

Food composition data: A transparent open framework to compile reproducible food composition tables and databases

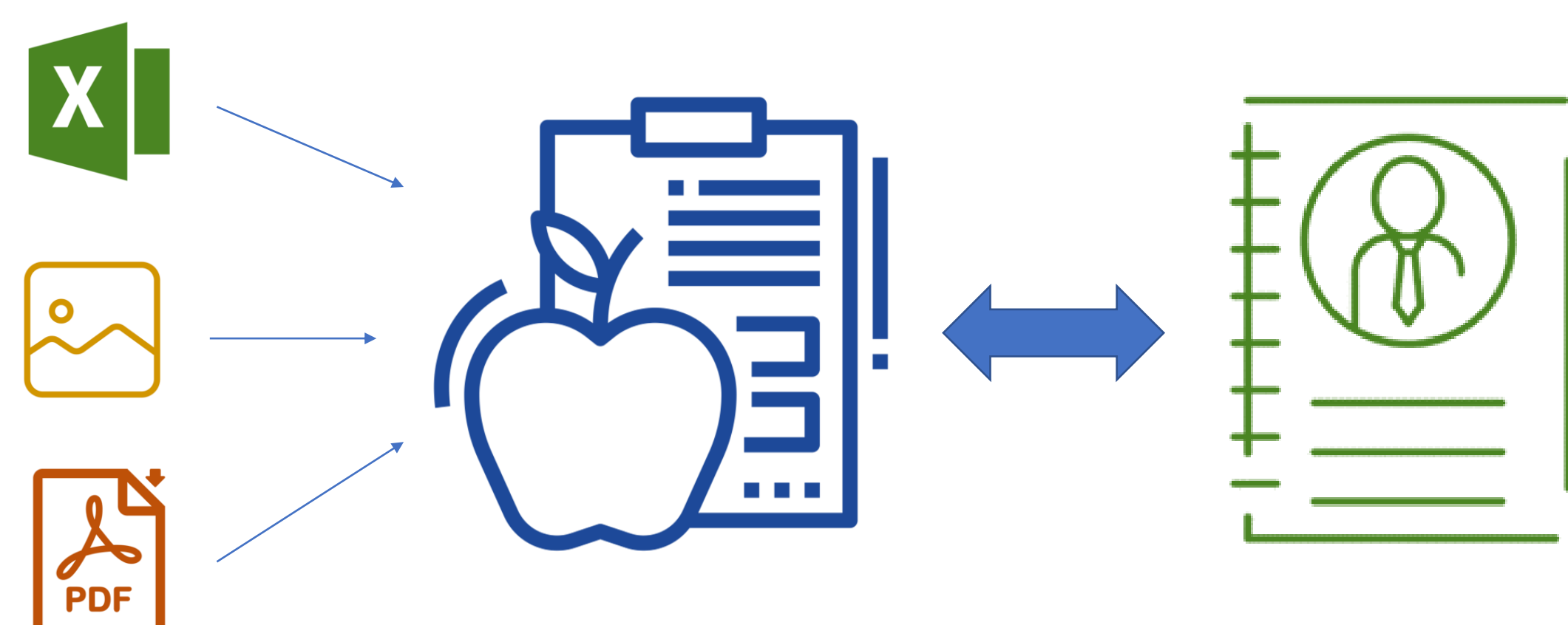


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Introduction

Food composition tables (FCTs) used in combination with food consumption data are essential for dietary assessment.



$$\text{Nutrient intake}_{\text{per person per day}} = \sum_{\text{food}=1} \left[\text{Nutrient content}_{\text{per 100g of food}} \times \frac{\text{Consumed food amount}_{\text{per person, per day}}}{100} \right]$$

