











# Solar irrigation and heating

- 750,000g pond gravity fed from rain catchment tanks
- Photovoltaic panels energize pump to irrigate crops
- Hydronic panels pre-heat water













07/14/2003

# Markets

- Farm household
- Commodity markets
- Niche-markets
- Community supported agriculture (CSA)



06/20/2003



07/04/2003



# Education

- Since 1994 trained 45 interns
- Since 2001 Farm-to-School program
  - K-12 classes in ecological food production and sustainable living
  - Farm tours, workshops, lectures



# Economics of small-scale, self-sufficient production

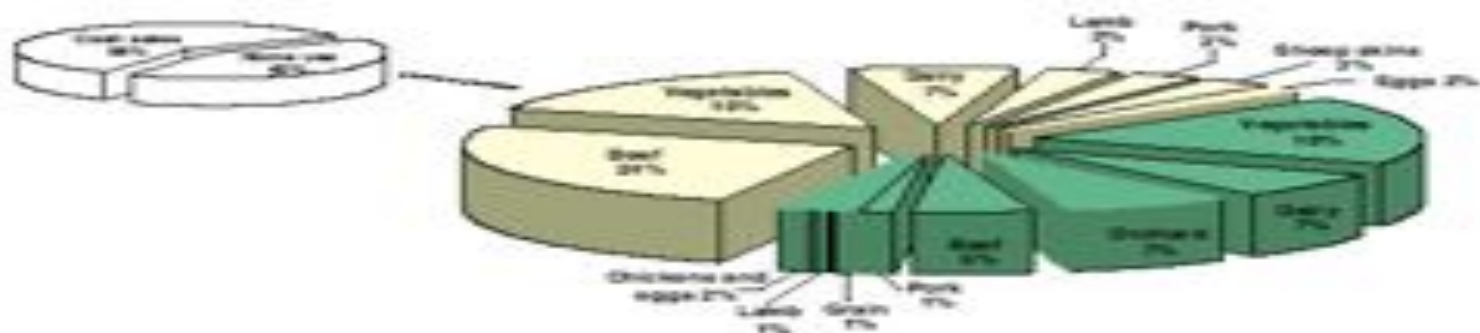
- Sales: beef, pork, lamb, vegetables, fruit, eggs, skins

- On-farm consumption: food, feed, fertilizer, grain, hay, firewood, water

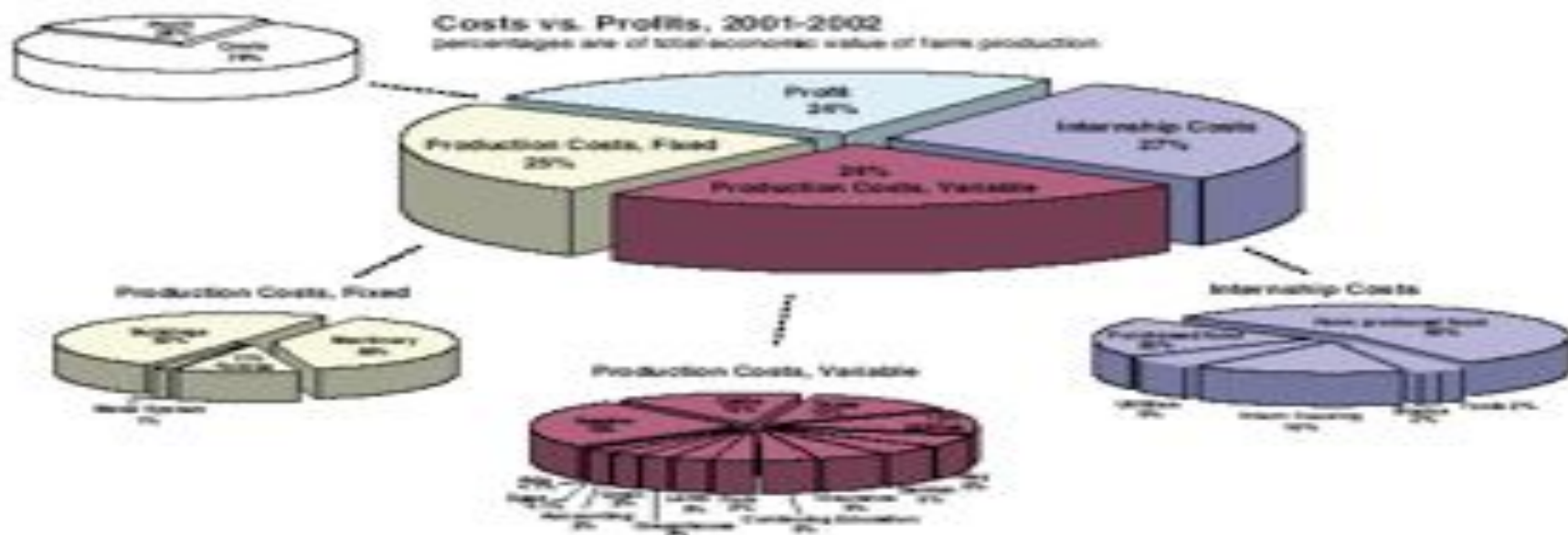
- Penny saved = penny earned: fuel, electricity, machines, services, wages, health care, supplements, transportation, entertainment

