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@Fitzisit
Food & Sustainability:

1. Sustainable food system challenge

2. Dairy is leading and taking action

3. What WE can do today
Eating is an agricultural act

-Wendell Berry
Foodprint
The Average U.S. Household Carbon Footprint

- Travel 30%
- Home 29%
- Goods 14%
- Services 12%
- Food 15%
- Other Food 3%
- Cereals 2%
- Produce 2%
- Dairy 2%
- Meat 6%

Quantifying Carbon Footprint Reduction Opportunities for U.S. Households and Communities
Christopher M. Jones* and Daniel M. Kammen*
Sustainability Food Issues

- Waste
- Land Rights
- Affordable and Accessible
- Food Miles
- Local
- Pesticides
- Safe
- Farmer Livable Wage
- Health
- Animal Care
- Labor
- Yields
- Trade
- Land Use Change
- Carbon Footprint
- Water Footprint
40 years = 8,000 years
Diversity of the biological food system is enormous
10,000 + Soil Types in the United States

Clay
Loam
Sand
Gravel

source: Ohio State University soil scientist
26 plant hardiness zones
(from 1a to 13b)
Farmer diversity is very similar to restaurants

1,000,000 restaurant operators
3,180,074 farmers
Unprecedented Change and Innovation Required
48% of landmass in the US is in the hands of farmers

Source: USDA, American Farmland Trust, 4% Continental U.S., 40% entire United States
Not only more food, but nutritionally adequate diets for healthy people

**2012**

Today’s Diet Patterns

Population
- 310M (U.S.)
- 7.5B (globally)

**Recommendations**

**2050**

Good food for more people

Population growth =
- + 110M (U.S.)
- + 2B (globally)

Enabling a 21\textsuperscript{st} century sustainable food system requires:

1. Reduce waste and inefficiencies
2. Manage for and adapt to natural resource constraints
3. Advance farm technologies for yields and optimize use of nutrients within a bioeconomy
Understanding Dairy’s hoofprint and our commitment to sustainability
Keeping livestock was required for successful farming.
The Dairy industry today at a glance

2013 DAIRY SNAPSHOT

Milk production occurs in all 50 states. The top 5 dairy states in 2013 produced ~53% of all milk in the U.S.

20.5% CA
6.7% ID
13.7% WI
5.3% PA
6.7% NY

47.1% Remaining States

~97% FAMILY-OWNED

46,960 LICENSED DAIRY FARMS
9.2 million DAIRY COWS

1,278 DAIRY PLANTS PRODUCED

199.4 billion POUNDS OF DAIRY PRODUCTS.

AVERAGE NUMBER OF MILES FROM FARM TO PROCESSING PLANT IS 275 miles.

13.3% OF DAIRY PRODUCTS WERE EXPORTED (by weight).

199.4 billion POUNDS OF DAIRY PRODUCTS.

HOW ALL THAT MILK WAS USED

43.2% Cheese
21.6% Fluid Milk
35.3% Other Products: butter, nonfat dry milk, frozen products and more

Milk and dairy products are distributed to schools and retail outlets ranging from small neighborhood stores to warehouse outlets.

Americans spent ~6% of their 2011 food budgets on dairy products at home.

Milk and dairy foods supply 70% of the calcium and 18% of the protein in the average American diet.

Sources: Milk production and dairy processing data: Dairy Data Highlights, National Milk Producers Federation, October 2012; Family farms stat: USDA ERS; Milk: Ulrich R, Thomas G, Nutter D, Wilson J. Tailpipe greenhouse gas emissions from tank trucks transporting raw milk from farms to processing plants. In: Dairy J. April 2013; 3(1):55-56; Commercial usage Annual Commercial Disappearance of Dairy Products, Milk Equivalents, Total Solids Basis (Source: NMFR and USDA/ERS); Export data: U.S. Dairy Export Council; Consumer spending: In 2011, American consumers spent an average of $6,458 on food purchases, of this amount, $497, or 6.3% percent, was spent on dairy products at home (Consumer Expenditure Survey, 2006-2011, BLS); Nutritional stats: Dairy Research Institute, NHANES (2003-2006); Ages 2+ years.
INNOVATION CENTER FOR U.S. DAIRY

HEALTHY PEOPLE • HEALTHY PRODUCTS • HEALTHY PLANET
113 companies & 180 professionals in the Sustainability Council

We commit to being leaders in sustainability, ensuring the health and well-being of our planet, communities, consumers and the industry.

