

Web-based Food Diary for Healthy Eating

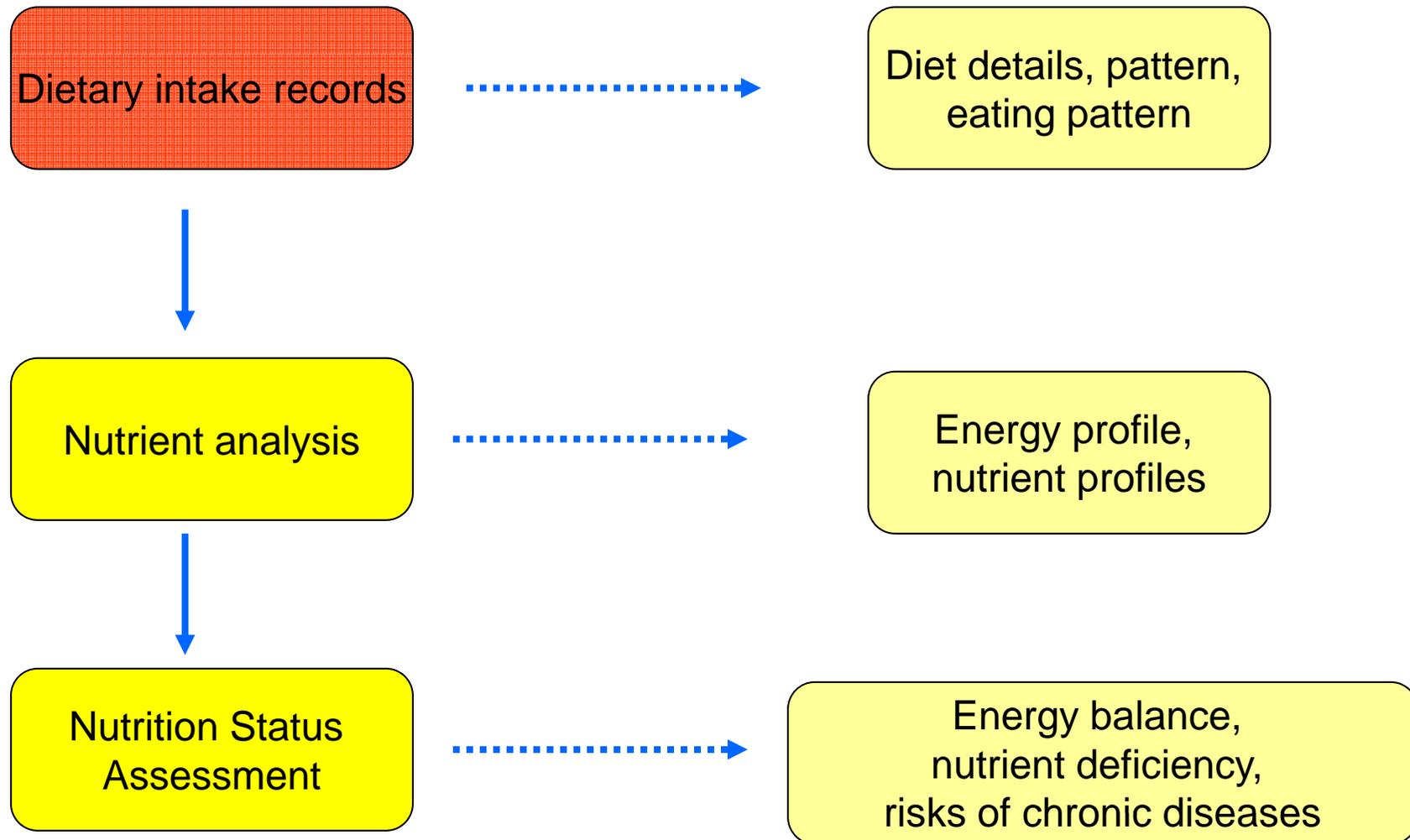
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Education in Healthy Eating

