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# Biodiversity and Food Composition

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# Outline

- Introduction
- Nutrition indicator for biodiversity
  - 1. Food composition
  - 2. Food consumption
- Conclusion



# Definition Biodiversity

**Biodiversity** covers diversity within species, between species and of ecosystems; *synonyms*: biological diversity, ecological diversity



## Schema of taxonomic names

Schema	Plant – example	Plant – example	Fish - example	Animal – example
Family	<i>Rosaceae</i> – Rose family	<i>Poaceae</i> – Grass family	<i>Pleuronectidae</i>	<i>Bovidae</i> <i>Caprinae</i>
Genus	<i>Prunus</i> L. – plum	<i>Triticum</i> L. – wheat	<i>Platichthys</i>	<i>Ovis</i>
Species	<i>Prunus domestica</i> L. – European plum	<i>Triticum aestivum</i> L. – common wheat	<i>Platichthys flesus</i> (Linnaeus, 1758)	<i>Ovis aries</i> – sheep
Subspecies	<i>Prunus domestica</i> L. subsp. <i>domestica</i>			(rarely used)
Variety Cultivar Breed	<i>Prunus domestica</i> L. var. <i>domestica</i> – European plum <i>Prunus domestica</i> ‘Cacak’s Beauty’	<i>Triticum aestivum</i> ‘Pioneer 2163’	<i>Platichthys flesus</i> var. <i>marmorata</i> Nordmann, 1840 - European flounder	Suffolk



# Differences in food composition

	Protein g	Fibre g	Iron mg	Vitamin C mg	Beta-Carotenes mcg
Rice	5.6 - 14.6		0.7 - 6.4		
Cassava	0.7-6.4	0.9-1.5	0.9-2.5	25-34	<5-790
Potato	1.4-2.9	1-2.23	0.3-2.7	6.4-36.9	1-7.7
Sweet potato	1.3-2.1	0.7-3.9	0.6-14	2.4-35	100-23100
Taro	1.1-3	2.1-3.8	0.6-3.6	0-15	5-2040
Eggplant		9 - 19		50 - 129	
Mango	0.3 - 1.0	1.3-3.8	0.4-2.8	22-110	20 – 4320
GAC					6180 – 13720
Apricot	0.8-1.4	1.7-2.5	0.3-0.9	3.5-16.5	200-6939 (beta carotene equivalent)
Banana			0.1-1.6	2.5-17.5	<1 – 8500

Per 100 g edible portion on wet weight basis



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# Links between biodiversity, food and nutrition recognized by

- Convention on Biological Diversity (CBD)
- Conference of the Parties of CBD: Decision VII/32
- Millennium Development Goals (MDG)
- Cross-cutting initiative on biodiversity for food and nutrition (IBFN)
- Intergovernmental Working Group on Plant Genetic Resources
- International Rice Commission



# Biodiversity & Nutrition Rationale

- Wild species and intraspecies biodiversity have key roles in global food security
  - Different varieties have statistically different nutrient contents
  - Nutrient content needs to be among criteria in cultivar promotion
  - Knowledge on nutrient data on existing biodiversity needs to be a prerequisite for decision-making in GMO work
  - Knowledge on nutrient data and intake data of varieties is essential in order to understand the impact of biodiversity on food security
- investigate and disseminate the nutrient and non-nutrient composition of wild foods and of foods at cultivar level
- include biodiversity questions and/or prompts in food consumption surveys



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# The double burden of malnutrition

Food composition data form the basis by which dietary adequacy is assessed – both under- and overnutrition

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

The importance of wild and underutilized species to food security – relevant to both the health and agriculture sectors – will only be realized when more data are available on composition and intake

WHO Technical Report Series  
916

## DIET, NUTRITION AND THE PREVENTION OF CHRONIC DISEASES

Report of a  
Joint WHO/FAO Expert Consultation



WORLD HEALTH ORGANIZATION



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# Nutrition indicators for biodiversity - objectives

- To monitor biodiversity over time by measuring the composition and consumption of food and medicinal plant and animal genetic resources
- To encourage researchers to generate and compile more food consumption and compositional data for food biodiversity
- To enable more research on food biodiversity and nutrition and health
- To raise awareness of the population, researchers and governments on food biodiversity and their impact on dietary adequacy
- To understand the impact of food biodiversity on food security