## Economic Data for S&S Homestead Farm and S&S Center for Sustainable Agriculture (a non-profit corporation)

**Economic Returns to S&S Homestead Farms, 2001-2002**  
percentages are of total economic value of farm production



**Costs vs. Profits, 2001-2002**  
percentages are of total economic value of farm production





# Ecological vs. organic production

- Organic production = non-synthetic inputs, non-GMO, no irradiation
- Ecological production = organic + non-industrial

## Naylor Farm

Industrial

Annual Species

Monoculture

Fossil Energy

Global Market

Specialized

Mechanical

Imported Fertility

Myriad Inputs

## Polyface Farm

Pastoral

Perennial Species

Polyculture

Solar Energy

Local Markets

Diversified

Biological

Local fertility

Chicken Feed

Michael Pollan, *The Omnivore's Dilemma*, 2006, 130-1.

# Industrial Paradigm

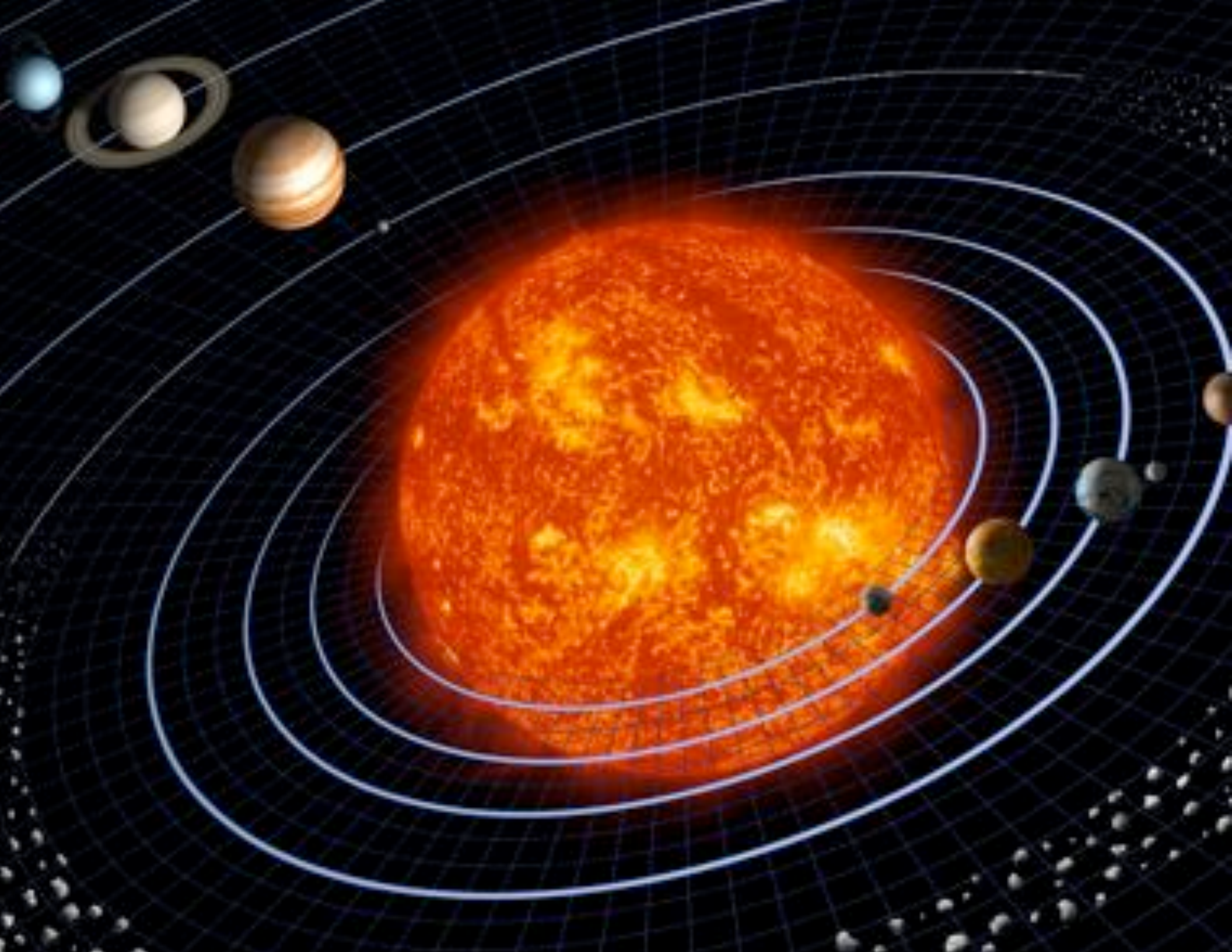
- Food and fiber production as a manufacturing process
- Functions like a machine converting inputs into outputs
- Inputs and outputs in global supply chain
- Economic orientation: reduce product unit cost through mechanization, specialization and labor reduction
- Self-sufficiency not a primary objective
- Farm programs dictated by market demands
- Environmental impacts externalized

# Ecological Paradigm

- Food and fiber production as biological and social process
- Functions like an organism converting solar energy into outputs
- Inputs and outputs in local supply chain
- Economic orientation: viability through efficient labor, synergy of enterprises, and self-capitalization
- Self-sufficiency *is* a primary objective
- Farm programs dictated by focus on farm health
- Environmental impacts internalized

# Local ecology, and global

- Local ecology: farm environment, community, landscape
- Global ecology: interdependence of all life, energies, human actions, climate
- Ecological production benefits both, local and global ecology



# Ecology on the farm: A baker's dozen of suggestions

1. Let the sun grow the feeds for your animals instead of buying them
2. Cycle nutrients to feed the soil to grow the feed
3. Catch rainwater and use the power of the sun to move it around the farm
4. Use rotational grazing to feed animals, fertilize and groom fields and pastures
5. Use naturalized, perennial, instead of high-input, annual forages

6. Save fossil fuel by minimizing farm mechanization
7. Eliminate use of chemicals; use biological processes
8. Control weeds by soil health management
9. Control pests by homeostasis and biodynamic preparations
10. Feed livestock for health rather than maximum production
11. Use your own labor to save money and improve stamina, health, fitness and joy of life
12. Provide for the farm household first, the rest to strengthen community food security, health, and economic viability
13. Integrate farm with surrounding landscape and beyond