Methods

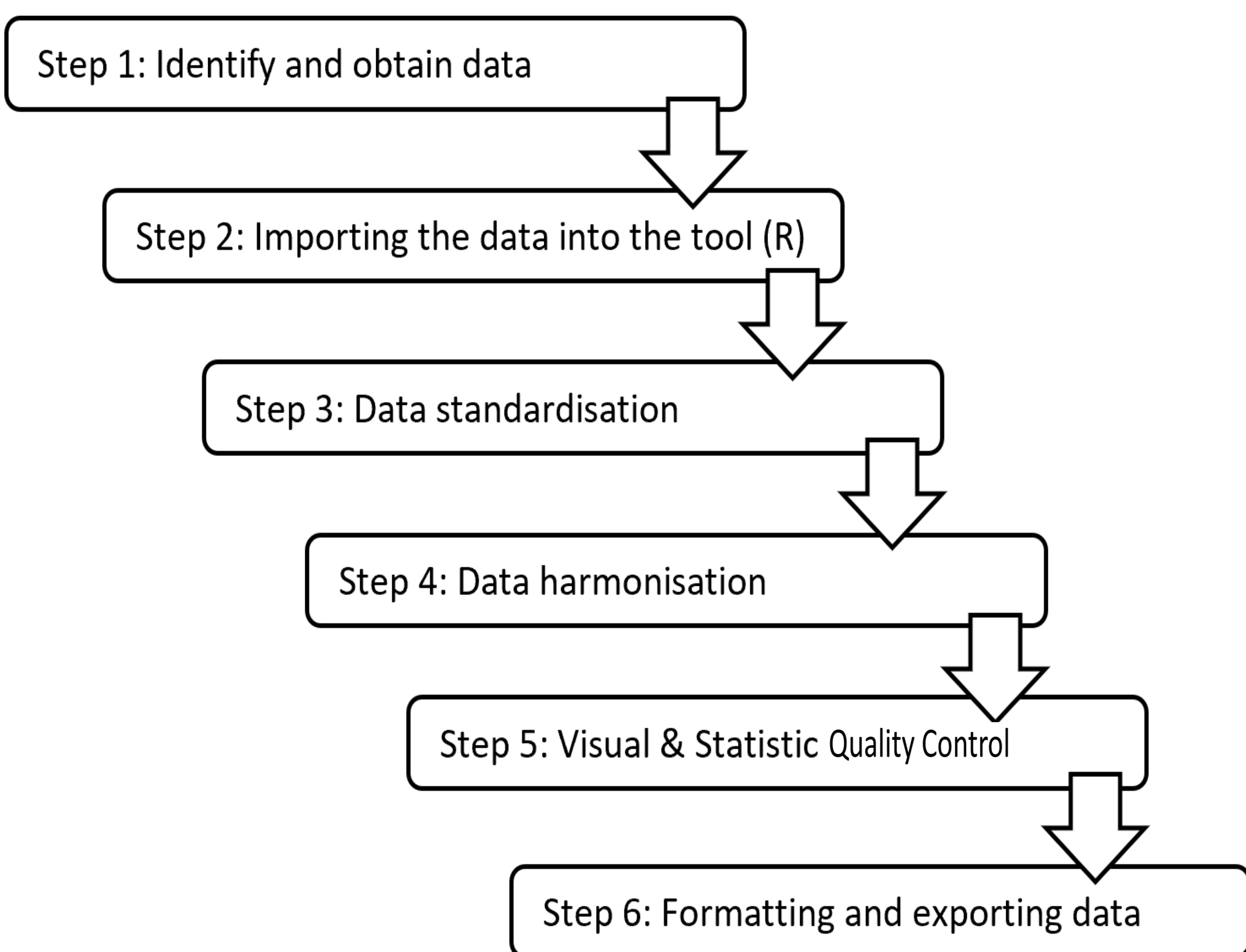


Figure 1: Workflow used to compile reproducible Food Composition Tables and Databases.

```

1
2 ENERCKcal_standardised <- function(PROTg, FATg_standardised,
3   CHOAVLDFg, FIBGTg, ALCg){
4   ALCg <- ALCg %>% replace_na(0)
5   FIBGTg <- replace_na(as.numeric(FIBGTg), 0)
6
7   ENERCKcal_std <- as.numeric(PROTg)*4 +
8     as.numeric(FATg_standardised)*9 +
9     as.numeric(CHOAVLDFg)*4 +
10    as.numeric(FIBGTg)*2 + as.numeric(ALCg)*7
11
12   return(ENERCKcal_std)
13 }

```

Figure 2: A function for calculating standardized energy (Kcal), one of many reusable functions written for the harmonization of the food composition library.

Findings & interpretations

The open framework allowed food composition data with information on **26 food components** for **4891 fish and fishery products** to be compiled from the harmonised food composition data library (n=12).