# Nutrition indicators for biodiversity

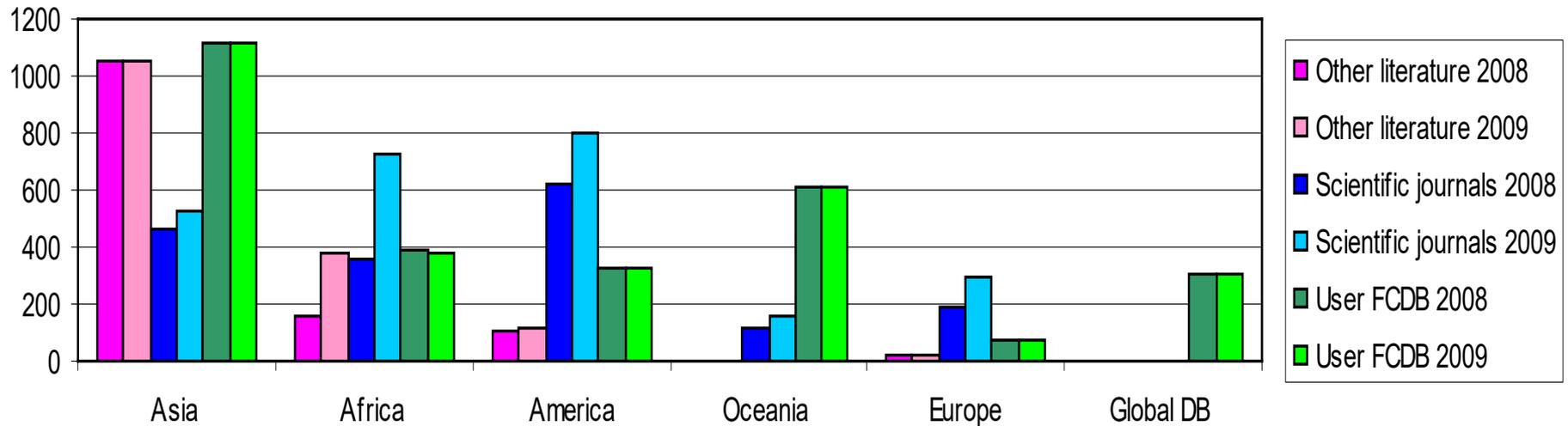
## 1. Food composition (2007)

It counts the number of foods

- at variety/ cultivar/ breed level for common foods
- species level for wild/ indigenous/ underutilized foods
- with at least one value for component
- found in published and unpublished literature
- Baseline collected in 2008 and for 2009



