About this Resource

The Stewardship and Sustainability Framework for U.S. Dairy (Framework) was developed by the Innovation Center for U.S. Dairy® to support dairy cooperatives, processors, manufacturers and milk marketing organizations that choose to voluntarily track and communicate sustainability progress.

Retailers and other U.S. dairy customers can use the Framework to track their suppliers’ continuous improvement on the sustainability measures that matter most and share this commitment with consumers.

The Framework is updated regularly to incorporate progress across all aspects of dairy’s sustainability commitment. Because the Framework is ever-changing, it is the user’s responsibility to refer to the most updated version.

THE INFORMATION AND INDICATORS PROVIDED IN THIS FRAMEWORK DOCUMENT ARE BASED ON STAKEHOLDER INPUT AND STATISTICAL ESTIMATES, AND NOT ON AN ACTUAL ASSESSMENT OF A DAIRY FARM’S OR DAIRY COMPANY’S BUSINESS NEEDS. AS SUCH, THE INFORMATION AND INDICATORS SHOULD NOT FORM THE BASIS FOR DECISIONS WITHOUT FIRST OBTAINING APPROPRIATE PROFESSIONAL, SCIENTIFIC, ENGINEERING AND / OR LEGAL ADVICE SPECIFIC TO THE BUSINESS.

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Chapter 1: About the Framework

Framework Defined

The Stewardship and Sustainability Framework for U.S. Dairy (Framework) serves as the primary resource through which producers, cooperatives and processors can voluntarily and credibly demonstrate the industry’s sustainability commitment to customers, engaged consumers and other key stakeholders. It defines sustainability measures, provides context as to the importance and relevance of each, and references applicable resources the dairy community can use to identify improvement opportunities and proactively report progress. By aggregating the industry’s collective efforts, the Framework provides U.S. Dairy with a platform to credibly demonstrate global leadership that meets the needs of a sustainable 21st century food system.

Dairy touches the lives of billions — from the livelihoods and stewardship efforts of farmers, processors and the communities they serve to the nutritious source of enjoyable, affordable food they provide. As such, dairy’s contribution to sustainable food systems is profound. Recognizing the need to demonstrate global leadership, U.S. Dairy convened in 2008 to define a common vision for socially responsible, economically viable and environmentally sound dairy. An industry-wide sustainability commitment was made and the Innovation Center for U.S. Dairy (Innovation Center) was created to bring this commitment to life.

The Innovation Center brings together the collective power of the dairy community. It ensures that U.S. Dairy lives up to the values of the sustainability commitment through The Stewardship and Sustainability Framework for U.S. Dairy.

A unified approach from “grass to glass”
To ensure an inclusive and mutually beneficial approach, the Framework is developed with voices spanning the value chain, including dairy farmers, manufacturers, retailers, brands, scientists and environmental nonprofits (acknowledgements on page 21). This multistakeholder approach takes place through the Innovation Center’s Dairy Sustainability Alliance, a forum where over 100 member organizations and more than 200 professionals convene to share knowledge and accelerate progress toward common sustainability goals across the dairy community.

Dairy customers are encouraged to use Framework metrics to assess sustainability and share this story with consumers. This unified approach mitigates inconsistency and provides clarity as to what is meant by sustainable dairy. From farm to table or “grass to glass,” everyone benefits—customers, the dairy community and, most importantly, consumers. Learn more at www.USDairy.com or contact the Innovation Center at innovationcenter@usdairy.com.

U.S. Dairy’s Sustainability Commitment

Dairy Sustainability Measurement Terms

- **Indicator**: An indicator provides a relevant measure to assess sustainability; for example, energy intensity.
- **Metric**: A metric defines how the indicator is measured. For example, energy intensity is calculated as the total amount of energy used per unit of production output.
- **Intensity**: Intensity metrics provide a normalization factor (for instance, units of milk production) to more accurately track progress over time. By dividing absolute impact by units of production, intensity metrics allow the dairy community to measure progress regardless of changes to production volume.
Chapter 1: About the Framework

Framework Alignment

The Framework has been developed by the Innovation Center with input and guidance from stakeholders including dairy farmers, manufacturers, retailers, brands and environmental nonprofits. When possible and practical, the Framework aligns with indicators and metrics developed by others to ensure harmonization and prevent duplication.

Field to Market®: The Alliance for Sustainable Agriculture

• Brings together a diverse group of stakeholders – including grower organizations, leading companies, academia, conservation groups and public sector partners – to define, measure and advance the sustainability of crop production in the United States.
• The Innovation Center has a formal partnership with Field to Market to harmonize on-farm sustainability metrics, and is engaged in joint efforts to help dairy farmers answer supply chain questions related to certain aspects of feed production (Page 7).

Farmers Assuring Responsible Management™ (FARM)

• Currently used by more than 98 percent of the U.S. fluid milk supply, FARM sets the highest standards for animal care from birth to end of life.
• The FARM Environmental Stewardship module allows for the collection and dissemination of information on greenhouse gas emissions (GHG) and energy use (Page 13).
• Administered by the National Milk Producers Federation in partnership with Dairy Management Inc.
• Participation in FARM demonstrates U.S. Dairy’s long-standing commitment to responsible animal care; therefore, the Framework’s animal care indicator is focused on FARM (Page 13).

Global Reporting Initiative™ (GRI)

• Provides a cross-industry framework for corporate sustainability reporting.
• GRI indicators are applicable to processing and manufacturing. When needed, the Framework’s indicators have been tailored to improve relevancy specific to dairy.
• The GRI indicators are less applicable to farming operations; therefore, farm and field indicators in the Framework may differ from GRI indicators.

Carbon Disclosure Project™ (CDP)

• Provides tools and guidance for reporting on environmental risk.
• Participants disclose data around climate change, supply chains, water and forests to provide information to customers, investors and other stakeholders.
• The Framework’s indicators and metrics can help cooperatives, processors and manufacturers prepare a portion of their submission to the CDP.

Dairy Sustainability Framework (DSF)

• Provides a global platform to map sustainability programs, identifies regional priority topics and measures progress across the global dairy value chain (Page 3).
• The Innovation Center is an aggregating member of the DSF on behalf of the U.S. market.
• The Innovation Center will continue to prioritize metrics and measurement tools to meet customer and consumer expectations for sustainability reporting and increase DSF alignment.
Global Alignment

Dairy plays an essential role in the lives of billions worldwide. In the American diet alone, dairy supplies 58 percent of vitamin D, 51 percent of the calcium and 16 percent of the protein. Further, the livelihoods of approximately one billion people are connected to dairy and 7 percent of the world’s land is cared for by the dairy sector. Thus, dairy has a significant role to play in contributing positive outcomes to address the world’s most pressing challenges, such as nutritional security, poverty reduction, resource scarcity and climate action. As the largest dairy producing country in the world, the U.S. must play a leadership role. This wider context fuels the Innovation Center’s work with leading global dairy, crop and environmental organizations to support shared efforts for sustainable dairy.

