Stewardship and Sustainability Guide for U.S. Dairy

A voluntary framework for tracking and communicating progress

May 2013

Draft Version 1.2 - Phase 1

For U.S. Dairy Stakeholder Consultation

INNOVATION CENTER FOR U.S. DAIRY

HEALTHY PEOPLE • HEALTHY PRODUCTS • HEALTHY PLANET

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About the Innovation Center for U.S. Dairy®

The Innovation Center for U.S. Dairy (Innovation Center) provides a forum for the dairy industry 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 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. It is the first of its kind to bring together milk producers, processors and manufacturers, to offer consumers the products they want — when and where they want them. Learn more at USDairy.com.

About this Document

This document is a draft of Version 1.2 of the Stewardship and Sustainability Guide for U.S. Dairy: *A voluntary framework for tracking and communicating progress* for Phase 1 Dairy Stakeholder Consultation.

OVERVIEW

Sustainability Vision

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

Introduction

In 2008, the dairy industry came together to foster new ways to work collectively in a precompetitive manner and create opportunities for producers and the industry at large. A significant part of this effort was the founding of a new venture, the Innovation Center for U.S. Dairy® (Innovation Center), which has sustainability as one of its six key priorities.

Since then, the dairy industry has become a sustainability leader by creating ways for dairy producers, cooperatives, processors/manufacturers, and other companies to capture value and improve sustainability outcomes. Notable accomplishments include the completion of the Greenhouse Gas Life Cycle Assessment for Fluid Milk, establishment of an industrywide greenhouse gas (GHG) reduction goal, and identification and launch of ten innovation projects. To communicate the industry's commitment to sustainability and progress made toward its sustainability goals and vision, the Innovation Center has published two sustainability reports, which are available at www.USDairy.com/sustainability.

To meet the public goal of reducing the industrywide GHG footprint by 25 percent by 2020, and to create further value in the supply chain, the industry needs to have a reliable way of assessing its sustainability performance. Such an assessment is critical to help the industry understand where it stands now and identify the greatest opportunities for future improvement.

In 2011, the Innovation Center launched the development of the Stewardship and Sustainability Guide for U.S. Dairy: *a voluntary framework for tracking and communicating progress* (Guide) as an important next step in achieving the industry's sustainability goals. Through the Guide, the industry has built a standardized and relevant approach to sustainability measurement and communication. Version 1.2 - Phase 1 of the Guide is the result of an industry-wide collaborative development process involving stakeholders throughout the dairy value chain, government agencies, non-governmental organizations and researchers. Appendix 1 lists the contributors to Version 1.2 - Phase 1. For more information about the development process, refer to the frequently asked questions (FAQ) document at www.USdairy.com/sustainability.

Retailers, food service companies, consumers and other stakeholders are showing an increasing interest in the dairy industry's ability to track and communicate sustainability progress. The Guide provides a consistent way for dairy farmers and companies to collect and communicate facts that support dairy's claims about societal benefits, stewardship legacy and sustainability achievements.

The Guide provides an industry-level and stakeholder view of sustainability topics that are relevant to the industry. It includes guidance regarding what to track and communicate—and how to do so at the farm level for energy, greenhouse gas and animal care and at the plant level for environmental, employee, and community topics. Organizations and farms that use the Guide will have the tools to tell their own sustainability story; as well as articulate to consumers what the industry as a whole is doing to meet changing market demands.

Version 1.2 - Phase 1 of the Guide contains an initial set of key environmental and community topics that are important to our industry today. Industry stakeholders reviewed these indicators during a 30-day review period. A 60-day public Stakeholder Consultation period will begin May 15, 2013. The initial pilot of the Version 1.2 - Phase 1 indicators is being conducted in 2013.

Over the coming years, the Guide will be expanded to include indicators for additional topics. The Guide is intended to be a living document that will be revised and adapted over time to address the emerging needs of the industry and its stakeholders. A commitment to continual improvement through

piloting and self-assessment are essential components in the Guide development process.

Objectives of the Guide

The dairy industry and its stakeholders are developing this Guide to enhance the sustainability performance of the industry's dairy farms, cooperatives, processors/manufacturers and other companies. In addition to encouraging and recognizing sustainability leadership by the industry's farms and companies, the Guide will help strengthen relationships with stakeholders through enhanced communication and reporting.

Guide Structure

Sustainability Council and Task Force

The Guide has undergone a development process led by the Sustainability Council and Sustainability Task Force. These bodies are made up of industry representatives from across the dairy value chain. Council and Task Force members are listed in the Appendix of this Guide.

Guiding Principles

The Guide includes a draft set of Guiding Principles, which express the industry's sustainability values. The U.S. Dairy Innovation Center Sustainability Council has endorsed the Guiding Principles.

Farm and Processor/Manufacturer Sections

The Guide contains two main sections to support the industry's dairy producers and fluid milk processors and dairy product manufacturers (e.g., cheese, yogurt, ice cream): Farm Indicators and Processor and Manufacturer (PM) Indicators.

Context

The Guide provides suggestions on communicating operational characteristics of the farm or dairy company, such as geographic location(s) and size, which provides context for evaluating the sustainability performance of the farm or dairy company. The contextual information enables Guide users and report audiences to understand more fully the farm or dairy company and the operational situation.

The goal for the Guide is to follow a triple-bottom-line approach to sustainability with environmental, social, and economic indicator categories, which align with the industry's Guiding Principles. Indicators and metrics are grouped into specific topics (e.g. energy, animal care) to support dairy producers, fluid milk processors and dairy product manufacturers in estimating, measuring and communicating sustainability performance.

