

# Towards Sustainable Food Systems: Metrics and Considerations with Examples from the Dairy Sector

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NDC

**Bringing to life the dairy  
community's shared vision  
of a healthy, happy,  
sustainable world,  
with science as our  
foundation**



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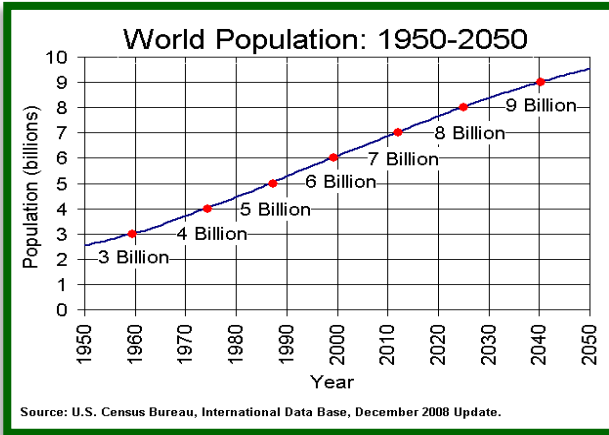


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# The Challenge



2009, FAO's Director-General on How to Feed the World in 2050. Population and Development Review, 35: 837-839.

# Malnutrition in the crosshairs



## The world faces a grave nutrition situation...



**2 billion** people lack key micronutrients like iron and vitamin A



**155 million** children are stunted



**52 million** children are wasted



**2 billion** adults are overweight or obese



**41 million** children are overweight



**88%** of countries face a serious burden of either two or three forms of malnutrition



And the world is off track to meet all global nutrition targets

2017



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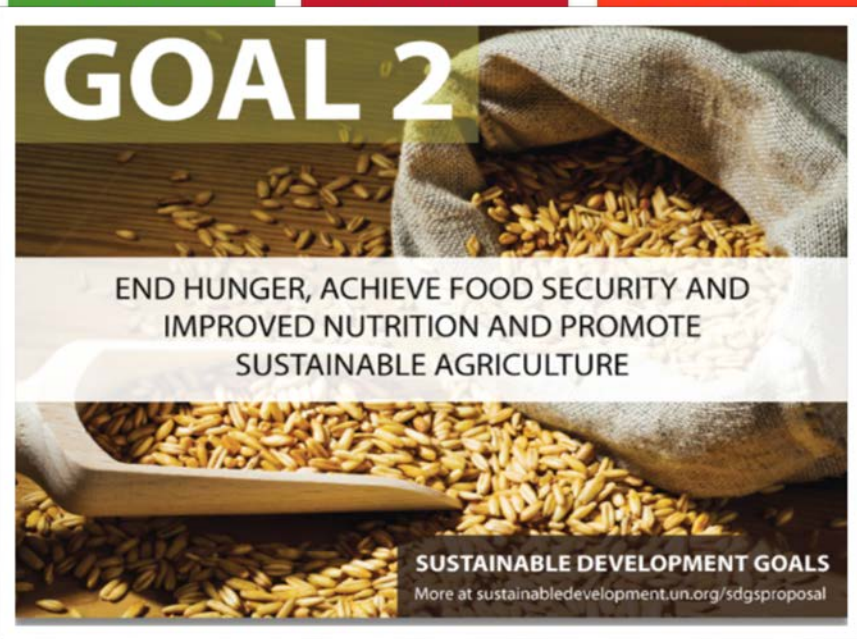
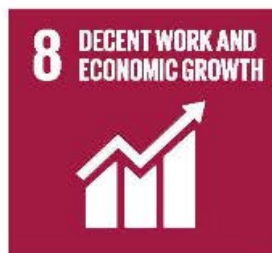
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# SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD



