

MODULE 3: FOOD FOR EDUCATION

I. INTRODUCTION

USAID's Office of Food for Peace (FFP) administers PL 480, Title II food aid commodities. FFP provides Title II resources to Cooperating Sponsors (CSs) to implement sustainable development programs targeted to improve the food security of needy people, either by the direct distribution of agricultural commodities or the use of local currencies generated by the sale of these commodities.

USAID supports education efforts and often uses food aid to help improve education opportunities and educational progress by providing school lunches and take-home incentive rations. School lunches are used to encourage school enrollment, attendance, and to improve students' attentiveness—especially for those without breakfast at home. Food to schools may be referred to as Food for Education program only if school feeding is integrated with other activities aimed at improving the quality of the education at the school, e.g., teacher training, curriculum development, development and provision of academic materials, infrastructural improvements, or provision of school supplies. The non-food resources for these activities cannot be included in an activity funded by Title II Food for Education resources. Some can be supported with Title II commodities, but the food must be requested in a separate proposal, e.g., a Food for Work proposal. Normally, the government, Cooperating Sponsor, or other agencies should provide the non-food resources. School feeding that is not integrated with other activities must be referred to simply as “school feeding”, not as Food for Education. The USAID/FFP office has made it clear that the FFE is the preferred approach.

Food insecure communities with poor school attendance are usually selected as targets. Within communities, some programs specifically target girls. This Module provides principles and examples of ration selection for FFE programs.

II. GUIDELINES FOR COMMODITY SELECTION FOR EDUCATION PROGRAMS

This module, following the general five step framework of Part Two of the CRG (Box 1). It includes key points of consideration for FFE programming under each step. This guidance is meant to be flexible enough to allow FFE Program Managers to select food aid rations appropriate for the situation. Box 1 lists the five steps.

Box 1: Five Steps for Commodity Selection

1. Program Design
2. Suitability of commodities
3. Ration Size
4. Ration Calculation
5. Ration Ranking and Selection

STEP 1: PROGRAM DESIGN

Program design considerations are those program attributes that affect appropriate commodity selection. Key program design considerations discussed in this chapter include: (1) carrying out a needs assessment; (2) developing program activity objectives; (3) determining the appropriate use of food; (4) identifying the target population's characteristics; and (5) determining the distribution mode and frequency.

1. Needs Assessment

As programs with a food aid component are being designed, it is important to articulate why food aid is needed and how it will be used to meet program goals. A needs assessment or problem analysis will help to identify the nature, extent, severity, and distribution of the food needs. It should also include an assessment of food availability, an analysis of the main causes of malnutrition, identify the technical and geographical areas in which the program will work, and summarize the resources and institutional capacity for action. Attention should be given to the extent which problems in these priority technical and geographic areas are already being addressed.

Information about the target population's demographic profile, nutritional status, food consumption patterns, health statistics, socio-economic statistics, and other basic information needs for program design can be attained from primary sources, such as qualitative research, food consumption surveys, and nutritional status surveys. A useful publication on how to use these methods is USAID/CDIE's Performance Monitoring and Evaluation Tips, which is available online at www.dec.org/usaaid_eval. Other resources are listed in the Reference List. Useful information can also be obtained through secondary data reviews followed up with local key informant interviews. Other sources of secondary information include:

- ✓ USAID reports and/or Demographic Health Surveys (DHS)
- ✓ Ministry of Health and other in-country institutional statistics
- ✓ National surveys or governmental action plans
- ✓ International and bilateral donor agency situation analyses and reports
- ✓ Other cooperating sponsors working in country
- ✓ Internet databanks (such as UNICEF, WHO, World Bank, WFP, etc.)

Please refer to the current USAID/BHR's *Title II Guidelines for Development Programs* for further guidance on developing a needs analysis (available online at www.usaid.gov/hum_response/ffp/dappaa.htm). Also refer to the Food Aid Management website for additional information: www.foodaid.org.

2. Program Activity Objectives

No matter how the food will be used, the desired result of the food assistance intervention should be stated in terms of objectives. Once these have been defined, then, food commodities and rations should be selected to be consistent with these objectives. Each CS has its way of expressing objectives. However, using USAID's Managing for Results terminology will facilitate reporting to USAID (for definitions of terms, see Annex 1 in Part Three of the CRG). Objectives for USAID-funded programs should be result statements, that is, they should clearly describe the desired end result of the intervention. For example, "*Improved attendance rates among school age children*" is a result-oriented objective.

