

**16.0 CALCULATIONS USED IN THE DIETSYS  
NUTRIENT ANALYSIS**



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- 16.1 The basic function of the DIETSYS Nutrient Analysis program is to calculate nutrient estimates. These estimates are based on the respondent's reported frequency of each food combined with the nutrient content and portion size data in the DIETSYS Foods Database. The formula for these estimates is given in Section 16.2. This algorithm gives the basic structure of the program, but in fact the program is much more complicated than that. Of the 29 Analysis Options, 26 have a direct impact on the nutrient estimates. The remaining 3 options determine the amount and format of the program's output.

This section of the documentation provides all formulas and calculations used in the DIETSYS Nutrient Analysis program. Section 16.2 and Appendix A (Analysis Options) provide information regarding any calculation which has an impact on the nutrient estimates. Sections 16.3 through 16.10 provide the formulas used to calculate other variables stored in the Analysis Results File (some of which are also printed to the Analysis Report). See Section 17 for the Analysis Results File codebook. See Section 18 for more information regarding the Analysis Report.

- 16.2 **Nutrient Estimates.** The Analysis Results File contains a Daily Estimate for each nutrient in the DIETSYS Foods Database. For each food, the program uses the two steps outlined below to calculate these estimates.

**Step 1:** The nutrient per week contributed by each food is calculated using the following formula. Each variable in the formula is described below.

$$\frac{(\text{Portion Size} \times \text{Nutrient Content} \times \text{Weekly Food Frequency} \times \text{Seasonality Factor})}{100}$$

100

**Portion Size** is the grams portion size for this food stored in the Portion Size Data File. This database file contains two different sets of portion sizes, OnQuest and AgeSex (Section 12.7). Values associated with small, medium, and large serving sizes are stored in the database. Extra-large portions are calculated as 1.5 times the large portion. A medium serving size is imputed for any food with a code of missing or error for serving size. If serving size is not asked, a medium serving size is imputed for all foods. The Portions Analysis Option determines if the AgeSex or OnQuest portions are used (Section 16A.20).

**Nutrient Content** is the amount of nutrient in 100g of this food. This amount is read from the Nutrient Content Data File.

Three foods in the DIETSYS Foods Database do not have nutrient values directly associated with them. These foods are Table Fat Added - By Program (Food 37), Milk In Coffee (Food 95), and Milk on Cereal Line Item (Food 128). The nutrient and portion size data for specific fats are used for Table Fat when the AddFats option is implemented (Section 16A.1). During the analysis, DIETSYS will determine which milk(s) the respondent reports for glasses of milk. The nutrient values for these milks will be used for Milk In Coffee and Milk on Cereal Line Item in the same proportion as used as beverage. If the respondent reports a frequency of never for the three beverage milks or the beverage milks are not asked on the questionnaire, nutrient values for 2% milk will be used.

In addition, nutrient values for milk are automatically added when there is a non-zero frequency for Instant Breakfast. The gram amount for a medium serving of 2% Milk will be added with the same frequency as Instant Breakfast. The nutrient content will be derived as described above for Milk in Coffee and Milk on Cereal Line Item. The DIETSYS Nutrient Analysis will locate Instant Breakfast in your food list and Foods Database via the Food ID set in the Adjust Options Reference Table (Sections 12.13 and 12.32). If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs (Section 12.32).

All other adjustments made during the analysis are controlled by the settings of the Analysis Options. Read Section 16, Appendix A for a detailed description of these options.

**Weekly Food Frequency.** In Categorical questionnaires, each frequency input code is assigned a frequency of the number of times and the unit of time. These two frequency segments are set in the Food Coding Schemes in the CFG File (see Section 11.12).

In Categorical questionnaires, each frequency input code is assigned a frequency of the number of times and the unit of time. These two frequency segments are set in the Food Coding Schemes in the CFG file (see Section 11.12).

In Non-categorical questionnaires, there are separate fields for the coding of the number of times and the unit of time. If unit of time is coded as day, week, month, or year but the number of times is coded as missing, once per time unit is imputed.

The respondent's reported food frequency is converted to a weekly frequency by multiplying the number of times by the appropriate factor as shown below.

Day:	7.0
Week:	1.0
Month:	0.2333
Year:	1/52

In Non-Categorical questionnaires, a period of time other than Year may be used for the largest unit of time (input code of '4'). In this case, the number of weeks for this period of time is set in the CFG File (Section 11.7). The number of weeks specified in the CFG File is used in place of 52 to calculate the conversion factor for the largest time unit.

**Seasonality Factor.** A Seasonality Factor is stored in the DIETSYS Foods Database for each Standard Food. See Sections 12.8 and 12.27 for more information regarding this value.

**Step 2:** The values calculated in Step 1 are summed over all foods, then divided by 7 to yield a Daily Nutrient Estimate.

- 16.3 **Nutrient Estimates (Excluding Alcoholic Beverages).** These nutrient estimates are calculated as in Section 16.2, except that any food which is a member of the Alcohol Food Group is ignored when calculating these estimates. See Section 15.14 for more information on Food Groups. Only eight nutrient estimates are calculated excluding alcohol. These are Calories, Protein, Total Fat, Carbohydrate, Phosphorus, Potassium, Riboflavin, and Niacin.

This may be useful for some analyses. For example, suppose a hypothesis is that a high carbohydrate intake is desirable. The results of such an analysis may be confounded if some people had a high carbohydrate intake because they drank a lot of beer.

- 16.4 **In Season Nutrient Estimates.** These nutrient estimates are calculated as in Section 16.2, except that the Seasonality Factor is not used in the equation. See Sections 12.8 and 12.27 for more information on the Seasonality Factor. Only twelve in-season nutrient estimates are calculated. These are:

- Vitamin A (IU)
- Vitamin A (RE)
- Vitamin C
- Dietary Fiber
- Folate
- Alpha-Carotene
- Beta-Carotene
- Cryptoxanthin
- Lutein
- Lycopene
- Retinol
- Pro-A Carotenes

These values will differ from the main nutrient estimates in 16.2 only if some foods on the questionnaire asked about consumption "in-season", and their Seasonality Factor does not equal 1.0. They give an estimate of nutrient intake when those foods are in season, rather than averaged over the whole year.

These values are stored in the Analysis Results File but not printed to the Analysis Report. To analyze these estimates, refer to Section 17 for the Analysis Results File codebook. In addition, a SAS program template has been provided (Section 17, Appendix A).

- 16.5 **Grams of Solid Food (Per Day).** This variable is the summed gram amounts of all solid foods. Each food in the DIETSYS Foods Database has a Solid Food indicator. All foods analyzed for a respondent which have 'Y' for the Solid Food flag will be counted toward the Grams of Solid Food (Per Day) calculation. To calculate the daily gram amount per food the program uses the two steps outlined below.

**Step 1:** The gram amount per week is calculated for each food using the following formula. Each variable in the formula is described in Section 16.2.

*(Portion Size x Weekly Food Frequency x Seasonality Factor)*

**Step 2:** The values from Step 1 are summed over all solid foods, then divided by 7 to yield the gram amount of food per day.

16.6 **Percent of Calories from Fat, Protein, etc.** Five percentages are calculated using the following formulas. These percentages are written to the Analysis Results File (Section 17) and printed in the Analysis Report (Section 18).

Percent of Calories From Fat:

$$\left( \frac{\text{Weekly Estimate of Total Fat} \times 9}{\text{Weekly Estimate of Total Calories}} \right) \times 100$$

Percent of Calories From Protein:

$$\left( \frac{\text{Weekly Estimate of Protein} \times 4}{\text{Weekly Estimate of Total Calories}} \right) \times 100$$

Percent of Calories From Carbohydrate:

$$\left( \frac{\text{Weekly Estimate of Carbohydrate} \times 4}{\text{Weekly Estimate of Total Calories}} \right) \times 100$$

Percent of Calories From Sweets:

$$\left( \frac{\text{Weekly Estimate of Calories from Sweets}}{\text{Weekly Estimate of Total Calories}} \right) \times 100$$

Percent of Calories From Alcoholic Beverages:

$$\left( \frac{\text{Weekly Estimate of Calories from Alcoholic Beverages}}{\text{Weekly Estimate of Total Calories}} \right) \times 100$$

The weekly estimates of Total Fat, Protein, and Carbohydrate are calculated using the formula in Step 1 of Section 16.2. The weekly estimate of Calories from Sweets is calculated by applying this same formula to only the foods in the Sweet Food Group. Likewise, the weekly estimate of calories from Alcoholic Beverages is calculated by using this formula but only considering the foods in the Alcohol Food Group. See Section 15.14 for more information on Food Groups. Note that the percent of calories from alcoholic beverages is based on calories from the beverages, not just from the alcohol they contain. These figures may be useful for educational and counseling purposes, and in addition, should be examined as possible risk factors in studies of the role of diet in disease.

Percent of calories from fat, protein and carbohydrate will sum to approximately 100% only for persons who consume no alcoholic beverages. Reasons for these three percents to fail to add up to 100% of calories are as follows: 1) For persons consuming alcohol, the calorie value includes the alcohol calories, which is in addition to the fat, protein and carbohydrate; 2) USDA factors for calculating energy from the component nutrients are rarely exactly 9,

4, and 4, and differ for each food. (For example, for wine the protein factor is 3.36); 3) When the nutrient composition database was developed as described in Block et al., 1986, the nutrient values to be used for each FFQ food item were derived independently; that is, for green beans the calorie, fat, protein and carbohydrate values were derived independently, and could have come from different USDA Handbook 8 food codes.

- 16.7 **Percent of Calories from Fat, Protein, Carbohydrates (Excluding Alcoholic Beverages).** These three percentages are calculated as in Section 16.6, except that any food which is a member of the Alcohol Food Group is ignored in the calculations. See Section 15.14 for more information on Food Groups.

Recommendations going back at least as far as the Senate Select Committee on Nutrition and Human Needs in 1977 state, when recommending a certain percentage of calories from fat, that percentages should be calculated "based on calories from food and nonalcoholic beverages". (Senate Select Committee on Nutrition and Human Needs: Dietary Goals for the United States, p.5.) Inclusion of alcohol calories in the calculation inflates the denominator and thus lowers the estimated percent of calories. The best way to have an (apparently) low percent of calories from fat is to drink a six-pack of beer a day. Both recommendations and research should consider the non-alcohol values.

