The Sustainability of Organic Dairy Production in the U.S.

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What is a Sustainable Farming System?

Sustainable Farming Systems

1. Agriculture that is socially just, humane, economically viable, and environmentally sound
2. A way of producing a stable food supply in perpetuity without degrading the natural resources that support production processes
3. A system of agriculture that promotes the well-being of natural and human resources through emphasis on environmental, economic and social factors

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Sustainable Production

- Profitable
- Environmentally benign
- Protects the health and well being of the animals

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Is Organic Dairy Production in the U.S. Sustainable?

- Profitability varies from year to year
- There are long-term environmental issues that need to be addressed
- Generally the health and well being of the animals is improved through well-managed grazing and lower production

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Is Dairy Production in the U.S. Sustainable?

- Profitability varies considerably from year to year
- Long-term environmental issues facing the industry are growing
- Health and well being of the animals varies considerably among farms

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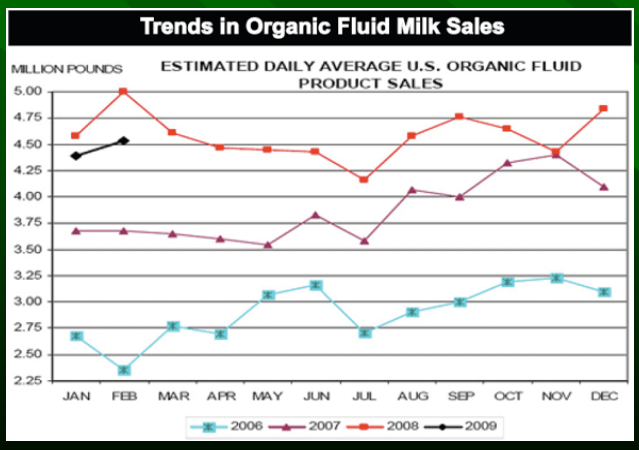
Is Organic Dairy Production more Sustainable than Conventional Production?

- Profitability
- Long-term environmental issues
- Health and well being of the animals

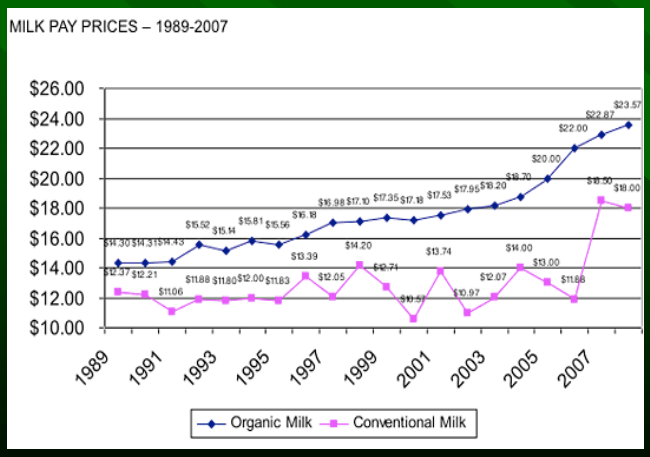
Organic Milk Consumption

Organic milk accounted for over 6% of fluid milk sales in 2008, up from 1.7% in 2006



Milk Prices

Retail organic milk price is 98% higher than non-organic (national average)



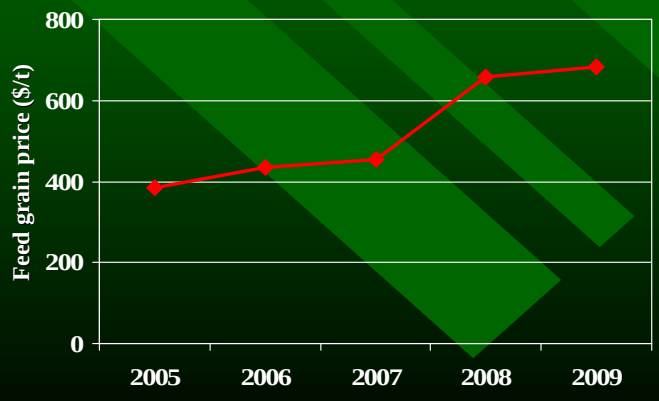
Farm Demographics (VT, ME)

	2004 (n=30)	2005 (n=44)	2006 (n=41)	2007 (n=28)
Milk price	$22.97	$24.94	$28.84	$29.35
Milk /cow	14,060	12,619	13,455	13,152
Herd size	49	56	63	66
Milk/farm	689,000	740,100	852,800	886,627
Net revenue	$28,122	$33,409	$63,970	$53,522

Parsons and Wang, 2009

What is happening?

