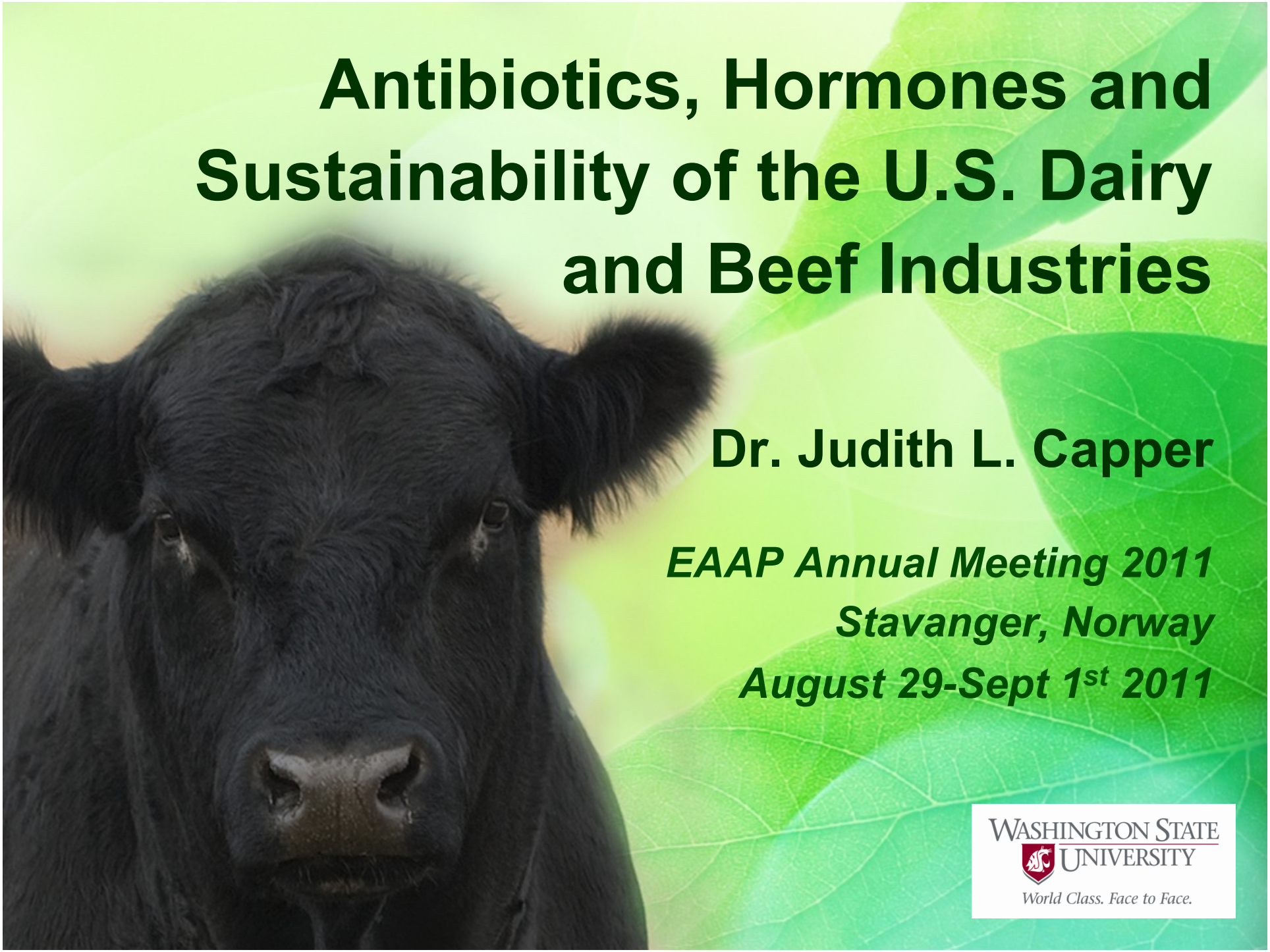


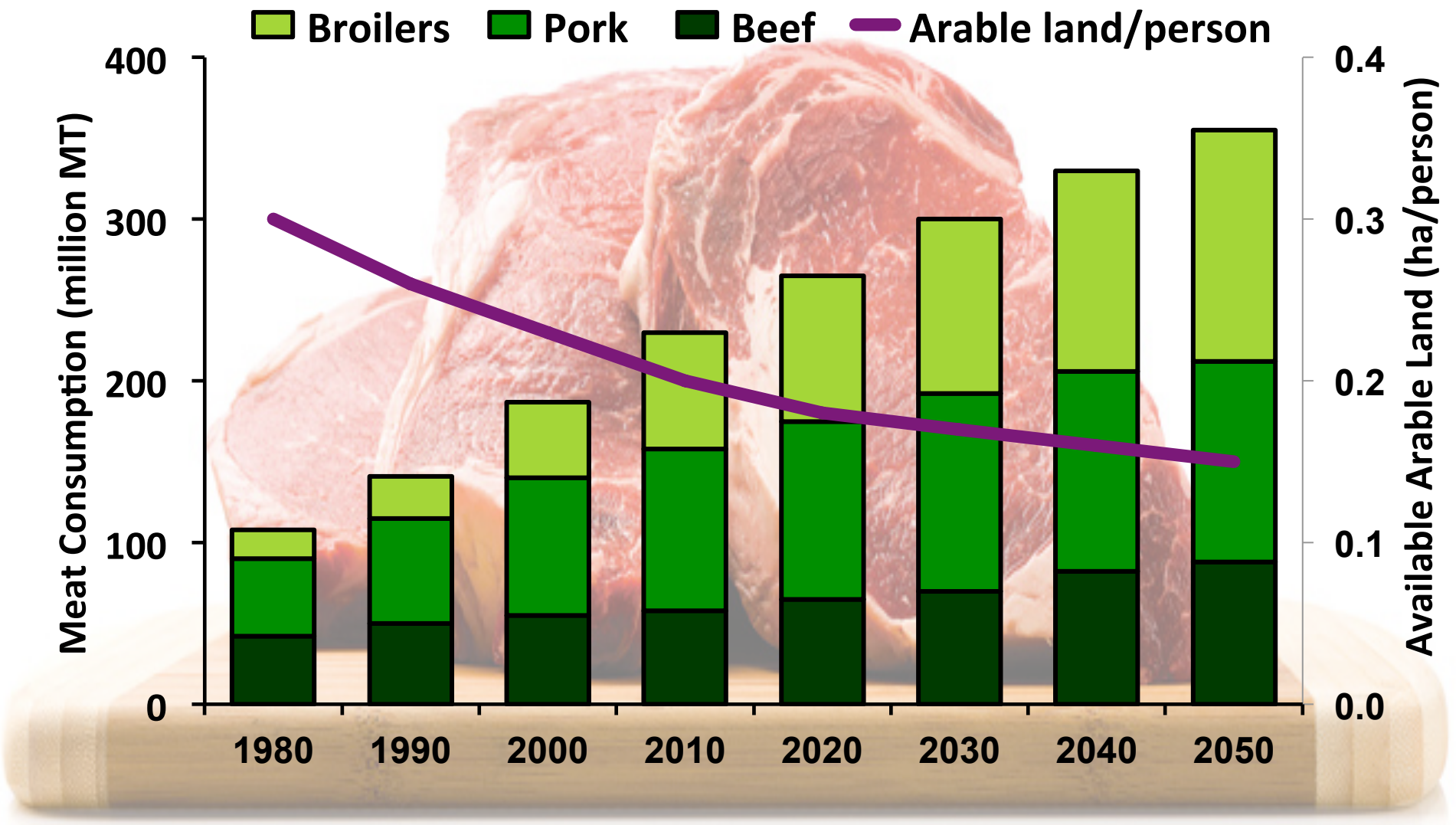
Antibiotics, Hormones and Sustainability of the U.S. Dairy and Beef Industries

Dr. Judith L. Capper

EAAP Annual Meeting 2011
Stavanger, Norway
August 29-Sept 1st 2011

WASHINGTON STATE UNIVERSITY
World Class. Face to Face.

