

# Evaluation of an Electronic Scottish Collaborative Group Food Frequency Questionnaire for British & Irish Adults

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## Background

The Scottish Collaborative Group Food Frequency Questionnaires designed to assess habitual diet ([www.foodfrequency.org](http://www.foodfrequency.org)) is currently paper based (p-FFQ). With the evolution of web-based technology an electronic version of the FFQ (e-FFQ) has been developed as an alternative to paper questionnaire. Our hypothesis is that the e-FFQ could improve participant response, quality of completion and reduce researcher costs and time during large scale dietary trials.

## Aim

Evaluate the reproducibility, acceptability and usability of the e-FFQ compared to the p-FFQ for adults.

## Methods

Twenty six male and 47 female participants, aged 18-64y took part in a randomised cross-over study, completing both the p-FFQ and e-FFQ (Figure 1) a minimum of one week apart.

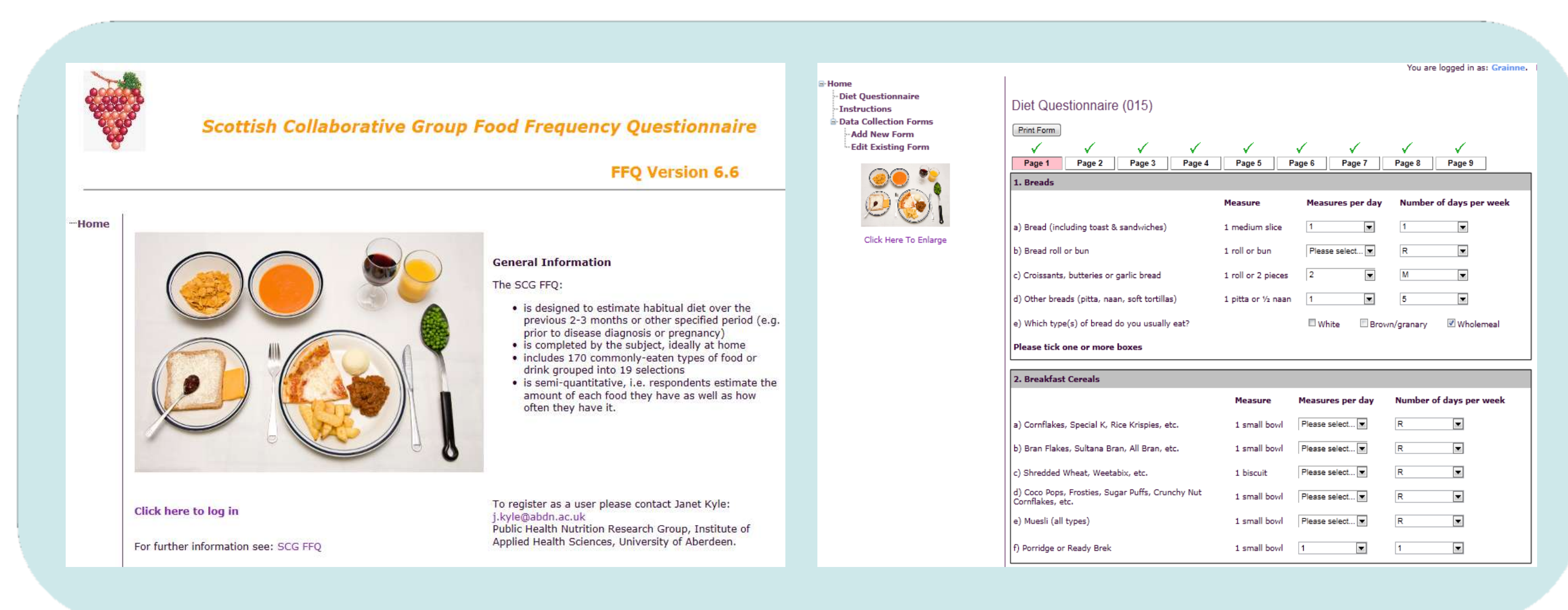


Figure 1: Web-based data entry form

Median agreement and correlation of energy and macronutrient intakes were assessed between the two FFQs. All participants completed a usability questionnaire, and 'Think aloud' (cognitive) interviewing was used with a sub-set of 6 subjects to assess acceptability and usability of the FFQs.

## Results

Good agreement and reproducibility was observed between the questionnaires for dietary nutrient intake (Figure 2).