A Global Platform for Sustainable Dairy

The linkages between dairy, its societal benefits and the environment are complex. The challenge has been to establish a common global platform to advance sustainability across the diversity of dairy production.

To this end, the Dairy Sustainability Framework (DSF), developed by the Global Dairy Agenda for Action (GDAA), was established for dairy organizations worldwide to map and connect their sustainability activities in a credible and consistent manner. As of 2017, nearly 27 percent of world milk production reports sustainability activity through the DSF.

The DSF consists of 11 Global Criteria that outline high level objectives (Strategic Intents) committed to by the dairy sector. Recognizing the diversity of dairy production systems, the DSF enables regional setting of priorities and measures and the quantification of progress. In the U.S. market, the Stewardship and Sustainability Framework aligns with the DSF and provides the national platform for global reporting.

<table>
<thead>
<tr>
<th>Global Criteria</th>
<th>U.S. Framework Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental</td>
<td>• Feed Impact (Page 7)</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>• Feed Impact (Page 7)</td>
</tr>
<tr>
<td>Greenhouse Gas</td>
<td>• Greenhouse Gas Intensity (Page 9, 15)</td>
</tr>
<tr>
<td>Soil</td>
<td>• Feed Impact (Page 7)</td>
</tr>
<tr>
<td>Soil Nutrients</td>
<td>• Nutrient Management Plan (Page 11)</td>
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<tr>
<td>Waste</td>
<td>• Resource Recovery (Page 12, 17, 18)</td>
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<tr>
<td>Water</td>
<td>• Water Quantity (Pages 10, 16); Water Quality (Page 16), Feed Impact (Page 7)</td>
</tr>
<tr>
<td>Social</td>
<td>• FARM Animal Care (Page 13)</td>
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<tr>
<td>Animal Care</td>
<td>• FARM Animal Care (Page 13)</td>
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<tr>
<td>Product Safety &amp; Quality</td>
<td>• Foundational to U.S. Dairy (Page 1)</td>
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<tr>
<td>Working Conditions</td>
<td>• Employee Engagement (Page 19)</td>
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<tr>
<td>Economic</td>
<td>• Foundational to U.S. Dairy (Page 1)</td>
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<tr>
<td>Market Development</td>
<td>• Foundational to U.S. Dairy (Page 1)</td>
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<tr>
<td>Rural Economies</td>
<td>• Community Contributions (Page 20)</td>
</tr>
</tbody>
</table>

### Chapter 1: About the Framework

**Dairy and United Nations Sustainable Development Goals**

The Sustainable Development Goals (SDGs) are a United Nations initiative to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. The linkages between the dairy sector and SDGs are all-encompassing.

<table>
<thead>
<tr>
<th>Goals</th>
<th>Dairy’s Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 NO POVERTY</strong></td>
<td>• Over two-thirds of the world’s poor live in rural areas, where dairy serves as a major economic development driver and pathway out of poverty.</td>
</tr>
<tr>
<td></td>
<td>• In many cases dairy farms offer higher wages than other agricultural labor and, unlike seasonal crops, provide long-term, 365 day per year employment.</td>
</tr>
<tr>
<td><strong>2 ZERO HUNGER</strong></td>
<td>• Dairy cows are a consistent source of nutrient-rich food and income for farmers, who either consume or sell milk every day. This provides a steady source of income to supplement seasonal harvests and meat production.</td>
</tr>
<tr>
<td></td>
<td>• By providing an average of 10 percent protein, 5 percent of calories and 9 percent of fat in global diets, dairy is a leading contributor to global food security.</td>
</tr>
<tr>
<td><strong>3 GOOD HEALTH AND WELL-BEING</strong></td>
<td>• Every day billions of people receive important nutritional benefits from the dairy foods they consume, including three of the four “nutrients of concern” – calcium, potassium and vitamin D – in the 2015-2020 Dietary Guidelines for Americans.</td>
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<tr>
<td></td>
<td>• Dairy also provides significant amounts of protein and micronutrients essential to reducing malnutrition.</td>
</tr>
<tr>
<td><strong>4 QUALITY EDUCATION</strong></td>
<td>• Globally, millions depend on dairy as the primary source of income for school fees and education.</td>
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<td></td>
<td>• Dairy as an economic driver contributes to a growing global middle class with more opportunities for education.</td>
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<tr>
<td><strong>5 GENDER EQUALITY</strong></td>
<td>• Smallholder dairy farming is a strong vehicle for women’s empowerment in poor countries.</td>
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<td></td>
<td>• 37 million farms are female-headed with over 80 million women engaged in dairy farming.</td>
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<tr>
<td><strong>6 CLEAN WATER AND SANITATION</strong></td>
<td>• Since the Innovation Center’s inception, water quality has been identified as a key priority.</td>
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<tr>
<td></td>
<td>• The Framework’s water quality indicators are in place at the feed (Page 7), dairy farm (via nutrient management, Page 10, 11) and processor (Page 16) level.</td>
</tr>
<tr>
<td><strong>7 AFFORDABLE AND CLEAN ENERGY</strong></td>
<td>• Continuous improvement in energy efficiency is measured through the Framework’s energy intensity indicators (Page 8, 14).</td>
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<tr>
<td></td>
<td>• When economically viable dairy farmers can capture methane from manure as a renewable source of clean energy.</td>
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<tr>
<td><strong>8 DECENT WORK AND ECONOMIC GROWTH</strong></td>
<td>• The National Milk Producers Federation estimates U.S. Dairy provides 751,000 jobs and has a $112 billion impact on economic output. Globally, USDA estimates that each billion dollars of U.S. Dairy exports generates 20,093 jobs at the production level and 3,150 processing jobs. This is significantly higher than the average for U.S. agriculture as a whole, which generates 5,780 jobs per billion dollars in exports.</td>
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</table>
### Chapter 1: About the Framework


