**Guidelinesfor entering and manipulating data in the ISNAPDS system**

**Entering and formatting data**

To enter data, use copy and paste or directly edit cell values. Do not use cut and paste to enter data in the input spreadsheets because this will cause errors in the formulas in the output sheets. When pasting data into the sheets one can overwrite the pre-populated example data and use as many columns and rows as needed depending on the structure of the input data.

If entering numerical input data that contains blank values, or erasing numerical input or output data, the formulas that reference these blank cells will treat them as if they contain a value of 0. This allows analyses to proceed in the presence of incomplete data but also means that the system will not be alerted if any numerical input or output data is accidentally deleted.

In the example data, observations are coded numerically and referred to as such in the protocol, but they may be entered as letters, combinations of letters and numbers, etc.

Spreadsheets can be added e.g., to consolidate dietary and non-dietary data in a single file. If certain sheets are not necessary inputs or outputs for the given analysis, or for the method selected for populating food intake data or the output data is not of interest, the sheets may be deleted.

**Manipulating rows and columns**

Prior to or after entering data, one can rename, append, insert, erase, or delete columns or rows depending on the structure of the input data (being careful not to accidentally shift cells instead as this may cause errors in some cases), and filter rows for ease of viewing. However, there are some exceptions that should be noted to prevent errors:

1. Once can rename the cells in row 1 (column headers) in any spreadsheets, e.g., this is required to harmonize food group names between the Food Composition and Food Group Intake sheets, but do not delete row 1 in any sheet, even to replace it with new column headers.
2. Once can append, insert, or delete columns in any spreadsheets. e.g., to add nutrients, foods, or food groups, or remove unneeded ones; or to add metadata for foods or observations, such as additional levels of food grouping or demographic characteristics of study participants, but do not delete the Food, Food Group, or Observation columns in any sheets, even to replace them with new columns.
3. One can insert rows in any spreadsheets, e.g., if data need to be added between existing rows or additional levels of column headers would be helpful to organize the data, except for the Food Composition and Nutrient Sources sheets. Consequently, the Food Composition sheet can contain only one level of column headers.

**Maintaining integration between spreadsheets**

The structure of the input and output sheets is defined by four lists: the observation, food, food group, and nutrient lists, which contain unique values of these four variables. Two Excel functions that may be useful for structuring the data are Remove Duplicates (under the Data tab), which generates unique lists, and Transpose (**copy data > right-click > Paste Special > Transpose**) which interconverts columns and rows, e.g., this can be useful for converting the food list from a row in the Food Intake sheet into a column in the Food Composition sheet.

To ensure the formulas correctly match foods, observations, nutrients, and food groups between spreadsheets, the order and length of the observation, food and nutrient lists must be consistent and the specific structure in which the Nutrient Sources sheet is arranged (repeating ordered lists of observations stacked vertically to which sets of food groups are assigned) must be retained (thus, sorting data top to bottom or left to right in any sheets should be avoided, as this will cause errors). The length of the food group list and the name of each food group must be consistent, but food groups are not case-sensitive and may be entered in any order.

If inserting or deleting columns or rows, formulas that reference these elements will automatically update, meaning that columns or rows corresponding to the inserted or deleted observations, foods, food groups, or nutrients should be inserted or deleted in every spreadsheet. Inserting or deleting columns or rows may also affect columns, rows, cells, and formulas referenced in the protocol (which is based on the example data). Before analyzing real survey data, one can practice inserting and deleting columns or rows in the example data to observe how these actions affect the formulas in each sheet and the columns, rows, cells, and formulas referenced in the protocol.

**Array formulas**

All the pre-populated formulas in ISNAPDS are array formulas that permit the matrix multiplication that they involve. On versions of the spreadsheet prior to 2021, array formulas must be entered using CTRL+SHIFT+ENTER/RETURN. Entering formulas in this way will cause them to be enclosed in curly brackets ({}) in the formula bar, which indicates that they are array formulas. Editing an array formula will cause the brackets to disappear and the formula will no longer evaluate as an array formula unless it is reentered using CTRL+SHIFT+ENTER/RETURN. If unexpected results or errors are encountered when using ISNAPDS, they may be due to formulas in the output spreadsheets that should have been entered as array formulas but were not, or because formulas in these sheets were edited and reentered without using CTRL+SHIFT+ENTER/RETURN. In newer versions of spreadsheets (2021 and later), array formulas are automatically recognized and evaluated as such, regardless of whether they are enclosed in curly brackets. If array formulas in a file were removed in a newer version and the file was reopened in an older version, the spreadsheet would still recognize the array formulas and automatically enclose them in brackets.

Copying and pasting or dragging array formulas will produce array formulas in the cell(s) that they are pasted into. If you copy a row or column of array formulas, be careful not to include any of the copied cells in those that are being pasted into, or else the spreadsheet will stop with an error.