

International Activities in Food Composition

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FAO & INFOODS

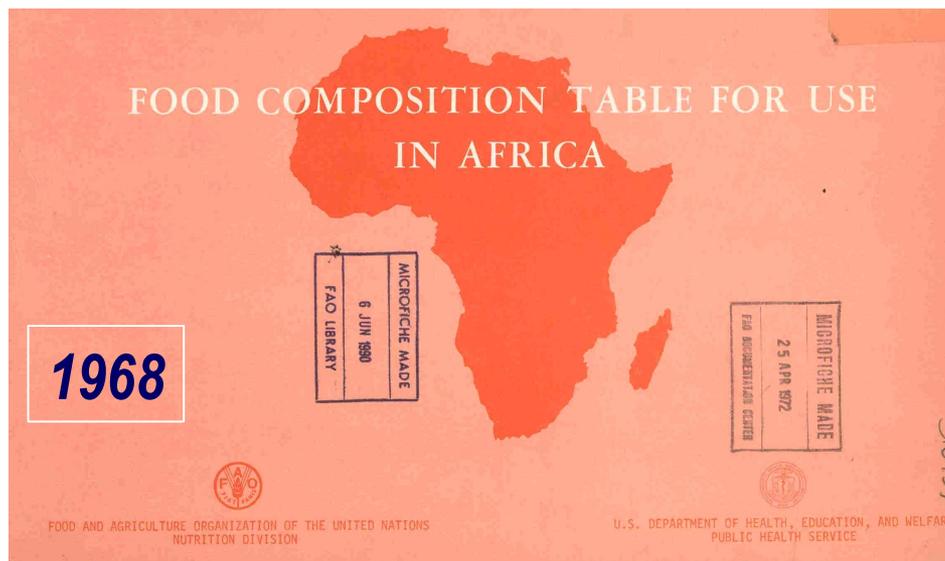
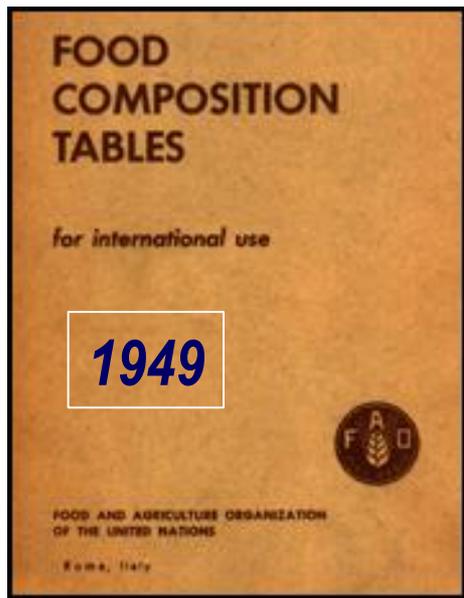
Outline

- International agencies
- Critical issues
 - Double burden of malnutrition
 - Biodiversity
 - Trade
 - Risk assessment
- The future