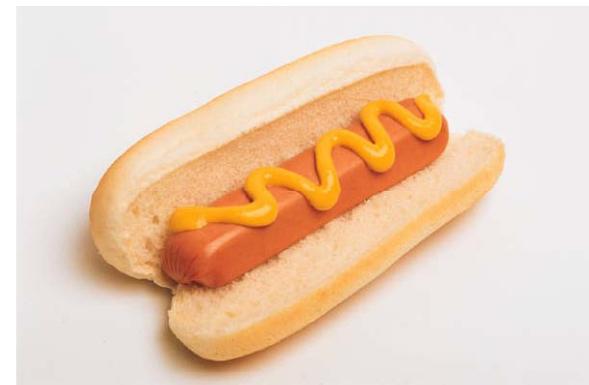


Dietary Recording Process



Dietary Recording Methods

- Direct Observation (Shankar et al., 2001)
- Telephone Interviews (Kay, Johnson, Rebecca and Dwight, 2000)
- Food Diaries (Cade, Thompson, Burley and Warm, 2002)
- Food Frequency Questionnaires (FFQs)
- 24-Hour Dietary Recalls
- Multiple Pass (Guenther et al., 1997, USDA, 2007)

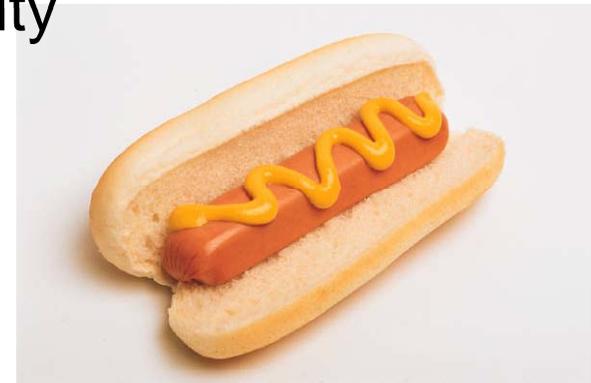


Current Issues

- Current dietary intake recording instrument
 - Developed more than 20 years
 - Designed in a paper format
 - Depend on memory recall
 - Repeat dietary analysis
 - Data cannot be stored and retrieved

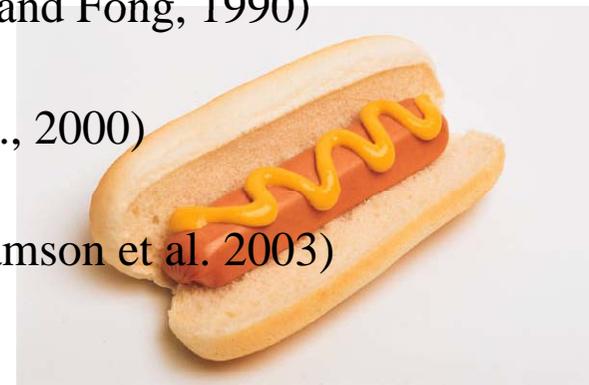
Web-based Food Recording Tool

- To design and develop a new dietary recording instrument based on food images so as to improve food estimation and to evaluate the usability of this instrument.



Recent Dietary Recording Methods

- Pictorial-recall Questionnaires (Brazdova, 1997)
- Tape-Recorded Food Records (Rockett and Colditz, 1997)
- Computer-assisted Self-Interviewing (CASI) (Kohlmeier et al., 1997)
- Spoken Diet Records (SDRs) (Lacson and Long, 2006)
- Nutrition Evaluation Scale System (NESSy) (Kretsch and Fong, 1990)
- Multimedia Diet Records (MMDR) (Kaczkowski et al., 2000)
- 2-Dimensional Food Images (Wang et al. 2006, Williamson et al. 2003)



