Imperial College London

myfood24

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myfood24: development and validation of a UK online 24h recall dietary

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[1] Nutritional Epidemiology Group, School of Food Science and Nutrition, University of Leeds, UK; [2]Global eHealth Unit, Department of Primary Care and Public Health, School of Public Health, Imperial College London & Centre for Innovative Research Across the Life Course, Coventry University, UK; [3] Academic Unit of Primary Care and Population Sciences, Faculty of Medicine, University of Southampton, UK; [4]Nutrition and Dietetic Research Group, Department of Investigative Medicine, Hammersmith Hospital, Imperial College London, UK; [5]Molecular Epidemiology Unit, Leeds Institute of Genetics, Health and Therapeutics, University of Leeds, UK; [6] Dept. of Food and Nutrition, King Abdul Aziz University, Saudi Arabia. [7] Leeds Institute for Data Analytics, University of Leeds

BACKGROUND & AIM

Reliable assessment of diet requires accurate and repeated measurements. An internet based tool may provide a useful way to support dietary assessment, obtaining real time feedback on food and nutrient intakes.

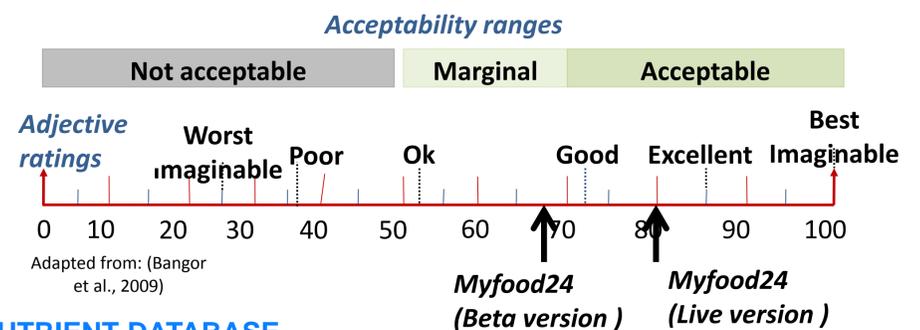**Potential benefits of an internet based 24h recall**
- ✓ Reduced underreporting compared to food-frequency questionnaires
- ✓ Extensive food tables can be incorporated
- ✓ Up-front coding and cleaning of responses reduces workload
- ✓ Can relatively easily be adapted for different countries & ethnicities
- ✓ A multiple pass method can be adopted without increasing participant frustration

AIM
To report on the development and validation of an internet based 24h recall tool, **myfood24**.

TOOL DEVELOPMENT

myfood24 was developed in 5 stages:

Stage 1: Formative research
- Literature Review
- Previous experience (My Meal Mate)
- Informal expert interviews

Stage 2: Focus group studies
Adolescents (11-18 years), adults (19-64) and older adults (≥65)
- Visual design (Look, feel & layout)
- Information design (Navigation, information content, requirements)
- User needs (Rewarding, easy to use)

Stage 3: Development of myfood24 beta-version
- Develop design specification for software developers
- In-house testing/feedback on clay-model

Stage 4: Usability & acceptability studies - beta
Adolescents (11-18 years), adults (19-64) and older adults (≥65)
- Testing with 24 hour recall (free living)
- Follow a test scenario

Stage 5: Develop full functional system of myfood24
- Final testing before live launch
- Validation study
- Ongoing feasibility studies

Underlying food database

FOCUS GROUP INTERVIEWS
Results varied by age group: tool must be quick to use; food portion images were important; design to be 'health neutral'; provide feedback. (Carter at al, 2015)

USABILITY TESTING
117 adolescents/adults completed the system usability scale

Acceptability ranges
Not acceptable | Marginal | Acceptable

Adjective ratings — Worst Imaginable, Poor, Ok, Good, Excellent, Best Imaginable

0 10 20 30 40 50 60 70 80 90 100

Adapted from: (Bangor et al., 2009)

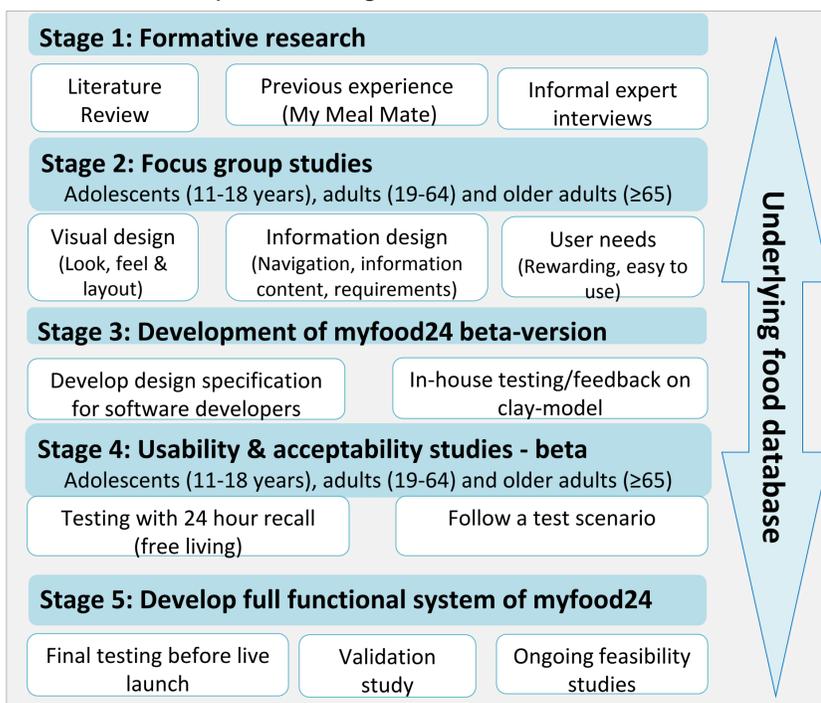*Myfood24 (Beta version)*   *Myfood24 (Live version)*

NUTRIENT DATABASE
An enhanced database has been developed ~45,000 branded foods have been mapped using back of pack nutrient information to 3,500 items in the standard McCance and Widdowson tables; creating a complete nutrient data set for branded foods (Carter et al, 2016).

VALIDATION STUDY

STUDY DESIGN
212 participants completed 2 x on-line 24hr recall and 2 x dietitian administered Multiple Pass Recalls (MPR) over a 6 month period plus 2 x blood and 24hr urine collection biomarker assessment and use of an Actiheart device to estimate total energy expenditure.

LABORATORY ANALYSIS
Urinary N and potassium, plasma antioxidants (vitamin C, carotenoids and vitamin E); fructose and sucrose.

RESULTS
- ➤ myfood24 gave *similar results* to more costly & time consuming interviewer-based multiple pass recall
  - ➤ median total E intake: men 2044 kcal (NDNS 2107 kcal); women 1613kcal (NDNS 1595kcal)
  - ➤ Mean protein myfood24: 71g (95%CI 66, 75) v. 68g (95%CI 64, 73) from biomarker
- ➤ *Both dietary assessment approaches (myfood24 & MPR) led to attenuation compared to biomarkers*

REFERENCES:
Carter M et al. (2015). Development of a UK online 24-hour dietary assessment tool: myfood24. Nutrients, 7(6), 4016-4032. doi:10.3390/nu7064016

Carter, M. C., et al. (2016). Development of a new branded UK food composition database for an online dietary assessment tool. Nutrients, 8(8). doi:10.3390/nu8080480

Dietary Assessment for Researchers and Health Professionals

Visit myfood24.org for a demo & more information.