Development of databases to support analysis of dietary recalls in rural Kenya

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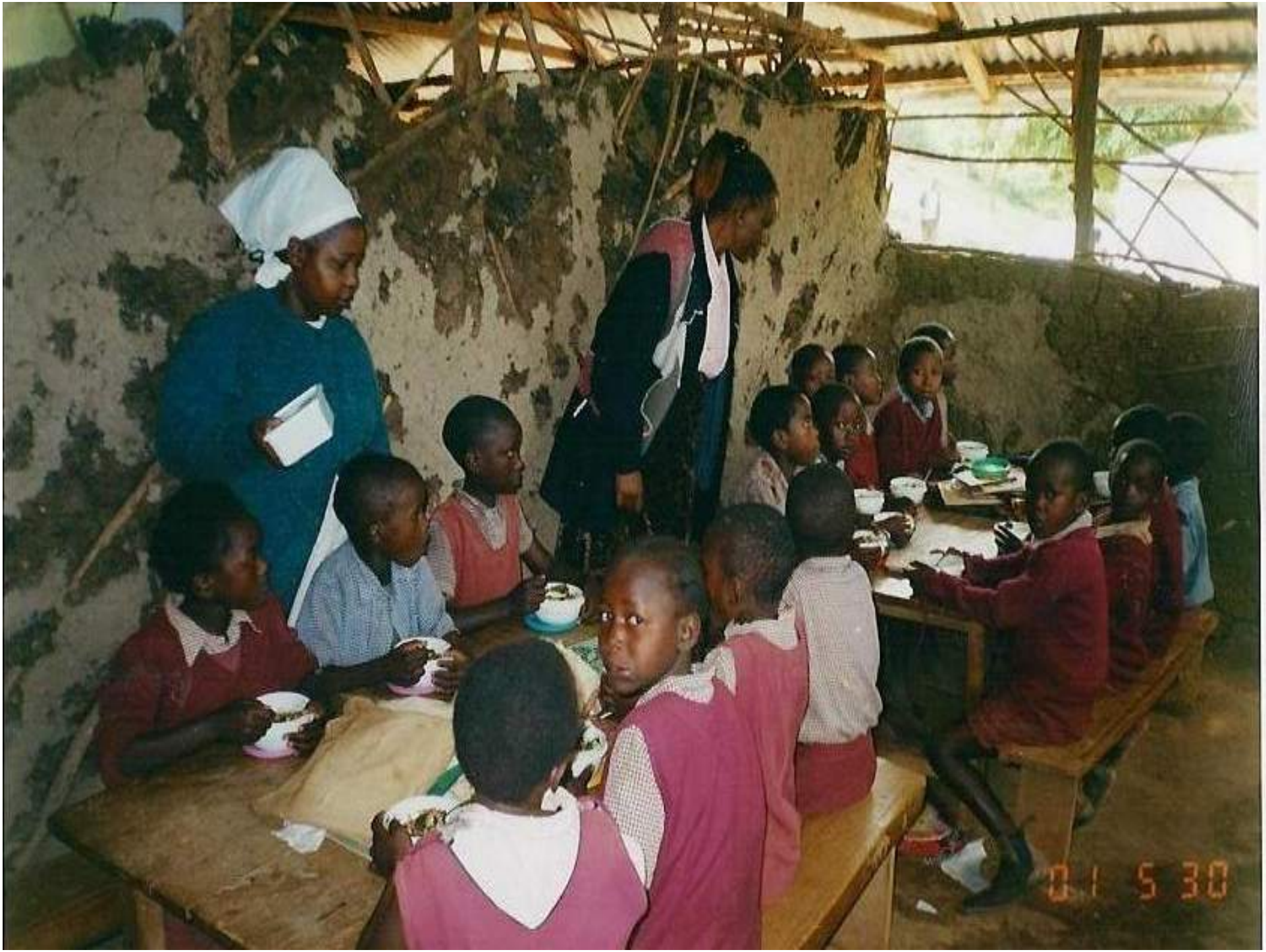
The Child Nutrition Project (CNP)

- Conducted in 1998-2001 in Embu District, Kenya.
- Provided snacks at school for approximately 450 children.
- Collected multiple 24-hour recalls for each child.
- Funded by: The Global Livestock CRSP, USAID.