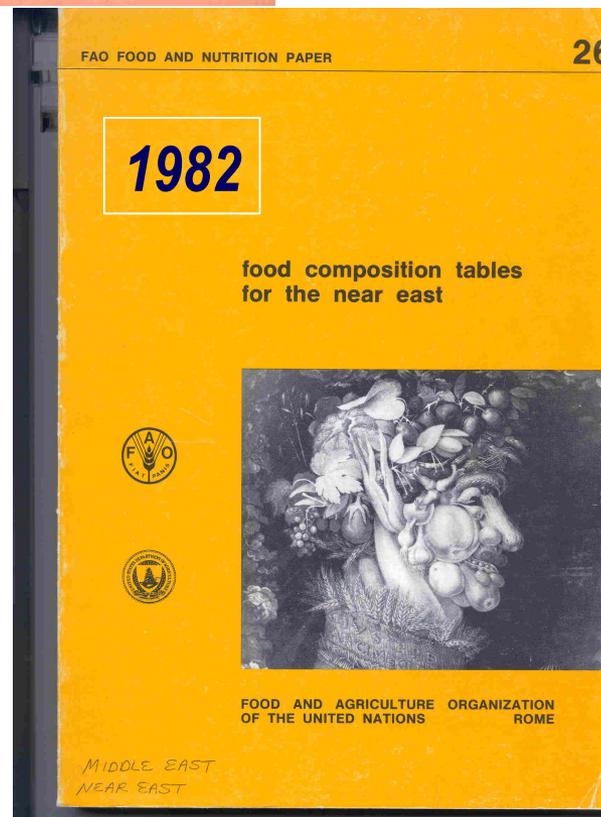
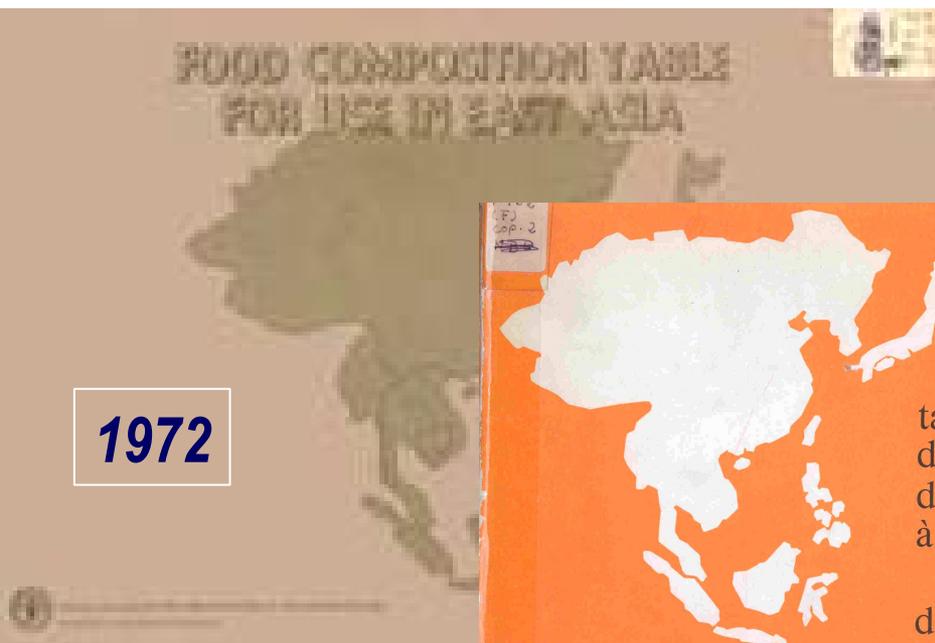


Food composition activities fall within Article 1.1 of FAO's constitution

“The Organization shall collect, analyse, interpret and disseminate information relating to *nutrition*, food and agriculture.”