World Beef, Pork and Poultry Consumption: 1980 - 2050



Sources: Global Insight Demand Analysis to 2050; Bauman and Capper (2011) Southwest Nutrition and Management Conference, Tempe, AZ.

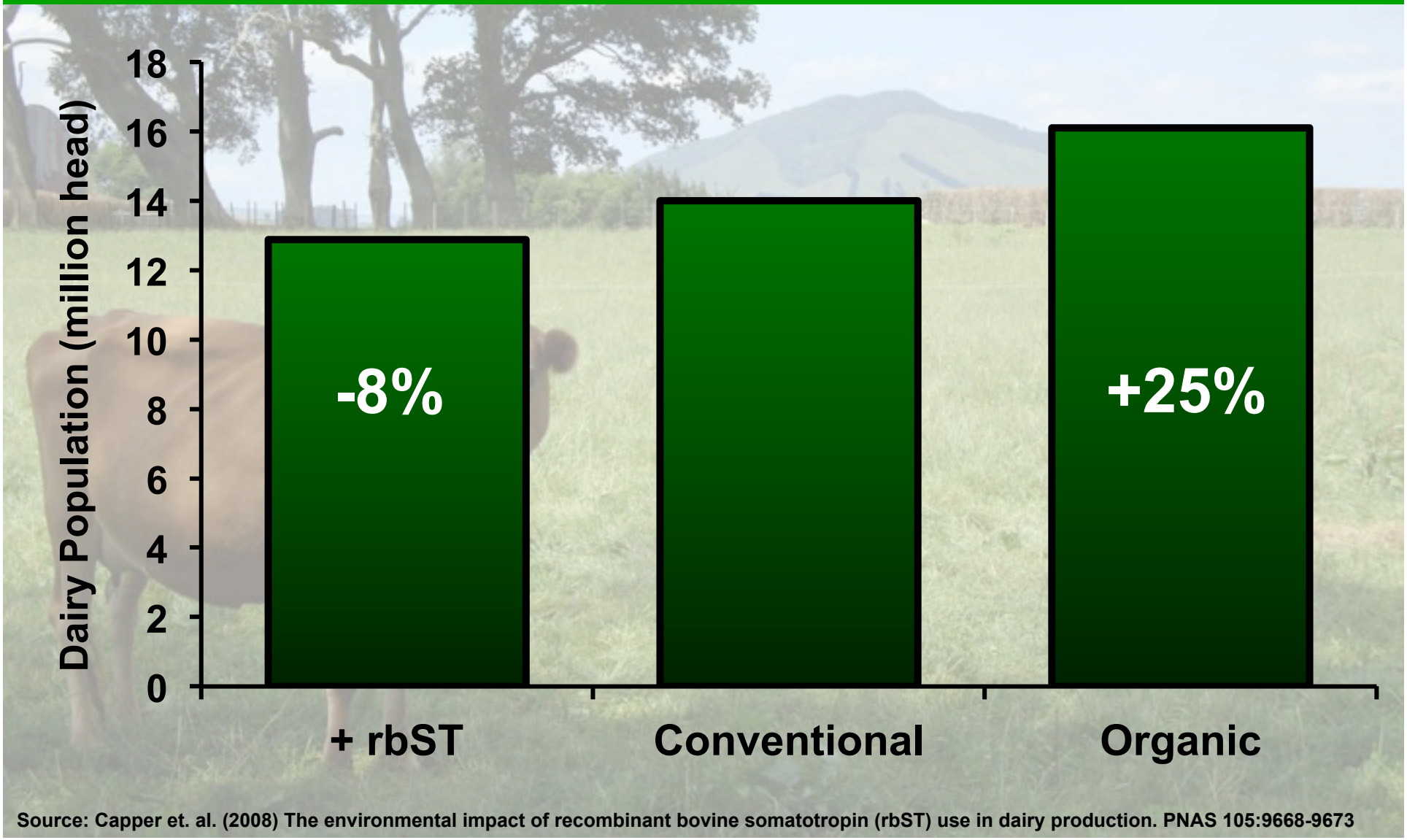
Sustainability Comprises Three Factors: Environmental, Economic & Social