- Net revenue is declining in recent years
- Production expenses are catching up to milk prices



Organic versus Conventional
(New England Dairy Farms)

- 2004, Conventional more profitable
- 2005, About the same
- 2006, Definitely organic!
- 2007, About the same??
- 2009, No data, both are struggling

Parsons and Wang, 2009

Current Situation

- 10-12% surplus of organic milk
- Growth of fluid organic milk sales is slowing
- Economic recession is reducing the demand for "premium" products
- "Discount center" organic milk now on the market
- "rBST-free" milk now available at a lower cost
- Processors are reducing prices, dropping farms, and reducing milk purchases (7%)

Is Organic Dairy Farming Profitable?

- Varies considerably among farms (dependent upon the production strategy)
  - Greater use and better management of pasture
  - Minimize the purchase of feed
- Generally a more viable alternative for smaller farms

A Comparison of Production Systems

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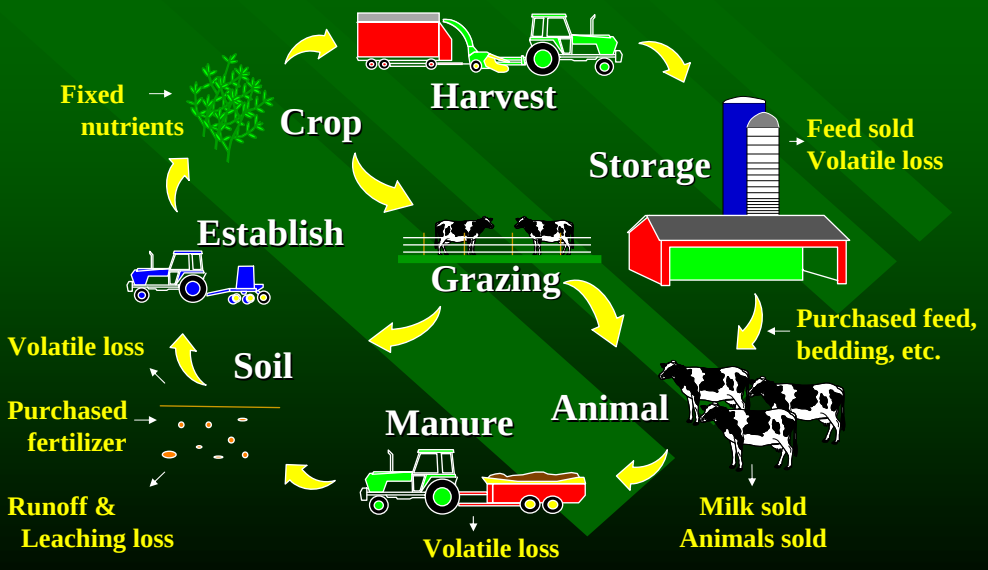
Integrated Farm System Model



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Farm Performance

- Crop yields and quality
- Feeds produced
- Feeds bought and sold
- Milk and animals produced
- Manure produced
- Labor, fuel and equipment use

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Economics

- Annual production costs (crop production, harvest, storage, feeding, etc.)
- Annual income from milk, animals, and crops sold
- Net return or profitability

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Production Systems

Organic grass: 100 small framed Holstein/Jersey cows maintained outdoors, annual milk production of 5,670 kg/cow (4% fat), 100 ha perennial grassland, animals fed high-forage diets, spring calving cycle

Organic Crop: 100 medium-framed Holstein cows housed in free stall barns plus replacement heifers housed in bedded pack barn, annual milk production of 7,940 kg/cow (3.5%), 70 ha of cropland (alfalfa, corn, wheat, soybean) and 30 ha of perennial grassland that is rotationally grazed during the growing season, animals fed high-forage diets, manure stored and spread in spring and fall

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Production Systems

Conventional grazing: 100 medium-framed Holstein cows housed in free stall barns plus replacement heifers housed in bedded pack barn, annual milk production of 8,165 kg/cow (3.5%), 60 ha of cropland (alfalfa, corn) and 40 ha of perennial grassland that is rotationally grazed and harvested, animals fed high-forage diets, manure stored and spread in spring and fall