<table>
<thead>
<tr>
<th>Goals</th>
<th>Dairy’s Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 <strong>Industry, Innovation and Infrastructure</strong></td>
<td>• A thriving agribusiness industry provides innovation to advance cow comfort and productivity and technologies to optimize manure management and crop yields. This results in more efficient dairy farms that use fewer natural resources.</td>
</tr>
</tbody>
</table>
| 10 **Reduced Inequalities** | • Dairy plays an active role alleviating poverty and unemployment in both rural and urban areas across all 50 states.  
• Globally, dairy provides millions or jobs for disadvantaged segments of society included subsistence farmers and landless laborers. |
| 11 **Sustainable Cities and Communities** | • Dairy processors and distributors provide millions of urban jobs that contribute billions of dollars to local economies.  
• The dairy community further enhances urban livelihoods though product donations and charitable contributions (Page 20). |
| 12 **Responsible Consumption and Production** | • Dairy cows convert inedible plant materials and incomplete plant proteins into higher quality, nutritious and edible products (Page 12).  
• Cows also produce manure, which is valuable as fertilizer for healthier, more productive soils and for growing crops (Page 11). |
| 13 **Climate Action** | • U.S. Dairy is proactively reducing climate-related impacts. U.S. farmers, through their long history of continuous improvement in cow comfort, health, nutrition, breeding and other on-farm advancements, are ever increasing the efficiency of milk production (Page 9). |
| 14 **Life below Water** | • Dairy serves as a land-based protein provider that helps alleviate the burden of overfishing.  
• U.S. dairy farmers utilize farm management practices such as reduced tillage, cover crops, riparian zones and buffer strips that aid in biodiversity and protect waterways from the impact of adjacent land uses. |
| 15 **Life on Land** | • U.S. Dairy’s commitment to environmental stewardship and continuous improvement promotes sustainable management of the land and ecosystem services such as habitat and scenic landscapes. |
| 16 **Peace, Justice and Strong Institutions** | • Dairy is a key contributor to employment and global food security, helping to break the links between hunger and conflict. |
| 17 **Partnerships for the Goals** | • Collaboration is a key driver within the entire dairy value chain. In the U.S. the Innovation Center provides a multistakeholder forum through which engaged stakeholders can work towards a common vision of sustainability leadership.  
• Through the DSF, this commitment is reflected worldwide as dairy aspires to serve as a collaborative global leader in responsible agricultural production. |
### U.S. Dairy Indicators at a Glance

#### Chapter 1: About the Framework

**FIELD**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Indicator</th>
</tr>
</thead>
</table>
| Feed Impact                    | • Field to Market® indicators for land use, irrigation water use, soil conservation, water quality, soil carbon and biodiversity  
                                 | • Innovation Center indicators for greenhouse gas and energy intensity |

**DAIRY FARM**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Indicator</th>
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</thead>
<tbody>
<tr>
<td>Energy Use</td>
<td>• Energy intensity</td>
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<tr>
<td>Greenhouse Gas Emissions</td>
<td>• Greenhouse gas intensity</td>
</tr>
<tr>
<td>Water Quantity</td>
<td>• Water use</td>
</tr>
<tr>
<td>Nutrient Management</td>
<td>• Nutrient Management Plan</td>
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<tr>
<td>Resource Recovery and Feed Management</td>
<td>• By-products in feed</td>
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<tr>
<td>Animal Care</td>
<td>• Farm animal care</td>
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**PROCESSOR / MANUFACTURER**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Indicator</th>
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<tbody>
<tr>
<td>Energy Use</td>
<td>• Energy intensity</td>
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<tr>
<td>Greenhouse Gas Emissions</td>
<td>• Greenhouse gas intensity</td>
</tr>
<tr>
<td>Water Quantity and Quality</td>
<td>• Water use</td>
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<td></td>
<td>• Water efficiency</td>
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<td></td>
<td>• Water discharge and quality</td>
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<td></td>
<td>• Water recycling and reuse</td>
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<td>Resource Recovery</td>
<td>• Waste diversion</td>
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<td></td>
<td>• Throughput efficiency</td>
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<td></td>
<td>• Resource utilization</td>
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<td>Employee Engagement</td>
<td>• Employment opportunities</td>
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<td>• Employee benefits</td>
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<td></td>
<td>• Employee retention</td>
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<td></td>
<td>• Employee engagement in health and safety management</td>
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<td></td>
<td>• Days of restricted work activity or job transfer</td>
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<tr>
<td>Community Contributions</td>
<td>• Community volunteering and capacity building</td>
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<tr>
<td></td>
<td>• Monetary and product donations</td>
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<td></td>
<td>• Educational opportunities</td>
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</table>
Chapter 2: Field Indicators

Feed Impact

*Every stage of the dairy life cycle contributes to dairy’s environmental footprint. To help understand field-level impacts, the Innovation Center works in partnership with Field to Market®: The Alliance for Sustainable Agriculture.*

Field to Market® Alignment

On average, dairy farmers only grow 35 percent of their cattle feed. They are, therefore, limited in the ability to collect primary data on two-thirds of the feed supply. To address this, the Innovation Center has a formal partnership with Field to Market and participates in all of Field to Market’s standing committees – metrics, education and outreach, verification, and awards and recognition.

Because an estimated 45 percent of a dairy cow’s feed comes from corn silage and alfalfa, the Innovation Center and Field to Market are focused on adding these crops to U.S. Dairy’s benchmarking and measurement programs. Field to Market added alfalfa to the Fieldprint® Platform in 2017 and continues to work with the Innovation Center and growers to pilot the tool and provide feedback.

Field to Market uses U.S. Department of Agriculture (USDA) data to calculate the environmental impact of feed production for several indicators. The scale varies depending upon the availability of datasets at national, state or Crop Reporting District levels. The dairy community will use these benchmarks in industry reports and tools. Individual companies can work directly with Field to Market to address specific supply chain reporting needs.

Using USDA data and Field to Market metrics are key in assessing sustainability and meeting supply chain needs. In the future, the Innovation Center aims to find opportunities to address feed grown on-farm.

### Indicators

- Field to Market quantitative outcomes for land use, irrigation water use and soil conservation
- Field to Market qualitative indices for water quality, soil carbon and biodiversity
- Innovation Center quantitative outcomes for GHG and energy intensity

### Metrics

- The Innovation Center continues to work with Field to Market to ensure the indicators and metrics are useful and relevant to dairy farmers and their customers and consumers.
- *U.S. Dairy’s Carbon and Water Life Cycle Assessment for U.S. Milk* is used to measure the greenhouse gas (GHG) and energy intensity of feed production. These metrics mirror those used at the dairy farm (Pages 8, 9) and are reported in aggregate. The Innovation Center will continue to work with Field to Market to determine how best to integrate GHG and energy metrics over time.

### Tools and Resources

- **Field to Market**, [www.fieldtomarket.org](http://www.fieldtomarket.org): Learn about Field to Market membership, see examples of ongoing projects and learn more about how farmers and the supply chain are working together to catalyze continuous improvement.

