THE CANCER COUNCIL VICTORIA

INFORMATION FOR USERS OF DIETARY QUESTIONNAIRE

The dietary questionnaire described below is the property of the Cancer Council Victoria. Its use is made available to other parties either on a fee for service basis or as a negotiated collaboration. Queries can be made to:

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QUESTIONNAIRE PERFORMANCE

Reproducibility

In a validation study involving 237 Australian men and women, the mean Spearman correlation coefficient for reproducibility of the 121 food items used in the first version of the questionnaire was 0.58 over 12 months. This compares well with similar studies conducted by researchers from Harvard University. The mean correlation coefficient for foods in the female Nurses' Health Study questionnaire was 0.57 and 0.59 in the male Health Professional Follow-up Study.

At the level of nutrients, the Cancer Council Victoria dietary questionnaire has similar reproducibility to the popular CSIRO food frequency questionnaire. The Spearman correlation coefficients for energy and protein are presented in the table below.

	Energy	**Protein**
ACCV, Australian women (n=48)	0.63	0.65
ACCV, Australian men (n=39)	0.73	0.71
CSIRO FFQ, women (n=100) *Rohan et al 1987*	0.62	0.49
CSIRO FFQ elderly men and women (n=62) *Lazarus et al 1995*	0.75	0.71

Validity: Comparison with biomarkers

The mean daily urinary excretions of nitrogen and potassium, averaged across four separate 24-hour periods over a year, were used as estimates of mean daily intake of protein and potassium. Energy requirements were estimated from Basal Metabolic Rate (BMR) multiplied by an activity level factor.

The male to female ratios of intake for energy, protein and potassium computed from the dietary questionnaire were 1.29, 1.28 and 1.14 respectively. The male to female ratios for the relevant biomarkers, BMR, urinary nitrogen and urinary potassium were 1.21, 1.21 and 1.13.

The estimated mean intake of energy (7569kJ females and 9761kJ males) was appropriate for middle-aged, relatively sedentary adults. The mean energy intake to BMR ratio was 1.29 for females and 1.37 for males.

The estimated mean daily intakes of protein (93g females and 119.2g males) were comparable to the estimates imputed from urinary nitrogen excretion (87.5g females, 105.7g males).

The estimated mean daily intakes of potassium (96.8 mmol females and 110.8 mmol males) were higher than the estimates imputed from urinary potassium excretion (67.3 mmol females, 75.7 mmol males). This is explained by the common phenomenon of food frequency questionnaires overestimating consumption of fruit and vegetables, which together are a major source of potassium intake. The problem of overestimation has been addressed in this latest version of the dietary instrument by including fruit and vegetable "calibrator" questions.

The relative validity of the ACCV dietary questionnaire was assessed by the measurement of the correlation of nutrient intake estimates and biomarkers. The Pearson correlation coefficients for energy, protein and potassium were 0.27, 0.35 and 0.32 respectively. Though not strong, this level of correlation of nutrient intake estimates and biomarkers is typical of dietary questionnaires.

SOURCES OF NUTRITIONAL DATA

Nutrients computed using Australian NUTTAB 95 database

Water	Kilojoules	Calories
Protein	Carbohydrate (total)	Sugars
Starch and Dextrins	Dietary Fibre	Cholesterol
Sodium	Potassium	Calcium
Phosphorus	Magnesium	Iron
Zinc	Retinol Equivalent	Retinol
Thiamin	Beta-Carotene Equivalent	Riboflavin
Niacin	Niacin Equivalent	Vitamin C
Alcohol	Saturated Fatty Acids (total)	Monounsaturated Fatty Acids(total)
Fat (total)	Polyunsaturated Acids (total)	

Nutrients computed using McCance and Widdowson (British) database

Vitamin E Folate.

ADDITIONAL INFORMATION REGARDING DIETARY QUESTIONNAIRE COMPLETION

Most people change the foods they eat from day to day and even from week to week. Yet, over a long period of time certain habits and food patterns can be seen in everyone's diet. The aim of this questionnaire is to estimate the average pattern of food intake over the past year. We are interested in **how often** and **in what quantity** various foods are eaten. Primarily, it is the frequency with which different foods are eaten that distinguishes the diet of one person from another.

As the completed forms are optically scanned, it is very important **that each question is correctly answered**.

Answers should be recorded by completely filling the appropriate bubble as indicated on page 1 of the questionnaire. If **ticks, crosses or lines** are used, the scanner will not detect the response.