1949-
1982





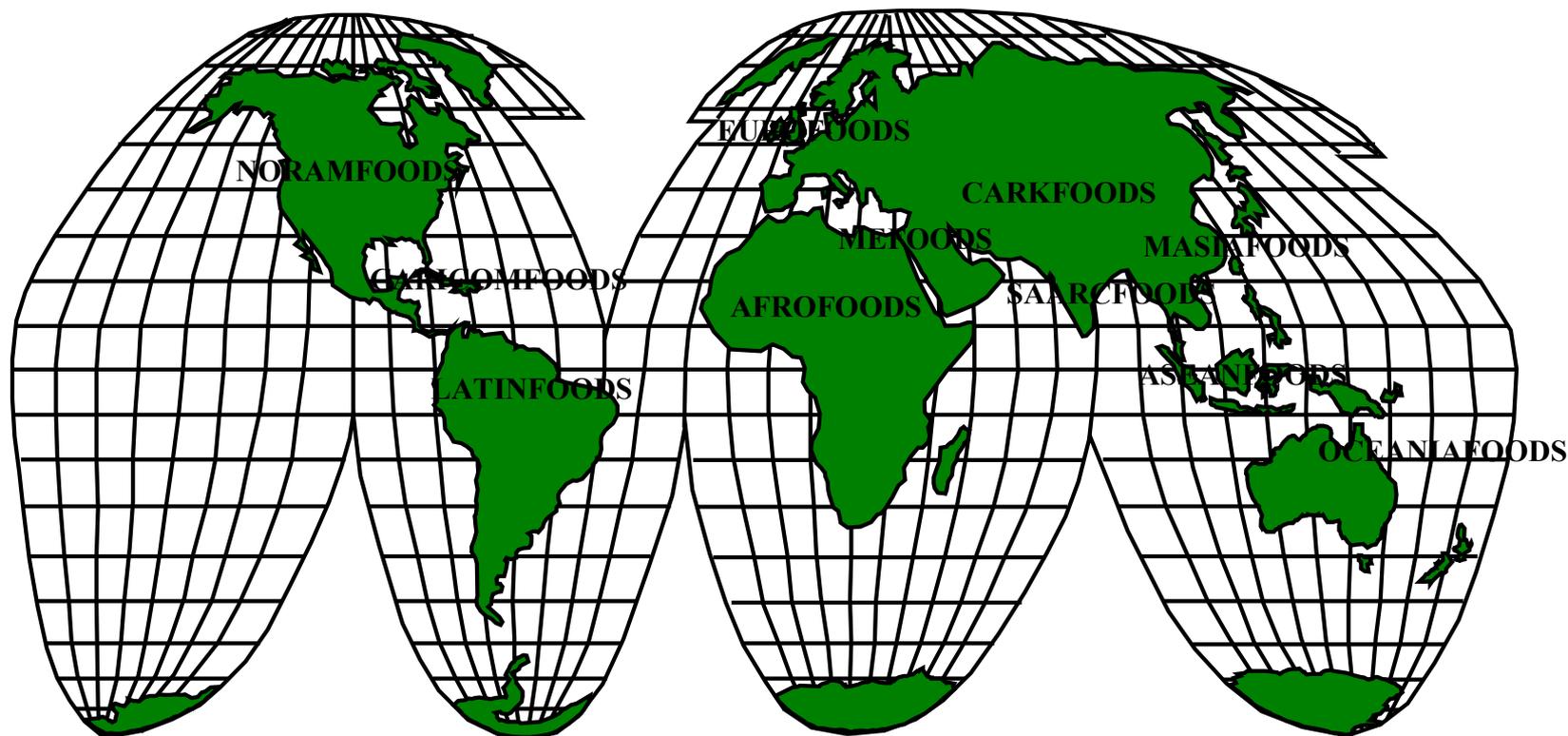
INFOODS

- Started by UNU in 1983
 - Secretariat in Boston, 1983-1994
- Co-sponsored by FAO since 1994
 - Secretariat in Boston and NZ, 1994-1998
- FAO/UNU INFOODS formalized by MoU
 - Secretariat in Rome since Jan 1999

Functions of the Secretariat

- Establish a network of regional data centers
- Organise an administrative framework for various expert task forces and standards' development
- Serve as a generator of and repository for special international data bases
- Stimulate national data base programs
- Support capacity building

18 INFOODS Regional and Subregional Data Centres

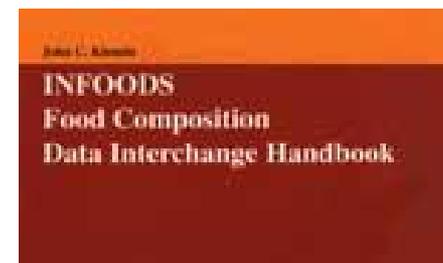
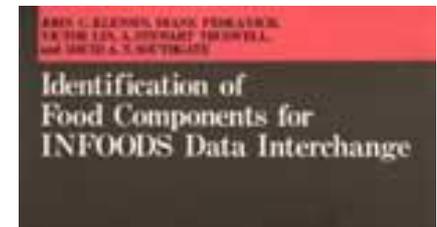
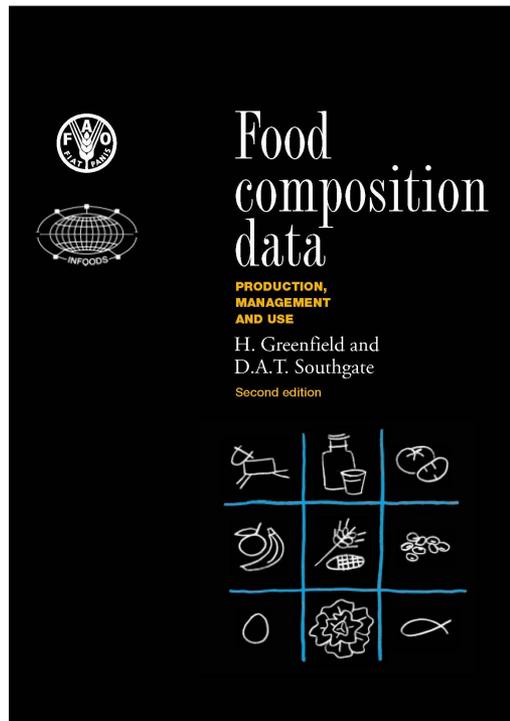
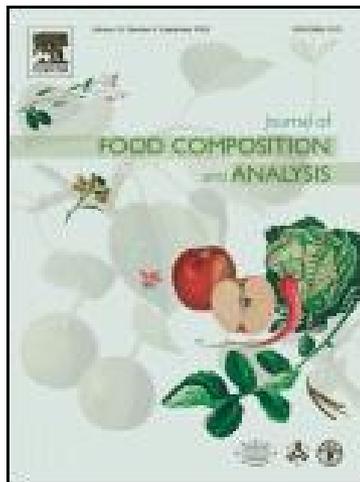


A major goal of INFOODS...