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Chapter 3: Dairy Farm Indicators

Energy Intensity

Fossil fuels, the world’s primary energy source, release greenhouse gas (GHG) emissions into the atmosphere. As is the case for the vast majority of U.S. industries, the dairy community relies on energy, electricity and fuel throughout the value chain: for tractors used in feed production and trucks that distribute milk and dairy products; for lighting, milking and other equipment necessary on the farm; and for pasteurization, sanitation and other needs in processing and manufacturing plants. In total, energy use across the dairy supply chain – from feed production to the end consumer – accounts for about 36 percent of dairy’s total GHG emissions.6

Managing Energy

As with all businesses, energy consumption affects the farm’s bottom line. Dairy farmers can strategically manage energy use in order to reduce on-farm costs and lessen exposure to price volatility. While energy reduction methods are specific to each operation, modern technologies, such as LED lighting, high efficiency milk chillers and improved ventilation can reduce the risk of volatile energy prices while ultimately increasing farm revenue. Moreover, there are growing opportunities to purchase energy from renewable sources, or generate energy on-farm through solar power or anaerobic digestion.

The U.S. Dairy’s energy indicator uses an intensity metric of total energy use per pound of fat and protein corrected milk (FPCM).6 Based on the Innovation Center’s comprehensive, peer-reviewed Carbon and Water Life Cycle Assessment for U.S. Milk, the scope of this metric includes energy used in dairy farm and field operations, as well as purchased feed. The Innovation Center continues to work with Field to Market (Page 7) to determine how best to integrate Field to Market’s crop-specific energy measurements and data into dairy feed calculations.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy intensity</td>
<td>Total energy use converted to MMBTU/lb. of milk (FPCM)</td>
</tr>
</tbody>
</table>

Tools and Resources

- **FARM Environmental Stewardship, http://bit.ly/2pRA3uc:** Available to all FARM participants (Page 13), the FARM Environmental Stewardship module integrates the methodology and research from Farm Smart™ an Innovation Center program built to give dairy cooperatives and milk marketing organizations the ability to address customers’ sustainability inquiries and provide aggregated GHG footprint data for a regional milk supply. The tool allows for the collection and dissemination of information on GHG emissions and energy use, helps identify potential efficiency gains and cost savings, and tracks progress in a secure, confidential platform.

- **Energy Conservation Support, http://bit.ly/29fk0YB:** This resource enables farmers to review best management practices, case studies and updates about financial assistance for energy audits and equipment upgrades.


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6Because much of the energy in dairy feed is converted to milk solids (fat, protein, etc.), and not all farms produce milk with standard fat and protein composition, on-farm milk production is normalized to the average content (4% fat, 3.3% protein). Lactose has little impact on the overall calculation. When kept as a constant, FPCM is the same measurement as energy-corrected milk.
Greenhouse Gas Intensity

Concern over climate change means that reducing greenhouse gas (GHG) emissions is a global priority. Certain agricultural practices emit GHG, so the agricultural sector can play an important role in efforts to mitigate climate change. Moreover, reducing GHG on the farm can contribute to improved performance for other environmental attributes such as energy and fuel use, as well as economic benefits through improved efficiency.

Measuring GHG

In 2008, the Innovation Center commissioned a life cycle assessment (LCA) unprecedented in size and scope to create a rigorous approach to measure and improve the environmental footprint of U.S. Dairy. LCA-based calculations provide the foundation for the Innovation Center’s GHG intensity metric and is measured as CO₂e per pound of fat and protein corrected milk (FPCM).³ The scope of this metric includes energy used in dairy farm and field operations, as well as purchased feed.

Leading the world in GHG reduction

U.S. dairy farms have the lowest average GHG intensity of milk production globally—in other words, the lowest amount of CO₂e emitted per gallon compared to any other country in the world. At 10.6 lbs. CO₂e per gallon, the GHG intensity of U.S. milk is nearly half the world average of 20.4 lbs.⁸

Farmers have achieved this through a long history of increasing milk production efficiency as a result of improved cow comfort, health, nutrition, breeding and other on-farm advancements. Because of the adoption of modern practices, in 2007 the carbon footprint of a glass of milk was 63 percent lower than it was in 1944.⁹

Additional reductions can be achieved through practices that increase milk yield per cow, reduce enteric emissions, improve manure handling and processing, optimize breeding and enhance cow comfort. All on-farm practices must be considered in the context of a farm’s daily management. The Innovation Center set an industry-wide goal to reduce GHG emissions 25 percent by 2020 from a 2007 baseline. Efforts are underway to measure progress against this goal.

Indicators Metrics

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHG intensity</td>
<td>Total GHG emissions (lb. CO₂e)/lb. of milk (FPCM) produced</td>
</tr>
</tbody>
</table>

Tools and Resources

- **FARM Environmental Stewardship, http://bit.ly/2pRA3Uc:** Available to all FARM participants (Page 13), the Environmental Stewardship tool integrates the methodology and research from Farm Smart™ an Innovation Center program built to give dairy cooperatives and milk marketing organizations the ability to address customers’ sustainability inquiries and provide aggregated GHG footprint data for a regional milk supply. The tool allows for the collection and dissemination of information on GHG emissions and energy use, helps identify potential efficiency gains and cost savings and tracks progress in a secure, confidential platform.

- **Continuous Improvement Reference Manual, http://bit.ly/2sKnCiX:** An informational resource to accompany the Environmental Stewardship tool, the manual is intended for those who make on-farm decisions, including farmers, nutritionists, veterinarians and manure specialists. It offers practical, science-based ideas for reducing GHG emissions in the areas of feed, production, manure management and energy use. These ideas are presented as opportunities and options for consideration. Links to resources for further information and detail are included.

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³CO₂e (carbon dioxide equivalent) is a standard unit for measuring carbon footprint. The idea is to express the impact of each different GHG in terms of the amount of CO₂ that would create the same amount of warming.

⁸Because much of the energy in dairy feed is converted to milk solids (fat, protein, etc.), and not all farms produce milk with standard fat and protein composition, on-farm production is normalized to the average content (4% fat, 3.3% protein). Lactose has little impact on the overall calculation. When kept as a constant, FPCM is the same measurement as energy-corrected milk.

