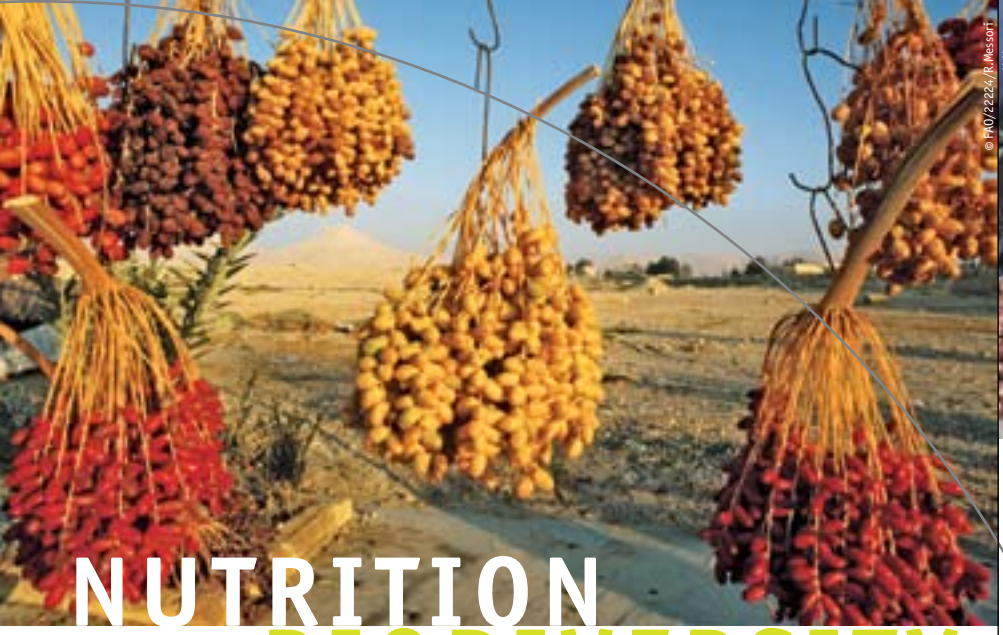

NUTRITION AND BIODIVERSITY

Nutrition and biodiversity converge to a common path leading to food security and sustainable development. They feature directly the Millennium Development Goals (MDGs): halve the proportion of people who suffer from hunger; and ensure environmental sustainability. In combination, a nutrition and biodiversity initiative provides the very foundation for achieving these MDGs.

In order to be successful, strategies to address nutrition problems have to be systematic and multi-sectoral, and should be integrated into a general framework. Sustainable improvement in nutritional well-being is achieved through a combination of evidence- and community-based actions to address local causes of malnutrition; improvements in national and sectoral policies and programmes; support to civil society institutions to enable poor households to access or acquire sufficient food and utilize it most effectively; and enhancement of education and public information for dietary improvement. These approaches go beyond simple improvements in dietary energy availability, to overall improvements in nutrition security, particularly related to micronutrients.

Gathering wild foods, growing locally adapted varieties and eating from the local ecosystem continue to be part of civilizations and cultures and their potential value for food security and rural development is recognized.
There is also growing acknowledgment of the need to adapt nutrition and health interventions to the diversity of needs of individuals and communities.
If nutrient analysis and data dissemination of the various food species and intra-species diversity are systematically undertaken, national information systems for food and agriculture will be strengthened and can be used to form the basis for priority setting and national policy making.

BIODIVERSITY AND NUTRITION RATIONALE

- Wild species and infraspecies biodiversity have key roles in global nutrition security.
- Different varieties of the same species 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.
- Nutrient data for wild foods and cultivars need to be systematically generated, centrally compiled and widely disseminated.
- Biodiversity questions and/or prompts need to be included in food consumption surveys.
- Acquiring nutrient data and intake data for varieties is essential in order to understand the impact of biodiversity on food and nutrition security.

For nutrition, this will mean introducing more compositional data on biodiversity in national food composition databases and tables; developing and using dietary assessment instruments that capture food intake at the species and variety/breed level; and allowing marketing and food labelling that encourage awareness of food plant varieties and food animal subspecies.

We need to increase the evidence base by filling our knowledge gaps with better inventories and more data, and accessible data, on composition and consumption. As we progress in this effort, information will be mainstreamed in all nutrition activities, and used effectively in community-based programmes and interventions.

Rice varietal differences in nutrient composition

Nutrient	Range	Average	Variety with highest nutrient content	Variety with lowest nutrient content
Protein (n=1339)	5.55 – 14.58 g/100g	8.55	Indica CR1707	Indica Rd 19 (Thailand)
Iron (n=57)	0.70 – 6.35 mg/100g	2.28	Long grained[a] red (China)	Undermilled Red[a] (Philippines)
Zinc (n=57)	0.79 – 5.89 mg/100g	3.34	Ganjay Roozy (IRRI)	Long grain[a] Fragrant (China)
Calcium (n=57)	1.0 – 6.5 mg/100g	26	ADT-21, red (India)	Brown Japonica[a] (Korea)
Thiamin (n=79)	0.117 – 1.74 mg/100g	0.475	Juchitan A-74 (Mexico)	Glutinous rice[a] special grade (China)
Riboflavin (n=80)	0.011 – 0.448 mg/100g	0.091	Tapol Dark Purple (Philippines)	Mun-pu red (Thailand)
Niacin (n=30)	1.97 – 9.22 mg/100g	5.32	Long grained[a] purple (China)	Glutinous round[a] grained (China)
Amylose (n=1182)	1.0 – 76.0 g/100g	22.4	Ingra 410 (Brazil)	Bpi-Ri-3 (Philippines)

[a] These data come from Food Composition Tables, and do not strictly represent rice varieties.

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

Variety	% moisture	β-carotene	α-carotene
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 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.

THE INTERNATIONAL RICE COMMISSION

The commission noted the following:

- Diversity is a fundamental principle of good nutrition and the basis of dietary guidelines for individuals and populations.
- Diversification for enhancing human nutrition takes several important forms when dealing with rice-based systems: dietary diversification among rice-eating urban populations; diversity of foods for rural populations within a rice-based ecosystem; biodiversity of rice genetic resources; and diversification in processing and preparation of raw materials.
- The rice ecosystem also provides many options for improved nutrition for rural populations and the ecosystem approach to improved nutrition has been gaining more attention recently.

The Commission *recommended* that:

- Existing biodiversity of rice varieties and their nutritional composition need to be explored *before* engaging in transgenics.
- Nutrient content needs to be among the criteria in cultivar promotion.
- Cultivar-specific nutrient analysis and data dissemination should be systematically undertaken.
- The evaluation of the composition and consumption of rice cultivars should continue for the development of food biodiversity indicators to guide agro-biodiversity conservation and human nutrition. Increasing the availability and promoting the use of whole grain and moderately milled rice and rice products will provide human nutrition benefits, particularly related to micronutrient intakes.

Learn more:
www.fao.org/infoods/biodiversity/index_en.stm

Further information about the work of FAO on biodiversity is available at:
www.fao.org/biodiversity

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