### Increase in foods counting for Biodiversity Indicator on food composition 2008 vs.2009



Coverage: over 50 countries and 300 publications



# Nutrition indicator for biodiversity

## 2. Food consumption (2009)

- **Two indicators:**

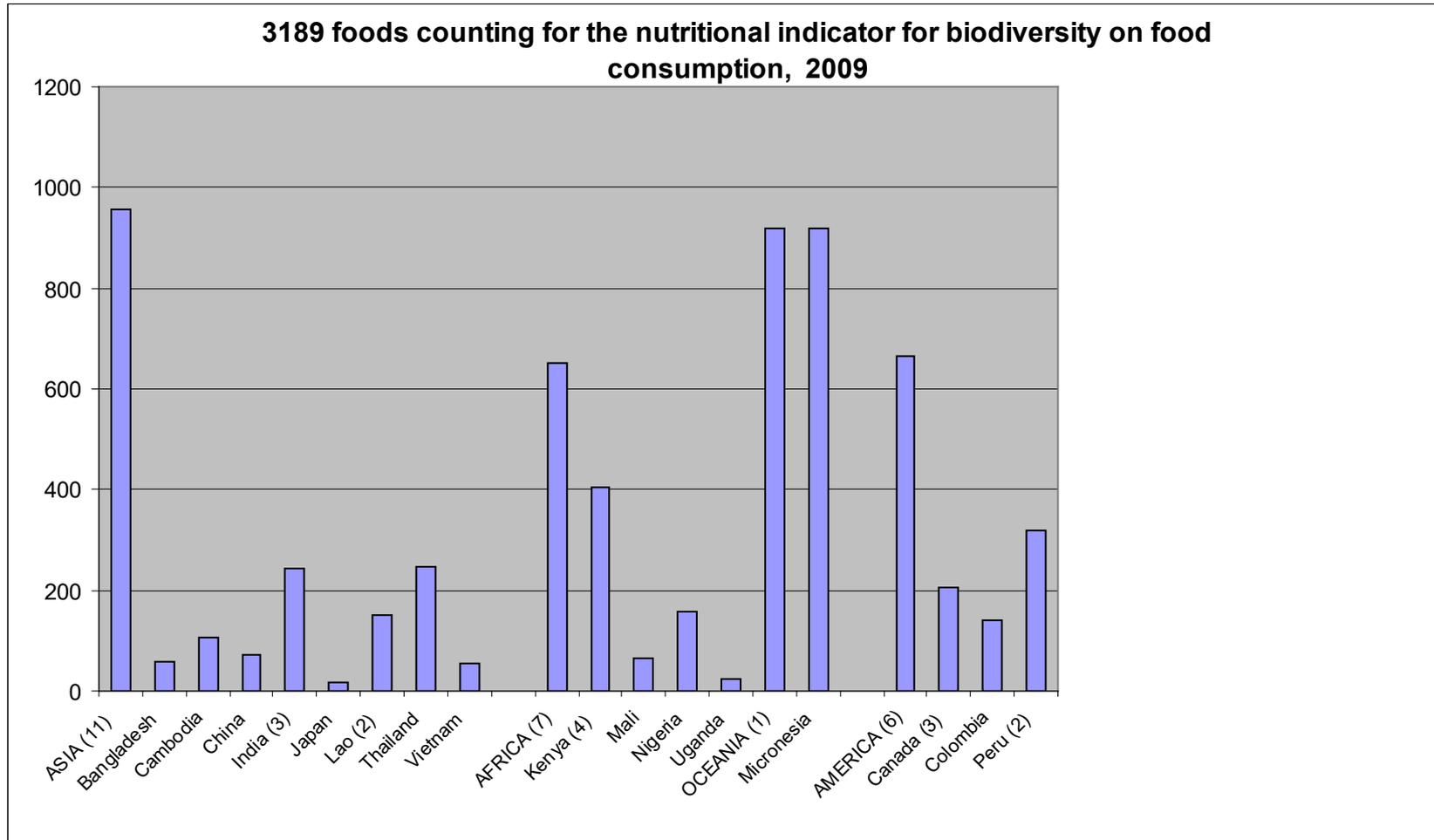
1. the taxonomic diversity of foods (i.e. counting the foods under species level e.g. varieties/cultivars/breeds).

Definition of foods is similar as for food composition.

Additional information will be reported on:

- Study (scope, date, number and description of subjects, geographical/ethnic coverage, instrument used; reference, total number of studies examined)
- Food (number of foods reported, food list)

2. number of surveys with at least one reported food counting for biodiversity



3189 foods were reported worldwide contributing to the Nutrition Indicator for biodiversity – 2. food consumption, most in Asia and Oceania



# Biodiversity & Nutrition – implications

For food composition database compilers:

- Sample and generate nutrient data for wild foods and individual cultivars, also by ecosystem
- Compile these data comprehensively, systematically and centrally, and disseminate widely

For food consumption surveys

- Include biodiversity questions and/or prompts in food consumption surveys
- Report food consumption also by ecosystem and/or ethnic group
- Communicate to food composition database compilers the need for compositional data for these specific foods

For nutrition education

- Investigate traditional foods and varieties
- Promote the most nutritious among them

For agriculture policies and programmes

- Nutrient content needs to be among criteria in promoting food biodiversity



# Conclusions

## **Biodiversity can**

- assist the agriculture sector to grow more nutritious varieties
- open new markets for these nutritious varieties
- contribute to sensible policy and programs for food aid and food fortification
- provide consumers with more information to obtain their nutrient requirements from food
- assist to conserve the biodiversity of our planet
- ➔ Contribute to nutrition, health and food security
- ➔ Contribute to preparedness to effects of climate change



# More information ...

## INFOODS webpages

- on Food biodiversity  
<http://www.fao.org/infoods/infoods/food-biodiversity/en/>
- Training <http://www.fao.org/infoods/infoods/training/en/>
  - in Food Composition Study guide: module 12 on biodiversity
  - in FAO/INFOODS e-Learning Course on Food Composition Data: Lesson 4.2 on food biodiversity



# What we all can do

- include biodiversity in our work
  - talk about biodiversity widely (conferences, meetings...)
  - get more professionals and consumers convinced about the importance of food biodiversity
- ➔ contribute to conserving and valuing our food biodiversity for our children and grandchildren

For more on food composition, visit [www.fao.org/infoods](http://www.fao.org/infoods)