Indicators and Metrics

An indicator is qualitative or quantitative information about results or outcomes associated with the farm or dairy company that is comparable and demonstrates change over time—for example, energy intensity for a farm or dairy company.

A metric is how an indicator is to be measured—for example energy intensity is measured as the total amount of energy consumption per unit of output.

Phased Development

The development of dairy indicators and metrics for the Guide is a phased process based on feedback received from the 2012 Industry Review. Phase 1 Indicators are included in the 2013 Stakeholder Consultation process. Farm Phase 1 Indicators include energy, greenhouse gas, and animal care. Processor/Manufacturer (PM) Indicators for Phase 1 include energy, greenhouse gas, water, labor management and community contributions.
The Guide designates Phase 1 Indicators as Primary or Secondary:

- **Primary Indicators** are indicators identified to be of interest to most stakeholders and assumed to be relevant unless deemed otherwise on the basis of the Global Reporting Initiative's (GRI) Sustainability Reporting Guidelines (to be used by dairy companies) or as indicated by the Innovation Center's Smart Tools.

- **Secondary Indicators** are indicators that represent emerging practices or address topics that may be relevant to some farms or dairy companies, but not generally to a majority. These indicators can also be used to communicate best practices and stories to support the primary indicators.

About the Metrics

The metrics included in the indicators are developed for U.S. users and audience and are expressed in imperial metrics. However, Guide users can choose to measure and report in SI metrics (International System of Units) depending on their current measurement systems and report audiences. Many conversion resources are available online at sites such as www.metric-conversions.org.

Note: Producers and dairy companies should set a baseline year for their measurement and communications to compare indicators over annual intervals and to set performance goals.

Audience and Usage

The Guide offers dairy producers, processors, retailers, brands and other stakeholders a foundation for a harmonized approach toward measuring and reporting sustainability. It informs a broad range of stakeholders about which measurements matter most regarding sustainability impacts of dairy farms and dairy processing and manufacturing operations.

Dairy producers and processors can use the Guide in a variety of ways:

> To enhance their leadership in sustainability by identifying and communicating sustainability performance to stakeholders. To support implementation of the Guide, producers and processors can use the Innovation Center's Smart Tools to assess potential sustainability-related risks and opportunities for improvements in dairy production and processing operations.

> To track progress toward the voluntary industrywide goal to reduce GHG emissions for fluid milk by 25 percent by 2020.

> To track progress over time and identify opportunities for efficiencies and improvement.

> To compare themselves (or benchmark) against industry averages. Eventually, voluntary anonymous aggregation from organizations that measure and report can help the industry communicate industrywide progress on key environmental, community and economic topics to consumers, retail partners and other stakeholders.

> Retailers and brands can use the Guide to inform their supplier or product scorecards. The Guide provides insights about what matters regarding dairy's sustainability; therefore, it can be used as a tool to engage their supply chains in improvement opportunities.

> Developers of other measurement initiatives can use the Guide and the foundational Life Cycle Assessment (LCA) science to inform their metric development.

The Guide is designed to support gradual expansion of measurement and reporting over time by the industry. Members of the industry are encouraged to measure and communicate relevant sustainability topics at any level they can: whether beginning with a few indicators and expanding reporting over time, or choosing to report on all Guide indicators. In addition, for any individual farm or processor, certain topics might not be relevant, based on the context in which the farm or processor operates.

Boundaries and Scope of the Guide

The indicators of Version 1.2 - Phase 1 of the Guide focus on operational performance of farms and dairy processors and manufacturers of dairy products.

Farm Indicators

Farm Indicators can be used for operations in all 50 states and independent territories. Within the dairy value chain, they focus on milk production, which includes the milking parlor, barn, and manure handling and storage systems and on- and/or off-farm feed production. The scope is defined in each indicator.

Processor and Manufacturer Indicators

Processor and Manufacturer (PM) Indicators cover operations in all 50 states and independent territories. The indicators cover energy that is used during the transportation of milk from the farm to the processing plants and from processing plants to retail or service centers, as well as during the processing and manufacturing practices. Some indicators also include impacts from activities upstream in the dairy supply chain. The scope is defined in each indicator. As dairy companies begin to utilize the Guide for communication to stakeholders, we encourage them to identify the boundaries of the reported information.

The environmental (e.g., energy intensity, water efficiency) indicators can be used by dairy companies to compare the company's performance internally over time and to track overall improvements.

These indicators, in their current format, should not be used to benchmark dairy companies against other companies. *The metrics do not include standardized allocations of input, outputs and processes; therefore, comparisons between different dairy companies could lead to false interpretations regarding the performance of these companies.*

The indicators can be used by fluid milk processors as well as by dairy product manufacturers. Over the coming years, more specific dairy-product-related components may be added to these indicators to increase accuracy.

Linkage with GRI

The draft indicators in Version 1.2 - Phase 1 are based on several of the performance indicators from the Global Reporting Initiative's Sustainability Reporting Guidelines, Version 3.1 (G3.1).[1] The GRI Guidelines are part of GRI's Reporting Framework, the most widely used framework for sustainability reporting worldwide. The GRI Guidelines have been developed through consultation with diverse international stakeholders, including representatives from businesses, civil society, labor, investors and professional institutions. Sustainability reports based on the GRI Reporting Framework can be benchmarked and compared over time.

