Food Security & Nutrition

Challenges & Opportunities for World Health

Future of Food Webinar
October 2014
Future of Food Archived Webinars

1. Hungry and Overweight: How is it Possible?
2. Contributors and Effects of Food Insecurity: Nutrition and Beyond
3. School Meals and Community Partnerships: Creative Solutions against Food Insecurity
4. Point A to Point B: Improving Access to Healthy Foods in Food Banks
5. A Flavorful Pairing: Nutrition Education in Food Banks
6. Ready, Set, Go: Preparing and Delivering Effective Nutrition Education for Audiences Facing Food Insecurity
7. Making an Impact with Food Insecure Populations
8. Successful Synergies

www.eatright.org/foundation/kidseatright
Academy Position Statement

“It is the position of the Academy of Nutrition and Dietetics that all people should have consistent access to an appropriately nutritious diet of food and water, coupled with a sanitary environment, adequate health services, and care that ensure a healthy and active life for all household members. The Academy supports policies, systems, programs, and practices that work with developing nations to achieve nutrition security and self-sufficiency while being environmentally and economically sustainable.”

J Acad Nutr Diet. 2013;113:581-595
Learning Objectives

• Identify at least two missing macro- or micro-nutrients in the diets of developing countries

• Explain the challenges and opportunities in nutritiously feeding a growing world population

• Describe at least one successful and promising intervention for improving global health and food security
Today’s Speakers

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USAID Senior Nutrition Advisor
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aheap@usaid.gov
Millennium Development Goals – 2015

1. Eradicate Extreme Poverty and Hunger
2. Achieve Universal Primary Education
3. Promote Gender Equality and Empower Women
4. Reduce Child Mortality
5. Improve Maternal Health
6. Combat HIV/AIDS, Malaria and Other Diseases
7. Ensure Environmental Sustainability
8. Global Partnership for Development
State of Global Health

- Undernutrition is responsible for 3 million deaths –45%--of children under 5 each year.

- In 2011 there were 165 million children under 5 with stunted growth.

- Suboptimal breastfeeding results in more than 800,000 child deaths annually.

- Fetal growth restriction causes 12% of annual neonatal deaths.

*The Lancet – June 2013*
## Global Nutrition Status

<table>
<thead>
<tr>
<th>Area</th>
<th>Kcal/kg/d</th>
<th>%CHO</th>
<th>%Pro</th>
<th>%Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>2780</td>
<td>63%</td>
<td>11%</td>
<td>26%</td>
</tr>
<tr>
<td>Developed countries</td>
<td>3420</td>
<td>53%</td>
<td>12%</td>
<td>34%</td>
</tr>
<tr>
<td>Developing countries</td>
<td>2630</td>
<td>67%</td>
<td>11%</td>
<td>23%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>2240</td>
<td>72%</td>
<td>10%</td>
<td>19%</td>
</tr>
<tr>
<td>Central Asia</td>
<td>1820</td>
<td>75%</td>
<td>11%</td>
<td>26%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area</th>
<th>Grams pro/person/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>77</td>
</tr>
<tr>
<td>Developed countries</td>
<td>103</td>
</tr>
<tr>
<td>Developing countries</td>
<td>70</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>55</td>
</tr>
</tbody>
</table>

FAO Statistics Division 2010, Food Balance Sheets, Food and Agriculture Organization of the United Nations
Animal source contributions to the diet

- Personal, cultural, religious, and access are reasons that animal source foods in the diet may be limited or prohibited.

- Small amounts of animal source foods can improve the nutritional status of low-income households.

- Meat, milk and eggs provide a variety of bio-available amino acids and nutrients such as iron, zinc, vitamin A, vitamin B12 and calcium in which many malnourished people are deficient.

- International guidelines suggest that the safe level of protein consumption is about 58 g per adult per day.
  - Standards do not differentiate between plant and animal sources.
### Micronutrients Deficiency Conditions and Their Worldwide Prevalence

<table>
<thead>
<tr>
<th>Micronutrient</th>
<th>Deficiency Prevalence</th>
<th>Major Deficiency Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>2 billion at risk</td>
<td>Goiter, hypothyroidism, iodine deficiency disorders, increased risk of stillbirth, birth defects, infant mortality, cognitive impairment</td>
</tr>
<tr>
<td>Iron</td>
<td>2 billion</td>
<td>Iron deficiency, anemia, reduced learning and work capacity, increased maternal and infant mortality, low birth weight</td>
</tr>
<tr>
<td>Zinc</td>
<td>Estimated high in developing countries</td>
<td>Poor pregnancy outcome, impaired growth (stunting), genetic disorders, decreased resistance to infectious diseases</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>254 million preschool children</td>
<td>Night blindness, xerophthalmia, increased risk of mortality in children and pregnant women</td>
</tr>
<tr>
<td>Folate (Vitamin B6)</td>
<td>Insufficient data</td>
<td>Megaloblastic anemia, neural tube and other birth defects, heart disease, stroke, impaired cognitive function, depression</td>
</tr>
<tr>
<td>Cobolamine (Vitamin B12)</td>
<td>Insufficient data</td>
<td>Megaloblastic anemia (associated with Helicobacter pylori induced gastric atrophy</td>
</tr>
</tbody>
</table>