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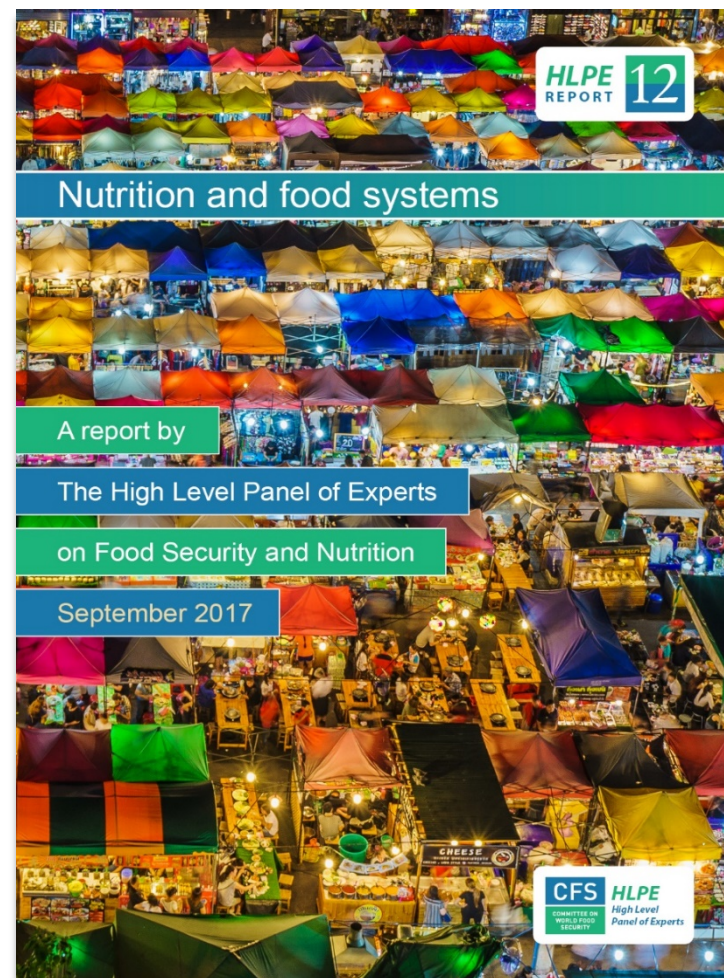


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# Nutrition and Food Systems