The GRI performance indicators are applicable to dairy processing and manufacturing operations; however, the PM indicators in the Guide have been tailored to improve the relevancy for dairy businesses. Some Guide indicators can be used instead of the cross-referenced GRI indicators in the list of indicators at the beginning of the PM section. Processors are encouraged to use the GRI Guidelines for support and guidance for reporting of sustainability information, including these Guide indicators.

The GRI indicators are less applicable to farming operations; therefore, the Farm indicators in the Guide may differ considerably from the GRI indicators. The lists of indicators at the beginning of the Farm and PM sections provide references where relevant to the GRI performance indicators that originally inspired the Guide indicators. GRI has reviewed the environmental indicators and approves of the references in the Guide to GRI indicators.

In addition to the GRI Guidelines, indicators and metrics from other measurement systems have been consulted and were considered for alignment where relevant and applicable. An overview of the frameworks that have been researched by the Innovation Center and how

they relate to the Guide is presented in the Research Compendium, to be released later in 2013. The Innovation Center for U.S. Dairy has chosen to make a linkage to the GRI framework and other relevant reporting tools in order to ensure harmonization and prevent duplication of efforts. To demonstrate this approach, the Innovation Center for U.S. Dairy became part of GRI's Organizational Stakeholder Program in April 2012.

For guidance regarding the preparation of a sustainability report, dairy processors and manufacturers can use the GRI G3.1 Sustainability Reporting Guidelines and Food Processing Sector Supplement to learn more about selecting key topics to report, defining report content and ensuring the quality of the information reported.

Integration with Other Innovation Center Efforts

The development of the Guide is part of the Innovation Center's larger sustainability strategy, which focuses on four integrated approaches:

- Assessment of the industry's performance through scientific research
- Measurement through the development of science-based measurement and decision-making tools for farms and dairy plants, including the Innovation Center's Smart Tools
- Mitigation of environmental impacts through development of case studies and sharing of learning and experiences
- Communication of sustainability performance by the industry, including farms and dairy companies, and progress toward sustainability goals through the Guide and other resources

Science-Informed Framework: Life Cycle Assessments

The Innovation Center is working with hundreds of dairy stakeholders to conduct nationwide life cycle assessments (LCAs) on greenhouse gas (GHG) emissions, energy use, water use and quality, and land use for fluid milk and cheese (Cheddar and Mozzarella).

An LCA is a compilation and evaluation method of the inputs, outputs and potential environmental impacts of a product throughout its life cycle from "cradle to grave."[2] LCAs help identify the largest impact areas along supply chains and provide a system-level view that accounts for diversity within and across the value chain for various business models, sizes, regions, plant ages, makes of equipment and operational processes. The use of fact-based LCAs provides the dairy industry and the Innovation Center's sustainability initiatives a scientific basis from which to focus measurement and self-assessment efforts and to identify improvement opportunities.

The GHG LCA for Fluid Milk, conducted by the Innovation Center, along with other research, has provided important insights for understanding the use of LCAs in the dairy industry and their application to the Guide:

- **Target areas of greatest impact:** LCA findings have identified around 20 variables that are responsible for up to 90 percent of the GHG emissions impacts throughout the dairy value chain.[3] The environmental indicators in the Guide focus on these variables that have the largest impacts and opportunities to improve dairy's environmental footprint. In addition, the water indicators focus on the areas that were identified by comprehensive LCAs as key impacts and improvement opportunity areas.
- **Emphasize practices:** The LCAs found significant variability in environmental impacts among farms in the U.S., beyond differences in size,

region and type of business; management practices mattered more. Analysis of the key variables indicates that a variety of opportunities exist to improve footprints, ranging from simply changing practices on the farm or at processing plants to investing in new equipment or technologies. LCA findings show that one-size-fits-all advice is not a best approach for such a diverse industry; therefore, the environmental indicators included in this Guide are outcome-based performance indicators. This approach allows each producer and dairy company to execute its own strategies to enhance its sustainability performance.

The Guide's Farm energy and GHG intensity indicators follow the measurement methods of the dairy LCAs. These indicators are based on the concept of Fat and Protein Corrected Milk (FPCM), or Energy Corrected Milk. This concept is important for accurate comparisons of the relative impacts of farms with differences in production because different herds produce milk with different fat and protein content. Standard relationships have been developed that can be used to convert milk with any fat or protein composition to a standardized composition, often 4 percent fat and 3.2 percent protein. This standardization of milk composition at the farm gate ensures that an appropriate set of conclusions can be made that are not improperly influenced simply because one form has a higher or lower milk fat content; in other words, the effects of different water content produced by different animals or breeds will not influence the conclusions of the comparative study.

Smart Tools and the Guide

The Innovation Center is developing web-based, user-friendly Smart Tools that empower continuous improvement for dairy producers and processors and share many of the same goals and origins as the Guide: Farm Smart™, Dairy Plant Smart™ and Dairy Fleet Smart™.

The Guide and Smart Tools share the same scientific basis of the fluid milk life-cycle assessment and all started as initiatives to meet the industry's sustainability goals. The Smart Tools are designed to give producers and processors the ability to assess and mitigate their environmental profile, track and measure their progress, plan for future improvements and report outcomes of practice changes to customers, community members, regulators and other stakeholders. Together the Smart Tools and the Guide will empower producers and processors to consistently measure and communicate sustainability efforts.