Conventional confinement: 100 large-frame Holstein cows plus replacement heifers housed in free stall barns, annual milk production of 10,000 kg/cow, 100 ha of cropland (alfalfa, corn), animals fed high-concentrate diets, manure stored and spread in spring and fall

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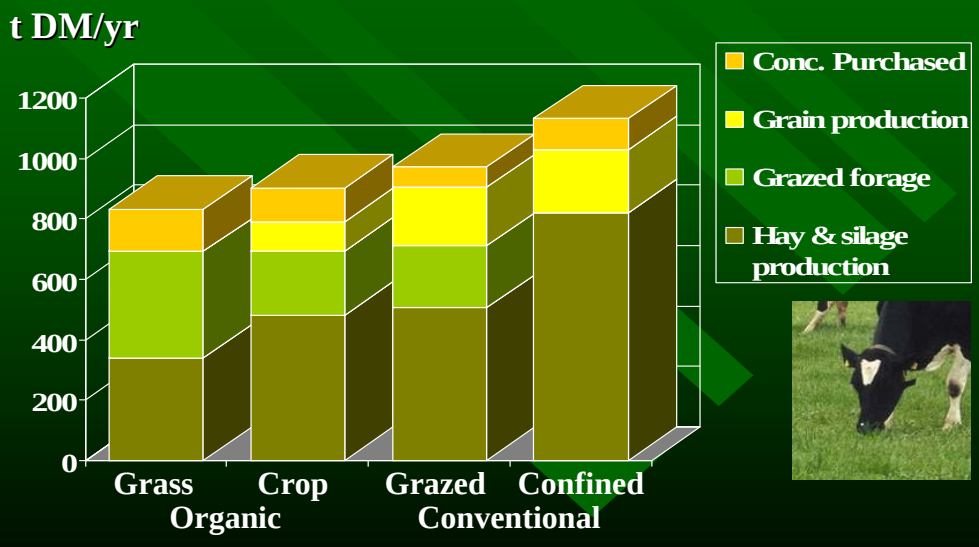
Feed Use



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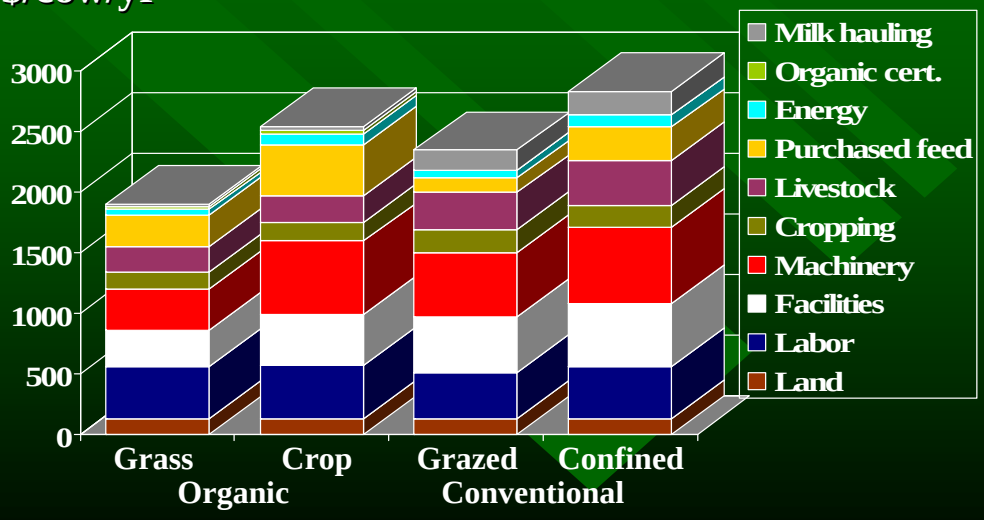
Production Costs