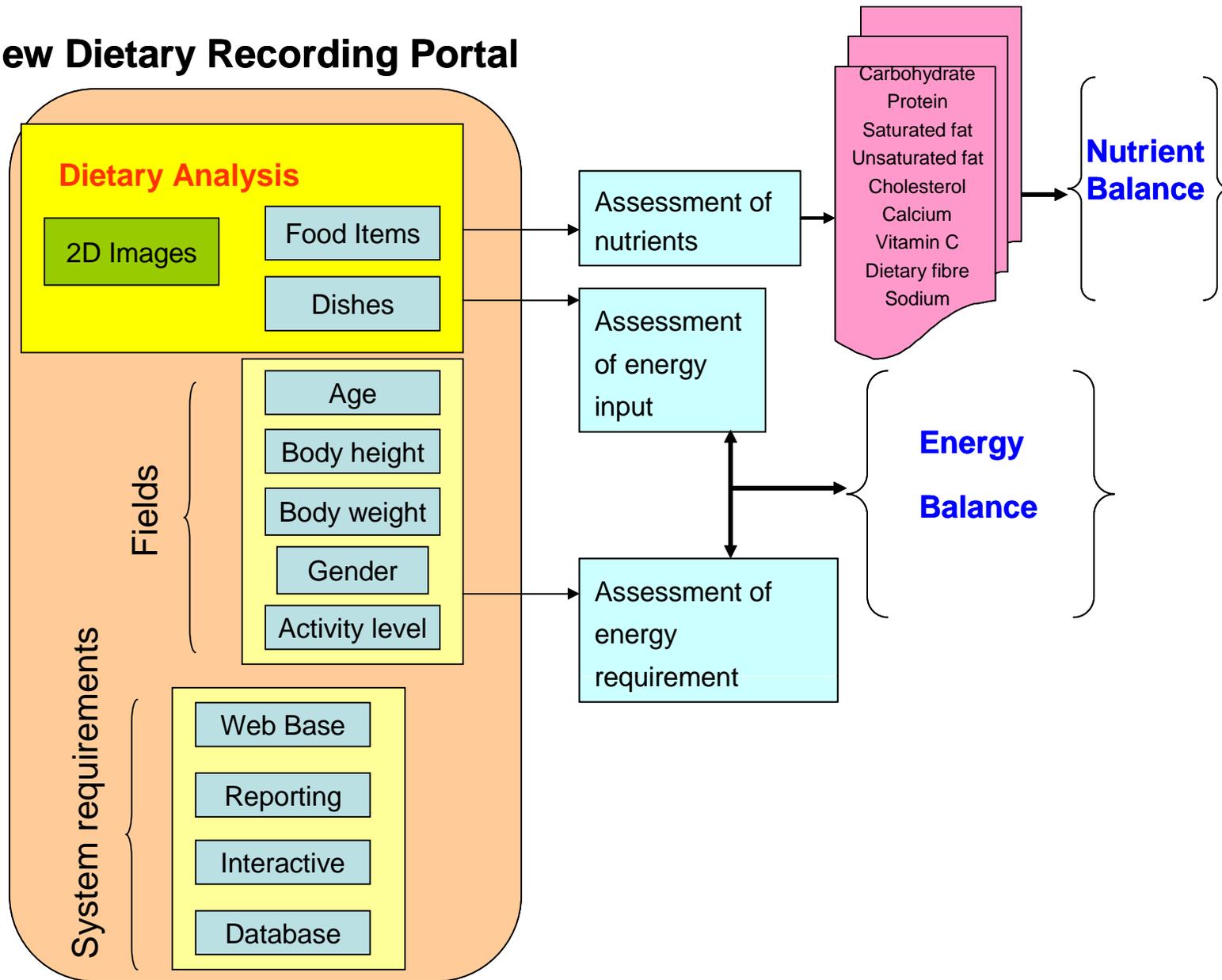
Defining Characteristics of the New Instrument



- Accessibility
- Individualization
- User-friendliness
- Interactivity
- Stickiness

New Dietary Recording Portal

Specifications



Specifications of new dietary recording portal

Defining Energy Balance

Energy Requirement (Energy Output) =

Resting Energy Expenditure (REE) x

Physical Activity Level (PAL) x

(100%+10%)

Thermic Effect of Food (TEF)

(Poehlman and Horton, 1988, Shetty et al. 1996, Hildreth and Johnson, 1995)

Defining Daily Nutrient Values

Carbohydrates	DRV	>60%
Protein	DRV	10%
Fat	DRV	<30%
Saturated Fat	DRV	<10%
Cholesterol	DRV	300mg
Dietary Fiber	DRV	>25g
Sodium	DRV	2400mg
Calcium	RDI	>1000mg
Vitamin C	RDI	>60mg

