Contracts were fulfilled over the past 2 years for the following companies or organisations:

- Australian Beverages Council
- Lion - Dairy and Drinks
- Rural Industries Research and Development Corporation
- Dairy Health and Nutrition Consortium
- Danisco NZ

Disclaimers

Food consumption surveys

- Food consumption
  - (not nutrition status)
  - Food as consumed
- Survey –
  - cross-sectional (e.g. not measuring change on an individual level)
Australian Dietary Surveys

- National Dietary Surveys (interview, 24 hr recall)
  - 2011-12
  - 2006 (children only)
  - 1995
  - 1985 (schoolchildren)
  - 1983 (adults – some capital cities)

- State surveys (telephone interview, short questions)
  - sporadic

Traditional requirement

- Over a defined reference period:
  - Amount consumed
  - Type consumed

- For the purpose of estimating intake of:
  - Foods
  - Nutrients
  - Toxic substances

- For groups of people
- With the capacity to sub-group individuals

Nice to know

- Structure of daily food and nutrient intake
  - what is eaten with what
  - how food is prepared
  - when food is eaten
  - where and in what context food is eaten

Problems

- Foods ‘as consumed’ are many, and can be complex mixtures
- Populations may be widely dispersed and culturally diverse
- Individuals may be poor informants
  - They may not know what is in food
  - They may not know what food is called
  - They may be confused over what they consumed

- Can new technologies help?
New uses of Technology

- Interactive computer based
- Image assisted/ Image based
- Hand held device
- Scan and sensor based

Interactive computer based

- Applicable to a range of dietary methodologies
- Complete system for probing, coding and processing.
- Interactivity can include:
  - touch screen functionality,
  - use of audio (eg reads questions aloud, reads answers aloud, etc)
  - Variable portion size indications
  - Pop-up guides
  - Animation

Examples

- ASA24-Australia
- Australian Eating Survey
  - (FFQ – University of Newcastle)
- CNAQ – Comprehensive Nutrition Assessment Questionnaire
  - (FFQ – Monash University)

Evaluation

- Benefit for participants – can be done at a convenient time and place
- Little need for training support
- Personnel cost reduction
- Can give immediate feedback (potential to improve response)
Image assisted + Image based

Daugherty et al. J Med Internet Res 2012

Rollo et al. Nutrients 2015

Harray et al Nutrients 2015

Harray et al Nutrients 2015
Food Identification

Life logging

eButton – University of Pittsburgh

Wearable Wireless Webcam
1998, Mann

SenseCam
2004, Microsoft

Lifelogging Camera
2012, Memoto
Latest technologies – dietary surveys | Dr Malcolm Riley

Evaluation

- Portion estimation under development
- Training required
- Can be a memory prompt
- Can be an objective guide to investigator
- Potential to lower subject burden

Hand held device – smart phones, PDA

- Widely-used
- Real-time collection
- Possibility for real-time processing
- Can incorporate digital photography and/or voice records
- Wireless connectivity
Evaluation

- Device cost is small because of widespread use
- Real time collection (not as reliant on memory)
- Training support needed
- Personnel cost reduction
- Can give immediate feedback and potentially check data (potential to improve response and quality)

Scan and sensor based

- Scan-based methods can include the use of loyalty cards, smart cards or food product labels
- Sensor-based methods make use of a range of functions related to eating

Automatic Ingestion Monitor (AIM)
University of Alabama
Monitoring swallows

Food identification by IR spectroscopy


Evaluation - Scans

- Specific to context – retail outlet
- Not specific to individual
- Domestic waste not assessed
- Cooking/preparation method imputed
- Not reliant on self-report
- Scan relates directly to food
Evaluation - Sensors

- Early stage
- Needs to be deployed
- Can be used in combination with other methods
- Has potential
  - to lower subject burden
  - to lower error rate in food identification
  - to accurately identify an eating occasion for further investigation

Latest technologies — dietary surveys | Dr Malcolm Riley

Conclusions

- New technologies for food intake measurement are promising.
- Current technology use is directed to problems with current methods:
  - Manual coding and data entry
  - Food identification
  - Portion size estimation
  - Subject convenience
  - Memory
- A combination of technologies is likely.
- Novel technology will develop new food intake measurement methods.

References

- http://www.epi.grants.concer.gov/asa24/