flour	140. Fresh cheese	208. Hot-dog
67. Sandwich bread	141. Hard cheese	209. Copetines (sausage)
68. Sweet bread roll	142. American processed cheese	210. Longaniza (sausage)
69. Homemade sweet bread	143. Parmesan cheese	211. Salami
70. Whole wheat bread	144. Pepper cheese	212. Fish filet
71. White bread roll	145. Quesillo	213. Whole fish
72. Homemade white bread	146. Cuajada	214. Dried fish
73. French bread	147. Requesón	215. Shrimp
74. Other white bread	148. Other cheese	216. Crab (river)
75. Sweet cracker	149. Cream 'rala'	217. Crab (ocean)
76. Salt cracker	150. Cream 'crema'	218. Caracol (shellfish)
77. Corn flakes	151. Yellow cream	219. Canned sardines
78. Oatmeal	152. Yogurt	220. Other meat, sea food
79. Thin egg noodles	153. Other milk product	

Fats	328. Pear	407. Bouillon cubes
240. Veg. shortening	329. Pineapple	408. Hot sauce
241. Lard (pig)	330. Rambután	409. Cocoa
242. Vegetable oil	331. Watermelon	410. Chips
243. Other oil	332. Suncuya	411. Spices
244. Margarine	333. Tamarind	412. Ice cream
245. Mayonnaise	334. Grapefruit	413. Juice (boxed)
246. Other fat	335. Grapes	414. Juice (canned)
	336. Zapote	415. Ketchup
Sugars	337. Other fruit	416. Corn starch
260. Refined white sugar		417. Mustard
261. Refined brown sugar	Vegetables	418. Dried oregano
262. Raw sugar	360. Garlic	419. Tomato paste
263. Sugar cane	361. Celery	420. Coagulant
264. Honey (bee)	362. Eggplant	421. Soda
265. Honey (sugar cane)	363. Broccoli	422. Baking soda
266. Other sugar	364. Onion	423. Salt
	365. Cauliflower	424. Tomato sauce
Fruit	366. Cilantro (castilla)	425. Worcestershire sauce
300. Avocado	367. Cilantro (pata)	426. Dried soup mix
301. Coconut	368. Sweet pepper	427. Sweet n Low
302. Anona	369. Hot pepper	428. Vinegar
303. Cherry	370. Spinach	429. Other misc. prods
304. Peach	371. Unripe red beans	
305. Strawberry	372. Lettuce	Local Dishes
306. Granada	373. Malanga	540 Meatballs
307. Granadilla	374. Mustard leaves	541 Rice with shrimp
308. Guanábana	375. Oregano	542 Rice with pork
309. Guava	376. Pataste	543 Rice with milk
310. Lichies	377. Cucumbers	544 Rice with corn
311. Lima	378. Parsley	545 Rice with chicken
312. Lemon	379. Pipian	546 Rice and beans
313. Mamones	380. Radishes	547 Cordon blue
314. Tangerine	381. Beets	548 Chop suey
315. Mango	382. Cabbage	549 Stew
316. Apple	383. Tomato	550 Other local dishes
317. Small apple variety	384. Carrot	
318. Passion fruit	385. Other vegetable	
319. Mazapán		
320. Peach	Other products	
321. Melon	400. Achiote	
322. Membrillo	401. Sesame	
323. Raspberry	402. Cinnamon	
324. Nance	403. Coffee toasted	
325. Sweet orange	404. Coffee bean not toasted	
326. Sour orange	405. Coffe bean unpeeled	
327. Papaya	406. Broth	

Note: Conversion factors were calculated only for ingredients with codes 1 through 301. These products are significant contributors of calories and protein, and were the only foods for which quantity estimates were obtained. (See tables on following pages.)

APPENDIX 2. SAMPLE INGREDIENT FORM CODES

Code	Form
0	Raw
1	Boiled
2	Fried
3	Stewed
4	Broiled
5	Baked
6	Ground
7	Juice
8	Soup

APPENDIX 3. SAMPLE UNIT OF MEASURE CODES

1.	Pound	2.	Ounce
3.	Kilogram	4.	Gram
5.	Liter	6.	Milliliter
7.	Unit	8.	Slice, piece
*80.	Tiny loaf	*9.	Small model
*10.	Medium model	*11.	Large model
*81.	Very large model	*12.	Small (rolls/crackers)
*13.	Medium (rolls/crackers)	*14.	Large (rolls/crackers)
15.	Centimeter	16.	Centimeter squared
82.	Centimeter cubed	17.	Gallon
#18.	2 liter Coke bottle	#19.	1 liter Coke bottle
#20.	½ liter Coke bottle	#21.	Small Coke bottle
#22.	Large bottle salsa	#23.	Small bottle salsa
#24.	Large Flor de Caña bottle	#25.	Small Flor de Caña bottle
#26.	Small Ron Botrán bottle	#27.	Large Ron Botrán bottle
#28.	Large vinegar bottle	29.	Liter box of milk
39.	Anega	40.	Arroba
#41.	Bag	#42.	Box
#43.	Truckload	#44.	Canasto
#45.	Carga	#46.	Carretada
47.	Cuartillo	#50.	Gavilla
51.	Mano	52.	Medida
53.	Matate	#54.	Mazo
55.	Medio	#56.	Paca
57.	Palo	58.	Quintal
59.	Racimo	#60.	Sack
61.	Tercio	62.	Man/day
63.	Piece	64.	Other unit of measure
*65.	Tortilla A1	*66.	Tortilla A2
*67.	Tortilla A3	*68.	Tortilla B1
*69.	Tortilla B2	*70.	Tortilla B3
*71.	Tortilla C1	*72.	Tortilla C2
*73.	Tortilla C3	*74.	Tortilla D1
*75.	Tortilla D2	*76.	Tortilla D3
*77.	Tortilla E1	*78.	Tortilla E2
*79.	Tortilla E3	99.	Doesn't know

* Conversion factors not included. Should be calculated when food models are developed prior to field work.

Use of these units of measure is not recommended, because they are not standardized. They were included in the list as a second-best solution when the interviewer was unable to collect the information using a standardized units. For example, if a household purchased milk from a producer using a large rum bottle, the interviewer should always ask whether the bottle is available and, if so, ask the respondent to fill it with water to the level it had been filled with milk. The quantity can then be recorded in milliliters. If, however, the bottle is not available, then an appropriate rum bottle code (24-27) can be used.

APPENDIX 4. CONVERSION FACTORS FOR COMMON HONDURAN FOODS

The table below presents conversion factors for common foods from a 1994 survey in Honduras. The gross and edible portion weights for the food models are *not* included. Food model weights will be specific to each survey, and calculated at the time that each model is developed (prior to the start of survey field work). The table does include, however, some common units of measure (e.g., arroba, medida), that are unique to the Honduran setting and should not be used in other countries without prior verification that the weights are the same.

The columns in the table contain:

(1) Ingredient code (see Appendix 1)
(2) Unit of measure (see Appendix 3)
(3) Ingredient form in which the quantity is estimated

0	Raw	5	Baked
1	Boiled	6	Soup
2	Fried	7	Juice
3	Stewed	8	Ground/blended
4	Grilled	9	Other

(4) Edible portion weight, in grams of raw ingredient per 1 unit of unit of measure
(5) Gross weight, in grams of raw ingredient per 1 unit of unit of measure

Thus the conversion factors include two transformations. All forms of the ingredient are converted to the equivalent in the raw ingredient, and all units of measures are converted to grams.

Two examples based on the table:

(1) The second line in the first column of the table is 001 01 1 00259.00100 00259.00100
The ingredient is 001 (dry white corn kernel)
The unit of measure is 01 (pound)
The form is 1 (boiled)
The equivalent weight in edible portion of raw white corn kernels is 259.001 grams.
Since corn kernels do not have any wastage, the equivalent gross weight of raw white corn kernels is also 259.001 grams.

(2) The first line in the sixth column of the table is 100 07 0 00100.00000 00150.00000
The ingredient is 100 (ripe banana)
The unit of measure is 07 (unit)
The form is 0 (raw)
The weight of the edible portion of the banana is 100 grams.
Since the peel of the banana is not consumed, the equivalent gross weight of the banana is 150 grams.

(1)	(2)	(3)	(4)	(5)
001	01	0	00453.59250	00453.59250
001	01	1	00259.00100	00259.00100
001	01	8	00480.80805	00480.80805
001	02	0	00028.34950	00028.34950
001	02	1	00016.18700	00016.18700
001	02	8	00030.05047	00030.05047
001	03	1	00571.00000	00571.00000
001	05	0	00907.20000	00907.20000
001	06	0	00000.90720	00000.90720
001	06	1	00000.60400	00000.60400
001	06	8	00000.56699	00000.56699
001	40	0	11339.81300	11339.81300
001	52	0	02267.96200	02267.96200
001	52	1	02267.96200	02267.96200
001	58	0	45358.25000	45359.25000
002	01	0	00453.59250	00453.59250
002	06	0	00000.90320	00000.90320
002	06	1	00000.82790	00000.82790
003	01	0	00453.59250	00453.59250
003	01	8	00480.80805	00480.80805
003	02	0	00028.34950	00028.34950
003	06	0	00001.00000	00001.00000
003	06	1	00000.82790	00000.82790
003	06	8	00000.59430	00000.59430
003	07	0	00100.00000	00100.00000
003	07	1	00057.10000	00057.10000
003	07	8	00100.00000	00100.00000
003	51	0	00500.00000	00500.00000
003	51	8	00500.00000	00500.00000
003	52	0	02267.96200	02267.96200
004	01	0	00316.60757	00316.60757
004	01	1	00316.60757	00316.60757
004	02	1	00019.78790	00019.78790
004	07	0	00023.26660	00023.26660
004	07	1	00023.26660	00023.26660
005	01	8	00216.36359	00216.36359
005	07	0	00100.00000	00100.00000
007	01	0	00453.59250	00453.59250
007	01	1	00259.00100	00259.00100
007	01	8	00480.80805	00480.80805
007	06	0	00000.90720	00000.90720
007	06	1	00000.60400	00000.60400
007	06	8	00000.56699	00000.56699
007	40	0	11339.81300	11339.81300
007	52	0	02267.96200	02267.96200
008	06	0	00001.00000	00001.00000
008	06	1	00000.82790	00000.82790
008	06	8	00000.59430	00000.59430
010	01	0	00316.60757	00316.60757
011	01	0	00204.11660	00204.11660
011	07	4	00100.00000	00100.00000
013	01	0	00453.59250	00453.59250
013	02	0	00028.34950	00028.34950
013	04	0	00001.00000	00001.00000
013	06	0	00000.58060	00000.58060
013	06	1	00000.34840	00000.34840
013	06	8	00000.43550	00000.43550
013	40	0	11339.81300	11339.81300
013	52	0	02267.96200	02267.96200
013	58	0	45358.25000	45359.25000
014	07	0	00023.26660	00023.26660
015	01	0	00453.59250	00453.59250
015	01	1	00141.74766	00141.74766
015	01	3	00141.74766	00141.74766
015	02	0	00028.34950	00028.34950
015	02	1	00008.85915	00008.85915
015	02	3	00008.85920	00008.85920
015	03	0	01000.00000	01000.00000
015	04	0	00001.00000	00001.00000
015	04	3	00000.31250	00000.31250
015	05	0	01225.00000	01225.00000
015	06	0	00001.22500	00001.22500
015	06	1	00000.23500	00000.23500
015	06	2	00001.14230	00001.14230
015	06	3	00000.23500	00000.23500
015	06	8	00001.29850	00001.29850
015	40	0	11339.81300	11339.81300
015	58	0	45358.25000	45359.25000
016	01	0	00453.59250	00453.59250
016	02	0	00028.34950	00028.34950
016	02	3	00008.85915	00008.85915
016	04	0	00001.00000	00001.00000
016	04	3	00000.53720	00000.53720
016	06	0	00001.39000	00001.39000
016	40	0	11339.81300	11339.81300
018	06	0	00000.72200	00000.72200
040	00	1	00210.46690	00210.46690
040	01	0	00453.60000	00453.60000
040	02	0	00028.35000	00028.35000
040	02	1	00013.15416	00013.15416
040	02	8	00013.15416	00013.15416
040	04	0	00001.00000	00001.00000
040	06	0	00000.83300	00000.83300
040	06	1	00000.38650	00000.38650
040	06	2	00000.38650	00000.38650
040	06	8	00000.48400	00000.48400
040	41	0	01133.98130	01133.98130
040	58	0	45358.25000	45359.25000
041	01	0	00453.59250	00453.59250
041	01	1	00210.46692	00210.46692
041	01	2	00210.46692	00210.46692
041	01	8	00210.46620	00210.46620
041	02	0	00028.31950	00028.31950
041	02	1	00013.15416	00013.15416
041	02	8	00013.15416	00013.15416
041	03	0	01000.00000	01000.00000
041	03	1	00464.00000	00464.00000
041	04	1	00000.86400	00000.86400
041	04	8	00000.86400	00000.86400
041	06	0	00000.83300	00000.83300
041	06	1	00000.31200	00000.31200
041	06	2	00000.48400	00000.48400
041	06	3	00000.31200	00000.31200
041	06	8	00000.42400	00000.42400
041	40	0	11339.81300	11339.81300
041	52	0	02267.96300	02267.96300
041	58	0	45359.25000	45359.25000
042	01	0	00453.59250	00453.59250
042	01	1	00212.73488	00212.73488
042	02	0	00028.34950	00028.34950
042	02	1	00013.29590	00013.29590
042	02	8	00013.89590	00013.89590
042	06	0	00000.85400	00000.85400
042	06	1	00000.37100	00000.37100
042	06	2	00000.37100	00000.37100
042	06	8	00000.37100	00000.37100
042	52	0	02267.96300	02267.96300
042	58	0	45358.25000	45359.25000
043	01	0	00453.59250	00453.59250
043	01	1	00210.46600	00210.46600
043	01	8	00210.46600	00210.46600
043	02	0	00028.34950	00028.34950
043	02	3	00013.15410	00013.15410
043	02	8	00013.15410	00013.15410
043	06	0	00000.39625	00000.39625
045	01	0	00453.59250	00453.59250
060	01	0	00453.59250	00453.59250
060	01	8	00453.59250	00453.59250
060	02	0	00028.34950	00028.34950
060	02	8	00028.34950	00028.34950
060	06	0	00000.60000	00000.60000
060	06	8	00000.60000	00000.60000
061	01	0	00294.83510	00453.59250
062	01	0	00453.59250	00453.59250
062	01	8	00453.59250	00453.59250
062	02	0	00028.34950	00028.34950
062	06	0	00000.60000	00000.60000
063	01	0	00453.59250	00453.59250
063	02	0	00028.34950	00028.34950
063	06	0	00000.60000	00000.60000
064	01	0	00480.80800	00480.80800
064	01	1	00480.80800	00480.80800
064	01	8	00480.80800	00480.80800
064	02	0	00030.05000	00030.05000
064	02	8	00030.05000	00030.05000
064	06	0	00000.63000	00000.63000
064	06	1	00000.63000	00000.63000
064	06	8	00000.63000	00000.63000
064	07	0	00023.00000	00023.00000
064	07	1	00023.00000	00023.00000
064	07	5	00023.00000	00023.00000
065	06	0	00000.56074	00000.56074

(1)	(2)	(3)	(4)	(5)
065	06	8	00000.56074	00000.56074
066	01	0	00453.59250	00453.59250
066	02	0	00000.63000	00000.63000
067	01	5	00453.59250	00453.59250
067	08	0	00021.00000	00021.00000
067	08	5	00021.00000	00021.00000
067	41	0	00348.75000	00348.75000
067	41	5	00348.75000	00348.75000
068	01	0	00453.59250	00453.59250
068	02	5	00028.34950	00028.34950
068	03	5	01000.00000	01000.00000
068	04	5	00001.00000	00001.00000
068	07	0	00047.70000	00047.70000
068	07	5	00047.70000	00047.70000
068	08	5	00023.58700	00023.58700
068	41	5	00272.15505	00272.15505
069	07	0	00043.09360	00043.09360
069	07	5	00043.09360	00043.09360
069	16	5	00001.99900	00001.99900
069	16	6	00001.99900	00001.99900
069	16	7	00001.99900	00001.99900
069	16	8	00001.99900	00001.99900
070	07	0	00020.70000	00020.70000
070	08	5	00021.00000	00021.00000
070	13	5	00043.09360	00043.09360
071	02	5	00028.34950	00028.34950
071	04	0	00001.00000	00001.00000
071	07	0	00020.70000	00020.70000
071	07	5	00020.70000	00020.70000
071	08	5	00021.00000	00021.00000
071	12	0	00028.34950	00028.34950
071	12	5	00028.34950	00028.34950
071	13	0	00043.09360	00043.09360
071	13	5	00043.09360	00043.09360
071	14	0	00105.83800	00105.83800
071	14	5	00105.83800	00105.83800
071	41	5	00310.50000	00310.50000
072	01	0	00453.59250	00453.59250
072	01	5	00453.59250	00453.59250
072	04	0	00001.00000	00001.00000
072	07	0	00043.09360	00043.09360
072	07	5	00043.09360	00043.09360
072	08	5	00021.00000	00021.00000
072	12	0	00028.34900	00028.34900
072	12	5	00028.34900	00028.34900
072	13	0	00043.09360	00043.09360
072	13	5	00043.09360	00043.09360
072	14	0	00105.83805	00105.83805
072	14	5	00105.83805	00105.83805
072	16	5	00001.99900	00001.99900
074	12	5	00028.34900	00028.34900
075	07	0	00043.09360	00043.09360
075	07	5	00043.09360	00043.09360
075	12	0	00028.34900	00028.34900
075	12	5	00028.34900	00028.34900
075	13	0	00043.09360	00043.09360
075	13	5	00043.09360	00043.09360
075	14	0	00105.85300	00105.85300
075	14	4	00105.85300	00105.85300
075	14	5	00105.85300	00105.85300
075	41	5	00215.46800	00215.46800
077	01	0	00453.59250	00453.59250
077	02	0	00028.34950	00028.34950
077	02	5	00028.34950	00028.34950
077	04	0	00001.00000	00001.00000
077	06	0	00000.10570	00000.10570
077	06	1	00000.10570	00000.10570
078	01	0	00453.59250	00453.59250
078	02	0	00028.34950	00028.34950
078	04	0	00001.00000	00001.00000
078	04	8	00001.00000	00001.00000
078	06	0	00000.57000	00000.57000
078	06	1	00000.57000	00000.57000
078	06	8	00000.57000	00000.57000
078	41	0	00057.00000	00057.00000
079	01	0	00453.59250	00453.59250
079	02	0	00028.34950	00028.34950
079	04	0	00001.00000	00001.00000
079	06	0	00000.33330	00000.33330
079	41	0	00453.59250	00453.59250
080	01	0	00453.59250	00453.59250
080	02	0	00028.34950	00028.34950
080	04	0	00001.00000	00001.00000
080	41	0	00453.59250	00453.59250
081	01	0	00453.59250	00453.59250
081	41	0	00453.59250	00453.59250
082	01	0	00453.59250	00453.59250
083	01	0	00453.59250	00453.59250
083	02	0	00028.34950	00028.34950
084	01	0	00453.59250	00453.59250
084	02	0	00028.34950	00028.34950
084	04	0	00001.00000	00001.00000
084	41	0	00453.59250	00453.59250
085	01	0	00453.59250	00453.59250
085	02	0	00028.34950	00028.34950
085	04	0	00001.00000	00001.00000
085	41	0	00453.59250	00453.59250
086	01	0	00453.59250	00453.59250
086	02	0	00028.34950	00028.34950
086	04	0	00001.00000	00001.00000
086	41	0	00453.59250	00453.59250
087	01	0	00453.59250	00453.59250
087	02	0	00028.34950	00028.34950
088	01	0	00453.59250	00453.59250
088	02	0	00028.34950	00028.34950
088	04	0	00001.00000	00001.00000
088	04	8	00001.00000	00001.00000
100	01	0	00302.39500	00453.59250
100	07	0	00100.00000	00150.00000
100	07	4	00100.00000	00150.00000
101	01	0	00302.39500	00453.59250
101	02	0	00001.88996	00028.34950
101	07	0	00100.00000	00150.00000
101	07	1	00100.00000	00150.00000
101	07	2	00100.00000	00150.00000
102	01	0	00151.18000	00453.59250
102	07	0	00060.00000	00180.00000
102	07	1	00060.00000	00180.00000
102	51	0	00300.00000	00900.00000
103	07	0	00017.35000	00023.13000
105	01	0	00344.73030	00453.59250
105	07	0	00190.00000	00250.00000
105	52	0	00950.00000	01250.00000
106	01	0	00388.87000	00453.59250
106	01	1	00388.87000	00453.59250
106	01	2	00388.87000	00453.59250
106	02	0	00024.30430	00028.34950
106	04	0	00000.85730	00001.00000
106	07	0	00120.00000	00140.00000
106	07	1	00120.00000	00140.00000
106	58	0	45358.25000	45359.25000
107	01	0	00366.04900	00453.59250
107	02	0	00022.87800	00028.34950
107	07	0	00460.00000	00570.00000
107	08	0	00120.00000	00135.00000
108	01	0	00376.48000	00453.59250
108	07	0	00170.00000	00190.00000
109	01	0	00318.10422	00453.59250
109	04	0	00000.70000	00001.00000
109	07	0	00250.00000	00450.00000
109	08	0	00250.00000	00450.00000
110	01	0	00328.74000	00453.59250
110	08	0	00080.00000	00100.00000
111	01	0	00331.20000	00453.59250
111	02	0	00020.69500	00028.34950
111	07	0	00100.00000	00150.00000
130	01	0	00227.27000	00227.27000
130	01	1	00227.27000	00227.27000
130	02	0	00014.20450	00014.20450
130	02	1	00014.20450	00014.20450
130	03	0	00499.99400	00499.99400
130	04	0	00000.49999	00000.49999
130	05	0	01000.00000	01000.00000
130	05	1	01000.00000	01000.00000
130	06	0	00001.00000	00001.00000
130	06	1	00001.00000	00001.00000
130	17	0	03785.60000	03785.60000
130	19	0	01000.00000	01000.00000
130	20	0	00500.00000	00500.00000
130	21	0	00354.00000	00354.00000
130	24	0	00750.00000	00750.00000
130	25	0	00375.00000	00375.00000