USAID recommends that each objective/result statement have at least one indicator to track progress of its achievement. Performance indicators are variables with a particular characteristic or dimension that can measure progress toward achievement of the desired result. Performance indicators should be direct, measurable, and sensitive to capture small changes over short time intervals. For example, an indicator for the result statement mentioned (*Improved attendance rates among school age children*) could be "*attendance rates in target schools*". USAID/CDIE's *Performance Monitoring and Evaluation Tips*, available online at www.dec.org/usaaid_eval, provides general guidance on how to develop objectives and indicators. FANTA project's "*Food for Education Indicator Guide*" proposes a set of indicators to measure the performance of FFE programs plus guidelines for computing these indicators and can be found at www.fantaproject.org. Whenever possible, programs should include input as well as impact indicators for measuring progress of food aid programs. CSs should also provide baseline data for selected indicators or a plan for collecting these data. Baseline studies of the target population, that incorporate the selected indicators should be part of the needs assessment, but may be accomplished immediately after activity approval. CSs should also articulate an evaluation and monitoring plan that outlines the how indicators will be tracked and progress evaluated.

3. Food Use

In the past, school feeding (SF) programs used food primarily as an incentive to children and their families to improve attendance. Based on new findings that show that short-term hunger has a negative effect on attentiveness and learning, the role of food in FFE programs has been extended and refined to additionally focus on improving learning, attention, and retention of material. The consumption of food early in the school day is important, but it is often logistically difficult to prepare a breakfast at school. Therefore, the trend is towards mid-morning meals or snacks. Provision of the food only near or at the end of the school day will reduce the effectiveness of the ration in achieving the learning objectives, but FFE programs does help students' families offset the costs of sending the child to school.

4. Target Population

The target group for FFE programs is school age children in food insecure communities. Generally, all children in selected schools benefit, although the girls may be selected for extra benefits or may be the only beneficiaries. Feeding may also be restricted to only certain grades within the school. Targeting of individual children is not done on the basis of nutritional criteria, but nutritional status at the community or population level could be a basis for selecting schools or districts. Examples of other criteria that may be used for school and district selection are: adequacy of food production, indicators

of socio-economic status, rates of student enrolment or attendance, or student achievement. To assure that educational benefits can be achieved, only schools that meet basic minimum standards of quality (to be determined in conjunction with the governing body and parents) should be targeted.

5. Distribution Mode and Frequency

The major mode of distribution for FFE programs is on-site feeding. However, take-home rations are sometimes provided. A description of both modes of distribution is provided below:

On-site school feeding: School feeding programs usually provide ready-to-eat meals or snacks on site. The food should be provided to the students early in the day to maximize the learning gains. Obviously, food is provided only the days that the child is actually in school (e.g. five or six days a week).

Take-home rations: Sometimes students are given a take-home ration in compensate the lost time they would normally have spent working at home during school hours. This is a common incentive to promote enrolment of girls.

STEP 2: SUITABILITY OF COMMODITIES

Suitability of the ration is defined by assessing those attributes of the individual ration recipient, target household, or community that will most affect utilization of the food aid commodities. Determining suitability must take into account nutritional needs, physiological appropriateness, food consumption preferences and patterns of the food aid recipient(s), locally available foods, food processing storage capacities, and local market prices. These factors all affect the selection and appropriate allocation of food aid rations. Below is a checklist for use in considering food aid rations for an intended target group(s). A detailed description of these factors can be found in Annex III.

Nutritional content is the nutritive content of the food commodity. Major nutrient considerations should include energy (calories), protein, and micronutrients (vitamins and minerals). Populations deficient in micronutrients would benefit from fortified food commodities. It is always important to consider the nutritional content of the commodities when designing ration packages. The age, sex, and activity level (e.g., depending on distance to walk to school), of the target school group are primary determinants of their nutritional needs. The ambient temperature during the school year must also be considered in cold climates. Special considerations of the disease burden affecting the school child may influence the amount of food provided. For example, HIV/AIDS affected people require additional energy and protein (refer to to the FANTA publication on “*Nutritional Care and Support for Persons Living with HIV/AIDS and other Affected Household Members*” at www.fantaproject.org).

Physiological appropriateness relates to the physical characteristics of the food commodity that affect its use by the target group. Consult local nutrition experts wherever available. Anything that could decrease utilization of the ration, such as food allergies and lactose intolerance, should be identified and taken into consideration.