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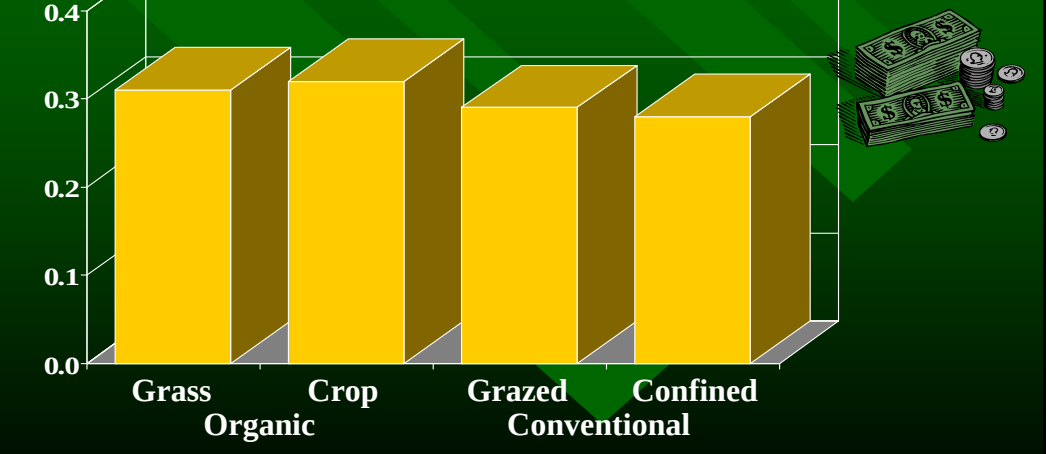
Production Cost



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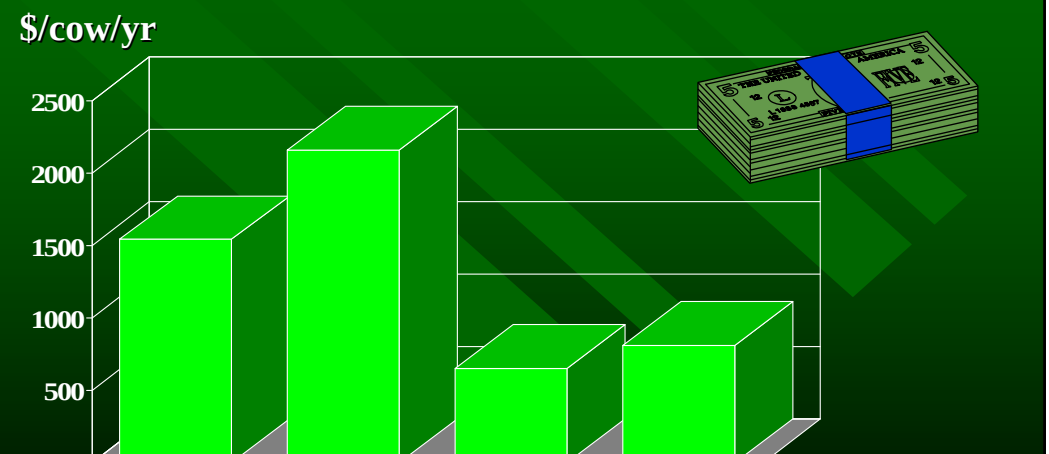
Net Return



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Economic Summary

- Organic production provides a more stable milk price and farm income
- Organic production does not guarantee greater profit, particularly for small farms
- Farm sizes of 100 cows or more utilizing well managed rotational grazing offer greater profitability
- The current economic recession appears to be reducing the demand for organic dairy products

What about the Environmental Impact?

Environmental Issues

Water Quality

- Leaching to ground water (nitrates)
- Surface runoff (sediment & phosphorus)

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Environmental Issues

Air Quality

- Hazardous compounds (ammonia)
- Greenhouse gases

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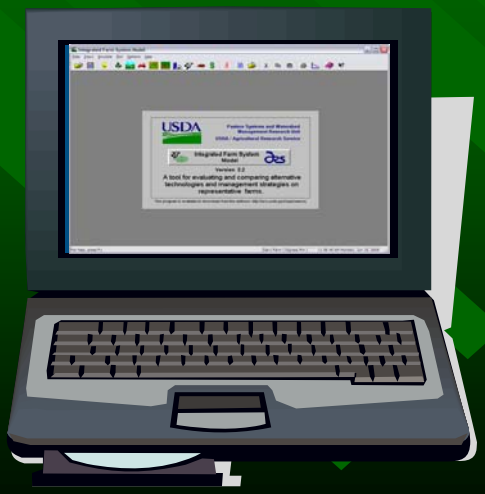
Integrated Farm System Model



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Environmental Impact

- Volatile N (ammonia) loss
- Denitrification N loss
- Leaching N (nitrate) loss
- Erosion of sediment