Adapted from Allen L et al.: Table 1.2 pp 6-10.2
<table>
<thead>
<tr>
<th>Micronutrient</th>
<th>Deficiency Prevalence</th>
<th>Major Deficiency Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiamine (Vitamin B1)</td>
<td>Insufficient data, estimated as common in developing countries and in famines, displaced persons</td>
<td>Beriberi (cardiac and neurologic), Wernicke and Korsakov syndromes (alcoholic confusion and paralysis)</td>
</tr>
<tr>
<td>Riboflavin (Vitamin B2)</td>
<td>Insufficient data, estimated to be common in developing countries</td>
<td>Non specific – fatigue, eye changes, dermatitis, brain dysfunction, impaired iron absorption</td>
</tr>
<tr>
<td>Niacin (Vitamins B3)</td>
<td>Insufficient data, estimated as common in developing countries and in famines, displaced persons</td>
<td>Pellagra (dermatitis, diarrhea, dementia, death)</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>Insufficient data, estimated as common in developing countries and in famines, displaced persons</td>
<td>Dermatitis, neurological disorders, convulsions, anemia, elevated plasma homocysteine</td>
</tr>
</tbody>
</table>

Adapted from Allen L et al.: Table 1.2 pp 6-10.2
<table>
<thead>
<tr>
<th>Micronutrient</th>
<th>Deficiency Prevalence</th>
<th>Major Deficiency Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin C</td>
<td>Common in famines, displaced persons</td>
<td>Scurvy (fatigue, hemorrhages, low resistance to infection, anemia)</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Widespread in all age groups, low exposure to ultra violet rays of sun</td>
<td>Rickets, osteomalacia, osteoporosis, colorectal cancer</td>
</tr>
<tr>
<td>Calcium</td>
<td>Insufficient data, estimated to be widespread</td>
<td>Decreased bone mineralization, rickets, osteoporosis</td>
</tr>
<tr>
<td>Selenium</td>
<td>Insufficient data, common in Asia, Scandinavia, Siberia</td>
<td>Cardiomyopathy, increased cancer and cardiovascular risk</td>
</tr>
<tr>
<td>Fluoride</td>
<td>Widespread</td>
<td>Increased dental decay, affects bone health</td>
</tr>
</tbody>
</table>

Adapted from Allen L et al.: Table 1.2 pp 6-10.2
Global Burden of Anemia in Women and Children

30% of women and 47% of children suffer from anemia.
Global Burden of Vitamin A Deficiency In Children

Countries and areas with survey data: Preschool-age children

Category of public health significance (presence of serum retinol <0.70 μmol/L)
- None (<2%)
- Mild (<2% - <10%)
- Moderate (<10% - <20%)
- Severe (>20%)
- No data
Infectious and Chronic Disease

35 million people are living with HIV and AIDS

Deaths from NCDs rose by 8 million in the past two decades
Understanding the Context

34 countries bear 90% of the global burden of undernutrition
• The proportion of overall disease burden attributable to childhood underweight remains the 8th risk worldwide.

• High body-mass index has increased globally to become the 6th risk worldwide.

• High blood pressure, high BMI and high fasting blood glucose have all increased significantly in terms of the their impact on global health between 1990 and 2010.

• Deaths from NCDs rose by about 8 million between 1990 and 2010, accounting for two of every three deaths (34·5 million) worldwide by 2010
Nutrition Transition

• A shift in dietary consumption and energy expenditure.

• Coincides with economic, demographic and epidemiologic changes.

• Contributes to improved food security, variety, gradual elimination of dietary deficiencies and overall nutrition status.

