



# Sustainable Animal Agriculture

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# What this lecture will do

- Provide context for the impetus for sustainable production
- Provide basic concepts related to sustainability and sustainable animal agriculture
- Provide understanding of the complexity of the main ethical and empirical issues regarding sustainable animal agriculture through a specific example

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# Impetus for sustainable production

- Not a new concept but new pressures
  - World population expected to increase to 9.2 billion people in 2050
  - UN projects world food production needs to increase up to 100%; suggests focus on greener methods to sustain population
  - Rising income levels in developing nations likely to cause dietary shifts to include more protein ⇒ increased energy demands ⇒ major stress on natural resources

EU Standing Committee on Agriculture  
Research (SCAR) 2011

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# Impetus for sustainable food production

- Potential depletion of fossil hydrocarbons likely to increase demand for biofuels and industrial materials, which may compete with food for biomass
- Simultaneous concerns about climate change



EU Standing Committee on  
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# Impetus for sustainable food production

- Consumer/citizen desire for value added products
- May feel disempowered to change food systems not aligned with values
  - May try to drive markets with voting and purchasing power
  - Escalated market demand for attributes such as “organic,” “free-range,” “humane,” “low carbon footprint,” “sustainable”



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# What is sustainable animal agriculture?

- Holistic or systems thinking (and not just at the individual level or about individuals)
- Reduce resource-intensive consumption and waste, and improve governance, efficiency, and resilience of the food system
- Consider sustainability of the food system: including production, processing, storage, dissemination, consumption, waste, recovery-reuse sectors, regulation
- Focus on interrelationships between:
  - a. People (reflects social values)
  - b. Planet (environmentally sound)
  - c. Profit (good business/economic practices)
- Interconnection between these components should be ‘healthy’

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# Sustainable animal agriculture

- Is premised on the moral idea that we should:
  - a. “[Meet] the needs of the present generation without compromising the ability of future generations to meet their own needs.”
    - Brundtland Report, UN World Commission on Environment and Development. Our Common Future, 1987
  - b. Address the general obligation to respect and protect the rights of future generations
  - c. Evaluate our current activities in terms of its predicted impact on future populations of humans, animals and plant species, ecosystems and biodiversity

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# Unsustainable animal agriculture

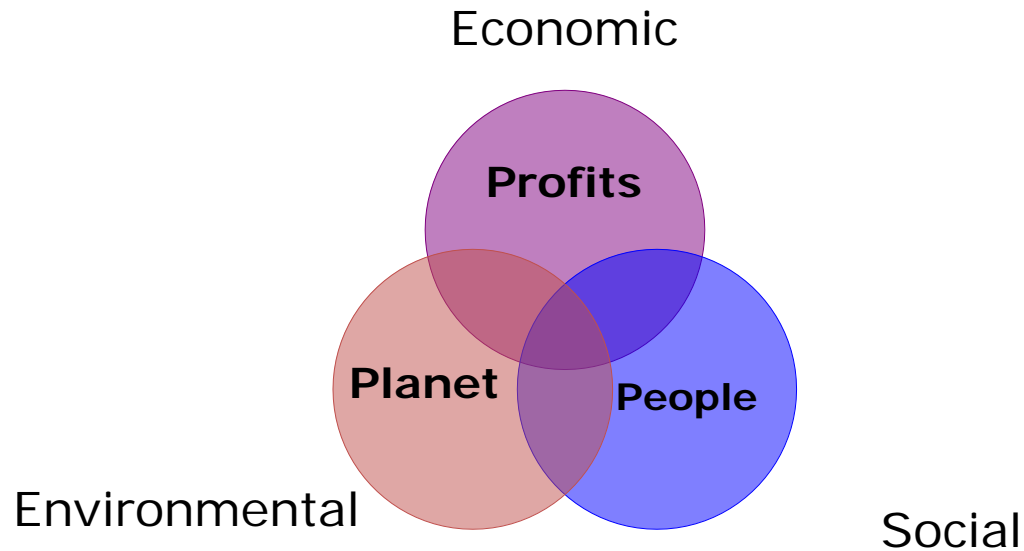
Is highlighted by:

- a. Resource depletion/loss to level that is unacceptable and prevents system function
- b. Harm (e.g., unsafe/unhealthy) to humans, animals and plants
- c. Wasteful and pollution jeopardizes others welfare
- d. Not produced using economically, socially, culturally and environmentally resilient methods
- e. Loss of biodiversity
- f. Poor governance/accountability

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# What is sustainable animal agriculture?