- Soluble and sediment P runoff loss
- Greenhouse gas emissions and carbon footprint
- Farm balance of N, P, K and C

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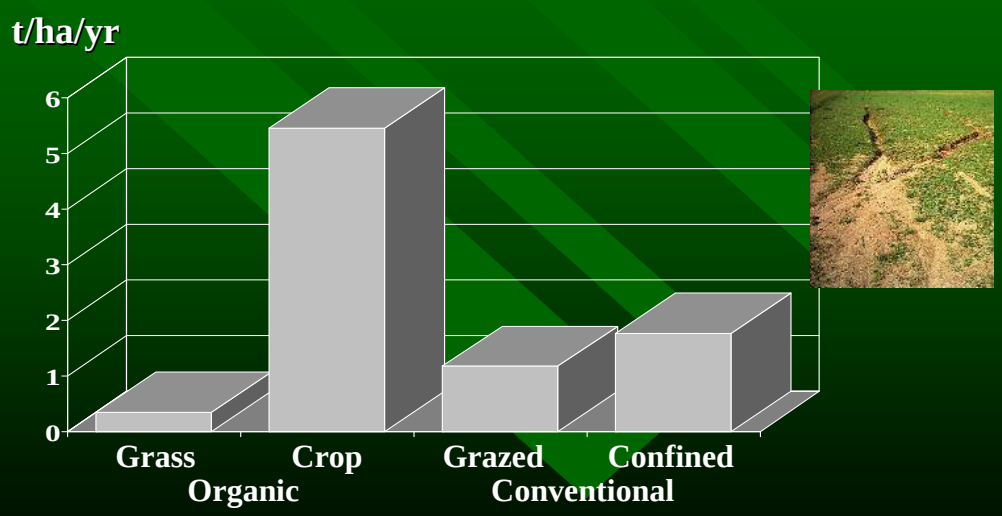
Erosion Loss



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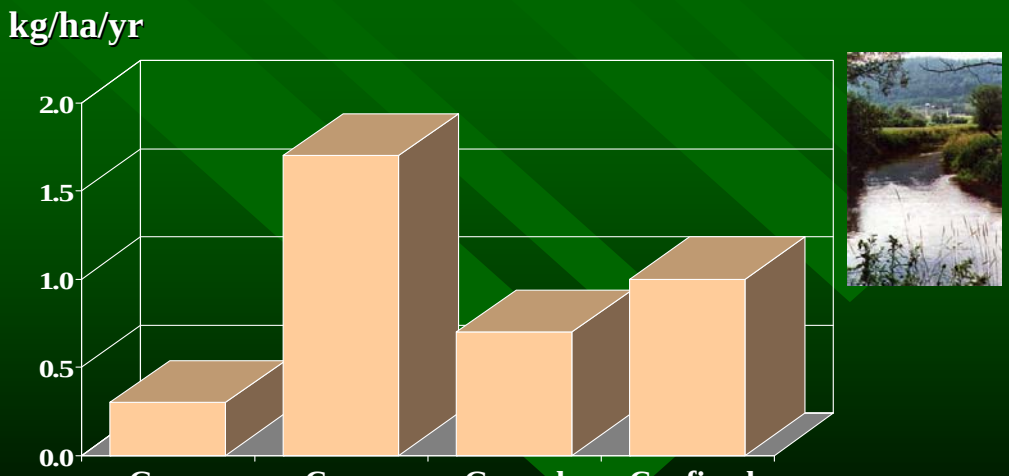
Phosphorus Loss