Through 2013, the Guide and Smart Tools will go through parallel development paths in order to develop a sound pilot process that will include alignment with the Smart Tools. Users in the pilot will have the option of using aspects of the Smart Tools to further advance the Guide pilot process.

As the scientific results of ongoing and future studies become available, the Smart Tools and the Guide may be expanded to include additional topics or indicators. For more information about these Smart Tools, visit www.USDairy.com/Sustainability.

Producer and Processor Handbooks

To support the efforts of dairy producers and processors, the Innovation Center has developed separate tailored handbook documents to guide the measurement and reporting process in a user-friendly format. The handbooks explain how the Guide can be used together with the Innovation Center Smart Tools. These producer and processor handbooks may both be found at www.USdairy.com/sustainability.

Guiding Principles

The Guiding Principles of the U.S. Dairy Sustainability Commitment communicate the dairy industry's values and definition of sustainability to its stakeholders. The principles provide the pillars of the *Stewardship and Sustainability Guide for U.S. Dairy - a voluntary guide for tracking and communicating progress*, and are designed to inform the sustainability programs, measurement and communication efforts of industry members. Additional indicators and metrics may be added to the Guide in line with topics covered by these guiding principles.

Guiding Principles of the U.S. Dairy Sustainability Commitment

The U.S. dairy industry supports socially responsible, economically viable and environmentally sound dairy food systems that promote the current and future health and wellbeing of:

- **Our consumers – through access to safe, nutritious, high-quality products.** We value consumer trust and relationships, and innovate to meet the full range of global dairy consumer needs.
- **Our communities – through contributing, participating, and investing where we live and operate.** Our businesses operate safely maintain agricultural heritage, and support community health and development through provision of educational, social and economic opportunities.
- **Our cows – through animal stewardship**. Our animals receive the greatest respect, care, health and comfort throughout their lives. Dairy farmers understand that healthy and productive cows provide high-quality milk.
- **Our employees – through ensuring a safe and respectful workplace.** We value the people on our team. We commit to safe and fair labor practices and equitable compensation, and to provide employees with training and development opportunities.
- **Our planet – through the stewardship and responsible use of natural resources.** We rely on ecosystems and are committed to their health. We manage our impacts on air, biodiversity, land, and water through the conservation of resources, and strive to improve our footprint.
- **Our businesses – through a focus on long-term economic vitality.** We employ leading business practices and meaningful partnerships to enhance the value chain of our products from farm to table. We manage for risk, prosperity and quality of life of our farms, families, communities and stakeholders. We strive to ensure our businesses are attractive to successive generations.

We apply leadership, measurement, science, education, innovation and continuous improvement to enhance our stewardship of sustainable food and agricultural systems.

We commit to these principles through our shared values of honesty, integrity, inclusiveness and transparency. The Guiding Principles helped to shape the development of the indicators. The table below shows which indicator(s) support each Principle.

Guiding Principles	Indicators
Our Planet	Energy, GHG Intensity (Producers and PM) Water (PM only)
Our Cows	Animal Care (Producers only)
Our People	Labor Management (PM only)
Our Communities	Community Contributions (PM only)
Our Businesses	TBD (e.g., economics)
Our Customers	TBD (e.g. nutrition, health, safety)

Dairy's Contribution to America's Health

Since ancient times when cows were first domesticated, dairy foods have been a part of the human diet and health. As the population grows and resources diminish, there is a greater need to optimize and be more efficient to feed 9 billion people. It's not just more food that's needed; it is nutrient-rich food that becomes essential to nourishing the world. Nutrient-rich dairy foods and beverages offer essential, high-quality nutrition because of their composition, inherent wholesomeness, and relative abundance.

The dairy food group (milk, cheese, and yogurt) is an important source of nutrients in the diet of Americans – at only 10% of the calories consumed. Contributions to daily nutrient intakes in the U.S. diet include:

- More than half of the total calcium and vitamin D
- About one fourth of the total vitamin A, vitamin B12, and riboflavin
- Nearly one fifth (18%) of total protein.

In fact, milk alone is the number one food source of three of the four nutrients of concern in American diets – calcium, vitamin D, and potassium.

The 2010 Dietary Guidelines for Americans indicates that dairy intake is linked to improved bone health, especially in children and adolescents, and is associated with a reduced risk of cardiovascular disease and type 2 diabetes and with lower blood pressure in adults.[4,5]

About the Indicators

Our Planet

Overview

Informed by Innovation Center-led LCA research, the environmental indicators focus on measuring the areas related to energy, GHG emissions and water that have the largest impacts and opportunities to improve dairy's environmental footprint.

1. Energy

The energy source for our society is currently based on fossil fuels, the use of which releases GHG emissions into the atmosphere. As is the case for the vast majority of U.S. industries, energy is critical for the dairy industry, from essential crop inputs to the farm up to the retailer.[6] The dairy industry relies on energy, electricity and fuel throughout the value chain: for tractors used in feed production and trucks for distribution and transportation of milk and dairy products; for lighting and running equipment; for milking and milk cooling on farms; and for pasteurization and cleaning in processing and manufacturing plants. This energy dependency, coupled with the effects of imported energy on pricing and availability, prompts concerns about how high and volatile energy prices might increase food prices, reduce domestic food security and affect domestic markets for dairy products.[7]

Energy use across the dairy supply chain accounts for about 36 percent of dairy's total GHG impacts. The GHG emissions from the fuel and electricity used to produce one gallon of fluid milk that is actually consumed are presented in the two middle columns of Figure 1.