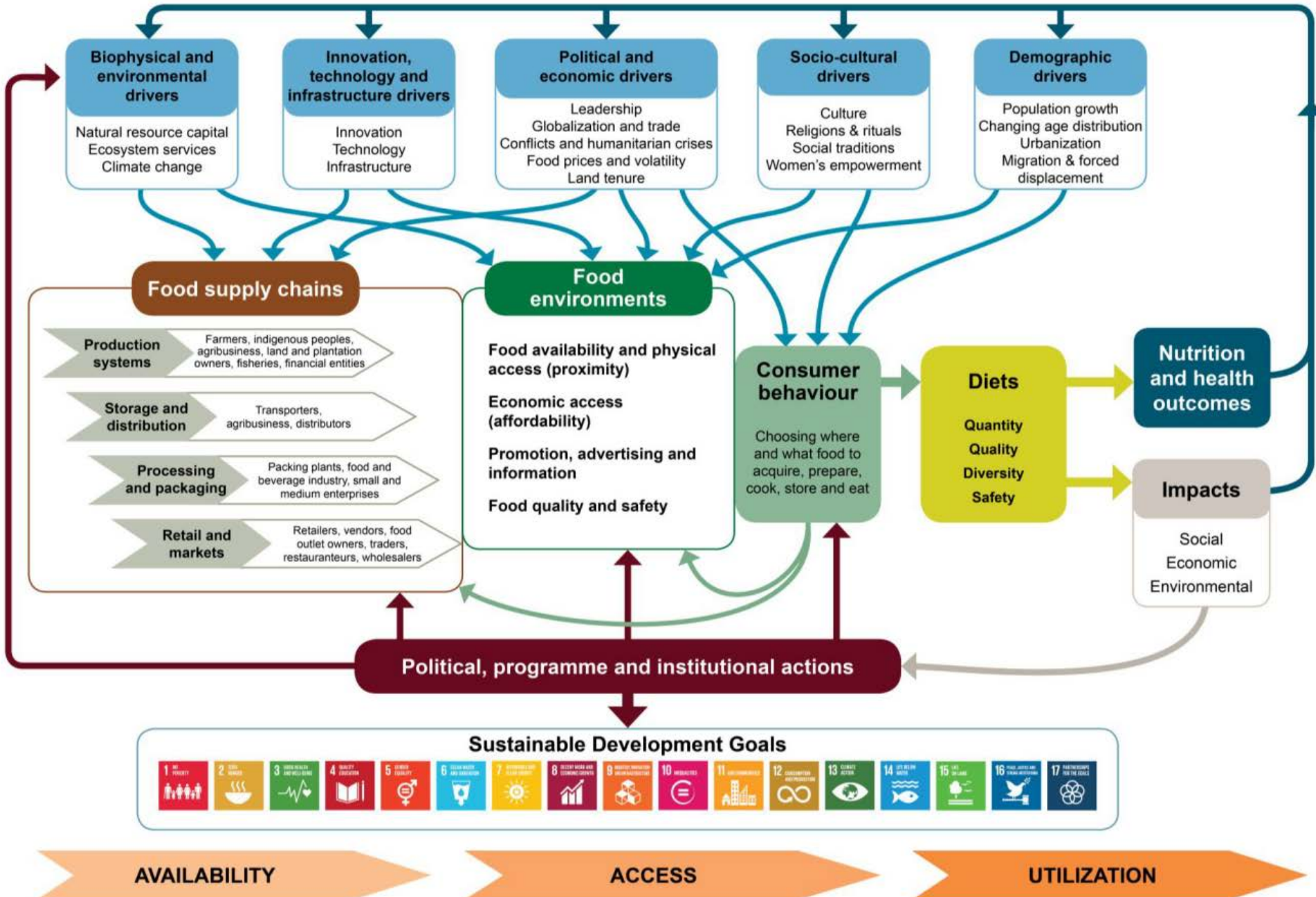
*A report by the High Level Panel of Experts (HLPE) on Food Security and Nutrition*



<http://www.fao.org/3/a-i7846e.pdf>

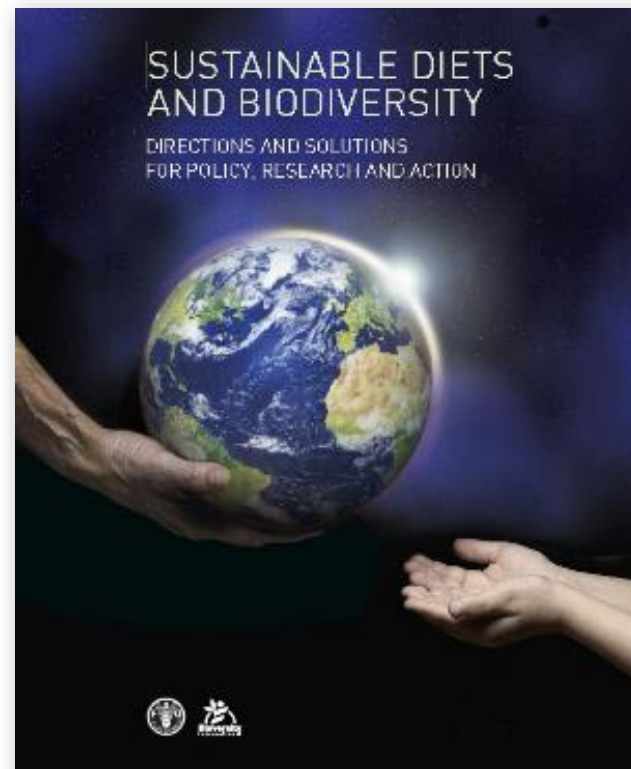


# Food Systems: A Conceptual Framework



# Sustainable diets as defined by FAO

*“Sustainable Diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.”*



Proceedings of the International Scientific Symposium,  
BIODIVERSITY AND SUSTAINABLE DIETS UNITED  
AGAINST HUNGER, 3–5 November 2010, FAO  
Headquarters, Rome



