The Need for Coherent Food Policy

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World Food Issues

Hunger, Food Insecurity

Environmental Impact of Agriculture

The Policy Picture

Obesity

Food Safety and Security
Hunger
Number of SNAP (Food Stamp) Beneficiaries

Source: CBO April, 2012: http://www.cbo.gov/publication/43175
Childhood malnutrition is responsible for over 2.5 million childhood deaths every year.
Under-5 Causes of Death

- Pneumonia: 41%
- Preterm birth complications: 33%
- Diarrhea: 18%
- Birth asphyxia: 14%
- Malaria: 11%
- Other causes: 7%

33% underlying cause: malnutrition

WHO, 2012
Proportion of People Undernourished

- **Asia & the Pacific**: 14%
- **Latin America & the Caribbean**: 8%
- **Near East & North Africa**: 9%
- **Sub-Saharan Africa**: 28%
- **Developed Countries**: <2%

Food and Agriculture Organization, 2012
OXFAM ISSUE BRIEFING

EXTREME WEATHER, EXTREME PRICES

The costs of feeding a warming world
Are Food Crises the New Normal?

The Great Food Crisis of 2011
It's real, and it's not going away anytime soon.
BY LESTER BROWN | JANUARY 10, 2011

High Food Prices Are Becoming a 'New Normal'
November 29, 2012 — The world cannot afford to be

UN warns of looming worldwide food crisis in 2013
2011 FAO Report

“Food-based Approaches”

- Fortification
- Dietary diversification
- Dietary modification
- Biofortification
Golden Rice

Genetically modified to contain Vitamin A
Most recent breed contains 100% DV
Bred with local crops

Increase Vitamin A intake in humans

Tang et al 2009
<table>
<thead>
<tr>
<th>Country</th>
<th># of Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>70</td>
</tr>
<tr>
<td>India</td>
<td>37</td>
</tr>
<tr>
<td>Mexico</td>
<td>37</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>23</td>
</tr>
<tr>
<td>The world overall</td>
<td>50</td>
</tr>
</tbody>
</table>
Obesity
The Dual Burden

Coexistence of hunger and obesity

Early nutrition experiences
(stunting and obesity)
The Environmental Impact of Agriculture
Water
By 2030

Half the world’s population will be in areas of high water stress


- Agricultural production: 92.0%
- Industrial Production: 4.4%
- Domestic Water Supply: 3.6%

Hoekstra and Mekonnen
Proceedings of the National Academy of Sciences, 2012
Trends in Global Water Use

The grey band represents the difference between the amount of water extracted and that actually consumed. Water may be extracted, used, recycled (or returned to rivers or aquifers) and reused several times over. Consumption is final use of water, after which it can no longer be reused. That extractions have increased at a much faster rate is an indication of how much more intensively we can now exploit water. Only a fraction of water extracted is lost through evaporation.
Gallons of Irrigated Water to Produce 1 kg of...

- Corn: 172 gallons
- Peas: 529 gallons
- Pork: 1587 gallons
- Beef: 11380 gallons

Pimentel, 2004
Estimated global meat production

Million metric tons

Calendar year


Source: USDA

Earth Policy Institute - www.earth-policy.org
Shrinking Biodiversity
Increasing homogeneity in global food supplies and the implications for food security

Colin K. Khoury\textsuperscript{a,b,1}, Anne D. Bjorkman\textsuperscript{c,d}, Hannes Dempewolf\textsuperscript{d,e,f}, Julian Ramirez-Villegas\textsuperscript{a,g,h}, Luigi Guarino\textsuperscript{f}, Andy Jarvis\textsuperscript{a,g}, Loren H. Rieseberg\textsuperscript{d,e,i}, and Paul C. Struijk\textsuperscript{b}

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"a decline of other cereal, oil, and starchy root species. The increase in homogeneity worldwide portends the establishment of a global standard food supply, which is relatively species-rich in regard to measured crops at the national level, but species-poor globally. These changes in food supplies heighten interdependence among countries in regard to availability and access to these food sources and the genetic resources supporting their production, and give further urgency to nutrition development priorities aimed at bolstering food security."
A Disease Cuts Corn Yields
Goss’s Wilt

“It has come on like a tidal wave, washing across the Corn Belt from Minnesota to the Texas panhandle, a disease that few farmers had seen until five years ago.”

10% of overall corn crop may be lost

“.. many plant pathologists suspect that the biggest factor is the hybrids chosen for genetic modification by major seed companies like Monsanto, DuPont and Syngenta.”

The Case of Orange Juice

- Year round production
- Uniform fruit
- Thin skin
- Few seeds
- High sugar
Climate Change
Carbon Dioxide Emissions
Fertilizers
Feed transport
Farm machinery
Animal processing & transport

Methane Emissions
Enteric fermentation in ruminants
Release from animal manure

Nitrous Oxide Emissions
Release from urine and manure
Global Warming Potential

Set carbon dioxide as 1 unit
Methane = 23 units
Nitrous oxide = 296 units

Global greenhouse gas emissions from animal agriculture exceed emissions from transportation

Steinfeld et al., 2006
Rome, FAO
Just Animal Agriculture

% of total global emissions for carbon dioxide  9%

% of total global emissions for methane  37%

% of total global emissions for nitrous oxide  65%
“All aspects of food security are potentially affected by climate change, including food access, utilization, and price stability.”
Food Safety and Food Security
USDA threatens to shutter Foster Farms plants tied to salmonella outbreak

JoNel Aleccia, NBC News

3 hours ago

U.S. Department of Agriculture officials are threatening to shut down three Foster Farms chicken plants in California linked to an outbreak of salmonella that has sickened nearly 300 people in 17 states.