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# People

- Equity or social justice
- Good governance and policy
  - Science/knowledge transfer
- Human rights
- Health and safety (including for food producers)
- Food and nutrition security
- Product quality
- Accountability

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# Planet

- Climate change and environmental stewardship
- Control waste and pollution/resource conservation
- Animal welfare
- Energy
- Air quality
- Water
- Soil
- Biodiversity
- Land use and impact
  - Use of feeds (e.g., corn) and impacts on land use, diversion of feedstuffs and energy
  - drug residue (e.g., antibiotics)

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# Profits

- Economic resilience
- Strategic management
- Decent livelihood
- Pricing, willingness to pay and ability to pay

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# Sustainable animal agriculture

- Inspired by Aldo Leopold (*Land Ethic*) and Rachel Carson (*Silent Spring*)
- E.g., Leopold's Land Ethic urges us to rethink of ourselves as a member of a wider ecological community, beyond our human communities
- Leopold saw the land as a complex interactive system that one should get to know and work with rather than try to dominate and control
- Treating the land mainly economically dismisses the the non-economic dimensions of ecology, such as the value of the ecological health of a System
- The Land Ethic provides an ethic to supplement and guide the economic relations

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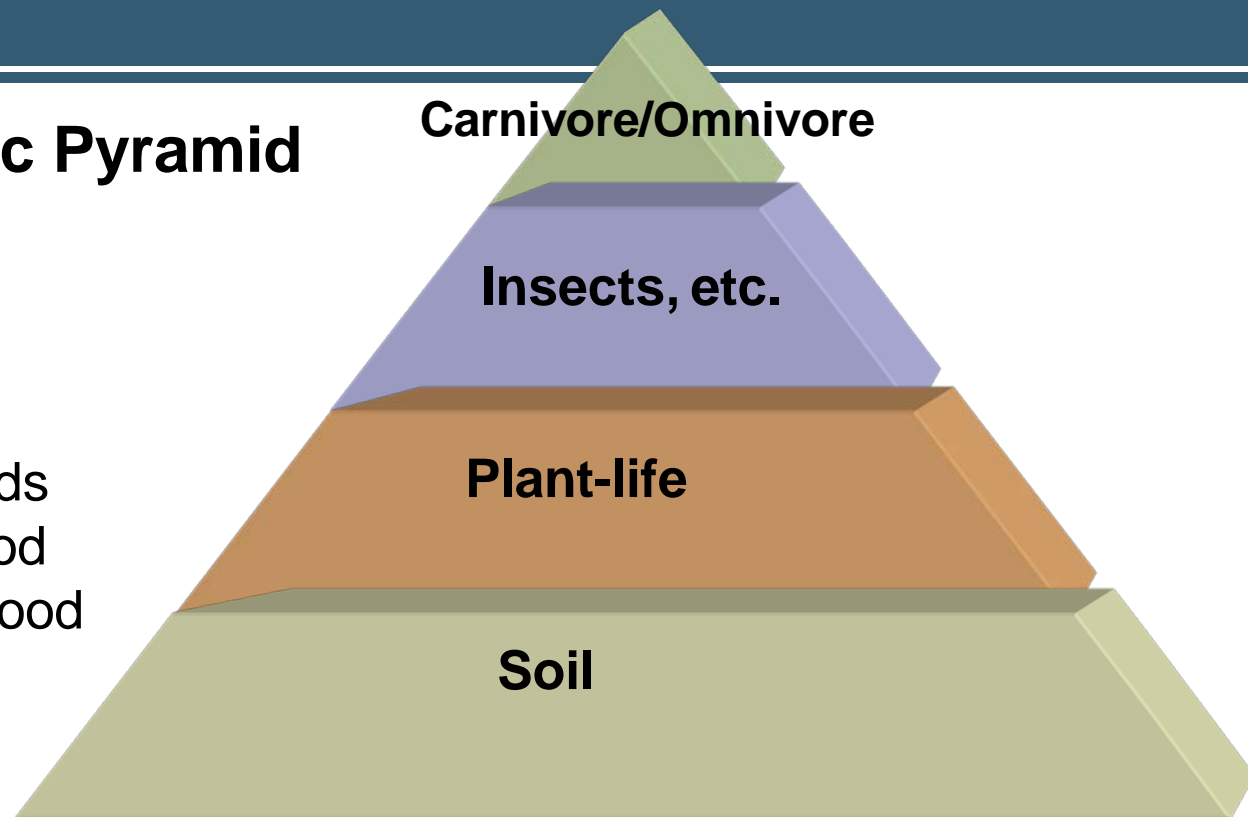
# Sustainable animal agriculture

