“The current U.S. food system works at odds with the health of children.”

An *industrialized* food system

*Industrialized agriculture.* Defn: The farm as a factory with “outputs” (corn, soy, animals) and “inputs”

Focus on production, yield

A food environment of bountiful low-priced, high-profit convenience food

An *industrialized* food system

Focus on production, yield

- Intensive use of: fossil fuels, antibiotics, heavy metals, farm chemicals
- Pollution, contamination risks


Source: David Wallinga, MD, IATP
Yield promoting antibiotics, arsenic in animal feed

“80% of all antibacterial drugs in the United States are being distributed for use on animals, not to protect human health.”

Only a small fraction are used to treat sick animals with diagnosed disease

Source: FDA, December 2010

Source: David Wallinga, MD, IATP
Industrialization

Food as source of toxic mixtures

Pesticides (DDT, Organophosphates)
Heavy metals (mercury, arsenic)
Plastic additives (bisphenol A)
Toxic organo-halogens
- PCBs
- Dioxins (90%)
- Brominated flame retardants?
- Perchlorate?
- Perfluorocarbons?

Synthetic food dyes

Orange = intentional use
Blue = contaminants

Neurotoxins & hormone disruptors

Source: David Wallinga, MD, IATP
Understanding industrialization

Intensive packaging, processing

Plastic incineration recycling pollutants into the food chain

Toxic chemicals leached into food from packages

Food pollutants from manufacturing [100 tons of BPA air released annually]

3000 FDA-approved food additives, “generally recognized as safe”

Source: David Wallinga, MD, IATP
Understanding industrialization

Cellular mechanisms

Nutritional/Environmental Factors

Altered Pathways

Inflammation
Oxidative Stress
Disrupted Insulin Signaling

Mechanisms of Action

Chronic Disease

(Courtesy of Ted Schettler, MD)

HealthyFoodAction.org

Institute for Agriculture and Trade Policy
Insulin signaling

• ↑ blood sugar
• ↑ artery disease
• ↑ triglycerides

Industrialization

A food system awash in inflammation promoting compounds

- Omega-6 / omega 3 fatty acids
- High glycemic carbohydrates
- Saturated fat

Source: David Wallinga, MD, IATP
Oxidative Stress

INTERNAL
- Mitochondria
- Activated Immune Cells (phagocytes)

EXTERNAL
- Tobacco smoke
- Industrial pollutants
- Ozone, particulate
- Pesticides
- Radiation
- Anesthetics
- Organic solvents
- Some pharmaceuticals
- High oxygen
- Food*

Sufficient antioxidants keep this process in check.
New thinking
Chemicals, food and epigenetics – what’s that?

http://dels-old.nas.edu/envirohealth/newsletters/newsletter1_epigenetics.pdf

National Academies Workshop, July 30-31, 2009:
Use of Emerging Science and Technologies to Explore Epigenetic Mechanisms Underlying the Developmental Basis for Disease

Linda Birnbaum, Dir. NIEHS:

New findings suggest chemicals in our environment and in our food can alter genes, and “can lead to increased susceptibility to disease” such as to diabetes, asthma, cancer and obesity
“There is a huge potential impact from these exposures, partly because the changes may be inherited across generations. You may be affected by what your mother and grandmother were exposed to during pregnancy,” Birnbaum said.
Healthy Food, Healthy Farms Webinars

Issues

**A healthy 2012 Farm Bill**
American’s health should be at the center of the next federal Farm Bill, the country’s largest and most influential piece of food policy. Re-negotiated every five years, the Farm Bill is up for approval in 2012 – but the debate has started already. Today’s Farm Bill fails farmers and consumers alike. If our nation hopes for a new food system that is healthier and more sustainable, it can’t happen without a Healthy Farm Bill. Healthy Food Action will pinpoint where health professional voices can make a difference.

**Banning arsenic from meat**
Of the nearly 9 billion chickens raised in the U.S. each year, most are fed arsenic compounds. This practice can leave arsenic residues in meat, in water and in the broader environment. Arsenic feed additives were never approved in Europe, and pose unnecessary health risks to Americans, as arsenic is, well, arsenic.