The Philippine Food Composition Tables

Current Status and Needs

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The format of the 1997 Philippine FCT

Table 1. Food components, modes of expression, method of analysis

<table>
<thead>
<tr>
<th>Food Component</th>
<th>Unit of Expression</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edible Portion, EP</td>
<td>Per cent, %</td>
<td>Part usually eaten, calculated as ( % \text{ EP} = \frac{\text{Edible Weight}}{\text{As Purchased weight}} \times 100 )</td>
</tr>
<tr>
<td>Water</td>
<td>gram, g</td>
<td>Water and volatile substances lost by drying (AOAC 1980)</td>
</tr>
<tr>
<td>Energy</td>
<td>Kilocalorie, kcal</td>
<td>Metabolizable, computed using Atwater factors, ( 4\text{Protein} + 9\text{Fat} + 4\text{CHO} )</td>
</tr>
<tr>
<td>Protein</td>
<td>gram, g</td>
<td>Nitrogen analysis (AOAC 1980) multiplied with specific protein factor*</td>
</tr>
<tr>
<td>Fat</td>
<td>gram, g</td>
<td>True fats and lipids such as fatty acids, lecithin and pigments extracted by Soxhlet using pet ether (AOAC, 1980)</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>gram, g</td>
<td>Total carbohydrate calculated by difference ( = 100 - %[\text{Water}+\text{Protein}+\text{Fat}+\text{Ash}] ) Zero (0) if subtrahend is &gt; 100</td>
</tr>
</tbody>
</table>
### Table 1. Continuation

<table>
<thead>
<tr>
<th>Food Component</th>
<th>Unit of Expression</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash</td>
<td>Gram, g</td>
<td>Mineral residue after incineration at 500-550°C (AOAC, 1980)</td>
</tr>
<tr>
<td>Calcium, phosphorus, iron</td>
<td>milligram, mg</td>
<td>Ca – titrmetry, precipitation of oxalate, (AOAC 1980) Phosphorus – Fiske and Subbarow colorimetric method, 1946 Iron – Hahn colorimetric method, 1945</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>microgram, μg</td>
<td>Carr Price (AOAC, 1980) 1RE = 1 μg retinol = 6 μg β-carotene = 3.33 IU = 10 IU from β-carotene</td>
</tr>
<tr>
<td>β-carotene</td>
<td>microgram, μg</td>
<td>Moore chromatographic (1943) modified by Wall and Kelly(1943)</td>
</tr>
<tr>
<td>Thiamin</td>
<td>milligram, mg</td>
<td>Analyzed using thiochrome method (AOAC, 1980) is the sum of free thiamin and thiamin from phosphate esters</td>
</tr>
</tbody>
</table>

### Table 2. Protein factors for specific foods

<table>
<thead>
<tr>
<th>Food Item</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat and Fish</td>
<td>6.25</td>
</tr>
<tr>
<td>Gelatin</td>
<td>5.55</td>
</tr>
<tr>
<td>Milk &amp; Products</td>
<td>6.38</td>
</tr>
<tr>
<td>Casein</td>
<td>6.40</td>
</tr>
<tr>
<td>Human milk</td>
<td>6.37</td>
</tr>
<tr>
<td>Egg</td>
<td></td>
</tr>
<tr>
<td>Whole</td>
<td>6.25</td>
</tr>
<tr>
<td>Albumin</td>
<td>6.32</td>
</tr>
<tr>
<td>Vitellin</td>
<td>6.12</td>
</tr>
<tr>
<td>Wheat, whole</td>
<td>5.83</td>
</tr>
<tr>
<td>Bran</td>
<td>6.31</td>
</tr>
</tbody>
</table>

### Code System:

- **Alpha-numeric where:**
  - Alpha code refers to the Main food group, excluding the letters I, O and L to prevent confusion with the numerals 0 and 1
  - Numeric code refers to the chronological order within the group, wherein food items are alphabetically listed

### Sources of data:

- Most of the food items were analyzed in the FNRI laboratory
- Values for food components not analyzed but known to be present in significant amounts were borrowed from local studies or foreign FCTs with clear descriptors, specified methods and detailed results.
Other features of the Philippine FCT 1997

- Harmonized with ASEANFOODS
  - Based on ASEANFOODS Sampling Guidelines
    a. Sampling – 100 to 300g for dry, and 500-1000g for fresh foods
    b. 10 outlets - north & south, east & west of Metro Manila
  - Zero (0) values assigned to:
    a. crude fiber, single animal foods,
    b. retinol, single plant foods,
    c. beta-carotene, white or light colored foods
    d. Vitamin C, single, raw, processed animal foods, food combinations, dried beans etc

The food groupings are based on the 18 ASEAN FCT Major Food Groupings

The Philippine FCT retained 17 of the food groupings with some modifications to suit the local needs. Letters I, L and O were not used to avoid confusion with the numeric codes