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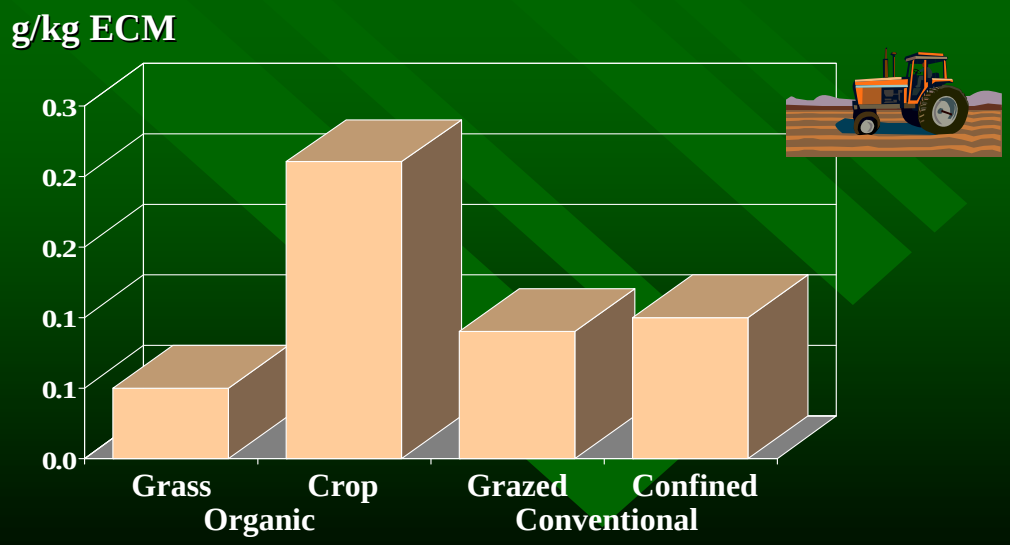
Phosphorus Footprint



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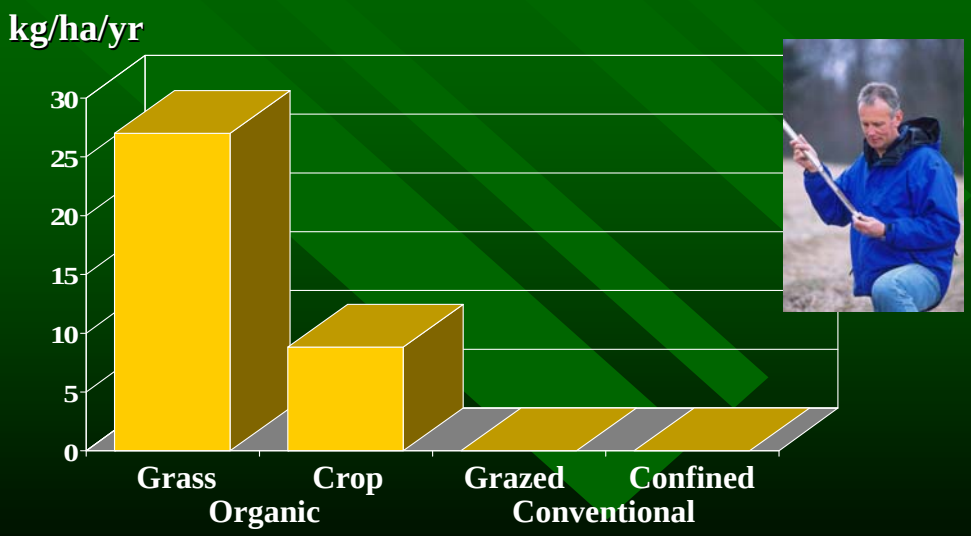
Phosphorus Accumulation