(1)	(2)	(3)	(4)	(5)
130	26	0	00375.00000	00375.00000
130	27	0	00750.00000	00750.00000
131	01	0	00227.27000	00227.27000
131	01	8	00227.27000	00227.27000
131	02	0	00014.20450	00014.20450
131	05	0	01000.00000	01000.00000
131	05	1	01000.00000	01000.00000
131	06	0	00001.00000	00001.00000
131	06	1	00001.00000	00001.00000
131	19	0	01000.00000	01000.00000
131	20	0	00500.00000	00500.00000
131	21	0	00354.00000	00354.00000
131	24	0	00750.00000	00750.00000
134	01	0	00453.59250	00453.59250
134	02	0	00028.34950	00028.34950
134	03	0	01000.00000	01000.00000
134	04	0	00001.00000	00001.00000
134	06	0	00000.52900	00000.52900
134	06	1	00000.52900	00000.52900
134	34	0	01800.00000	01800.00000
135	01	0	00453.59250	00453.59250
135	04	0	00001.00000	00001.00000
136	01	0	00453.59250	00453.59250
136	01	1	00453.59250	00453.59250
136	02	0	00028.34950	00028.34950
136	03	0	01000.00000	01000.00000
136	04	0	00001.00000	00001.00000
136	06	0	00000.52900	00000.52900
136	06	1	00000.52900	00000.52900
137	06	0	00000.52900	00000.52900
138	04	0	00000.49999	00000.49999
138	05	0	01000.00000	01000.00000
139	01	0	00453.59250	00453.59250
139	02	0	00028.34950	00028.34950
139	04	0	00001.00000	00001.00000
140	01	0	00453.59250	00453.59250
140	02	0	00028.34950	00028.34950
140	04	0	00001.00000	00001.00000
140	07	0	00453.59250	00453.59250
141	01	0	00453.59250	00453.59250
141	02	0	00028.34950	00028.34950
141	04	0	00001.00000	00001.00000
141	06	0	00000.52900	00000.52900
142	01	0	00453.59250	00453.59250
142	02	0	00028.34950	00028.34950
142	04	0	00001.00000	00001.00000
142	08	0	00023.13300	00023.13300
143	01	0	00453.59250	00453.59250
143	02	0	00028.34950	00028.34950
143	06	0	00000.52900	00000.52900
144	01	0	00453.59250	00453.59250
144	02	0	00028.34950	00028.34950
144	06	0	00000.52900	00000.52900
145	01	0	00453.59250	00453.59250
145	01	1	00453.59250	00453.59250
145	02	0	00028.34950	00028.34950
145	02	1	00028.34950	00028.34950
145	03	0	01000.00000	01000.00000
145	05	0	00529.00000	00529.00000
145	06	0	00000.52900	00000.52900
145	07	0	00453.59250	00453.59250
146	01	0	00453.59250	00453.59250
146	01	1	00453.59250	00453.59250
146	02	0	00028.34950	00028.34950
146	02	1	00028.34950	00028.34950
146	05	0	00529.00000	00529.00000
146	06	0	00000.52900	00000.52900
147	01	0	00453.59250	00453.59250
147	01	1	00453.59250	00453.59250
147	02	0	00028.34950	00028.34950
147	02	1	00028.34950	00028.34950
148	02	0	00028.34950	00028.34950
148	06	0	00000.52900	00000.52900
149	01	0	00453.59250	00453.59250
149	01	1	00453.59250	00453.59250
149	02	0	00028.34950	00028.34950
149	02	1	00028.34950	00028.34950
149	04	0	00001.00000	00001.00000
149	04	1	00001.00000	00001.00000
149	05	0	01120.00000	01120.00000
149	06	0	00001.12000	00001.12000
149	06	1	00001.12000	00001.12000
150	01	0	00453.59250	00453.59250
150	02	0	00028.34950	00028.34950
150	02	1	00028.34950	00028.34950
150	03	0	01000.00000	01000.00000
150	04	0	00001.00000	00001.00000
150	06	0	00001.16600	00001.16600
150	07	0	00113.39800	00113.39800
151	01	0	00453.59250	00453.59250
151	04	0	00001.00000	00001.00000
152	01	0	00453.59250	00453.59250
152	04	0	00001.00000	00001.00000
153	01	0	00453.59250	00453.59250
153	02	8	00028.34950	00028.34950
153	05	0	01000.00000	01000.00000
153	06	0	00001.00000	00001.00000
153	06	8	00001.00000	00001.00000
170	07	0	00001.00000	00001.00000
170	07	1	00001.00000	00001.00000
170	07	2	00001.00000	00001.00000
170	07	5	00001.00000	00001.00000
170	07	6	00001.00000	00001.00000
170	48	0	00012.00000	00012.00000
171	07	0	00001.00000	00001.00000
171	07	5	00001.00000	00001.00000
171	48	0	00012.00000	00012.00000
173	07	0	00001.00000	00001.00000
173	07	1	00001.00000	00001.00000
173	07	2	00001.00000	00001.00000
173	48	0	00012.00000	00012.00000
180	01	0	00290.29900	00453.59250
180	01	6	00290.29900	00453.59250
180	02	0	00018.14360	00028.34950
181	01	0	00453.59250	00453.59250
181	01	2	00453.59250	00453.59250
181	01	3	00453.59250	00453.59250
181	01	4	00453.59250	00453.59250
181	01	8	00453.59250	00453.59250
181	02	0	00028.34950	00028.34950
181	02	2	00028.34950	00028.34950
181	02	3	00028.34950	00028.34950
181	02	4	00028.34950	00028.34950
181	02	8	00028.34950	00028.34950
181	06	0	00000.94347	00000.94347
181	06	3	00000.94347	00000.94347
181	06	4	00000.94347	00000.94347
181	06	8	00000.94347	00000.94347
182	01	0	00278.27900	00453.59250
183	01	0	00290.29900	00453.59250
184	01	0	00358.33800	00453.59250
184	01	2	00358.33800	00453.59250
184	02	0	00022.40000	00028.34950
184	02	2	00022.40000	00028.34950
184	02	3	00022.40000	00028.34950
185	01	0	00453.59250	00453.59250
185	01	1	00453.59250	00453.59250
185	01	2	00453.59250	00453.59250
185	01	3	00453.59250	00453.59250
185	01	5	00453.59250	00453.59250
185	02	0	00028.34950	00028.34950
185	02	2	00028.34950	00028.34950
186	01	0	00453.59250	00453.59250
186	01	1	00453.59250	00453.59250
186	01	8	00453.59250	00453.59250
186	02	0	00028.34950	00028.34950
186	02	8	00028.34950	00028.34950
187	01	0	00358.33800	00453.59250
187	02	0	00022.39610	00028.34950
188	01	0	00385.55830	00453.59250
188	01	2	00385.55830	00453.59250
188	02	0	00024.09700	00028.34950
188	04	0	00000.85000	00001.00000
189	01	0	00340.19430	00453.59250
190	01	0	00408.23700	00453.59250
190	01	3	00408.23700	00453.59250
190	02	0	00025.51455	00028.34950
191	01	0	00453.59250	00453.59250
192	01	0	00453.59250	00453.59250
193	01	0	00453.59250	00453.59250
194	01	0	00204.11660	00453.59250
195	01	0	00453.59250	00453.59250

(1)	(2)	(3)	(4)	(5)
196	01	0	00303.90600	00453.59250
196	01	1	00303.90600	00453.59250
196	01	2	00303.90600	00453.59250
196	01	3	00303.90600	00453.59250
196	01	4	00303.90600	00453.59250
196	01	5	00303.90600	00453.59250
196	02	0	00016.98400	00028.34950
196	02	2	00016.98400	00028.34950
196	02	3	00016.98400	00028.34950
196	02	4	00016.98400	00028.34950
196	06	1	00000.53290	00000.88950
196	06	2	00000.53290	00000.88950
196	06	3	00000.53290	00000.88950
196	06	4	00000.53290	00000.88950
196	06	5	00000.53290	00000.88950
196	07	0	00759.76700	01133.98130
196	07	2	00759.76700	01133.98130
197	01	0	00362.87400	00453.59250
197	01	2	00362.87400	00453.59250
197	07	2	00157.92000	00188.00000
198	01	0	00304.18000	00453.59250
199	01	0	00391.22000	00453.59250
199	01	1	00391.22000	00453.59250
199	01	2	00391.22000	00453.59250
199	01	3	00391.22000	00453.59250
199	01	6	00391.22000	00453.59250
199	02	0	00024.45100	00028.34950
199	02	3	00024.45100	00028.34950
199	41	0	00391.22000	00453.59250
200	01	0	00303.90600	00453.59250
200	01	1	00303.90600	00453.59250
200	01	3	00303.90600	00453.59250
200	01	6	00303.90600	00453.59250
200	02	3	00018.99410	00028.34950
200	07	0	01063.67400	01587.57820
203	01	0	00391.22000	00453.59250
204	01	0	00245.00000	00453.59250
205	01	0	00453.59250	00453.59250
205	01	1	00453.59250	00453.59250
205	02	0	00028.34950	00028.34950
205	02	2	00028.34950	00028.34950
205	04	0	00001.00000	00001.00000
205	08	0	00045.35900	00045.35900
205	08	2	00045.35900	00045.35900
206	01	0	00453.59250	00453.59250
206	01	1	00453.59250	00453.59250
206	02	0	00028.34950	00028.34950
206	08	0	00037.79900	00037.79900
207	01	0	00453.59250	00453.59250
207	01	2	00453.59250	00453.59250
207	02	0	00028.34950	00028.34950
207	04	0	00001.00000	00001.00000
207	07	0	00100.79800	00100.79800
207	07	2	00100.79800	00100.79800
208	01	0	00453.59250	00453.59250
208	01	1	00453.59250	00453.59250
208	02	0	00028.34950	00028.34950
208	04	0	00001.00000	00001.00000
208	07	0	00030.23950	00030.23950
209	01	0	00453.59250	00453.59250
209	02	0	00028.34950	00028.34950
209	07	0	00010.53800	00010.53800
210	01	0	00453.59250	00453.59250
210	02	0	00028.34950	00028.34950
210	04	0	00001.00000	00001.00000
211	01	0	00453.59250	00453.59250
211	02	0	00028.34950	00028.34950
212	01	0	00453.59250	00453.59250
213	01	0	00367.40900	00453.59250
213	01	1	00367.40900	00453.59250
213	01	2	00367.40900	00453.59250
213	01	4	00367.40900	00453.59250
213	01	6	00367.40900	00453.59250
213	02	0	00022.96300	00028.34950
213	07	0	00300.00000	00580.00000
214	01	0	00453.59250	00453.59250
214	02	0	00028.34950	00028.34950
214	07	0	00175.00000	00175.00000
215	01	0	00340.19400	00453.59250
215	01	1	00340.19400	00453.59250
215	02	0	00021.26210	00028.34950
216	01	0	00226.79600	00453.59250
216	02	0	00014.17470	00028.34950
219	01	0	00453.59250	00453.59250
219	02	0	00028.34950	00028.34950
219	02	1	00028.34950	00028.34950
219	02	3	00028.34950	00028.34950
219	04	0	00001.00000	00001.00000
220	01	0	00362.87400	00453.59250
220	01	2	00362.87400	00453.59250
220	02	0	00022.67960	00028.34950
220	02	4	00022.67960	00028.34950
220	04	0	00000.80000	00001.00000
220	04	1	00000.80000	00001.00000
240	01	0	00453.59250	00453.59250
240	02	0	00028.34950	00028.34950
240	03	0	01000.00000	01000.00000
240	04	0	00001.00000	00001.00000
240	05	0	01166.00000	01166.00000
240	06	0	00001.16600	00001.16600
240	06	1	00001.16600	00001.16600
240	06	2	00001.16600	00001.16600
240	26	0	00437.25000	00437.25000
241	01	0	00453.59250	00453.59250
241	06	0	00001.16600	00001.16600
241	06	1	00001.16600	00001.16600
241	17	0	03785.60000	03785.60000
241	25	0	00375.00000	00375.00000
241	26	0	00375.00000	00375.00000
241	27	0	00874.50000	00874.50000
242	01	0	00453.59250	00453.59250
242	02	0	00028.34950	00028.34950
242	05	0	00951.90000	00951.90000
242	06	0	00000.95190	00000.95190
242	06	1	00000.95190	00000.95190
242	17	0	03603.51300	03603.51300
242	24	0	00750.00000	00750.00000
243	02	0	00028.34950	00028.34950
243	06	0	00000.95190	00000.95190
244	01	0	00453.59250	00453.59250
244	02	0	00028.34950	00028.34950
244	03	0	01000.00000	01000.00000
244	04	0	00001.00000	00001.00000
244	06	0	00001.16600	00001.16600
244	42	0	00453.59250	00453.59250
245	01	0	00453.59250	00453.59250
245	02	0	00028.34950	00028.34950
245	04	0	00001.00000	00001.00000
245	06	0	00000.93000	00000.93000
246	01	0	00453.59250	00453.59250
246	06	0	00001.16600	00001.16600
260	01	0	00453.59250	00453.59250
260	02	0	00028.34950	00028.34950
260	03	0	01000.00000	01000.00000
260	04	0	00001.00000	00001.00000
260	05	0	01088.60000	01088.60000
260	06	0	00001.08860	00001.08860
260	06	1	00001.08860	00001.08860
260	60	0	00453.59250	00453.59250
260	58	0	45358.25000	45359.25000
261	01	0	00453.59250	00453.59250
261	06	0	00001.08860	00001.08860
262	01	0	00453.59250	00453.59250
262	01	1	00453.59250	00453.59250
262	02	0	00028.34950	00028.34950
262	02	1	00028.34950	00028.34950
262	06	0	00000.72300	00000.72300
262	06	1	00000.72300	00000.72300
263	02	1	00018.42700	00018.42700
264	01	0	00453.59250	00453.59250
264	02	0	00028.34950	00028.34950
264	02	1	00028.34950	00028.34950
264	04	0	00001.00000	00001.00000
264	06	0	00001.43300	00001.43300
264	21	0	00507.28200	00507.28200
264	24	0	01074.75000	01074.75000
264	25	0	00537.37500	00537.37500
300	01	0	00359.74580	00453.59250
300	07	0	00230.00000	00290.00000
301	06	0	00000.33810	00000.33810
301	07	0	00396.76000	00763.00000

APPENDIX 5. SAMPLE ACTIVITIES FOR MALES AND FEMALES, GROUPED BY ACTIVITY LEVEL

Males: Activity Level		
Light	**Moderate**	**High**
Activities		
Lying	Strolling	Chopping firewood
Sitting	Fishing with spear	Laying floor (LDC)
Standing quietly	Light or moderate cleaning	Walking uphill
Cooking	Tying fence posts	Heavy recreational (jogging, athletics)
Fishing with line	Walking slowly or at normal pace	Putting coconuts in a bag
Fishing from canoe	Walking downhill, at any pace	Brick breaking
Playing cards	Weaving bamboo wall	Sharpening posts
Washing clothes	Roofing house	Planting trees
Making bows and arrows	Singing and dancing	Cutting palm tree trunks
Light recreational (billiards, golf, cricket)	Nailing	Splitting wood for posts
Office work	Hunting birds, flying fox, pigs	Sawing and power sawing
Driving bus, taxi, tractor	Walking with 10 kg load	Route marching (Army)
Flying helicopter	Moderate recreation (dancing, swimming, tennis)	Shoveling mud
Sewing	Shoemaking	Collecting coconuts (incl. climbing trees
Sorting crops, kneeling	Kneading clay	Cutting grass with machete
Laboratory work	Painting and decorating	Loading sacks
Weaving	Planting	Cutting trees
Carving	Milking cows by hand	Pushing wheelbarrow
Sorghum harvest - cutting ears	Making bricks, squatting	Repairing fences
Tailoring	Electrical industry	Digging holes for posts
Cleaning kit (Army)	Machine tool industry	Assault course (Army)
	Cutting bamboo	Laboring
	Joinery	Collecting and spreading manure by hand
	Drill (Army)	Pulling cart
	Bricklaying	Digging irrigation channels
	Paddling canoe	Digging earth to make mud
	Jungle patrol (Army)	Shoveling
	Uprooting timbers	Jungle march (Army)
	Carpentry	Mining
	Chemical industry	Earth cutting
	Feeding animals	Digging holes
	Making a fence	Husking coconuts
	Lifting grain sacks	Loading manure by hand
	Winnowing	Cutting sugar cane
		Forking
		Pedaling rickshaw
		Trimming branches of a tree
		Felling tree with ax
		Hand sawing

Females: Activity Level		
Light	**Moderate**	**High**
Activities		
Lying down Sitting quietly Roasting corn Ironing Preparing vegetables Sitting, sewing clothes Podding beans Sewing Sewing pandanus mat Weaving carrying bag Preparing rope Standing Peeling taro Washing dishes Cooking Squeezing coconut Collecting leaves for flavoring Breaking nuts e.g., peanuts Spinning cotton Preparing tobacco Picking coffee Winnowing Office work De-seeding cotton Electrical industry Beating cotton	Walking downhill Strolling Singing and dancing Loading earth oven Light cleaning Light weeding Sweeping house Walking slowly or at normal pace Washing clothes Sweeping yard Moderate cleaning Stirring porridge Grinding grain on millstone Catching fish by hand Machine tool industry Brewery work Chemical industry Harvesting grains Harvesting vegetables Harvesting root crops Harvesting medicinal crops Kneading clay Milking cows/goats by hand Making cheese Feeding animals Furnishing industry Laundry work Cutting fruit from trees Clearing ground Planting	Walking with load Fetching water from well Chopping wood Catching crabs Pounding grain Walking uphill (w/ or w/o load) Walking downhill (fast with load) Sawing Binding sheaves Digging holes for planting Hoeing Digging ground Threshing Cutting grass with machete Collecting fuel wood Road construction Digging irrigation ditches Digging holes Cutting sugar cane Husking coconuts Putting coconuts in a bag Harvesting tree crops Planting trees

APPENDIX 6. USING SPSS/PC TO CALCULATE HOUSEHOLD CALORIE INTAKE

To calculate household calorie intake and requirements, the data analyst(s) will need to make several adjustments to the data collected using data from the food-intake questionnaire described in the text. Dishes and many individual ingredients must be transformed into standard units, for which caloric equivalents can be assigned. The caloric value of leftover food must be calculated and deducted. The caloric requirements for the household must be calculated, based on several factors, and finally, a calculation of the adequecy of caloric intake can be made. Procedures and SPSS/PC programs for making these adjustments are presented and explained in detail below.

I. Calculating Adult Equivalent Ratio for Household Members

The adult equivalent ratio (AER) for each household member needs to be calculated and saved in a separate file, for use in processing the 24-hour recall data. The AER is based on the individual's caloric requirements, which are calculated based on age, sex, imputed weight, current activity level, and physiological status, as well as the caloric requirements of a standardized adult equivalent. Weight is labeled "imputed" because the interviewer does not actually weigh household members or ask the respondent to estimate weights. Instead, country specific averages are used (see section I.A. for further details).

I.A. Caloric Requirements of Adult Equivalents

The denominator of the AER is the daily caloric requirement of an adult equivalent. An adult equivalent can be defined by any combination of age, sex, and activity level. However, once defined, the adult equivalent must be considered standard and fixed for all cases in a study. Appendix 7 contains caloric requirements for suggested adult equivalents for FAO-member countries with populations greater than 300,000 (countries are listed in Appendix 6). The definition of an adult equivalent in the table is an adult male, 30-60 years old, of moderate activity, and average weight for the respective country.

I.B. Caloric Requirements for Each Household Member

The numerator of the AER is the daily caloric requirement of each household member currently residing in the household (code of '1' in Column 8 of the Household Composition Questionnaire, figure 2). The four steps outlined below should be followed to calculate individual caloric requirements for household members aged 10 years and over. While it is possible to calculate requirements for individual children under 10, the FAO/WHO Committee recommends using the standardized caloric requirements contained in Appendix 8, tables 1-4. These requirements were estimated based on observed intakes of healthy children growing normally. Figure 4 illustrates how AERs were calculated for a Kenyan household.

I.B.1. Estimate Household Member's Weight

Appendix 9 contains weight data for FAO member countries to be used as a best estimate of average weight in kilograms by age and sex. This is the "imputed weight."

I.B.2. Calculate Basal Metabolic Rate (BMR) Caloric Requirements

The imputed weight (W) for each age/sex is included in the following equations to estimate the basal metabolic rate (BMR) caloric, or energy, requirements of an individual while "at rest." This formula is applied to all household members ten years old and older. Younger children are assigned caloric requirements according to age and irrespective of weight. The appropriate tables are listed in Appendix 8.

Equations for Predicting BMR from Body Weight in kgs (W)

Age Range (in Years)	Equation for Calories per Day
Male	
10-17+	(17.5 x W) + 651
18-29+	(15.3 x W) + 679
30-59+	(11.6 x W) + 879
60+	(13.5 x W) + 487
Female	
10-17+	(12.2 x W) + 746
18-29+	(14.7 x W) + 496
30-59+	(8.7 x W) + 829
60+	(10.5 x W) + 596

Source: WHO, 1985, *Energy and Protein Requirements: Report of a Joint FAO/WHO/UNU Expert Consultation*, World Health Organization: Geneva, 71.

I.B.3. Allow for Activity Level

Individual BMR requirements are multiplied by a factor to reflect his or her activity level. Although BMR multipliers represent broad averages, they serve to increase total caloric requirements to reflect relative rates of energy use. More detailed and precise BMR multipliers can be calculated if more detailed information of time allocation is collected for each household member, but this level of detail is not necessary, given the relative level of precision of the caloric adequacy indicator.

BMR Multipliers for Current Activity Level

Gender	Activity Level		
	Light	***Moderate***	***Heavy***
Male	1.55	1.78	2.10
Female	1.56	1.64	1.82

Source: WHO, 1985, *Energy and Protein Requirements: Report of a Joint FAO/WHO/UNU Expert Consultation*, World Health Organization: Geneva, p. 78.