Environmental

Social

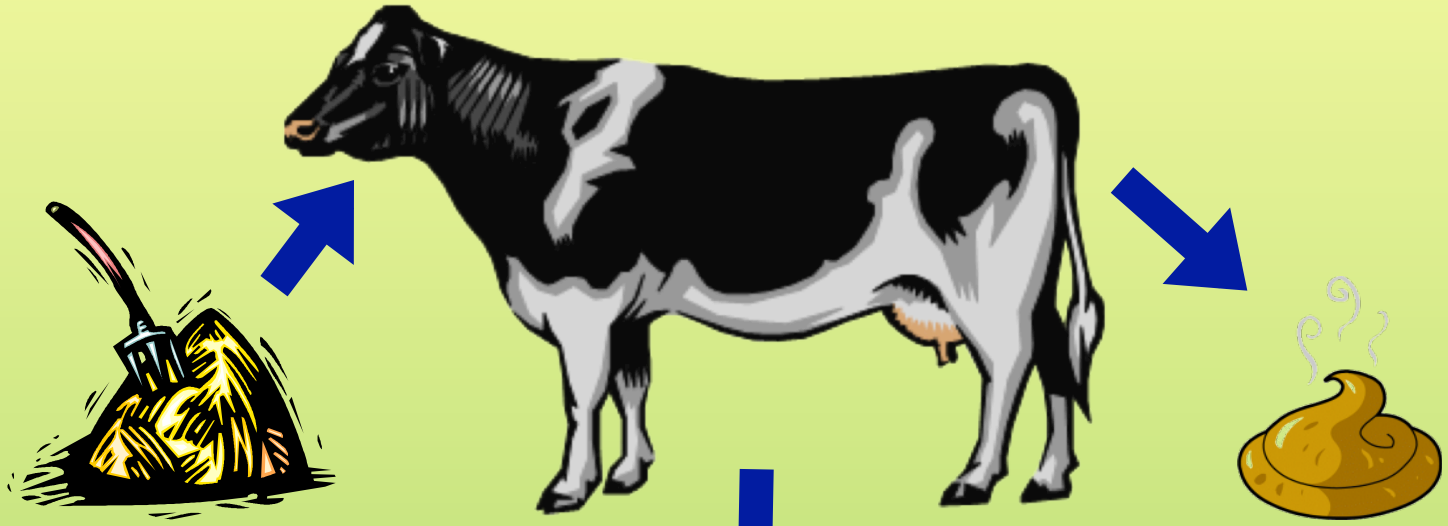
Economic

Future U.S. Demand for Dairy Products Best Met via Improved Productivity



Source: Capper et. al. (2008) The environmental impact of recombinant bovine somatotropin (rbST) use in dairy production. PNAS 105:9668-9673