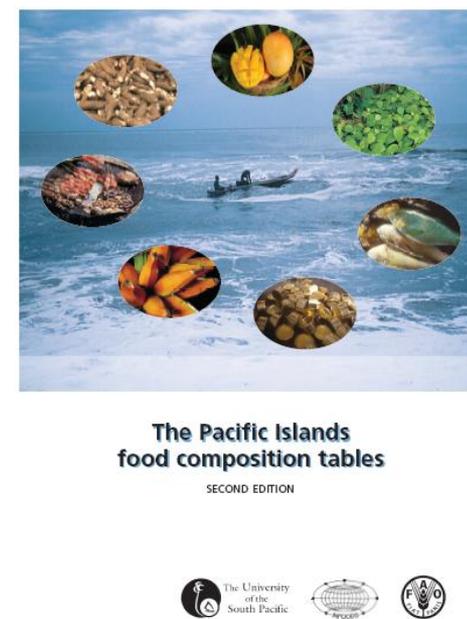
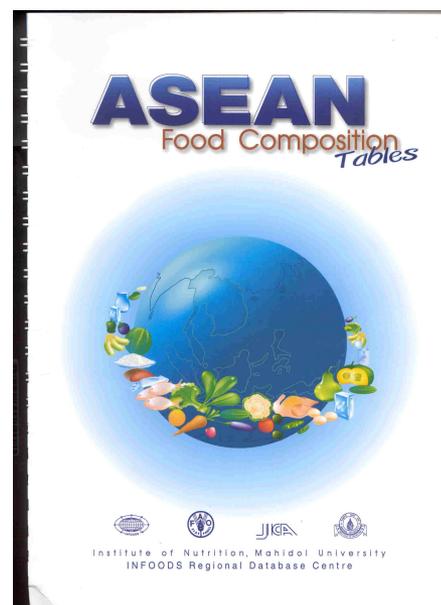
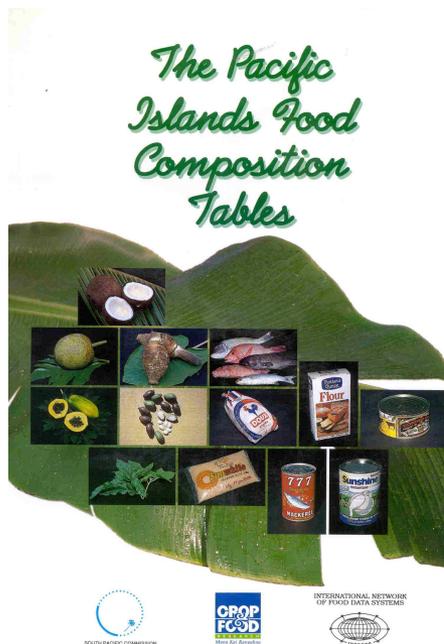


The development standards for compiling and interchanging food composition data; increasing the evidence-base:

- **Nomenclature, terminology, descriptor systems**
- **Component identification**
- **International interchange**



1996-2005



Middle East, 2006; Mali, 2005; Tanzania, 2007

Assistance to developing countries



- Training
 - Laboratory qa/qc, accreditation
 - Analytical techniques
 - Food comp courses
- Technical cooperation projects
 - Equipment
 - Sampling/analysis
 - Data compilation/dissemination



Nutrition and consumer protection


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Food composition



United Nations University



The International Network
of Food Data Systems

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Background to INFOODS

Reliable data on the nutrient composition of foods consumed by people are critical in many areas - health assessment, the formulation of appropriate institutional and therapeutic diets, nutrition education, food and nutrition training, epidemiological research on relationships between diet and disease, plant breeding, nutrition labeling, food regulations, consumer protection, and agricultural goods and products, as well as for a variety of applications in trade, research, development, and assistance.