“We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect. There is no other way for land to survive the impact of mechanized man, nor for us to reap from it the esthetic harvest it is capable, under science, of contributing to culture”  
(Leopold, 1949, pp. xviii-xix).

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# Leopold's Biotic Pyramid

Relationship of interdependence: Each successive layer depends on those below it for food and, in turn, furnishes food and services to those above.



Our role in the food system is one of an apex species. Thus, the things we eat, consume other things that, in turn, consume other things and so on. When someone eats, e.g., a cow, she depends on the health of cow. The cow in turn depends on the health of the grass and water and subsequently, the grass depends on the health of the water and soil. If humans poison the soil, they are undermining their own well-being.

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# Leopold on agriculture

- In 1945, Leopold highlighted two competing views of the farm:
  - a. As “a food-factory” and the criterion of its success is “salable products” or
  - b. As place and way to live and “the criterion of success is a harmonious balance between plants, animals, and people; between the domestic and the wild; between utility and beauty. . .” (In Callicott 1999, 278)

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# Animal welfare and sustainable animal agriculture

- Animal welfare should be a component of sustainability
- Improved animal welfare can contribute to securing environmental and economic sustainability, and overall social responsibility
- E.g., animal welfare plays central role in sustainable development

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# Animal welfare and sustainable animal agriculture

- Animal agriculture and animal welfare are inextricably linked with economic, environmental and social/ethical issues
- Current food animal production
- Impacts the environment and climate change from the emission of greenhouse gasses to the use of energy, water and land resources
- Contributes to the health and nutrition of consumers around the world
- Promotes the livelihoods of farmers, rural communities, and is a significant source of trade and GDP

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# Animal welfare and sustainable animal agriculture

- Animal welfare is a societal concern and should be considered when seeking to promote fundamental human rights, such as the right to:
  - a. Food and adequate nutrition
  - b. Livelihood
  - c. Occupational health and safety

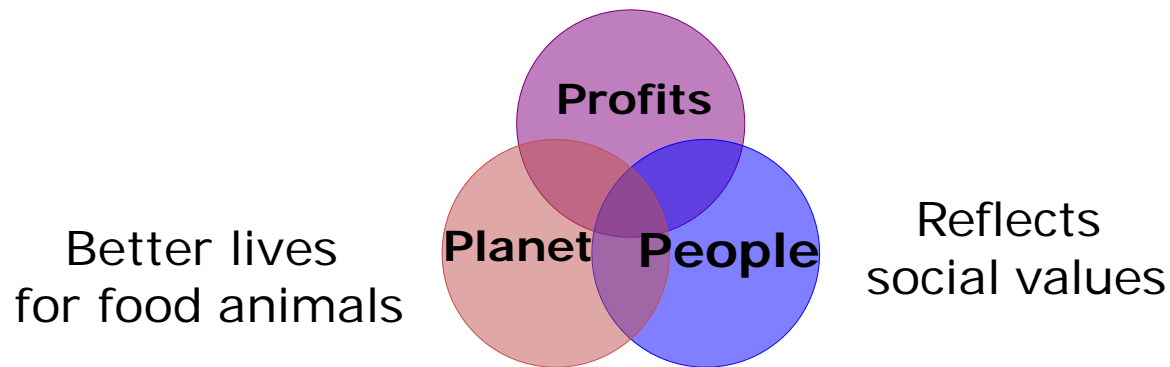
# Animal welfare and sustainable animal agriculture