Livestock Population Size is a Proxy for Resource Use, Waste Output and Cost



RESOURCES

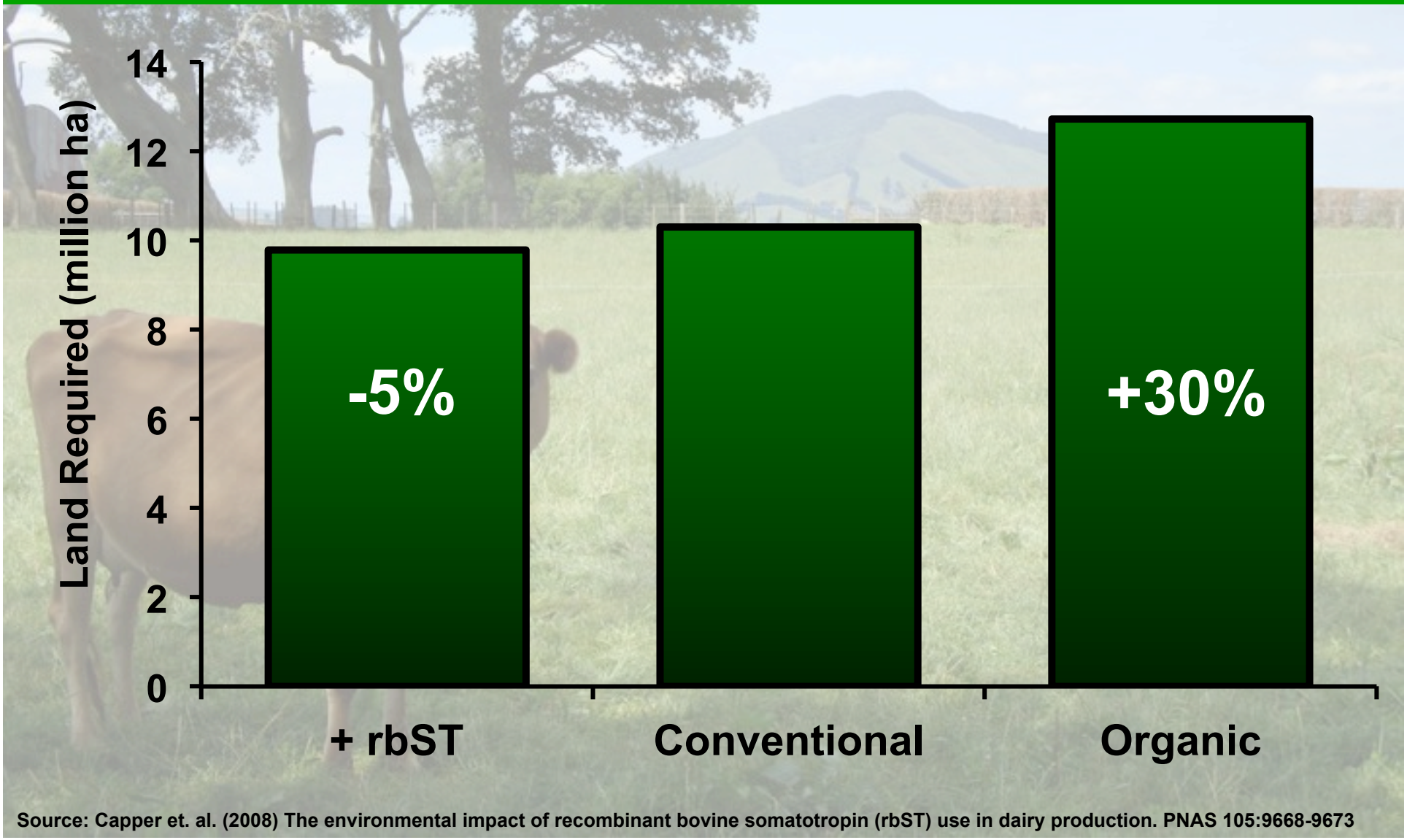
- Crops
- Land
- Fertilizers
- Pesticides
- Fuel

WASTE

- Manure
- Methane
- Nitrous Oxide
- Carbon Dioxide

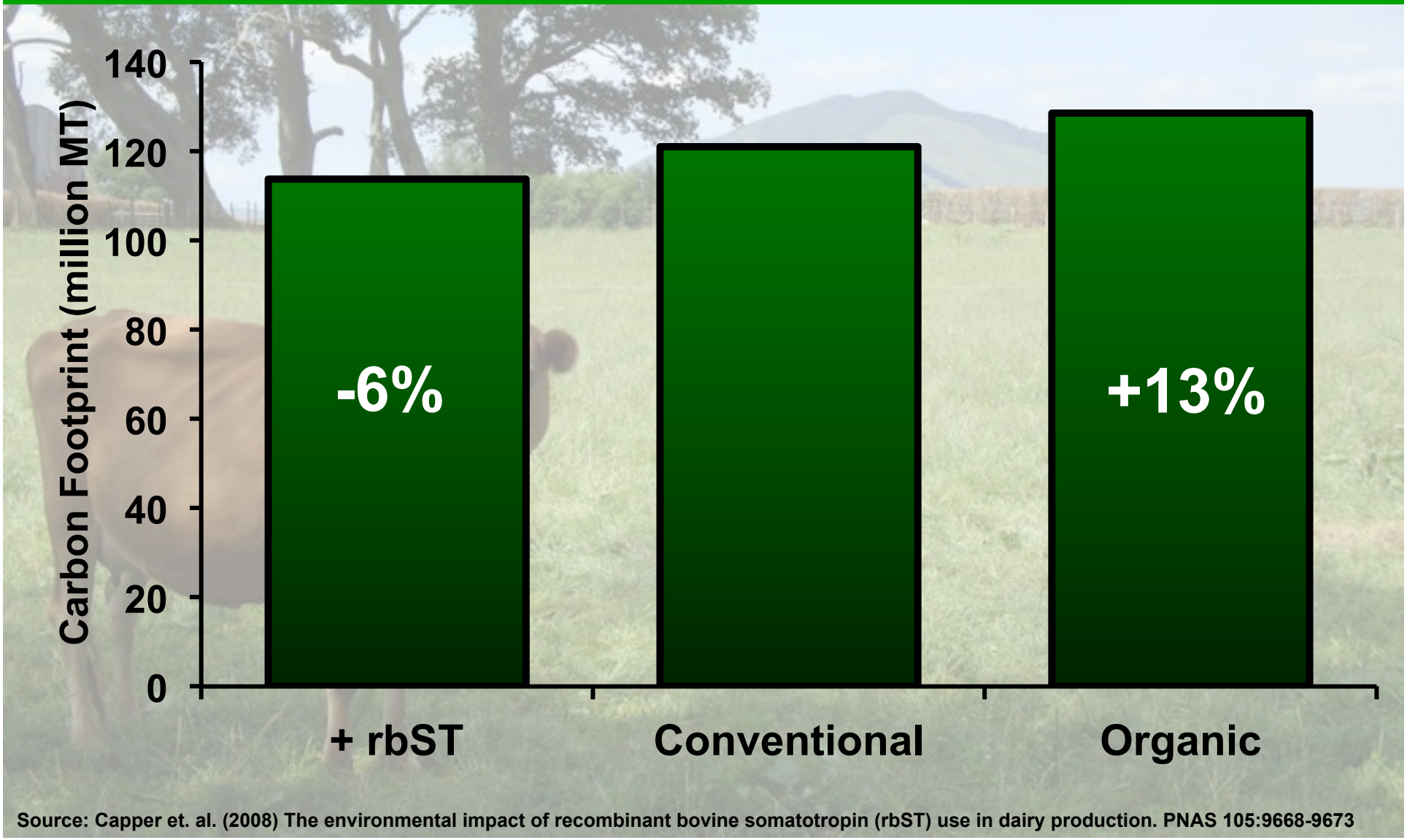
Source: Created by Dr. Judith L. Capper, Washington State University, 2010