International Network of Food Data Systems (INFOODS) was established in 1984 on the basis of the recommendations of an international group convened under the auspices of the United Nations University ([UNU](#)). Its goal was to stimulate and coordinate efforts to improve the quality and availability of food analysis data worldwide and to ensure that anyone any where would be able to obtain adequate and reliable food composition data. In furtherance of these purposes INFOODS has provided leadership and administrative framework for the development of standards and guidelines for collection, compilation, and reporting of food component data. It is establishing and coordinating a global network of regional data centers directed toward the generation, compilation and dissemination of accurate and complete data on food composition. It is also the generator and repository of special international data bases and serves as a general and specific resource for persons and organizations interested in food composition data on a worldwide basis. Its Secretariat has developed the necessary software for the electronic storage of food composition data and its interchange among data bases. The INFOODS effort is intrinsically interdisciplinary, depending on the efforts of food scientists, analytical chemists, and nutritionists working together with computer and information scientists.



Nutrition and consumer protection


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Food composition



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Standards

Over the years, INFOODS has convened technical meetings on several topics, the most important of which are listed with the headings below. These web pages provide links to relevant technical documents by INFOODS and other food composition groups. New efforts are starting to consolidate and update the technical recommendations and specifications. Feedback, suggestions, and additional links would be most welcomed.

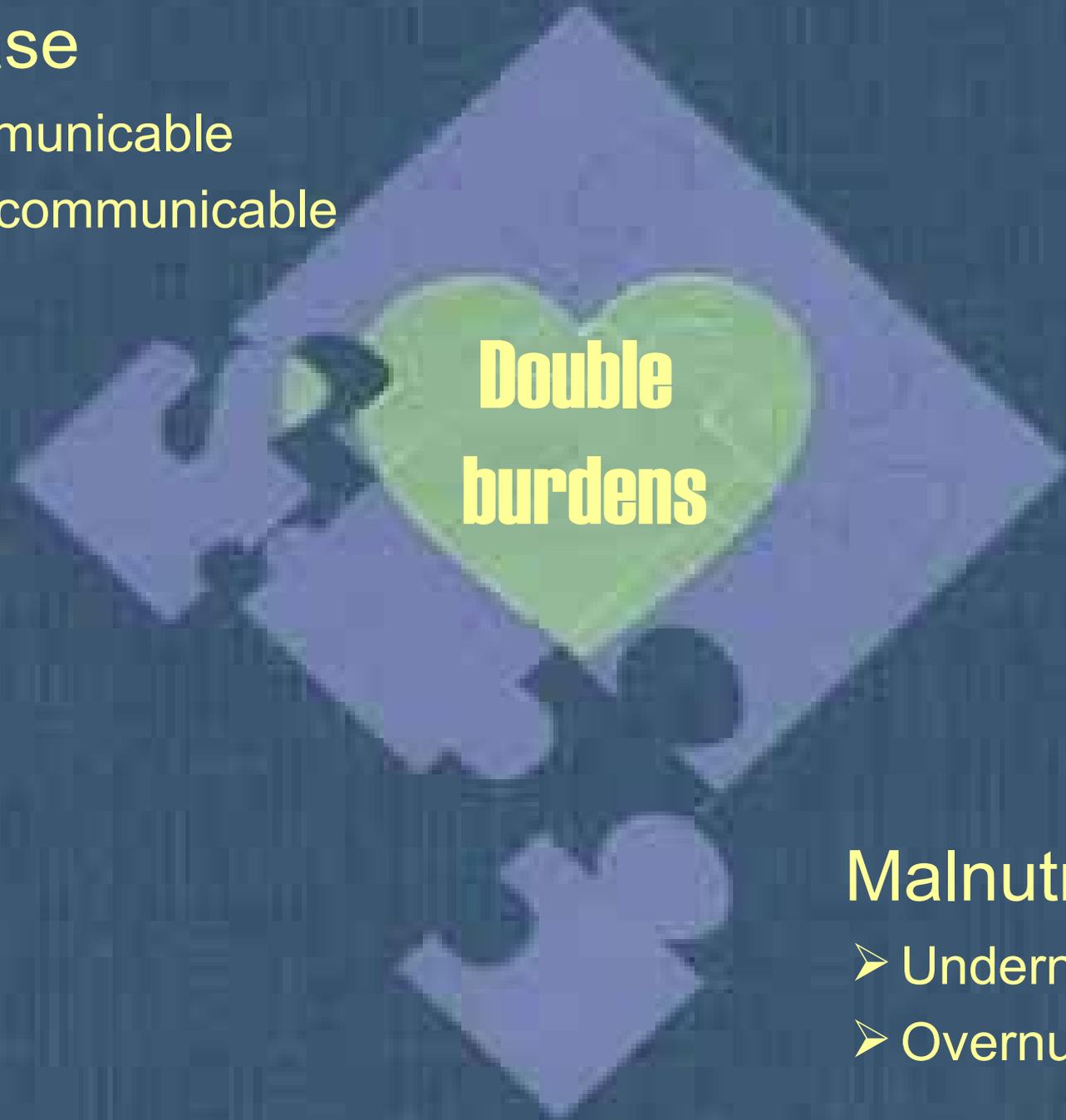
- [Food Nomenclature, Terminology and Classification Systems](#)
- [Food Component Identifiers](#)
- [International Interchange of Food Composition Data](#)