I.B.4. Additional Requirements During Pregnancy and Lactation

Pregnancy and lactation increase a woman's caloric requirements. If a household member is pregnant, 285 calories should be added to her daily caloric requirement. Add 700 calories a day if she is breastfeeding a child under 6 months of age, and 500 calories a day if the breastfed child is six months or older. Combine the additional requirements if the woman is both pregnant and breastfeeding.

I.C. Calculating Adult Equivalent Ratios for Each Household Member

The AER is the daily caloric requirement of each household member divided by the caloric requirements of the adult equivalent for the country of interest. Thus each household member's AER represents the proportion of the adult equivalent caloric requirements required by the household member. See Figure 4 for an example of an AER calculation.

I.D. Creating an Adult Equivalent Data File

The following example presents a partial set of SPSS/PC commands used to assign AER values to household members in a Honduran data set. The commands assign AER for adult males and non-pregnant, non-lactating females. Similar commands can be created for all possible groupings of age/sex/physiological status/activity level for which there are separate AER calculations.

```
If (AGE ge 18 and AGE lt 30) and SEX = 1 and STAT = 1 and ACT = 1)AER = 1.374.
If (AGE ge 18 and AGE lt 30) and SEX = 1 and STAT = 1 and ACT = 2)AER = 1.164.
If (AGE ge 18 and AGE lt 30) and SEX = 1 and STAT = 1 and ACT = 3)AER = 1.014.
If (AGE ge 18 and AGE lt 30) and SEX = 2 and STAT = 1 and ACT = 1)AER = .951.
If (AGE ge 18 and AGE lt 30) and SEX = 2 and STAT = 1 and ACT = 2)AER = .857
If (AGE ge 18 and AGE lt 30) and SEX = 2 and STAT = 1 and ACT = 3)AER = .815
```

Key:

AGE	Age in years
SEX	Gender 1 = Male 2 = Female
STAT	Physiological status 1. Not pregnant nor lactating 2. Pregnant 3. Breastfeeding child < 6 mo. 4. Breastfeeding child >= 6 mo. 5. Pregnant and breastfeeding child < 6 mo. 6. Pregnant and breastfeeding child >= 6 mo.
ACT	Activity level 1 = High 2 = Moderate 3 = Light

Once the AER has been calculated for each household member, an adult equivalent data file (ADEQUIV.SYS) should be created for use during processing of the dietary intake data. The ADEQUIV.SYS will contain one line per household, with the AER of all household members listed as separate variables. To create this file, the household composition file (HHCOMP.SYS) needs to be transposed.

For example:

HHCOMP.SYS

HHID	MEMID	SEX	AGE	STAT	ACT	AER
1	1	1	45	1	2	1
1	2	2	41	4	2	1.071
1	3	2	12	1	3	0.799
2	1	2	39	1	1	0.962
2	2	1	18	1	1	1.355
2	3	2	15	2	2	0.963
2	4	2	9	1	3	0.737
3	1	2	82	1	3	0.736
4	1	1	27	1	2	1.164
4	2	2	24	2	2	0.973

HHID = Household ID
MEMID = Member ID

```
If (MEMID = 1) AECAL1 = AER.
If (MEMID = 2) AECAL2 = AER.
If (MEMID = 3) AECAL3 = AER.
If (MEMID = 4) AECAL4 = AER.
If (MEMID = 5) AECAL5 = AER.
```

*** The number of "if statements" should equal the maximum number of household members in the data set. In the example from Honduras, there were 24.*

The result of the above set of commands is: HHCOMP.SYS

HHID	MEMID	SEX	AGE	STAT	ACT	AER	AECAL1	AECAL2	AECAL3	AECAL4	AECAL5
1	1	1	45	1	2	1	1	.	.	.	.
1	2	2	41	4	2	1.071	.	1.071	.	.	.
1	3	2	12	1	3	0.799	.	.	0.799	.	.
2	1	2	39	1	1	0.962	0.962	.	.	.	.
2	2	1	18	1	1	1.355	.	1.355	.	.	.
2	3	2	15	2	2	0.963	.	.	0.963	.	.
2	4	2	9	1	3	0.737	.	.	.	0.737	.
3	1	2	82	1	3	0.736	0.736	.	.	.	.
4	1	1	27	1	2	1.164	1.164	.	.	.	.
4	2	2	24	2	2	0.973	.	0.973	.	.	.

The next step is to reduce HHCOMP.SYS from one line per household member to one line per household. The SPSS/PC AGGREGATE command is used, with "household" as the break variable.

Figure 4. Sample AER calculation (Kenya)

Member ID	Name	Sex	Age		Physiological status (14 - 60 yrs only)	Activity level
			Number	Unit		
1		1	45	1		1
2		2	42	1	6	2
		1. Male 2. Female		1. Years 2. Months (children < 1 year only)	1. Not pregnant nor lactating 2. Pregnant 3. Breastfeeding (child < 6 mos.) 4. Breastfeeding (child >= 6 mo.) 5. Pregnant and breastfeeding (child < 6 mo.) 6. Pregnant and breastfeeding (child >= 6 mo.)	1. High 2. Medium 3. Light

Sample Adult Equivalent Ratio Calculation

Member ID	Weight (Appendix 9)	BMR calculation	BMR cal/day requirement	Activity level multiplier	BMR requirement adjusted for activity level	Pregnancy/ lactation requirement cals/day	Total caloric requirement Cals/day	Adult equivalent caloric requirement	Member Adult Equivalent Ratio (AER) for calories
1	59.1	(11.6 x 59.1) + 879	1565	2.10	3286	0	3286	2840	1.16
2	52.8	(8.7 x 52.8) + 829	1288	1.64	2113	285+500	2328	2840	.82

aggregate file 'ADEQUIV.SYS' / break HHID / AECAL1 = sum(AECAL1)
/ AECAL2 = sum(AECAL2) / AECAL3 = sum(AECAL3)
/ AECAL4 = sum(AECAL4) / AECAL5 = sum(AECAL5) ...etc...
**There will be as many variable creation subcommands as the maximum number of household members in the data set.*
**The result of the above set of commands: ADEQUIV.SYS.*

HHID	AECAL1	AECAL2	AECAL3	AECAL4	AECAL5
1	1	1.071	0.799	.	.
2	0.962	1.355	0.963	0.737	.
3	0.736	.	.	.	.
4	1.164	0.973	.	.	.

II. Calculating Household Food Intake

This section details the data-processing steps necessary to convert raw food intake data into a summary variable of calories consumed per adult equivalent for each household. Examples of SPSS/PC command language for each step are included.

II.A. Dietary File

Once food intake data has been collected and entered, the data file should look like the one shown below. In this file, henceforth referred to as the "Dietary File," each row represents either an ingredient that the household used for preparing a dish, or the dish itself. Therefore, the number of rows (lines of data) in the file will equal the number of dishes prepared, plus the number of ingredients in each dish that the household prepared the previous day. Thus if a household used sugar in three dishes, sugar should appear three times in the data for that household.

Sample Dietary File

Line #	HHID 1	Meal 2	Abst1 .. AbstN* 3	18M 4	18F 5	AdM/F # 6	Chl4/11# 7	Dnum 8	Dish 9	Ingr 10	Quan 11	Unit 12	Lquan 13	Lunit 14	Src 15
1	21	1	1	0	0	0	0	1	1003	1003	35	19	4	19	1
2	21	1	1	0	0	0	0	1	1003	1001	1300	6	0	0	2
3	21	1	1	1	0	0	0	2	1403	1403	900	6	0	0	0
4	21	1	1	1	0	0	0	2	1403	403	.00	0	0	0	1
5	21	1	1	1	0	0	0	2	1403	260	110	6	0	0	1
6	21	2	0	0	0	0	0	1	2170	2170	5	7	0	0	0
7	21	2	0	0	0	0	0	1	2170	170	5	7	0	0	12
8	21	2	0	0	0	0	0	1	2170	240	70	6	0	0	1

* The number of Absent Member variables (Abst1...AbstN) will equal the maximum number of household members in
the data set.
There will be separate variables for Male and Female adolescent guests; and for 0-4 and 5-11 year old categories.
Note: the number of columns had to be limited in the interest of space and clarity of presentation.

Where the variable labels are:

Variables	**Labels**
HHID	Household ID
MEAL	Number of eating occasions
ABS1, ABS2 ...ABSN	Member1 absent from meal, Member2 absent from meal, ... MemberN absent from meal
18M	Number of male guests 18 and over
18F	Number of female guests 18 and over
ADM	Number of adolescent male guests
ADF	Number of adolescent female guests
CHL11	Number of child guests 5-11 yrs
CHL4	Number of child guests 0-4 yrs

DNUM	Dish number for this eating occasion
DISH	Dish code
INGR	Ingredient code (include form of ingredient)
QUAN	Quantity prepared
UNIT	Unit of quantity prepared
LQUAN	Left over quantity
LUNIT	Unit of left over quantity
SRC	Source

In the dietary file, the lines in which the dish and the ingredient have the same code are referred to as "dish" lines. Line numbers 1, 3, and 6 in the dietary file shown are dish lines. A dish line is followed by one or more ingredient lines, depending on the number of ingredients used in the preparation of a dish. In the example, line 2 in the dietary file is an ingredient line; in this line the ingredient and the dish have different codes. A dish line separates one dish from the next. For example, line 3 separates dish 1003 from dish 1403.

The first step in preparing the data for analysis is to label the dish and ingredient lines by putting a flag on each line, since calories will be computed only for the ingredient lines. The flags also help to identify dishes that do not have ingredients listed after them and dishes without recipes. The following SPSS/PC commands are used to separate the dish and ingredient lines:

```
Do if (DISH = INGR)
Compute LINETYP = 1                    *(dish line)
Else
Compute LINETYP = 2                    *(ingredient line.
End if
Variable labels LINETYP 'dish or ingredient'
Value labels LINETYP 1 'dish' 2 'ingredient'
```

As a result of the above command, each line of data in the file will have a variable LINETYP, which will be either 1 or 2, depending upon whether it is a dish or an ingredient line (see Appendix 10).

The next step is to ensure that the data are sorted by HHID, MEAL, DNUM, and LINETYP, so that the data are in the correct order; meals are ordered by the number of eating occasion or hour; dishes at each meal are ordered by dish number; and the ingredients in each dish follow the dish line to which they belong.

```
sort HHID MEAL DNUM LINETYP
```

II.B. Convert Ingredient Quantity to a Standard Weight

At the time of data collection, the ingredients used to prepare food may have been measured using a number of different units (milliliters, pounds, units, etc.). These measures have to be converted into a uniform standard weight (grams in this example) before nutritional values can be calculated. In the dish/ingredient coding system used, the ingredient (INGR) variable, includes codes for type (e.g., corn) and form (e.g., boiled) of the ingredient. Ingredients are coded using a four-digit code in which the first digit corresponds to the *form*, and the last three digits to the *type* of ingredient (referred to as PRODUCT). In order to assign a standard weight to the quantity of a specific type of ingredient used in a certain form, two new variables are created from the INGR variable, so that the type and form for each ingredient can be easily distinguished. The following SPSS/PC commands are used to separate the FORM from the PRODUCT in an ingredient code.

```
Compute PRODUCT  = INGR - 1000 * trunc(INGR/1000)
Compute FORM = trunc((INGR-PRODUCT)/1000)
```

The dietary file (Appendix 11) now has information on the type of ingredient, its form, the unit of measure, and the quantity of that unit prepared in the household. To convert the quantities of ingredients measured in different units into a common unit (such as grams), a standard weight conversion file is used. This file contains information on the equivalent weight (WGTFACT) in raw edible product of one unit of measure for each form of the products in the data file. The sample file below has weight in grams of the raw product (WGTFACT), for dry corn kernels (PRODUCT = 1) in three forms: raw, cooked and ground (FORM = 0 or 1 or 8), measured in two units, pounds or milliliters (UNIT = 1 or 6). Note that WGTFACT for cooked ingredients (e.g., 1 milliliter of cooked corn (line 3) calculates the weight of the equivalent in raw product, not the weight per milliliter of cooked product. WGTFACT is in essence carrying out 2 conversions: it converts the volume of a cooked (or ground etc.) product to its equivalent volume of raw product, and then converts that raw volume to weight. This facilitates subsequent calculation of the total amount consumed of each product.

Sample Standard Weights File

Line #	PRODUCT	FORM	UNIT	WGTFACT
1	1	0	1	453.59
2	1	0	6	0.91
3	1	1	6	0.60
4	1	8	1	480.81
5	1	8	6	0.57

The weight conversion file (INGRDWGT.SYS) is matched with the dietary file (DIETARY.SYS) by PRODUCT, FORM and UNIT to insert the appropriate weight conversion factor (WGTFACT) in each ingredient line. The total weight (WGT) of the PRODUCT used is then calculated by multiplying the quantity (QUAN) of PRODUCT by WGTFACT. Appendix 12 shows a dietary file after these steps have been taken.

```
Join match file 'DIETARY.SYS' /table 'INGRDWGT.SYS'/by PRODUCT FORM UNIT.
Compute WGT = QUAN * WGTFACT.
```

II.C. Obtaining Recipes for Dishes with No Recipes

The interviewer will not obtain recipes for dishes consumed by the households when the food was a leftover, a gift, or purchased outside the home for consumption in the home. Dishes with no recipe need to be identified before proceeding further with the analysis. The following SPSS/PC commands can be used to identify dishes that are not followed by any ingredient lines, which are those without recipes (see Appendix 13).

```
Create LINETY_N = lead (LINETYP,1)          * Create a variable LINETY_N
                                              whose value is equal to the value of
                                              the LINETYP variable in the next
                                              case.
Variable label LINETY_N 'value of linetyp for next case'
Compute NORECIPE = 0
If (LINETY_N  = 1 and LINETYP = 1) NORECIPE = 1   * If the case with
                                                    LINETYP= 1 (dish line) is
```

followed by another dish line (LINETY_N = 1), it should be marked as a case where dish has no recipe.

Value label NORECIPE 0 'dish has recipe' 1 'dish has no recipe'

Dishes that would not normally have ingredients must be excluded from the list of dishes with no recipes. For example, a ripe banana or a slice of cheese would be "dishes" with no ingredients. This can be done by listing the codes of DISH for all dishes with no recipe, and then manually selecting out those would not be expected to have a recipe. For these codes, the nutritional value for the dish line itself will be computed. LINETYP for these dishes should be recoded to 2, to flag these "dish-same-as-ingredient" lines. For example, a ripe banana would have a DISH code of 0100. To recode LINETYP:

If (DISH=0100)LINETYP=3

Average recipes need to be calculated for dishes that have no recipe in the data, so that nutritional values can be computed. Recipes are imputed either from the household itself or from the next level of sampling, such as the cluster. Average recipes from the cluster or domain level can be used when household recipes are not available. The program used for imputing the recipes, provided in Appendix 14, is complex and lengthy. It requires that the different units in which the foods are measured be converted into standard weights.

II.D. Accounting for Leftovers

At the time of data collection, information was obtained on the quantities left over from each dish (LQUAN). In order to be able to subtract the leftover quantities from the total amount of dish prepared, it is important for the interviewer to ensure that the leftovers are measured in the same units as the dish itself. The fraction of dish left over is computed, and deducted from 1 to get the fraction of dish consumed by the household.

```
Compute LFRAC = LQUAN/QUAN                    *Compute fraction left over
Compute CFRAC = 1-LFRAC                       *Compute fraction consumed
Variable label   LFRAC 'fraction left over'/
                 CFRAC 'fraction consumed'
```

Since information on leftover quantities and, therefore, fraction consumed (CFRAC), is available only on the dish line, it next has to be copied onto each of the INGR lines for that dish.

```
If (linetyp = 2) CFRAC = lag (CFRAC)          * If the line is an ingredient line
                                              (LINETY = 2), set fraction
                                              consumed, CFRAC to be the same
                                              as CFRAC for the previous case
```

The fraction of the dish consumed is then multiplied with the WGT of PRODUCT used in the DISH to come up with the net amount (WGT1) of PRODUCT (see Appendix 15).

```
Compute WGT1=WGT * CFRAC
Variable label WGT1 'net grams of ingredient'
```

This step should be taken after the recipes for dishes with no recipes have been imputed (see Appendix 14).

II.E. Computing Number of Adult Equivalents That Ate Each Dish

The dietary file contains information on the ID of household resident members who were not present at the meal, as well as on guests who ate a particular dish. An adult equivalent has been computed for each member, based on age, gender, physiological status, and activity level (see section I.). This information is in the ADEQUIV.SYS file, which contains the household ID code and adult equivalent values for each of the household members in the data. That file presents the data in the form shown Appendix 16. The adult equivalent file is then matched with the dietary file, to include the adult equivalent information for each member of the household in the dietary file. The sum of the adult equivalents for all members of the household gives us the total adult equivalent number for the household.

```
Compute TOTADEQ = sum (AECAL1, AECAL2....)
Variable label 'total number of adult equivalents in a household'
```

The next step is to calculate the number of adult equivalents who ate each dish. The dietary file contains information on the ID of household members who did *not* eat a meal. The adult equivalent values for these members are summed to get the total value of adult equivalents not eating a meal.

For example, let AECAL1, AECAL2... be the adult equivalent values for household member IDs 1,2.... and ABAECA1, ABAECA2.... be the adult equivalent values for the household members (IDs 1,2...) *absent* from a meal. The adult equivalent value for each member is available from the adult equivalent file, which was matched with the dietary file in the previous step. Next, if a member was absent from a meal, the value for absent adult equivalent is set to be equal to the adult equivalent value for that member.

```
If (ABST1 = 1) ABAECA1 = AECAL1      * Find the adult equivalent values
If (ABST2 = 1) ABAECA2 = AECAL2       for IDs 1 and 2 (and all possible IDs). Note:
                                     the absent adult equivalent is calculated only if
                                     the member was not present at a meal and did
                                     not take food for that particular meal from the
                                     household to consume outside the household.

Compute TABSADEQ = sum (ABAECA1, ABAECA2 .....)   * summing to get total
                                                      hh adult equivalents absent
Variable label TABSADEQ 'total number of adult equivalent absent from a meal'
```

Next, calculate adult equivalents for guests. Weighted average adult equivalent ratios are calculated for each guest age/sex category, based on population distribution by age and sex in the country. (See Appendix 18 for population distributions by age and sex and Appendix 19 for a sample calculation of weighted adult equivalent values for each guest category for Honduras). The weighted AERs for guests are multiplied by the number of guests in each category, then summed to get total guest adult equivalents who have *eaten that dish* (TGSTADEQ).

```
If (18M ge 1) GSTCAL1 = (18M * .970)          *Using Honduras weighted average
If (18F ge 1) GSTCAL2 = (18F * .728)          guest AERs from Appendix 19
If (ADM ge 1) GSTCAL3 = (ADM * .872)          example
If (ADF ge 1) GSTCAL4 = (ADF * .743)
If (CHL11 ge 1) GSTCAL5 = (CHL11 * .642)
If (CHL4 ge 1) GSTCAL6 = (CHL4 * .445)
Compute TGSTADEQ = sum (GSTCAL1, GSTCAL2,     *Sum of total guest adult
GSTCAL3, GSTCAL4, GSTCAL5, GSTCAL6).              equivalents eating a meal
```

The number of adult equivalents who have eaten a dish (DSHADEQ) can then be calculated by subtracting adult equivalents absent from a meal (TABSADEQ) from total household adult equivalents (TOTADEQ), and then adding guest adult equivalents (TGSTADEQ) to the result.

```
Compute DSHADEQ = TOTADEQ + TGSTADEQ - TGSTADEQ
```

The data file at this stage will look like the one shown in Appendix 19.

II.F. Calculating Nutritional Content

Nutritional values can be calculated once all of the measured ingredients in the data have been assigned net weight consumed. Nutritional values of foods can be obtained from local or international sources.[12] It is important to keep track of different sources of nutritional values used, as there tend to be large differences in reported values. Nutritional values are computed only for the ingredient lines, except in the cases of dishes that do not normally have recipes, such as ripe bananas and cheese. Nutritional value data can be prepared in several ways. It can either be in the form of a data file that can be matched with the dietary file, or it can be written in the form of command language, as shown in Appendix 20. Either way, once a conversion factor for nutrients (CALCON) is added to each line of data, the ingredient lines (LINETYP = 2) are selected, and the nutritional value calculated.

```
If (LINETYP = 2) CAL = CALCON * WGT1     *If data line is for an ingredient, calculate
                                          calories
```

Dishes that do not normally have recipes need to be selected, and the nutritional value for the dish lines (LINETYP = 1) must be calculated.

```
If (PRODUCT = 100 and LINETYP = 1 and NORECIPE = 1)  CAL = WGT1 * CALCON
```

The data (see Appendix 21) are then aggregated to calculate the total amount of calories per dish consumed at the household level (DSHCAL).

```
Aggregate outfile = *
/break = HHID DAY MEAL DISH
/DSHCAL = sum (CAL)
/DSHADEQ = first (DSHADEQ)
```

This aggregated file now has dishes as a case; that is, one line of data will represent a single dish consumed by the household (see Appendix 22). Using this aggregated file, DSHCAL is divided by DSHADEQ to compute calories per adult equivalent obtained from each dish (DSHCALAE).

```
Compute DSHCALAE = DSHCAL/DSHADEQ
```

II.G. Calculating Household Calorie Consumption

At this stage information is available on the number of calories per adult equivalent obtained from each dish that the household consumed. The next step is to aggregate the calories obtained from different dishes consumed, and calculate the total number of calories per adult equivalent obtained during the 24-hour recall period (DAYCALAE).

[12]A comprehensive list of food composition tables for most regions can be obtained from the International Network of Food Systems (INFOODS) at http://www.crop.cri.nz/foodinfo/infoods /infoods.htm, or via email to infoods@crop.cri.nz.

```
Aggregate outfile = *
 /break = HHID
 /DAYCALAE = sum (DSHCALAE)
```

A row in the resulting file contains the sum of calories per adult equivalent for the day of recall for each household (se Appendix 23).