MAJOR FOOD GROUPINGS

A. CEREALS & PRODUCTS

203 Food Items

B. STARCHY ROOTCROPS & TUBERS & PRODUCTS

41 Food Items
C. NUTS, DRIED BEANS AND SEEDS AND PRODUCTS

69 Food Items

MAJOR FOOD GROUPINGS

D. VEGETABLES AND PRODUCTS

293 Food Items

E. FRUITS AND PRODUCTS

116 Food Items

MAJOR FOOD GROUPINGS

F. MEATS AND OTHER ANIMALS AND PRODUCTS

263 Food Items
G. FINFISH, SHELLFISH AND OTHER AQUATIC ANIMALS AND PRODUCTS

232 Food Items

H. EGGS AND PRODUCTS

22 Food Items

J. MILK AND PRODUCTS

26 Food Items

K. FATS AND OILS

11 Food Items
FOOD AND NUTRITION RESEARCH INSTITUTE
DEPARTMENT OF SCIENCE AND TECHNOLOGY

MAJOR FOOD GROUPINGS

M. SUGAR, SYRUP AND CONFECTIONERY
50 Food Items

N. SPICES AND CONDIMENTS
30 Food Items

P. ALCOHOLIC BEVERAGES
5 Food Items

Q. NON-ALCOHOLIC BEVERAGES
61 Food Items
R. COMBINATION/MIXED DISHES

87 Food Items

Internal and external quality control systems for the 1997 FCT

- Participation to Interlaboratory Proficiency Test Programs
- Results acceptance criteria
  - Precision Tests (using the Horwitz Achievable Coefficient of Variation)
    \[
    \text{Horwitz ACV} = 2^{1-0.5 \log C}
    \]
    where \( C \) = fraction concentration of the analyte

Analyses were repeated if the CV or %RSD of results is > than the Horwitz's ACV
Due to transfer of our Institute to a new location and the temporary suspension of the FCT activities, we can no longer locate:

- Records of method validation for the different analysis
- Photographs of the single food items, if there are any
- Details of the sample preparation
- Written descriptors e.g., physical dimensions, mode of transport, sample locations, etc.

However, there are records/photoalbums of some of the product labels of processed foods that were analyzed.

In 2006, FCT activities were revived.

Objective: To update the 1997 FCT in terms of additional food items and health food components e.g., cholesterol, dietary fiber, fatty acid, iodine, potassium, sodium and zinc.

We started with four (4) food items identified from the priority list of the Philippine National Nutrition Survey of 2003 and boiled variant of two food items:

1. Egg, chicken, whole
2. Egg, chicken, whole, boiled
3. Noodles, instant, chicken flv
4. Noodles, instant, chicken flv, cooked
5. Sardines in tomato sauce, cnd
6. Fertilized Egg, duck, boiled
Sample collection points

A. Map of Metro Manila Philippines
B. Population Density

The list of priority foods...

The first thirty (30) commonly consumed foods, Philippines

Source: The Sixth Nationwide Nutrition Survey, 2003

Documentation Forms

Form1 Sample Registration
Form2 Sample Preparation

Internal and external quality control systems for the on-going FCT project

- Use of ISO 17025 accredited methods of analysis
- Use of SRM and In-House reference standards
- Use of control charts
- Qualified/trained analysts from our ISO 17025 laboratory
- Results acceptance criteria
  1. Recovery, analyte dependent
  2. ± 10% of the mean result
  3. Control Chart
  4. Correlation coefficient ~ 0.999
Our qualification....

Our FCT Staff at work

Sample Documentation.....

Weighing and mixing the sample
Practice makes perfect!

We perform trial runs (for vegetable and fruit samples) to determine the best procedure for sample preparation.

Our initial attempts at getting the photos of the samples

Squash

Chayote

This is how we document pictures of our samples

Presently, we have analyzed > 90 food samples categorized under:

A. Cereals and Products – 5
B. Cereals and Products – 5
C. Cereals and Products – 5
D. Vegetables and Other Products – 39
E. Fruits and Products – 1
F. Meat and Other Animals and Products – 21
G. Finfish, Shellfish and Other Aquatic Animals and Products – 5
H. Eggs and Products – 3
J. Milk and Products – 1
M. Sugar, Syrup and Confectioner – 1
Q. Non-alcoholic Beverages – 3
R. Combination Foods/Mixed Dishes – 15
Current status of the Philippine FCT

We are presently involved with the development of a handbook on the nutrient composition of selected Philippine vegetables which include some of the indigenous varieties.

Current problems of the Project on FCT

- Very limited budget
- Limited number of food components
- Few staff involved in the generation of the data
- Sampling sites are limited to the metropolitan area
- No validated methods for some food components of interest (e.g. HPLC methods for iodine, vitamin C and folate)

Current needs of the Project on FCT

- Development of new analytical procedures
- Upgrade and replacement of existing laboratory facilities

Recommendations for the FCT

- Sufficient funds to sustain the operation of the laboratory
- Validation of new methods of analysis
- Training/motivation for dedication, quality and skill in the production and management of FCT

Recommendations for the FCT

- Continuous improvement in the compilation of food composition data
- Government/management commitment and support for the success of the endeavor
- Course on food composition be introduced in the curricula of courses on food and nutrition
- Possible inclusion of the FCT as a textbook to increase the awareness and use/application of the food data
Recommendations for the FCT

- Nationwide marketing through education campaign as guide to healthy food choices in addition to nutrient labels
- Make data available to homemakers and especially those involved in grass-root level activities

- Make data presentation readily understandable for single foods like fruits, vegetables (especially the indigenous varieties), animals and other members of the flora and the fauna to:
  1. encourage conservation, and
  2. increase the cultivation
  3. develop local and sustainable recipes and food products
  4. save from extinction and
  5. support global efforts at food biodiversity and ensuring food security