Chapter 3: Dairy Farm Indicators

Water Quantity

Dairy farmers use water responsibly and generally recycle it multiple times. Clean water is used to wash cows, clean the milking parlor and milking equipment and cool milk storage tanks. That water is reused to flush manure from barn floors and then, finally, recycled and blended with irrigation water to nourish crops grown to feed cows. Due to improved water management and increased milk production efficiencies, in 2007 the water footprint of a glass of milk was 65 percent lower than it was in 1944.10

Reducing Water Use

Dairy farmers understand the importance of water resources because their prosperity is directly tied to water access, scarcity and excess. In recent decades, many dairy farms have advanced their water conservation and recycling practices, driven by economic and environmental concerns and the availability of more sophisticated data, research, equipment and technology. These advances are aided by state agriculture extension services, USDA’s Natural Resources Conservation Service (NRCS), conservation organizations and others.

Measuring on-farm water use can provide farmers with improved information and risk management options. Efficiency is the basic measure of on-farm water use.

Dairy measures water efficiency per pound of fat and protein corrected milk (FPCM).11 Based on the Carbon and Water Life Cycle Assessment for U.S. Milk, this metric’s scope includes drinking, cooling, cleaning and washing for lactating dairy cows. Nationally, average on-farm water use is 14 gallons per pound of milk.12 This aggregate number can serve as a benchmark or be used for reporting when measurement tools for on-farm water use are unavailable.

Dairy feed production accounts for more than 90 percent of water use. Through the Innovation Center and Field to Market partnership (Page 7), feed impacts will be aggregated and used in dairy industry reports, tools and calculators. Since 65 percent of dairy feed is purchased, aggregated data is vital to capturing water stewardship efforts. In the future, the Innovation Center aims to find opportunities to address the estimated 35 percent of feed grown on U.S. dairy farms.

Indicators
- Dairy on-farm water use

Metrics
- Gallons of water/lb. of milk (FPCM)
- This metric measures water use for lactating cows. The scope of this metric includes drinking, cooling, cleaning and washing.

Tools and Resources

11Because much of the energy in dairy feed is converted to milk solids (fat, protein, etc.), and not all farms produce milk with standard fat and protein composition, we have normalized on-farm production to the average content (4% fat, 3.3% protein). Lactose has little impact on the overall calculation. When kept as a content, this is the same measurement as energy-corrected milk.
Nutrient Management

Fertilizer, manure and compost are used to enrich the soil in which crops are grown. The proper nutrients should be applied at the right rate, time and location to achieve optimal forage and crop productivity. Due to productivity improvements, in 2007 U.S. Dairy used 65 percent less cropland to produce a gallon of milk than it did in 1944.13

Optimizing Nutrients

Nutrient management is the practice of efficiently using nutrients to maximize forage and crop growth while safeguarding natural resources. When inadequate nutrients are made available, yield and quality may be compromised. Also, when nutrients are applied in excess or improperly managed, farmers lose money on the wasted inputs and may adversely impact air and water quality.

A nutrient management plan (NMP) helps guide management decisions to ensure nutrients are applied in an economically efficient and environmentally sound manner. For example, a NMP includes steps for testing soil nutrient levels before applying manure or fertilizer to help guide the proper source, rate, timing and placement of additional nutrients.

A NMP is tailored so recommendations meet a farm's unique needs. For dairy farms, the NMP typically focuses on how manure and wastewater are handled, stored, transferred and applied. Some farmers, especially those in states with plentiful surface water and participating in certain federal conservation programs, are required to have a NMP. Many others voluntarily develop a NMP. The standards for developing a NMP vary by state. Regardless of state policies, Environmental Protection Agency national regulations require dairy farms with more than 700 cows to have a Comprehensive NMP, which is a whole-operation conservation plan including nutrient management.

Indicators

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Nutrient Management Plan</td>
<td>• Are you required to implement a nutrient management plan?</td>
</tr>
<tr>
<td></td>
<td>• If no, do you implement a nutrient management plan?</td>
</tr>
</tbody>
</table>

Tools and Resources

- USDA NRCS State and Local Agencies, http://1.usa.gov/1WlxT7G: State and local agencies offer regionally-specific NMP resources. Guidance documents and management tools include:
  - Manure Management Planner, http://bit.ly/29hamoP3: A computer program that helps users allocate manure (where, when and how much) on a monthly basis for the length of the plan (1 to 10 years).

Resource Recovery and Feed Management

Dairy farmers develop carefully managed feed rations to ensure optimal herd health. It is a misconception that dairy feed and human food are interchangeable. In the U.S., only 20 percent of what cows eat is edible by humans, and only 2 percent is what people would actually want to eat. By converting human-inedible feed into a nutrient-rich food, dairy cows play a key role in sustainable food systems.

Recycling By-products

The dairy farm is an important part of a sustainable food system. Working with professional dairy cow nutritionists, dairy farmers feed their cows by-products from the processing of other foods and fibers, such as citrus pulp, distillers grains and cottonseed. Additionally, the manure from cows is recycled as a fertilizer for crops, thus helping to maintain soil fertility by returning nutrients from its feed back into the soil.

Using by-products is a vital resource recovery tool for farmers, but their use must be optimized and economically viable. Great care is taken in selecting ingredients and rations that are healthy for dairy cows. If by-products are fed at the expense of a balanced diet, this will compromise milk yields, the health of the cow and the overall sustainability of the farm. The economic and environmental value of by-product use also varies based on regional and seasonal availability, transportation logistics and distance from feed source to the farm. Because of these variations, a farm- or regional-level measurement for by-products is not necessarily a good indicator of sustainability or a metric that can be tracked for continuous improvement over time.

Despite regional variations, dairy has a strong and positive story of environmental stewardship through by-product use. At a national level, 14 by-products account for 19 percent of a dairy cow’s dry matter intake. This national level data helps cooperatives and others answer supply chain questions and informs dairy industry reporting efforts.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>• By-products in feed</td>
<td>• Percent of food and agricultural by-products of total ration fed to cows</td>
</tr>
<tr>
<td></td>
<td>• Information is reported at a national level. On average, 19 percent of a U.S. dairy cow’s dry matter diet is comprised of by-products.</td>
</tr>
</tbody>
</table>

Tools and Resources

These publications provide guidance and insight on incorporating by-product ingredients into dairy cow diets:

Animal Care

U.S. dairy farmers are committed to ensuring the well-being of animals in their care. Uniting around the highest standards and making sound decisions are not only ethical obligations, but essential for a productive herd and critical to the farm's profitability and success.

FARM Animal Care Participation

U.S. Dairy demonstrates its commitment to animal care through The National Dairy FARM Program: Farmers Assuring Responsible Management™ (FARM). Updated every three years, the program fosters a culture of continuous improvement and provides assurance that dairy farmers raise and care for their animals in a humane and ethical manner.

