

## Meeting the Global Protein Demand: The Role of Animal Protein in a Sustainable Food System

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WEDNESDAY, AUGUST 15, 2018 | 1:00 – 2:00 PM CT

Webinar will begin at the top of the hour. Audio for today's presentation is being broadcast over your computer speakers or headphones. To be sure they are turned on and the volume is on.

## Continuing Education Info

**Awarded for 1.0 Continuing Education Credit**

– Commission on Dietetic Registration (CDR)

**Certificates will be awarded via email**

**Webinar is being recorded**

– Will be available at: <https://www.eatrightpro.org/practice/professional-development/distance-learning/free-cpe-for-members>

## Learning Objectives

1. Address consumer concerns on animal protein's role within the context of a sustainable food system.
2. Identify ways that the animal agriculture community aims to meet the growing global protein demand while balancing environmental stewardship, economic viability, and social responsibility throughout the supply chain.
3. Provide context to existing data on animal agriculture's carbon footprint and the nexuses of economic, social and environmental components of sustainability, including the tradeoffs between environmental footprints of food and nutrient density.

## Mary Lee Chin, MS, RD

Specializes in food issues and nutrition trends, including genetically modified foods, and environmental and sustainability issues

Serves on the Academy of Nutrition and Dietetics "RD Farmer & Agriculture Committee of Experts" and advises on their "Future of Food" and "Healthy Food for a Healthy Planet" initiatives

Serves on the Community Health & Nutrition Program at University of Northern Colorado



## Mary Lee Chin, MS, RD - Speaker Disclosure

### Board Member/Advisory Panel

- Academy of Nutrition and Dietetics RD Farmer & Agriculture Committee of Experts
- Nutrition Dietetics Program, College of Natural and Health Sciences at University of Northern Colorado

### Consultant

- Monsanto LEAD Network
- Ajinomoto

### Owner/Employee

- Consultant-Food and Nutrition Communications, Nutrition Edge Communications

### Speaker's Bureau

- National Cattlemen's Beef Association Nutrition Seminar Program

### Other

- Trustee, Denver Botanic Gardens

## Sara Place, PhD

Senior Director of Sustainable Beef Production Research at National Cattlemen's Beef Association

Previously, Assistant Professor of Sustainable Beef Cattle Systems at Oklahoma State University, with a split research and teaching appointment

- Research program focused on the measurement of enteric methane emissions from cattle
- Teaching responsibilities included Animal Nutrition, Dairy Cattle Science, Ethics and Professionalism, and Sustainable Animal Agriculture



## Sara Place, PhD - Speaker Disclosure

### Employee

- Senior Director of Sustainable Beef Production Research, National Cattlemen's Beef Association

## The Role of Animal Protein in a Sustainable Food System

### The sustainability of our food systems requires balancing multiple important criteria

**Environment**

- Environmental footprints
- Ecosystem services/biodiversity
- Multi-functionality of land use
- Considering animal feed use from a human edible standpoint

**Economic**

- Producer economic viability
- Contributions to rural economies
- Affordability of food to consumers

**Social**

- Nutritional quality
- Animal welfare
- Antibiotic/technology use
- Culture/traditions of producers and eaters

**Overarching needs:**

- Whole systems approaches
- Focus on the nexus of different aspects of sustainability
- Characterize and quantify interrelatedness of food, fiber, and fuel industries and integration of plant and animal agriculture
- Recognize the role of value judgments and uncertainty

### Greenhouse gas emissions intensities vary across species, regions, and production systems (and model assumptions)

FIGURE 3. Global emission intensities by commodity

Note: Functional unit = kg of protein

Source: UN FAO, 2013. Tackling Climate Change through Livestock



### Cattle are upcyclers: More than simply recycling - they are upgrading plant proteins (incl. plant leftovers) into higher quality protein for people

Human edible and inedible plants

1 lb. human edible protein

Upcycling

1.19 lb. human edible protein

High quality protein, B vitamins, iron, zinc

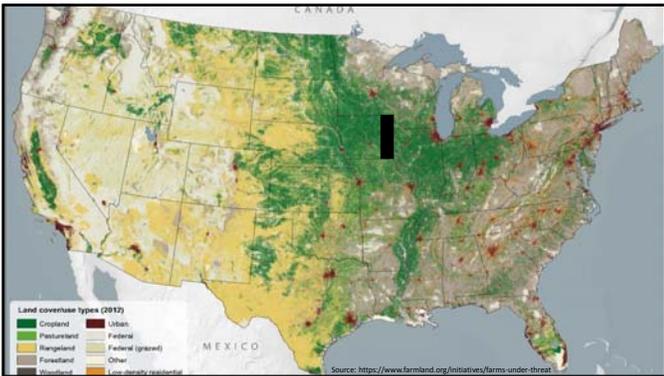
81% Human inedible forage (whole plants)

10% Human inedible byproducts, vitamins, minerals

9% Grain

Greater than 90% of what grain finished beef cattle eat is not in competition with the human food supply – upcycling is the fundamental value beef brings to a sustainable food system!