Future U.S. Demand for Dairy Products Best Met via Improved Productivity



Source: Capper et. al. (2008) The environmental impact of recombinant bovine somatotropin (rbST) use in dairy production. PNAS 105:9668-9673

Future U.S. Demand for Dairy Products Best Met via Improved Productivity



Source: Capper et. al. (2008) The environmental impact of recombinant bovine somatotropin (rbST) use in dairy production. PNAS 105:9668-9673

What Effect Would Technology Removal Have on Beef Industry Sustainability?

+ Technology:

- ✓ Extensive pasture-based system until weaning (7 mo)
- ✓ Animals enter feedlot at weaning (15% of calves) or 12 mo of age after a backgrounder stage (85% of calves)
- ✓ Production-enhancing technology used at current industry adoption rates:
  - ✓ Ionophores
  - ✓ Hormone implants
  - ✓ Melengestrol acetate
  - ✓ β-agonists

- Technology:

- ✓ Identical system without production-enhancing technology

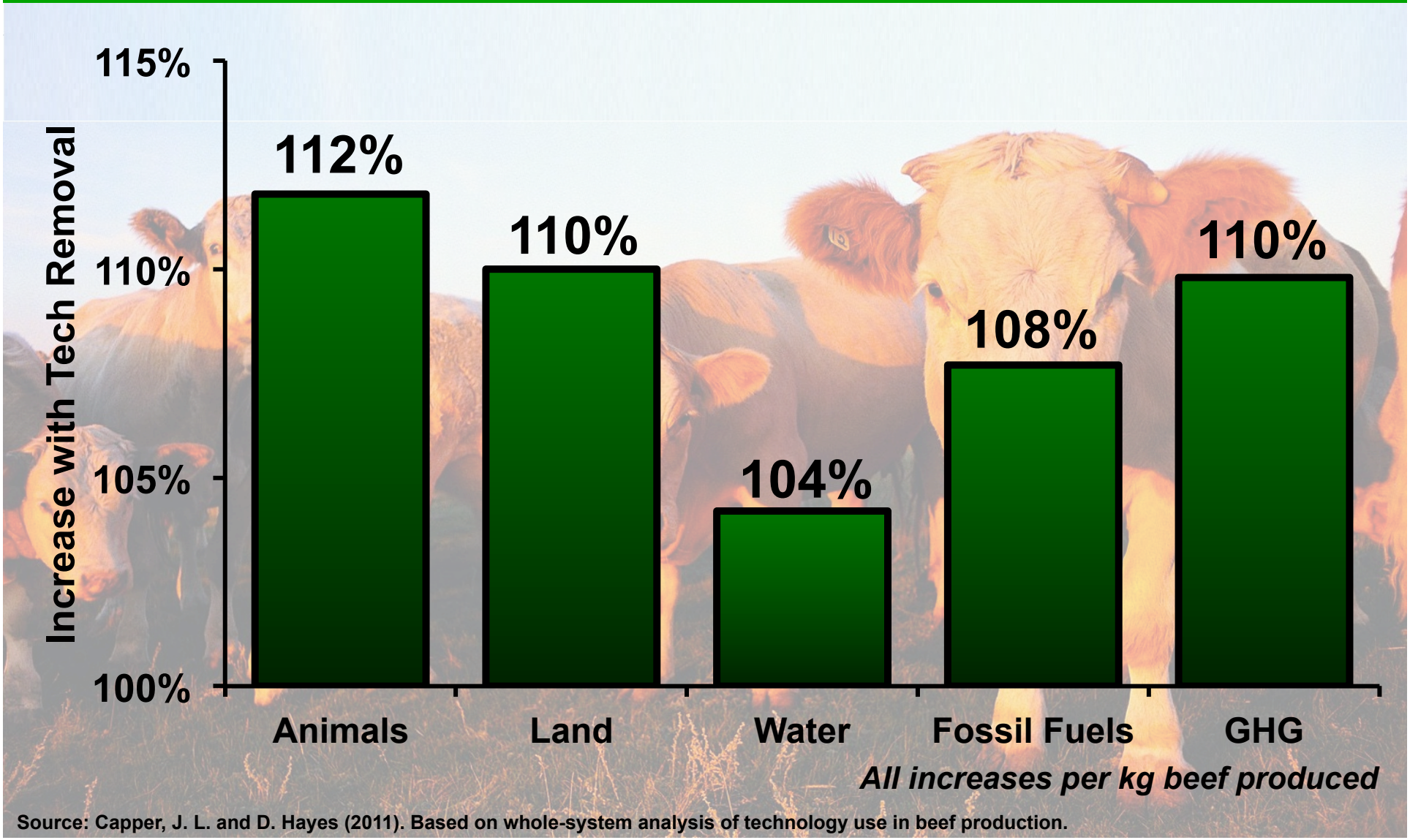
Source: Capper, J. L. and D. Hayes (2011). Based on whole-system analysis of technology use in beef production.