- **Cultural suitability:** Consider the cultural acceptability, including taste preferences, traditional taboos, and local practices of the target population or group that will affect food use and consumption. For example, most Brazilians prefer black beans while Nicaraguans prefer small red beans. Another important consideration is whether the commodities are culturally suitable for the particular role they

are to play in the project. It is key to identify major constraints to using particular commodities.

Availability of processing and/or storage facilities: Food preparation, processing, and storage facilities need to be considered when designing food supplements for FFE programs. Important questions to ask are: (1) are mills available to process whole grains; (2) are school facilities adequate for storing the food supplement; (3) what fuel, preparation equipment or cooling facilities are available; and (4) what other locally available foods are available to improve taste, acceptability and nutrient diversity.

Characteristics of local food production are factors that provide an understanding of which local foods are relatively available and affordable to the target group. Often parents are asked to contribute fresh foods or condiments to add to the food aid commodities to add micronutrients or increase the palatability of the school meals. If take-home rations are provided it would be wise to look at the production cycle helps to identify how food harvests correspond to the school year. Commodities for take-home could be selected to help fill those gaps. Also, care should be taken in the commodity selection to assure that there is no disincentive to local production.

Cost will, in part, determine which food ration will be used.

Using this list, exclude commodities which do not meet the physiological criteria, are not culturally acceptable, are difficult to store or process, and/or will compete with local food production from the list of potential commodities. Making these decisions will aid in creating a short list of commodities from which to choose. Annex III provides a detailed description of the factors mentioned above.

STEP 3: RATION SPECIFICATIONS

The size of the ration should be based on specified nutritional needs and/or income values, costs or ration standards that other agencies are currently using. Past program ration specifications for size and type of ration, the approval of the USAID mission, and commodities that have been already ordered and are in the pipeline (up to several months in advance of the start of a program) are also key considerations.

To determine ration size, first determine the nutritional or income value that a ration must have to achieve the project objectives and impact. Then list suitability criteria and key characteristics that are important to the full utilization and consumption of the ration as described in Step 2. Below are suggestions on how to best determine the nutritional or income value of FFE food rations.

1. Determining Nutritional Values

The nutritional value of the ration is described in terms of its energy (calories), protein, fat and micronutrient content. Establishing the beneficiaries' minimum energy and protein needs, which depend on the child's age and sex, provides a basis for defining a supplement package appropriate to meet project requirements. These requirements are described in terms of the average number of kilocalories and grams of protein needed per person per day before selecting the commodities. In addition, the fat in the rations should provide 10-20% of the total energy.

FFE programs generally provide only a snack or a meal, which would not be expected to fill the nutrition deficit completely. There are no fixed guidelines for calculating the nutritional value of

supplementary food rations for a FFE program, since the food supplement is not based on the nutrient deficit of the target group. Past experience with food aid programs may be the best way to determine the nutritional value of the food ration. However, it can be assumed that the meal provided will substitute for at least one meal normally provided at home. Thus, the following general steps could be used for calculating the nutritional value of the meal.

- Determine which meal the food supplement would replace—breakfast or lunch.
- Determine the percentage of energy that meal represents. For example, if the breakfast is usually light, it may represent 10-15% of a child's total intake per day. If the meal is served as a lunch, the percentage of energy may be higher given that lunch is usually the bigger meal in most countries.
- Multiply the percentage times the Recommended Energy and protein allowances. The CRG uses Annex V and VI, however, CSs may use their own dietary standards.

Box 2 provides an example of calculating the nutritional value of a FFE meal ration for 7 to 10 year old children based on percentage of recommended dietary allowances.

Box 2- EXAMPLE OF HOW TO CALCULATE A MEAL RATION FOR 7-10 YEAR OLD CHILD

Assumptions:

The mid-day meal represents approximately 45% of the target group's diet.

- 1) Determine recommended energy allowance (REA) for 7-10 year olds = 2,000 kcal (from Annex V)
- 2) Multiply 2,000 (kcal) x .45 = 900 kcal per child per day
- 3) Determine recommended protein allowance (RPA) for 7-10 year olds = 28 grams (from Annex VI)
- 4) Multiply 28 grams x .45 = 12.6, rounded to 13 grams protein per child per day

Thus the nutritional value of the food supplement is 900 kilocalories and 13 grams protein.