Either pen or pencil can be used but pencil is preferable as mistakes can be more easily erased. **All mistakes must be completely erased, not crossed out.** Every question should be answered, including the date section on the front page.

We have recently modified the program used to compute nutrients from the FFQ so that where questions have been left incomplete, or inconsistencies noted between questions, nutrients will not be computed for that person. Incorrectly completed questionnaires will returned to the user, along with an error report detailing the problems. It will then be up to the user to decide what to do about the missing or inconsistent data. You may choose to exclude the individual or recontact them to fix data.

QUESTIONS 1 AND 2

The program that computes nutrient values from the scanned data uses responses to questions 1 and 2 to adjust the answers about fruit and vegetable intake in question 15. If either of these questions is left blank the program will not compute nutrients for that person. Also if the responses to questions 1 or 2 are completely inconsistent with the responses in question 15, nutrients will not be computed. It is not expected that answers will match exactly, but if for example it were indicated in question 1 that the respondent did not eat fruit, and in question 15 they reported eating fruit, this would be rejected. Similarly, if some fruit were reported in question 1 and none in question 15, this would lead to rejection. The same logic applies to vegetables in questions 2 and 15.

More about question 1 and frequency of fruit intake

The information obtained about fruit in question 15 is necessary to determine the relative contribution various types of fruit make to the person's total fruit intake. It is often found that the food frequency questionnaires do not provide an accurate estimate of a person's total fruit intake, so question 1 has been added to scale the responses in question 15. Generally people find question 1

easy to answer because their total intake of fruit is reasonably constant over the year even if the types of fruit they consume varies with the seasons.

More about question 2 and frequency of vegetable intake

As with fruit, the information obtained about vegetables in question 15 is essential for determining the relative contribution various vegetables make to a person's total vegetable intake. Question 2 asks about how many different vegetables the person usually eats per day. We chose not to ask about the number of "serves" of vegetables because there is confusion about what constitutes a "serve" of vegetables. Moreover, we obtain information about vegetable serving sizes separately in questions 11 and 12. The response to question 2 is used scale the responses about frequency of vegetable consumption asked in question 15.

NUMBER OF RESPONSES EXPECTED FOR QUESTIONS 1 - 10.

Only one response is required for most of these questions. However, for questions 3, 5, 7 and 10 more than one answer is acceptable. If more than a single type of milk, bread, spread or cheese is selected, it will be assumed that each is consumed in equal quantities for the computation of nutrient intakes. Inconsistencies between questions determining types of foods and amounts consumed will result in the data for that person being rejected. For questions 1, 2, 4, 6, 8 and 9, only one response is allowed, if more than one response is given the lowest response will be recorded and used for the nutritional analysis.

PORTION SIZE QUESTIONS (Questions 11-14)

Responses to the portion size questions are used to calculate a single portion size factor (PSF) indicating whether on average a person eats median size serves (PSF=1), more than the median (PSF > 1), or less than the median (PSF < 1). The PSF is used to scale the standard portion size for different foods up or down.
Instructions are given at the top of the page for these four questions. Exactly one response should be recorded on each line. If more than one response per line is given, the smallest portion size will be assumed. If some of the questions are left blank, for example the steak in a vegetarian respondent, the portion size factor will be calculated as the average of all portion size responses provided. If all four portion size questions are left unanswered, nutrients will not be computed for that person.

QUESTION 15

The 74 food items are grouped into four categories:

- Cereal foods; sweets and snacks
- Dairy products, meats and fish
- Fruit
- Vegetables

Take care that **only one response** is recorded per line. It is easy to put two marks on one line and miss the next one.

Certain foods such as sandwiches and salads are not listed as distinct items because their composition varies depending on how they are made. People should think about the separate ingredients that make up these foods and answer the questionnaire accordingly. For example, if a person ate a salad that included tomato once a week and a tomato sandwich once a week, the appropriate answer for tomato would be "2 times per week".

If a particular food item is never eaten, the circle in the column headed “NEVER” should be filled to indicate this.

For all the foods listed, the circle indicating how often they were eaten on average should be filled . People should think back over the past year about foods eaten away from home or when on holidays as well as foods eaten and prepared at home. For seasonal foods, record frequency as if foods are in season.

ALCOHOL QUESTIONS

Question 16

Asks for average alcohol consumption for the past twelve months. Each alcohol type is asked about separately. Only **one response** is permitted per line.