*FAO and Biodiversity International 2012*



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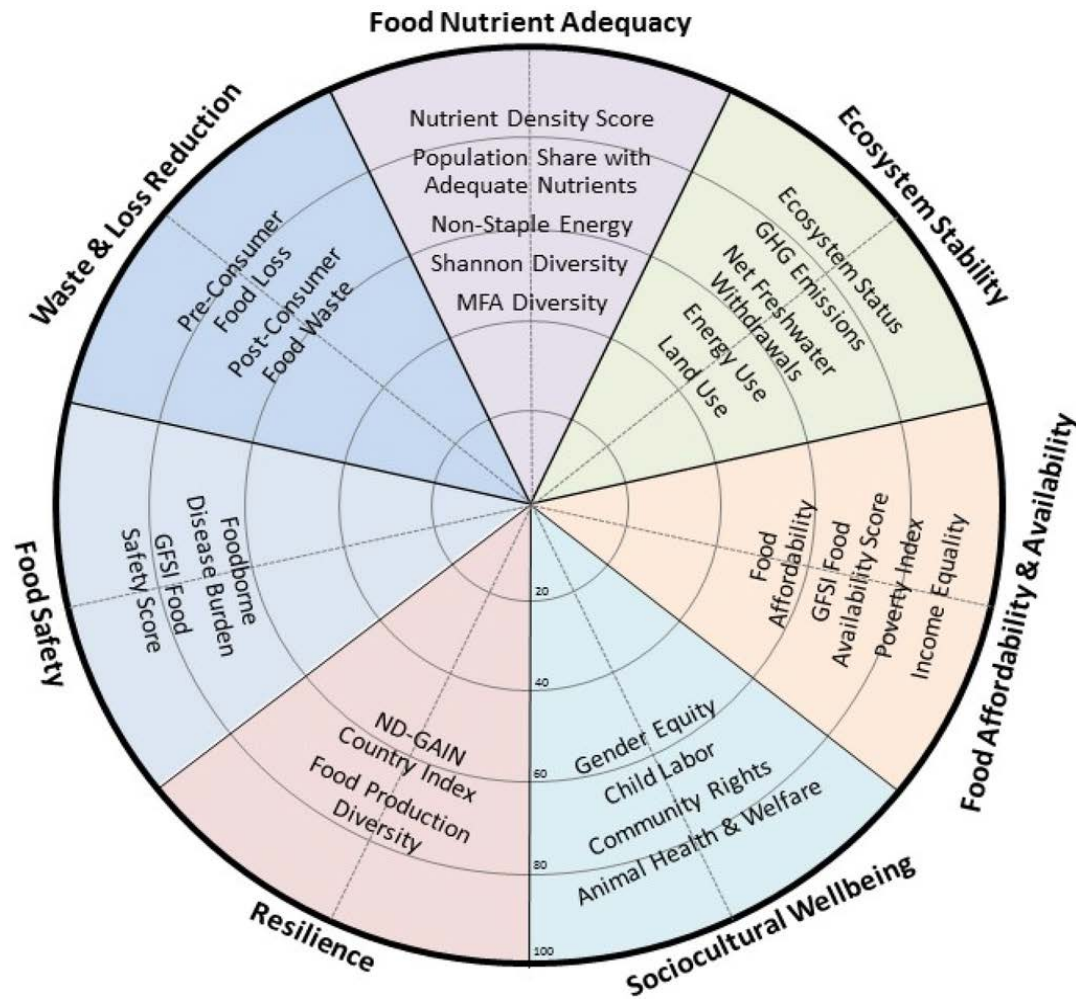
Gustafson et al. *Sustainability*. 2016