- Conventional animal agriculture (large scale, corporate dominated, “intensive,” confinement CAFOs, vertical integration) has come under heavy scrutiny in recent years (Cronney and Anthony, 2010)
  - a. Consumers want cheap food but may be uninformed on production narrative
  - b. Portrayed as cruel to animals, unhealthy, unsafe, and unsustainable

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# Animal welfare and sustainable animal agriculture

Beneficial for producing sector



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# Decisions about sustainable animal production systems...

Should have embedded social and environmental justice (ethics) implications

- For example, resolving questions of what housing systems should be allowed requires addressing:
  - Animal care aspects
    - What are the impacts of system X on animals and are the benefits and harms to the animals appropriately accounted for?
    - What is acceptable quality of life for animals?

# Decisions about sustainable animal production systems...

## – Economic considerations

- Human health concerns
  - Worker health and safety
- Major environmental justice implications associated with minority laborers
  - Wages, education, health (some effects are tied to immediate working conditions) and health care access
- Human/public health
- Food safety and quality, food access (via pricing and availability) and Security
- Environmental costs and potential savings

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# Decisions about sustainable animal production systems...

- Environmental considerations (particularly as scale of agriculture grows)
  - Direct and indirect impacts on land, water, air
  - Local ecosystem considerations
    - Particularly important in cases where agricultural animals are introduced species that may compete with native species
    - E.g., cattle on range likewise can impact watersheds and wild species (e.g., fish populations)
    - Implications for ecological integrity, sustainability
  - Location of animal production sites and impacts on rural communities

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# Ex.: Sustainable beef production

- Beef consumption in the US is declining but global consumption is increasing
- In 2011, global beef consumption was 64.5 million metric tons (about 142 billion pounds)
  - Projected to increase 24% by 2020
- Major concerns are environmental
  - Land and water use
  - Ecosystem impacts depending on location

Alli Condra, Food Safety News, March 2012

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# Scientific considerations

- Stewardship
  - Land/soil management
  - Pasture management;
  - Water usage and impacts on water quality/safety (waste runoff, chemical use; also applies to land impacts)
  - Ecosystem/biodiversity maintenance
  - Air quality
  - Greenhouse gases
  - Animal health & welfare (nutrition, handling, management, housing, transport, slaughter)
  - Efficiency of animal management practices (grain vs. grass finishing—See Capper 2010, 2011, CAST, 2013)
  - Energy utilization (minimize and shift to less most efficient, least negative environmental impacts)

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# Areas of greatest scientific contention

- Environmental impacts of beef production, especially water usage & land impacts (see Capper, 2010, 2011 and Water Footprint Network, 2011).
  - How to assess & how to optimize

# Ethical considerations

- Social responsibility
  - Effect on local communities and perceptions
  - Need to ensure good relationships (cultural considerations, cognition must be a factor)
    - Influence of cultural cognition on risk assessment
  - Broad impacts considered on people, animals, other aspects of environment

# Economic considerations

- Monitoring/documentation of practices and impacts; financial & environmental costs, returns, incentives
  - Carbon footprint assessment
  - GHG emissions mitigation
  - Water & land use/impacts assessment
  - Labor force issues
    - Responsible labor practices
      - Worker health and safety
    - Worker support
      - Investment in worker education, resource provision (e.g., educational and personal)

# Economic considerations

- Willingness to Pay (WTP) for animal welfare
- Would consumers pay more for value-added products that are “sustainable?”
- How should we decide a fair price for “sustainable animal welfare” products?
- Who should fix this price and set the criteria?



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