• Also contributes to the dual burden of disease which is a developmental challenge of epic proportion. This is an emerging health challenge that exists predominately in low to middle income countries.
<table>
<thead>
<tr>
<th>Cause</th>
<th>2010 DALYs (95% UI) in thousands</th>
<th>1990 DALYs (95% UI) in thousands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischemic heart disease</td>
<td>129,795 (119,218–137,398)</td>
<td>100,455 (96,669–108,702)</td>
</tr>
<tr>
<td>Lower respiratory tract infections</td>
<td>115,227 (102,255–126,972)</td>
<td>206,461 (183,354–222,979)</td>
</tr>
<tr>
<td>Stroke</td>
<td>102,239 (90,472–108,003)</td>
<td>86,012 (81,033–94,802)</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>89,524 (77,595–99,193)</td>
<td>133,543 (168,791–197,655)</td>
</tr>
<tr>
<td>HIV–AIDS</td>
<td>81,549 (74,698–88,371)</td>
<td>18,118 (14,996–22,269)</td>
</tr>
<tr>
<td>Malaria</td>
<td>82,689 (63,465–109,846)</td>
<td>69,141 (54,547–85,589)</td>
</tr>
<tr>
<td>Low back pain</td>
<td>80,667 (56,066–108,723)</td>
<td>56,384 (38,773–76,233)</td>
</tr>
<tr>
<td>Preterm birth complications</td>
<td>76,980 (66,210–88,132)</td>
<td>105,965 (88,144–120,894)</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>76,779 (66,000–89,147)</td>
<td>78,298 (70,407–86,849)</td>
</tr>
<tr>
<td>Road-traffic injury</td>
<td>75,487 (61,555–94,777)</td>
<td>56,651 (49,633–68,046)</td>
</tr>
<tr>
<td>Major depressive disorder</td>
<td>61,239 (47,894–80,784)</td>
<td>46,177 (34,524–58,436)</td>
</tr>
<tr>
<td>Neonatal encephalopathy*</td>
<td>50,161 (40,351–59,810)</td>
<td>60,604 (50,209–74,826)</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>49,399 (40,027–56,009)</td>
<td>61,256 (55,465–71,083)</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>46,857 (40,212–55,252)</td>
<td>27,719 (23,668–32,925)</td>
</tr>
<tr>
<td>Sepsis and other infectious disorders in newborns</td>
<td>44,236 (27,349–72,418)</td>
<td>46,029 (25,147–70,357)</td>
</tr>
<tr>
<td>Congenital anomalies</td>
<td>38,890 (31,891–45,739)</td>
<td>54,245 (45,491–69,057)</td>
</tr>
<tr>
<td>Self-harm</td>
<td>36,655 (26,894–44,652)</td>
<td>29,605 (23,039–37,333)</td>
</tr>
<tr>
<td>Falls</td>
<td>35,406 (28,583–44,052)</td>
<td>25,900 (21,252–31,656)</td>
</tr>
<tr>
<td>Protein-energy malnutrition</td>
<td>34,874 (27,957–41,662)</td>
<td>60,542 (50,378–71,639)</td>
</tr>
<tr>
<td>Cancer of the trachea, bronchus, or lung</td>
<td>32,405 (24,401–38,327)</td>
<td>23,850 (18,839–29,837)</td>
</tr>
<tr>
<td>Other musculoskeletal disorders</td>
<td>30,877 (25,858–34,650)</td>
<td>20,596 (17,025–23,262)</td>
</tr>
<tr>
<td>Cirrhosis of the liver</td>
<td>31,026 (25,951–34,629)</td>
<td>24,325 (20,653–27,134)</td>
</tr>
<tr>
<td>Meningitis</td>
<td>29,407 (25,576–33,442)</td>
<td>37,822 (33,817–44,962)</td>
</tr>
</tbody>
</table>
Post-2015 Nutrition Targets

1. **40% Reduction in the number of children under-5 who are stunted**
2. **50% Reduction of anaemia in women of reproductive age**
3. **30% Reduction in low birth weight**
4. **No increase in childhood overweight**
5. **Increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%**
6. **Reduce and maintain childhood wasting to less than 5%**
Undernourishment around the world

- 805 million people estimated to be suffering from chronic hunger in 2012–14, down 100 million in the last decade.
- The vast majority, 791 million, live in developing countries.
The MDG 1c hunger target can be reached, with additional effort.

WFS goal out of reach
Progress in most regions, but uneven

- **Sub-Saharan Africa**: 33.3% in 1990-92, 23.8% in 2012-14
- **Caribbean**: 27.0% in 1990-92, 20.1% in 2012-14
- **Southern Asia**: 24.0% in 1990-92, 15.8% in 2012-14
- **Oceania**: 23.2% in 1990-92, 15.7% in 2012-14
- **Eastern Asia**: 24.0% in 1990-92, 15.7% in 2012-14
- **South-Eastern Asia**: 30.7% in 1990-92, 10.3% in 2012-14
- **Western Asia**: 8.7% in 1990-92, 6.3% in 2012-14
- **Caucasus and Central Asia**: 14.1% in 1990-92, 7.4% in 2012-14
- **Latin America**: 14.4% in 1990-92, 5.1% in 2012-14

Majority of hungry live in **developing countries**, where over one in eight, or **13.5 percent** of the population, remain chronically undernourished.