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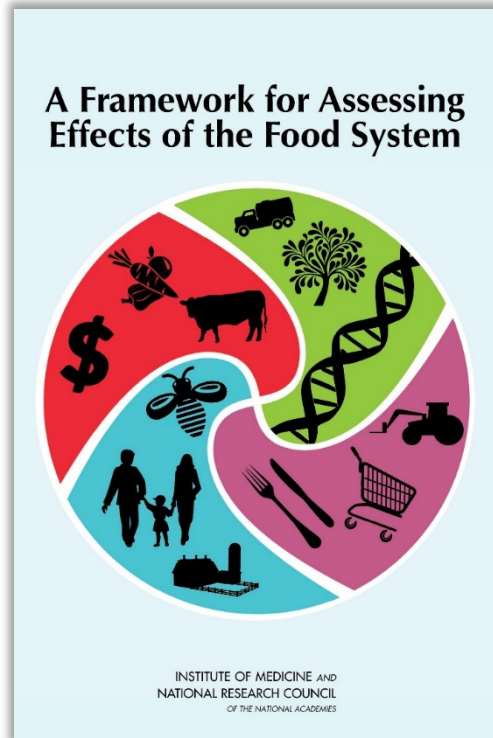
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# Metrics to evaluate sustainability of food systems need to assess the multiple aspects



# A Framework for Assessing Effects of the Food System



To arrive at a decision whose benefits outweigh its risks, decision makers must carefully consider a broad range of effects and interactions across the health, environmental, social, and economic domains.

*See more at:*

<http://iom.nationalacademies.org/Reports/2015/Food-System.aspx#sthash.mbeljiym.dpuf>



# Dairy Sector commitment to sustainable production



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

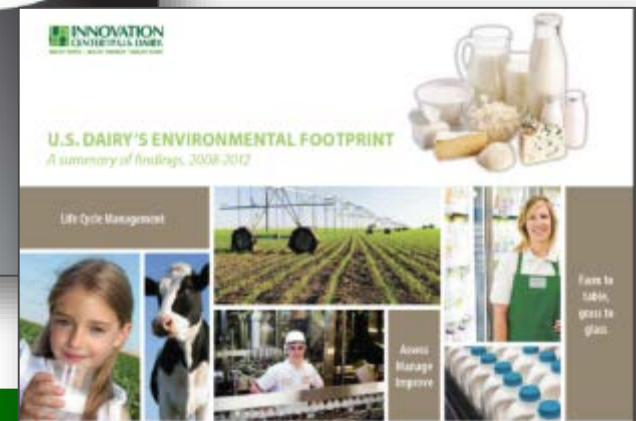
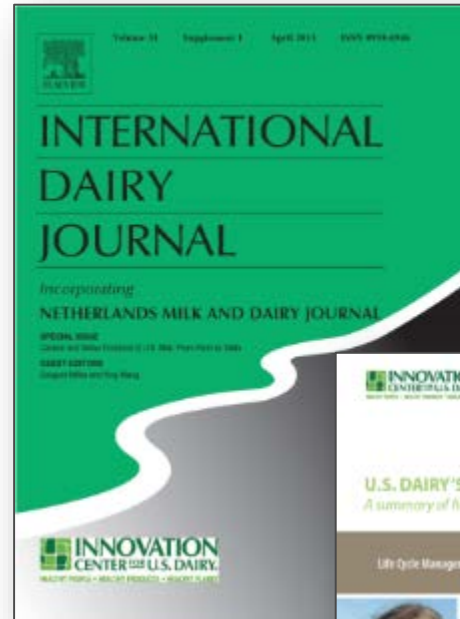


113 companies & 180 professionals in the Sustainability Council



# Environment: 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
- Greenhouse gas emissions of milk = 17.6 lbs. CO<sub>2</sub> per gallon
- Goal to reduce GHGe by 25% by 2020



**U.S. Dairy** is ~2% of U.S. GHGe, 5% total water withdrawal and <4% farmland occupation

<https://dairygood.org/content/2017/2016-us-dairy-sustainability-report>



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# Environment: Reducing use of resources and lowering our impact