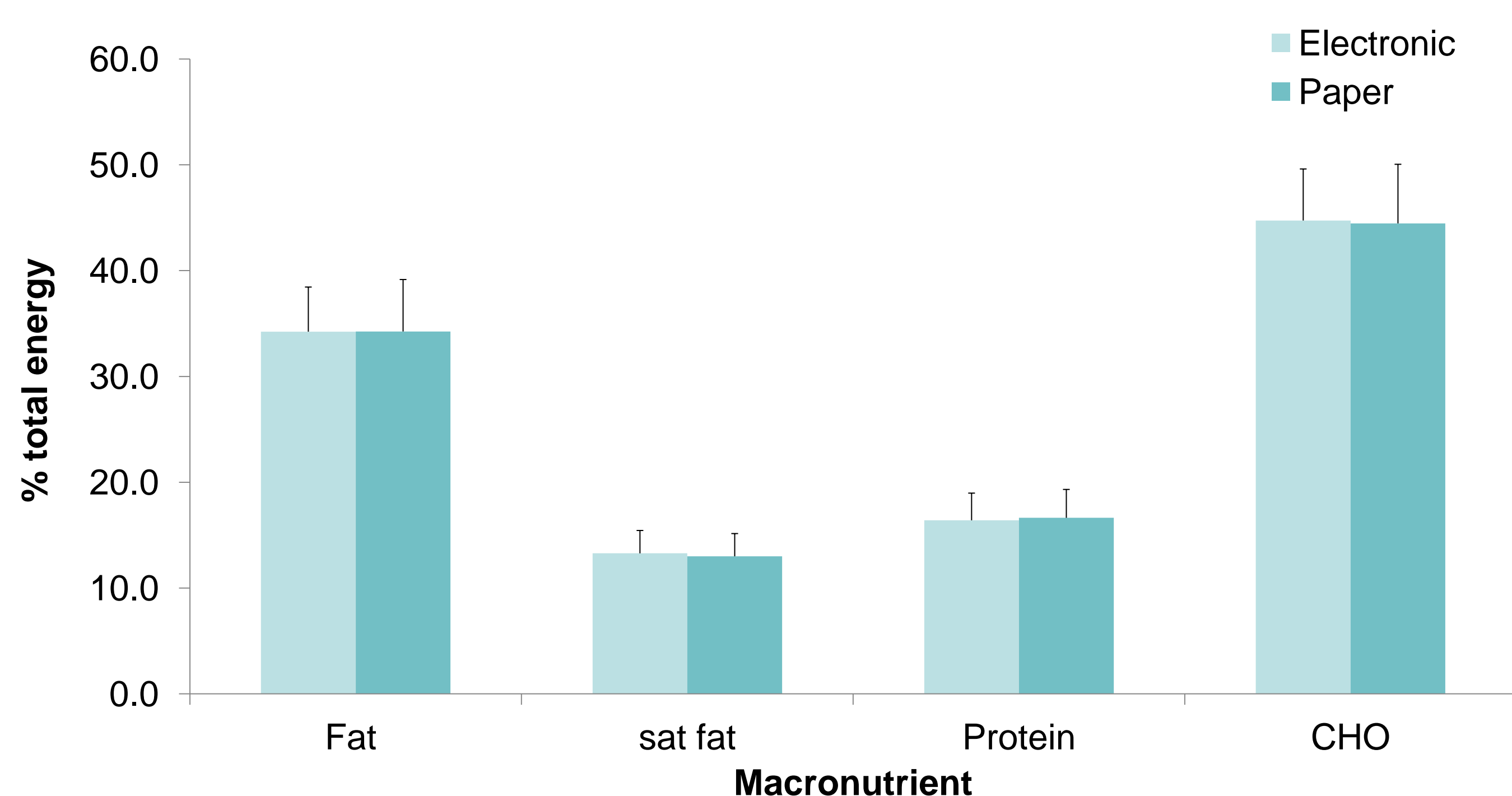


Figure 2: Macronutrient as percentage of total energy intake reported by the electronic and paper versions of the SCG FFQ

Strong correlations and good agreement (i.e. classified correctly into the same tertiles) were observed between the two questionnaires for macro and micronutrients (Table 1).

Table 1: Correlation and agreement in rank of level between paper and electronic versions of the SCG FFQ

| Nutrient     | Spearman's Rank Correlation<br>$r_s$ | Percentage Agreement |              |
|--------------|--------------------------------------|----------------------|--------------|
|              |                                      | same 1/3             | opposite 1/3 |
| Energy MJ/d  | 0.817***                             | 73                   | 3            |
| Fat (g)      | 0.864***                             | 75                   | 0            |
| Sat Fat (g)  | 0.851***                             | 64                   | 0            |
| Protein (g)  | 0.796***                             | 68                   | 0            |
| CHO (g)      | 0.776***                             | 70                   | 1            |
| Fibre (g/d)  | 0.666***                             | 58                   | 4            |
| Na (mg/d)    | 0.795***                             | 63                   | 0            |
| Fe (mg/d)    | 0.718***                             | 64                   | 5            |
| Vit D (ug/d) | 0.712***                             | 66                   | 4            |
| Vit C (mg/d) | 0.683***                             | 53                   | 4            |

