Section E

The Role of Food Animal Production
The Connection Between Livestock and Crops

- Only 1/32 of the earth’s surface is suitable for food production

- Meat production is an inefficient use of resources: grain, land, water

- Meat production accounts for ...
  - 70% of all agricultural land
  - 30% of the planet’s land surface
  - 40% of the world’s grain is grown for livestock feed

Sources: American Farmland Trust; Worldwatch; National Corn Growers Association; FAO.
The Connection Between Livestock and Crops

- 7% of global water use is to grow feed grains for livestock

- 70% of herbicide and 37% of insecticide use in US agriculture can be attributed to the livestock industry in the form of corn and soy feed

- About **half** of the corn grown in the US is used as animal feed vs. less than 1% for direct human consumption, such as sweet corn (i.e., corn on the cob)

Sources: American Farmland Trust; Worldwatch; National Corn Growers Association; FAO.
Increasing Grain Consumption

Grain Stocks Continue To Shrink, Despite Record Production

“… steadily rising consumption due to population growth and expanding livestock sectors will again outstrip production”


Grain: World markets and trade.
Grain Imports Rise as Livestock Production Rises

“Growth in coarse grain imports is strongly linked to expansion of livestock production in regions unable to meet their own feed needs”
Increasing Competition for Crop Resources

Feed and residual

*Feed, seed, and industrial less ethanol.

What Is Industrial Food Animal Production?

- **Vertical integration**
  - One corporation controls nearly every aspect of production and processing

- Animals grown in confined animal feeding operations (CAFOs)

- Animal feed and conditions strictly controlled by corporation, not by the “grower”

- Contracts often restrict rights of “growers”

- Grower has to deal with waste and losses
Livestock outnumber humans in the US (5:1)
- 5 tons of animal waste for each person

In 2002 ...
- 10 billion animals in the US were slaughtered for food
- 50 billion worldwide
  ▶ 93% chickens (46 billion)

In the US
- 35 million cattle
- 100 million hogs
- More than 95% chickens and turkeys
  ▶ 1 million broilers killed each hour
CAFO Effects on Public Health

- Concentrated, high-speed meat production leads to greater risk from foodborne pathogens, some of them newly emerging

- Excessive antibiotic use in animal agriculture may create resistant strains of microbes in humans

- Persistent organic pollutants (dioxins, furans, polychlorinated bromides) enter the food chain through the diets of food animals

- Communities are usually not involved in decisions to build or expand CAFOs

- Health threats from CAFOs magnified in those most closely and regularly exposed

- Workers, their families, and community members have higher than average rates of injuries and various illnesses
Livestock and Climate Change

- Livestock are responsible for 18% of greenhouse gas (GHG) emissions (FAO, *Livestock’s Long Shadow*, 2006)
  - Greater contribution than transportation

- 37% of emissions of methane
  - More than 20-times the global warming potential of CO\textsubscript{2}

- 65% of emissions of nitrous oxide
  - 286-times the global warming potential of CO\textsubscript{2}
  - Stays in the atmosphere for 114 years
  - Nitrogen-based fertilizers are a top source
    - 51% of US nitrogen is used for fertilizers for animal feed/pasture
Climate Change and Agricultural Productivity

Projected changes in agricultural productivity 2080 due to climate change, incorporating the effects of carbon fertilization.

Legend:
-50% to 0% decrease
-15% to +15% decrease
+15% to +35% increase
No data
Agricultural Trends to 2035

- From agricultural expert Dennis Keeney*
  - Global climate disruption accelerates
  - Grain yields continue to increase, but more slowly
  - New markets develop, particularly for biofuels
  - More pressure worldwide on food availability, cost, because of the following:
    - Rising population
    - Increasing living standards
    - Droughts and floods in grain-producing regions
    - Non-food uses (biofuels)

*Dennis Keeney, PhD, MS (Founding Director, Aldo Leopold Center, distinguished soil scientist, and CLF Visiting Scholar)
Precautionary Principle

- Rio Declaration on Environment and Development, 1992
  - Principle 15: “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities”

- Wingspread conference, 1998
  - “When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically.”
  - “In this context the proponent of an activity, rather than the public, should bear the burden of proof.”
Small holder farming and economically viable agricultural economies

- 500 million smallholder farms worldwide support 2 billion people
- GDP growth originating in agriculture is at least twice as effective in reducing poverty as GDP growth originating outside agriculture
- Based on agroecology with a diversity of crops and livestock
- “Sustainable intensification”—higher yields with fewer resources
- Reinvestment by governments, NGOs, private sector
  - Technology should be free, based on best-practices and science
- Invest in women farmers

Feeding a Growing World Population in a Livable Future

- Improvements in infrastructure: roads to access markets, storage and refrigeration, surplus

- Global shift in dietary consumption patterns
  - Decreased meat (grain) consumption in high-income countries
  - Greater access to sustainably produced iron- and protein-rich animal food sources in the least developed countries

Resilience, a New Word for “Sustainability?”

1. The power or ability to return to the original form, position, etc., after being bent, compressed, or stretched; elasticity

2. Ability to recover readily from illness, depression, adversity, or the like; buoyancy

“The whole problem of health, in soil, plant, animal, and man is one great subject”

— Sir Albert Howard, 1939