Alliance Dairies
Clauss Dairy Farms
Fair Oaks Farms
Fiscalini Farms
Foster Brothers Farm
Gar-Lin Dairy Farm
Graywood Farm
Haubenschild Farms Inc.
Holsum Dairies
Kooistra Farms
Maddox Dairy
MarBec Dairy
Medeiros & Sons Dairy
McCarty Family Farms
Mystic Valley Dairy
Nobis Dairy
PrairieLand Dairy
Rovey Dairy
Simonson Dairy
Spruce Haven Farm
Triple A Farms
Werkhoven Dairy

Sustainability Council

Associations/Government
Farm to Table: The Dairy Value Chain

Environmental impact
Grounded in science

- Life cycle science establishes baseline environmental footprint for U.S. Dairy
- Peer-reviewed, published, and contributed to open-source National Agricultural Library
- National Institute for Food and Agriculture
- National Academies of Science
Since 1944, producing a gallon of milk requires fewer resources

- Cropland: 90% less in 2007
- Water: 65% less in 2007
- Carbon: 63% less in 2007

Opportunities for efficiency and innovation across the value chain

Carbon footprint of 1 gallon of milk=
17.6 lbs CO$_2$e/gallon fluid milk consumed$^2$

2.05 CO$_2$e kg/kg fluid milk consumed

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1 Does not include sources related to waste.
2 “Greenhouse Gas Emissions of Fluid Milk in the U.S.” University of Arkansas, 2010. Based on environmental and consumption data from 2007-2008. Natural variability in data ranges from 15.3 to 20.7 lbs. CO2e. The total fluid milk carbon footprint is approximately 35 million metric tons, with a 95% confidence range from 30 to 45 million metric tons.
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US Dairy industry is ~2% of US emissions, with ~1.4% of US total at farm gate

Total US GHG (7168 Tg CO2e) Emissions by EPA sectors

- Transportation 28%
- Industry 29%
- Commercial 17%
- Residential 17%
- US Territory 1%
- Agriculture 7.7%
- US Dairy Farms 1.4%

Sources: 1: EPA (2010), for 2007 data;
Note: crop production for cows is double-counted; it appears in Ag and US Dairy Farms.
Key findings: dairy uses ~5.1% of U.S. water withdrawal
Variability = Opportunities

We are on a continual journey to a more sustainable food system.
34 dairy industry CEOs and chairpersons committed to...

25% by 2020

GHG reduction for fluid milk
USDA Memorandum of Understanding (MOU)

U.N. Climate Change Conference
December 2009 Copenhagen, DK

“This historic agreement, the first of its kind, will help us achieve the ambitious goal of drastically reducing greenhouse gas emissions while benefiting dairy farmers.”

-- USDA Secretary Tom Vilsack

MOU was renewed April 24, 2013 in Washington, DC
Farm Smart™

Smart Tools

Management Practice Improvements
- Cost savings
- Conservation
- Compliance
- New revenue

Soil, Climate, Crop and Water Information

Forecasting and Modeling Tool

Decision Making

Measurable Results

Consumer Communications
Credible, transparent and industry led. Program that is equal to or exceeds the competition while satisfying the demands of retail customers and dairy consumers.

Demonstrate progress. Buyers and sellers seek proof that dairy – “from grass to glass” – uses practices that protect natural resources and promote community well-being and economic vitality.

Mission: one approach. Create a voluntary method to track and communicate stewardship and sustainability progress.
Small steps add up!
Collaboration with the World Wildlife Fund

Two farms taking different steps to address climate change

Steve Maddox,
Maddox Dairy Farm, Riverdale, CA

Andrea and Cliff Sensenig,
Kirkwood, PA

http://www.worldwildlife.org/partnerships/innovation-center-for-us-dairy
Dairy cows contribute to the nutrient cycle of the food system

Grass and parts of plants as well as other foods humans can’t eat such as almond hulls, wheat straw, citrus pulp

Human Edible

Provide Nutrient dense foods

Contribute to food system

Natural Fertilizer

Dairy Cow Diet

80% humans can’t eat

20% humans might eat
Farmers can’t do this for us in the next 40 years if we are still eating too much and throwing food away
Today, 1/3 food is wasted

Lost retail value $166 B
Disposal costs add $1 B in local taxes/yr

Food waste is 4 x the impact of buses and rail
The average consumer wastes 1.1 lbs. of food per day, 401.5 lbs. per person each year.

Food waste from the average American family of four adds up to 1,606 lbs. of uneaten food annually.
Collaboration with the White House on voluntary commitment and innovation
It’s Only Waste
If You Waste It

What if we could enable a 21st century food system and bioeconomy through food cycling?
What if: 2 tons/wk of food waste were repurposed?

• 2 tons/week

2 tons/week ➔ Nutrients (N & P)

• 17 tons Nitrogen
• 1.3 tons Phosphorus

(Annual Values)

What if: 2 tons/wk food waste added to manure digester?

• 2 tons/week

2 tons/week ➔ Dairy digester (1,000 cows)

• 226 tons Nitrogen
• 28 tons Phosphorus
• Green Power for 300 homes

(Annual Values)

Manure & Food Waste: closes the food cycle

Reduces total landfill by 8%

15 M tons commercial & retail food waste
70% of retail waste

4.8 M tons food processing waste

109 M tons dairy cow manure

3.2M cars off the road
Or 25% of total dairy footprint

Electricity for 1 M homes

813 M bags of nutrient rich potting fiber

Nitrogen fertilizer for 5% of corn production

Phosphorus for more than all U.S. tomato production

Informa Economics, USDA, White House, Based on 2,700 dairy farms and average food loss
Fork to Farm
Provide food back to food system

Portion control
  • Leftovers

Recover valuable nutrients back to the landbase

Get good food to people who need it