II.H. Average Daily Caloric Contribution from Breast Milk

Using the breastfeeding status of women, an estimation of the nutritional contribution from breast milk in the diets of children should be added to the daily calories at this stage, because the amount of breast milk consumed is usually estimated on a daily basis. Since surveys of this nature only collect information on whether a woman is breastfeeding a child, the analysis is usually limited to computing average calories obtained from breast milk for different age groups. The average amount of milk produced and the average nutritional value of milk for different age groups can be obtained from literature for a similar ethnic, cultural, and socioeconomic population.

In this example from Honduras, the data included children up to four years of age who were reported to be breast-fed. It was decided that the contribution from breast milk would be computed for children who were 18 months or younger, since that was the reported average duration of breastfeeding among children in Honduras. Although children over this age may have been receiving some caloric contribution from breast milk, it is more likely that after 18 months the actual intake of breast milk for most children was limited, thus diminishing its nutritional contribution for these older children. The values noted below were used to estimate the average number of calories derived from breast milk, based on average amounts secreted and average nutritional value of breast milk for different age groups. These values, derived from a low-income, rural Guatemalan sample, were obtained from a joint World Health Organization/Food and Agriculture Organization report on breastfeeding.[13]

Households with a breastfeeding woman are identified using information from the household composition file. The nutritional contribution of breast milk should be computed for the youngest child. Variables needed for computing the caloric contribution of breast milk to the household calories include household id (HHID), youngest child's age in years (AGE), and adult equivalent value for the youngest child (ADLTEQ).

```
If (AGE le .0833) BMCAL = 305
If (AGE gt .0833 and AGE lt .25) BMCAL = 344
If (AGE = .25) BMCAL = 384
If (AGE gt .25 and AGE lt .5) BMCAL = 389
If (AGE = .5) BMCAL = 337
If (AGE gt .5 and AGE lt .75) BMCAL = 341
If (AGE = .75) BMCAL = 344
If (AGE gt .75 and AGE lt 1.25) BMCAL = 341
If (AGE = 1.25)BMCAL = 339
If (AGE gt 1.25 and AGE lt 1.5) BMCAL = 332
If (AGE = 1.5) BMCAL = 325
```

[13] WHO. *The quantity and quality of breast milk, report on the WHO collaborative study on Breast Feeding.* Geneva, Switzerland: World Health Organization, 1985.

The BMCAL (calories from breastmilk**)** variable is divided by the adult equivalent for the breastfeeding child, to get the BMCALAE variable. From the above file, save HHID and BMCALAE to a file and match them with the dietary file. In the dietary file, add the new variable BMCALAE to DAYCALAE to get the total calories per adult equivalent (including breast milk) DAYCALA1 consumed by the household.

III. Calculate Percentage of Caloric Adequacy

Once the average number of calories consumed per adult equivalent by each household in the sample has been computed, it is compared to the calorie requirement of an adult equivalent to calculate the level of caloric adequacy. The daily calorie requirements for an adult equivalent for different countries are presented in Appendix 7. When the level of calorie requirement for an adult equivalent has been established (for example, 2858 for Honduras), the average calories consumed per adult equivalent (AVECALAE) is divided by the number of calories required, to compute the level of caloric adequacy. In the Honduran example, the level of caloric adequacy (CALADEQ) of a household will be computed as:

```
Compute CALADEQ = (AVECALAE / 2858) *100
Variable label CALADEQ '% calorie adequacy'
```

The final step is to determine the percent of households that are at or above 100 percent of caloric requirements.

```
If (CALADEQ ge 100)REQSMET = 100
If (CALADEQ lt 100)REQSMET = 0
Variable label REQSMET 'Household meets caloric requirements'
Value labels REQSMET 100 'yes' 0 'no'
```

For convenience, the code "100," rather than "1," is assigned to households meeting caloric requirements, so that the average of the REQSMET variable over a group of interest will directly indicate the percent of households meeting caloric requirements.[14]

For purposes of analysis it is often useful to categorize households into various levels of caloric adequacy (Appendix 24).

```
If (CALADEQ le 60)CALCAT = 1
If (CALADEQ gt 60 and CALADEQ le 80) CALCAT = 2.
If (CALADEQ gt 80 and CALADEQ le 100) CALCAT = 3
If (CALADEQ gt 100 and CALADEQ le 120) CALCAT = 4
If (CALADEQ gt 120) CALCAT = 5
Variable label CALCAT 'calorie adequacy category'
Value label CALCAT 1 '<= 60%' 2 '60 - 80%' 3 '80-100%' 4 '100 - 120%'
  5 '>120%'
```

[14] If a code of 1 were used, the average of REQSMET would give the proportion rather than the percent of households.

APPENDIX 7. ROW NUMBERS FOR FAO MEMBER COUNTRIES

Country	Row #	Country	Row #	Country	Row #
Africa		**Latin America/Caribbean**		**Near East**	
Algeria	55	*Argentina	36	Afghanistan	15
Angola	3	Barbados	45	Bahrain	52
Benin	3	*Bolivia	37	*Egypt	51
Botswana	3	*Brazil	38	Iran	52
Burkina Faso	4	*Chile	39	Iraq	52
#Burundi	1	*Colombia	40	*Jordan	52
Cameroon	6	*Costa Rica	41	Kuwait	51
Cape Verde	4	*Cuba	42	*Lebanon	53
C.A.R.	6	Dominican Republic	42	Libya	51
Chad	8	Ecuador	39	Oman	54
Comoros	11	El Salvador	43	Qatar	54
Congo	6	*Guatemala	43	Saudi Arabia	51
*Côte d'Ivoire	3	#Guyana	20	Syria	53
Equatorial Guinea	8	*Haiti	44	U.A.E.	54
*Ethiopia	2	Honduras	43	Yemen, Arab Rep.	54
Gabon	3	*Jamaica	45	Yemen, P.D.R.	54
Gambia	4	*Mexico	46		
Ghana	3	Nicaragua	43	**South Pacific**	
Guinea	3	*Panama	47	#Fiji	59
Guinea-Bissau	3	Paraguay	36	*Papua New Guinea	61
Kenya	11	Peru	39		
Lesotho	11	Surinam	48		
*Liberia	4	#Trinidad and Tobago	48		
Madagascar	6	*Uruguay	49		
Malawi	11	*Venezuela	50		
Mali	8				
Mauritania	8	**Asia**			
#Mauritius	5	*Bangladesh	12		
Morocco	54	Bhutan	14		
*Mozambique	6	Cambodia	18		
Namibia	11	*China	14		
Niger	8	*India	15		
Nigeria	4	*Indonesia	16		
#Rwanda	7	*Japan	17		
*Senegal	8	Laos	18		
Sierra Leone	4	*North Korea	18		
*Somalia	9	#Malaysia	19		
*Sudan	10	Mongolia	14		
Swaziland	11	*Myanmar	13		
*Tanzania	11	Nepal	14		
Togo	3	Pakistan	15		
*Tunisia	54	*Philippines	21		
Uganda	11	Sri Lanka	15		
Zaire	6	South Korea	18		
Zambia	3	*Thailand	22		
Zimbabwe	3	Vietnam	22		

* Original data # Combined data from more than one study

APPENDIX 8. DAILY CALORIE REQUIREMENT FOR AN ADULT EQUIVALENT

An adult equivalent is defined as an adult male, 30-to-60 years old, of average weight and height for the country, with moderate activity level. For country-specific adult equivalent requirements, refer to Appendix 6 and identify the relevant Row number for this Appendix 7 table, where the relevant adult equivalent figures will be found.

Row number	Weight (kg) adult equivalent	Height (mt) adult equivalent	Daily calorie requirement for an adult equivalent	Row number	Weight (kg) adult equivalent	Height (mt) adult equivalent	Daily calorie requirement for an adult equivalent
1	57.5	1.67	2810	32	72.5	1.78	3062
2	55.6	1.66	2773	33	71.4	1.74	3087
3	64.6	1.71	2953	34	72.5	1.78	3109
4	58.2	1.71	2824	35	72.8	1.74	3117
5	60.2	1.69	2862	36	69.2	1.73	3044
6	62.9	1.73	2917	37	57.7	1.66	2813
7	57.4	1.67	2807	38	59.1	1.68	2842
8	60.5	1.70	2868	39	58.2	1.71	2822
9	56.5	1.73	2789	40	57.5	1.66	2809
10	58.2	1.68	2823	41	60.7	1.71	2874
11	59.1	1.68	2840	42	61.1	1.71	2881
12	53.1	1.65	2721	43	60.0	1.66	2858
13	53.9	1.65	2738	44	62.6	1.73	2910
14	55.4	1.70	2767	45	66.9	1.74	2996
15	51.1	1.64	2679	46	61.1	1.71	2881
16	55.7	1.68	2773	47	63.0	1.66	2918
17	62.5	1.68	2909	48	62.5	1.70	2909
18	58.0	1.68	2818	49	67.5	1.71	3009
19	55.6	1.69	2771	50	57.5	1.66	2808
20	62.1	1.70	2900	51	61.7	1.71	2893
21	53.9	1.65	2737	52	57.5	1.66	2809
22	58.8	1.68	2834	53	67.2	1.71	3002
23	78.5	1.78	3233	54	61.4	1.68	2887
24	69.2	1.73	3045	55	72.1	1.75	3105
25	71.2	1.76	3087	56	72.9	1.74	3119
26	76.3	1.78	3188	57	78.1	1.80	3225
27	75.0	1.76	3161	58	70.0	1.74	3063
28	71.2	1.76	3086	59	68.1	1.72	3024
29	71.2	1.76	3083	60	69.3	1.74	3048
30	61.9	1.68	2899	61	59.2	1.64	2845
31	77.2	1.79	3157	62	70.4	1.75	3068

APPENDIX 9. CALORIE REQUIREMENTS FOR CHILDREN UNDER 10 YEARS OF AGE, BY SEX

Table 1. Children Under 6 Months of Age

Age (months)	Calorie Requirement (per kg per day)	Calorie requirement per day*	
		Male	Female
< 1	124	470	445
1 < 2	116	550	505
2 < 3	109	610	545
3 < 4	103	655	590
4 < 5	99	695	630
5 < 6	96.5	730	670

* Based on NCHS median weights at mid-point of month.

Source: WHO, 1985, *Energy and Protein Requirements*: *Report of a Joint FAO/WHO/UNU Expert Consultation*, Geneva, World Health Organization, p. 91.

Table 2. Children 6 Months to 2 Years of Age

Age (years)	Calorie requirement per kg per day*		Calorie requirement per day#	
	Male	Female	Male	Female
.5 < .75	109	109	850	784
.75 < 1	109	109	1003	937
1 < 1.5	108	113	1102	1074
1.5 < 2	108	113	1242	1220

* Includes allowance for infection and desirable activity level.

Based on NCHS median weights at mid-point of age range. *Source*: WHO, 1985, *Energy and Protein Requirements*: *Report of a Joint FAO/WHO/UNU Expert Consultation*. Geneva, World Health Organization, p.180.

Source: W.P.T. James and E.C. Schofield, 1990, *Human Energy Requirements: A Manual for Planners and Nutritionists*, Oxford, Oxford Medical Publications, p. 74.

Table 3. Children 2-5 Years of Age

Age (years)	Calorie requirement per kg per day*		Calorie requirement per day#	
	Male	Female	Male	Female
2 < 3	104	102	1410	1310
3 < 4	99	95	1560	1440
4 < 5	95	92	1690	1540
5 < 6	92	88	1810	1630

* Based on NCHS median weights at mid-point of year.

Based on estimated average daily energy intakes from data of Ferro-Luzzi & Durnin + 5 percent for desirable activity level.

Source: WHO, 1985, *Energy and Protein Requirements: Report of a Joint FAO/WHO/UNU Expert Consultation*. Geneva. World Health Organization, pp. 94-95.

Table 4. Children 6-9 Years of Age

Age (Years)	Calorie requirement per day*	
	Male	Female
6 < 7	1822	1619
7 < 8	1901	1657
8 < 9	1948	1711
9 < 10	2023	1767

* Based on estimated average daily energy intakes from data of Ferro-Luzzi & Durnin + 5 percent for desirable activity level.

Source: WHO, 1985, *Energy and Protein Requirements: Report of a Joint FAO/WHO/UNU Expert Consultation*, Geneva, World Health Organization, pp. 94-95.

APPENDIX 10. AVERAGE WEIGHT BY AGE AND SEX FOR FAO MEMBER COUNTRIES (IN KILOGRAMS)

Note: See Appendix 7 to identify relevant row number for country of interest.

The growth curves provided in below are *not* newly developed local standards, but simply currently available data from single studies made within some of the listed countries. The data sets vary in size and quality; some are the result of national surveys and others are taken from surveys on smaller communities within a country. Sampling techniques vary, and in many cross-sectional surveys, sample sizes have changed from year to year, thus affecting the consistency of the growth curves which is shown by wide fluctuations in percentile values between age bands. For comparative purposes, and for use in contexts where no local data are available, the curves have been modified as described below. They therefore can only be considered as 'best estimates' rather than statistically representative national data sets. Hence it is *recommended* that, where possible, local data should be used rather than values provided in the following paragraphs.

I. 0-17+ Years

1. Weight and height data for groups *aged 0-17+ years* have been used from a variety of sources, currently gathered together by the Food Policy and Nutrition Division, FAO.
2. For comparative purposes the weight and height curves have been smoothed, matched with the NCHS standards, and expressed as percentiles. To prevent bias, all measurements were allocated to the nearest main percentile (i.e., 3^{rd}, 5^{th}, 10, 20, 30, 40 , 50, 60, 70, 80, 90, 95 and 97^{th} percentiles).
3. Thus a series of 62 modified curves has been established which is provided in Appendix 7.

II. Adult data

1. Complete growth curves covering the whole life span are available for only a few countries. Therefore some established characteristics of growth and anthropometry had to be used when estimating appropriate adult values. They are:
   a. Females are regarded as having reached their maximum growth potential by 18 years.
   b. In well nourished male populations full growth *may* be achieved by 18 years, but in less well nourished populations, growth may continue for another 4-5 years so, in the absence of data, heights must be derived.
   c. A commonly observed feature of the relationship between male and female height is that in many populations females are approximately 7 percent shorter than males. This relationship was therefore used to obtain adult male heights.
   d. The body mass index (BMI), which expresses a relationship between weight and height (Wt/Ht^2) can be used to calculate an actual desirable weight from height.
2. *Height*. Where adult measurements are unavailable, the actual heights of females at 18 years has been treated as the adult height. Male heights have been estimated by calculating a value 7 percent higher than that of the females.
3. *Weight*. Similarly, weights of females at 18 years have been treated as adult weights. Male weights have been calculated using BMIs and the estimated heights and then applying an estimate of the BMI.

   Source of male BMIs:
   a. Studies on adults from the country itself; or
   b. In the absence of a study, appropriate BMIs from a nearby country have been applied; or

c. Where no data are available for LDCs, a BMI within the range of 19-21 has been selected. This range was found to apply to the LDC adult data provided by Eveleth and Tanner.[15]

4. *Patterns of weight change*. Lean body mass does not in general increase over the age of 24 years, but total body weight does, with a consequential increase in BMI. This process generally occurs in western societies and in the urban populations of some LDCs. Evidence from studies in the U.S.A., the U.K. and Belgium suggest that an increment of 2 BMI points could be added to adult weights in the 30-59 years age group in order to allow for the extra energy required to maintain the actual body weight.

Source: James, W.P.T. and Schofield, E.C. (1990). *Human Energy Requirements: A Manual for Planners and Nutritionists*. Oxford University Press, Oxford, p. 116-117.

[15] Eveleth, P.B. and J.M. Tanner. *International Biological Programme 8: Worldwide variation in human growth.* Cambridge, U.K.: Cambridge University Press, 1984.

Row #	Male									Female								
	10 yrs++	11 yrs+	12 yrs+	13 yrs+	14 yrs+	15 yrs+	16 yrs+	17 yrs+	Adult	10 yrs+	11 yrs+	12 yrs+	13 yrs+	14 yrs+	15 yrs+	16 yrs+	17 yrs+	Adult
1	27.8	30.8	32.2	34.8	39.8	44.9	49.4	53.1	57.5	25.2	28.0	30.0	33.5	36.8	40.0	41.9	44.9	45.4
2	24.9	27.5	29.3	33.4	38.4	43.4	47.8	51.0	55.6	25.2	28.3	31.7	33.5	38.8	41.6	43.5	44.4	44.7
3	30.6	34.3	36.5	41.4	43.3	48.5	49.9	56.3	64.6	29.8	33.6	37.6	41.6	45.3	48.1	49.8	50.4	52.0
4	29.0	32.4	36.5	38.0	43.3	48.5	53.1	56.3	58.2	31.7	35.7	40.0	44.1	47.8	50.7	52.3	52.8	53.3
5	26.7	29.7	33.4	38.0	43.3	48.5	53.1	56.3	60.2	27.3	30.7	37.6	41.6	45.3	48.1	49.8	52.8	53.0
6	30.6	34.3	36.5	41.4	45.8	49.2	53.1	56.3	62.9	33.3	35.7	40.0	44.1	47.8	52.9	54.4	54.8	55.2
7	27.7	30.6	32.1	34.6	39.7	44.7	49.2	52.8	57.4	25.2	28.1	30.0	33.5	36.8	40.0	41.9	44.8	45.4
8	29.0	29.7	33.4	35.2	40.3	45.4	52.1	60.3	60.5	27.3	30.7	34.4	38.2	45.3	48.1	52.3	52.8	53.5
9	26.7	29.7	30.9	35.2	38.4	43.4	49.9	51.0	56.5	29.8	33.6	34.4	41.6	45.3	48.1	49.8	50.4	50.5
10	24.9	27.5	33.4	35.2	40.3	45.4	53.1	56.3	58.2	27.3	30.7	34.4	38.2	41.7	48.1	52.3	52.8	53.2
11	24.9	27.5	33.4	35.2	40.3	45.4	53.1	56.3	59.1	27.3	28.3	34.4	38.2	41.7	48.1	49.8	52.8	52.8
12	23.7	26.1	29.3	33.4	38.4	43.4	47.8	51.0	53.1	23.8	26.7	30.0	33.5	36.8	39.7	41.6	42.7	42.9
13	23.7	26.1	29.3	33.4	38.4	43.4	47.8	51.0	53.9	23.8	26.7	30.0	33.5	38.8	41.6	43.5	44.4	44.7
14	26.7	29.7	30.9	35.2	43.3	45.4	49.9	53.1	55.4	27.3	30.7	34.4	38.2	41.7	44.6	46.4	47.2	48.0
15	23.7	26.1	29.3	33.4	38.4	43.4	47.8	51.0	51.1	23.8	26.7	30.0	33.5	36.8	39.7	41.6	42.7	42.9
16	23.7	26.1	29.3	33.4	38.4	43.4	47.8	51.0	55.7	23.8	26.7	30.0	35.3	36.8	39.7	41.6	42.7	44.4
17	30.6	34.3	38.6	43.8	49.5	52.3	57.0	60.3	62.5	29.8	35.7	40.0	44.1	47.8	50.7	52.3	52.8	52.8
18	29.0	32.4	36.5	38.0	43.3	48.5	53.1	56.3	58.0	29.8	30.7	37.6	41.6	41.7	44.6	46.4	47.2	49.0
19	25.0	26.7	30.0	34.2	41.6	45.4	49.9	51.9	55.6	25.3	29.3	31.9	36.5	40.0	44.6	46.4	47.2	48.1
20	27.8	29.7	33.4	38.0	43.3	47.0	53.1	56.3	62.1	28.5	32.1	37.6	41.6	45.3	48.1	49.8	52.8	53.0
21	23.7	26.1	29.3	33.4	38.4	43.4	47.8	51.0	53.9	23.8	28.3	31.7	35.3	38.8	41.6	43.5	44.4	45.7
22	23.7	26.1	29.3	33.4	38.4	43.4	47.8	51.0	58.8	23.8	26.7	30.0	35.3	36.8	41.6	43.5	44.4	45.0
23	33.3	37.5	40.5	45.9	53.8	59.5	62.2	65.5	78.5	33.3	39.2	43.8	48.3	52.1	55.0	56.4	56.7	56.9
24	35.3	39.8	42.3	47.8	51.7	55.0	57.0	60.3	69.2	33.3	37.5	42.0	46.3	50.0	52.9	54.4	54.8	55.2
25	33.3	37.5	42.3	47.8	53.8	59.5	64.4	67.8	71.2	34.7	39.2	43.8	48.3	52.1	55.0	56.4	59.7	61.5
26	33.3	35.9	40.5	45.9	51.7	57.3	62.2	65.5	76.3	31.7	35.7	42.0	46.3	52.1	52.9	54.4	56.7	57.3
27	32.0	35.9	38.6	43.8	49.5	57.3	59.8	63.1	75.0	31.7	35.7	40.0	46.3	50.0	50.7	52.3	52.8	53.5
28	33.3	37.5	40.5	45.9	51.7	59.5	62.2	65.5	71.2	33.3	37.5	43.8	48.3	52.1	55.0	56.4	56.7	57.4
29	30.6	34.3	38.6	43.8	49.5	55.0	59.8	63.1	71.2	33.3	39.2	46.7	51.3	52.1	55.0	56.4	56.7	56.7
30	29.0	39.7	33.4	38.0	43.3	48.5	53.1	56.3	61.9	27.3	33.6	37.6	41.6	45.3	48.1	52.3	54.8	56.0
31	33.3	35.9	40.5	43.8	51.7	57.3	62.2	65.5	77.2	33.3	37.5	42.0	48.3	52.1	55.0	56.4	56.7	58.2
32	33.3	35.9	40.5	45.9	51.7	57.3	62.2	65.5	72.5	33.3	37.5	42.0	48.3	52.1	52.9	56.4	56.7	58.0

