Supplemental file 1

> a. *SAS syntax for regression calibration of the FFQ using two 24hR as reference instrument*

For the regression procedure, the mean of the two 24hR ($\bar{R}$) needs to be calculated and is the dependent variable in the regression equation. The FFQ estimate is the independent variable in the equation. Generic labels for the variables are used (recalls is named $\bar{R}$, FFQ is named FFQ). The dataset is called mydataset.

```
Proc reg data=mydataset;
Model R̄=FFQ;
Run;
```

Parameter estimates can be found in the output. Regression calibration equation to obtain RC predicted dietary intake estimates:

> RC= intercept parameter estimate + (FFQ parameter estimate*FFQ)

> b. *SAS syntax for enhanced regression calibration of the FFQ using two 24hR as reference instrument while adding random effects to the regression calibration*

For the mixed procedure, the dataset needs to be ordered using a long data format, i.e. 24hR1 en 24hR2 are listed below each other for each participant. FFQ estimates are duplicated on each row. Generic labels for the variables are used (participant identifier is named pID, recalls is named 24hR, FFQ is named FFQ). The dataset is called mydataset.

```
Ods output solutionr=solutionrandom solutionf=solutionfixed;
Proc mixed data=mydataset;
Class pID;
Model 24hR=FFQ / solution;
Random intercept /subject=pID solution;
Run;
```

Parameter estimates can be found in the output. Regression calibration equation to obtain ERC predicted dietary intake estimates:

> ERC= estimateSF1 + (estimateSF2*FFQ) + estimateR

Where estimateSF1 represents the fixed effect intercept estimate, estimateSF2 represents the fixed effect FFQ parameter estimate, both obtained from the solutionfixed output. EstimateR represents the random effect individual estimate, obtained from the solutionrandom output.