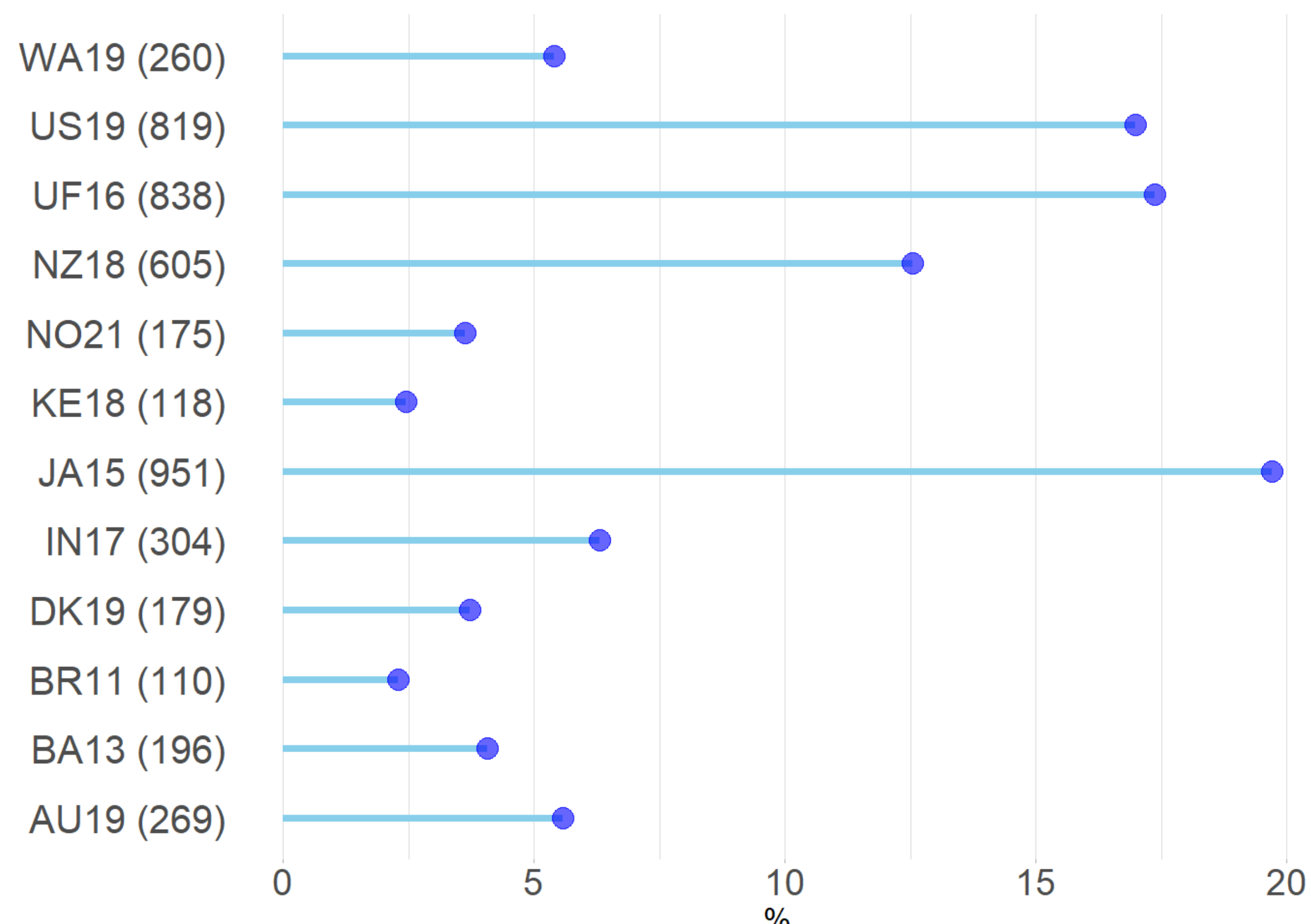


Figure 3: Contribution (percentage) to the total fish and fishery products compiled (n=4891) from the different FCT's (n=12). The number of items per FCT's shown in parenthesis.