Removing Technology from Beef Production Considerably Increases Animal Numbers

*Animal numbers refer to cows, calves, heifers, bulls, growing and finishing animals

Source: Capper, J. L. and D. Hayes (2011). Based on whole-system analysis of technology use in beef production.

Removing Technology from Beef Production Increases Resource Use and GHG Emissions



Source: Capper, J. L. and D. Hayes (2011). Based on whole-system analysis of technology use in beef production.

Removing Technology from Beef Production* Increases Resource Use and GHG Emissions

- ✓ **Land use by 7.0 million ha**

  22% of Norway's land area

- ✓ **Water use by 532 thousand million litres**

  Annual usage by 2.4 thousand million Norwegians

- ✓ **Fossil fuel use by 8.3 thousand million MJ**

  Equal to 237 million litres gasoline

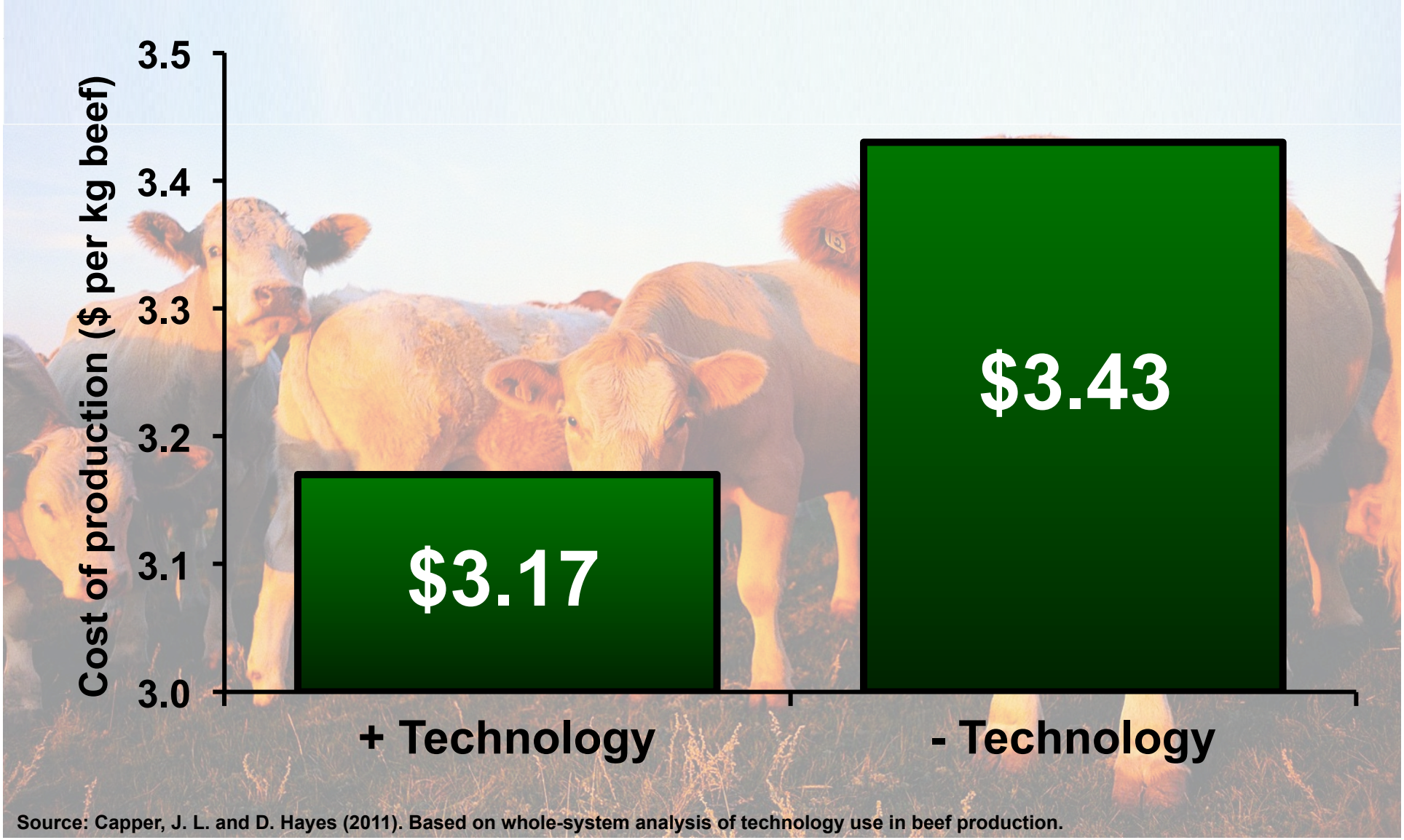
- ✓ **GHG emissions by 18.9 million t CO_2-eq**