- American farmers have succeeded in improving efficiency while caring for the environment.
- Compared with 1944, the U.S. dairy industry now produces a gallon of milk using:

**90% less land**

**65% less water**

And producing:

**75% less manure**

**63% smaller carbon footprint**

USDA-NASS, [http://www.nass.usda.gov/Data\\_and\\_Statistics/Quick\\_Stats\\_1.0/index.asp](http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats_1.0/index.asp), Last accessed 25OCT10

USDA-ARS-AIPL, <http://aipl.arsusda.gov/eval/summary/trend.cfm>, Last accessed 26,OCT10

Capper J. Cady A. Bauman D. 2009. The environmental impact of dairy production; 1944 compared with 2007. Journal of Animal Science. 87:2160-2167



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# Social and Environment: Animal Care



## FARM Program

~98% of U.S. milk comes from farms participating in the FARM Program

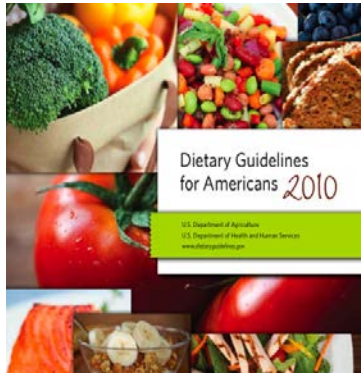


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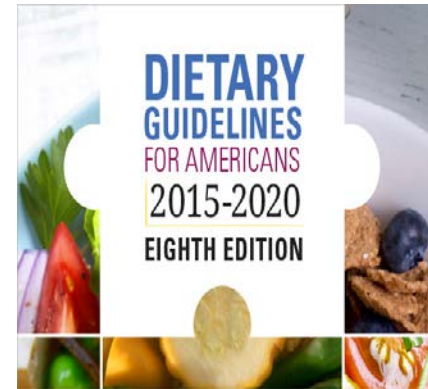
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# Social: Dairy's role in cardiovascular and metabolic health recognized by Dietary Guidelines for Americans Advisory Committees 2010 and 2015



“Moderate evidence also indicates that intake of milk and milk products is associated with a reduced risk of cardiovascular disease and type 2 diabetes and with lower blood pressure in adults.”

*2010 Dietary Guidelines Advisory Committee Report*



“Consumption of dairy foods provides numerous health benefits, including lower risk of diabetes, metabolic syndrome, cardiovascular disease and obesity.”