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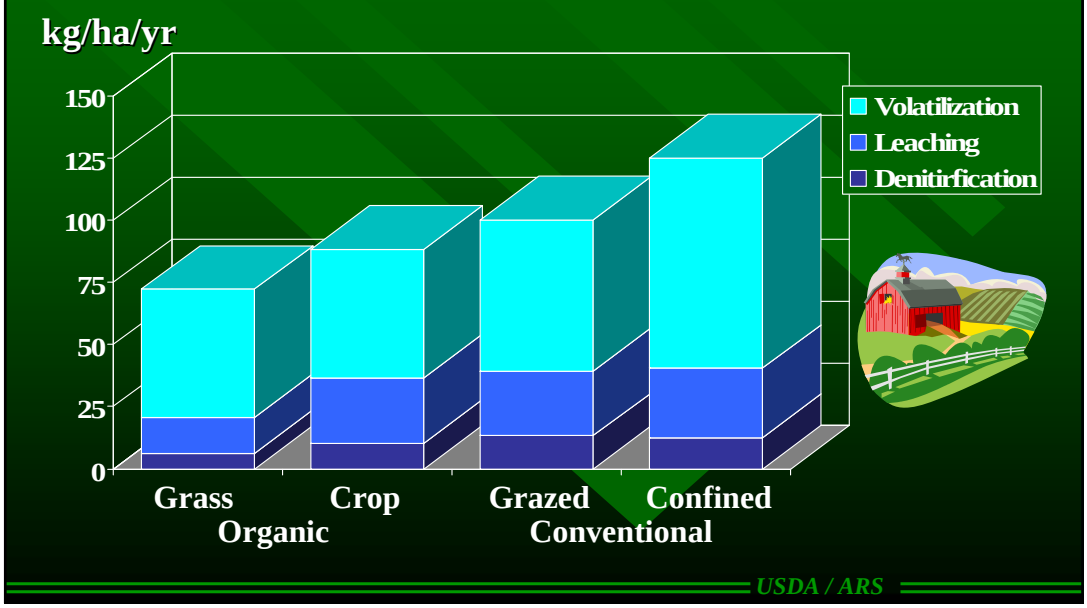
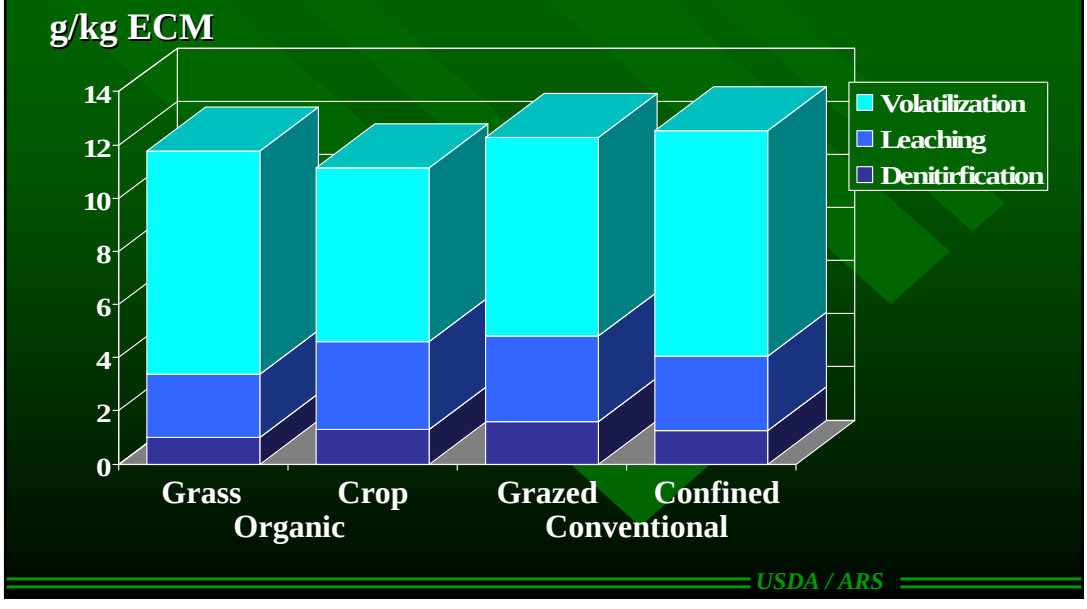
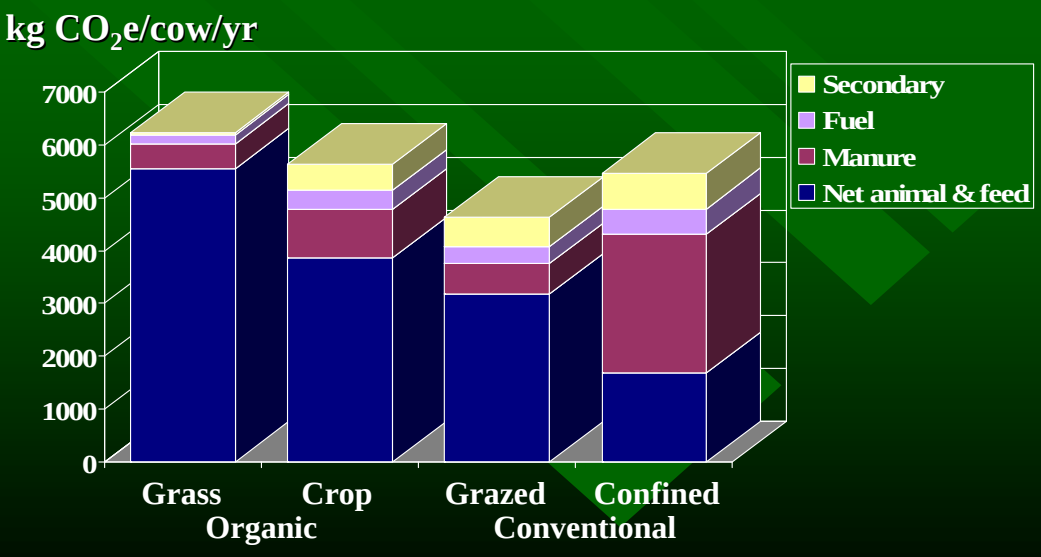
Nitrogen Loss