Row #	Male									Female								
	10 yrs+	11 yrs+	12 yrs+	13 yrs+	14 yrs+	15 yrs+	16 yrs+	17 yrs+	Adult	10 yrs+	11 yrs+	12 yrs+	13 yrs+	14 yrs+	15 yrs+	16 yrs+	17 yrs+	Adult
33	35.3	37.5	42.3	47.8	53.8	57.8	62.2	65.5	71.4	34.7	39.2	43.8	48.3	50.0	52.9	54.4	54.8	56.4
34	33.3	37.5	42.3	45.9	51.7	55.0	59.8	60.3	72.5	33.3	37.5	42.0	46.3	52.1	55.0	56.4	56.7	58.0
35	32.0	35.9	40.5	45.9	51.7	57.3	59.8	63.1	72.9	33.3	37.5	43.8	48.3	52.1	55.0	56.4	56.7	56.7
36	35.3	37.5	42.3	45.9	51.7	57.3	59.8	63.1	69.2	34.7	39.2	43.8	46.3	50.0	52.9	54.4	54.8	55.6
37	29.0	32.4	33.4	38.0	40.3	43.4	49.9	53.1	57.5	27.3	30.7	34.4	38.2	45.3	48.1	52.3	52.8	53.0
38	30.6	32.4	33.4	35.2	40.3	48.5	53.1	56.3	59.1	29.8	35.7	37.6	41.6	45.3	48.1	49.8	50.4	50.9
39	30.6	32.4	36.5	41.4	46.9	52.3	53.1	56.3	58.2	31.7	35.7	40.0	41.6	47.8	48.1	49.8	50.4	51.0
40	30.6	32.4	36.5	41.4	43.3	48.5	53.1	56.3	57.5	25.2	28.3	31.7	35.3	38.8	44.6	49.8	50.4	50.9
41	29.0	32.4	36.5	41.4	46.9	48.5	53.1	56.3	60.7	29.8	33.6	37.6	41.6	45.3	48.1	49.8	50.4	50.5
42	29.0	32.4	36.5	38.0	43.3	48.5	53.1	56.3	61.1	29.8	33.6	37.6	41.6	45.3	48.1	49.8	50.4	50.5
43	29.0	32.4	33.4	38.0	40.3	43.4	49.9	53.1	60.0	27.3	30.7	34.4	38.2	45.3	48.1	52.3	52.8	53.0
44	32.0	35.9	38.6	43.8	46.9	52.3	53.1	60.3	62.6	33.3	37.5	43.8	46.3	50.0	52.9	54.4	54.8	55.1
45	26.7	29.7	33.4	35.2	38.4	43.4	49.9	53.1	66.9	27.3	30.7	34.4	41.6	45.3	48.1	49.8	52.8	53.2
46	30.6	32.4	36.5	41.4	46.9	52.3	53.1	56.3	61.1	31.7	35.7	40.0	41.6	47.8	48.1	49.8	50.4	51.0
47	30.6	32.4	36.5	41.4	43.3	48.5	53.1	56.3	63.0	25.2	28.3	31.7	35.3	38.8	44.6	49.8	50.4	52.0
48	28.1	29.7	33.4	38.0	43.3	46.6	53.1	56.3	62.5	28.8	32.4	37.6	41.6	45.3	48.1	49.8	52.8	53.0
49	30.6	34.3	38.6	47.8	49.5	55.0	57.0	60.3	67.5	33.3	35.7	40.0	46.3	50.0	52.9	56.4	56.7	57.6
50	26.7	29.7	33.4	38.0	40.3	48.5	53.1	56.3	57.5	29.8	33.6	37.6	41.6	45.3	48.1	49.8	50.4	52.8
51	29.0	32.4	36.5	41.4	46.9	52.3	57.0	60.3	61.7	29.8	33.6	37.6	44.1	50.0	52.9	54.4	56.7	56.7
52	26.7	29.7	33.4	35.2	40.3	45.4	49.9	53.1	57.5	25.2	28.3	31.7	38.2	41.7	48.1	52.3	54.8	55.7
53	30.6	34.3	38.6	43.8	46.9	55.0	57.0	60.3	67.2	31.7	33.6	40.0	44.1	47.8	52.9	54.4	54.8	56.1
54	29.0	29.7	33.4	38.0	43.3	48.5	53.1	56.3	61.4	27.3	33.6	37.6	41.6	45.3	48.1	52.3	54.8	56.0
55	35.3	39.8	45.0	50.7	56.9	59.5	64.4	67.8	72.1	37.0	41.9	46.7	51.3	52.1	55.0	56.4	56.7	56.8
56	30.6	32.4	38.6	43.8	46.9	52.4	57.1	60.3	72.9	31.7	35.7	40.0	44.1	47.8	50.7	52.3	54.8	55.9
57	33.3	37.5	42.3	47.8	53.8	59.5	64.4	67.8	78.1	34.7	39.2	43.8	48.3	52.1	55.0	56.4	56.7	56.7
58	33.3	37.5	42.3	45.9	51.7	57.3	62.2	65.5	70.0	33.3	37.5	43.8	48.3	50.0	52.9	54.4	54.8	55.3
59	27.9	31.1	33.4	38.0	43.3	48.5	53.1	58.3	68.1	28.6	32.2	37.6	41.6	46.6	50.5	53.1	56.4	56.8
60	35.3	39.8	45.0	50.7	56.9	57.3	59.8	63.1	69.3	34.7	39.2	43.8	48.3	50.0	52.9	56.4	56.7	56.7
61	23.7	26.1	29.3	33.4	38.4	43.4	47.8	53.1	59.2	23.8	26.7	30.0	33.5	36.8	39.7	43.5	47.2	47.3
62	35.1	38.9	43.2	47.5	52.4	57.3	62.1	65.6	70.4	34.5	38.6	42.4	47.1	50.3	52.2	52.8	54.0	61.4

APPENDIX 11. DIETARY FILE

HHID 1	Meal 2	Abst1* 3	18M 4	18F 5	AdM/F# 6	Chl4/11# 7	Dnum 8	Dish 9	Ingr 10	Quan 11	Unit 12	Lquan 13	Lunit 14	Src 15	Linetyp 16
21	1	1	0	0	0	0	1	1003	1003	35	19	4	A2	1	1
21	1	1	0	0	0	0	1	1003	1001	1300	6	0	0	2	2
21	1	1	1	0	0	0	2	1403	1403	900	6	0	0	0	1
21	1	1	1	0	0	0	2	1403	403	.00	0	0	0	1	2
21	1	1	1	0	0	0	2	1403	260	110	6	0	0	1	2
21	2	0	0	0	0	0	1	2170	2170	5	7	0	0	0	1
21	2	0	0	0	0	0	1	2170	170	5	7	0	0	12	2
21	2	0	0	0	0	0	1	2170	240	70	6	0	0	1	2

APPENDIX 12. DIETARY FILE

HHID 1	Meal 2	Abst1* 3	18M 4	18F 5	AdM/F# 6	Chl4/11# 7	Dnum 8	Dish 9	Ingr 10	Quan 11	Unit 12	Lquan 13	Lunit 14	Src 15	Linetyp 16	Product 17	Form 18
21	1	1	0	0	0	0	1	1003	1003	35	19	4	19	1	1	3	1
21	1	1	0	0	0	0	1	1003	1001	1300	6	0	0	2	2	1	1
21	1	1	1	0	0	0	2	1403	1403	900	6	0	0	0	1	403	1
21	1	1	1	0	0	0	2	1403	403	.00	0	0	0	1	2	403	0
21	1	1	1	0	0	0	2	1403	260	110	6	0	0	1	2	260	0
21	2	0	0	0	0	0	1	2170	2170	5	7	0	0	0	1	170	2
21	2	0	0	0	0	0	1	2170	170	5	7	0	0	12	2	170	0
21	2	0	0	0	0	0	1	2170	240	70	6	0	0	1	2	240	0

APPENDIX 13. DIETARY FILE

HHID 1	Meal 2	Abst1* 3	18M 4	18F 5	AdM/F # 6	Chl4/11 # 7	Dnum 8	Dish 9	Ingr 10	Quan 11	Unit 12	Lquan 13	Lunit 14	Src 15	Linetyp 16	Product 17	Form 18	Wgtfact 19	Wgt 20
21	1	1	0	0	0	0	1	1003	1003	35	19	4	19	1	1	3	1	33.92	1187.2
21	1	1	0	0	0	0	1	1003	1001	1300	6	0	0	2	2	1	1	.60	780
21	1	1	1	0	0	0	2	1403	1403	900	6	0	0	0	1	403	1	.#	.
21	1	1	1	0	0	0	2	1403	403	.00	0	0	0	1	2	403	0	.	.
21	1	1	1	0	0	0	2	1403	260	110	6	0	0	1	2	260	0	1.0886	119.746
21	2	0	0	0	0	0	1	2170	2170	5	7	0	0	0	1	170	2	1+	5
21	2	0	0	0	0	0	1	2170	170	5	7	0	0	12	2	170	0	1+	5
21	2	0	0	0	0	0	1	2170	240	70	6	0	0	1	2	240	0	1.166	81.62

Coffee was not measured, as it does not contribute any calories to the diet.

+ For eggs, units are used instead of weights.

APPENDIX 14. DIETARY FILE

HHID 1	Meal 2	Dnum 3	Dish 9	Ingr 10	Quan 11	Unit 12	Lquan 13	Lunit 14	Src 15	Linetyp 16	Product 17	Form 18	Wgtfact 19	Wgt 20	Linetype_n 21	Norecipe 22
21	1	1	1003	1003	35	A2	4	A2	1	1	3	1	33.92	1187.2	2	0
21	1	1	1003	1001	1300	6	0	0	2	2	1	1	.60	780	1	0
21	1	2	1403	1403	900	6	0	0	0	1	403	1	.%	.	2	0
21	1	2	1403	403	.00	0	0	0	1	2	403	0	.	.	2	0
21	1	2	1403	260	110	6	0	0	1	2	260	0	1.0886	119.746	1	0
21	2	1	2170	2170	5	7	0	0	0	1	170	2	1+	5	2	0
21	2	1	2170	170	5	7	0	0	12	2	170	0	1+	5	2	0
21	2	1	2170	240	70	6	0	0	1	2	240	0	1.166	81.62	1	0
21	2	2	2040	2040	220	6	0	0	22	1	40	2	.3865	85.03	1	1
21	2	3	1403	1403	500	6	0	0	0	1	403	1	.	.	2	0

APPENDIX 15. IMPUTING AVERAGE RECIPES FOR DISHES WITHOUT RECIPES

To impute an average recipe for dishes without recipes in the data, start with the dietary file that has the NORECIPE labels and weights (WGT) of ingredients converted into grams. The procedure described below involves computing proportions of ingredients (by weight) used for preparing a certain amount of a dish. First, recipes are calculated at the household level. If the household does not have a matching recipe, the recipe should be calculated at the next level of sample stratification (for example, a cluster of households, a block, or a region).

In the first step, the unit and quantity on the dish line is recoded as dish quantity (DSHQUAN) and dish unit (DSHUNIT). This information is then copied onto all the ingredients belonging to that particular dish. This information will be used for computing the ingredient proportions.

```
If (LINETYP = 1) DSHQUAN = QUAN
If (LINETYP = 1) DSHUNIT = UNIT
If (LINETYP = 2) DSHUNIT = lag (DSHUNIT)
If (LINETYP = 2) DSHQUAN = lag (DSHQUAN)
```

Then, the proportion of ingredients in each recipe (RECPROP) is calculated and aggregated to obtain a mean recipe for households in the sample. RECPROP is aggregated on household id, dish id, dish unit, and ingredient, to compute specific proportions for each unit of measurement of the dish. For example, if bread was measured as a small loaf and a large loaf, specific proportions of flour and other ingredients went into the preparation of small and large loaves. In this example the proportions are calculated based on dish *quantities*, rather than dish weight, because the information on dish weight conversions in the standard files was not complete.

```
Select if (NORECIPE = 0)                    *Select only those cases
If (DSHQUAN gt 0) and (LINETYP = 2)         that have recipes
RECPROP = (WGT/DSHQUAN)                     *Use gross weight, which
aggregate outfile = *                       includes leftovers
  /break = HHID DISH DSHUNIT INGR
  /MRECPROP = mean(RECPROP)
```

Once the household-level average recipe proportions have been computed, the ingredients in each recipe are numbered in consecutive order, in order to identify each ingredient in a recipe by a number, and to know the maximum number of possible ingredients in any recipe in the data. The ingredient ordering sequence does not matter (for fried eggs, oil could be numbered one and eggs numbered two, or vice versa) as long as all ingredients in a recipe are identified by an ingredient number.

```
If (DISH = INGR) INGORD = 0
If (DISH ne INGR) INGORD =  (lag(INGORD) + 1)
Var label INGORD ‘order of ingredient in a recipe’
Sort cases by HHID DISH DSHUNIT INGORD
Save outfile = ‘recprop.sav’
```

Ingredient number 1 for each dish is then saved in one file, ingredient number 2 in another file and so on. This will enable the subsequent matching of the ingredients to their specific dishes in the file that contains dishes with no recipes.

```
Get file = 'recprop.sav'
Select if (INGORD = 1)
Sort case by HHID DISH DSHUNIT
Save outfile = 'ing1.sav'

Get file = 'recprop.sav'
Select if (INGORD = 2)
Sort case by HHID DISH DSHUNIT
Save outfile = 'ing2.sav'

Get file = 'recprop.sav'
Select if (INGORD = N)
Sort case by HHID DISH DSHUNIT
Save outfile = 'ingN.sav'
```

Using the original dietary file, cases that do not have recipes are then selected to match the new recipes with them.

```
Get file = 'dietary.sav'
Select if (NORECIPE = 1)
Save outfile = 'norecipe.sav'

Get file = 'norecipe.sav'/drop = INGR LINETYP        *Drop these, as we will be matching
                                                     new list of ingredients to these lines.
Sort cases by HHID DISH DSHUNIT
Save outfile = 'norecipe1.sav'
```

Using the file just saved, match the different files containing the various ingredients with the recipes. The output will be ingredient lines for different dishes for which recipe matches could be found. All ingredients numbered 1 will be saved in one file, and all ingredients numbered 2 in the second file, and so on.

```
Match file file = 'norecipe1.sav'
 /table = 'ing1.sav' /by HHID DISH DSHUNIT
 /map
Sort cases by HHID DAY  DSHNUM
Save outfile = 'withrec1.sav'

Match file file = 'norecipe1.sav'
 /table = 'ing2.sav' /by HHID DISH DSHUNIT
 /map
Sort cases by HHID DAY DSHNUM.
Save outfile = 'withrec2.sav'

Match file file = 'norecipe1.sav'
 /table = 'ingN.sav' /by HHID DISH DSHUNIT
 /map
Sort cases by HHID DAY  DSHNUM
Save outfile = 'withrecN.sav'
```

Files containing the ingredient lines are then added to the file containing no recipes. The '/BY' qualifier in the "add" command is used with the variables HHID DSHNUM so that each ingredient line is added after the specific recipe to which it belongs.

```
Get file = 'norecipe.sav'
Sort case by HHID DSHNUM
Save outfile = 'norecipe.sav'

Add file file = 'norecipe.sav'
     /in = in0                                  *The in = in0 etc. allows us
    /file = 'withrec1.sav'                      to put a flag on each line to
    /in = in1                                    identify which file that particular
    /file = 'withrec2.sav'                      line came from
    /in = in2
    /file = 'withrecN.sav'
    /in = inN
    /by HHID DSHNUM.
Compute extra = 0
If (sysmis(INGR)) extra = 1                     *There will be extra lines of data
                                                 because each dish will have the
                                                 maximum possible number of
                                                 ingredient lines added after it
Select if (extra = 0)
Save outfile = 'hhrec.sav'
```

The file now has recipes for the dishes that had matches at the household level. To get the recipes for others, the process is repeated for the next level of data stratification—CENTER, in this example. First, the cases lacking matching household level recipes are separated out, using the commands that created the NORECIPE variable.

```
Get file = 'hhrec.sav'
Do if (DISH = INGR )
  compute LINETYP = 1
Else
  Compute LINETYP = 2
End if
Sort cases by HHID DSHNUM LINETYP
Create LINETY_N = lead (LINETYP, 1)
Var label LINETY_N 'value linetyp nxt case'
Compute NOHHREC = 0
If (LINETY_N = 1 and LINETYP = 1) NOHHREC = 1
Var label NOHHREC 'no hh recipe'
Value label NOHHREC 0 'with recipe' 1 'no recipe'
Save outfile = 'hhrec.sav'
```

Next, create average recipes at the cluster (or center) level.

```
Get file = 'dietary.sav'
If (LINETYP = 1) DSHQUAN = QUAN
If (LINETYP = 1) DSHUNIT = UNIT
If (LINETYP = 2) DSHUNIT = lag(DSHUNIT)
```

```
If (LINETYP = 2) DSHQUAN = lag(DSHQUAN)
Select if (NORECIPE = 0).=
If (DSHQUAN gt 0) and (LINETYP = 2)
  RECPROP = (WGT/DSHQUAN)
Aggregate outfile = *
   /break = CENTER DISH DSHUNIT INGR
   /CRECPROP = MEAN(RECPROP)
Save outfile = 'crecprop.sav'
```

Once again, the ingredients in these average recipes are ordered.

```
Get file = 'crecprop.sav'
Do if (DISH = INGR )
  Compute LINETYP = 1
Else
  Compute LINETYP = 2
End if
Sort cases by CENTER DISH DSHUNIT LINETYP
If (DISH = INGR) INGORD = 0
If (DISH ne INGR) INGORD =  (lag(INGORD) + 1)
Sort cases by CENTER DISH DSHUNIT INGORD
Save outfile = 'crecprop.sav'
```

The ingredients ordered number 1 for all recipes are saved in one file, and ingredients ordered number 2 in the second file, and so on.

```
Get file = 'crecprop.sav'
Select if (INGORD = 1)
Sort case by CENTER DISH DSHUNIT
Save outfile = 'ing1.sav'

Get file = 'crecprop.sav'
Select if (INGORD = 2)
Sort case by CENTER DISH DSHUNIT
Save outfile = 'ing2.sav'

Get file = 'crecprop.sav'
Select if (INGORD = N)
Sort case by CENTER DISH DSHUNIT
Save outfile = 'ingN.sav'
```

Using the file in which the household-level recipes were matched, separate out the dishes that still do not have a recipe.

```
Get file = 'hhrec.sav'/drop = in0 to extra wgt        *Drop these variables, as this file will
                                                        be used to match the center-level
                                                        recipes, which will have new values
                                                       for  these variables
```

```
Select if (NOHHREC = 1)
Save outfile = 'nohhrece.sav'
```

Next, this file is prepared so that the ingredient lines can be matched to the dish line, by dropping the old variables, for which there will be new values in the matched file.

```
Get file = 'nohhrece.sav'/drop = INGR INGORD LINETYP
Sort cases by CENTER DISH DSHUNIT
Save outfile = 'nohhrec1.sav'
```

Each file containing ingredients of the dishes is matched, one at a time.

```
Match file file = 'nohhrec1.sav'
 /table = 'ing1.sav' /by CENTER DISH DSHUNIT
 /map.
Sort cases by CENTER DSHNUM
Save outfile = 'withrec1.sav'

Match file file = 'nohhrec1.sav'
 /table = 'ing2.sav' /by CENTER DISH DSHUNIT
 /map.
Sort cases by CENTER DSHNUM
Save outfile = 'withrec2.sav'

Match file file = 'nohhrec1.sav'
 /table = 'ingN.sav' /by CENTER DISH DSHUNIT
 /map.
Sort cases by CENTER DSHNUM
Save outfile = 'withrecN.sav'

Get file = 'nohhrece.sav'
Sort cases by CENTER DSHNUM
Save outfile = 'nohhrece.sav'

Add file = 'nohhrece.sav'
     /in = in0
    /file = 'withrec1.sav'
    /in = in1
   /file = 'withrec2.sav'
   /in =in2
   /file = 'withrecNsav'
    /in = inN
   /by CENTER DSHNUM.
Compute EXTRA = 0
If (sysmis(INGR)) EXTRA = 1
Select if (EXTRA = 0)
Save outfile = 'centrec.sav'
```

At the end of this step, once again separate out cases lacking center-level recipes, and repeat the iterations as above for the next level of sample stratification (e.g., region). Once recipes have been found for all the cases, the information in these files is added to the dietary file.

```
Get file = 'dietary.sav'
Select if (NORECIPE = 0)                          *All dishes with recipe
Save outfile = 'first.sav'

Get file = 'hhrec.sav'/drop = IN0 to EXTRA WGT CENTER INGORD LINETY_N
select if (NOHHREC = 0)                           *Dishes with household recipes
If (LINETYP = 2)WGT = MRECPROP*DSHQUAN
Save outfile = 'second.sav'

Get file = 'centrec.sav'/drop= IN0 to EXTRA
  CENTER INGORD LINETY_N
Select if (NOCREC = 0)                            *Dishes with center-level recipes,
                                                  last
                                                   level in this example
If (LINETYP = 2) WGT = CRECPROP*DSHQUAN
Save outfile = 'third.sav'
```

If recipes were imputed at other levels of data stratification, those files should also appear here.