In letters sent to Foster Farms chief executive Ron Foster Monday, USDA officials said they’d detected high levels of the salmonella Heidelberg bacteria tied to illness at two plants in Fresno and one in Livingston. They said the company had until Thursday to respond or the agency would withhold inspections, effectively shuttering the plants.

“The prevalence of Salmonella in finished poultry

Raw Foster Farms poultry has been linked to an outbreak of salmonella Heidelberg that has sickened nearly 300 people in 17 states. USDA officials are threatening to close three California plants.
LOCAL NEWS

Colorado brothers plead guilty in listeria outbreak that killed 33

By Tom McGhee
The Denver Post

POSTED: 10/22/2013 11:31:59 AM MDT | UPDATED: ABOUT 8 HOURS AGO | 6 COMMENTS
Multistate Outbreak of Shiga toxin-producing *Escherichia coli* O121 Infections Linked to Farm Rich Brand Frozen Food Products (Final Update)

Posted May 30, 2013 01:00 PM ET

This particular outbreak appears to be over. However, *E. coli* is still an important cause of human illness in the United States. More information about *E. coli*, and steps people can take to reduce their risk of infection, can be found on the [CDC E. coli Web Page](http://www.cdc.gov/ecoli/2013/O121-03-13/index.html).

**Highlights**

- Read the Advice to Consumers »

- A total of 35 persons infected with the outbreak strain of Shiga toxin-producing *Escherichia coli* O121 (STEC O121) were reported from 19 states.
  - 82% of ill persons were 21 years of age or younger.

**At a Glance:**

- Case Count: **35**
- States: **19**
- Deaths: 0
- Hospitalizations: **9**
- Recall: **Yes**

http://www.cdc.gov/ecoli/2013/O121-03-13/index.html
Among the Major Concerns

E. coli
Salmonella
Campylobacter
Reports of Selected *E. coli* Outbreak Investigations

2013

- Multistate Outbreak of Shiga toxin-producing *Escherichia coli* O121 Infections Linked to Farm Rich Brand Frozen Food Products

2012

- Multistate Outbreak of Shiga Toxin-producing *Escherichia coli* O157:H7 Infections Linked to Organic Spinach and Spring Mix Blend
- Multistate Outbreak of Shiga Toxin-producing *Escherichia coli* O145 Infections
- Multistate Outbreak of Shiga toxin-producing *Escherichia coli* O26 Infections Linked to Raw Clover Sprouts at Jimmy John’s Restaurants

2011

- Multistate Outbreak of *E. coli* O157:H7 Infections Linked to Romaine Lettuce
- Outbreak of Shiga toxin-producing *E. coli* O104 (STEC O104:H4) Infections Associated with Travel to Germany
- Multistate Outbreak of *E. coli* O157:H7 Infections Associated with Lebanon Bologna
- Multistate Outbreak of *E. coli* O157:H7 Infections Associated with In-shell Hazelnuts

2010

- Bravo Farms Cheeses - *E. coli* O157:H7
- Shredded Romaine Lettuce from a Single Processing Facility - *E. coli* O145
- Infections Associated with Beef from National Steak and Poultry - *E. coli* O157:H7

2009

- Beef from Fairbank Farms - *E. coli* O157:H7
- Beef from JBS Swift Beef Company - *E. coli* O157:H7
- Prepackaged Cookie Dough - *E. coli* O157:H7

2008

- Beef from Kroger/Nebraska Ltd - *E. coli* O157:H7

2007

- Totino's/Jeno's Pizza - *E. coli* O157:H7
- Topp's Ground Beef Patties - *E. coli* O157:H7
U.S. Foodborne Illness

48 million Americans sickened each year
128,000 hospitalized
3,000 die

http://www.cdc.gov/foodborneburden/index.html
China Food-Safety Woes Soar
“Foodborne diseases remain responsible for high levels of morbidity and mortality in the general population, but particularly for at-risk groups, such as infants and young, children, the elderly and the immunocompromised.”

http://www.who.int/foodsafety/foodborne_disease/en/
Who Is Watching The Store?
Hunger, Food Insecurity

Environmental Impact of Agriculture

Obesity

Food Safety and Security
Hunger, Food Insecurity

Environmental Impact of Agriculture

Obesity

Food Safety and Security
Hunger, Food Insecurity

Obesity

Environmental Impact of Agriculture

Food Safety and Security

World Health Organization
Hunger, Food Insecurity

Environmental Impact of Agriculture

Obesity

Food Safety and Security
Hunger, Food Insecurity

Environmental Impact of Agriculture

Obesity

Food Safety and Security
The Problem

- Hunger, Food Insecurity
- Obesity
- Environmental Impact of Agriculture
- Food Safety and Security
- Disconnected Uncoordinated World Food Policy
Examples of Conflicts

- Food industry growth vs public health
- Green Revolution vs. the environment
- SNAP benefits and soda
- Corn to ethanol supports
- Development and nutrition
The Bridge at the Edge of the World
Capitalism, the Environment, and Crossing from Crisis to Sustainability
Association between economic growth and early childhood undernutrition: evidence from 121 Demographic and Health Surveys from 36 low-income and middle-income countries

Sebastian Vollmer, Kenneth Harttgen, Malavika A Subramanyam, Jocelyn Finlay, Stephan Klasen, S V Subramanian
A Booming Economy Doesn't Save Children From Malnutrition

A World Food Institute
A World Food Institute At Duke?