- 16.8 **Fiber.** Separate fiber estimates are calculated for Fiber from Beans, Fiber from Vegetables/Fruit, and Fiber from Grains. These fiber estimates are calculated by applying the formula in Section 16.2 to only the foods which are members of the three Food Groups, Bean Group for Fiber, Vegetables & Fruit for Fiber, and Grain for Fiber. The sum of fiber from these three groups should be approximately equal to the total Dietary Fiber value, if all fiber-containing foods have been included in one of these three groups. Separate examinations of these three fiber sources may be useful in attempting to understand the role of different types of fiber, and to disentangle "fiber" effects from the effects of other components of these foods. Section 15.14 contains information regarding Food Groups

These values are stored in the Analysis Results File but not printed to the Analysis Report. To analyze these estimates, refer to Section 17 for the Analysis Results File codebook. In addition, a SAS program template has been provided (Section 17, Appendix A).

- 16.9 **Nutrient Estimates from Supplements.** Thirteen nutrient estimates are calculated from vitamin and mineral supplements. These are:

- Vitamin A
- Vitamin C
- Vitamin D
- Vitamin E
- Iron
- Calcium
- Zinc
- Beta-Carotene
- Thiamin
- Vitamin B6
- Vitamin B12
- Folate
- Copper

These estimates are written to the Analysis Results File separately from the estimates of these nutrients from foods (Section 17) and printed in the Analysis Report (Section 18).

Each of these nutrient estimates is calculated by adding the daily amount of the nutrient obtained from single-nutrient pills plus the daily amount of nutrient from multiple vitamin pills. See Section 10 for information on the format and coding of the vitamin questions on your questionnaire.

Frequencies may be asked for up to six single-nutrient pills. These are:

Vitamin A	Calcium or Dolomite
Vitamin C	Zinc
Vitamin E	Beta-Carotene

Frequencies may be asked for up to three multiple vitamins. These are:

- One-A-Day Type
- Theragran Type
- Stress-Tabs Type

The same formula is used for each of the thirteen nutrient estimates. As an example, the equation for Vitamin A is given below. This same equation is then applied to each of the other twelve. Note that the daily frequency and amount of nutrient obtained from single-nutrient pills will automatically be zero for the seven supplements which may not be asked as single-nutrient pills (Vitamin D, Iron, Thiamin, Vitamin B6, Vitamin B12, Folate, and Copper). The nutrient estimates from supplements for these seven will come exclusively from multiple vitamins.

*(Daily Frequency of Vitamin A Pills x Amount of Vitamin A Per Pill) +  
(Daily Frequency for One-A-Day x Amount of Vitamin A in a One-A-Day) +  
(Daily Frequency for Theragran x Amount of Vitamin A in a Theragran) +  
(Daily Frequency for Stress-Tabs x Amount of Vitamin A in a Stress-Tab)*

**Daily Frequency.** The Daily Frequency for Non-Categorical questionnaires is calculated by multiplying the reported number of times by a factor to convert the frequency to daily. This factor is based on the unit of time segment of the frequency as shown below.

Day:	1.0
Week:	0.1429
Month:	0.0333
Year:	0.0027
Missing:	1.0 If a number of times is given by the respondent but the unit of time is missing for Non-Categorical questionnaires, then "per day" is imputed.

In Categorical questionnaires, each frequency input code is assigned a daily frequency as shown below.

<u>Input Code</u>	<u>Questionnaire Text</u>	<u>Daily Frequency</u>
1	Never	0.0
2	1-3 per week	2 x 0.1429 (2 per week)
3	4-6 per week	5 x 0.1429 (5 per week)
4	1 per day	1.0
5	2 per day	2.0
6	3 per day	3.0
7	4 per day	4.0
8	5+ per day	5.0
Missing or Error Code		0.0

**Amount of Nutrient Per Pill.** The amount of each nutrient in the six single-nutrient pills and the three multiple vitamins is stored in the DIETSYS Foods Database. See Sections 12.11 and 12.33 for more information regarding these data.

16.10 **Desirable Weight.** A recommendation regarding weight may be included in two sections of the Analysis Report. If the Weight and Height HHHQ Questions are both asked, DIETSYS will automatically print the following to the report:

The desirable weight for your height is approximately LOW - HIGH pounds.

In addition, Desirable Weight (DESIRWT) is a single value which may be printed in the Advice Section of the Analysis Report (see Section 18.7).

Note that Desirable Weight is not stored in the Analysis Results File. DIETSYS calculates this value as well as the desirable weight range at the time the report is printed using the methods described below.

Males:

For males with a reported height of less than or equal to 5 feet (60 inches), Desirable Weight is 106 pounds. For males with a reported height greater than 60 inches, the Desirable Weight equals 106 + 6 pounds for every inch over 60 inches.

Females:

For females with a reported height of less than or equal to 5 feet (60 inches), Desirable Weight is 100 pounds. For females with a reported height greater than 60 inches, the Desirable Weight equals 100 + 5 pounds for every inch over 60 inches.

The desirable weight range reported in the Analysis Report is 5% below and above the Desirable Weight calculated above.



## APPENDIX A

### 16A.1 AddFats

**Purpose:** To add the appropriate fats to the nutrient estimates according to the type and frequencies obtained from the "fat in cooking" and "fat added at the table" HHHQ Questions. These calculations are independent of and in addition to any fats asked as line items such as "Butter" and "Margarine".

**Implementation:** Three HHHQ Questions and one food frequency are used to implement the AddFats option. These are:

- a. What types of fat do you usually use in cooking (to fry, stir-fry, or saute)? (Section 10A.20)
- b. What types of fat do you usually add to vegetables, potatoes, etc? (Section 10A.20)
- c. How often do you use fat or oil in cooking? (Section 10A.22)
- d. The food frequency of "TABLE FAT ADDED - BY PROGRAM". This is Food 37 in the DIETSYS Foods Database and is worded on NCI questionnaires as "Butter, margarine or other fat on vegetables, potatoes, etc". This food frequency should be included in the Main Food List of your questionnaire if you intend to analyze the response to the HHHQ Question shown in b above.

When AddFats = ON:

Up to four foods are added to the analysis based on the responses to the questions and frequencies above. Cooking fat and table fat are considered independently and each may add up to two types of fat, depending on the respondent's answers to the "What type..." HHHQ Questions (a and b above). Thus, two foods may be added for cooking fat and two for table fat. The data from these foods are then incorporated into the analysis in the same manner as all other food items on the questionnaire.

If the coded response to the "What type..." contains only the following codes, no foods will be added for that fat type (cooking or table).

NON	Non-fat foods (e.g., Pam)
UNK	Don't know/don't cook OR Don't know/don't add fat
NR	No Response

The codes for NON, UNK, and NR are described in the coding manuals contained in this documentation. If you are using an NCI questionnaire, refer to the appropriate coding manual (Sections 6 for FULL87 and Long Interactive Interviews; Section 7 for SCAN92; Section 8 for BRIEF87; and Section 9 for Short Interactive Interviews) for coding instructions. If you have designed your own questionnaire, refer to Section 10A.20 for instructions in coding both "What type..." HHHQ Questions.

## Cooking Fats:

Frequency: The frequencies for the cooking fats are derived from the HHHQ Question, "How often do you use fat or oil in cooking?". If two fats are indicated in the "What types of fat do you usually use in cooking?" question, each will be added with a frequency equal to 50% of the response to the cooking fat frequency HHHQ Question.

If the questionnaire is in a Categorical format, the one character frequency code is translated as follows:

<u>Value</u>	<u>Input Code</u>	<u>Questionnaire Text</u>	<u>Weekly Frequency</u>
	1	< once per week	0.47
	2	1-2 per week	1.44
	3	3-4 per week	3.27
	4	5-6 per week	5.13
	5	1 per day	7.0
	6	1 1/2 per day	10.73
	7	2 per day	14.0
	8	3 per day	21.0
	9	4+ per day	28.0
	Missing Code	No response	0.0

Fat(s) Used: The identities of the cooking fats are derived from the HHHQ Question, "What type of fat do you usually use in cooking?". Each coded response corresponds to a food in the DIETSYS Foods Database as set in the CFG File. If using an NCI version of the questionnaire, refer to the codebook corresponding to that questionnaire (Sections 6 through 9). If you have designed your own questionnaire, you must follow the coding rules in Section 10A.20 to code the "What types of fat" HHHQ Question. The respondent is to be instructed to indicate one or two types of fat.

Serving Size: The setting of the CookFat option is used as the serving size for the foods added as cooking fats. The CookFat option may be set to MEDIUM or LARGE. The gram amount used is the value in the DIETSYS Foods Database of the specific fat reported, associated with the serving size assigned in the CookFat option.

Respondents may erroneously indicate more than two types of fat on Categorical questionnaires. If more than two types of fat are coded as used in cooking, DIETSYS selects two. The following adjustments will be made in the order listed below. If an adjustment reduces the number of fats to two, no further adjustments will be made.

1. If Diet Margarine and Soft Tub Margarine are both selected, Soft Tub Margarine is set as not selected.

2. If Stick Margarine and Crisco are both selected, Crisco is set as not selected.
3. If Lard and Crisco are both selected, Crisco is set as not selected.
4. If Stick Margarine and Soft Tub Margarine are both selected, Soft Tub Margarine is set as not selected.

If more than two fats remain, the first two of those remaining are used. That is, the first two as the codes appear in the Questionnaire Data File.

**Table Fats:**

**Frequency:** The frequencies for the table fats are derived from the frequency for Food 37, listed as d on page 16A-1. The frequency for Food 37 needs to be asked in the Main Food List of the questionnaire. If two table fats are used, each will be added with a frequency equal to 50% of the response to the frequency for Food 37.

**Fat(s) Used:** The identities of the table fats are derived from the HHHQ Question, "What types of fat do you usually add to vegetables, potatoes, etc?". Each coded response corresponds to a food in the DIETSYS Foods Database as set in the CFG File. If using an NCI version of the questionnaire, refer to the codebook corresponding to that questionnaire (Sections 6 through 9). If you have designed your own questionnaire, you must follow the coding rules in Section 10A.20 to code the "What types of fat" HHHQ Question. The respondent is to be instructed to indicate one or two types of fat.

Respondents may erroneously indicate more than two types of fat on Categorical questionnaires. If more than two types of table fat are coded as eaten, DIETSYS selects two. The following adjustments will be made in the order listed below. If an adjustment reduces the number of fats to two, no further adjustments will be made.

1. If Butter and Half Butter/Half Margarine are both selected, Half Butter/Half Margarine is set as not selected.
2. If Stick Margarine and Half Butter/Half Margarine are both selected, Half Butter/Half Margarine is set as not selected.
3. If Stick Margarine and Soft Tub Margarine are both selected, Soft Tub Margarine is set as not selected.
4. If Stick Margarine and Diet Margarine are both selected, Diet Margarine is set as not selected.