From 1997 to 2002, energy use in dairy food processing steadily increased as Americans increasingly relied on processed foods; however, energy use on dairy farms steadily declined over the same period.[8] Although U.S. dairy industry businesses, including dairy farms, have made great strides in reducing energy use, efforts at energy conservation can vary greatly across businesses in each stage of the dairy value chain. This variability represents a great opportunity to reduce costs and improve the economic sustainability of the industry. The LCA research has demonstrated that businesses at each stage of the value chain have opportunities to cut costs and emissions from their use of fossil fuels and electricity.[9]

The indicators in the Guide focus on measuring the main impact variables related to energy intensity for farm and dairy fluid milk processing or dairy product manufacturing facilities.

2. Greenhouse Gases

Greenhouse gases are emitted from various sources throughout the dairy supply chain as shown in Figure 1. Approximately 70 percent of the GHG of the dairy value chain are emitted before the milk leaves the farm gate.

The overall carbon footprint of fluid milk as identified by the GHG LCA for Fluid Milk is shown in Figure 1, which indicates the contribution of each part of the dairy supply chain to the footprint.[10] The total GHG footprint for fluid milk consumed in the U.S. is 17.6 pounds (lbs.) carbon dioxide equivalents (CO_2e) per gallon of milk consumed (2.05 kg CO_2e per kilogram (kg) milk consumed).[11] In 2007, the cumulative total emissions of GHG emissions associated with the consumption of fluid milk in the U.S. were 35 teragrams (Tg) CO_2e, which represents approximately 2 percent of the total U.S. GHG emissions.[12]

To meet the needs of the marketplace, the U.S. dairy industry, under the leadership of the Innovation Center for U.S. Dairy, endorsed a voluntary goal to reduce GHG emissions for fluid milk by 25 percent by 2020.[13]

The indicators in the Guide focus on the intensity of GHG emissions at various stages of the dairy value chain. For each indicator,

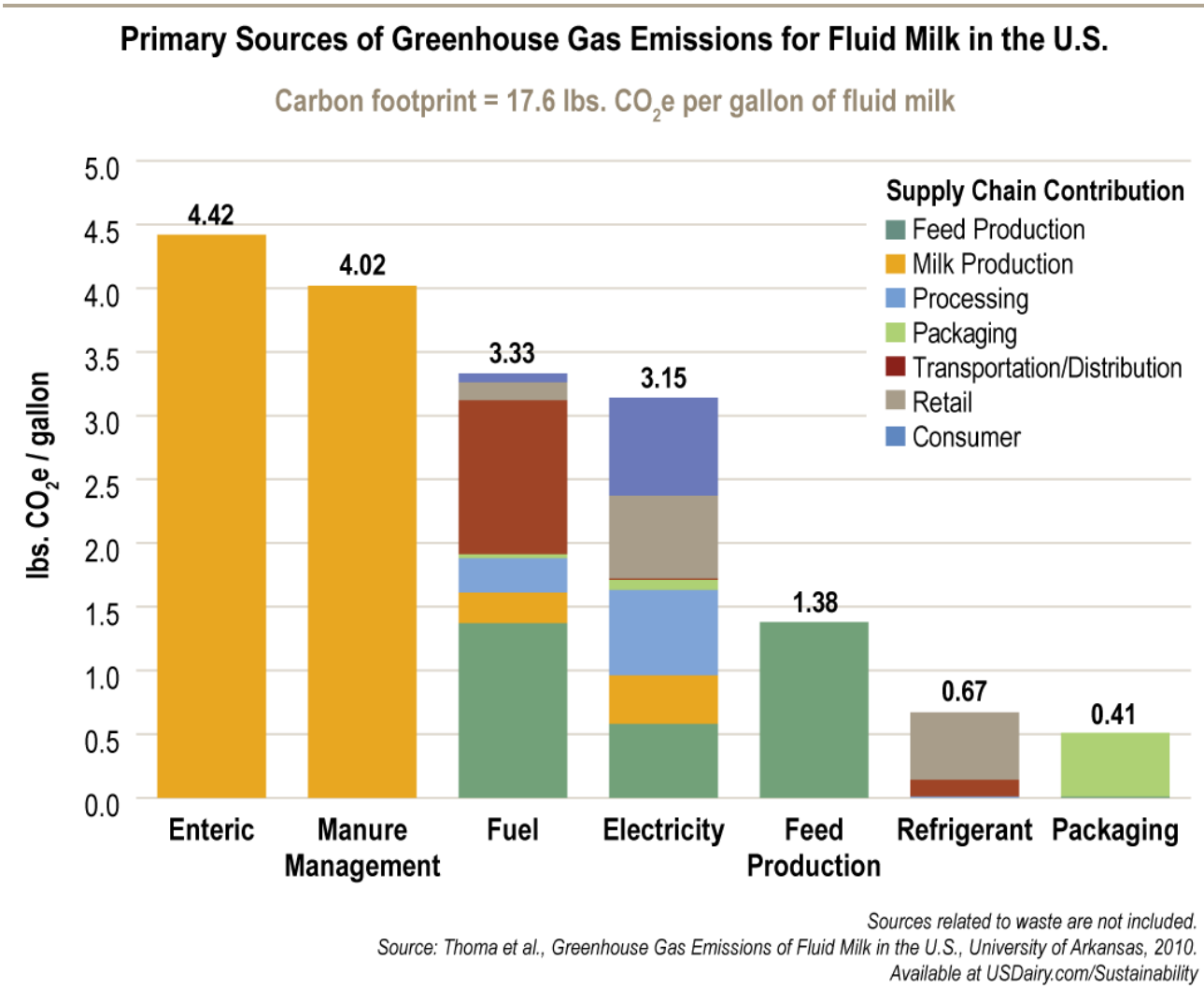

Figure. 1 Primary Sources of Greenhouse Gas Emissions for U.S. Fluid Milk

the boundary and scope of the emissions is indicated.