*DRV=Daily reference value, RDI=Dietary reference intakes

Dietary Intake Interface with Individualized Food Questionnaire

eDietary Intake Portal
 | food diary | report | questionnaire

Hi! Abbie | [logout](#) |

Pick Your Intake Date: Aug 7 2008

Breakfast	Lunch	Afternoon Tea	Dinner	Midnight Snack
This intake has been recorded previously. <input type="button" value="Re-Submit"/>	This intake has been recorded previously. <input type="button" value="Re-Submit"/>	This intake has been recorded previously. <input type="button" value="Re-Submit"/>	Cheese Cake(1) Cappucino(1)	Cup Noodle(1) Melon(1) Milk(1)
			<input type="button" value="Submit"/>	<input type="button" value="Submit"/>

Daily Dietary Reports

eDietary Intake Portal
 | food dietary | **report** | questionnaire

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Pick Your Intake Date: Aug 8 2008

Food Name	Unit	Calories	Carbohydrate	Protein	Total fat	Saturated fat	Non-saturated fat	Fibre	Calcium	Potassium	Sodium	Cholesterol
Breakfast												
Bread	1	9.0	9.0	9.0	18.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Milk	1	9.0	9.0	9.0	18.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Lunch												
Rice	1	250.0	30.0	30.0	60.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Cappucino	1	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Tea												
Cheese Cake	1	2400.0	8.0	8.0	16.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Dinner												
Rice	1	250.0	30.0	30.0	60.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Melon	1	9.0	9.0	9.0	18.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Beer	1	9.0	9.0	9.0	18.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Night Snacks												
Cup Noodle	1	9.0	9.0	9.0	18.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Total		2950.0	118.0	118.0	236.0	118.0	118.0	118.0	118.0	118.0	118.0	118.0

Energy Requirement 1888 Kcal

Total Energy Intake	2950.0 Kcal	Nutritional Status	Too Much
Carbohydrate	118.0 g		Not Enough
Protein	118.0 g		Not Enough
Total Fat	236.0 g		Pass
Saturated Fat	118.0 g		Pass
Calcium	118.0 mg		Not Enough
Sodium	118.0 mg		Pass
Cholesterol	118.0 mg		Pass

Evidence-based Research

- **Good reliability and accuracy in food evaluation (ICC=0.916, F=17.001, p<0.001)**

Chung, L.M.Y, Chung, J.W.Y. Tele-dietetics with food images as dietary intake records in nutrition assessment. *Telemed eHealth*, 2010, **16(6)**: 691-698.

- **Good usability in terms of system usability and information and interface quality**

Chung, L.M.Y., Chung, J.W.Y., Wong, T.K.S. Usability test of an interactive dietary recording. *Int Electron J Health Educ* 2009, **12**: 123-134.