5. If Butter and Crisco are both selected, Crisco is set as not selected.

If more than two fats remain, the first two of those remaining are used. That is, the first two as the codes appear in the Questionnaire Data File.

When AddFats = OFF:

The responses to the HHHQ Questions and the frequency of Food 37, listed as a-d on page 16A-1, are ignored by the DIETSYS analysis.

**Defaults for NCI Questionnaires:** ON for all (SCAN92, FULL87, BRIEF87, the Long Interactive Interview, and the Short Interactive Interview).

**Recommendations:** To analyze the HHHQ Questions regarding type and frequency of fat in cooking or table fat added to vegetables, set AddFats to ON.

## 16A.2 AddMilk

**Purpose:** This option pertains to the frequency and type of milk added to cereal. There are three possible settings: AUTO, LINE ITEM, OFF. If AddMilk = AUTO the analysis program will automatically add milk at the same frequency with which cereals were reported. The LINE ITEM setting is designed for use when "MILK ON CEREAL" is specifically asked as a food question in the Main Food List of the questionnaire.

**Implementation:** The DIETSYS Nutrient Analysis program will automatically add nutrient values for milk on cereal if the AddMilk option is set to either AUTO or LINE ITEM. Food frequencies for the cereals must be included in the Main Food List of your questionnaire. It is recommended that all four cereals be included. These are:

Bran Cereal	Other Dry Cereals
Highly Fortified Cereal	Hot Cereal

The DIETSYS Nutrient Analysis will locate these cereals in your food list via the Food IDs set in the Adjust Options Reference Table (Sections 12.13 and 12.32). If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs for these cereals (Section 12.32).

If AddMilk = LINE ITEM, you must also include a food frequency question for "MILK ON CEREAL" in the Main Food List section of your questionnaire. The Food ID for "MILK ON CEREAL" is 128, as required by DIETSYS.

The following equation is used to add nutrient values for the additional milks. The variables in the equation will be described below.

$$\frac{(AddMilk\ Frequency \times Grams\ Portion\ Size \times Nutrient\ Content\ in\ 100g)}{100}$$

A. **AddMilk Frequency.** The frequency used is dependent on the AddMilk option setting.

**LINE ITEM.** If the AddMilk option is set to LINE ITEM, the frequency used as the "AddMilk Frequency" is equal to the reported frequency for the Milk On Cereal line item.

**AUTO.** If the AddMilk option is set to AUTO, the frequency used as the "AddMilk Frequency" is based on the reported frequencies of the four line item cereals, using the four steps outlined below.

Step 1: Calculate the weekly frequency for all line item cereals. This value will be referred to below as "Unadjusted Frequency for All Cereals".

Step 2: Calculate the weekly frequency for the three cold cereal line items. This frequency will be referred to as "Cold Cereal Freq".

Step 3: Calculate the weekly frequency for the hot cereal line item. Multiply this frequency by 0.5 to account for the smaller portion sizes of milk used on hot cereals. Even though this is a portion size correction, it is easier to implement it at this point. This adjusted frequency will be referred to as Hot Cereal Freq.

Step 4: A reasonableness check is made on the Unadjusted Frequency for All Cereals. Remember that the adjustment for hot cereals is really a portion size adjustment, not a frequency adjustment.

If the Unadjusted Frequency for All Cereals is greater than 7, the following calculation is made:

$$AddMilk\ Frequency = (7/Unadjusted\ Freq\ forAll) \times (Hot\ Cereal\ Freq + Cold\ Cereal\ Freq)$$

If the Unadjusted Frequency for All Cereals is less than or equal to 7, the following calculation is made:

$$AddMilk\ Frequency = Hot\ Cereal\ Freq + Cold\ Cereal\ Frequency$$

B. **Grams Portion Size.** The grams per serving size data used for adding milk is dependent on the AddMilk option setting.

**LINE ITEM.** DIETSYS uses the portion size data for Food 128 (Milk on Cereal) in the DIETSYS Foods Database. The serving size used is the serving size (small, medium,

large, xl) reported by the respondent for Food 128 in the Main Food List section of the questionnaire.

**AUTO.** DIETSYS uses the portion size data for 2% Milk in the DIETSYS Foods Database. The DIETSYS Nutrient Analysis will locate 2% Milk in your Foods Database via the Food IDs set in the Adjust Options Reference Table (Sections 12.13 and 12.32). If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs for 2% Milk (Section 12.32).

Grams Portion Size for AddMilk = AUTO equals:

0.45 x MEDIUM Serving of 2% Milk

The 45% adjustment accounts for the smaller portions of milk used on cereal compared to beverage portions. The portion size added for Hot Cereal is actually half of this amount. The adjustment for the Hot Cereal portion was made when the AddMilk Frequency was calculated in A above.

C. **Nutrient Content in 100g.** For both the AUTO and LINE ITEM settings, the Nutrient Content in 100g is derived from the nutrient values for the three milks on the DIETSYS Foods Database, that is, the three milks which are used as food frequency line items for milk as a beverage. These are "2% Milk", "Whole Milk", and "Skim Milk".

The program uses the same proportion of whole, 2%, and skim as the respondent reported for these three food items in the Main Food List of the questionnaire. The nutrient content of 2% Milk will be used if the frequencies for all three beverage milks are zero, or if these questions were skipped or not asked on the questionnaire.

**Defaults for NCI Questionnaires:** LINE ITEM for the SCAN92 version. AUTO for BRIEF87, FULL87, the Long Interactive Interview, and the Short Interactive Interview.

**Recommendations:** Either a line item for Milk on Cereal should be asked, or if it has not been, this option should be set to AUTO.

### 16A.3 AddSalt

**Purpose:** Sodium values (like all the nutrient values) are based on NHANES II, and thus do already include salt naturally present or normally added in cooking, etc. This option permits the addition of sodium to take account of salt added from the shaker at the table.

#### **Implementation:**

If AddSalt = ON:

If the answer to the "How often do you add salt to your food" question is:

SOMETIMES	Sodium value is increased by 15%
OFTEN/ALWAYS	Sodium value is increased by 30%

**Defaults for NCI Questionnaires:** OFF

**Recommendations:** Set the AddSalt option to OFF if you did not ask the salt question or if you do not wish to add additional sodium. Set to ON to experiment with its impact.

#### 16A.4 AgeDefault

**Purpose:** This option allows you to specify which "age group" the analysis program will use for respondents who skipped the age question. This determines the set of age-sex specific portions used if the Portions option is set to AgeSex (Section 16A.20); and it determines the set of factors used to implement the Predict option (Section 16A.21). The value of the AgeDefault option will be used as the age group for all questionnaires if the age question was not asked. This is intended for use with populations of one age group.

**Implementation:** There are three possible settings for the AgeDefault option. For each setting, the portion sizes and set of predict factors used for respondents who skipped the age question are given below. These same settings will be used for all questionnaires if the age question was not asked on the questionnaire.

YOUNGER	DIETSYS Foods Database portion sizes: Younger Age Group. Predict factors: Set 1.
MID AGE	DIETSYS Foods Database portion sizes: Middle Age Group. Predict factors: Set 3.
OLDER	DIETSYS Foods Database portion sizes: Older Age Group. Predict factors: Set 5.

The AgeDefault option will not affect the portion sizes if the Portions option is set to ONQUEST. See Section 16A.20 for more information regarding the Portions option.

**Defaults for NCI Questionnaires:** MID AGE

**Recommendations:** The AgeDefault option should not be used instead of asking the Age HHHQ Question. It is possible, however, to use this with populations in a single age group. If age was not asked of a population of various ages, the following option settings should be used: Predict=OFF and Portions=ONQUEST. When Predict and Portions have these settings, the AgeDefault option will have no impact.

#### 16A.5 CerealAdj

**Purpose:** When three different types of cold cereals are asked on questionnaires, as they are on the NCI-Block questionnaires, people often report frequencies of individual cereals which add up to more cereals than they actually eat. The CerealAdj option adjusts for this by adjusting the frequencies of the individual cereal frequencies based on the frequency coded for the cereal summary HHHQ Question ("About how many servings of cold cereal do you eat?"). This question is included on the SCAN92 questionnaire. If using the SCAN92 questionnaire, refer to Section 7 for instructions to code this HHHQ Question. If you have designed your own questionnaire, see Section 10A.22 for coding instructions.

**Implementation:** The members of the Cereals for Adjust Food Group are the individual cereals which are used for the CerealAdj option (see Section 15.14 for more information on Food Groups). The frequencies of these cereals are summed to create a Group Frequency. These food frequencies may be coded in either the Main Food List or an Open Ended Food Section of your questionnaire.

The Summary Frequency is obtained from the response to the HHHQ Question regarding frequency of cereals. If the questionnaire is in a Categorical format, the one character frequency code is translated as follows:

<u>Input Code</u>	<u>Questionnaire Text</u>	<u>Weekly Frequency Value</u>
1	Less than once per week	0.0
2	1-2 per week	1.85
3	3-4 per week	3.46
4	5-6 per week	5.3
5	1 per day	7.0
6	1 1/2 per day	10.15
7	2 per day	14.0
8	3 per day	21.0
9	4+ per day	28.0
Missing Code	No response	0.0

The Group Frequency for the Cereals for Adjust is compared to the Summary Frequency. If the Group Frequency is within 20% of the Summary Frequency or the Summary Frequency equals zero, no adjustments are made by DIETSYS. Otherwise, DIETSYS performs the following adjustments.

- a. If the Cereals For Adjust Group Frequency is more than 20% greater than the Summary Frequency, DIETSYS will reduce the frequency of each member of the Cereals For Adjust group. The frequency for each member of the Cereals for Adjust group is reduced by the following factor:

$$\text{Summary Frequency} / \text{Group Frequency}$$

- b. If the Cereals for Adjust Group Frequency is less than 80% of the Summary Frequency, it is assumed that the respondent eats cereals which were not mentioned on the questionnaire. This will be taken into account by adding the food "Other Dry Cereals" to this individual's analysis. This food will be added with a frequency of the difference between the Summary Frequency and the Cereals for Adjust Group Frequency. If the respondent had already reported eating Other Dry Cereals, the reported frequency will be increased using the same calculation.

If the frequency for Other Dry Cereals was not asked on the questionnaire, no adjustment will be made if the Group Frequency is less than 80% of the Summary Frequency. The Food ID of the Other Dry Cereals line item is assigned in the Adjust Options Reference Table. If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs for Other Dry Cereals (Sections 12.13 and 12.32).

**Defaults for NCI Questionnaires:** ON for SCAN92; summary question not asked on other versions (FULL 87, BRIEF87, or Interactive Interviews).

