Bringing Agriculture to the Table

Managing the Dietary Transition: Implications for Agriculture

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Agriculture, nutrition and health links
NCDs kill people at a younger age in developing countries

The highest increases in NCDs are expected in Africa, South-East Asia, and the Southern Mediterranean—an over 20 percent increase expected by 2020.

Source: WHO, 2008

Age-standardized deaths per 100,000 from cardiovascular disease

Source: WHO, 2010
The economic burden of NCDs will overwhelm health systems and slow economic growth

NCD COSTS

Health spending on diabetes ranges from 6% of all health costs in China to 15% in Mexico

Source: P. Zhang, et al, 2010

Each 10% increase in NCD burden is associated with a 0.5% reduction in annual economic growth.

Source: WHO

23 high burden countries are projected to lose $84 billion in GDP between 2005-2015 from 3 NCDs


NCDs will cost more than $47 trillion globally between now and 2030

Source: D. Bloom, 2011
Nutrition Confusion
Why Our Infatuation with Single Nutrients?

• In 1753, James Lind tested whether eating citrus fruits prevented scurvy.

• In 1932, Vitamin C isolated, confirmed as the active protective nutrient. One nutrient → one disease.

• Soon: Thiamine (beriberi), niacin (pellagra), iron (anemia), iodine (goiter), vitamin A (night blindness), vitamin D (rickets).

• Early 20th century dietary guidelines thus focused on preventing nutrient deficiency diseases. Great Depression and World War II food shortages → further emphasis.

• The League of Nations, British Medical Association, and USDA formed panels to create new minimum requirements for calories, protein, calcium, phosphorus, iron, and various vitamins → First RDAs in 1941.

• Modern dietary guidelines were developed to meet these new RDAs. Set precedent to start with nutrient targets and then translate these into food recommendations.
# Nutrient Focus: Recipe for Confusion

![Table showing GO, SLOW, and WHOA classifications of various food groups](http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/downloads/go-slow-whoa.pdf)

**Food Group**

<table>
<thead>
<tr>
<th>GO (Almost Anytime Foods)</th>
<th>SLOW (Sometimes Foods)</th>
<th>WHOA (Once in a While Foods)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td>Fried potatoes, like French fries or hash browns; other deep-fried vegetables</td>
<td></td>
</tr>
<tr>
<td>Meats, Poultry, Fish, Eggs, Beans, and Nuts</td>
<td>Trimmerd beef and pork, extra lean ground beef; chicken and turkey without skin; tuna canned in water; baked, broiled, steamed, grilled fish and shellfish; beans, split peas, lentils, tofu; egg whites and egg substitutes</td>
<td>Untrimmed beef and pork; regular ground beef; fried hamburgers; ribs; bacon; fried chicken, chicken nuggets; hot dogs, lunch meats, pepperoni, sausage; fried fish and shellfish; whole eggs cooked with fat</td>
</tr>
<tr>
<td>Sweets and Snacks*</td>
<td>Ice milk bars; frozen fruit juice bars; low-fat or fat-free frozen yogurt and ice cream; fig bars, ginger snaps, baked chips; low-fat microwave popcorn; pretzels</td>
<td>Cookies and cakes; pies; cheese cake; ice cream; chocolate; candy; chips; buttered microwave popcorn</td>
</tr>
<tr>
<td>Fats/Condiments</td>
<td>Vegetable oil, olive oil, and oil-based salad dressing; soft margarine; low-fat creamy salad dressing; low-fat mayonnaise; low-fat sour cream**</td>
<td>Butter, stick margarine; lard; salt pork; gravy; regular creamy salad dressing; mayonnaise; tartar sauce; sour cream; cheese sauce; cream sauce; cream cheese dips</td>
</tr>
<tr>
<td>Beverages</td>
<td>2 percent low-fat milk; 100 percent fruit juice; sports drinks</td>
<td>Whole milk; regular soda; calorically sweetened iced teas and lemonade; fruit drinks with less than 100 percent fruit juice</td>
</tr>
</tbody>
</table>
Nutrient Focus: Recipe for Manipulation

- Low fat = "Low calorie"
- Fat-free = "Healthy"
- Low saturated fat = "Healthy"
Nutrient Focus: Recipe for Manipulation

- Fortified = "Healthy"
- Vitamins = "Healthy"
Focus on Individual Nutrients: A Success?