Currently, over 98 percent of the U.S. milk supply comes from participating farms. Guidelines around responsible operating procedures include appropriate care for cows and calves, clean and proper housing, employee training, record-keeping and working with veterinarians and other animal care professionals. Farms must meet criteria in three “Priority One” areas, including: a relationship with a veterinarian documented by a completed and signed veterinarian-client-patient-relationship form on an annual basis, animal stockmanship and care training for all employees, and eliminating the practice of routine tail docking. “Priority Two” areas include: animal observation benchmarks and a written Herd Health Plan outlining protocols for newborn and milk-fed dairy calves, pain management, training for non-ambulatory animal management, and euthanasia.

The program takes a three-pronged approach:

1. The FARM Animal Care Reference Manual and corresponding educational materials detail the highest standards for animal care.
2. Farmers are evaluated at least once every three years by trained and certified experts. Evaluators provide feedback around areas in which farmers are excelling, as well as those where improvement is needed.
3. Third-party verification ensures program integrity through outside experts, who provide statistically verified data on the implementation of the program and industry-wide animal care.

If an improvement need is identified, then a mandatory corrective action plan for Priority One areas or a continuous improvement plan for Priority Two areas is developed in consultation with dairy professionals. Within 12 months, the action plan must be resolved and verified before the next evaluation for continuous improvement plans (sooner, if a mandatory correction action plan was assigned). If a Priority One area is not resolved within 12 months or sooner, the farm risks probation and eventual suspension.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm animal care</td>
<td>Do you participate in the FARM Animal Care? Yes / No</td>
</tr>
</tbody>
</table>

Tools and Resources


- **FARM Program, www.nationaldairyfarm.com:** Provides accompanying resources including the FARM Program Drug Residue Prevention Manual and FARM Environmental Stewardship.

- **Year in Review, http://bit.ly/2ahzjoQ:** Provides an annual report of FARM progress and details the national results of on-farm assessments.
Energy Intensity

Energy intensity gauges the amount of energy used to produce a specific quantity of product. If tracked over time, it can demonstrate the results of processors’ and manufacturers’ efforts to reduce energy consumption and optimize production through the introduction of new technologies and/or energy management practices.

Measuring Energy

The use of improved energy practices or technologies can directly reduce a company’s operational costs and future dependency on nonrenewable energy sources. Also, better energy performance can be a key strategy for reducing GHG emissions and impacts from the extraction and processing of energy.14

Energy intensity should be analyzed within the context of the company’s operations and production outputs. An improved intensity ratio is not a direct indication of reduced greenhouse gas (GHG) emissions and, therefore, should be analyzed appropriately. This indicator is intended to track continuous improvement within an organization’s own operations.

Because inputs, final products and processes vary across manufacturing plants, comparisons between different companies can lead to false interpretations. As such, energy intensity should not be used to benchmark against other companies.

When comparing the energy intensity of plants within the same company, the methods of measurement need to be the same. Some companies may process or produce both dairy and nondairy products. In that case, the company should indicate whether or not nondairy products were included in the measurement and reporting.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Energy intensity</td>
<td>• Total energy use (converted to MMBTU)/unit of production output</td>
</tr>
<tr>
<td></td>
<td>• Unit of production output can include:</td>
</tr>
<tr>
<td></td>
<td>◦ Gallon (milk, ice cream or other frozen products)</td>
</tr>
<tr>
<td></td>
<td>◦ Pound of product (cheese, butter, etc.)</td>
</tr>
<tr>
<td></td>
<td>◦ Pound of milk</td>
</tr>
</tbody>
</table>

Tools and Resources

- **EPA’s ENERGY STAR® Performance Indicators, www.energystar.gov**: Provides industry-specific benchmarking tools to score a plant’s energy performance and compare it to that of similar plants; includes resources and guidance.

Chapter 4: Dairy Processor Indicators

Greenhouse Gas Intensity

On average, processing accounts for 2.50 pounds CO₂e of the 17.6 pounds CO₂e per gallon of milk’s total carbon footprint. Dairy processors and manufacturers can reduce greenhouse gas (GHG) emissions by using energy efficient materials and processing equipment and establishing energy conservation measures.

Measuring GHG

The dairy community has made a voluntary commitment to reduce GHG emissions for fluid milk by 25 percent by 2020 from a 2007 baseline.

GHG emissions are generally measured as Scope 1 (direct GHG emissions), Scope 2 (GHG emissions from consumption of purchased electricity, heat or steam), and Scope 3 (all other indirect emissions from sources not controlled by the company). GHG reduction opportunities are generally measured by Scopes 1 and 2, which are more readily quantified.

This indicator is intended to track continuous improvement within an organization’s own operations. Because inputs, final products and processes vary across manufacturing plants, this indicator should not be used to compare companies.

When comparing the GHG emission intensity of plants within the same company, the methods of measurement need to be the same. Some companies may process or produce both dairy and nondairy products. In that case, the company should indicate whether or not nondairy products were included in the measurement and reporting.

![U.S. Dairy Carbon Footprint — All Products](image)

**Indicators**

- GHG intensity

**Metrics**

- Total GHG emissions (lbs. CO₂e, Scope 1 and 2) per unit of production output
- Unit of production output can include:
  - Gallon (milk, ice cream or other frozen products)
  - Pound of product (cheese, butter, etc.)
  - Pound of milk

**Tools and Resources**

- The Carbon Disclosure Project, [www.cdp.net](http://www.cdp.net): Works with some of the largest corporations worldwide to help ensure that an effective carbon emissions/reductions strategy is made integral to their business.
- EPA, [https://www.epa.gov/climate-indicators](https://www.epa.gov/climate-indicators): Includes comprehensive insights on the impacts of GHG emissions on climate change and guidance on GHG reduction.

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15CO₂e, or carbon dioxide equivalent, is a standard unit for measuring carbon footprints. The idea is to express the impact of each different greenhouse gas in terms of the amount of CO₂ that would create the same amount of warming.


17www.ghgprotocol.org/calculation-tools/faq.
Water Quantity and Quality

Water is a finite resource under increasing pressure from human activities as well as changing climate. Water use is directly linked to other local, regional and national sustainability concerns. For example, water availability and quality have implications to human health, the economy, food security and ecosystem health. As a result, water management has become a key issue for many food companies.18

Demonstrating Water Efficiency

While water efficiently is a good general practice, the availability of water differs throughout the U.S. In areas where water is scarcer, optimal water management becomes increasingly important for the dairy community and others.

Water recycling is one of several strategies dairy processors can use to reduce their impact on stressed water sources. Proper water management includes a variety of practices to reduce the volume used and impacts on quality.