**Recommendations:** ON if you asked the Cereal Summary Question.

#### 16A.6 CodeCereal

**Purpose:** The CodeCereal option permits greater cereal specificity, if the "Type of Cold Cereal" HHHQ Question was included on the questionnaire. This HHHQ Question is described in Section 10A.21; this question is included in the FULL87, Long Interactive Interview, and Short Interactive Interview questionnaires.

**Implementation:** One HHHQ Question and three food frequencies in the Main Food List are used to implement the CodeCereal option. These are:

- a. HHHQ Question: If you eat cold cereal, what kind do you eat most often? See Section 10A.21 for coding instructions.
- b. Food frequencies of Bran Cereal, Highly Fortified Cereal, and Other Dry Cereals. The Food IDs of these line item cereals are assigned in the Adjust Options Reference Table. If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs for these cereals (see Sections 12.13 and 12.32).

The "Type of Cold Cereal" HHHQ Question asks the respondent to print the name of the cereal eaten most often. The coded response stored in the Questionnaire Data File is the three character Cereal Code. The Cereal Code identifies the food in the DIETSYS Foods Database (Section 12.12 and 12.28). The last two characters in the Cereal Code correspond to the sequence of the cereal in the Brand-Name Cereal section of the DIETSYS Foods Database. The first character of the Cereal Code is ignored by the DIETSYS analysis. (The first character was used in previous versions, and its position is preserved for compatibility with those software versions.)

When the CodeCereal option is ON, the Brand-Name Cereal portion size and nutrient values are substituted for one of the three line item cereals. The line item cereal replaced is determined by the Cereal Type variable of the Brand-Name Cereal. The Cereal Type is stored in the DIETSYS Foods Database and may have the following values:

- B = Bran or high fiber cereals
- F = Highly fortified cereals (many nutrients at approximately 100% of RDA per serving)
- O = Other dry cereals (no fortification or moderate fortification levels, most nutrients approximately 25% of RDA per serving)

If the food frequency of the cereal to be replaced is missing or zero, this option will have no impact on the analysis. Likewise, if the food frequency of the cereal to be replaced was not included on the questionnaire, this option will have no impact on the analysis.

**Defaults for NCI Questionnaires:** ON for FULL87, Short and Long Interactive Interviews; OFF for the SCAN92 and BRIEF87 versions.

**Recommendations:** If you have included the "Type of Cold Cereal" HHHQ Question, it is recommended to turn this option ON. To evaluate the contribution of cereal specificity, analyze your data once with the CodeCereal option ON and once with it OFF. You must set the CodeCereal option to OFF if you did not include the "Type of Cold Cereal" question on your questionnaire.

#### 16A.7 **ColapsXL**

**Purpose:** To allow the investigator to compare nutrient estimates with and without extra-large portion sizes. Some questionnaires may include extra-large as a portion size choice. You provide this information to the program in the CFG File (Section 11). However, after collecting the data, you may wish to evaluate the impact of using the XL portion choice.

**Implementation:**

If ColapsXL = ON

A large portion size will be used for all foods with a serving size recorded as extra-large. That is, XL portions will be collapsed into "large".

If ColapsXL = OFF

Extra-large serving sizes will be used in the nutrient estimates. The grams per serving of an extra-large portion is calculated as 50% more than that of a large serving.

**Defaults for NCI Questionnaires:** OFF

#### 16A.8 **CookFat**

**Purpose:** To set the portion size to be used for the fat used in cooking. The respondent is not queried for a portion size for these fats.

**Implementation:** The CookFat option has two possible settings: MEDIUM and LARGE. The setting of the CookFat option will be used as the serving size for any foods added to the analysis to account for fats used in cooking. These fats are only incorporated into the analysis if the AddFats option is ON. See Section 16A.1 for more information on AddFats.

**Defaults for NCI Questionnaires:** MEDIUM

**Changes Since V2.3:** In Version 2.3 of the software, CookFat also affected the portion sizes used for Food 64 (Salad Dressing) and Open-Ended Food 32 (Diet Salad Dressing). In version 2.3, CookFat also affected the serving size used for fats added at the table (even

though the documentation specifically said it did not). In version 3.0, CookFat does not affect any foods other than fats used in cooking.

#### 16A.9 **DarkQues**

**Purpose:** You may use this option if you asked the HHHQ Question on whether poultry eaten is light or dark meat, from the Women's Health Trial questionnaire (See Section 10A.24). If the DarkQues option is ON, the response to this question will influence which meats in the database will be used for one or both of the chicken food frequencies, that is, Fried Chicken and/or Other Chicken.

**Implementation:** The nutrient content will be obtained from the appropriate items in the database in place of the chicken line items as warranted by the answer to the "Light or Dark Poultry" HHHQ Question. The DarkQues and EatSkin options are implemented together. Section 16A.11 contains tables which show the substitution algorithms. Note that the portion size data of the original chicken line items are always used. There are no portion size data in the Meats Used for Adjust Options section of the DIETSYS Foods Database (Section 12.2).

The DIETSYS Nutrient Analysis will identify Fried Chicken and Other Chicken in your food list via the Food IDs set in the Adjust Options Reference Table (Sections 12.13 and 12.32). If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs.

**Defaults for NCI Questionnaires:** OFF

**Recommendations:** Set the DarkQues option to OFF if you did not ask this poultry HHHQ Question, or if you did ask it and wish to investigate the impact of this option.

#### 16A.10 **EatSkin**

**Purpose:** You may use this option if you asked the question: "How often do you eat the skin on chicken?" (1=Seldom/Never, 2=Sometimes, 3=Often/Always.) If the EatSkin option is ON, the response to this question will determine which meats in the database will be used for the two chicken food frequencies, that is, Fried Chicken and/or Other Chicken.

**Implementation:** The nutrient content will be obtained from the appropriate items in the database in place of the chicken line items as warranted by the answer to this HHHQ Question. The EatSkin and DarkQues options are implemented together. The tables in Section 16A.11 show the substitution algorithms. Note that the portion size data of the original chicken line items are always used. There are no portion size data in the Meats Used for Adjust Options section of the DIETSYS Foods Database (Section 12.2).

The DIETSYS Nutrient Analysis will identify Fried Chicken and Other Chicken in your food list via the Food IDs set in the Adjust Options Reference Table (Sections 12.13 and 12.32). If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs.

**Defaults for NCI Questionnaires:** ON

**Recommendations:** Set the EatSkin option to OFF if you did not ask this poultry HHHQ Question, or if you did ask it and wish to investigate the impact of this option.

16A.11 The tables below show the substitutions made by the DarkQues and Eatskin options.

DarkQues & Eatskin Options for <b>Fried Chicken</b>		
DarkQues Option	EatSkin Option	Food Used
1=Light	1=Seldom/Never	Fried Chicken Without Skin, Light Meat
	2=Sometimes	Fried Chicken (Line Item)
	3=Often/Always	Fried Chicken With Skin, Light Meat
	Missing/Error Code	Fried Chicken (Line Item)
	OPTION=OFF	Fried Chicken (Line Item)
All values <b>except</b> Light	1=Seldom/Never	Fried Chicken Without Skin
	2=Sometimes	Fried Chicken (Line Item)
	3=Often/Always	Fried Chicken With Skin
	Missing/Error Code	Fried Chicken (Line Item)
	OPTION=OFF	Fried Chicken (Line Item)

DarkQues & Eatskin Options for <b>Other Chicken</b>		
DarkQues Option	EatSkin Option	Food Used
1=Light	1=Seldom/Never	Other Chicken Without Skin, Light Meat
	2=Sometimes	Other Chicken (Line Item)
	3=Often/Always	Other Chicken With Skin, Light Meat
	Missing/Error Code	Other Chicken (Line Item)
	OPTION=OFF	Other Chicken (Line Item)
All values <b>except</b> Light	1=Seldom/Never	Other Chicken Without Skin
	2=Sometimes	Other Chicken (Line Item)
	3=Often/Always	Other Chicken With Skin
	Missing/Error Code	Other Chicken (Line Item)
	OPTION=OFF	Other Chicken (Line Item)

## 16A.12 FruitAdj

**Purpose:** Extensive frequency-type questionnaires often overestimate vitamin A, C and fiber, because people often report frequencies of individual fruit which add up to more fruits than they actually eat. The FruitAdj option adjusts for this by adjusting the frequencies of the individual fruit frequencies based on the frequency coded for the fruit summary HHHQ Question ("About how many servings of fruit do you eat, not counting juices?"). If using an NCI version of the HHHQ, refer to the questionnaire's manual for instructions to code this HHHQ Question. If you have designed your own questionnaire, see Section 10A.22 for coding instructions.

**Implementation:** The members of the Fruits for Adjust Food Group are the individual fruits which are used for the FruitAdj option (see Section 15.14 for more information on Food Groups). The frequencies of these fruits are summed to create a Group Frequency. These food frequencies may be coded in either the Main Food List or an Open Ended Food Section of your questionnaire.

The Summary Frequency is obtained from the response to the HHHQ Question regarding frequency of fruits. If the questionnaire is in a Categorical format, the one character frequency code is translated as follows:

<u>Input Code</u>	<u>Questionnaire Text</u>	<u>Weekly Frequency Value</u>
1	Less than once per week	0.0
2	1-2 per week	1.71
3	3-4 per week	3.46
4	5-6 per week	5.3
5	1 per day	7.0
6	1 1/2 per day	10.38
7	2 per day	14.0
8	3 per day	21.0
9	4+ per day	28.0
Missing Code	No response	0.0

The Group Frequency for the Fruits for Adjust is compared to the Summary Frequency. If the Group Frequency is within 20% of the Summary Frequency or the Summary Frequency equals zero, no adjustments are made by DIETSYS. Otherwise, DIETSYS performs the following adjustments.

- a. If the Fruits For Adjust Group Frequency is more than 20% greater than the Summary Frequency, DIETSYS will reduce the frequency of each member of the Fruits For Adjust group. The frequency for each member of the Fruits for Adjust group is reduced by the following factor:

$$\text{Summary Frequency} / \text{Group Frequency}$$

- b. If the Fruits for Adjust Group Frequency is less than 80% of the Summary Frequency, it is assumed that the respondent eats fruits which were not mentioned on the

questionnaire. This will be taken into account by adding the food "Other Fruits" to this individual's analysis. This food will be added with a frequency of the difference between the Summary Frequency and the Fruits for Adjust Group Frequency. If the respondent had already reported eating Other Fruits, the reported frequency will be increased using the same calculation.

The Food ID of the Other Fruits line item is assigned in the Adjust Options Reference Table. If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs for Other Fruits (see Sections 12.13 and 12.32).