Ontologies

- **INFOODS tagnames**
- **USDA Codes**
- **CAS numbers**
- **Chemical formulas**
- **Methods of analysis**

Disease

- Communicable
- Non-communicable



Malnutrition

- Undernutrition
- Overnutrition

AGRICULTURE & HEALTH

Evidence

6. Convincing
7. Probable
8. Possible
9. Insufficient

WHO Technical Report Series

916

DIET, NUTRITION AND THE PREVENTION OF CHRONIC DISEASES

Report of a
Joint WHO/FAO Expert Consultation



WORLD HEALTH ORGANIZATION



FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

Summary of evidence, part 1

	CVD	Obesity	Type 2 diabetes
Energy and fats			
High intake of energy-dense foods		C↑	Po↑
Saturated fatty acids	C↑		P↑
Trans fatty acids	C↑		Po ↑
Dietary cholesterol	P↑		
Myristic and palmitic acid	C↑		
Linoleic acid	C↓		
Fish and fish oils (EPA and DHA)	C↓		Po ↓
Plant sterols and stanols	P↓		
α-Linolenic acid	P↓		
Oleic acid	P↓		
Stearic acid	P-NR		
Nuts (unsalted)	P↓		

Summary of evidence, part 2

	Obesity	Type 2 diabetes	CVD	Cancer	Dental disease
Alcohol	I	I			
High intake of NSP (dietary fibre)	C↓	P↓	P↓		
Free sugars (frequency and amount)					C↑
Sugar-free chewing gum					P↓
Starch					C-NR
Wholegrain cereals			P↓		

Summary of evidence, part 3

	CVD	Cancer	Dental disease	Osteoporosis
Vitamins				
Vitamin C deficiency			C↑	
Vitamin D			C↓	C↓
Vitamin E supplements	C-NR			
Folate	P↓			
Minerals				
High sodium intake	C↑			
Salt-preserved foods and salt		P↑		
Potassium	C↓			
Calcium				C↓
Fluoride, local			C↓	
Fluoride, systemic			C↓	P-NR
Fluoride, excess			C↑	
Hypocalcaemia			P↑	



Food composition data form the basis by which intakes, and hence diet-disease relationships, are assessed.

Food composition data are the fundamental information by which dietary intake goals can be established and achieved.

Without sufficient quantity and quality of compositional data—past, present and future—all diet/disease evidence would be insufficient.

The body of data used can and should be world-wide.

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Biodiversity

- Sample for varieties
- Generate analytical data for varieties
- Compile these data systematically and centrally
- Collect diet survey data on varieties
- Consider nutrient content in crop variety promotions

Issues for Environment Sector

- Agro-biodiversity
- Endangered species
- Ozone depletion
- Global warming
- LMOs
- Sustainability and global food security



Millennium Development Goals

Goal 1. Eradicate extreme poverty and hunger

- Reduce by half the proportion of people who suffer from hunger

Goal 7. Ensure environmental sustainability



Cross-cutting initiative on nutrition and biodiversity

- Substantiating and promoting awareness of the links between biodiversity, food and nutrition
- Compilation, review and analysis of existing scientific information, indigenous and traditional knowledge (in a manner consistent with the CBD, Article 8(j)), and case studies;
- Development of a communication strategy, and associated publications and other materials to address: the general public (including the promotion of local varieties, crops and food products in the popular media); decision makers; local communities; and the nutrition, agriculture, health and environment communities;
- Convening of regional advocacy and policy workshops.