Dairy processing plants can track water consumption and identify production efficiency opportunities through the use of meters. In addition, processors must monitor water leaving the plants to ensure quality meets or exceeds environmental regulations.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Water use</td>
<td>• Percentage of total water withdrawn and consumed by source</td>
</tr>
<tr>
<td>2. Water efficiency</td>
<td>• Total water consumed/unit of production output. Unit of output production can include:</td>
</tr>
<tr>
<td></td>
<td>◦ Gallon (milk, ice cream or other frozen products)</td>
</tr>
<tr>
<td></td>
<td>◦ Pound of product (cheese, butter, etc.)</td>
</tr>
<tr>
<td></td>
<td>◦ Pound of milk</td>
</tr>
<tr>
<td>3. Water discharge and quality</td>
<td>• Do you have a policy, program or monitoring system that ensures routine compliance with industrial or storm water permit parameters?</td>
</tr>
<tr>
<td>4. Water recycling and reuse</td>
<td>• Percentage and total volume of water that is recycled and reused</td>
</tr>
</tbody>
</table>

Tools and Resources

- EPA Case Studies and Guidance, http://1.usa.gov/1ZEBouO: For both water and energy use efficiency.

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Resource Recovery

Resource recovery is the selective extraction of disposed materials (waste) for a specific next use, such as production of new materials, compost or energy. The aim of resource recovery is to extract the maximum practical benefits from products, delay the consumption of virgin natural resources and generate the minimum amount of waste. Additionally, dairy processing plants can implement waste management plans, which help reduce waste before it is ever created (avoided waste). Resource recovery may also be extended from processing to the dairy farm through opportunities such as using by-products from food processing as animal feed and sending organic food waste to on-farm anaerobic digesters.

Optimizing Recovery

A range of compelling reasons exist for dairy processors and manufacturers to optimize their material efficiency and resource recovery efforts. From an economic perspective, reducing materials consumed and increasing efficiencies in the manufacturing process relate directly to lowered operational costs. Also, repurposed waste, such as recyclable products, can become added sources of revenue. As such, resource recovery and avoided waste can be some of the easiest sustainability wins within a plant’s operations.

From an environmental perspective, the case for resource recovery is apparent. Faced with a growing population and a finite resource base, there is a clear need to do more with less. Furthermore, food waste is a significant contributor to GHG emissions and comprises over 20 percent of what is hauled to landfills. Resource recovery options include recycled packaging, reused wastewater and repurposed organics/food waste. Of these, food waste is a priority issue for agricultural products. In the U.S., one in three calories is wasted, and 40 percent of food goes uneaten. At the same time, one out of every six Americans lacks a secure supply of food.

It is critical, therefore, to maximize efficiencies in the U.S. food system and minimize waste in the journey to consumers’ plates.

EPA Waste Management and Food Recovery Hierarchies provide guidance to prioritize actions to prevent and reduce waste and inform dairy’s resource recovery indicators. The illustration below merges these two hierarchies to aid processors in waste stream accounting and metric calculations. The scope of the resource recovery indicators includes waste produced from a manufacturing facility during normal manufacturing processes. The boundary of the indicators is the point where a recycling, treatment or disposal facility accepts a processing plant’s waste.

## Resource Recovery, cont.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Waste diversion</td>
<td>• Percent by weight total waste stream (lbs.) diverted from landfill OR incineration without recapturing energy</td>
</tr>
<tr>
<td></td>
<td>• Calculation: the merged EPA hierarchy defines each category:</td>
</tr>
<tr>
<td></td>
<td>All Waste in Categories 2-3 (by weight, lbs.)</td>
</tr>
<tr>
<td></td>
<td>All Waste in Categories 2-4 (by weight, lbs.)</td>
</tr>
<tr>
<td></td>
<td>• Source reduction is not included in the waste diversion metric, as it is not part of existing waste streams. However, having no waste to begin with is the most preferred method of waste reduction. Processors are encouraged to communicate their source reduction efforts. Source reduction is also fundamental to improvements in the throughput efficiency indicator.</td>
</tr>
<tr>
<td>2. Throughput efficiency</td>
<td>• Total waste stream/unit of production output (lbs.)</td>
</tr>
<tr>
<td></td>
<td>• Calculation: the merged EPA hierarchy defines each category:</td>
</tr>
<tr>
<td></td>
<td>Waste in Categories 2-4 (by weight, lbs.)</td>
</tr>
<tr>
<td></td>
<td>Unit of Production Output</td>
</tr>
<tr>
<td></td>
<td>• Due to the breadth of dairy products and manufacturing processes across processing plants, throughput can’t be used for benchmarking or comparison. This is intended for use by processors as an internal operational indicator.</td>
</tr>
<tr>
<td>3. Resource utilization</td>
<td>• Food donated or repurposed as animal feed AND non-food recycled or composted/total waste stream</td>
</tr>
<tr>
<td></td>
<td>• Food repurposed for industrial uses or compost AND non-food repurposed for energy recovery/total waste stream</td>
</tr>
<tr>
<td></td>
<td>• Waste sent to landfill or incineration without recapturing energy/total waste stream</td>
</tr>
<tr>
<td></td>
<td>• Calculation: the merged EPA hierarchy defines each category:</td>
</tr>
<tr>
<td></td>
<td>All Waste in Categories 2, 3 or 4 (by weight, lbs.)</td>
</tr>
<tr>
<td></td>
<td>All Waste in Categories 2-4 (by weight, lbs.)</td>
</tr>
<tr>
<td></td>
<td>• Food donations are not specifically reported in the resource utilization metric, as they are captured in the Dairy Processor Indicators as monetary and product donations (Page 20).</td>
</tr>
</tbody>
</table>

### Tools and Resources

- **Comprehensive Guidance for Sustainable Materials Management, [www.epa.gov/smm](http://www.epa.gov/smm).**
Employee Investment

Labor management is closely watched by external stakeholders to help ensure employee safety and worker livelihoods. Processors and manufacturers monitor labor management not only to ensure employee health and safety, but also because employee satisfaction and productivity are essential to a positive corporate culture, labor retention, profitability and business success.

Measuring Labor Management

In the U.S., the production of dairy products creates an estimated 1.58 million jobs either directly (farming and processing) or indirectly (farm inputs, machinery, etc.). This does not include jobs required to distribute, market and sell dairy products. As such, the sustainability of the dairy industry depends upon the availability and retention of quality employees.