If the frequency for Other Fruits was not asked on the questionnaire, no adjustment will be made if the Group Frequency is less than 80% of the Summary Frequency.

**Defaults for NCI Questionnaires:** ON for all (SCAN92, FULL87, BRIEF87, the Long Interactive Interview, and the Short Interactive Interview).

**Recommendations:** Repeat analysis ON and OFF to investigate impact. ON will give more accurate counts of foods in this group.

#### 16A.13 **LeanMeat**

**Purpose:** You may use this option if you asked a question on leanness of hamburger/beef (1=Regular, 2=Lean, 3=Extra Lean). If the LeanMeat option is ON, the response to this question will determine which meat in the database will be used for Beef and which will be used for Hamburger.

**Implementation:** The nutrient content will be obtained from the appropriate items in the database in place of the Beef and Hamburger line items as warranted by the answer to this HHHQ Question. Section 16A.15 contains tables which show the substitution algorithm. Note that the portion size data of the original Beef and Hamburger line items are always used. There are no portion size data in the Meats Used for Adjust Options section of the DIETSYS Foods Database (Section 12.2).

The DIETSYS Nutrient Analysis will identify Hamburger and Beef in your food list via the Food IDs set in the Adjust Options Reference Table (Sections 12.13 and 12.32). If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs.

**Defaults for NCI Questionnaires:** OFF

**Recommendations:** Set the LeanMeat option to OFF if you did not ask the leanness of beef HHHQ Question, or if did ask it and wish to investigate the impact of this option.

#### 16A.14 **MeatFat**

**Purpose:** You may use this option if you asked the question: "How often do you eat the fat on meat?". (1=Seldom/Never, 2=Sometimes, 3=Often/Always). If the MeatFat option

is ON, the response to this question will determine which meats in the database will be used for Beef and Pork.

**Implementation:** The nutrient content will be obtained from the appropriate items in the database in place of the Beef and Pork line items as warranted by the answer to this HHHQ Question. This option has no impact on Hamburger. Section 16A.15 contains tables which show the substitution algorithm. Note that the portion size data of the original Beef and Pork line items are always used. There are no portion size data in the Meats Used for Adjust Options section of the DIETSYS Foods Database (Section 12.2).

The DIETSYS Nutrient Analysis will identify Beef and Pork in your food list via the Food IDs set in the Adjust Options Reference Table (Sections 12.13 and 12.32). If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs.

**Defaults for NCI Questionnaires:** ON

**Recommendations:** Set the MeatFat option to OFF if you did not ask this HHHQ Question, or if you did ask it and wish to investigate the impact of this option.

16A.15 The tables below show the substitutions made by the MeatFat and LeanMeat options.

LeanMeat Option for <b>Hamburger</b>	
LeanMeat Option	Food Used
1=Regular	Hamburger, Regular
2=Lean	Hamburger (Line Item)
3=Extra Lean	Hamburger, Extra Lean
Missing/Error Code	Hamburger (Line Item)
OPTION=OFF	Hamburger (Line Item)

MeatFat Option for <b>Pork</b>	
MeatFat Option	Food Used
1=Seldom/Never	Pork (Fat Trimmed Off)
2=Sometimes	Pork (Line Item)
3=Often/Always	Pork (Fat Not Trimmed)
Missing/Error Code	Pork (Line Item)
OPTION=OFF	Pork (Line Item)

MeatFat & LeanMeat Options for <b>Beef</b>		
LeanMeat Option	MeatFat Option	Food Used
All values <b>except</b> Extra Lean	1=Seldom/Never	Beef (Fat Trimmed Off)
	2=Sometimes	Beef (Line Item)
	3=Often/Always	Beef (Fat Not Trimmed Off)
	Missing/Error Code	Beef (Line Item)
	OPTION=OFF	Beef (Line Item)
3=Extra Lean	1=Seldom/Never	Beef (Trimmed & Extra Lean)
	2=Sometimes	Beef (Fat Trimmed Off)
	3=Often/Always	Beef (Line Item)
	Missing/Error Code	Beef (Trimmed & Extra Lean)
	OPTION=OFF	Beef (Trimmed & Extra Lean)

#### 16A.16 **LowFatFoods**

Set the LowFatFoods option to ON if you wish to evaluate the effect of the response to the LowFatFoods HHHQ Question ("When you eat the following foods, how often do you eat a low-fat or non-fat version of the foods: Cheese, Ice Cream/Yogurt, Salad Dressing?" (1=Always low-fat, 2=Sometimes, 3=Rarely Low-Fat).

**Enhancement:** As of version 3.4, DIETSYS allows you to customize the LowFatFoods question to incorporate other foods. This change is documented in the README.TXT file distributed with the software.

**Purpose:** This option incorporates the response to the Low Fat Food HHHQ Question into the nutrient analysis.

**Implementation:** The Low Fat Food HHHQ Question must be included on your questionnaire to use this option. The LowFatFoods option determines which foods in the DIETSYS Foods Database are used for three cheese food items, ice cream, yogurt, and salad dressing. The DIETSYS Nutrient Analysis program will check the response to each of the three segments of the HHHQ Question shown above. If '1' (always) is the response, DIETSYS will use the portion size and nutrient content data from the low-fat version of the appropriate food. The regular fat version of the food will be used if anything other than '1' (always) is coded (this includes '2' for Sometimes, '3' for Rarely, the Missing Code, or the Error Code).

The Food IDs of the foods to be affected by the LowFatFoods option are assigned in the Adjust Options Reference Table. If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs (see Sections 12.13 and 12.32).

Each segment of the LowFatFoods HHHQ question affects a different set of foods. These foods are listed below. The text used to describe each food is the same text used in the Adjust Options Reference Table.

**CHEESE:** If the 1st character in the coded response to the LowFatFoods HHHQ response code is '1' (always), the following substitutions will be made.

Low Fat Cheese & Spread for Cheese & Cheese Spread  
Low Fat Cottage Cheese for Cottage Cheese  
Low Fat Hard Cheeses for Hard Cheeses

**Ice Cream/Yogurt:** If the 2nd character in the coded response to the LowFatFoods HHHQ response code is '1' (always), the following substitutions will be made.

Low Fat Ice Cream for Ice Cream  
Low Fat Yogurt for Yogurt

**Salad Dressing:** If the 3rd character in the coded response to the LowFatFoods HHHQ response code is '1' (always), the following substitutions will be made.

Diet Salad Dressing for Salad Dressing

If the LowFatFoods option is OFF, or none of the foods above were reported as eaten by the respondent, the LowFatFoods option will have no impact on the analysis.

**Defaults for NCI Questionnaires:** ON for the SCAN92 version. OFF for BRIEF87, FULL87, the Long and Short Interactive Interviews.

**Recommendations:** If you are designing your own questionnaire, use of this HHHQ Question is recommended.

#### 16A.17 MedOnly

**Purpose:** To allow the investigator to assess the impact of asking serving size (small, medium, large) on the dietary analysis.

**Implementation:**

If MedOnly = ON

A medium portion size will be used for ALL foods.

If MedOnly = OFF

The serving size specified by the respondent will be used for each food.

**Defaults for NCI Questionnaires:** OFF

**Recommendations:** MedOnly = OFF will give better nutrient estimates.

#### 16A.18 **Minimum Freq**

**Purpose:** This option permits the investigator to give nutrient credit only to foods eaten with a certain frequency.

**Implementation:** Minimum Freq has three possible settings. They are:

- a. **NO MIN.** If NO MIN is the option setting, all foods will be included in the analysis.
- b. **1/WEEK.** If 1/WEEK is the option setting, only foods with a weekly frequency greater than or equal to 0.933 will be included in the analysis.
- c. **1/MONTH.** If 1/MONTH is the option setting, only foods with a weekly frequency greater than or equal to 0.233 will be included in the analysis.

**Defaults for NCI Questionnaires:** NO MIN

**Recommendations:** This option makes it possible to examine the impact of infrequently eaten foods.

#### 16A.19 **OpenEnded Min**

**Purpose:** This option permits the investigator to exclude foods in the Open Ended food sections which were not eaten with a minimum frequency. Open Ended food sections often ask the respondent to list foods not previously mentioned which are eaten at least once per week. This option is available for consistency of calculations for those investigators who wish to include only open-ended foods eaten at least once per week.

See Section 12.3 for a description of Open Ended foods. If you are using an NCI questionnaire, refer to the questionnaire's codebook (Sections 6 through 9) for coding information. If you have designed your own questionnaire, see Section 10.6 for information on coding Open Ended Foods.

**Implementation:** OpenEnded Min has four possible settings. They are:

- a. **1/DAY.** If 1/DAY is the option setting, only Open Ended foods with a weekly frequency greater than or equal to 7 will be included in the analysis.
- b. **1/WEEK.** If 1/WEEK is the option setting, only Open Ended foods with a weekly frequency greater than or equal to 0.933 will be included in the analysis.
- c. **1/MONTH.** If 1/MONTH is the option setting, only Open Ended foods with a weekly frequency greater than or equal to 0.233 will be included in the analysis.

- d. **NO OPEN FOODS.** If NO OPEN FOODS is the option setting, all Open Ended foods will be excluded from the analysis.

**Defaults for NCI Questionnaires:** NO OPEN FOODS for SCAN92 and BRIEF87. 1/WEEK for FULL87 and the Long and Short Interactive Interviews.

**Recommendations:** If your questionnaire requests the respondent to list foods which are eaten at least once per week, you may wish to include only open-ended foods eaten at least 1/week. NO OPEN FOODS permits investigating the value of including an Open Ended section on the questionnaire.

## 16A.20 Portions

**Purpose:** This option determines which set of portion sizes from the DIETSYS Foods Database will be used to calculate the nutrient estimates. When Portions = AGESEX, age-sex-specific portion sizes are used. AGESEX is the recommended setting. AGESEX will give better estimates than ONQUEST for men under 60 and probably for young women, as well. When set to ONQUEST, a single set of portion sizes, not age-sex-specific, will be used. ONQUEST portion sizes are approximately equal to the size stated on the printed questionnaire.

**Implementation:** If Portions = ONQUEST, one set of portion sizes in the DIETSYS Foods Database will be used for all respondents. That is, the gram amount for a "Medium" portion of a particular food will be the same for men and women of all ages. See Section 12.7 for more information on the ONQUEST portion size data.