General guidance provided by WFP/UNESCO/WHO¹ for full day primary schools is to provide a:

- mid-morning snack containing 400-600 kilocalories per child and a
- full lunch of 700-900 kilocalories,
- for a total of 1200-1500 kilocalories per child (or 60-75% of REA), with 28-36 g protein (70-90% of RPA) and 13-17g fat. (Refer to WFP/UNESCO/WHO. Rome 1999. *School Feeding Handbook*.)

For half day primary schools, depending on the frequency of feeding and whether or not the school feeding is intended to provide a full lunch, the guidance provided is:

- A mid-morning snack only: 500 kcal (or 25% of REA); about 13g protein (33% of RPA); about 6 g fat.

- Two snacks (before school and mid-morning): 600-900 kilocalories (or 30-45% of REA); 16-24 g protein (40-50% of RPA); 7-11g fat.
- A mid-morning snack and lunch: 1200-1500 kilocalories; 28-36 g protein; 13-17 g fat (i.e., like full day schools).

Micronutrient deficiencies are widespread in developing countries where Title II food aid is distributed. All processed food cereals under Title II programs, with the exception of parboiled rice, are fortified with B vitamins (thiamin, riboflavin, folic acid, and niacin), vitamin A, calcium, and iron. Blended cereals (corn-soy blend and wheat-soy blend) are further fortified with zinc, B12, pantothenic acid, iodine, magnesium, vitamin C, vitamin D, and vitamin E. Vegetable oil is fortified with vitamin A. If micronutrient deficiencies are known, the contribution from fortified commodities can be estimated by from the Commodity Fact Sheets in Section II of the CRG, available on line at www.usaid.gov/hum_response/crg. Check with school authorities to ensure that children are not already been supplemented with multi-vitamins or specific vitamins such as vitamin A.

2. Income Transfer Value

Income transfer value is the value of the ration in monetary terms to the household receiving the food aid. If a FFE program uses food rations mainly for their income transfer (monetary) value, Program Managers will need to determine the ration package's target level and the minimum level of acceptable income transfer value. The cash value of rations is determined by the price (market or selling) of the local commodity that is most similar to the food aid commodity in the household diet. When used as an incentive to families to offset the costs of sending their children to school, past program experience, conversations with community leaders, tests of different income transfer value levels, and discussions with the USAID mission may be necessary before agreeing upon a minimum level. Commodities that substitute for highly valued and expensive food items, such as oil, may have a substantial income mediating effect, freeing up income typically used for purchasing these expensive items to buy additional local foods or goods.

STEP 4: RATION CALCULATION

When designing ration packages program managers need to (1) choose the ration package based on the nutritive or income transfer values, (2) calculate the total amount of commodities needed for the program, and (3) determine commodity cost-effectiveness. The large number of commodities on the eligibility list makes it possible to design a variety of ration packages. It is useful to develop several alternative ration packages so that they can be compared for cost and other trade-offs. Programs may wish to consider alternative rations in the initial planning steps as contingency plans for when a commodity is not available, is delayed in transport, or when changes in commodity availability, prices, and packaging alter the relative cost effectiveness of ration packages.

1. Calculating the ration package

For logistical and management reasons, a ration package that meets nutritional values **should use no more than three commodities per ration** unless strong reasons exit. Because vegetable oil is a dense source of energy for food deficient populations, it should almost always be included in a ration package. While there is an element of trial and error, the following checklist helps provide a systematic approach for calculating the ration package and selecting the commodities to meet

nutritional values. For the sake of calculation, commodity 1 will be fortified vegetable oil, commodity 2 will be a cereal or cereal blend, and commodity 3 will be a legume.