The scope of the labor management indicators for processors and manufacturers includes: employment opportunities; employee benefits, such as housing and health care; employee engagement in health and safety management; and employee retention. Days of Restricted Work Activity and Job Transfer provides an important metric for workplace safety. It is a mathematical calculation that describes the number of employees involved in a recordable injury or illness.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Employment opportunities</td>
<td>• Total number of jobs supplied</td>
</tr>
<tr>
<td></td>
<td>• This metric includes full time employees, part time employees</td>
</tr>
<tr>
<td></td>
<td>and consultants</td>
</tr>
<tr>
<td>2. Employee benefits</td>
<td>• List or indicate indirect and non-monetary benefits available to employees</td>
</tr>
<tr>
<td></td>
<td>• This metric includes health insurance, retirement plans, housing and</td>
</tr>
<tr>
<td></td>
<td>other applicable benefits for both part-time and full-time employees.</td>
</tr>
<tr>
<td>3. Employee retention</td>
<td>• Total number employed during the past year and percentage of employees</td>
</tr>
<tr>
<td></td>
<td>who have been employed for 5, 10 and 20 years</td>
</tr>
<tr>
<td>4. Employee engagement in health and safety</td>
<td>• Number of opportunities for workers to participate in, and percentage</td>
</tr>
<tr>
<td>management</td>
<td>of employees who participated in developing, implementing and</td>
</tr>
<tr>
<td></td>
<td>managing health and safety initiatives; also, the levels in the</td>
</tr>
<tr>
<td></td>
<td>corporation at which these programs operate</td>
</tr>
<tr>
<td>5. Days of restricted work activity or job</td>
<td>• Days of restricted work activity or job transfer (DART) rate</td>
</tr>
<tr>
<td>transfer</td>
<td>• Explain why this has changed over time</td>
</tr>
</tbody>
</table>

Tools and Resources


Community Contributions

Dairy companies and their employees contribute to local communities and regions in ways that can be obvious to consumers and stakeholders, such as direct economic support, local taxes paid and as a source for local employment opportunities. Other impacts may be less obvious including: community involvement by employers and employees in service organizations, churches and schools, charitable contributions and general contributions and capacity building to support the overall vitality of many rural communities.

Investing in Local Communities

Employees of dairy processors and manufacturers play crucial leadership roles in their communities. For instance, employees may serve on local government, fire departments and school boards, and may participate in community and youth programs. Many processors and manufacturers also offer scholarships for college students, provide grant funding to local community projects and get involved in community volunteering and charitable efforts.

The indicators for community contributions focus on the impact dairy processors and manufacturers have on sustaining vibrant local communities. They include time and financial contributions, such as volunteering, donations and educational opportunities which are provided in the form of tours and informational events.

If they have access to the necessary information, this category of educational opportunities is an indicator that processors and manufacturers are encouraged to complete and communicate in their sustainability reports.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Community volunteering and capacity building</td>
<td>• Volunteer activities performed by employees</td>
</tr>
<tr>
<td>2. Monetary and product donations</td>
<td>• Monetary and product donation activities</td>
</tr>
<tr>
<td></td>
<td>° Provide a narrative description of product donations for the past year</td>
</tr>
<tr>
<td>3. Educational opportunities</td>
<td>• Describe community educational events per year and the total number of participants.</td>
</tr>
</tbody>
</table>

Tools and Resources


• Examples of Community Contributions by Dairy Companies:
Acknowledgments

The Innovation Center for U.S. Dairy® gratefully acknowledges contributions made by the following organizations and individuals:

Farms, Farmers and Cooperatives

Agri-Mark Cooperative
Alliance Dairies and Alliance Grazing Group
Blue Spruce Farms, VT dairy farmers
Bob Foster, Foster Brothers Farms, VT dairy farmer
Brian Medeiros, Medeiros & Son Dairy, CA dairy farmer
Chris Kraft, CO dairy farmer
California Dairies, Inc.
Dairy Farmers of America, Inc.
Darigold, Inc
Doug Young, Spruce Haven Farms
Eldorado Dairy, NM dairy farmers
Everett Williams, GA dairy farmer
Foremost Farms USA
Freund’s, CT dairy farmers
Gallo Legacy Farms
Holsum Dairies, LLC
Horizon Dairy
Jacques Parent, VT dairy farmer
Jerry Truelove, GA dairy farmer
Jill Hauser, MD dairy farmer
Jim Boyle Dairy, AZ dairy farmer
Jim Werkhoven, WA dairy farmer
Kevin Moore, FL dairy farmer
Land O’Lakes, Inc.
Laurelbrook Dairy, CT dairy farmers
Lorraine Merrill, NH dairy farmer
Lou Brown, OH dairy farmer
Mary Kraft, CO dairy farmer
Maryland and Virginia Milk Producers
McCarty Family, KS dairy farmers
Michigan Milk Producers Association
Mike Miller, LA dairy farmer
Myles Payne, NC dairy farmer
Organic Valley/CROPP
Paul Rovey, AZ dairy farmer
Prairie Farms Dairy
Randy Burnham, FL dairy farmer
Ray-Lin, CA dairy farmers
Sarah Lloyd, WI dairy farmer
Select Milk Producers, Inc.
Steve Graybeal, PA dairy farmer
United Dairymen of Arizona
Wholesome Wisconsin Dairies
Zach Myers, NC dairy farmer

Processors, Retailers and Brands

C.F. Burger Creamery
Cabot Creamery
Crystal Creamery
Danone
Dean Foods
General Mills, Inc.
Glanbia Foods Inc.
Hilmar Cheese Company
Kemps
The Kroger Company
Leprino Foods Company
McDonald’s
Sargento Foods Inc.
Schreiber Foods Inc.
The Starbucks Company
Unilever
Walmart

Associations and Government

Florida Dairy Farmers
Idaho Dairymen’s Association
International Dairy Foods Association
Midwest Dairy Association
National Milk Producers Federation
New Hampshire Dairy Industry Association
United States Department of Agriculture
Washington State Dairy Federation
Washington State Dairy Products Commission

Community

California Dairy Cares
California Dairy Research Foundation
Environmental Defense Fund
Manomet, Inc.
New Mexico State University
Pennsylvania State University
University of California, Davis
University of Wisconsin–Madison
Water Stewardship Inc.
World Wildlife Fund

NOTE: This report represents a collaborative effort and, as such, its content may not reflect the perspective of each individual contributor.
About the Innovation Center for U.S. Dairy®
The Innovation Center for U.S. Dairy (Innovation Center) provides a forum for dairy companies to work pre-competitively to address barriers to and opportunities for innovation and sales growth. The Innovation Center aligns the collective resources of the industry to offer consumers nutritious dairy products and ingredients, and to promote the health of people, communities, the planet and the industry.

The Innovation Center was established in 2008 under the leadership of America’s dairy farmers through Dairy Management Inc.™, the nonprofit organization that manages the producer checkoff program. Learn more at www.USDairy.com.

www.USDairy.com • InnovationCenter@USDairy.com