If Portions = AGESEX, the age-sex-specific portion size data stored in the DIETSYS Foods Database will be used for the nutrient estimates from food sources (Section 12.7). All respondents with a code of '1' for the Sex HHHQ Question will be analyzed using the male set of portion data; respondents with a code of '2' will be analyzed using the female set. Respondents with a Missing Code or Error Code for the Sex HHHQ Question will be analyzed using the set of portion sizes corresponding to the value of the SexDefault option. If the Sex HHHQ Question is not asked on the questionnaire, all respondents will be analyzed using the SexDefault portion sizes (Section 16A.26).

If the Age HHHQ Question is coded as number of years (a 2 digit field), the age specific portion sizes are assigned for both sexes as shown below.

<u>Portion Sizes</u>	<u>Age</u>
Younger Age Group	1-29
Middle Age Group	30-69
Older Age Groups	70 and older

If the Age HHHQ Question is coded in a 1 digit field, the portion size set to be used per input code is set in the CFG File. If you are using the SCAN92 questionnaire, refer to the codebook in Section 7. If you have designed your own questionnaire, set the Age Coding scheme as described in Section 11.15.



If you wish to record age in number of years (2 digit format) but would like to assign the portion size sets differently, do the following:

1. In the CFG File, the Age HHHQ Question should be set in the 1 digit format (See Section 11). In this field, enter an age code which properly assigns the respondent to a set of portion sizes. This code should be based on the age question described in #2.
2. Ask the "number of years" age as an Other Question (Section 11). DIETSYS will never analyze the response to this question, but it will be included in the Questionnaire Data File for your reference.

If you ask age in both formats and are scanning self-administered forms, you will either have to ask the respondent to indicate age in two different questions or mark the 1 character age code yourself.

#### **Defaults for NCI Questionnaires: AGESEX**

##### **16A.21 Predict**

**Purpose:** This option is designed for use with questionnaires which have food lists of approximately 60 items. If Predict is ON and 50-75 foods are asked on the questionnaire, the nutrient estimates will be multiplied by the adjustment factors to produce nutrient estimates close to those seen in national 24-hour recall surveys by age and sex.

**Implementation:** If Predict is ON and there are fewer than 50 or greater than 75 foods in the Main Food List of the questionnaire, Predict will automatically be turned OFF by the DIETSYS analysis. If Predict is ON and 50-75 foods are in the Main Food List of the questionnaire, each nutrient estimate will be multiplied by the age-sex specific factors shown below. Any nutrients not listed in this table will not be affected.

Six sets of age-specific factors, numbered '1' to '6', are shown for each sex. These are assigned to the following ages:

<u>Set</u>	<u>Age</u>
1	= 18-24
2	= 25-34
3	= 35-44
4	= 45-54
5	= 55-64
6	= 65+

If you asked the Age HHHQ Question in its one-character format, you may specify the Predict Age Category for each age code in your Analysis Options File (see Section 15.19).

Male Predict Factor Sets

	1	2	3	4	5	6
TOTAL CALORIES	1.1549	1.1903	1.2485	1.2816	1.1939	1.1611
PROTEIN	1.1553	1.2090	1.2361	1.2605	1.2145	1.1879
TOTAL FAT	1.1084	1.1452	1.2348	1.2403	1.1673	1.1351
CARBOHYDRATE	1.1387	1.1990	1.2385	1.2880	1.1980	1.1904
PHOSPHORUS	1.1699	1.1958	1.2006	1.2244	1.1613	1.1063
IRON	1.1203	1.2340	1.3089	1.3697	1.2759	1.3429
SODIUM	1.1910	1.1824	1.2412	1.3321	1.1897	1.1807
POTASSIUM	0.9673	1.0419	1.1417	1.1435	1.0973	1.0479
VITAMIN A (IU)	0.6791	0.6832	0.6577	0.6929	0.6420	0.6799
VITAMIN A (RE)	0.6791	0.6832	0.6577	0.6929	0.6420	0.6799
THIAMIN (B1)	1.0848	1.1986	1.2683	1.2773	1.1667	1.1875
RIBOFLAVIN (B2)	1.1016	1.1381	1.1405	1.1492	1.0730	1.1084
NIACIN	1.1739	1.2896	1.3351	1.3901	1.2543	1.3446
VITAMIN C	0.8124	0.7751	0.8450	0.8951	0.8445	0.7765
SATURATED FAT	1.0460	1.0798	1.1899	1.2237	1.1502	1.0984
OLEIC ACID	1.1103	1.1583	1.2500	1.2551	1.1978	1.1633
CHOLESTEROL	1.0428	1.0607	1.1398	1.2135	1.2515	1.2268
DIETARY FIBER	1.0397	1.1311	1.1589	1.1743	1.1250	1.0893
ZINC	1.1553	1.2090	1.2361	1.2605	1.2145	1.1879
ZINC FROM ANIMAL	1.1553	1.2090	1.2361	1.2605	1.2145	1.1879
VITAMIN B6	1.1553	1.2090	1.2361	1.2605	1.2145	1.1879

Female Predict Factor Sets

TOTAL CALORIES	1.0458	1.0843	1.2130	1.1442	1.1710	1.1691
PROTEIN	1.0016	1.0428	1.1711	1.1152	1.1237	1.1457
TOTAL FAT	0.9670	1.0228	1.1767	1.0909	1.1194	1.0789
CARBOHYDRATE	1.1174	1.1471	1.2290	1.1797	1.2141	1.2506
PHOSPHORUS	1.0229	1.0029	1.1193	1.0787	1.0586	1.0795
IRON	1.0606	1.1720	1.3176	1.2235	1.2892	1.3553
SODIUM	1.0427	1.0848	1.2063	1.1297	1.1578	1.1018
POTASSIUM	0.8720	0.9622	1.0738	1.0607	1.0882	1.1380
VITAMIN A (IU)	0.6359	0.6914	0.7075	0.7186	0.7430	0.7970
VITAMIN A (RE)	0.6359	0.6914	0.7075	0.7186	0.7430	0.7970
THIAMIN (B1)	1.0095	1.1134	1.2093	1.1264	1.1250	1.1628
RIBOFLAVIN (B2)	0.9441	0.9487	1.0511	1.0297	1.0000	1.0625
NIACIN	1.0671	1.2132	1.3821	1.2787	1.2991	1.3679
VITAMIN C	0.7608	0.7981	0.7718	0.8328	0.8853	0.8908
SATURATED FAT	0.8959	0.9405	1.1048	1.0446	1.0588	1.0299
OLEIC ACID	0.9526	1.0381	1.2079	1.1168	1.1475	1.1006
CHOLESTEROL	0.9228	0.9549	1.2041	1.1619	1.1472	1.1538
DIETARY FIBER	1.0238	1.0930	1.0824	1.0449	1.1087	1.1667
ZINC	1.0016	1.0428	1.1711	1.1152	1.1237	1.1457
ZINC FROM ANIMAL	1.0016	1.0428	1.1711	1.1152	1.1237	1.1457
VITAMIN B6	1.0016	1.0428	1.1711	1.1152	1.1237	1.1457

If the VegAdj and FrtAdj options are both ON, the factors shown below are used.

Male Predict Factor Sets

	1	2	3	4	5	
6						
VITAMIN A (IU)	0.74	0.74	0.74	0.78	0.81	0.78
VITAMIN A (RE)	0.74	0.74	0.74	0.78	0.81	0.78
VITAMIN C	0.74	0.76	0.84	0.89	0.87	0.80

Female Predict Factor Sets

VITAMIN A (IU)	0.70	0.76	0.78	0.78	0.86	0.93
VITAMIN A (RE)	0.70	0.76	0.78	0.78	0.86	0.93
VITAMIN C	0.73	0.79	0.78	0.82	0.89	0.88

**Defaults for NCI Questionnaires: OFF**

**Recommendations:** This option will improve the level of point estimates from brief questionnaires, and so may be useful if results are to be provided to the respondent. It will not improve correlations with reference data, and so is not necessary in research situations.

16A.22 **Recalc**

**Purpose:** If Recalc = ON, the nutrient estimates for outliers are recalculated with adjustments to serving size.

**Implementation:** If Recalc = ON and the Total Calories calculated for an individual is out of range based on age and sex standards, all nutrient estimates are recalculated for that individual. Adjustments are made to serving size in the second calculation of the nutrient estimates. That is, outliers with high values for Total Calories are recalculated with MEDIUM portions replacing all LARGES, and LARGE portions replacing all EXTRA-LARGES. Outliers with LOW calories are recalculated with MEDIUM portions replacing all SMALLS. Thus, the difference in the original values vs. the recalculated values is dependent on the number of LARGE or SMALL portion sizes reported. The recalculated values will be the only reported nutrient estimates in the DIETSYS Analysis Report and the DIETSYS Analysis Results File.

Each individual is assigned to an age group. This age group is based on the Age HHHQ Question, if it is asked. If Age is not asked, the age group used for the Recalc option is equal to the setting of the AgeDefault option. Likewise, if the coded response to the Age HHHQ Question is the Missing or Error Code, the age group used for Recalc is equal to the setting of the AgeDefault option. If the Age HHHQ Question is asked as number of years (a 2 digit code), the age groups used for Recalc are the same as those used for the Portions option. These are:

<u>Portion Sizes</u>	<u>Age</u>
Younger Age Group	1-29
Middle Age Group	30-69
Older Age Groups	70 and older

If the Sex HHHQ Question is not asked or the coded response to the Sex HHHQ Question is the Missing or Error Code, the gender used by the Recalc option is equal to the setting of the SexDefault option.

Once the sex and age group of an individual are assigned, the criterion described below is used to determine if an individual is an outlier. These cutoffs are approximate 10th and 90th percentiles in Total Calories from the HHHQ used in the 1987 National Health Interview Survey (Block and Subar, 1992).

**Males:**

Younger Age Group:

- Low Outlier = Total Calories less than 1660 per day.
- High Outlier = Total Calories greater than 4300 per day.

Middle Age Group:

- Low Outlier = Total Calories less than 1400 per day.
- High Outlier = Total Calories greater than 3500 per day.

Older Age Group:

- Low Outlier = Total Calories less than 1160 per day.
- High Outlier = Total Calories greater than 2700 per day.

**Females:**

Younger Age Group:

- Low Outlier = Total Calories less than 1000 per day.
- High Outlier = Total Calories greater than 2500 per day.

Middle Age Group:

- Low Outlier = Total Calories less than 950 per day.
- High Outlier = Total Calories greater than 2300 per day.

Older Age Group:

- Low Outlier = Total Calories less than 800 per day.
- High Outlier = Total Calories greater than 1800 per day.