3. Water

Globally, approximately 70 percent of the world's freshwater withdrawals are for agricultural use (crop irrigation, livestock, etc.).[14] Furthermore, total water use for agriculture is expected to increase 13 percent by 2050.[15] As a result, water management has become a key issue for agriculture and food companies.[16]

Water impacts along the dairy value chain are twofold: 1. water supply and 2. water quality.

Water Supply

Water is an important resource used throughout the dairy supply chain. Across the dairy value chain, up to 90 percent of the water consumed is a result of crop irrigation. The remaining 10 percent is used during other stages of the dairy supply chain, which partially includes fluid milk processing and dairy product manufacturing (cleaning of the processing pipes, equipment, trucks).

The availability of water differs throughout the United States. Challenges related to availability of water are a regional issue because water users are confined to local watersheds. In areas where water becomes scarcer, good water management becomes increasingly important for the dairy industry and other users of water in those areas.

In Phase 1, water use and efficiency indicators for processors and manufacturers are included.

Water Quality

Through their various activities, processing and manufacturing facilities have an impact on the quality of water sources, which could be immediate in their local area as well as farther away.

Dairy processing facilities and manufacturing plants discharge wastewater that has been treated, which could be applied in the form of sludge on the land as fertilizer, discharged into local water bodies or sent to local wastewater treatment plants.

The Guide includes water quality indicators as Phase 1 Indicators for processors and manufacturers.

Our Cows

4. Animal Care

Animal care is a key consideration for all dairy farms—an animal's health and well-being is a key indicator of farm performance and therefore, the profitability and success of the farm. In recent years, consumer interest in animal wellbeing has greatly increased.[17] The Center for Food Integrity conducted a survey that revealed Americans consider humane farm animal treatment to be more important than worker care, but less important than other topics such as cost of food and food safety.[18] Such findings have led to the development of multiple guidelines and certification programs that help promote practices that ensure proper animal care on dairy farms. The effort to document and communicate animal care practices also helps to build consumer confidence in agriculture.[19]

A typical dairy farm maintains the health of the dairy cattle by providing appropriate nutrition, housing, and disease prevention and detection along with well-designed treatment programs. These programs are usually developed through consultation with a qualified veterinarian and often include a Herd Health Plan (HHP).

Aspects of animal care included in the Farm Phase 1 Indicators encompass the animals' environment, handling and treatment, as well as herd health and management of special needs animals. Nationally, the National Milk Producers Federation (NMPF) has created the National Dairy FARM Program: Farmers Assuring Responsible Management ™ (FARM), which outlines best management practices for animal care. The Farm Indicators for animal care align with the FARM program, creating the potential for reporting and communication efficiencies for cooperatives and producers currently utilizing the FARM program. The Guide also gives consideration to producers who may not currently utilize the FARM program, by providing questions in the indicators about animal care to which they can reply and communicate with customers or other stakeholders.

Our Employees

5. Dairy and Labor Management

Labor management is a closely watched sustainability topic, examined not only by external stakeholders, but also by the dairy processors and manufacturers themselves, because employee productivity and engagement are essential to profitability and business success. In a recent randomized global survey by GRI on reporting on community impacts, 79 percent of North American companies report on some topic directly related to working conditions.[20]

Dairy processing and manufacturing operations rely on plant and factory workers to convert raw milk into safe products for human consumption with manufactured products ranging from pasteurized and ultra-high temperature processing (UHT) milk to value-added dairy products such as yogurt, butter and cheese.

The sustainability of the dairy industry depends upon the availability and retention of plant employees.

Draft PM Indicators for labor management include dairy employment opportunities, employee benefits, such as housing, food, and health care, employee training, and management-employee relationships. Additionally, worker safety in processing facilities is another indicator of labor management addressed in the Guide.

Our Communities

6. Community Contributions

Processors contribute to their local communities and regions in ways that can be obvious to consumers and stakeholders, such as direct economic support, payment of local taxes and providing local jobs. Other impacts may be less obvious:

- Community engagement by employers and employees to service organizations, churches and schools
- Charitable contributions
- General contributions and capacity building to support the overall vitality of rural communities

Dairy processors frequently play a crucial role in their communities. Many dairy processors make giving back to their communities a priority, through charitable donations, volunteering and serving in local positions.

The community contribution indicators for processors and manufacturers include monetary and product donations, and educational opportunities.