*2015 Dietary Guidelines Advisory Committee Report*



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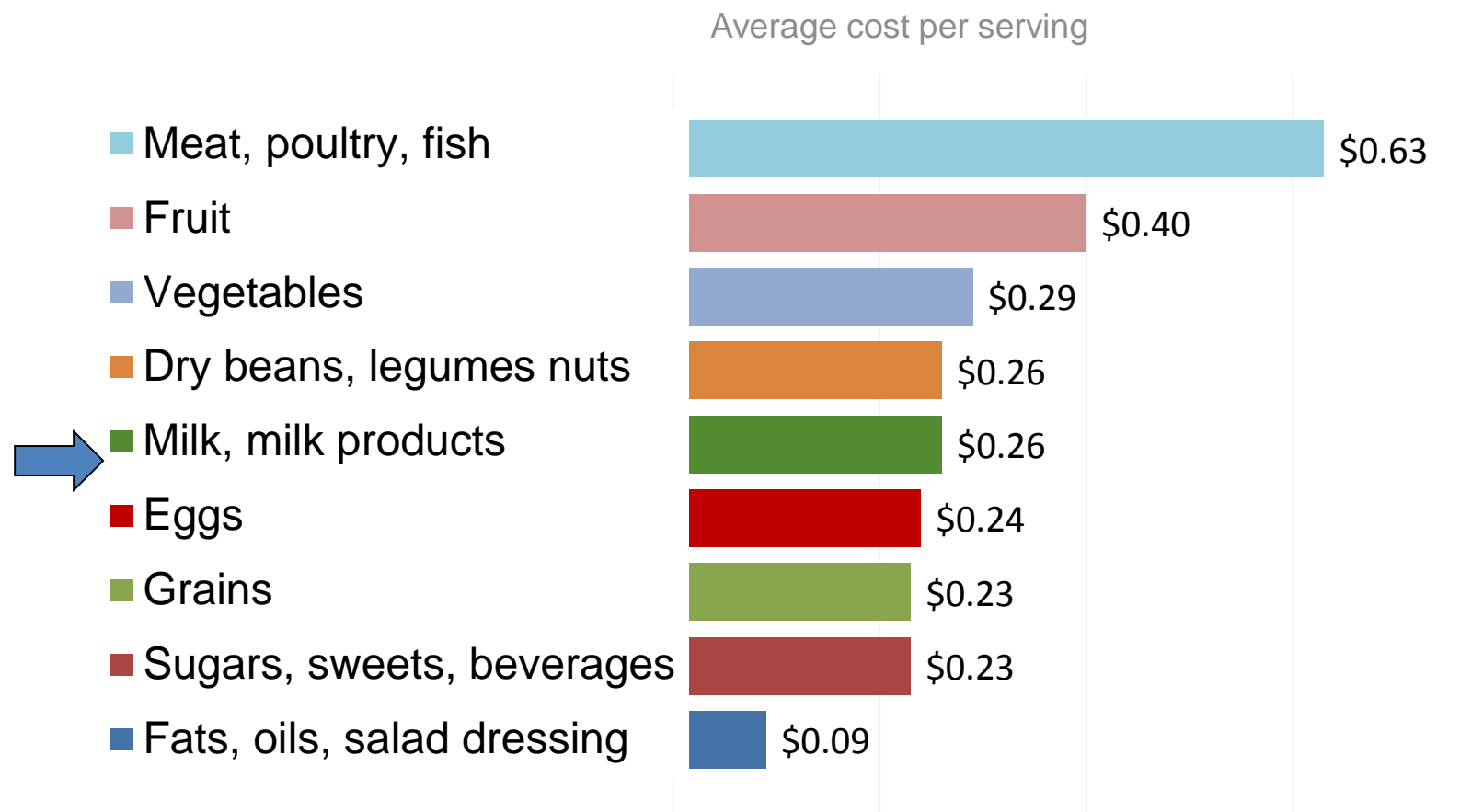


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# Economic: Milk and milk products are an economical source of nutrition



Values, 2001-2002 USDA CNPP database, Serving size, Reference Amount Customarily Consumed.