- ❑ Consider the caloric and protein nutritional values of the proposed food ration, which have been calculated using Step 3.
- ❑ Calculate the oil ration. Around 10 to 20% of the food ration's energy should come from oil. Multiply the total caloric value of the ration package by 10 to 20%. Then divide this amount by 9 (number of kcal per 1 gram of vegetable oil).
- ❑ Subtract the caloric contribution of oil from the total caloric value of the proposed food package.
- ❑ Select a cereal or cereal blend from the list of commodities in Section I of the CRG to make up the balance of kilocalories. At present, Title II cereals include wheat, sorghum, bulgur, corn, and rice. Blended cereals include corn-soy blends (CSB) and wheat-soy blends (WSB). Projects targeting a protein deficit population utilizing a two-commodity ration should first consider soy-fortified cereals. While blended, fortified, or value added foods should be considered first, Program Managers should also consider cost, energy and protein content, acceptability, ease of storage and processing attributes of commodities.
- ❑ Calculate the number of kilocalories per 1 gram of cereal/cereal blend by dividing the number of kilocalories per 100 grams of commodity (from Commodity Fact Sheets in Section II of the CRG, available online at www.info.usaid.gov/hum_response/crg) by 100.
- ❑ Divide the balance of kilocalories by the number of kilocalories per 1 gram of cereal/cereal blend.
- ❑ Calculate the number of grams of protein per 1 gram of cereal/cereal blend by dividing the number of grams of protein per 100 grams of commodity (from Commodity Fact Sheets) by 100.
- ❑ Multiply the amount of protein per 1 gram of cereal/cereal blend times the total grams of cereal/cereal blend in the ration package.
- ❑ Subtract the protein contribution of the cereal/cereal blend from total protein value of the proposed ration package. If more protein is needed, either increase the amount of cereal/cereal blend or use a three-commodity ration.
- ❑ For a three-commodity ration package, the third commodity should be dry beans, peas, lentils, and soy to increase the protein value of the package.
- ❑ Determine the grams of protein needed to make up the difference between the protein contribution of the cereal (soy-cereal blends are generally not used in 3-commodity rations). See Box 6 for specific instructions. Do not forget to take into account the caloric value of the protein source and, if necessary, adjust your cereal ration accordingly.
- ❑ Assess suitability and physiological appropriateness of the commodities (see Step 2 and Annex IV).

Box 3 provides a detailed example of how to calculate ration package with two commodities.

BOX 3: EXAMPLE OF HOW TO CALCULATE A TWO-COMMODITY RATION

- 1) The caloric and protein values for this example are 900 kcal and 13 grams (g) of protein per person per day, respectively. (from Box 2).
- 2) Multiply the total number of kcal times 10-20% to determine kcal from oil ration.
 $900 \text{ kcal} \times 0.20 = 180 \text{ kcal}$
- 3) Divide the number of kcal of oil by 9 (1 gram oil = 9 kcal).
 $270 \text{ kcal} \div 9 \text{ kcal} = 30 \text{ g of fortified vegetable oil per child per day}$
- 4) Subtract the caloric contribution of oil from the total caloric value of the ration package.
 $900 \text{ kcal} - 180 \text{ kcal fat} = 720 \text{ kcal balance}$
- 5) Select a cereal or cereal blend to make up the balance of kilocalories. Using the Commodity Fact Sheets (available online at www.info.usaid.gov/hum_response/crg) calculate the number of kilocalories per 1 gram of cereal/cereal blend by dividing the number of kilocalories of 100 grams of cereal/cereal blend by 100. This example uses cornmeal.
 $366 \text{ kcal} \div 100 \text{ g} = 3.66 \text{ kcal per 1 gram of cornmeal.}$
- 6) Divide the balance of kilocalories by the number of kilocalories per 1 gram of cornmeal.
 $720 \text{ kcal} \div 3.66 \text{ kcal} = 196 \text{ g of cornmeal per person per day}$
- 7) Calculate whether 196 grams of cornmeal provides enough protein. To do this, first determine the amount of protein per 1 gram of corn-soy blend by dividing the grams of protein per 100 g commodity (from Commodity Fact Sheets) by 100.
 $8.5 \text{ g} \div 100 \text{ g} = 0.085 \text{ g}$
- 8) Then multiply the protein amount per 1 gram of corn soy blend times the total grams of corn-soy blend.
 $196 \text{ g} \times 0.085 \text{ g} = 16.6 \text{ g of protein per child per day. This amount is slightly more than the 13 grams proposed.}$

Thus, a two-commodity ration package of 30 grams fortified vegetable oil and 196 grams cornmeal provides 900 kilocalories and 16.6 grams of protein per child per day.

2. Calculate the Total Amount of Food Commodities Needed

Once the ration package is determined, Program Managers will need to calculate how much of the commodities (usually in metric tons) will be needed to feed the total number of students or household per year or project period. To calculate the number of metric tons needed for each commodity (vegetable oil, cereal, cereal blend, or legume) use the following steps.