The MDG 1c hunger target is **within reach**, but large differences across developing regions remain.

- East Asia, South-East Asia, Latin America and the Caribbean have achieved the MDG hunger target. LAC are on track to reach WFS goal.
- Insufficient progress in sub-Saharan Africa, South and West Asia.
Food availability is a major element of food insecurity in poorer regions, notably sub-Saharan Africa and parts of South Asia.

Access to food has improved quickly in countries showing rapid economic progress, notably East and South-East Asia.

Access has improved in South Asia and Latin America with social protection.

Utilization remains the single greatest challenge, despite progress over past two decades.

Stability remains a challenge in regions heavily reliant on international food markets, such as Near East, North Africa and Caribbean.
Strengthening the enabling environment to improve food security and nutrition

- **Sustained political commitment** at highest level crucial – legal frameworks can help that all work responsibly.
- **Broad participation in policy formulation and implementation** necessary to consider all views and empower poor and vulnerable.
- Coherence and **integration** of policy instruments to ensure **complementarities** to maximize impacts and benefits.
- **Institutional and governance** mechanisms promoting cooperation and coordination among ministries and facilitating policy coherencce essential.
NACS Program

Clinical Care (PMTCT/ART)
Assessment
Support
Counseling

Clinic

Community
Surveillance, Referral, Counseling & Support

Community

Food Security & Nutrition: The Challenges & Opportunities for World Health
“There is a deeply worrying gulf between country needs and global actions. But what is most different—an extraordinary opportunity as well as a severe challenge—is the political urgency of nutrition.”

*The Lancet – June 2013*
Stacia Nordin, RD
Nutrition Advisor, Malawi
www.NeverEndingFood.org
NordinMalawi@gmail.com
**Food Security** = “All people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, access, utilization, and stability.”

**Nutrition Security** = Food Security + Water + Healthy conditions
Factors Contributing to Nutrition Insecurity

- Education
- Diversity
- Resources
- Diseases
- Population
- Poverty
- Violence
- Lifestyles
- Instability
- Equality
- Politics
- Growth
Scaling Up Nutrition (SUN) movement

First 1,000 days of life

Healthy Eating & Living:

1. Healthy Diverse Diets
   • Parents
   • Pregnant & Lactating Women

2. Infant Young Child Feeding:
   • Exclusive breastfeeding (0 - 6 mo.)
   • Complementary feeding (6 - 24 mo.)

3. Water, Hygiene & Sanitation

Treatments / supplements
Depending on country’s situation:

4. Vitamin A supplementation
5. Zinc supplementation for diarrhoea
6. Multiple micronutrient powders
7. Deworming
8. Iron & folate supplements
9. Iodised oil capsules
10. Salt iodisation
11. Iron fortification of staple
12. Prevent & treat Undernutrition
13. Treat Severe Acute Malnutrition
As incomes rises, (Q5) Dietary Diversity increases ... But to what?  

Note: Data refer to households of lowest and highest income quintiles in 47 developing countries.  
Source: FAO, analysis of household surveys.
Problem: Mono-Cultures

- Only 2% of identified edible plants are used for human consumption.
- 3 crops (wheat, rice, and maize) provide more than half of calories globally derived from plants.
- 30 crops provide 95% of calories/protein.
### Successful Examples


[www.eatright.org/About/Content.aspx?id=8358](www.eatright.org/About/Content.aspx?id=8358)