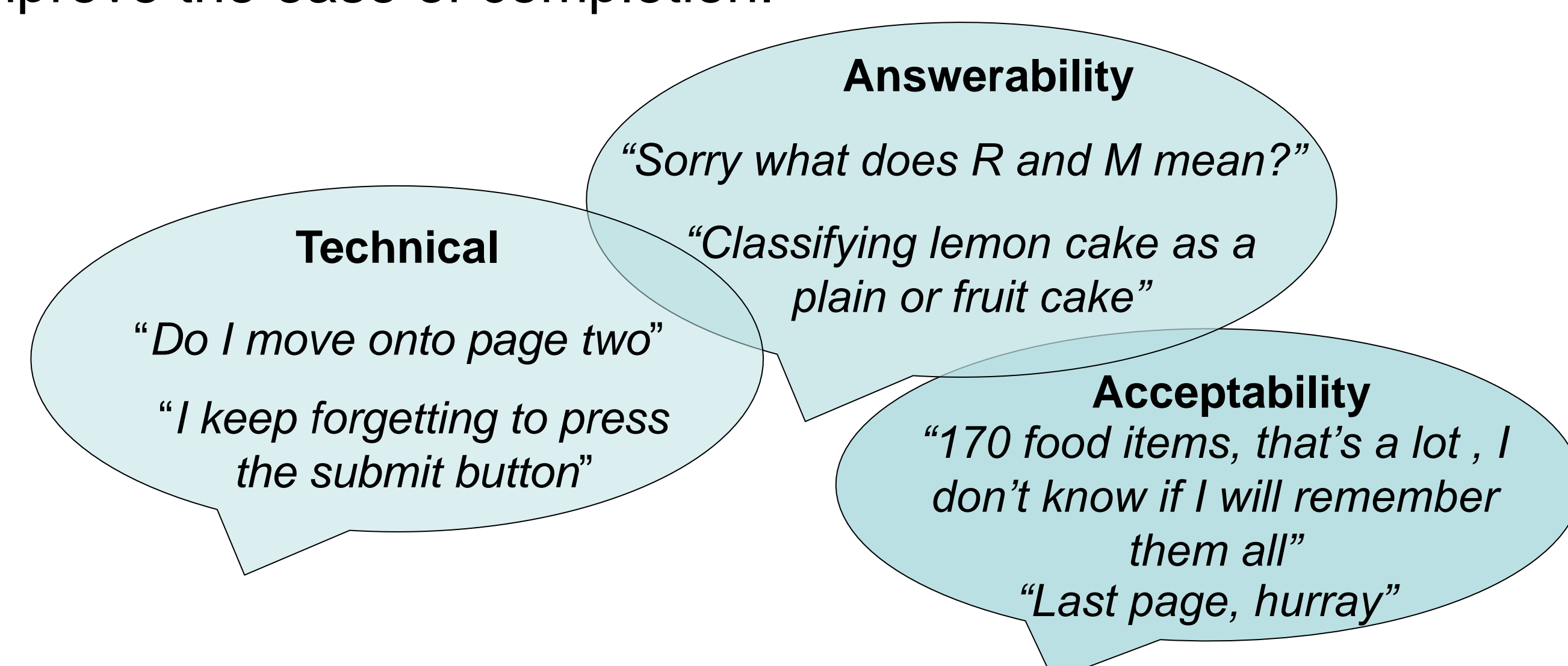
(\*\*\* p<0.001)

The e-FFQ took a median of 30 minutes to complete (range 13 – 60 minutes) and the acceptability and usability assessment of the e-FFQs is shown in table 2.

Table 2: Summary of selected usability questions after completing the e-FFQ.

| Usability            | Rating                  | % of participants |
|----------------------|-------------------------|-------------------|
| Easy of use          | Very easy               | 31                |
|                      | Quite easy              | 56                |
|                      | Had a little difficulty | 14                |
| Layout               | Clear & easy            | 90                |
|                      | Difficult & confusing   | 10                |
| No. questions / page | Too little              | 0                 |
|                      | Just right              | 90                |
|                      | Too many                | 10                |

Cognitive interviews highlighted some acceptability and answerability issues common to both questionnaires and technical factors specific to the e-FFQ that could be incorporated to improve the ease of completion.



## Conclusion

The e-FFQ has shown good agreement and repeatability with the paper version. Participants' indicated the e-FFQ was both acceptable and usable, demonstrating the electronic FFQ can be utilised in nutritional epidemiological studies.