Phase 1
DRAFT FARM INDICATORS

List of Phase 1 Draft Farm Indicators

Indicator	Metric	Page	GRI G3.1
Our Planet			
Energy Intensity - Primary Farm Energy 1	Total energy use (converted to MBTU)/ unit of production	25	EN3/EN4
Greenhouse Gas Intensity - Primary Farm GHG 1	Total GHG emission (t CO_2e)/unit of milk production (FPCM)	30	EN16
Our Cows			
Animal Care Guidelines - Primary Farm Animal Care 1	Participation in FARM or an equivalent animal care guideline program	33	
Veterinary Care - Primary Farm Animal Care 2	Established Veterinary-Client-Patient Relationship (VCPR)	34	
Herd Health - Primary Farm Animal Care 3	Implementation of a Herd Health Plan with standard operating procedures	35	

Introduction

Scope of Farm Indicators

Farm Indicators can be utilized by any farm in the United States and encompass all aspects of dairy production. Dairy production activities included by these indicators are: on- and/or off-farm feed production, feeding and milking of cows; cleaning of the barn and milking parlor; handling and storage of manure; and cooling of milk.

Audience and Usage

The Farm Indicators are created for dairy producers and cooperatives in the United States. The indicators support producers in identifying the main impact areas to measure and track over time to assess progress toward improved performance. Producers and cooperatives can choose which indicators they want to communicate to tell their stories about stewardship. Guidance for reporting is also included in the indicators for those who would like to use it.

Measuring sustainability indicators at the farm level can support producers in identifying risks and opportunities; for example, cost savings through reduced use of energy or sharing information to educate consumers about animal care. Producers have opportunities to enhance their leadership in sustainability with the ability to verify and communicate their sustainability performance to their stakeholders, which aids the reputation of the dairy industry.

This voluntary Guide will align with and inform ongoing sustainability tool development at the Innovation Center. The document itself is not intended to be used by producers as a decision-making measurement tool; rather, it is intended to communicate the relevant indicators for dairy farms to a range of stakeholders for the purposes of:

- Informing stakeholders, including customers, about which measurements matter most related to farm operations and decision-making as it relates to sustainability.
- Inviting stakeholders, including dairy producers, to review the indicators, test indicators through measurement and reporting, and to provide feedback on how the indicators can be enhanced.

How to Measure and Report at the Farm Level

The Innovation Center is developing self-assessment tools for dairy producers regarding farm operations and sustainability and the Guide provides information about measurement and communications by farms to a broad range of stakeholders.

The indicators are aligned with Farm Smart™, an on-line tool that can be used by producers to estimate and measure the energy and GHG intensity Indicators.

Cooperatives could play a key role in communicating the sustainability progress of producers to key stakeholders.

A producer handbook for using the Stewardship and Sustainability Guide together with Farm Smart, is available for free at www.USdairy.com/sustainability.

Farm Context

When communicating information about a farm's sustainability performance, it is important for the reader to understand the farm's operating system and context. The questions below suggest information points that a dairy producer can communicate to stakeholders to give a snapshot of the farm's operations, against which the stakeholders can assess the sustainability information provided by the farm.

General Farm Information

1. Farm name
2. State and county where farm operations are located
3. Year of production covered in this communication material or report
4. Farm operations covered in this communication material or report
5. Nature of ownership of farm
6. Number of employees (FTE: full time equivalent)
7. Contact point for questions about this communication material or report

Farm Operations

Milk Production and Animals

8. Total annual milk production in pounds
9. Average milk fat content in percentages
10. Average milk protein content in percentages
11. Annual rolling average of total cows in the herd (includes lactating and dry cows)
12. Annual rolling average of dry cows in herd as percentage of total cows
13. Annual rolling average number of heifer calves (less than 2 months):
    i. Raised on-farm
    ii. Raised off-farm
14. Total annual number of heifers (2 months to first calf):
    i. Raised on-farm
    ii. Raised off-farm
15. Total annual number of mature cows culled for beef
16. Average weight per cow (per pounds)
17. Total annual number of calves sold for beef

Animal Feedstuffs and Grazing Practices

18. Indicate grazing practices in the table below:

	Lactating	Dry	Young Stock
Number of weeks per year			
Number of hours per day			

19. Average Dry Matter Intake (DMI) in pounds per head per day for lactating cows (excluding dry cows and young stock). If pasturing, include an estimate of pasture DMI in this total. If known, include where feed is transported from and where it is grown.
20. Percent makeup (in dry matter) in the above-average lactating cow ration of each feedstuff listed below. For each feed type, indicate what percentage (%) is purchased or self-grown.

Feed	% DMI	Grown (%)	Purchased (%)
Corn grain			
Corn silage			
Wet DGS			
Dry DGS			
Soybean (raw or roasted)			
Soybean meal			
Alfalfa hay			
Alfalfa silage			
Grass hay			
Grass silage			
Pasture			
All other feed			

Manure Management

21. Indicate the manure management systems (MMS) on the farm in the table below, and estimate the total fraction of excreted manure going to this system, in percentages (%):

MMS	Percentage (%)
Daily spread	
Solid storage	
Dry lot	
Liquid/slurry w/ natural crust	
Liquid/slurry w/o natural crust	
Uncovered anaerobic lagoon	
Covered anaerobic lagoon	
Pit storage below animals < 1 month	
Pit storage below animals > 1 month	
Anaerobic digester	
Deep bedding < 1 month	
Deep bedding > 1 month	
Composting, in-vessel or static pile	
Composting, intensive windrow (forced aeration)	
Composting, natural aeration	
Aerobic treatment with forced aeration	
Aerobic treatment with natural aeration	
Direct deposit on pasture	

If a system not included above is in use, please describe.

Our Planet

1. Energy

Why Measure Energy Impacts?