Dietary Assessment for CNP

- Challenge: To convert the foods reported on 24-hour recalls into daily nutrient and food group intakes
- Solution: Develop 5 databases and a SAS program
- Today's presentation is an update of the information presented at the 2003 NNDC/IFDC

Challenges and solutions

- Adapt an existing international food composition table.
- Update a cross-reference index linking local foods to the food composition table.
- Update local standard recipes.
- Create a food density database.
- Develop food group assignments.

Challenges and solutions

- Adapt an existing international food composition table.

International Minilist (IML)

- Developed in 1988-92 as part of the WorldFood Dietary Assessment System.
- Composition for 195 basic food ingredients.
- 52 nutrients and food components.
- No missing values.

International Minilist (IML)

- By keeping the number of foods small, it is possible to include a variety of food components that are important in developing country diets.
- Builds on concepts developed by Jean Pennington and Doris Calloway.

International Minilist (IML)

Available at no cost at:

www.fao.org/infoods

Challenges and solutions

- Adapt an existing international food composition table.
- Update a cross-reference index linking local foods to the food composition table.

Country-specific foods can be linked to foods on the IML

- Using a cross-reference index.
- Indexes have been developed for:
  - Egypt
  - Kenya
  - Mexico
  - India
  - Senegal
  - Indonesia
- Also available at www.fao.org/infoods

Cross-Reference Indexes

- Foods are matched depending on nutrient profile.
- For example, fruits matched on carbohydrate, vitamins C and A, so jackfruit indexed to banana.
- Factors are used to adjust for moisture differences.
- Multiple IML foods may be linked to create a “recipe”.

To create a “medium fat beef” in Kenya

- 6% beef tallow (IML 7066) is combined with beef, medium fat (IML 8067)
- Achieves the appropriate level of fat for the Kenyan medium fat beef.

Challenges and solutions

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- Update local standard recipes.

Standard recipes used whenever the exact recipe was unknown

- Food eaten away from home.
- Food brought into home from another household.
- About 6% of all food items.

Challenges and solutions

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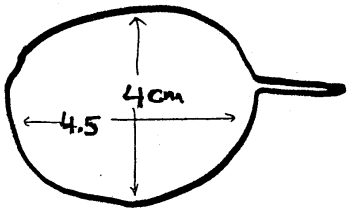
- Create a food density database.

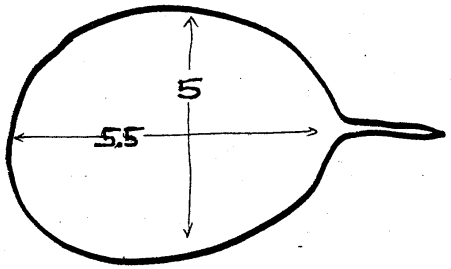
To quantify amounts, enumerators used household measures

- File was needed to convert household measures to gram weights
- No gram weight or density files were currently available for local measures.
- Staff spent several months developing the appropriate protocols and databases.

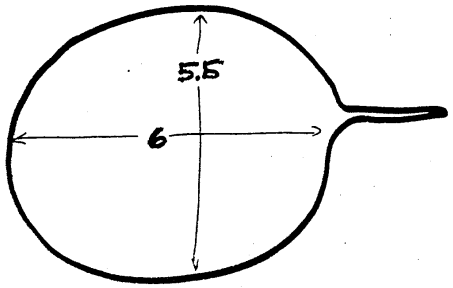
PASSIONFRUIT (black)



small (30g)



medium (55g)



Large (60g)

Sample density file entries

Carrot, raw	5 g/cm
Carrot, raw	small = 30 g
Carrot, raw	medium = 70 g
Carrot, chopped	0.48 g/ml

Current food density file contains:

- 2505 densities and weights
- 480 foods and recipes (average of 5 entries per food item).

Challenges and solutions

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- Update local standard recipes.
- Create a food density database.
- Develop food group assignments

Food group assignments

- Every food on the IML was assigned to a food group
- 9 major groups:
  - Starches
  - Vegetables
  - Fruits
  - Dairy
  - Meat
  - Legumes/nuts
  - Fats
  - Sweets
  - Beverages