- Multiply the number of grams of the commodity per person per day times the total number of persons to receive the commodity.
- Multiple the total number of grams of the commodity needed to feed the target group times the total number of days the program will provide the ration package.
- Determine the number of metric tons of commodity needed by dividing the total number of grams of commodity needed per program period by 1,000,000 (number of grams in a metric ton).
- Complete the same calculation for each commodity (vegetable oil, cereal, cereal blend, or legume) that comprises the ration.

Box 4 provides an example of how to calculate the total amount of commodities needed to provide the two-commodity ration package from Box 3 to 15,300 children for one school year of 180 school days.

BOX 4: CALCULATING AMOUNT OF COMMODITIES NEEDED FOR 15,300 STUDENTS FOR 180 SCHOOL DAYS.

- 1) Multiply grams of oil per person per day times 15,300 persons times 180 days.
 $30 \text{ g oil (Box 3)} \times 15,300 \text{ persons} = 459,000 \text{ g per day} \times 180 \text{ days} = 82,620,000 \text{ g per year}$
- 2) Divide the total number of grams of vegetable oil per year by 1,000,000 (number of grams per metric ton)
 $82,620,000 \text{ g} \div 1,000,000 = \mathbf{83 \text{ metric tons of fortified vegetable oil per school year}}$
- 3) Multiply grams of cornmeal per person per day times 15,300 persons times 180 days.
 $195 \text{ g cornmeal (Box 3)} \times 15,300 \text{ persons} = 2,983,000 \text{ g per day} \times 180 \text{ days} = 537,030,000 \text{ g per school year.}$
- 4) Divide the total number of grams of cornmeal by 1,000,000
 $537,030,000 \text{ g} \div 1,000,000 = \mathbf{437 \text{ metric tons of cornmeal per school year}}$

3. Determine Cost Effectiveness of ration package

Cost is often not the primary factor for selecting the commodities. Food preferences, availability and potential disincentive effects often outweigh cost considerations. The cost of the commodity per its nutritive or income value may help in determining whether it is cost-effective and/or appropriate for the food aid component of a development assistance or emergency program. CSs should determine the primary purpose of the food aid program (nutritional benefit or income transfer) and conduct the appropriate cost-effectiveness analysis.²

Calculating the cost-effectiveness of desired commodities in terms of cost per unit of nutritional value (100 calories or 10 grams of protein) or income transfer value (in U.S.\$ to the recipient) provides information about which commodities provide the most nutritional benefits or highest income at the lowest cost to the project. It is important to note that cost per calorie of blended and fortified foods will always be higher than bulk grains.

Cost Effectiveness per Nutritional Value: To determine the cost effectiveness value of a commodity per its nutritive value, calculate the cost in cents per kilogram of commodity using the following steps. Commodity values in Annex VII and the nutritional values of commodities from the Food Commodity Fact Sheets (Section II of CRG available online at www.usaid.gov/hum_response/crg) are two sources of information Program Managers will need to make these calculations.

a) Per Caloric value:

- ❑ As the cost of a commodity listed in Annex VII is per metric ton, divide the cost per metric ton by 10,000 ($100 \text{ g} \times 10,000 = 1 \text{ MT}$), which will give the cost per 100 grams of commodity.
- ❑ Divide that amount by the number of calories per 100 grams of commodity.
- ❑ Multiply the resulting figure by 100 to determine the cost in cents of one kilocalorie of the commodity.

b) Per protein value:

- ❑ Divide the cost per metric ton (from Annex VII) by 10,000, which will give the cost per 100 grams of commodity.
- ❑ Divide that amount by the number of grams of protein per 100 grams of commodity.
- ❑ Multiply the resulting figure by 100 to determine the cost in cents of one gram of protein from the commodity.

² Cost also refers to costs to the project associated with a commodity (such as CCC dollar values found in Annex IX). In some projects, in-country transportation and storage costs and special handling costs may be critical, however, these costs may be similar for most commodities. For each project, first decide which of these cost elements are most relevant.

Box 5 gives an example of how to calculate the cost effectiveness of both the caloric and protein nutritive values for cornmeal.