Next, the dishes that normally do not have recipes are selected and given a new LINETYP code so that their nutritional values can be calculated.

```
Get file =  'dietary.sav'
Select if (NORECIPE = 1)
Sort cases by HHID DSHNUM
Save outfile =  'fourth.sav'

Match file file =  'fourth.sav'
 /table =  'third.sav'/by = HHID DSHNUM           *Last level at which the
/map.                                              recipes were imputed



Select if (nocrec = 1).                           *Select those dishes for which we
                                                  did
                                                   not find any recipes
If (nocrec = 1 and (DISH = 100 or DISH = 139 or .....)) LINETYP = 3.
                                                  *Dishes that normally lack recipes
Save outfile = 'c:\temp\fourth.sav'

Add file file = 'first.sav'
 /file = 'second.sav'
 /file = 'third.sav'
 /file = 'fourth.sav'.
Save outfile = 'recepall.sav'
```

APPENDIX 15A. DIETARY FILE

HHID 1	Meal 2	Dnum 8	Dish 9	Ingr 10	Quan 11	Unit 12	Linetyp 16	Product 17	Form 18	Wgtfact 19	Wgt 20	Linety_n 21	Norecipe 22	Dshquan 23	Dshunit 24
21	1	1	1003	1003	35	19	1	3	1	33.92	1187.2	2	0	35	19
21	1	1	1003	1001	1300	6	2	1	1	.60	780	1	0	35	19
21	1	2	1403	1403	900	6	1	403	1	.	.	2	0	900	6
21	1	2	1403	403	.00	0	2	403	0	.	.	2	0	900	6
21	1	2	1403	260	110	6	2	260	0	1.0886	119.746	1	0	900	6
21	2	1	2170	2170	5	7	1	170	2	1	5	2	0	5	7
21	2	1	2170	170	5	7	2	170	0	1	5	2	0	5	7
21	2	1	2170	240	70	6	2	240	0	1.166	81.62	1	0	5	7
21	2	2	2040	2040	220	6	1	40	2	.3865	85.03	1	1	220	6
21	2	3	1403	1403	500	6	1	403	1	.	.	2	0	500	6

APPENDIX 15B. HOUSEHOLD RECIPE PROPORTIONS

HHID 1	Dish 2	Dshunit 3	Ingr 4	Mrecprop 5	Ingord
21	1003	19	1003	33.92	0
21	1003	19	1001	22.28	1
21	1403	6	1403	.	0
21	1403	6	403	.	1
21	1403	6	260	.13305	2
21	2170	7	2170	1	0
21	2170	7	170	1	1
21	2170	7	240	16.324	2
21	2040	6	2040	.3865	0
21	2040	6	040	.2272	1
21	2040	6	240	.04545	2
21	1403	6	1403	.	0

To show the computation steps, the proportions in this table were computed assuming that every time the household prepared the above dishes, they used the recipes given in Appendix 14-A. In practice, this may not be the case.

File containing ingredient number 1 from all recipes ING1.SAV

HHID 1	Dish 2	Dshunit 3	Ingr 4	Mrecprop 5	Ingord 6
21	1003	19	1	22.28	1
21	1403	6	403	.	1
21	2170	7	170	1	1
21	2040	6	40	.2272	1

File containing ingredient number 2 from all recipes ING2.SAV

HHID 1	Dish 2	Dshunit 3	Ingr 4	Mrecprop 5	Ingord
21	1403	6	260	.13305	2
21	2170	7	240	16.324	2
21	2040	6	240	.04545	2

File containing dishes with no recipes NORECIPE.SAV

HHID 1	Meal 2	Dnum 8	Dish 9	Ingr 10	Quan 11	Unit 12	Linetyp 16	Product 17	Form 18	Wgtfact 19	Wgt 20	Linety_n 21	Norecipe 22	Dshquan 23	Dshunit 24
21	2	2	2040	2040	220	6	1	40	2	.3865	85.03	1	1	220	6
21	2	5	5476	5476	4	7	1	476	5	.	.	1	1	4	7

File containing dishes with no recipes NORECIPE1.SAV without INGR and LINETYP Variables

HHID 1	Meal 2	Dnum 8	Dish 9	Quan 11	Unit 13\2	Form 18	Wgtfact 19	Wgt 20	Linety_n 21	Norecipe 22	Dshquan 23	Dshunit 24
21	2	2	2040	220	6	2	.3865	85.03	1	1	220	6
21	2	5	5476	4	7	5	.	.	1	1	4	7

File containing ingredient 1 for all recipes WITHREC1.SAV

HHID 1	Meal 2	Dnum 8	Dish 9	Norecipe 22	Dshquan 23	Dshunit 24	Ingr 25	Mrecprop 26	Ingord 27
21	2	2	2040	1	220	6	040	.2272	1
22	3	4	1435	1	12	2	180	.5646	1

File containing ingredient 2 for all recipes WITHREC2.SAV

HHID 1	Meal 2	Dnum 8	Dish 9	Norecipe 22	Dshquan 23	Dshunit 24	Ingr 25	Mrecprop 26	Ingord 27
21	2	2	2040	1	220	6	240	.04545	2
22	3	4	1435	1	12	2	105	.245	2

File containing household recipes HHREC.SAV

HHID 1	Meal 2	Dnum 8	Dish 9	Norecipe 22	Dshquan 23	Dshunit 24	Ingr 25	Mrecprop 26	Ingord 27
21	2	2	2040	1	220	6	2040	.	
21	2	2	2040	1	220	6	040	.2272	1
21	2	2	2040	1	220	6	240	.04545	2
22	3	4	1435	1	12	2	180	.5646	1
22	3	4	1435	1	12	2	105	.245	2

Files for cluster-level recipes will be similar to those displayed above.

APPENDIX 16. DIETARY FILE

HHID 1	Meal 2	Dnum 8	Dish 9	Ingr 10	Quan 11	Unit 12	Lquan 13	Lunit 14	Src 15	Linetyp 16	Product 17	Form 18	Wgtfact 19	Wgt 20	Linety_n 21	Norecipe 22	Lfrac 23	Cfrac 24	Wgt1 25
21	1	1	1003	1003	35	A2	4	A2	1	1	3	1	33.92	1187.2	2	0	.11429	.88571	1051.34
21	1	1	1003	1001	1300	6	0	0	2	2	1	1	.60	780	1	0	.11429	.88571	690.854
21	1	2	1403	1403	900	6	0	0	0	1	403	1	.	.	2	0	0	1	.
21	1	2	1403	403	.00	0	0	0	1	2	403	0	.	.	2	0	0	1	.
21	1	2	1403	260	110	6	0	0	1	2	260	0	1.0886	119.746	1	0	0	1	119.746
21	2	1	2170	2170	5	7	0	0	0	1	170	2	1	5	2	0	0	1	5
21	2	1	2170	170	5	7	0	0	12	2	170	0	1	5	2	0	0	1	5
21	2	1	2170	240	70	6	0	0	1	2	240	0	1.166	81.62	1	0	0	1	81.62
21	2	2	2040	2040	220	6	0	0	22	1	40	2	.3865	85.03	1	1	0	1	85.03
21	2	3	1403	1403	500	6	0	0	0	1	403	1	.	.	2	0	0	1	.

APPENDIX 17. ADULT EQUIVALENT FILE

HHID	aecal1*	aecal2	aecal3
21	1.18	.959	.339
22	.871	.924	.410
23	.718	.888	.482
24	.838	1.106	.871

*There will be as many variables in the data as there are maximum numbers of household members.

APPENDIX 18. POPULATION DISTRIBUTION (PROPORTIONS) BY AGE AND SEX FOR SELECTED COUNTRIES, 1997

COUNTRY	SEX	AGE IN YEARS																				Total Population
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18-29	30-59	60+	
Afghanistan	Male	.038	.034	.032	.031	.030	.030	.029	.028	.027	.027	.025	.025	.024	.023	.023	.022	.022	.021	.209	.255	.046	12,223,573
	Female	.038	.035	.033	.032	.030	.031	.029	.029	.028	.027	.026	.025	.025	.024	.023	.023	.022	.021	.208	.248	.044	11,514,512
Albania	Male	.023	.023	.023	.023	.024	.025	.026	.025	.025	.025	.024	.024	.024	.024	.023	.023	.022	.021	.167	.323	.084	1,580,997
	Female	.019	.019	.020	.020	.020	.021	.022	.022	.022	.021	.021	.021	.021	.020	.020	.019	.018	.019	.204	.335	.096	1,712,255
Algeria	Male	.027	.027	.026	.026	.026	.026	.026	.026	.025	.025	.024	.027	.028	.027	.026	.025	.024	.023	.226	.254	.054	15,067,956
	Female	.027	.026	.026	.026	.026	.026	.025	.025	.025	.025	.024	.027	.027	.027	.026	.025	.024	.023	.223	.257	.062	14,762,414
Angola	Male	.040	.036	.035	.034	.033	.032	.031	.030	.029	.028	.026	.025	.024	.023	.022	.021	.021	.019	.194	.251	.043	5,317,767
	Female	.039	.036	.035	.034	.032	.032	.031	.030	.028	.027	.026	.025	.024	.023	.022	.021	.021	.020	.200	.243	.051	5,231,080
Argentina	Male	.020	.020	.020	.019	.019	.019	.019	.019	.019	.019	.019	.019	.018	.018	.018	.019	.019	.020	.196	.342	.120	17,679,895
	Female	.019	.019	.019	.018	.018	.018	.018	.018	.018	.018	.018	.017	.017	.017	.017	.018	.018	.019	.187	.335	.155	18,117,641
Armenia	Male	.017	.016	.015	.015	.017	.019	.021	.021	.021	.021	.021	.022	.022	.021	.020	.019	.019	.019	.196	.352	.107	1,694,695
	Female	.015	.014	.014	.014	.015	.018	.019	.019	.019	.019	.019	.020	.020	.019	.018	.018	.017	.017	.179	.370	.135	1,770,916
Azerbaijan	Male	.022	.021	.021	.022	.022	.024	.024	.024	.023	.023	.023	.023	.023	.022	.020	.020	.020	.019	.214	.308	.084	3,770,958
	Female	.020	.020	.020	.020	.020	.022	.022	.022	.021	.020	.021	.021	.020	.019	.018	.018	.018	.017	.193	.334	.115	3,964,960
Bangladesh	Male	.028	.026	.026	.025	.026	.026	.026	.025	.025	.025	.024	.024	.025	.025	.025	.025	.024	.023	.222	.273	.054	64,360,139
	Female	.028	.027	.026	.026	.026	.026	.026	.026	.025	.025	.024	.024	.025	.025	.025	.025	.025	.023	.227	.268	.049	60,980,122
Belarus	Male	.013	.013	.012	.012	.013	.014	.015	.016	.017	.017	.017	.018	.017	.018	.017	.016	.016	.016	.181	.405	.136	4,914,444
	Female	.011	.011	.011	.011	.011	.012	.012	.013	.014	.014	.015	.015	.015	.015	.015	.014	.014	.014	.161	.383	.220	5,525,472
Belgium	Male	.013	.012	.012	.012	.013	.013	.013	.013	.013	.012	.012	.012	.012	.012	.012	.013	.013	.013	.163	.425	.187	4,991,829
	Female	.011	.011	.011	.011	.012	.012	.012	.012	.012	.011	.011	.011	.011	.011	.011	.012	.012	.012	.152	.399	.244	5,211,854
Benin	Male	.044	.041	.039	.037	.036	.035	.034	.033	.031	.030	.029	.028	.027	.026	.025	.024	.023	.022	.215	.189	.033	2,882,399
	Female	.041	.038	.037	.035	.034	.033	.032	.031	.030	.028	.027	.026	.025	.024	.024	.023	.022	.021	.200	.225	.041	3,019,779
Bhutan	Male	.035	.032	.031	.030	.029	.028	.027	.027	.026	.025	.024	.023	.023	.022	.021	.021	.020	.020	.202	.272	.062	961,767
	Female	.035	.032	.031	.030	.029	.028	.027	.026	.025	.024	.024	.023	.022	.021	.021	.020	.020	.019	.201	.278	.064	903,424
Bolivia	Male	.032	.030	.029	.029	.028	.028	.027	.027	.027	.026	.026	.025	.025	.024	.024	.023	.023	.022	.207	.257	.059	3,783,842
	Female	.030	.029	.028	.027	.027	.027	.026	.026	.026	.025	.025	.024	.024	.023	.023	.022	.022	.021	.208	.270	.068	3,886,026
Bosnia and Herzegovina	Male	.007	.006	.006	.007	.008	.011	.015	.016	.017	.018	.018	.018	.018	.018	.018	.018	.019	.018	.173	.392	.178	1,275,669
	Female	.006	.006	.006	.006	.007	.008	.013	.014	.015	.015	.015	.015	.016	.016	.016	.016	.017	.017	.140	.421	.216	1,332,065

Botswana	Male	.033	.032	.031	.031	.031	.030	.030	.028	.028	.028	.028	.028	.028	.027	.027	.026	.026	.025	.227	.211	.045	726,402
	Female	.030	.029	.029	.028	.028	.028	.027	.026	.026	.026	.026	.025	.025	.025	.025	.024	.024	.023	.227	.237	.062	774,363
Brazil	Male	.020	.020	.020	.020	.020	.019	.019	.020	.021	.022	.022	.021	.021	.021	.022	.023	.022	.022	.235	.329	.062	81,417,819
	Female	.019	.019	.019	.019	.019	.018	.018	.019	.020	.021	.020	.020	.019	.020	.021	.021	.021	.021	.226	.337	.084	83,093,547
Bulgaria	Male	.009	.009	.009	.010	.011	.011	.012	.012	.013	.013	.013	.014	.014	.013	.014	.014	.014	.015	.186	.402	.191	4,239,177
	Female	.008	.008	.008	.009	.010	.010	.011	.011	.012	.012	.012	.012	.012	.012	.013	.013	.013	.013	.172	.394	.232	4,413,568
Burkina Faso	Male	.044	.041	.039	.037	.036	.035	.034	.033	.032	.031	.029	.028	.027	.026	.025	.024	.023	.023	.207	.181	.043	5,298,042
	Female	.041	.038	.036	.035	.033	.033	.032	.031	.030	.029	.028	.027	.026	.025	.024	.023	.022	.021	.196	.219	.053	5,593,117
Burma	Male	.028	.027	.027	.026	.026	.026	.025	.025	.024	.024	.024	.023	.023	.022	.022	.022	.021	.021	.217	.290	.058	23,495,319
	Female	.027	.026	.026	.026	.025	.025	.024	.024	.024	.023	.023	.022	.022	.022	.021	.021	.020	.020	.211	.298	.069	23,326,624
Burundi	Male	.040	.038	.037	.035	.034	.033	.033	.032	.031	.030	.029	.028	.027	.026	.025	.024	.023	.022	.196	.223	.034	2,978,722
	Female	.038	.036	.036	.034	.033	.032	.032	.031	.030	.029	.028	.027	.026	.025	.024	.023	.022	.021	.188	.235	.049	3,073,892
Cambodia	Male	.042	.039	.037	.036	.035	.034	.033	.032	.031	.029	.028	.027	.026	.025	.024	.023	.022	.020	.198	.220	.039	5,385,225
	Female	.037	.035	.034	.033	.031	.031	.030	.029	.028	.027	.026	.025	.024	.023	.022	.021	.020	.018	.183	.271	.054	5,778,636
Cameroon	Male	.040	.038	.036	.035	.034	.033	.032	.030	.029	.028	.027	.027	.026	.025	.024	.023	.022	.022	.192	.231	.048	7,320,234
	Female	.039	.037	.035	.034	.033	.032	.031	.030	.029	.028	.027	.026	.025	.025	.024	.023	.022	.022	.190	.232	.055	7,357,276
Cape Verde	Male	.036	.035	.035	.035	.034	.034	.034	.033	.033	.032	.031	.030	.029	.027	.026	.025	.024	.020	.179	.198	.070	188,871
	Female	.032	.032	.032	.032	.031	.031	.031	.030	.030	.029	.028	.027	.026	.025	.024	.022	.021	.018	.173	.230	.098	204,972
Central African Republic	Male	.037	.035	.033	.032	.032	.031	.030	.030	.029	.028	.028	.027	.026	.025	.024	.024	.023	.022	.205	.230	.050	1,651,857
	Female	.036	.033	.032	.031	.030	.030	.029	.029	.028	.028	.027	.026	.025	.024	.024	.023	.022	.021	.200	.243	.058	1,690,194
Chad	Male	.041	.038	.036	.034	.033	.031	.030	.029	.028	.027	.026	.025	.025	.023	.023	.022	.021	.021	.196	.247	.044	3,536,034
	Female	.039	.036	.035	.033	.032	.030	.029	.028	.027	.026	.025	.025	.024	.023	.022	.021	.021	.020	.198	.252	.053	3,629,989
Chile	Male	.018	.018	.018	.019	.020	.020	.020	.021	.021	.020	.019	.018	.018	.018	.018	.020	.019	.018	.200	.369	.087	7,157,848
	Female	.017	.018	.018	.019	.019	.020	.020	.019	.020	.019	.018	.018	.018	.018	.018	.019	.018	.017	.190	.368	.112	7,350,320
China Mainland	Male	.017	.017	.017	.017	.017	.017	.018	.019	.019	.020	.020	.018	.016	.016	.017	.018	.015	.016	.224	.373	.090	629,862,051
	Female	.016	.016	.016	.016	.016	.016	.017	.018	.018	.019	.020	.017	.016	.015	.016	.018	.015	.016	.225	.370	.104	591,729,727
Colombia	Male	.021	.021	.021	.021	.022	.022	.022	.022	.022	.022	.022	.022	.021	.021	.021	.020	.019	.019	.230	.325	.063	18,485,758
	Female	.020	.020	.020	.020	.021	.021	.021	.021	.021	.021	.021	.021	.020	.020	.020	.019	.019	.018	.221	.340	.076	18,932,532
Comoros	Male	.043	.041	.039	.037	.036	.035	.033	.032	.031	.029	.028	.027	.026	.025	.024	.023	.022	.022	.209	.198	.041	293,115
	Female	.042	.040	.038	.037	.035	.034	.033	.031	.030	.029	.028	.026	.025	.024	.024	.023	.022	.021	.201	.215	.043	296,682
Congo	Male	.037	.034	.033	.031	.031	.030	.029	.029	.028	.027	.027	.026	.026	.025	.027	.026	.025	.024	.220	.222	.044	1,270,882
	Female	.035	.033	.031	.030	.029	.029	.028	.028	.027	.026	.025	.025	.024	.024	.026	.025	.024	.023	.214	.233	.060	1,312,316
Costa Rica	Male	.023	.023	.023	.023	.023	.023	.023	.023	.023	.023	.023	.023	.022	.022	.022	.021	.020	.020	.213	.315	.067	1,787,974
	Female	.023	.023	.023	.023	.023	.023	.023	.023	.023	.023	.023	.022	.021	.021	.021	.020	.019	.019	.206	.323	.076	1,746,200
Côte d'Ivoire	Male	.039	.036	.035	.034	.033	.032	.031	.031	.030	.029	.029	.028	.027	.026	.025	.024	.023	.022	.201	.230	.036	7,630,421
	Female	.040	.037	.036	.035	.034	.033	.032	.032	.031	.030	.029	.028	.027	.026	.026	.025	.024	.023	.202	.216	.035	7,355,797
Croatia	Male	.010	.010	.011	.011	.011	.011	.012	.013	.013	.013	.013	.013	.014	.014	.014	.014	.014	.015	.176	.435	.164	2,449,551
	Female	.009	.009	.009	.010	.010	.010	.011	.011	.011	.012	.012	.012	.012	.013	.013	.013	.013	.013	.162	.405	.229	2,577,444

Cuba	Male	.013	.014	.014	.014	.014	.015	.017	.017	.017	.017	.016	.016	.016	.015	.015	.013	.011	.011	.220	.394	.122	5,509,856
	Female	.013	.013	.013	.013	.014	.014	.016	.016	.016	.016	.015	.015	.015	.014	.014	.013	.011	.011	.212	.402	.136	5,489,185
Djibouti	Male	.038	.035	.033	.032	.030	.029	.028	.027	.026	.025	.024	.024	.024	.020	.020	.021	.021	.021	.192	.285	.046	224,091
	Female	.040	.037	.035	.034	.032	.031	.030	.029	.028	.027	.026	.025	.025	.021	.022	.022	.022	.022	.198	.251	.044	210,025
Dominican Republic	Male	.022	.022	.022	.022	.023	.023	.023	.023	.023	.023	.023	.022	.022	.022	.021	.021	.021	.020	.226	.316	.060	4,168,603
	Female	.022	.022	.022	.022	.022	.023	.023	.023	.023	.023	.023	.022	.022	.022	.021	.021	.021	.020	.225	.312	.067	4,059,548
Ecuador	Male	.024	.024	.025	.026	.026	.027	.026	.026	.026	.025	.025	.024	.024	.023	.023	.023	.022	.022	.223	.276	.060	6,029,971
	Female	.023	.023	.024	.025	.025	.026	.025	.025	.025	.024	.024	.023	.023	.022	.022	.022	.022	.021	.226	.285	.067	6,075,153
Egypt	Male	.027	.026	.026	.025	.025	.025	.025	.025	.025	.025	.025	.023	.023	.023	.022	.022	.022	.021	.225	.288	.053	32,747,611
	Female	.026	.025	.025	.025	.024	.024	.024	.024	.024	.024	.025	.023	.023	.022	.022	.022	.022	.021	.212	.299	.064	32,076,855
El Salvador	Male	.028	.028	.027	.027	.027	.027	.027	.027	.026	.026	.025	.025	.025	.025	.024	.024	.024	.024	.219	.247	.069	2,755,845
	Female	.025	.025	.025	.025	.025	.024	.024	.024	.024	.023	.023	.023	.023	.022	.022	.022	.022	.022	.224	.274	.077	2,905,982
Equatorial Guinea	Male	.038	.035	.034	.033	.032	.031	.031	.030	.029	.028	.027	.026	.025	.024	.023	.023	.022	.021	.209	.224	.056	214,844
	Female	.035	.033	.032	.031	.030	.029	.029	.028	.027	.026	.025	.024	.023	.023	.022	.021	.021	.020	.196	.260	.063	227,672
Eritrea	Male	.040	.036	.033	.032	.030	.029	.028	.028	.028	.027	.026	.026	.025	.022	.025	.025	.025	.024	.231	.212	.049	1,800,522
	Female	.040	.036	.034	.032	.030	.029	.028	.028	.027	.027	.026	.025	.025	.022	.024	.024	.024	.024	.216	.234	.047	1,789,165
Estonia	Male	.012	.011	.011	.011	.012	.013	.014	.016	.017	.017	.017	.016	.016	.016	.016	.016	.016	.015	.189	.402	.147	673,194
	Female	.010	.009	.009	.009	.010	.011	.012	.013	.014	.014	.014	.014	.014	.014	.014	.013	.013	.013	.156	.390	.234	771,527
Ethiopia	Male	.042	.038	.036	.035	.033	.032	.031	.030	.029	.028	.027	.025	.023	.024	.024	.023	.022	.021	.198	.236	.042	29,405,683
	Female	.041	.038	.036	.035	.033	.032	.031	.030	.029	.028	.027	.025	.023	.024	.024	.023	.022	.021	.196	.232	.047	29,326,894
Fiji	Male	.023	.023	.023	.023	.023	.023	.023	.024	.024	.024	.024	.024	.024	.024	.024	.024	.023	.023	.211	.314	.052	398,433
	Female	.022	.022	.022	.022	.022	.023	.023	.023	.023	.023	.023	.023	.023	.023	.023	.023	.022	.022	.206	.328	.056	394,008
Gabon	Male	.026	.025	.024	.024	.023	.023	.022	.022	.022	.021	.021	.021	.020	.020	.020	.019	.019	.019	.191	.328	.090	599,291
	Female	.026	.025	.024	.024	.024	.023	.023	.022	.022	.022	.021	.021	.020	.020	.020	.020	.019	.019	.195	.321	.089	590,868
The Gambia	Male	.041	.039	.037	.035	.034	.033	.032	.030	.029	.028	.027	.026	.024	.023	.023	.022	.021	.020	.193	.239	.045	622,844
	Female	.041	.038	.036	.035	.034	.033	.031	.030	.029	.028	.026	.025	.024	.023	.022	.022	.021	.020	.197	.244	.040	625,241
Gaza Strip	Male	.049	.046	.044	.043	.041	.040	.038	.035	.032	.029	.027	.025	.025	.025	.024	.023	.022	.021	.193	.183	.035	499,002
	Female	.047	.045	.043	.042	.040	.039	.037	.034	.031	.029	.027	.025	.024	.024	.023	.022	.021	.020	.181	.198	.050	488,867
Georgia	Male	.014	.013	.012	.012	.013	.015	.017	.018	.017	.017	.018	.018	.018	.018	.017	.017	.017	.017	.197	.370	.145	2,445,260
	Female	.012	.011	.010	.010	.011	.013	.015	.015	.015	.015	.015	.016	.016	.015	.015	.015	.015	.015	.168	.383	.201	2,729,382
Ghana	Male	.033	.032	.031	.031	.031	.031	.031	.030	.029	.029	.028	.028	.026	.025	.023	.021	.020	.020	.214	.239	.048	8,972,930
	Female	.032	.031	.031	.030	.030	.030	.030	.029	.029	.028	.028	.027	.026	.024	.022	.021	.020	.020	.213	.249	.051	9,127,773
Guadeloupe	Male	.018	.018	.018	.018	.018	.019	.019	.019	.018	.017	.016	.016	.016	.016	.016	.016	.017	.017	.238	.348	.102	202,608
	Female	.016	.016	.016	.016	.017	.017	.017	.018	.017	.016	.015	.015	.015	.016	.016	.015	.016	.016	.225	.353	.130	209,215
Guatemala	Male	.032	.032	.031	.031	.030	.030	.030	.029	.029	.028	.028	.027	.026	.025	.024	.024	.023	.023	.214	.236	.051	5,816,751
	Female	.031	.031	.030	.030	.029	.029	.029	.028	.028	.027	.027	.026	.025	.024	.023	.023	.023	.022	.211	.247	.057	5,741,656
Guinea	Male	.039	.036	.034	.033	.032	.031	.030	.030	.029	.028	.027	.026	.025	.024	.024	.023	.022	.021	.203	.245	.039	3,637,064
	Female	.037	.035	.033	.032	.031	.031	.029	.029	.028	.027	.026	.025	.024	.023	.023	.022	.021	.020	.199	.254	.050	3,768,311
Guinea Bissau	Male	.037	.035	.033	.032	.031	.031	.030	.029	.028	.027	.027	.026	.025	.025	.024	.024	.023	.022	.221	.225	.044	571,760