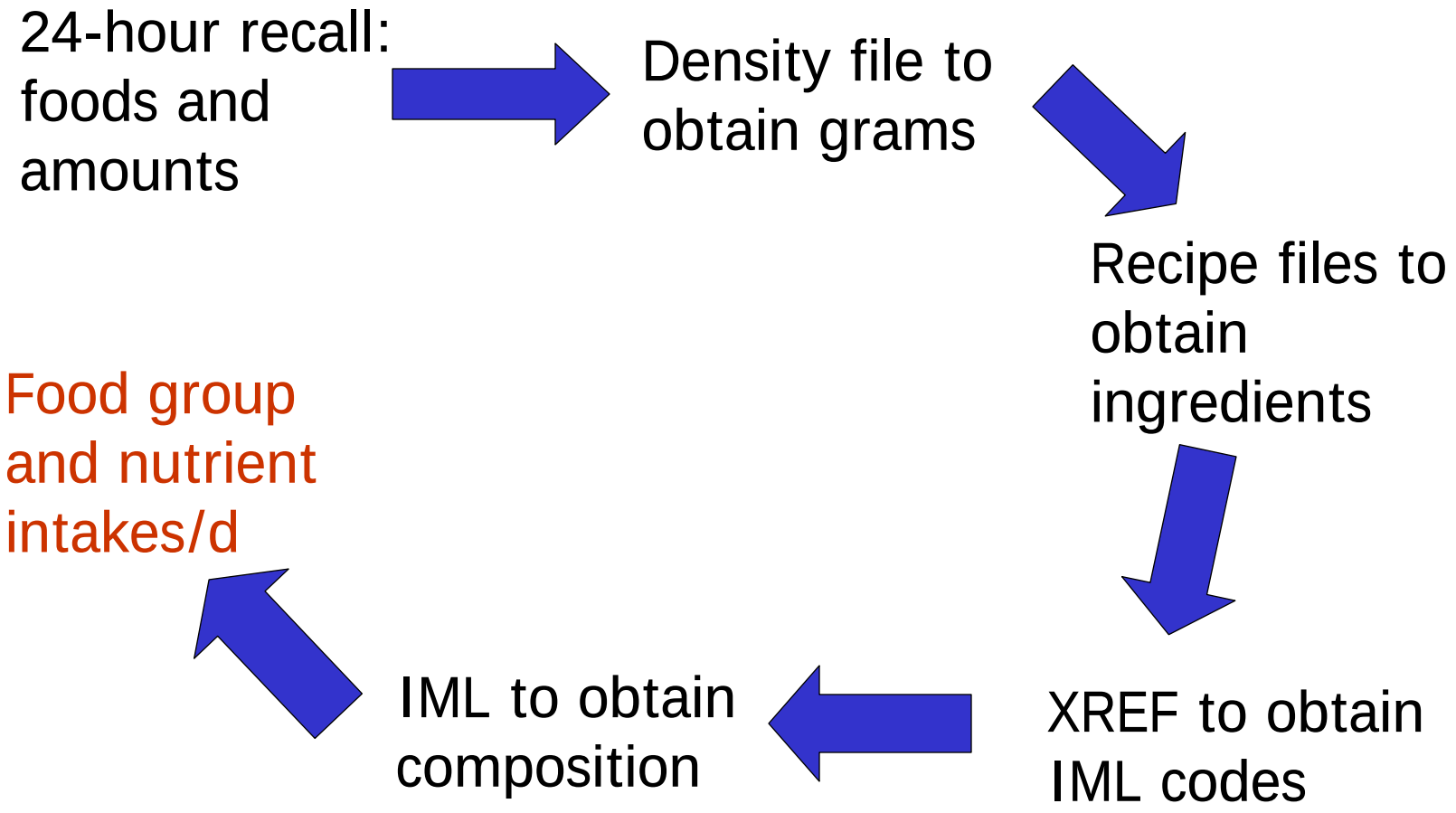
27 subgroups

- Starches
  - Wheat
  - Maize/sorghum
  - White potatoes/taro/cassava
  - Plantain/banana/breadfruit
  - Rice
  - Oats/millet/other grains

Nutrient calculation program was developed in SAS to:

- Read Excel spreadsheets containing intake data.
- Access all the relevant databases.
- Calculate gram weights and nutrient levels, for each food consumed in a day.
- Sum across all foods to give nutrient and food group totals per child per day.

Flow of analysis



Publication

- Murphy SP, Gewa C, Grillenberger M, Neumann CG. Adapting an international food composition table for use in rural Kenya. J Food Comp Analysis 2004;17:523-530.

Now also available for Tanzania

- Developed by Zohra Lukmanji
- To be on website of the Harvard School of Public Health

Conclusions

- Multiple databases are needed to analyze 24-hour recalls
- Publicly available in the US but may need to be developed for international studies
- Ample personnel and funding should be allocated for this task