If ALL responses to this question are “NEVER”, **no further questions need be answered**.

Question 17

This question asks about the **total** number of glasses of all alcohol types usually drunk per day. This may require totaling of all alcohol types **usually** drunk.

Question 18.

This question asks for the **maximum** number of glasses of alcohol drunk in **any** 24 hours during the past year. Because the response to this question is not used in calculation of nutrients, missing this question will not stop nutrients being computed, but a warning will be given in the error report.

ALCOHOL CALCULATIONS IN THE FFQ

Because the FFQ asks about beverage-specific frequency of consumption but only about overall quantity of consumption, we have to make some assumptions in the calculation of nutrients. To estimate beverage-specific (and total) weekly consumption, we calculate a weighted average from two extreme methods of assigning quantity to consumption of individual beverages. The first method assumes that people who consume more than one type of beverage always do so on the same days (subject to the constraints of the beverage-specific frequencies), while the second method assumes that people separate their beverages wherever possible. In both methods, on days when people drink more than one beverage, we apportion the total glasses consumed equally among all types consumed on that day. From the 3-day diary of the 1995 National Health Survey, we determined that people who drank more than one beverage were about two times as likely to drink them on separate days as on the same day. Therefore, the data from the second method are given two times the weight of the first method when we construct the weighted average.

Due to the assumptions required in the calculation of nutrients from alcoholic beverages, the results are less reliable than are those for nutrients from food. Therefore nutrients from alcoholic beverages are reported separately and it is up to the user to decide whether to include these nutrients in the totals. If you want to include alcohol, all nutrients in the alcohol file should be added to the nutrients in the main file.

SCANNING ERRORS

It has been our experience that a large proportion of completed questionnaires returned for scanning contain considerable errors that prevent further processing to compute nutrients. As a result, we have developed a set of editing rules that are applied when missing or multiple responses are detected in questions 15 to 16. These default rules are provided below, if you would like alternative rules applied to your data, please contact us to discuss your requirements.

Edit rules

When a question has not been answered (missing), it is assumed none of that food or drink item was consumed in the past 12 months.

Cauliflower o ✓o o o o o o o o o

When two responses have been given when only one was expected (multiple response) the lowest response is taken (based on the assumption that people tend to over estimate food intake rather than underestimate).

Cauliflower o o o ● ✓o o o ● o o

When two responses have been given to one question and the following question has been left unanswered, it is assumed that the greater response on the first line actually belongs to the second line.

Cauliflower o ● ✓o o o o o o ●↓ o

Broccoli o o o o o o o o o o

When one question is left unanswered and the following question has two responses the greater response on the lower line is taken for the missing question

Cauliflower o o o o o o o o o o
Broccoli o ●✓ o o o o o o ●↑o

In the future scanning errors will also be reported and users will have to correct them.

BARCODE LABELS

Each questionnaire requires a barcode label to be affixed prior to scanning. A sample barcode is shown below. Information that can be included on the barcode label includes the study participant unique identification number (mandatory) and either the study name or the participant's surname and first name initial.

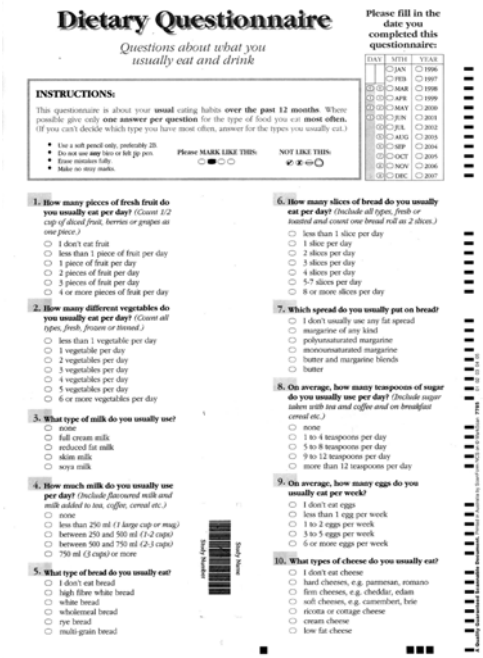
The cost of the barcode labels is included with the cost of the questionnaire. The preferred maximum length for a study participant unique identification number is 8 characters. If the unique identification numbers for participants enrolled in your study are longer than 8 characters, please make contact with us to discuss your requirements.