Percent of Americans Meeting Dietary Guidelines

- Fruit + juices
- Vegetables + juices
- Whole Grains
- Fish, Shellfish
- Nuts, Seeds, Beans
- Sodium
- Sugar Beverages
- Processed meats

Based on NHANES 2005-06; Mozaffarian et al., unpublished
Lifestyle and Obesity: Conventional Wisdom

Adiposity

Energy Expenditure

Energy Consumption

Total Fat Energy Density

Ecologic Studies

Animal Experiments
Lifestyle and Obesity: Modern Science

Smoking
TV Watching
Sleep Duration

Energy Expenditure

Adiposity

Energy Consumption

Foods / Dietary Patterns:
- Carbohydrate Quality
- Nuts, Fruits, Vegetables
- Vegetable Oils, Dairy
- Processed Meats
- Trans Fats

Mozaffarian et al.,
NEJM 2011
New GBD results for dietary risk factors

- New GBD has systematic and comparable estimates of:
  - Quantitative **causal effects** of major dietary risks.
  - Global, regional, and national data on key **dietary intakes**.
  - Assessment of the global, regional, and national **impact** of specific dietary risk factors on chronic diseases.

- Independent of calories or obesity, **dietary quality** is a major risk factor for chronic diseases, including CVD, diabetes, and common cancers. Dietary quality also influences risk of weight gain.

- For chronic diseases, dietary quality is best defined by **foods and diet patterns**, not nutrients.

- Existing global data on relevant dietary intakes, and corresponding global and regional impact on chronic diseases, is very **limited**.
Essential Dietary Habits for Heart Health

**EAT:**
- Fish and Seafood
- Whole Grains
- Fruits
- Vegetables
- Nuts
- Vegetable Oils
- Moderate Dairy

**LIMIT:**
- Starches, refined grains, sugars
- Processed Meats
- Sweetened Drinks
- Industrial Trans Fat *
- Salt *

Mozaffarian et al. Circulation 2011
A food system should offer choices for a healthy, balanced diet

Reaching that goal involves a wide range of actors, each with their own goals and function in the food system

**Agriculture**
Agribusiness and Extension Services (seeds, crop protection, farm machinery), farmers (including smallholders and subsistence farming), agricultural laborers

**Primary Food Storage, Processing and Distribution**
Packers, millers, crushers, refiners, farmers collectives, distributors

**Secondary Food Storage and Processing**
Importers, exporters, donors and international institutions, food and beverage manufacturers

**Food Wholesaling and Retailing**
Street vendors, supermarkets, restaurants, fast food companies, public institutions (schools, prisons)

**Food Marketing**
Advertising and communications agencies
Avenues of Change:

Governance
Financing
Policy
Research and Education
Technology
Personal Behavior
Key recommendations at a glance
Key recommendations at a glance

**International organizations**: Form cross-sectoral technical assistance teams to devise development plans and policies in countries that go beyond coordination to support and accountability.
Key recommendations at a glance

**International organizations**: Supplement and incentivize countries through development loans and technical assistance that align agriculture and health.
Key recommendations at a glance

Agri-food Businesses: Use value chain analysis to identify opportunities to shift sourcing to healthy food ingredients
Key recommendations at a glance

**Agri-food Businesses:** Support the development of norms, standards, policies, and guidelines in the agriculture and food sector to improve nutrition and health.
Key recommendations at a glance

**Agri-food Businesses:** Work with researchers in developing countries to characterize the local food supply and diet.
Key recommendations at a glance

**Donors:** Support operations research on how “nutrition-sensitive” agriculture can address the dual burden of malnutrition.
Key recommendations at a glance

Donors: Require and fund transparent and comparable evaluations of agriculture and health programs
Key recommendations at a glance

**Donors:** Assess structural and programmatic opportunities for linked programming among agriculture, nutrition, and health
Tools for agriculture to improve health

Agriculture and Food Value Chain Approaches

A value chain reveals social, environmental and health benefits in the production process.

EXAMPLES:
• New product formulation and cold chain innovations to reach people at the bottom of the pyramid
• Build capacity into local food chains to raise quality and lower price

Mutual Metrics

Mutual metrics are results indicators shared between agriculture and health.

EXAMPLES:
• Volume of fresh fruits and vegetables timely delivered to consumer markets
• Substitution of healthier oils for palm oil in processed foods
Agriculture can improve health by...

**Partnering for New Programs and Policies**

**EXAMPLES:**
- PepsiCo subsidizes smallholder farmers in Mexico to produce healthier oilcrops (WSJ, June 2011)
- Partner with companies in the developing world to help small food processors produce safe, nutritious, affordable food products

**Creating New Policy for a Healthy Food Supply**

**EXAMPLES:**
- Align agricultural policies with health goals
- Limitations on sales and marketing of high-sugar products to children
- Nutrition education integrated with production choices for non-staple crops