SOP 3. Obtaining nutrient data for missing values in the DINO nutrient database

1. What

An SOP for the acquisition of data for filling in missing nutrient values to the DINO database

2. When

The nutrient composition data are incomplete for basic foods

3. Who

To be used by anyone who is involved in using DINO for diet coding and data analysis.

4. Why

To ensure the accurate analysis of nutrients from dietary records.

5. Procedure/Method

There is a program in DINO which lists all the foods in a particular study that have a missing value for a given nutrient, together with the frequency of each food consumed. The output gives the frequency with which a food item has occurred and the total weight of that item consumed.

To navigate to the Missing values; From `DINO` select `Food Tables` click on `Missing values`. On opening, you will see the following screen;
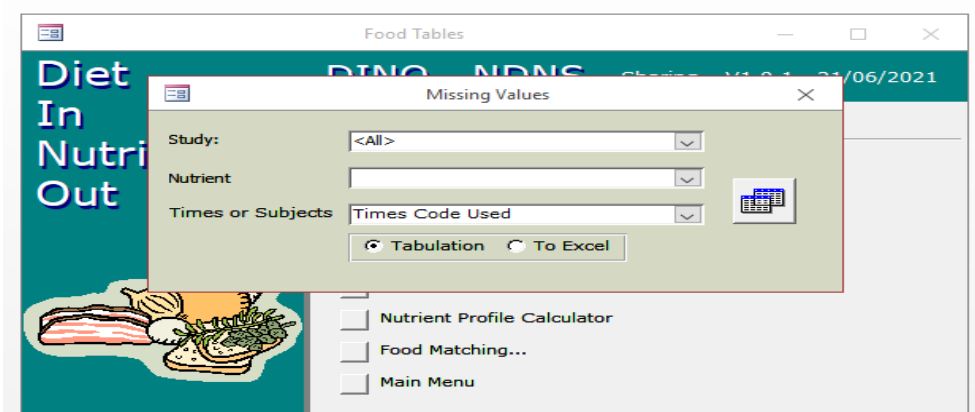
Choose the study from the dropdown, select the nutrient required and click on the icon on the right to run the query to tabulation or excel.

Sources of data

Updated MW food tables. Nutrients may be assigned from later editions of the MW food tables, *provided these can be considered to be appropriate*. Some foods will genuinely have changed over the years, e.g. fat content of meat, fortification of breakfast cereals and other manufactured foods, origin of the wheat used in the UK for bread making.

Manufacturers' data. This may appear on the packaging or on the manufacturers' website. It should be particularly noted that for added nutrients, the amount quoted will be a 'not less than' amount (which allows for shelf life losses), the actual value is likely to be considerably higher. Also ensure what method was used for dietary fibre analysis, most

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commonly AOAC, and how nutrients are sometimes expressed relative to the RDA (a European list, not the UK RNI).

USDA National Nutrient Database. This is available on-line www.nal.usda.gov/fnic/foodcomp/search/ , but should be used with caution. Some nutrient contents may be transferable, but it must be borne in mind that there may be fortifications not applicable in the UK. Also some nutrients, e.g. selenium, are very dependent on the environment where a food is grown and levels will not be appropriate to the UK. Be aware that total carbohydrate is arrived at by calculation by difference and as such is not transferable.

Closely related foods. Values for missing nutrients can also be imputed from a closely related food already on the database. Adjustments for water content and/or fat content (e.g. for fat soluble vitamins and fatty acids) should be made where these differ in the two foods. (See below)

Calculation from a nutrient ratio. It is sometimes possible to relate the missing nutrient to a known one, e.g. fibre related to starch, B vitamins related to protein, by calculating the ratio in foods that have complete information. A ratio of fat to fat soluble vitamins and fatty acids can also be used provided it is clear that there is only *one* source of fat in the food, e.g. olive oil is the only fat in French Dressing (see below).

Assumed zero. A zero can be assumed where it is known that the nutrient in question is not present in that type of food, e.g. alcohol in vegetables, vitamin C in fat spreads. However, assumptions should not be made for manufactured foods without careful checking, as many seemingly unlikely fortifications are increasingly being added to foods. If there is any doubt, a zero should *not* be used.

Literature sources. The quality of the source must be assessed according to the criteria as laid down for compilers of food composition data (see MW7, Introduction, Table 2). Particular care is needed when adopting values from other national food tables or from original publications, to ensure that the foods are adequately described, that they are a sufficiently similar match, that fortification practices are relevant for the UK (see above for USDA), that analytical methods are appropriate and that results are presented in a way that can be correctly adopted or recalculated for our own nutrient database.

A judged estimate. Finally, with experience, it may be possible to estimate a nutrient from an expected average level that is in most foods in that food group, or for example plants in a similar family. The aim is to leave no blanks (-1), as a blank will result in a composite food containing that ingredient entered into the nutrient profile calculator having a blank for that nutrient (such estimated values are in brackets in the printed food tables, but this can't be distinguished in the computer nutrient intake calculations). Such estimates must be documented appropriately (see below).

Calculations

Water content. If the food containing the missing nutrient(s) is similar to a known food but with a different water content, the nutrient in question will be related to the dry matter (100-H_2O).

E.g.: Food A (known), H_2O = 30g/100g, Ca = 500mg/100g

Food B (unknown), H2O = 45g/100g, Ca = 500*(55/70) = 393 mg/100g

Adjusting for fat content.

E.g.: Food A (known), Fat = 70g/100g, Vit K= 36µg/100g

Food B (unknown), Fat = 40g/100g, Vit K = 36*(40/70) =21µg/100g

Loss of water on cooking. When using a raw value to calculate a nutrient for a cooked item, e.g. toast from bread, there may be a water loss on cooking and also

some vitamin loss (see cooked foods section of food tables MW6 pages 431-440 [McCance & Widdowson 6th edition]).

E.g. If water loss is 10%, nutrient in raw food is adjusted by 100/90.

Check calculations

Wherever possible, check columns should be added, e.g. for the sum of proximates (protein + fat + carbohydrate + fibre + alcohol + water should be around 95%, and is suspicious if < 90%). The sum of saturated, mono- and poly-unsaturated fatty acids should almost equate the total fat, ditto the sum of individual fatty acids. Sugars + starch should equal total carbohydrate in most foods.

Entering nutrient information into DINO

New values for nutrients should be entered directly in **DINO.** From the **main menu** select `**Food tables**` then `**Foods`.** For information on adding new food codes, refer to SOP 2. Processing Food Queries, adding new foods to DINO.

The source of the information and /or calculations for derived values can be entered in the appropriate box; either for all nutrients or for specific nutrients. The date of entering new nutrient information should also be entered in the source box.

6. Related Documentation

Doc Number	Title
SOP 2	Processing Food Queries, adding new Food codes to DINO