Source: CASI, 1999 and NRC, 2016



Carbon footprint of US beef is lower than many parts of the world

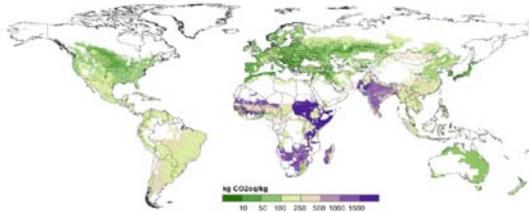
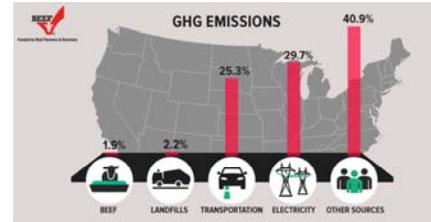


Figure S 47. GHG efficiency of bovine meat production (expressed in kg CO<sub>2</sub>e/g protein) in the year 2000

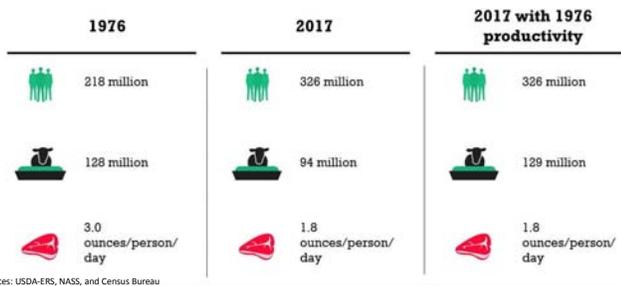
Source: Herrero et al., 2013. Proc. Natl. Acad. Sci. 110: 20888-20893

Beef production is responsible for about 2% of U.S. greenhouse gas emissions



Source: U.S. EPA GHG Inventory, 2016

Productivity is a key driver in improving sustainability



Sources: USDA-ERS, NASS, and Census Bureau

Food for thought

Continuing to reduce the environmental footprint of beef, and all foods, is important

But, are we missing other important "food system" sustainability issues, by focusing only on environmental footprints of individual foods?



## If every American went vegan, we'd reduce U.S. greenhouse gas emissions 2.6% (which is 0.36% of global emissions)\*

\*This assumes all livestock in the U.S. would disappear

*"Overall, the removal of animals resulted in diets that are nonviable in the long or short term to support the nutritional needs of the US population without nutrient supplementation."*

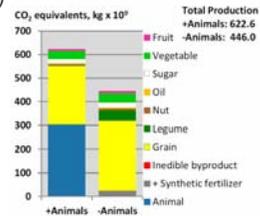


Fig. 5. GHG emissions associated with food production in a system representative of the current United States and a modeled system in which animal-derived food inputs are eliminated.

White and Hall, 2017, Proc. Natl. Acad. Sci. 114: E10301-E10308

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## Bottom line:

Animal agriculture affects the environment **as does all food production and human activity**

Environmental impacts per unit of animal protein have been **declining** over the past several decades

U.S. animal agriculture has one of the **lowest carbon footprints in the world**

Higher "footprints" of beef (land, carbon, water) are driven by the unique biology of cattle/ruminants that allows them to **upcycle protein** and **produce food on land unsuitable for cultivated agriculture**

- Sustainability is about tradeoffs and nuance (e.g., land used for beef production is multifunctional)

Sustainability is not about one production system or dietary pattern over another, rather it's about continuous improvement that makes **the whole plate better for everyone**

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## Defining the Parameters of a Sustainable Diet

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## The Sustainability/Diet Connection

RDs/RDNs – Trusted source of information

Evaluate the benefits of meat nutrition against the trade-offs of the higher footprint of beef production

Our challenge in developing a sustainable diet– Balancing environmental factors with considerations such as economics, social equity, food sourcing, food waste & food loss and of course, nutrition

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**Sustainability & Diet Choices Have Converged**

- “Value” Food seen as a proxy: quality, freshness, social and environmental sustainability, economic development, feeding the world<sup>1</sup>
- Consumers, esp. millennials, want to know all about what they eat; where it comes from, how it's made, who produced the protein on their plates.<sup>2</sup>
- Consumers translating meaning of sustainability into food choices that are local, organic, and grass-fed rather than conventionally produced.

1. IFIC, 2018 Food and Health Survey  
2. NIRA, 2018, What's Hot: Culinary Forecast

## Economic Profitability

- Provides a secure living for farm families and all those who work along the food production system
- Bolsters local and regional economies<sup>3</sup>



• Producer economic viability  
• Contributions to rural economies

3. SARE, What is Sustainable Agriculture?