**Defaults for NCI Questionnaires:** OFF.

**Recommendations:** Extremely low or high intakes do occur and should not be excluded automatically. However, poor estimates can occur because an older person checked a lot of "smalls", or a younger person checked a lot of "larges", not realizing that age-sex specific portion sizes have already taken many age-sex differences into account. We recommend that

this option be set to ON for the final analysis, but in early analysis runs it should be OFF for a clear examination of the respondent's answers.

#### 16A.23 Report

**Purpose:** To generate formatted reports of the DIETSYS Nutrient Analysis results for each respondent while the analysis is in progress.

**Implementation:** If Report = ON, the Analysis Report will automatically be created after the questionnaires have been analyzed. If Report = ON, you will be given the opportunity to have the report saved in a file or have it output directly to the printer. In addition, you will be prompted to set the Report Options (Section 15.8). If Report = OFF, you may create the report from the same analysis at a later time by selecting "Print Previous Analysis" from the DIETSYS menu (Section 15.21).

**Defaults for NCI Questionnaires:** ON

#### 16A.24 RestAdj

**Purpose:** To adjust the nutrient intake estimate, if necessary, after examining the respondent's responses to the Restaurant HHHQ Question.

**Implementation:** Each restaurant listed in the Restaurant HHHQ Question has a corresponding line item food frequency which may be asked in the Main Food List or an Open Ended section of the questionnaire. The Food IDs of these line items are assigned in the Adjust Options Reference Table. If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs for these foods (see Sections 12.13 and 12.32).

In addition, each restaurant has nutrient content and portion size data in the Restaurant Foods section of the DIETSYS Foods Database. The portion size data in the Restaurant Foods database section are slightly higher to accommodate average restaurant portions. In addition, there is only one set of portion size data for restaurants since men and women of all ages are served the same portions. See Section 12 for more information regarding the DIETSYS Foods Database.

The coded response for each restaurant type in the Restaurant HHHQ Question indicates the frequency range selected by the respondent for each restaurant. These ranges are indicated in the Questionnaire Text of the table below.

Questionnaire <u>Text</u>	<u>Restaurant Frequency Ranges (weekly)</u>		
	<u>Low</u>	<u>High</u>	<u>Middle</u>
Never in Past Year	0.0	0.0	0.0
1-4 Times Past Year	0.019	0.077	0.048
5-11 Times Past Year	0.096	0.212	0.154
1-3 Times a Month	0.23	0.69	0.46
Once a Week	1.0	1.0	1.0
2-4 Times a Week	2.0	4.0	3.0
Almost Every Day	5.0	7.0	5.0

The frequency for the line item food (e.g., Hamburgers, Cheeseburgers line item) is compared to the frequency range coded for the corresponding restaurant. An adjustment is made based on this comparison. This comparison is done using the values indicated in the Low and High columns in the table above as the Restaurant Frequency Range. DIETSYS performs the adjustments below for the possible results of the comparison.

- a. **Line Item Frequency is between "low" and "high" of the Restaurant Frequency Range.** This indicates that virtually every time the respondent eats this type of food, the food is from a restaurant. DIETSYS will use the nutrient content and portion size data of the Restaurant Food from the DIETSYS Foods Database. The frequency and serving size (small, medium, large, extra large) used are those reported by the respondent for the line item food. If no serving size was indicated, MEDIUM is used. Thus, in this situation, the nutrient content and portion size gram amounts from the DIETSYS Foods Database for the line item food are not used.
- b. **Line Item Frequency is less than the lower limit of the Restaurant Frequency Range.** This indicates that the respondent misunderstood the questions. It is possible that if the Restaurant HHHQ Question was answered first, that the respondent thought s/he was not supposed to include times eaten in a restaurant in the line item frequency, or simply forgot restaurant consumption. In this case, only the Restaurant Food will be added by DIETSYS (because it is larger than the line item frequency). The Restaurant Food will be added using the Middle Frequency value for the coded response to the Restaurant HHHQ Question. The serving size (small, medium, large, extra large) used is the one reported by the respondent for the line item food. If no serving size was indicated, MEDIUM is used. Thus, in this situation, the nutrient content, portion size gram amounts, and frequency of the line item food are not used.
- c. **Line Item Frequency is greater than upper limit of the Restaurant Frequency Range.** This response indicates that both home and restaurant consumption were included by the respondent in his line-item response. Both the Restaurant Food and the line item food are used in the analysis. The frequency used for the Restaurant Food is indicated as the Middle Weekly Frequency value in the table above. The frequency used for the line item food is the difference between the respondent's indicated line item frequency and the frequency used for the Restaurant Food. Therefore, the total frequency equals the frequency indicated for the line item food. The respondent's reported serving size for the line item food is used for both the Restaurant Food and the line item food. If no serving size was indicated, MEDIUM is used.

- d. **The Line Item Food was not Asked on the Questionnaire.** In this case, only the Restaurant Food (if asked) will be added by DIETSYS. It will be added using the Middle Frequency value in the table above. A "medium" serving size will be used.
- e. **A Restaurant Type was not Asked on the Questionnaire.** In this case, only the line item food (if asked) will be added by DIETSYS with no adjustments for consumption in a restaurant.

NOTE: If the line item food is specified as a "Food to be Dropped", the corresponding Restaurant Type will also be dropped. See Section 15.13 for more information regarding "Foods to be Dropped".

**Defaults for NCI Questionnaires:** ON for all (SCAN92, FULL87, BRIEF87, the Long Interactive Interview, and the Short Interactive Interview).

**Recommendations:** Set RestAdj to ON if you have asked the Restaurant HHHQ Question on your questionnaire. Set the RestAdj option to OFF if you did not ask the Restaurant HHHQ Question or if you wish to investigate the impact of ignoring it. Note: If the questionnaire time frame is less than one year (e.g., "past six months"), you may use just the categories "1-3 times a month" and higher from the table above. However, it is then essential to make sure that coders and/or scanners code them correctly, never using the codes for "1-4 times past year" and "5-11 times past year". See Section 10A.19 for coding instructions for this question.

#### 16A.25 Sel-Quests

**Purpose:** To allow the analysis of a subset of the questionnaires in the Questionnaire Data File. And further, to allow the investigator three ways to identify the questionnaires to be analyzed.

Three settings for this option have been chosen to allow the investigator to:

1. Analyze all questionnaires in the Questionnaire Data File.
2. To analyze the last questionnaire in the Questionnaire Data File. This feature allows the investigator to give the respondent a copy of the printed analysis report immediately subsequent to the dietary interview.
3. To analyze specific questionnaire(s) in the Questionnaire Data File. The questionnaires to be analyzed can be identified by ID or by their sequence in the file.

#### **Implementation:**

If Sel-Quests = ALL

All questionnaires in the Questionnaire Data File will be analyzed in the order they appear in the file.

If Sel-Quests = LAST

The last questionnaire in the Questionnaire Data File will be the only questionnaire analyzed.

If Sel-Quests = MATCH ID

Each questionnaire is identified by a 10 character respondent ID field. If Sel-Quests = MATCH ID, the program will prompt for characters to use as criteria in selecting the questionnaires to analyze.

You will be prompted to enter 1 to 10 characters. Questionnaires with ID's starting with the characters you enter will be analyzed.

For example, if you enter the two characters ST, questionnaires with ST in the first two positions of the respondent ID will be analyzed, such as questionnaires with the following ID's:

```
STUDY00001
STUDY00002
ST12345678
```

Questionnaires without ST in the first two positions would not be analyzed. That includes questionnaires with ST elsewhere in the ID, such as AST1234567.

If each respondent ID in the data file is unique, you may use the MATCH ID setting to analyze a specific questionnaire by entering its full 10 character respondent ID.

If Sel-Quests = SEQUENCE

The SEQUENCE setting allows you to specify which questionnaire(s) to analyze by their relative position in the Questionnaire Data File.

If Sel-Quests = SEQUENCE, the program will prompt for the questionnaire(s) to be analyzed. Enter a range of numbers corresponding to the order of appearance of the questionnaire(s) in the data file.

For example, 1-5, 151 would signal the program to analyze the first 5 questionnaires in the file and the 151st questionnaire in the file.

**Defaults for NCI Questionnaires: ALL**

#### 16A.26 **SexDefault**

**Purpose:** This option allows you to specify the gender to be used by the DIETSYS Nutrient Analysis for respondents without a code of Male or Female for the Sex HHHQ Question. Section 6-9 contain coding instructions for the NCI questionnaire versions. If you have developed your own questionnaire, see Section 10A.11 for coding instructions. This includes respondents who skipped the question (coded with the Missing Code) and those with a Scanner Error code for this question. In addition, if sex was not included in the questionnaire, all questionnaires in the file will be analyzed as if they were of the SexDefault gender. This option is intended for the analysis of same-sex populations.

Sex is an important variable in the DIETSYS nutrient analysis. It is used by the Portions, Predict, and Recalc analysis options (Sections 16A.20, 16A.21, and 16A.22, respectively). Many of the error flags generated by both the DIETSYS Analysis and DIETSYS Edit Checking features are gender dependent. In addition, when generating the Analysis Report, DIETSYS uses gender in implementing the advice feature as well as in miscellaneous calculations such as desired weight.

Gender determines the set of age-sex specific portions used if the Portions option is set to AgeSex (Section 16A.20); and it determines the set of factors used to implement the Predict option (Section 16A.21). The SexDefault option is intended for the analysis of same-sex populations. It is not advisable to rely on the SexDefault option for implementing these analysis options in the analysis of mixed populations. If sex was not asked of a mixed population, the following option settings should be used: Predict=OFF and Portions=ONQUEST.

**Implementation:** The SexDefault option may be set to either MALE or FEMALE. All questionnaires without a code of MALE or FEMALE for the Sex HHHQ Question will be analyzed as if they were of the SexDefault gender. See the following sections to investigate the impact on the analysis:

Portions Option	Section 16A.20
Predict Option	Section 16A.21
Recalc Option	Section 16A.22
Advice	Section 18.2 and 18.7
Analysis Report	Section 15 and 18
Desirable Weight	Section 16.10 and 18
Error Flags	Section 14

The SexDefault option will not affect the portion sizes if the Portions option is set to ONQUEST.

**Defaults for NCI Questionnaires:** FEMALE

#### 16A.27 Sources-Matrix

**Purpose:** To produce a file containing data analogous to Block's (1985) Nutrient Sources papers, that is, the amount which each food contributed to intake of each of the nutrients among the population analyzed in that run. When Sources-Matrix = ON, the Nutrient Sources data is stored as a matrix in an ASCII file. The same data may be generated in a sorted listing by using the Sources-Sort option.