Biodiversity & Nutrition Rationale



- Wild species and intraspecies biodiversity have key roles in global food security
- Different varieties have statistically different nutrient contents
- Acquiring nutrient data on existing biodiversity needs to be a prerequisite for decision-making in GMO work
- Nutrient content needs to be among criteria in cultivar promotion
- Sample and generate nutrient data for wild foods and cultivars
- Compile these data systematically and centrally and disseminate widely
- Include biodiversity questions and/or prompts in food consumption surveys
- Acquiring nutrient data and intake data for varieties is essential in order to understand the impact of biodiversity on food security



Sweet potato varieties: α - and β -carotene, mg/100g fresh wt

Variety	%Moisture	β -carotene	α -carotene
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Orange Flesh

Excel	77.8 (0.8)	12.8 (0.1)	< 0.1
Kona B #	77.8 (0.6)	6.7 (0.2)	1.5 (0.2)
Regal	77.2 (2.1)	13.1 (0.7)	< 0.1
UH 71-5 #	70.3 (1.1)	8.0 (0.1)	< 0.1

Yellow/White Flesh

Hoolehua Red #	70.4 (2.7)	0.2 (0.1)	< 0.1
Satsuma #	68.3 (0.2)	0.6 (0.1)	< 0.1

n=6, values in parentheses are standard errors. # Varieties are recommended by the University of Hawaii Extension Service for good yield and disease resistance. *Source:* A. S. Huang, L. Tanudjaja, D. Lum. *Journal of Food Composition and Analysis*, Vol. 12, No. 2, Jun 1999, pp. 147-151.

Exceptional nutritional value ~ Taste ~ Economical ~ Available ~ Cultural



DELIKAT BENSE
 Tradisional minuman
 Protein: 2380-4300 mg
 AS: 100-100 mg
 Vitamin: 1.13-21.4 mg



BELINGHAT PULIN
 Tradisional minuman
 Protein: 40-100 mg
 AS: 10-10 mg
 Vitamin: 20-100 mg



DIKIRPAD
 Tradisional minuman
 Protein: 40-100 mg
 AS: 10-10 mg
 Vitamin: 20-100 mg



QURUP
 Tradisional minuman
 Protein: 1.4-22.1 g
 AS: 100-100 mg
 Vitamin: 50-100 mg



WALU KUNYAS
 Tradisional minuman
 Protein: 1.4-22.1 g
 AS: 100-100 mg
 Vitamin: 50-100 mg



WIKO
 Tradisional minuman
 Protein: 40-100 mg
 AS: 10-10 mg
 Vitamin: 20-100 mg



WALU KUNYAS
 Tradisional minuman
 Protein: 1.4-22.1 g
 AS: 100-100 mg
 Vitamin: 50-100 mg



INTERNATIONAL DECADE OF THE WORLD'S INDIGENOUS PEOPLES CELEBRATE DIVERSITY IN GLOBAL INDIGENOUS FOOD



All values are per 100 g of food item.

Exceptional nutritional value ~ Taste ~ Economical ~ Available ~ Cultural



AYAH
 Tradisional minuman
 Protein: 1.4-22.1 g
 AS: 100-100 mg
 Vitamin: 50-100 mg



WIKELANDAN
 Tradisional minuman
 Protein: 40-100 mg
 AS: 10-10 mg
 Vitamin: 20-100 mg



WIKELANDAN
 Tradisional minuman
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 AS: 10-10 mg
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INTERNATIONAL DECADE OF THE WORLD'S INDIGENOUS PEOPLES CELEBRATE DIVERSITY IN ASIAN INDIGENOUS FOOD



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Issues for Trade: Regulation & Legislation

- World Trade Organization
- Codex Alimentarius
- Regional agreements (CER, EU)
- Major export markets (NLEA, OASIS)
- National standards/regulations
 - Labelling, claims, GMOs, compositional definitions, etc.



Codex Committees

1. Food Additives & Contaminants (38th)
2. Food Labelling (34th)
3. Methods of Analysis & Sampling (27th)
4. Nutrition & Foods for Special Dietary Uses (28th)
5. Pesticide Residues (39th)

What is a nutrient?

Historic: Components of food that cannot be made by the body, but are required for normal growth and development; the lack of which causes organ system or cell dysfunction that can be reversed upon reintroduction into the diet.



What is a nutrient?