The data required for barcode labels should be provided in a comma-separated file with a .csv file name extension. The format should look as follows:

12345678,J Smith or 12345678,MCC Study

Where to place barcode labels

Barcode labels should be placed on the bottom half of the front page of the questionnaire; the label fits neatly within the small square brackets. An example of the correct position for the label is shown below.


Dietary Questionnaire

Questions about what you usually eat and drink

Please fill in the date you completed this questionnaire:

INSTRUCTIONS:

This questionnaire is about your **usual** eating habits **over the past 12 months**. Where possible give only **one answer per question** for the type of food you eat **most often.** (If you can't decide which type you have most often, answer for the types you usually eat.)

- Use a soft pencil only, preferably 2B.
- Do not use **any** biro or felt tip pen.
- Erase mistakes fully.
- Make no stray marks.

Please MARK LIKE THIS: ● NOT LIKE THIS: ✓ ✗ ○

1. **How many pieces of fresh fruit do you usually eat per day?** *(Count 1/2 cup of sliced fruit, berries or grapes as one piece.)*
   - 1 don't eat fruit
   - less than 1 piece of fruit per day
   - 1 piece of fruit per day
   - 2 pieces of fruit per day
   - 3 pieces of fruit per day
   - 4 or more pieces of fruit per day

2. **How many different vegetables do you usually eat per day?** *(Count all types, fresh, frozen or tinned.)*
   - less than 1 vegetable per day
   - 1 vegetable per day
   - 2 vegetables per day
   - 3 vegetables per day
   - 4 vegetables per day
   - 5 vegetables per day
   - 6 or more vegetables per day

3. **What type of milk do you usually use?**
   - none
   - full cream milk
   - reduced fat milk
   - skim milk
   - soya milk

4. **How much milk do you usually use per day?** *(Include flavoured milk and milk added to tea, coffee, cereal etc.)*
   - none
   - less than 250 ml *(1 large cup or mug)*
   - between 250 and 500 ml *(1-2 cups)*
   - between 500 and 750 ml *(2-3 cups)*
   - 750 ml *(3 cups)* or more

5. **What type of bread do you usually eat?**
   - I don't eat bread
   - high fibre white bread
   - white bread
   - wholemeal bread
   - rye bread
   - multi-grain bread

6. **How many slices of bread do you usually eat per day?** *(Include all types, fresh or toasted and count one bread roll as 2 slices.)*
   - less than 1 slice per day
   - 1 slice per day
   - 2 slices per day
   - 3 slices per day
   - 4 slices per day
   - 5-7 slices per day
   - 8 or more slices per day

7. **Which spread do you usually put on bread?**
   - I don't usually use any fat spread
   - margarine of any kind
   - polyunsaturated margarine
   - monounsaturated margarine
   - butter and margarine blends
   - butter

8. **On average, how many teaspoons of sugar do you usually use per day?** *(Include sugar taken with tea and coffee and on breakfast cereal etc.)*
   - none
   - 1 to 4 teaspoons per day
   - 5 to 8 teaspoons per day
   - 9 to 12 teaspoons per day
   - more than 12 teaspoons per day

9. **On average, how many eggs do you usually eat per week?**
   - I don't eat eggs
   - less than 1 egg per week
   - 1 to 2 eggs per week
   - 3 to 5 eggs per week
   - 6 or more eggs per week

10. **What types of cheese do you usually eat?**
    - I don't eat cheese
    - hard cheeses, e.g. parmesan, romano
    - firm cheeses, e.g. cheddar, edam
    - soft cheeses, e.g. camembert, brie
    - ricotta or cottage cheese
    - cream cheese
    - low fat cheese

Study Name

Study Number

ADMINISTRATION OF THE FFQ

The FFQ is designed to be self-administered, but if you choose to use this method you should instruct the respondents thoroughly on the need to fill in circles completely, not leave questions blank, and except in questions 3, 5, 7, 10 to only give one answer. As completed questionnaires are collected they should be checked for completeness and errors so that mistakes can be corrected on the spot. If questionnaires are to be interviewer administered it is important that all interviewers have read the instructions carefully.
Changes in the program mean that more questionnaires will be rejected than previously. It will save users a lot of time if mistakes can be corrected before the forms are scanned.