<table>
<thead>
<tr>
<th>Treatment (locally made)</th>
<th>• Valid International <a href="http://www.ValidInternational.org">www.ValidInternational.org</a></th>
</tr>
</thead>
</table>
| Food & Water Security    | • HKI Homestead Food Production Program [www.HKI.org](http://www.HKI.org)  
                           | • Educational Concerns for Hunger Organization [www.EchoNet.org](http://www.EchoNet.org)  
                           | • Save and Grow [www.FAO.org](http://www.FAO.org)  
                           | • USAID Feed the Future [www.USDAID.gov](http://www.USDAID.gov)  
                           | • Ontario Gleaners [http://ontariogleaners.org/1279](http://ontariogleaners.org/1279)  
                           | • Urban Harvest [www.urbanharvest.co.za](http://www.urbanharvest.co.za) |
| Information & Financial systems | • Food Tank [www.FoodTank.org](http://www.FoodTank.org)  
                                   | • Microloan foundation [www.microloanfoundation.org.uk](http://www.microloanfoundation.org.uk) |
| Natural Resources        | • Bioversity International [www.bioversityinternational.org](http://www.bioversityinternational.org) |
• Delivers scientific evidence, management practices and policy options to use and safeguard agricultural and tree biodiversity to attain sustainable global food and nutrition security
• Holistic approach to link biodiversity, nutrition, & health
• Bio-diversity in the thousands-millions: trees, plants, animals
• For human and environmental health & resilience
• Education for Consumption & Income Generation
• Seed Banks, National Herbarium & Botanical Gardens
High Diversity = High potential for good Health

- 200 of 600 available foods grown at Never Ending Food in Malawi.
- Teach others about permaculture, Designs for Sustainable Living.
- Systems provide for human needs through sustainable practices (i.e. use of resources, composting toilets and water harvesting).
Our Vision: The Microloan Foundation’s vision is to help millions of people help themselves out of poverty by providing them with the opportunity to start small, self-sustainable businesses.

In 2013, we disbursed over £4 million of small loans to women in Malawi and Zambia.
Helen Keller International
Integrates treatments, nutrition education, gardens & livestock production

• **ESSENTIAL NUTRITION ACTIONS (ENA)** - Integrated package of cost-effective nutrition actions proven to reduce maternal and child under-nutrition and associated mortality and morbidity.

• **AWARENESS**: 2+ billion people suffer from under-nutrition caused by a lack of basic nutrients in their food. Under-nutrition stunts both physical & mental health.

• **TREATMENT**: Providing low-cost vitamin + mineral supplements to millions of hard-to-reach, deeply vulnerable people.

• **FOOD PRODUCTION & CONSUMPTION**: Encouraging people and communities to make simple changes. Promotes Homestead Food Production to creates nutritional self-sufficiency for small communities in Africa and Asia through the establishment of thousands of women-tended gardens.
Organization supporting food & water security: Educational Concerns for Hunger Organization

Gardens, orchards, development worker training, seed bank & multiplication, support

ECHO exists to reduce hunger and improve the lives of small-scale farmers worldwide. We work to identify, validate, document and disseminate best practices in sustainable agriculture and appropriate technology.

We provide agricultural and appropriate technology training to development workers in more than 165 countries. Read More
Organizations supporting food & water security:

**Feed the Future**
US Government Improving Nutrition through Agriculture Value Chains

**Save & Grow**
Agro-Ecology: Agriculture that works with Ecological processes to strengthen the earth and people.
Organizations supporting food & water security:

**Ontario Gleaners**
Volunteers process donated produce into nutritious soup mixes and/or dried fruit packages for donating to areas in need.

**Urban Harvest**
Helps South Africans grow their own food, supporting a healthier, happier and more sustainable way of life for everyone.

Through corporate social investments (CSI) the unique school community food-garden model ensures highly productive gardens & inspiring ‘garden champions’ that generate food, incomes and skills.
Ready to Use Therapeutic Foods (RUTFs): Fortified spread Fat-Milk-Legume

Thanks to an appropriate management scheme, from being severely malnourished (weight 4.75 kg), this 2-year old girl not only gained 32% more weight in 3 weeks (weight 6.28), but she also gained an appetite for living.

http://www.who.int/nutrition/topics/malnutrition/en/
Knowledge & Skills are Powerful!

Mbongozi Primary School

teachers, students, parents, community members:

Proud to know, practice and share all the food groups.
What can you do?

1. Start with yourself
   - **Observe**  Research, study, read, listen: Standing Committee on Nutrition [www.UNSCN.org](http://www.UNSCN.org)
   - **Learn**  Try, do, implement, apply, diversify everything
   - **Share**  Write, speak, show, demonstrate, gift

2. Join together
   See AND position paper for more ideas
   - AODA
   - HEN
   - FCP-Agriculture
   - NEP
   - SNEB
   - WPHNA

   **No one can do Everything**
   **But, Everyone can do Something**
Future of Food NEXT Webinar:

Food Production & Our Environmental Responsibility

Monday, December 8, 2014
1-2pm CST

Presenters
Jude Capper, PhD, Livestock Sustainability Consultant
Carlos Saviani, Vice President Animal Protein, World Wildlife Fund

Register
www.eatright.org/foundation/kidseatright
View recorded webinars at
www.eatright.org/foundation/kidseatright

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the development of this webinar
with an educational grant.
References


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