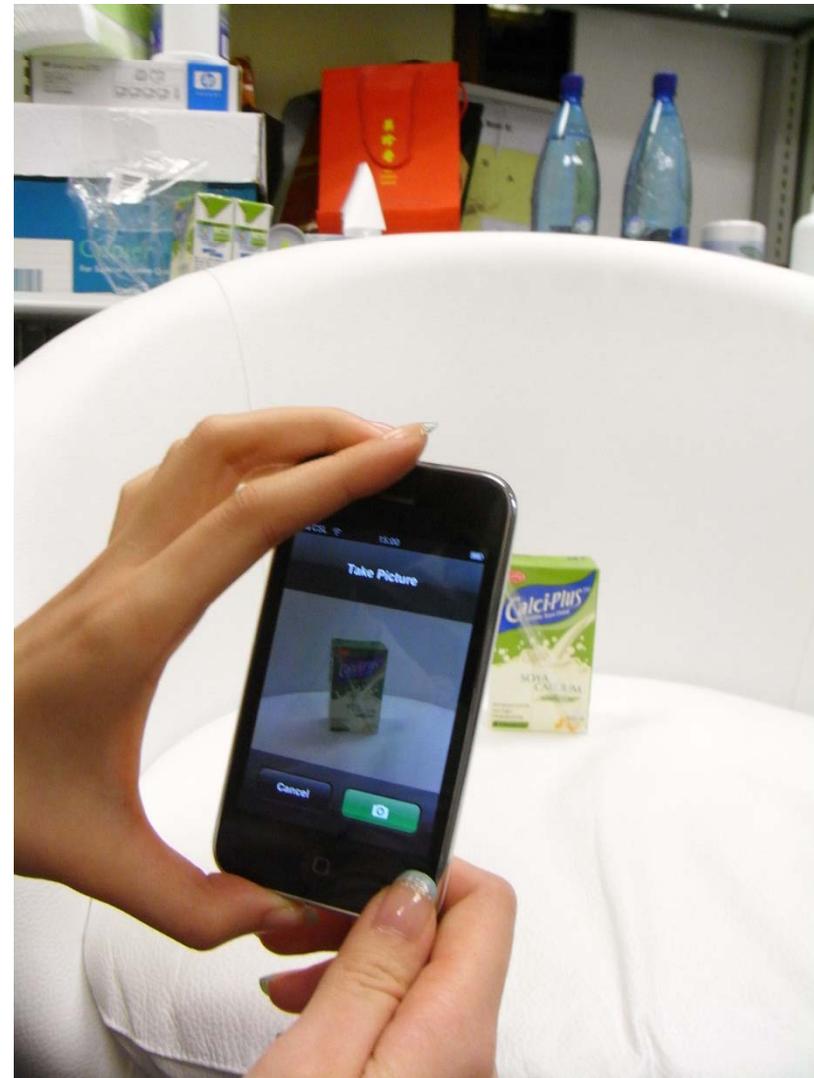
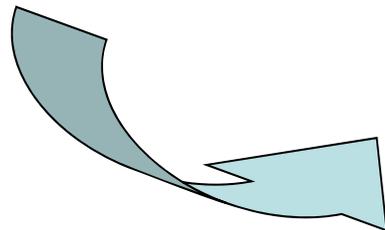
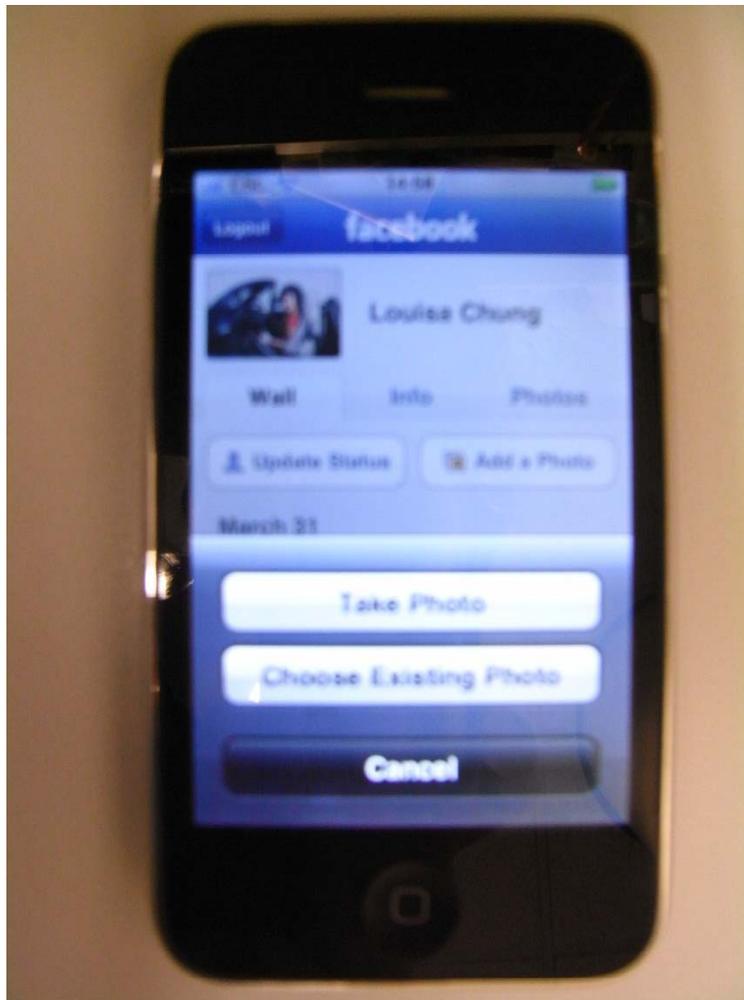
Potential Applications

- Promotion of nutrition knowledge
- Weight management intervention
- Behavioural modification
- Benefits to large scale research

Future Developments

- Alternative to FFQs and food diaries
- Instant mobile upload to the Portal





Thank You