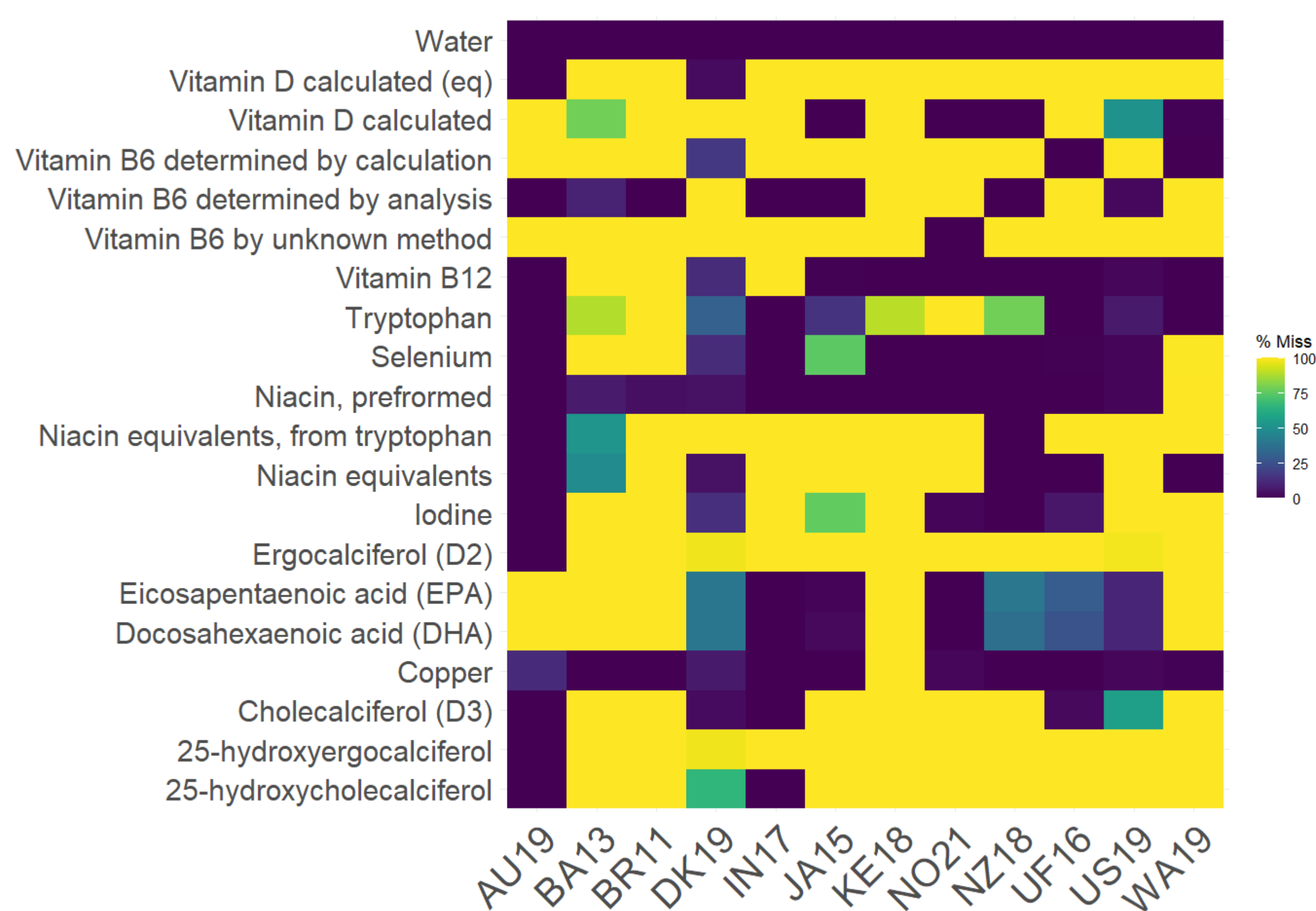


Figure 4: Visualisation for quality control: Identifying missing values for key nutrients in different FCT's.

Conclusions

- FCTs are widely used and are **important tools** in nutrition, for example, to estimate the risk of inadequate intake.
- **Transparency and reproducibility** with food composition data are problematic mostly due to the manual nature of the work.
- **Open science** approaches offer **opportunities** to greatly reduce the resources to compile food composition libraries for dietary assessment.
- **Findable, Accessible, Interoperable, and Reproducible (FAIR)** approaches should be considered when creating country, regional or survey FCTs.