BOX 5: EXAMPLE OF COST PER NUTRITIVE VALUE OF CORNMEAL

Per caloric content of cornmeal:

$$\text{\$ } 194 \div 10,000 = \frac{\text{\$ } 0.0194 \text{ per } 100 \text{ g}}{366 \text{ kcal per } 100 \text{ g}} = \text{\$ } .000053 \text{ or } .053 \text{ cents per kilocalorie}$$

Thus, the cost of one kilocalorie of cornmeal is 0.05 cents

Per protein content of CSB:

$$\text{\$ } 194 \div 10,000 = \frac{\text{\$ } 0.0194 \text{ (per } 100 \text{ g)}}{8.5 \text{ grams (per } 100 \text{ g)}} = \text{\$ } .0023 \text{ or } .23 \text{ cents per gram of protein}$$

Thus, the cost of one gram of protein provided from cornmeal is .23 cents

This type of analysis would be used to assess different rations designed to meet nutritional objectives; and to determine which objective is most cost-effective. For example, the cost effectiveness of cornmeal can be compared the cost effectiveness of another commodity, such as CSB. CSB turns out to be a more expensive source of nutritional energy but a more expensive source of protein. (See the example in Part Two, *Overview* . [Hyperlink](#). Based on the cost effectiveness values for different ration packages, Program managers are better able to select the ration, which meets program objectives at the lowest cost to the project.

Cost per Income Value: Another analysis that could be done for when CSs use food aid commodities to provide a given value or an incentive or wage. In this context, cost effectiveness is the cost of a commodity per \$5.00 of income value. For each commodity under consideration, use Annex VII to calculate the income value of 1 kg of that commodity. Then calculate the amount of the ration that is required to yield \$5.00 income value. Box 6 provides an example.

BOX 2 – EXAMPLE OF INCENTIVE VALUE CALCULATION

- 1) First, calculate the cost of one kg of cornmeal to the household if purchased in the local market. Example uses the following (made up) figures:
1 kg flour costs the household \$.25 at their local market.
- 2) Dividing \$0.25/kg into \$5.00 yields 20 kg. Thus, to provide \$5 worth of incentive requires distribution of 20 kilograms of cornmeal to the recipient.

*See Part I *Overview* for a cost effectiveness method comparing this cost to the cost to the program of delivering the cornmeal to the school.

Changes in commodity availability, prices, and packaging can alter the relative cost effectiveness of ration packages. It is useful to develop at least one alternative ration packages so that it can be compared for cost and other trade-offs.

Take into consideration the following when designing an alternative ration package:

- ❑ Design rations that meet specifications using no more than three commodities per ration.
- ❑ Use commodities, which provide the maximum gain to recipients at lowest cost to the project.
- ❑ Based on the cost per unit of nutritional and/or income transfer value provided to the recipient, use the most cost-effective commodities and design at least one alternative package if a new project is being planned.
- ❑ Compare the nutritional and/or income transfer values of currently used rations with specifications and key suitability criteria.
- ❑ Alter the ration packages according to how they will meet nutritional or income transfer objectives as well as their cost-effectiveness.

STEP 5: RANKING AND SELECTION

It is important to rank your ration packages and commodities in order to select the most cost-effective and appropriate rations to meet program objectives. Cost plays a vital role in the size and effectiveness of projects, and budgetary requirements can be affected by the inclusion of certain commodities, especially when ordered in large quantities. Costs of the individual commodities are vital in obtaining a total ration cost. Calculating the costs of commodities involves decisions about which cost elements to consider. At a minimum, Commodity Credit Corporation (CCC) values (see Annex VII) and various in-country transportation and storage costs can be used. Other factors to consider are:

- **Market disruptions:** The Bellmon determination must ensure that the local market is not disrupted. Market considerations in local areas where programs are targeted might also come into play. For example, it may be less disruptive to provide certain foods in the lean season rather than the harvest season. Guidance on conducting the Bellmon analysis may be found online at www.usaid.gov/hum_response/ffp/bellmon.htm
- **Logistics and management:** Some commodities may impose undue management or cost burdens due to unusual local conditions (transportation, storage, handling, pilferage, accounting costs, etc.) or unsuitable packaging for the shelf life of the commodity.

The usual sources of these data for considering secondary purposes, potential market disruptions, and logistical problems include past evaluations of the same or similar programs; interviews with local personnel, Ministries of Agriculture or Finance; USAID mission agricultural offices, and USDA representatives at U.S. Embassies.

Thus, ration packages can be ranked by nutritional value, income transfer value, total cost, and other factors, such as, secondary purposes of the ration, market disruptions, and logistical problems. Alternative rations should meet all the minimum standards of nutritional and/or income transfer value as well as other critical specifications. Decisions to change ration packages can be made easily and less arbitrarily when alternative rations and their main attributes have been worked out in advance.

III. REFERENCE LIST

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