

# Community Nutritional Assessment (1)

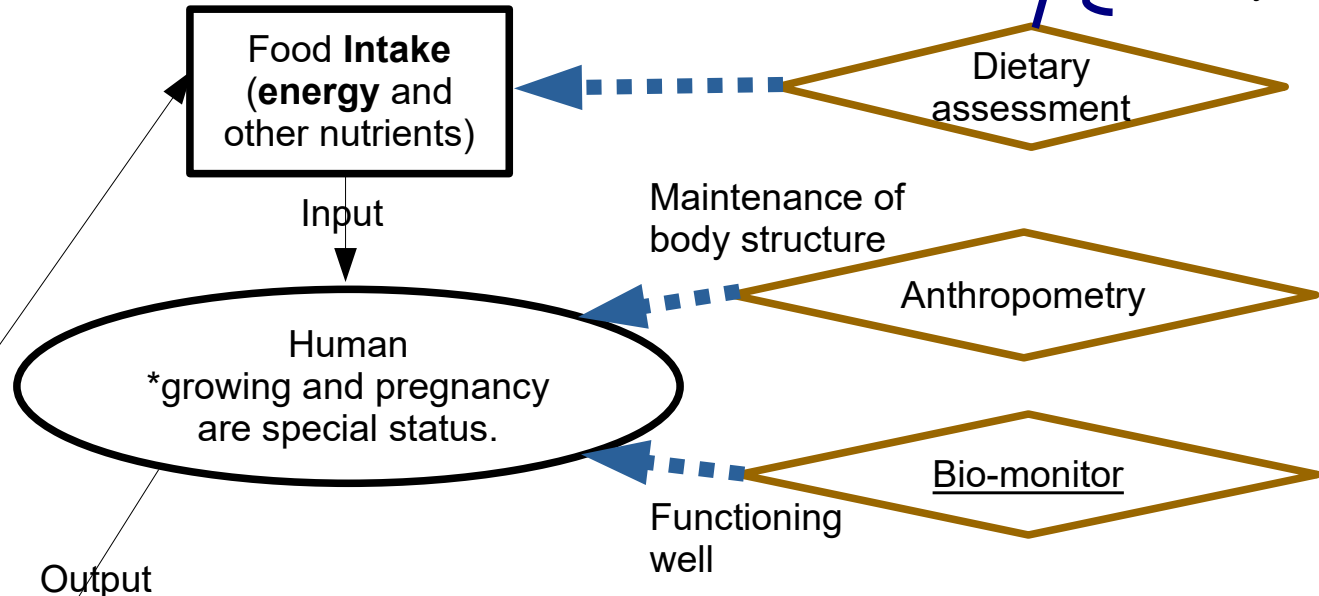
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# Framework

\* Sustainability and equity within community and among communities are important.

\* current / habitual  
\* quantity / quality  
\* diversity



Next week

Getting food and other needs

Output

Physical activity assessment

**Energy expenditure**  
= BMR + DIT or TEF + AMR  
Otherwise, estimated from direct calorimetry, indirect calorimetry, or RQ from DLW

- \* **BMR** (basal metabolic rate) ← body composition ← **LBM** (lean body mass)
- \*\* Approx. estimates based on height, weight, age and sex (Ganpule AA, Tanaka S, Ishikawa-Takata K, Tabata I. Interindividual variability in sleeping metabolic rate in Japanese subjects. Eur J Clin Nutr. 2007;61(11):1256-1261. doi:10.1038/sj.ejcn.1602645)
- \* **LBM** ← weight – fat mass
- \* fat mass ← ST (skinfold thickness), BIA (bio-impedance analysis), ...
- \* DIT (dietary induced thermogenesis) or TEF (thermic effect of food)
- \* AMR (active metabolic rate) ← PA (physical activity assessment) using **METS**
- \*\* Ainsworth BE, Haskell WL, Whitt MC, et al. Compendium of physical activities: an update of activity codes and MET intensities. Med Sci Sports Exerc. 2000;32(9 Suppl):S498-S504. doi:10.1097/00005768-200009001-00009