  Annual emissions from 3.7 million cars

***Per 11.8 billion kg beef as produced in 2010**

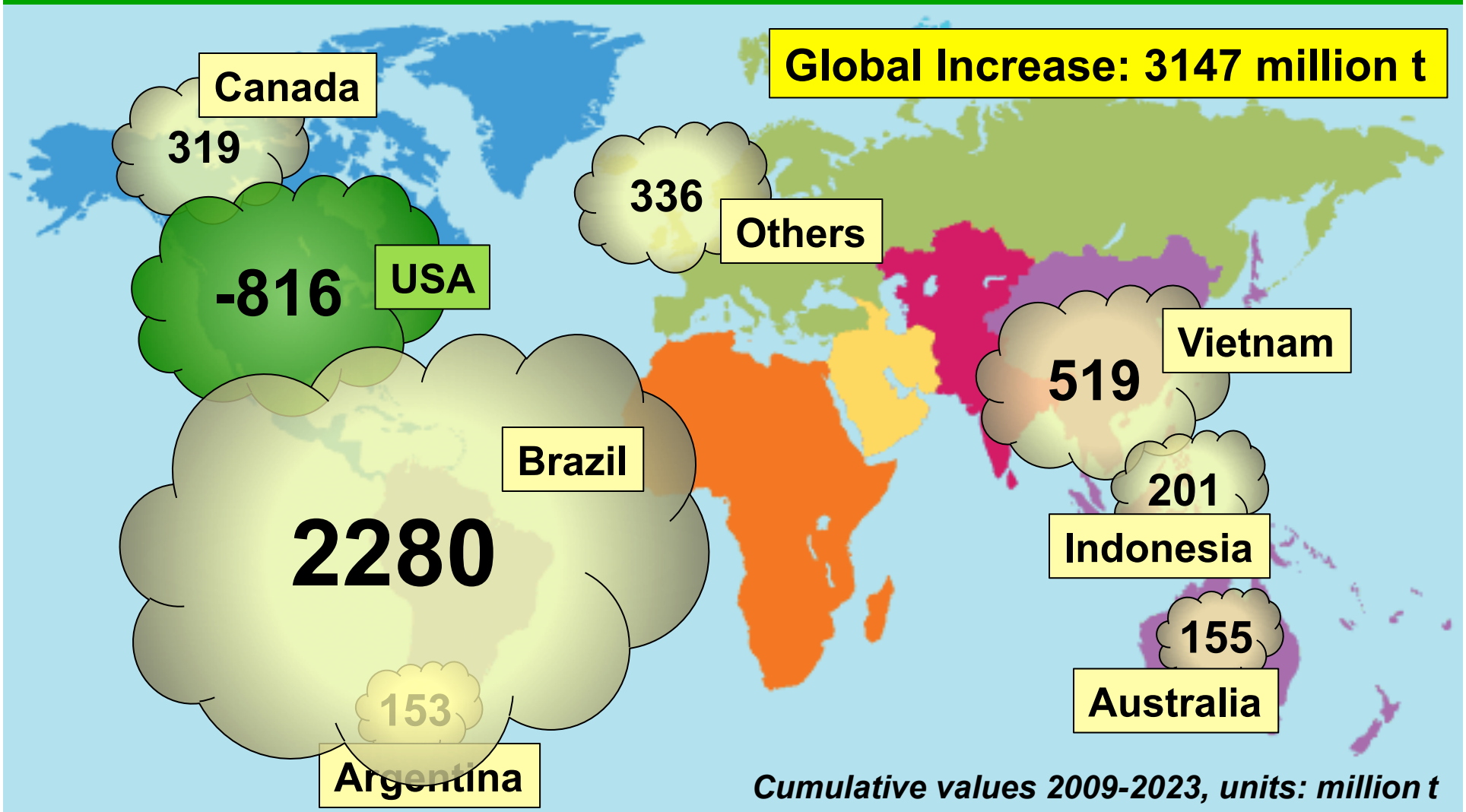
Source: Capper, J. L. and D. Hayes (2011). Based on whole-system analysis of technology use in beef production.

Removing Technology from Beef Production Increases Economic Cost of Production



Source: Capper, J. L. and D. Hayes (2011). Based on whole-system analysis of technology use in beef production.