Drewnowski. Nutr Rev; 2017



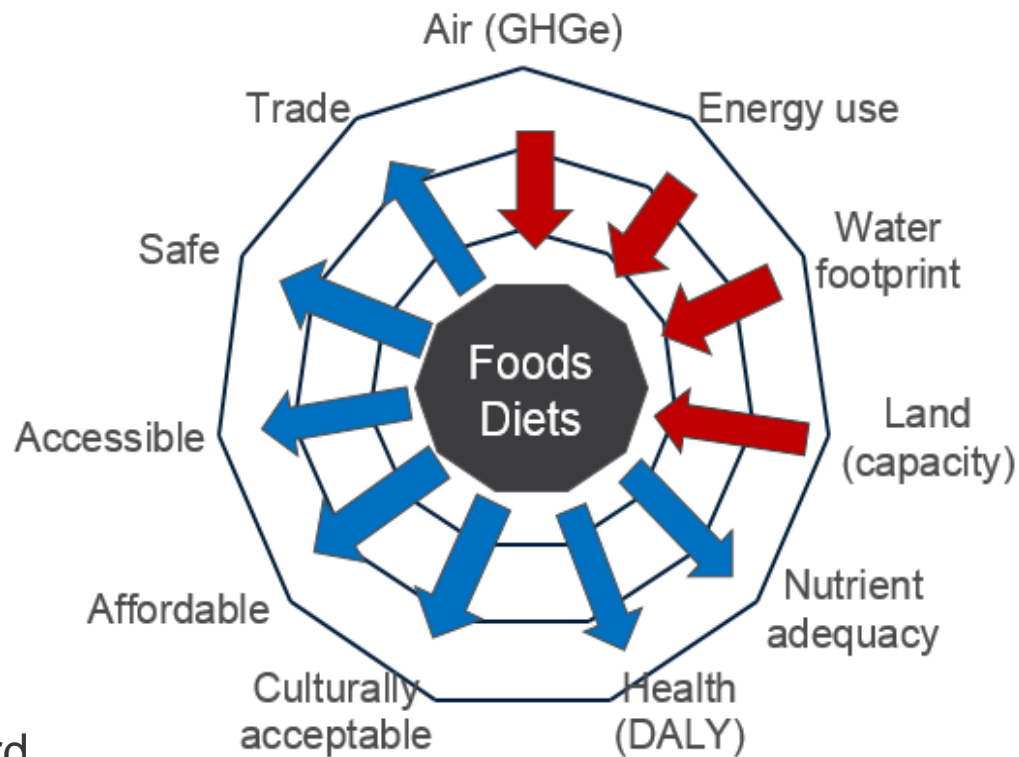
# Systematic approach to evaluating nutrition and food systems sustainability is required

Need to think systemically!

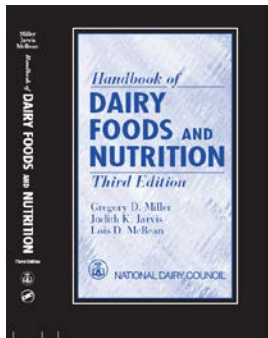
- Across different domains of a food system
- Farm to consumer to farm
- Multiple food and nutrition systems (not one diet nor one farm system!)

Nascent research

- Limited number of studies
- Inconsistent or nuanced
- Trade-offs among the domains of sustainability will likely have to be made.
- Focusing on the environmental footprint of food as the sole standard for sustainable food patterns may run counter to human nutritional needs.



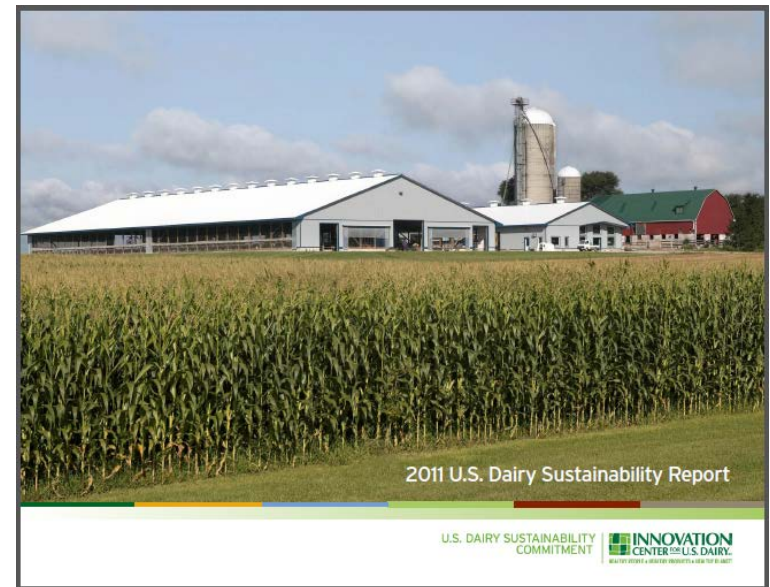
# Thank you



[www.usdairy.com](http://www.usdairy.com)

[www.dairygood.org](http://www.dairygood.org)

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Miller and Auestad, *Toward a sustainable dairy sector*. Int. J Dairy Technology (2013). Volume 66, Issue 3, Article first published online: 20 MAY 2013



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