Nitrogen Footprint



Greenhouse Gas Emissions



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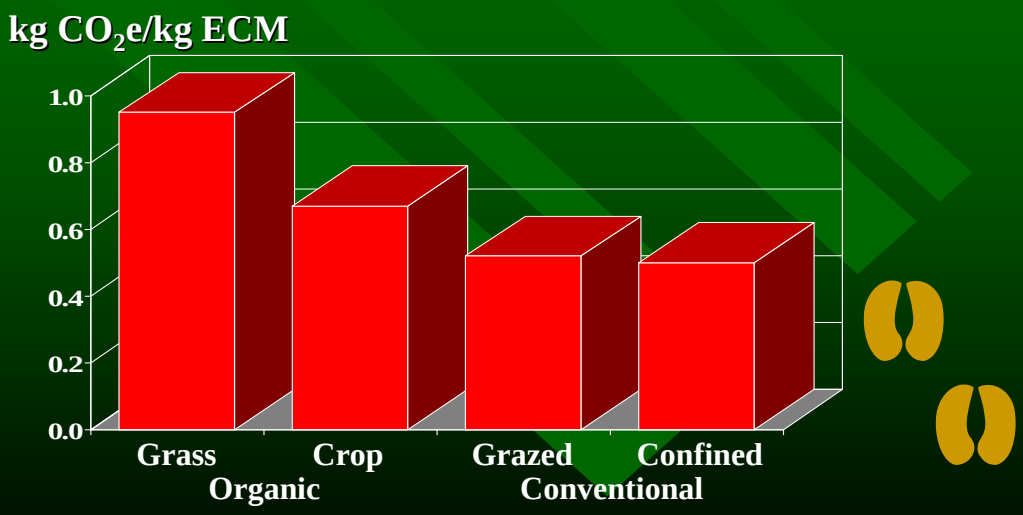
Carbon Footprint



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Environmental Summary

- Erosion and phosphorus loss can be a problem with cropping systems that heavily utilize tillage for weed control
- Soil phosphorus accumulation can be a problem when poultry manure is used as a nitrogen fertilizer
- Carbon footprint may be greater due to lower milk production and use of organic fertilizers (poultry manure)

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Environmental Solutions

- Develop reduced tillage systems for weed control
- Develop/obtain an inexpensive organic nitrogen fertilizer
- Increase milk production per animal

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What about animal health and well being?

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Animal Welfare

Grass-based organic dairy production systems generally maintain healthier animals

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But What is an Organic Dairy Farm?

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Organic Pasture Standard

- Currently reads “access to pasture”
- Proposed changes suggest a minimum “30% DMI from pasture for at least 120 days per year”
- Lactation is not a stage of production that exempts pasture
- Final USDA ruling due out later this year
- This may impact our larger organic dairies

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Benefits of Pasture

- Lameness: Outside access decreases risk (70% or more)
- Milk quality: Risk of clinical mastitis and somatic cell counts decrease with grazing
- Reproduction: Fertility may increase on pasture (10%)
- Longevity: Culling rate is decreased (25%)

L.L. Tikofsky, DVM, Cornell University, 2006

Benefits of Pasture

- Veterinary costs: Healthier animals on pasture reduce costs (20% or more)
- Young stock health: Mortality may decrease in pastured animals (40%)
- Behavior: Cows on pasture rest for longer periods and exhibit less restlessness

L.L. Tikofsky, DVM, Cornell University, 2006

Potential Concerns

- Fly control
- Internal parasites
- Inclement weather
- Inadequate nutrition
- Improper or inadequate medical care

L.L. Tikofsky, DVM, Cornell University, 2006

Is Organic Dairy Production in the U.S. Sustainable?

Economically: Depends upon the future market, which currently appears uncertain

Environmentally: Fewer resource and management options creates a greater challenge

Animal health and well being: Use of well-managed rotational grazing improves animal care

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