	Female	.035	.032	.031	.030	.029	.029	.028	.027	.026	.026	.025	.024	.024	.023	.023	.022	.022	.021	.205	.267	.048	606,824
Guyana	Male	.018	.019	.019	.019	.020	.020	.021	.021	.022	.023	.023	.024	.024	.025	.025	.026	.025	.025	.248	.291	.061	354,882
	Female	.018	.018	.018	.019	.019	.020	.020	.021	.022	.022	.023	.023	.023	.024	.025	.025	.024	.024	.229	.312	.071	351,234
Haiti	Male	.032	.030	.029	.029	.029	.029	.030	.030	.031	.031	.031	.031	.029	.028	.027	.026	.024	.023	.201	.218	.063	3,254,586
	Female	.030	.028	.027	.027	.027	.028	.028	.029	.029	.029	.029	.029	.028	.027	.026	.025	.023	.021	.194	.255	.063	3,356,821
Honduras	Male	.032	.032	.031	.031	.031	.030	.030	.029	.028	.027	.027	.026	.026	.026	.025	.025	.024	.023	.222	.227	.049	2,880,644
	Female	.031	.030	.030	.030	.030	.029	.029	.028	.027	.026	.026	.026	.025	.025	.024	.024	.023	.023	.218	.243	.053	2,870,740
India	Male	.025	.024	.024	.024	.023	.023	.023	.024	.023	.023	.023	.022	.022	.022	.022	.021	.021	.021	.216	.306	.068	500,005,495
	Female	.025	.025	.025	.024	.024	.023	.023	.024	.024	.023	.023	.023	.022	.022	.021	.021	.020	.020	.212	.308	.070	466,777,676
Indonesia	Male	.023	.022	.022	.021	.021	.021	.021	.021	.021	.021	.021	.020	.021	.021	.022	.022	.022	.022	.233	.325	.058	104,696,028
	Female	.022	.021	.021	.021	.021	.021	.020	.020	.020	.020	.020	.020	.020	.021	.021	.021	.021	.021	.229	.329	.071	105,078,110
Iraq	Male	.041	.039	.037	.036	.035	.034	.034	.033	.031	.029	.028	.027	.026	.025	.024	.023	.023	.022	.218	.197	.040	11,233,719
	Female	.040	.038	.037	.036	.034	.033	.033	.032	.030	.029	.028	.026	.025	.025	.024	.023	.023	.022	.211	.203	.046	10,985,570
Jamaica	Male	.022	.022	.023	.022	.022	.022	.022	.022	.021	.021	.022	.022	.022	.022	.022	.021	.020	.020	.239	.288	.083	1,300,893
	Female	.021	.021	.021	.021	.021	.021	.021	.021	.020	.020	.021	.021	.021	.021	.021	.020	.019	.019	.230	.301	.100	1,314,689
Kazakstan	Male	.019	.019	.019	.019	.020	.021	.021	.022	.022	.023	.023	.023	.022	.021	.020	.020	.019	.019	.209	.344	.077	8,146,209
	Female	.017	.017	.016	.016	.017	.018	.019	.019	.020	.021	.021	.021	.020	.019	.018	.018	.018	.017	.188	.350	.129	8,752,363
Kenya	Male	.031	.031	.031	.030	.030	.029	.030	.030	.030	.030	.030	.029	.028	.028	.027	.026	.025	.025	.230	.212	.037	14,426,891
	Female	.031	.030	.030	.029	.029	.029	.029	.029	.029	.029	.029	.029	.028	.027	.027	.026	.025	.024	.224	.220	.045	14,376,194
Kyrgyzstan	Male	.025	.024	.024	.024	.025	.027	.027	.027	.027	.027	.027	.026	.025	.024	.023	.022	.021	.020	.213	.272	.072	2,215,507
	Female	.023	.023	.023	.022	.024	.025	.025	.025	.025	.025	.025	.024	.023	.022	.021	.021	.020	.019	.199	.282	.106	2,324,678
Laos	Male	.039	.037	.036	.035	.034	.033	.032	.031	.030	.029	.028	.027	.026	.025	.024	.023	.022	.022	.204	.218	.047	2,527,748
	Female	.037	.035	.034	.033	.032	.031	.031	.030	.029	.028	.027	.026	.024	.023	.023	.022	.021	.021	.200	.241	.054	2,589,211
Latvia	Male	.012	.011	.011	.011	.012	.014	.015	.016	.017	.017	.017	.017	.017	.017	.017	.015	.015	.015	.178	.407	.149	1,123,120
	Female	.010	.009	.009	.009	.010	.011	.012	.013	.013	.014	.014	.014	.014	.014	.014	.013	.012	.012	.147	.393	.242	1,314,529
Lebanon	Male	.023	.022	.022	.022	.021	.021	.020	.020	.020	.020	.020	.021	.021	.022	.022	.023	.023	.024	.285	.238	.089	1,668,581
	Female	.021	.020	.020	.019	.019	.019	.018	.018	.018	.018	.018	.019	.019	.019	.020	.020	.021	.022	.260	.294	.095	1,780,997
Lesotho	Male	.031	.030	.029	.029	.029	.028	.028	.028	.028	.027	.027	.027	.026	.025	.025	.024	.024	.023	.217	.237	.058	980,040
	Female	.029	.028	.028	.027	.027	.027	.027	.026	.026	.026	.026	.025	.025	.024	.024	.023	.022	.022	.205	.256	.075	1,027,774
Liberia	Male	.038	.037	.035	.033	.033	.031	.033	.028	.029	.027	.026	.024	.025	.024	.022	.021	.020	.020	.192	.253	.051	1,318,162
	Female	.039	.037	.035	.034	.033	.032	.033	.028	.030	.028	.026	.024	.025	.024	.023	.022	.020	.021	.196	.237	.053	1,283,906
Lithuania	Male	.014	.013	.013	.013	.014	.015	.016	.016	.016	.017	.017	.017	.017	.017	.016	.015	.015	.015	.189	.396	.138	1,712,193
	Female	.012	.011	.011	.011	.012	.013	.014	.014	.014	.014	.015	.015	.015	.014	.014	.013	.013	.013	.161	.387	.214	1,923,739
Macedonia (former Yugo.)	Male	.013	.013	.013	.014	.015	.016	.015	.014	.015	.015	.016	.016	.016	.016	.016	.016	.017	.016	.185	.407	.135	1,066,660
	Female	.013	.012	.013	.013	.014	.015	.014	.014	.014	.015	.015	.015	.016	.016	.016	.016	.016	.016	.177	.399	.161	1,047,206
Madagascar	Male	.040	.037	.035	.034	.033	.032	.031	.030	.029	.028	.027	.026	.025	.024	.024	.023	.022	.021	.204	.228	.048	7,025,577
	Female	.039	.036	.035	.033	.032	.031	.030	.029	.028	.027	.026	.025	.025	.024	.023	.022	.022	.021	.201	.239	.052	7,036,050
Malawi	Male	.038	.035	.033	.033	.032	.032	.031	.031	.030	.030	.029	.029	.028	.027	.027	.026	.025	.024	.223	.200	.037	4,750,059
	Female	.036	.034	.032	.032	.031	.031	.030	.030	.029	.029	.028	.028	.027	.026	.026	.025	.024	.023	.208	.221	.049	4,859,022

Malaysia	Male	.027	.027	.026	.026	.026	.025	.025	.024	.024	.024	.024	.024	.023	.022	.021	.021	.020	.018	.209	.309	.055	10,280,096
	Female	.026	.025	.025	.025	.025	.024	.023	.023	.023	.023	.023	.023	.022	.021	.021	.020	.020	.017	.203	.320	.068	10,211,207
Mali	Male	.049	.044	.040	.038	.036	.034	.033	.031	.030	.029	.027	.026	.025	.025	.024	.024	.023	.022	.197	.193	.049	4,833,839
	Female	.045	.041	.038	.036	.034	.032	.031	.030	.029	.028	.026	.025	.024	.024	.023	.023	.022	.021	.190	.227	.051	5,111,544
Martinique	Male	.017	.017	.017	.016	.016	.016	.016	.016	.016	.016	.015	.015	.015	.015	.014	.015	.015	.016	.238	.361	.117	197,296
	Female	.016	.016	.016	.015	.015	.015	.015	.015	.015	.015	.015	.014	.014	.013	.013	.013	.014	.015	.221	.365	.149	205,688
Mauritania	Male	.045	.042	.039	.038	.036	.035	.034	.032	.031	.030	.029	.027	.026	.025	.024	.024	.023	.022	.202	.205	.032	1,188,141
	Female	.042	.039	.038	.036	.035	.034	.033	.031	.030	.029	.028	.027	.026	.025	.024	.023	.022	.021	.199	.219	.041	1,223,176
Mauritius	Male	.019	.019	.019	.019	.019	.020	.019	.019	.018	.017	.017	.016	.017	.017	.018	.021	.021	.021	.207	.382	.075	570,904
	Female	.018	.018	.018	.018	.019	.018	.018	.018	.017	.016	.016	.015	.016	.016	.017	.020	.020	.020	.197	.383	.099	583,368
Mexico	Male	.026	.026	.026	.026	.025	.025	.025	.025	.025	.024	.024	.024	.024	.023	.023	.023	.023	.022	.233	.266	.062	48,072,941
	Female	.024	.024	.024	.024	.024	.024	.024	.023	.023	.023	.023	.022	.022	.022	.022	.022	.022	.021	.228	.289	.070	49,490,433
Moldova	Male	.017	.016	.015	.015	.016	.017	.018	.019	.020	.020	.021	.021	.021	.020	.020	.018	.018	.018	.189	.370	.112	2,134,589
	Female	.015	.014	.014	.013	.014	.015	.015	.016	.017	.018	.019	.019	.018	.018	.017	.016	.016	.016	.169	.379	.160	2,340,643
Mongolia	Male	.024	.024	.024	.024	.024	.025	.027	.028	.028	.028	.027	.026	.025	.024	.023	.023	.022	.022	.233	.268	.049	1,269,575
	Female	.023	.023	.023	.023	.023	.024	.026	.027	.027	.027	.027	.026	.025	.024	.023	.022	.022	.022	.229	.272	.062	1,268,636
Mozambique	Male	.042	.039	.037	.035	.033	.031	.029	.028	.027	.027	.026	.026	.025	.025	.024	.023	.023	.021	.222	.224	.034	8,873,787
	Female	.039	.037	.035	.034	.033	.031	.029	.028	.027	.027	.026	.026	.025	.025	.024	.023	.023	.021	.202	.243	.043	9,291,689
Namibia	Male	.036	.035	.034	.033	.032	.031	.030	.029	.028	.028	.027	.027	.026	.026	.025	.024	.023	.022	.208	.228	.050	852,424
	Female	.034	.033	.032	.031	.030	.029	.028	.027	.027	.026	.026	.026	.025	.024	.024	.023	.022	.022	.210	.239	.060	874,759
Nepal	Male	.035	.033	.031	.030	.030	.029	.028	.028	.027	.026	.026	.025	.025	.024	.024	.024	.023	.022	.210	.252	.048	11,548,384
	Female	.034	.032	.031	.030	.029	.029	.028	.028	.027	.026	.026	.025	.025	.024	.024	.023	.023	.022	.208	.256	.049	11,092,677
Nicaragua	Male	.033	.032	.032	.032	.031	.031	.030	.030	.029	.029	.028	.028	.027	.027	.026	.025	.024	.023	.219	.224	.038	2,162,353
	Female	.031	.030	.030	.030	.030	.030	.029	.029	.028	.028	.027	.027	.027	.026	.025	.025	.024	.023	.219	.236	.046	2,224,046
Niger	Male	.050	.045	.040	.038	.036	.034	.033	.031	.030	.028	.027	.026	.025	.024	.024	.023	.022	.021	.193	.211	.041	4,694,658
	Female	.049	.043	.039	.036	.034	.032	.031	.030	.028	.027	.026	.025	.024	.023	.022	.021	.021	.020	.203	.229	.036	4,694,201
Nigeria	Male	.040	.037	.035	.034	.032	.031	.030	.029	.028	.027	.026	.025	.024	.024	.023	.023	.022	.021	.196	.246	.047	54,217,739
	Female	.040	.038	.036	.034	.033	.032	.031	.030	.029	.027	.026	.025	.025	.024	.024	.023	.022	.021	.197	.237	.047	52,911,730
North Korea	Male	.023	.023	.023	.022	.022	.022	.021	.021	.020	.019	.019	.018	.018	.018	.017	.017	.017	.017	.240	.352	.052	12,042,483
	Female	.021	.021	.021	.021	.021	.021	.020	.019	.019	.018	.018	.017	.017	.017	.016	.016	.016	.016	.230	.351	.084	12,274,521
Panama	Male	.022	.022	.021	.022	.022	.022	.023	.022	.022	.022	.022	.022	.021	.021	.020	.020	.020	.019	.225	.313	.078	1,363,852
	Female	.022	.021	.021	.021	.022	.022	.022	.022	.022	.021	.021	.021	.021	.020	.020	.020	.019	.019	.223	.315	.083	1,329,565
Papua New Guinea	Male	.031	.030	.029	.028	.028	.027	.027	.026	.026	.025	.025	.024	.024	.024	.023	.023	.023	.022	.231	.261	.044	2,320,792
	Female	.031	.030	.029	.029	.028	.028	.027	.026	.026	.026	.025	.025	.024	.024	.024	.023	.023	.023	.224	.253	.052	2,175,429
Paraguay	Male	.030	.030	.029	.029	.029	.028	.028	.027	.027	.026	.026	.026	.025	.025	.024	.023	.022	.021	.201	.268	.056	2,844,648
	Female	.029	.029	.028	.028	.028	.027	.027	.027	.026	.026	.025	.025	.024	.024	.023	.023	.022	.021	.200	.274	.065	2,806,986
Peru	Male	.023	.023	.023	.023	.024	.024	.023	.023	.023	.023	.023	.023	.023	.023	.023	.023	.022	.022	.227	.296	.064	12,552,649
	Female	.023	.022	.022	.023	.023	.023	.023	.023	.023	.023	.022	.022	.022	.022	.023	.023	.021	.021	.224	.298	.074	12,396,863
Philippines	Male	.029	.028	.028	.028	.028	.027	.027	.026	.025	.025	.024	.024	.023	.023	.023	.023	.022	.022	.223	.272	.050	37,869,476

	Female	.027	.027	.027	.027	.026	.026	.026	.025	.024	.024	.023	.023	.022	.022	.022	.022	.022	.021	.218	.286	.059	38,234,088
Reunion	Male	.024	.024	.024	.024	.024	.024	.024	.023	.023	.022	.021	.020	.020	.019	.018	.018	.017	.017	.218	.322	.073	341,978
	Female	.022	.023	.023	.023	.023	.022	.022	.022	.021	.020	.020	.019	.018	.017	.017	.016	.016	.016	.212	.333	.095	350,226
Romania	Male	.010	.010	.010	.011	.011	.012	.012	.015	.016	.016	.017	.016	.016	.015	.015	.016	.017	.018	.211	.372	.165	10,437,409
	Female	.009	.009	.009	.010	.010	.010	.011	.013	.015	.015	.015	.015	.014	.013	.013	.015	.016	.016	.194	.368	.208	10,961,705
Russia	Male	.011	.011	.011	.011	.011	.013	.014	.016	.017	.018	.018	.018	.018	.018	.018	.017	.016	.016	.185	.421	.121	69,197,422
	Female	.009	.009	.009	.009	.010	.011	.012	.013	.014	.015	.016	.015	.015	.015	.015	.014	.014	.014	.159	.399	.212	78,789,679
Rwanda	Male	.035	.034	.030	.029	.028	.030	.031	.032	.031	.031	.031	.030	.029	.030	.029	.028	.026	.024	.210	.214	.036	3,835,879
	Female	.034	.033	.029	.029	.028	.030	.030	.031	.030	.030	.030	.029	.029	.029	.029	.028	.026	.024	.203	.219	.049	3,901,658
Senegal	Male	.044	.041	.039	.038	.036	.035	.034	.033	.031	.030	.029	.028	.026	.025	.024	.023	.022	.021	.190	.207	.044	4,580,770
	Female	.041	.039	.037	.036	.035	.033	.032	.031	.030	.029	.028	.027	.026	.024	.023	.022	.021	.020	.194	.229	.043	4,822,776
Serbia	Male	.014	.014	.014	.014	.013	.014	.014	.015	.015	.015	.015	.015	.016	.016	.016	.015	.016	.016	.183	.388	.161	4,969,668
	Female	.013	.013	.013	.013	.012	.013	.013	.013	.014	.014	.014	.014	.014	.014	.014	.014	.015	.015	.170	.380	.204	5,047,726
Sierra Leone	Male	.043	.039	.037	.036	.034	.033	.031	.030	.028	.027	.026	.025	.024	.023	.022	.021	.020	.020	.201	.229	.052	2,377,218
	Female	.041	.038	.036	.035	.034	.032	.030	.029	.028	.026	.025	.025	.023	.022	.022	.021	.020	.020	.203	.241	.049	2,514,328