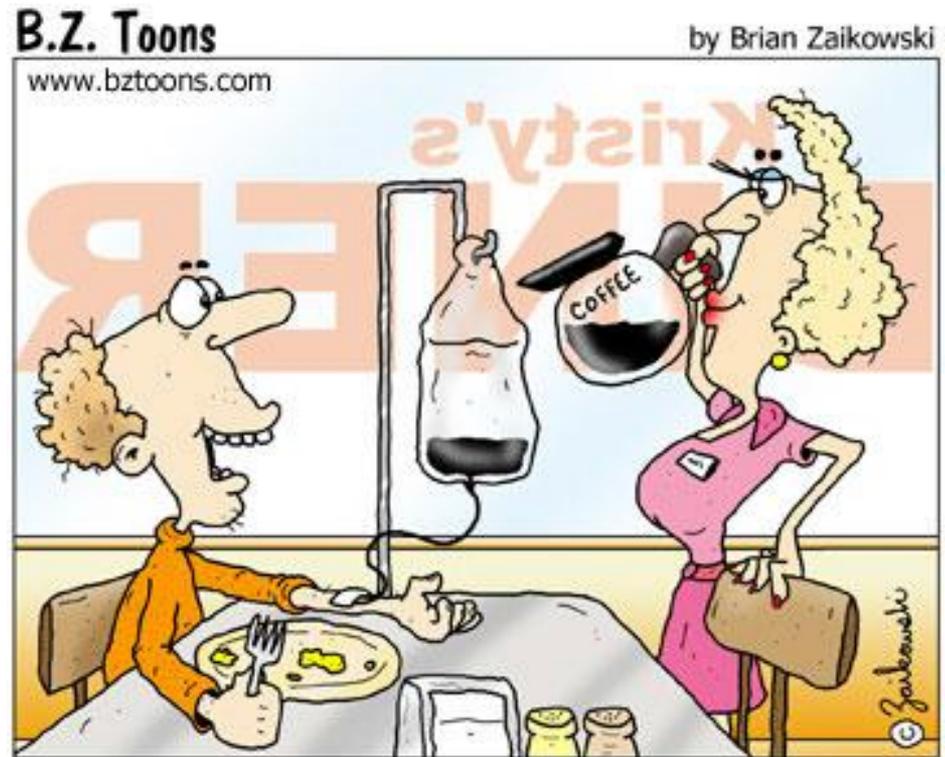
- *"It is a fully characterized (physical, chemical, physiological) constituent of a diet, natural or designed, that serves as a significant energy yielding substrate, or a precursor for the synthesis of macromolecules or of other components needed for normal cell differentiation, growth, renewal, repair, defence and/or maintenance or a required signaling molecule, cofactor or determinant of normal molecular structure/function and/or a promoter of cell and organ integrity."*

V. R. Young. 2002. J. Nutr. 132:621-629, 2002



What is a nutrient?

1. Defining the Food-Drug Continuum
 - Food-Drug-Toxicant Continuum
2. Lutein, lycopene, β -cryptoxanthin
3. Phytate, oxalates, tannins
4. Caffeine, salicylates



Furthermore...

“...the definition does not allude to the concept of nutrient essentiality,” and

“...can be harmful”



Technical workshops

1. A Model for Establishing Upper Levels of Intake for Nutrients and Related Substances

- Report of a Joint FAO/WHO Technical Workshop on Nutrient Risk Assessment
- 2-6 May 2005
- http://www.who.int/ipcs/highlights/full_report.pdf

2. Principles and Methods for the Risk Assessment of Chemicals in Food

- Report of Joint FAO/WHO Technical Workshop to develop the guidance on exposure/intake assessment
- 2-6 May 2005
- <http://www.who.int/ipcs/en/>



The consultation

1. Recognise the continuum for components
2. Develop a process
3. Use the risk assessment framework
4. Estimating the distribution of usual nutrient exposures in populations
 - Food, water, supplements
 - Form of the nutrient
 - Population subgroup
 - Time frame



Food composition and dietary intakes

1. Nutrients are toxicants, and nutrient intakes are exposures
2. Foods are nutrients & contaminants, and more
3. A dietary assessment is a risk assessment
4. A food composition database is a supplement database, an additive database, a contaminant database, and a nutrient database



Conclusions

1. Food composition data are fundamental for establishing diet/disease relationships;
2. databases should include all ingestants: water, supplements, etc.
3. generate and compile high quality compositional data (nutrient and contaminants) using international standards
4. increase collaboration between agriculture, environment, food safety and nutrition;
5. multiple goals: assessing nutrient adequacy, better understanding risk, establishing nutrient requirements, UL, MRL;
6. establish a network of compatible databases; share the data.



Mahalo