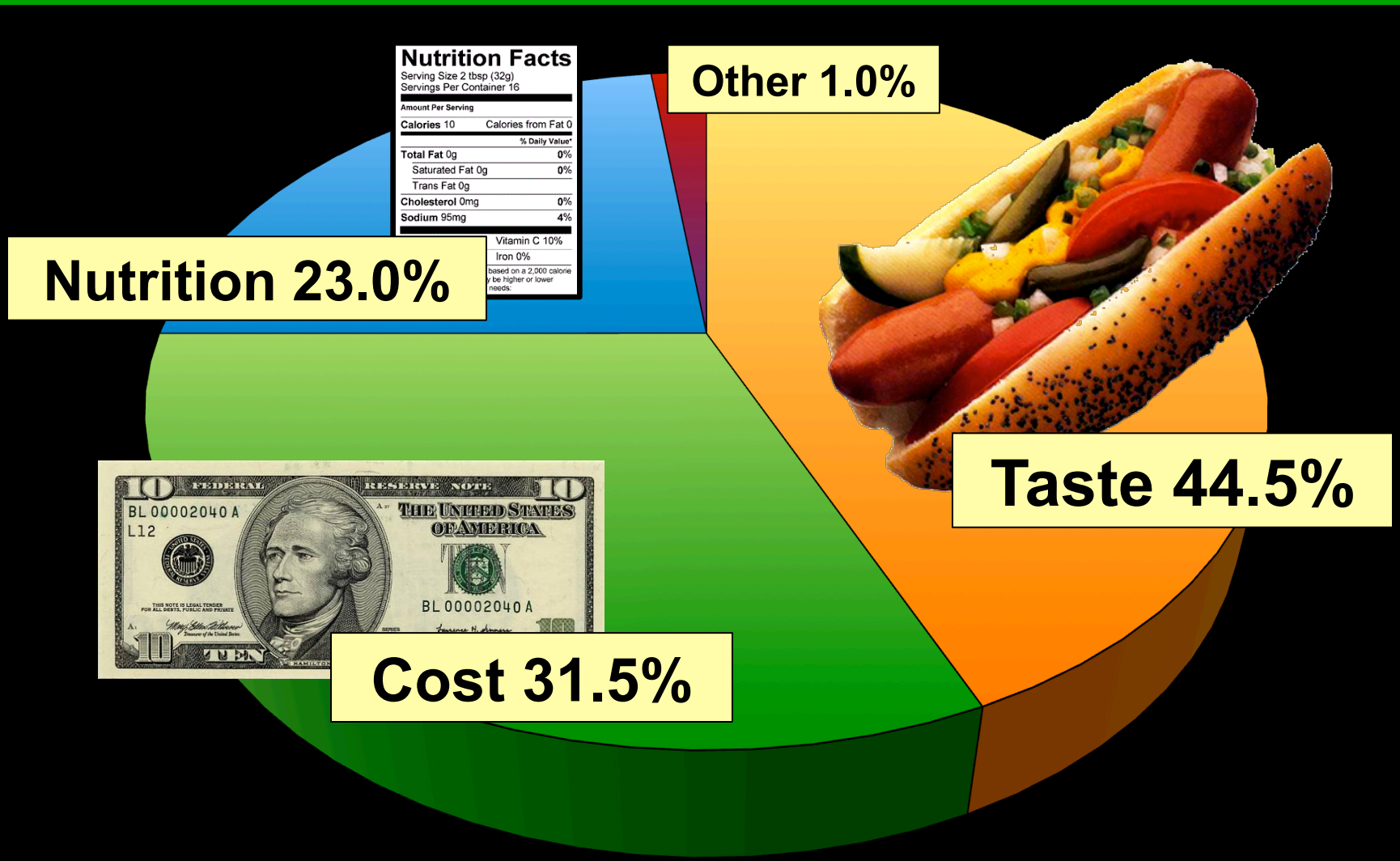
Removing Technology from Beef Production Increases Global Carbon Footprint



Source: Capper, J. L. and D. Hayes (2011). Based on whole-system analysis of technology use in beef production, with carbon projections based on the FAPRI model and extrapolated from Dumortier etal., 2010.

Productivity-Enhancing Technologies Are Often Demonized in Popular Media

Consumer Buying Choices Based on Three Factors



Source: Simmons (2011). Making safe, affordable and abundant food a global reality. Elanco Animal Health.

The Majority of Consumers Support Technology or are Technology–Neutral

1.6%
Anti-Tech

4.4%
Lifestyle

94%
Support/ Neutral

Source: Simmons (2011). Making safe, affordable and abundant food a global reality. Elanco Animal Health.

Conclusions

- ✓ **All three facets of suitability must balance for technology use to be viable**
- ✓ **Technologies that improve productivity reduce resource use, environmental impact and economic cost of dairy and beef production**
- ✓ **The challenge lies in improving stakeholder and consumer understanding and making decisions based on science rather than intrinsic philosophical perceptions**

Thank you!

capper@wsu.edu

@bovidiva

www.bovidiva.com

WASHINGTON STATE UNIVERSITY

World Class. Face to Face.

Source: http://offthemark.com/search-results/key/mickey+mouse/; www.bovidiva.com is not affiliated with Washington State University