Slovakia	Male	.013	.013	.013	.013	.014	.014	.015	.015	.015	.016	.016	.017	.017	.017	.017	.017	.018	.018	.199	.394	.127	2,625,227
	Female	.012	.012	.012	.012	.013	.013	.014	.014	.014	.014	.015	.015	.015	.016	.016	.016	.016	.017	.182	.385	.179	2,767,789
Slovenia	Male	.009	.009	.009	.010	.010	.011	.011	.012	.013	.013	.013	.013	.014	.014	.015	.015	.016	.016	.185	.440	.152	944,720
	Female	.008	.008	.008	.009	.009	.010	.010	.011	.011	.012	.012	.012	.012	.013	.013	.014	.014	.014	.168	.411	.221	1,001,278
Solomon Islands	Male	.036	.035	.035	.034	.033	.032	.031	.030	.029	.029	.028	.027	.026	.025	.025	.024	.023	.023	.217	.213	.045	216,844
	Female	.036	.035	.034	.033	.033	.032	.031	.030	.029	.028	.028	.027	.026	.025	.025	.024	.023	.023	.216	.214	.046	210,011
Somalia	Male	.041	.036	.033	.030	.029	.031	.032	.032	.030	.027	.025	.024	.023	.023	.022	.021	.020	.019	.227	.234	.041	3,315,514
	Female	.041	.036	.033	.030	.029	.031	.032	.032	.031	.027	.025	.025	.024	.023	.023	.023	.021	.020	.205	.238	.050	3,274,811
South Africa	Male	.026	.026	.025	.025	.025	.024	.024	.023	.023	.023	.023	.023	.023	.022	.022	.022	.021	.021	.222	.300	.058	20,962,238
	Female	.025	.025	.024	.024	.024	.024	.023	.022	.022	.022	.022	.022	.022	.022	.021	.021	.021	.020	.213	.303	.078	21,365,220
Sri Lanka	Male	.018	.018	.018	.018	.018	.018	.018	.019	.019	.019	.019	.020	.020	.021	.021	.021	.022	.020	.222	.345	.088	9,348,019
	Female	.017	.017	.017	.017	.017	.017	.017	.018	.018	.018	.018	.019	.019	.020	.020	.020	.021	.019	.215	.366	.092	9,414,056
Sudan	Male	.038	.036	.035	.034	.033	.033	.032	.031	.028	.027	.028	.027	.026	.025	.024	.024	.023	.022	.212	.220	.041	16,519,468
	Female	.038	.036	.034	.034	.033	.032	.031	.030	.028	.027	.028	.027	.026	.025	.024	.023	.022	.021	.203	.244	.034	16,074,660
Suriname	Male	.023	.023	.023	.023	.023	.023	.023	.023	.023	.023	.022	.022	.022	.021	.021	.020	.020	.020	.232	.298	.071	215,238
	Female	.023	.023	.023	.023	.023	.023	.023	.023	.022	.022	.022	.021	.021	.020	.020	.019	.019	.019	.224	.303	.083	209,331
Swaziland	Male	.041	.038	.036	.035	.034	.033	.033	.031	.030	.029	.027	.026	.026	.025	.024	.024	.023	.022	.214	.214	.035	500,694
	Female	.038	.036	.034	.033	.032	.032	.031	.030	.028	.027	.026	.025	.025	.024	.023	.023	.022	.022	.208	.237	.043	530,906
Syria	Male	.037	.036	.036	.035	.034	.033	.032	.031	.030	.029	.028	.027	.027	.026	.025	.024	.024	.022	.211	.211	.043	8,248,230
	Female	.037	.036	.035	.035	.034	.033	.032	.031	.030	.029	.028	.027	.026	.026	.025	.024	.024	.022	.209	.213	.046	7,889,669
Tajikistan	Male	.032	.029	.028	.027	.027	.030	.033	.032	.030	.030	.030	.029	.027	.025	.024	.023	.021	.021	.208	.235	.059	2,987,232
	Female	.031	.029	.028	.027	.027	.029	.031	.030	.029	.029	.029	.028	.026	.024	.023	.022	.021	.020	.204	.240	.073	3,026,623
Tanzania	Male	.039	.036	.034	.033	.032	.031	.031	.030	.029	.028	.028	.027	.027	.026	.025	.025	.024	.024	.221	.209	.043	14,493,583
	Female	.037	.035	.033	.032	.031	.030	.030	.029	.028	.028	.027	.027	.026	.025	.025	.024	.024	.023	.213	.224	.048	14,967,170
Thailand	Male	.017	.017	.017	.017	.017	.017	.017	.017	.015	.015	.016	.017	.018	.019	.020	.020	.020	.020	.234	.366	.083	29,370,158
	Female	.016	.016	.016	.016	.016	.016	.016	.016	.014	.014	.015	.016	.017	.018	.019	.019	.019	.019	.227	.378	.097	30,080,660
Togo	Male	.044	.041	.039	.037	.036	.035	.034	.033	.031	.030	.029	.028	.027	.026	.025	.024	.023	.022	.204	.199	.033	2,330,105
	Female	.041	.039	.037	.036	.035	.034	.033	.032	.030	.029	.028	.027	.026	.025	.024	.023	.022	.021	.193	.228	.038	2,405,505
Trinidad & Tobago	Male	.015	.015	.016	.016	.017	.017	.017	.018	.019	.021	.022	.024	.024	.024	.024	.023	.021	.021	.185	.370	.090	577,591
	Female	.015	.016	.016	.017	.017	.018	.017	.018	.019	.021	.023	.024	.024	.023	.023	.023	.021	.020	.172	.364	.109	552,746
Tunisia	Male	.023	.023	.023	.023	.023	.022	.022	.021	.022	.023	.024	.024	.023	.022	.023	.023	.022	.021	.227	.285	.081	4,658,302
	Female	.022	.022	.022	.022	.022	.021	.021	.020	.021	.022	.023	.023	.023	.022	.022	.022	.022	.021	.224	.301	.081	4,524,795
Turkmenistan	Male	.028	.027	.027	.026	.027	.028	.028	.028	.028	.028	.028	.027	.026	.024	.023	.022	.021	.021	.217	.266	.051	2,083,239
	Female	.026	.025	.025	.024	.025	.026	.027	.027	.026	.026	.026	.026	.024	.023	.022	.021	.020	.020	.206	.280	.074	2,142,112
Uganda	Male	.042	.040	.039	.037	.036	.035	.034	.033	.032	.031	.030	.029	.027	.026	.025	.024	.023	.022	.200	.199	.036	10,309,459
	Female	.042	.040	.038	.037	.036	.035	.034	.033	.032	.031	.030	.029	.027	.026	.025	.024	.023	.021	.196	.203	.038	10,295,415
Ukraine	Male	.012	.012	.011	.011	.012	.013	.014	.014	.015	.016	.017	.017	.017	.017	.016	.016	.016	.016	.182	.408	.148	23,516,163
	Female	.010	.010	.009	.009	.010	.011	.011	.012	.013	.013	.014	.014	.014	.014	.014	.013	.013	.013	.154	.392	.235	27,168,472

Uruguay	Male	.018	.017	.017	.017	.017	.017	.017	.018	.017	.017	.017	.017	.015	.016	.017	.017	.018	.018	.196	.344	.152	1,590,527
	Female	.016	.016	.016	.016	.016	.016	.016	.016	.016	.015	.015	.015	.014	.015	.015	.016	.016	.016	.181	.347	.193	1,671,180
Uzbekistan	Male	.028	.027	.027	.026	.027	.028	.028	.028	.028	.028	.028	.027	.026	.024	.023	.022	.021	.021	.208	.266	.057	11,807,968
	Female	.027	.026	.026	.025	.026	.027	.027	.026	.026	.027	.027	.026	.025	.023	.022	.021	.020	.020	.203	.269	.079	12,052,484
Venezuela	Male	.024	.024	.024	.024	.024	.026	.026	.023	.023	.023	.022	.022	.022	.022	.022	.022	.021	.021	.222	.302	.060	11,298,958
	Female	.023	.023	.023	.023	.023	.024	.025	.022	.022	.022	.021	.021	.021	.021	.021	.021	.021	.021	.219	.314	.070	11,097,449
Vietnam	Male	.023	.023	.023	.024	.025	.026	.026	.027	.026	.024	.023	.025	.026	.026	.025	.023	.022	.022	.225	.274	.063	36,834,391
	Female	.021	.021	.021	.022	.023	.023	.024	.024	.023	.022	.021	.023	.024	.024	.023	.021	.020	.020	.215	.299	.086	38,289,489
West Bank	Male	.037	.037	.036	.036	.035	.035	.034	.032	.028	.027	.026	.025	.025	.024	.023	.023	.022	.022	.214	.221	.040	756,222
	Female	.036	.036	.035	.035	.034	.034	.033	.031	.028	.026	.025	.024	.024	.023	.022	.022	.021	.021	.201	.232	.057	739,461
Yemen	Male	.043	.040	.039	.037	.036	.034	.033	.033	.031	.030	.029	.027	.026	.025	.024	.023	.022	.021	.220	.190	.037	7,038,728
	Female	.042	.039	.038	.036	.035	.033	.032	.031	.029	.028	.027	.026	.025	.024	.023	.022	.022	.021	.207	.211	.050	6,933,749
Zaire	Male	.045	.041	.039	.037	.036	.034	.033	.032	.031	.030	.029	.028	.027	.025	.024	.023	.023	.022	.205	.202	.036	23,372,417
	Female	.043	.040	.037	.036	.034	.033	.032	.031	.030	.029	.028	.027	.026	.025	.024	.023	.022	.021	.200	.215	.046	24,067,945
Zambia	Male	.042	.039	.037	.036	.035	.034	.034	.033	.032	.032	.031	.030	.029	.028	.027	.026	.025	.025	.205	.183	.037	4,639,894
	Female	.040	.038	.036	.035	.034	.033	.033	.032	.031	.031	.030	.029	.028	.027	.026	.025	.024	.024	.198	.201	.042	4,710,081
Zimbabwe	Male	.031	.030	.029	.029	.029	.030	.030	.030	.031	.030	.030	.029	.028	.028	.027	.029	.027	.026	.238	.196	.042	5,682,082
	Female	.030	.029	.028	.028	.029	.029	.029	.030	.030	.030	.029	.029	.028	.027	.026	.029	.027	.026	.228	.216	.044	5,741,093

APPENDIX 19. SAMPLE CALCULATION OF WEIGHTED AVERAGE ADULT EQUIVALENT RATIOS FOR GUEST CATEGORIES

Steps:

1) Find proportional distribution of population by age and sex for country of interest in Appendix 17.
2) Calculate the population in each age/sex category by multiplying the proportion of the population in each age/sex category by the total population by sex (2,880,664 males and 2,870,740 females for Honduras).
3) Calculate daily caloric requirements for each age/sex category (see section I.B.).
4) Calculate the AER for each age/sex category (see section I.). The caloric requirement for an adult equivalent in Honduras is 2858.
5) Calculate the weight of each age/sex category within each guest age/sex category. Divide the population in each age/sex category by the total population in each guest age/sex category. For example, 10.3 percent (.103) of Honduran children 0-4 years old are one-year- old males (90,854/883,643).
6) Multiply the AER for each age/sex category by its weight, and sum for weighted average AER for each guest age/sex category.

		AGE IN YEARS																			
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18-29**	**30-59**	**60+**
Step 1																						
Proportion of population	Male	.032	.032	.031	.031	.031	.030	.030	.029	.028	.027	.027	.026	.026	.026	.025	.025	.024	.023	.222	.227	.049
	Female	.031	.030	.030	.030	.030	.029	.029	.028	.027	.026	.026	.026	.025	.025	.024	.024	.023	.023	.218	.243	.053
Step 2																						
Population	Male	92,513	90,854	89,857	89,057	88,184	87,252	85,419	82,724	80,065	78,280	77,018	75,759	74,620	73,550	72,397	70,968	69,282	67,368	639,578	654,668	141,231
	Female	88,661	87,321	86,458	85,760	84,978	84,138	82,444	79,925	77,429	75,778	74,473	73,327	72,305	71,345	70,256	68,857	67,178	65,234	624,980	696,697	153,196
Step 3																						
Caloric requirement	Male	772	1172	1410	1560	1690	1810	1822	1901	1948	2023	2062	2168	2199	2342	2414	2511	2713	2813	2843	2804	2309
	Female	712	1147	1310	1440	1540	1630	1619	1657	1711	1767	1770	1838	1912	1988	2130	2186	2270	2280	2091	2116	1890
Step 4																						
Adult equivalent ratio (AER)	Male	0.270	0.410	0.493	0.546	0.591	0.633	0.638	0.665	0.682	0.708	0.722	0.759	0.769	0.820	0.845	0.878	0.949	0.984	0.995	0.981	0.808
	Female	0.249	0.401	0.458	0.504	0.539	0.570	0.566	0.580	0.599	0.618	0.619	0.643	0.669	0.696	0.745	0.765	0.794	0.798	0.732	0.740	0.661
Step 5																						
Weight w/in guest category	Male	0.105	0.103	0.102	0.101	0.100	0.078	0.077	0.074	0.072	0.070	0.069	0.068	0.174	0.172	0.169	0.166	0.162	0.157	0.446	0.456	0.098
	Female	0.100	0.099	0.098	0.097	0.096	0.076	0.074	0.072	0.070	0.068	0.067	0.066	0.174	0.172	0.169	0.166	0.162	0.157	0.424	0.472	0.104
Step 6																						
Weighted average		0.445				(Children 0 - 4 yrs)	0.642					(Children 5 - 11 yrs)		0.872				(Males 12 - 17 yrs)		0.970		(Males 18+ years)
4AER by category														0.743				(Females 12 - 17 yrs)		0.728		(Females 18+ years)

APPENDIX 20. DIETARY FILE

HHID 1	Meal 3	Abst1* 2	18M 3	Dnum 8	Dish 9	Aecal1* 26	Totadeq 27	Abaeca1* 28	Gstcal1* 29	Tgstadeq 30	Dshadeq 31
21	1	1	0	1	1003	1.18	7.36	1.18	0	0	6.18
21	1	1	0	1	1003	1.18	7.36	1.18	0	0	6.18
21	1	1	1	2	1403	1.18	7.36	1.18	1.014	1.014	7.194
21	1	1	1	2	1403	1.18	7.36	1.18	1.014	1.014	7.194
21	1	1	1	2	1403	1.18	7.36	1.18	1.014	1.014	7.194
21	2	0	0	1	2170	0	7.36	0	0	0	7.36
21	2	0	0	1	2170	0	7.36	0	0	0	7.36
21	2	0	0	1	2170	0	7.36	0	0	0	7.36
21	2	0	0	2	2040	0	7.36	0	0	0	7.36
21	2	0	0	3	1403	0	7.36	0	0	0	7.36

*There will be as many variables as there are maximum number of members/guests in the data.

APPENDIX 21. COMMAND FILE CONTAINING NUTRITIONAL VALUE OF FOODS

(Taken from USAID, *Commodity Reference Guide*, Washington, D.C.USAID/FFP)

```
Do if (product = 90)
  Compute calcon = 3.8
  Compute prtcon = .18
  Compute vitacon = .6
  Compute fatcon = .06
end if.
```

APPENDIX 22. DIETARY FILE

HHID 1	Meal 2	Dnum 8	Dish 9	Linetyp 16	Product 17	Norecipe 22	Wgt1 25	Dshadeq 31	Calfact 32	Cal 33
21	1	1	1003	1	3	0	1051.34	6.18	2.037	.
21	1	1	1003	2	1	0	690.854	6.18	3.6	2487
21	1	2	1403	1	403	0	.	7.194	.	.
21	1	2	1403	2	403	0	.	7.194	.	.
21	1	2	1403	2	260	0	119.746	7.194	2.8333	339.276
21	2	1	2170	1	170	0	5	7.36	72	.
21	2	1	2170	2	170	0	5	7.36	72	360
21	2	1	2170	2	240	0	81.62	7.36	8.000	652.96
21	2	2	2040	1	40	1	85.03	7.36	1.60	.
21	2	3	1403	1	403	0	.	7.36	.	.

APPENDIX 23. AGGREGATED DIETARY FILE

(aggregated, case = dish)

HHID 1	Meal 2	Dish 3	Dshadeq 4	Dshcal 5	Dshcalae 6
21	1	1003	6.18	2487	402.427
21	1	1403	7.194	339.276	47.161
21	2	2170	7.36	1012.92	137.25
21	2	2040	7.36	.	.

APPENDIX 24. AGGREGATED DIETARY FILE

(aggregated, case = household)

HHID 1	Daycalae	Numdays
21	2816.33	3
22	2140	2
23	2948.33	3
24	1784	2

APPENDIX 25. AGGREGATED DIETARY FILE

(aggregated, case = Household)

HHID 1	Avecalae	Numdays	Caladeq	Calcat
21	2816.33	3	98.53	3
22	2140	2	74.88	2
23	2948.33	3	103.15	4
24	1784	2	62.42	2

APPENDIX 26. LIST OF TITLE II GENERIC INDICATORS

Category	Level	Indicator
Health, nutrition, and MCH	Impact	% stunted children 24-59 months (height/age Z-score)
		% underweight children by age group (weight/age Z-score)
		% infants breastfed w/in 8 hours of birth
		% infants under 6 months breastfed only
		% infants 6-10 months fed complementary foods
		% infants continuously fed during diarrhea
		% infants fed extra food for 2 weeks after diarrhea
	Annual monitoring	% eligible children in growth monitoring/promotion
		% children immunized for measles at 12 months
		% of communities with community health organizations
		% children in growth promotion program gaining weight in past 3 months (by gender)
Water and sanitation	Impact	% infants with diarrhea in last two weeks
		Liters of household water use per person
		% population with proper hand washing behavior
		% households with access to adequate sanitation (also annual monitoring)
	Annual monitoring	% households with year-round access to safe water
		% water/sanitation facilities maintained by community
Household food consumption	Impact	% households consuming minimum daily food requirements
		Number of meals/snacks eaten per day
		Number of different food/food groups eaten
Agricultural productivity	Impact	Annual yield of targeted crops
		Yield gaps (actual vs. potential)
		Yield variability under varying conditions
		Value of agricultural production per vulnerable household
		Months of household grain provisions
		% of crops lost to pests or environment
	Annual monitoring	Annual yield of targeted crops
		Number of hectares in which improved practices adopted
		Number of storage facilities built and used
Natural resource management	Impact	Imputed soil erosion
		Imputed soil fertility
		Yields or yield variability (also annual monitoring)
	Annual monitoring	Number of hectares in which NRM practices used
		Seedling/sapling survival rate
FFW/ CFW roads	Impact	Agriculture input price margins between areas
		Availability of key agriculture inputs
		Staple food transport costs by seasons
		Volume of agriculture produce transported by households to markets
		Volume of vehicle traffic by vehicle type
	Annual monitoring	Kilometers of farm to market roads rehabilitated
		Selected annual measurements of the impact indicators

APPENDIX 27. SETTING FOOD DIVERSITY TARGETS

An increase in the average number of different foods or food groups consumed provides a quantifiable measure of improved household food security. However, to use this indicator to assess improvements in food security, the changes in consumption diversity must be compared to some meaningful target level of diversity. Unfortunately, data on 'ideal' or 'target' levels of diversity are usually not available.

Several options are available to determine appropriate targets. One method is to use the consumption patterns of wealthier households as targets, with 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 dietary diversity indicator usually include interventions aimed at 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 should be divided into four income groups (quartiles of income), and the average number of food groups consumed should be calculated for the richest income quartile. The average dietary diversity in the richest 25 percent of households can then serve as a target level of dietary diversity 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.

In the absence of income or economic data from the baseline survey, a food-diversity target can be established by taking the average diversity of 25 percent of households with the highest diversity (upper quartile of diversity). Because most food security projects aim to increase household incomes as a means to improve food security, income-based targets are preferable to this diversity- based target.

Instructions on how to code income quantities and calculate average diversity using SPSS appear below. The program can also be used to calculate diversity quartiles, by substituting diversity for income. In either case, the descriptive statistics need to be run on the diversity variable. Using the Windows 95 version of SPSS, locate in the pull down menu TRANSFORM. "Rank Cases" creates new variables containing ranks, normal, and savage scores, as well as percentile values for numeric variables. New variable names and descriptive variable labels are automatically generated by SPSS, based on the original variable name and the selected measure(s). A summary table lists the original variables, the new variable, and the variable labels.

Cases can be ranked either in ascending or descending order. Organize rankings into subgroups by selecting one or more grouping variables for the By list. Ranks are computed within each group. Groups are defined by the combination of values of the grouping variables. For example, if you select GENDER and MINORITY as grouping variables, ranks are computed for each combination of GENDER and MINORITY.

Use the "Rank Types" button to select multiple ranking methods. A separate ranking variable is created for each method. Ranking methods include simple ranks, savage scores, fractional ranks, and percentiles. Rankings can also be created based on proportion estimates and normal scores.

```
RANK
  VARIABLES=3Dincome (A) /RANK /NTILES (4) /PRINT=3DYES
  /TIES=3DMEAN
-----------------------------------
```

Example:

DATA FILE

Food Group	**Household ID # (HHID#)**							
	1	2	3	4	5	6	7	8
Cereals	1	1	1	1	1	1	1	1
Roots/tubers	0	0	1	0	0	0	0	1
Milk/milk products	0	1	1	1	0	0	1	0
Eggs	0	1	1	0	1	0	1	1
Meat/offal	0	1	1	1	0	0	1	1
Fish/seafood	0	0	0	0	1	0	0	0
Oil/fat	1	1	1	1	1	1	1	1
Sugar/honey	1	1	1	1	1	1	1	1
Fruits	0	0	1	0	0	0	1	0
Vegetables	1	1	1	1	1	0	1	1
Other (spices, sodas, etc)	0	1	1	1	1	1	1	1
DIVERSE (total # of food groups consumed)	4	8	10	7	7	4	9	8
INCOME	250	700	1500	540	630	180	980	760

Frequency variable = INCOME /format=notables /ntiles=4.

FREQUENCY COMMAND OUTPUT

INCOME

Percentile	Value	Percentile	Value	Percentile	Value
25	322.5	50	665.0	75	925.0

IF STATEMENT TO CREATE QUARTILE VARIABLE:

If (INCOME <= 322.5) QUARTILE = 1.
If (INCOME > 322.5 and INCOME <= 665.0) QUARTILE = 2.
If (INCOME > 665.0 and INCOME <= 925.0) QUARTILE = 3.
If (INCOME > 925.0) QUARTILE = 4.

DATA FILE RESULT

HHID#	1	2	3	4	5	6	7	8
DIVERSE	4	8	10	7	7	4	9	8
INCOME	250	700	1500	540	630	180	980	760
QUARTILE	1	3	4	2	2	1	4	3

CALCULATE AVERAGE DIVERSITY (DIVERSE) FOR HOUSEHOLDS IN QUARTILE 4

Select if (QUARTILE = 4).
Descriptives variable DIVERSE.

OUTPUT OF DESCRIPTIVES COMMAND

Number of valid observations (listwise) = 2.00

Variable	Mean	StdDev	Minimum	Maximum	Valid N
DIVERSE	9.50	.71	9	10	2

CALCULATE AVERAGE DIVERSITY FOR HOUSEHOLDS IN SAMPLE

Descriptives variable DIVERSE.

OUTPUT OF DESCRIPTIVES COMMAND

Number of valid observations (listwise) = 8.00

Variable	Mean	StdDev	Minimum	Maximum	Valid N
DIVERSE	7.13	2.17	4	10	8

The average dietary diversity among the 25 percent richest households is 9.50. Current diversity for the sample as a whole is 7.13. The PVO can use this data to establish baseline (7.13) and target (9.50) diversity levels for the target population.