OUTPUT

Estimated daily intake of specified nutrients is computed. Nutrient intake is measured as follows:

Energy	kilojoules
Fats, protein, carbohydrate fibre and alcohol	grams per day
Beta carotene and folate	micrograms per day.
Calcium, cholesterol, iron, sodium Vitamin C	
Vitamin E and zinc	milligrams per day

The computed nutrients are in Excel spreadsheet format. Three Excel files will be sent containing (i) nutrients computed without alcoholic beverages, (ii) nutrients from alcoholic beverages, (iii) error messages. Samples are shown overleaf.

Example of Nutrient Output

1) Not including alcoholic beverages

Scan ID	Scan Date	Portion Standard Factor	Energy kJ/day	All Fat g/day	SatFat g/day	PolyFat g/day	MonoFat g/day	Protein g/day	Carbohydrate g/day	Sugars g/day	Starch g/day	Fibre g/day	Alcohol g/day
3.4	10/09/01	1.475	7011.999	67.63371	17.53638	14.62905	29.72801	77.62991	191.2813	78.41105	111.0552	27.98367	0

BetaCarotene ug/day	Calcium mg/day	Cholesterol mg/day	Folate ug/day	Iron mg/day	Magnesium mg/day	Niacin mg/day	Niacin Equiv mg/day	Phosphorus mg/day	Potassium mg/day	Retinol ug/day	Retinol Equiv ug/day	Riboflavin mg/day	Sodium mg/day
2350.486	726.3369	202.2731	246.0553	12.52451	301.9704	17.74626	32.88213	1460.079	2562.528	331.977	724.6707	1.578635	2255.364

Thiamin mg/day	VitaminC mg/day	VitaminE mg/day	Zinc mg/day
1.327552	104.4174	8.463334	8.493729

2) From alcoholic beverages only

Scan ID	Scan Date	Portion Standard Factor	Energy kJ/day	All Fat g/day	SatFat g/day	PolyFat g/day	MonoFat g/day	Protein g/day	Carbohydrate g/day	Sugars g/day	Starch g/day	Fibre g/day	Alcohol g/day
3.4	10/09/01	1.475	2327.017	0	0	0	0	3.90987	21.10941	1.44585	19.66356	0	65.06568

BetaCarotene ug/day	Calcium mg/day	Cholesterol mg/day	Folate ug/day	Iron mg/day	Magnesium mg/day	Niacin mg/day	Niacin Equiv mg/day	Phosphorus mg/day	Potassium mg/day	Retinol ug/day	Retinol Equiv ug/day	Riboflavin mg/day	Sodium mg/day
0	65.9988	0	75.1842	0.729	106.6041	6.084721	6.084721	192.0915	661.9806	0	0	0.115668	121.0626

Thiamin mg/day	VitaminC mg/day	VitaminE mg/day	Zinc mg/day
0	23.1336	0	0

ERROR REPORT

Scan File is : hos8.csv
Processing was commenced at 29/04/02 14:10:57

ID Warning/Rejection reasons
1.36 (Question 11-14) answer missing.
1.36 (Question 17) answer missing.
1.36 (Question 18) answer missing.
1.36 Record rejected !

1.37 (Question 17) answer missing.
1.37 (Question 18) answer missing.
1.37 Record rejected !

2.2 (Question 10)I do not eat cheese and (Question 15) cheese eaten.
2.2 (Question 10)No cheese selected and (Question 15) cheese eaten.
2.2 Record rejected !

1.38 (Question 6) answer missing.
1.38 Record rejected !

2.22 (Question 10)I do not eat cheese not selected and (Question 15)cheese never eaten.

Processing was completed at 29/04/02 14:11:19
Number of records processed : 16
Number of records rejected : 4

DIETARY QUESTIONNAIRE COSTINGS

Collaborative Research Projects

In the instance of collaborative studies with the CEC that result in joint publications, an appropriate fee will be negotiated

Commissioned Surveys

For non-collaborative research projects where Cancer Epidemiology Centre is not involved in authorship of papers, full costs are charged as follows (plus postage & delivery charges as appropriate):

Questionnaires – printing, scanning, and processing by the Cancer Epidemiology Centre.

Output includes raw data plus food frequencies and nutrients on disc.

Unit cost decreases with increasing numbers as follows:

Quantity	Cost per FFQ	Cost of Scanning /Analysis	Total
<1000	$2.20	$5.50	$7.70
1000 to 4000	$1.90	$4.70	$6.60
4001 to 10,000	$1.60	$3.90	$5.50
>10,000	$1.30	$3.10	$4.40

All prices are inclusive of GST.

DATE: July 2025