**Implementation:** If Sources-Matrix = ON, the Nutrient Sources data is saved in a file in a matrix format. The Nutrient Sources data is the amount each food contributed to the intake of each nutrient for the population analyzed. The matrix consists of a row of data per food, and a column per nutrient analyzed. Only foods which contributed to at least one nutrient estimate are included in the file. The Food ID and Food Name are included in the Nutrient Sources Matrix file. A complete description of this file is given below.

**Sources Matrix Data File Format.** The number of data lines in this file depends on the number of foods analyzed with a non-zero frequency. There will be one line of data for every food, and one line of data containing the name of the Questionnaire Data File analyzed and the number of questionnaires analyzed from this file.

The number of variables in the food lines is determined by the number of nutrients in the Nutrient Composition Data File used in the analysis which created this Sources Matrix Data

File. The Food ID and Food Name are written to the beginning of each data line, followed by a value for each nutrient analyzed. The weekly frequency is always the last variable in the file. All variables are separated by a blank.

Line 1:

Number of Questionnaires Analyzed

Blank

Filename of the Questionnaire Data File (including path)

Lines 2 through last - one line for every food analyzed with a non-zero frequency. All of the numeric variables in these lines are floating point numbers. Nutrient values equal the amount contributed by this food to the daily estimate and are averaged for the population.

Food ID (columns 1-3)

Blank (column 4)

Food Name (columns 5-35)

Blank (column 36)

Nutrient Contributed by this food - Nutrient 1

Blank

Nutrient Contributed by this food - Nutrient 2

Blank

.

.

.

.

Nutrient Contributed by this food - Nutrient *nm* (where *nm* is the number of nutrients in the DIETSYS Foods Database)

Blank

Weekly Frequency for this Food

If the food listed is a meat substituted by an adjust option or a Restaurant Type added by the RestAdj option, "ADJ" will be printed instead of a Food ID. See Section 12 for more information on the Meats used for Adjust Options. Section 16A.24 contains information on RestAdj. The meat adjust options are DarkQues (Section 16A.9), EatSkin (Section 16A.10), LeanMeat (Section 16A.13), MeatFat (Section 16A.14), and TunaQues (Section 16A.30).

**Defaults for NCI Questionnaires:** OFF

**Recommendations:** Use Sources-Matrix if you wish to generate a file of Nutrient Sources data which can be analyzed using a statistical software package. In addition, you may want to use Sources-Matrix if you do not have a printer online or do not have sufficient disk space for the file generated by Sources-Sort.

#### 16A.28 Sources-Sort

**Purpose:** To produce a file containing data analogous to Block's (1985) Nutrient Sources papers, that is, the proportion which each food contributed to intake of each of the nutrients among the population analyzed in that run. This option generates a sorted listing of the

Nutrient Sources data. This listing may be stored in a file or sent directly to a printer. The same data may be generated and stored in matrix format by using the Sources-Matrix option.

**Implementation:** The Sources-Sort option has three settings, OFF, PRINTER, and FILE. If Sources-Sort is set to FILE or PRINTER, a sorted listing of the Nutrient Sources data is generated. If the setting is FILE, you will be prompted for the name of the file to contain this listing. If Sources-Sort is set to PRINTER, the Nutrient Sources listing will sent directly to your printer (as designated by the default port, Section 20).

The sorted listing of the Nutrient Sources consists of a list for each of the nutrients in the DIETSYS Foods Database. Each of these lists contain all foods which contributed some of the nutrient to any individual's estimates in the population. Therefore, this listing can be quite lengthy, depending on the food list and the population size. You may not want to send such a large listing to the printer. If saved to a file, you may view the ASCII file using a listing program or wordprocessor of your choice.

**Defaults for NCI Questionnaires:** OFF

**Recommendations:** An examination of the population's food sources of nutrients can be useful in evaluating the importance of some foods on your questionnaire, as well as for education. Note that nutrients may be distributed across several related items, and thus for a complete picture of the importance of a particular food, you may need to add up several items. For example, if Rest Adj is ON, the calories and other nutrients from hamburger may be split between the "Hamburger, cheeseburger" line item and "Restaurant burgers", with each having a lower ranking than if the two were summed.

Finally, sources data can be a useful debugging tool. Examine the sources list to identify culprit foods if a questionnaire has produced puzzling results. If you run the analysis on a single respondent of particular concern, the sorted sources list will show all foods contributing to each nutrient estimate.

#### 16A.29 TopSources

**Purpose:** To identify the top three food sources for nutrients of particular interest to the investigator or the respondent.

**Implementation:** If TopSources = ON, the top three food sources for up to 10 nutrients will listed in the DIETSYS Analysis Report (Section 18) and the DIETSYS Analysis Results File (Section 17). This output includes the following:

- a. Nutrient Identifier. The Nutrient Name is printed in the DIETSYS Analysis Report. The DIETSYS Foods Database sequence number of the nutrient is stored in the Analysis Results File. This number would be '01' for Total Calories, '02' for Protein, etc.
- b. Three Food Names. The three foods which contributed the most of the nutrient are listed after the Nutrient Identifier. The food which contributed the most of this

nutrient is listed first. In the DIETSYS Analysis Report, the three foods are listed by name. In the DIETSYS Analysis Results File, the foods are listed by Food ID.

For details on the format of this output see Section 18, Appendix A for a sample DIETSYS Analysis Report and Section 17 for the codebook of the DIETSYS Analysis Results File.

**Default:** ON for all NCI Questionnaire versions. The 10 nutrients selected for the TopSources option in all Analysis Option Files distributed with the software are shown below. This list can be changed by modifying the TopSources Nutrient List stored in the Analysis Options File (Section 15.18).

1. 01 TOTAL CALORIES	6. 33 PRO-A CAROTENES
2. 03 TOTAL FAT	7. 23 ZINC
3. 16 SATURATED FAT	8. 21 FOLATE
4. 20 DIETARY FIBER	9. 22 VITAMIN E
5. 15 VITAMIN C	10. 25 VITAMIN B6

**Recommendations:** This is a very useful educational option for the respondent, and can also be useful in debugging.

#### 16A.30 TunaQues

**Purpose:** To incorporate the response to the Tuna HHHQ Question in the DIETSYS Nutrient Analysis.

**Implementation:** One HHHQ Question and one food frequency in the Main Food List are used to implement the TunaQues option. These are:

- a. HHHQ Question: "When you eat tuna, is it usually oil packed, water packed, or either one?" (See Section 10A.25 for coding instructions.)
- b. The food frequency for Regular Tuna. The DIETSYS Nutrient Analysis will locate this food in your food list via the Food ID set in the Adjust Options Reference Table (Sections 12.13 and 12.32). If you have moved or replaced any foods in your database, be sure this table contains the correct Food ID for Regular Tuna.

The TunaQues option allows you to request the frequency of tuna from the respondent once, but still account for the differences in nutrient content between tuna packed in oil and tuna packed in water. Tuna In Water is a food in the Foods Database section of "Meats used for Adjust Options" (Section 12). If TunaQues = ON, the coded response to the Tuna HHHQ Question will determine if the nutrient content data from Tuna In Water or Regular Tuna is used to calculate the contribution of this food to the nutrient estimates.

If TunaQues = ON and the coded response to the Tuna HHHQ Question is 2 (water packed), the nutrient content data for Tuna in Water will be used. The nutrient content for Regular Tuna will be used if any other response is coded (oil, mixed, Missing Code, or Error). The portion size data for Regular Tuna is always used.

If TunaQues = OFF, the nutrient content data for Regular Tuna will be used regardless of the response to the Tuna HHHQ Question.

**Defaults for NCI Questionnaires:** OFF

16A.31 **VegAdj**

**Purpose:** Extensive frequency-type questionnaires often overestimate vitamin A, C and fiber, because people often report frequencies of individual vegetables which add up to more vegetables than they actually eat. The VegAdj option adjusts for this by adjusting the frequencies of the individual vegetable frequencies based on the frequency coded for the vegetable summary HHHQ Question ("Not counting salad or potatoes, how often do you eat vegetables?"). If using an NCI version of the HHHQ, refer to the questionnaire's manual for instructions to code this HHHQ Question. If you have designed your own questionnaire, see Section 10A.22 for coding instructions.

**Implementation:** The members of the Vegetables for Adjust Food Group are the individual vegetables which are used for the VegAdj option (see Section 15.14 for more information on Food Groups). The frequencies of these vegetables are summed to create a Group Frequency. These food frequencies may be coded in either the Main Food List or an Open Ended Food Section of your questionnaire.

The Summary Frequency is obtained from the response to the HHHQ Question regarding frequency of vegetables ("...how often do you eat vegetables?"). If the questionnaire is in a Categorical format, the one character frequency code is translated as follows:

<u>Input Code</u>	<u>Questionnaire Text</u>	<u>Weekly Frequency Value</u>
1	Less than once per week	0.0
2	1-2 per week	1.85
3	3-4 per week	3.46
4	5-6 per week	5.3
5	1 per day	7.0
6	1 1/2 per day	10.15
7	2 per day	14.0
8	3 per day	21.0
9	4+ per day	28.0
Missing Code	No response	0.0

The Group Frequency for the Vegetables for Adjust is compared to the Summary Frequency. If the Group Frequency is within 20% of the Summary Frequency or the Summary Frequency equals zero, no adjustments are made by DIETSYS. Otherwise, DIETSYS performs the following adjustments.

- a. If the Vegetables For Adjust Group Frequency is more than 20% greater than the Summary Frequency, DIETSYS will reduce the frequency of each member of the Vegetables For Adjust group. The frequency for each member of the Vegetables for Adjust group is reduced by the following factor:

$$\text{Summary Frequency} / \text{Group Frequency}$$

- b. If the Vegetables for Adjust Group Frequency is less than 80% of the Summary Frequency, it is assumed that the respondent eats vegetables which were not mentioned on the questionnaire. This will be taken into account by adding the food "Other Vegetables" to this individual's analysis. This food will be added with a frequency of the difference between the Summary Frequency and the Vegetables for Adjust Group Frequency. If the respondent had already reported eating Other Vegetables, the reported frequency will be increased using the same calculation.

The Food ID of the Other Vegetables line item is assigned in the Adjust Options Reference Table. If you have moved or replaced any foods in your database, be sure this table contains the correct Food IDs for Other Vegetables (see Sections 12.13 and 12.32).

If the frequency for Other Vegetables was not asked on the questionnaire, no adjustment will be made if the Group Frequency is less than 80% of the Summary Frequency.

**Defaults for NCI Questionnaires:** ON for all (SCAN92, FULL87, BRIEF87, the Long Interactive Interview, and the Short Interactive Interview).

**Recommendations:** Repeat analyses ON and OFF to investigate impact. ON will give more accurate counts of foods in this group.