# Dietary Intake Research

- Sources
  - <https://www.nutritools.org/tools>
  - <http://www.fao.org/3/i9940en/I9940EN.pdf>
  - <https://www.measurement-toolkit.org/> (DAPA toolkit)
- Dietary Diversity
  - FAO's DD (2012) <http://www.fao.org/3/i1983e/i1983e00.htm>
    - For Women <http://www.fao.org/3/i5486e/i5486e.pdf>
  - FDSK-11 (2008) <http://yumik-fn.sakura.ne.jp/whats-fn/>
- FFQ (Food Frequency Questionnaire) <https://doi.org/10.1136/bmjopen-2021-058831>  
<https://www.birmingham.ac.uk/Documents/college-les/gees/inflame/consortium/atcs/food-frequency-question-b-rantsaeter.pdf>
  - NHANES (USA) <https://epi.grants.cancer.gov/diet/usualintakes/ffq.html>
  - BDHQ/DHQ (Japan) <http://www.nutrep.m.u-tokyo.ac.jp/dhq/summary.html> (in Japanese)  
<https://webpark1505.sakura.ne.jp/english/dhq/dhq.html>
- 24 hours dietary recall  
<https://www.measurement-toolkit.org/diet/subjective-methods/24-hour-dietary-recall>
  - ASA24 <https://epi.grants.cancer.gov/asa24/>
    - (For research) <https://asa24.nci.nih.gov/researchersite/>
    - (Demonstration) <https://asa24.nci.nih.gov/demo/>
- Food diary
  - Weighed diary <https://www.measurement-toolkit.org/diet/subjective-methods/weighed-food-diaries>
  - Estimated diary <https://www.measurement-toolkit.org/diet/subjective-methods/estimated-food-diaries>
- Technology-assisted methods  
<https://www.measurement-toolkit.org/diet/subjective-methods/technology-assisted>
- Direct observation <https://www.measurement-toolkit.org/diet/objective-methods/direct-observation>
- Duplicated diets <https://www.measurement-toolkit.org/diet/objective-methods/duplicate-diets>

# Anthropometry

- Sources
  - <https://www.measurement-toolkit.org/anthropometry/introduction/anthropometry>
  - <https://www.fao.org/4/y4249e/y4249e0b.htm>
  - <https://wwwn.cdc.gov/nchs/data/nhanes/2021-2023/manuals/2021-Anthropometry-Procedures-Manual-508.pdf>
  - <https://www.fantaproject.org/tools/anthropometry-guide>
- Direct measurements
  - Height: Using stadiometer (eg. Seca 213)  
[https://www.seca.com/en\\_ee/products/all-products/product-details/seca213.html](https://www.seca.com/en_ee/products/all-products/product-details/seca213.html)
  - Weight: Using digital scale (eg. Withings Body+)  
<https://www.withings.com/jp/en/body-plus>
  - Mid-Upper Arm Circumference: Using tape measure
  - Skinfold thickness: Using skinfold caliper (eg. Harpenden <http://www.harpenden-skinfold.com/>)
  - Waist circumference: Using tape measure (eg. Seca 201/203)  
[https://www.seca.com/en\\_ee/products/all-products/product-details/seca201.html](https://www.seca.com/en_ee/products/all-products/product-details/seca201.html)
  - Hip circumference: Using tape measure (eg. Seca 201/203)
- Calculated indices
  - BMI = Weight (kg) / Height · Height (m<sup>2</sup>)
  - Z scores based on **the standards (below)**: (Values – Standard) / SD of Standard  
[http://conflict.lshtm.ac.uk/page\\_125.htm](http://conflict.lshtm.ac.uk/page_125.htm)  
HAZ (for stunting), WAZ (for underweight), WHZ (for wasting)  
<https://www.cdc.gov/nccdphp/dnpa/growthcharts/resources/growthchart.pdf>
    - CDC [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_246.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_246.pdf)
    - WHO <https://www.who.int/tools/child-growth-standards/standards>

6/20/24 Waist-to-hip ratio = Waist circumference / Hip circumference

# Biomonitoring

- Measure nutrients and its metabolites in biological specimen
  - <https://www.cdc.gov/biomonitoring/videos/Biomonitoring-teaches-about-nutrition.html>
  - <https://www.measurement-toolkit.org/diet/objective-methods/biomarkers>
  - <https://www.biomedcentral.com/collections/bfnr>
  - <https://academic.oup.com/jn/article/133/3/873S/4688049>
  - <https://dx.doi.org/10.3390%2Fnu11051092>
  - <http://www.ph.ucla.edu/epi/faculty/zhang/courses/epi242/reading%20week%204-2d.pdf>
- Blood
  - <https://magazine.baze.com/blood-testing/>
  - [https://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.63.11\\_Suppl.28](https://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.63.11_Suppl.28)
- Urine (non-invasive, frequently used for salt and iodine intake)
  - <https://doi.org/10.3164/jcbn.16-50>
  - <https://doi.org/10.1017/S136898002000097X>
  - <https://doi.org/10.1038/ejcn.2013.62>
- Feces for gut microbiota
  - <https://doi.org/10.1093/jn/nxaa285>
  - <https://doi.org/10.1136/bmj.k2179>
- Stable isotope in hair and nail
  - <https://doi.org/10.1073/pnas.1914087117>
  - <https://doi.org/10.1371/journal.pone.0184921>