Energy is a frequently monitored attribute in sustainability efforts because the unabated trend of increasing and volatile energy prices affects the bottom line and could create business risks. Farms can strategically manage energy use in order to reduce costs and reduce their exposure to volatile energy prices. In addition, energy is tracked in sustainability efforts (fossil fuel use, in particular) because it is directly linked to other key sustainability concerns of stakeholders, including GHG emissions, air pollution, water quality and use, and other indirect environmental impacts.

Controlling energy costs and improving energy efficiency can increase economic viability. For farms, the benefits of improved energy management can include reduced operating costs, increased productivity, reduced regulatory issues (including air pollution and GHG emissions regulations), reduced vulnerability to energy price volatility, enhanced public image and enhanced reputation within the supply chain, including buyers. Though direct energy costs may be a small part of total costs for dairy farms, energy prices and their volatility can be challenging.

Scope of the Indicators

The energy indicator focuses on measuring energy used on-farm in the barn and milking parlor for milk production as well as energy used in on- and/or off-farm feed production and reporting energy intensity as a unit of output.

Producers can use Farm Smart™ to pilot these indicators, and find more information about energy and costs savings at www.USdairy.com/saveenergy.

Energy Intensity - Primary Farm Energy 1

1. Relevance

This indicator tracks the relative energy intensity of a dairy farm; that is, the amount of energy used to produce milk and on- and/or off-farm feed production. If tracked through time, it can demonstrate the results of proactive farm efforts to reduce energy intensity and increase energy efficiency by introduction of new technologies and/or management practices. U.S. farms have been able to distinguish themselves from dairy producers in other countries and control costs by reducing their energy intensity. The use of improved energy technology can directly reduce operational costs and a farm's future dependency on nonrenewable energy sources. Better energy performance is a key strategy for reducing GHG emissions and reducing impacts of extraction and processing of some forms of energy. On average, U.S. dairy farms are the most energy efficient dairy farms in the world.

2. Metric

Total direct energy use (converted to MBTU)/unit of milk production

Unit of production can include:[a]

- Cwt (hundred weight for milk in pounds) (FPCM)
- Gallon of milk (FPCM)
- Kg of milk (FPCM)

3. Calculation and Reporting

3.1 Measure direct energy used

Total energy use in MBTUs should be calculated and reported using the following equation:

Total energy consumption =
energy purchased - energy produced

Assess and report the amounts of energy purchased by the farm operation in MBTUs. This includes energy sources such as:

- Electricity
- Diesel
- Biodiesel
- Fuel oil
- Propane
- Natural gas
- Gasoline

Energy used for manure storage and removal of manure from the barn and milking parlor is included. Energy used in crop production and energy used in the growing of purchased feed is included.

Nondairy activities are not included in the measurement, such as energy used in household or other nondairy related business operations.

[a]Although a nutrient density base unit such fat and protein corrected milk [FPCM: 1 kg = raw milk (kg) * (0.337 + 0.116 * Fat content (%) + 0.06 * Protein content (%)] (Vellinga, et al., 2010) has been suggested, there is not yet a food industry standard for assessing nutrient density. USDA uses Milk Equivalent Total Solids based on a 40% milk fat & 60% solids not fat (SNF) to estimate how many pounds of milk fat or how many pounds of skim solids it takes to make one pound of product.

Units	MBTU
Coal	
tonne (metric)	24.6432
ton (short)	22.3590
ton (long)	25.0413
Crude Oil	
barrel	5.8954
tonne (metric)	42.4622
ton (short)	38.5193
ton (long)	43.1446
Gasoline	
U.S. gallon	0.1185
tonne (metric)	42,463,154.8
Diesel	
U.S. gallon	0.1308
tonne (metric)	41.0689
Fuel Oil	
U.S. gallon	0.1365
tonne (metric)	38.0928
Natural Gas	
therm	0.1000
1000 cubic feet	1.0470
1000 cubic meters	36.9743
Biofuel (B10)[2]	
U.S. gallon	0.1273
Biofuel (B100)[2]	
U.S. gallon	0.1183
Electricity	
kilowatt-hour	0.003412
megawatt-hour	3.412
gigawatt-hour	3412.1
Ethanol (E100)[3]	
U.S. gallon	0.0761
Ethanol (E85)[3]	
U.S. gallon	0.0818

[1] All conversion factors were derived from conversion factors in GRI G3.1 Guidelines unless otherwise cited
[2] U.S. EPA, 2009
[3] U.S. DOE, 2009.

3.2 Measure the energy produced

Determine the amounts of primary energy sources produced by the farm operation standardized to MBTUs. This can include electricity generated from biogas digester systems, biodiesel from oil crops, wind and solar installations, etc.

3.3 Measure total annual milk production

Measure total annual milk production as a unit of production. Unit of production can include:[b]

- Cwt (hundred weight for milk in pounds) (FPCM)
- Gallon of milk (FPCM)
- Kg of milk (FPCM)

3.4 Report the energy intensity

Report the total energy used in MMBTUs per unit of annual milk production.

Producers can use Farm Smart™ to measure energy intensity**.**

4. Optional Measurement Considerations

Consider reporting energy consumption in MBTUs in total. Report renewable energy or fuel produced on the farm as an additional information point.

Renewable energy sources and fuel include:

- Biomass-based intermediate energy

[b] Although a nutrient density base unit such fat and protein corrected milk [FPCM: 1 kg = raw milk (kg) * (0.337 + 0.116 * Fat content (%) + 0.06 * Protein content (%)] (Vellinga, et al., 2010) has been suggested, there is not yet a food industry standard for assessing nutrient density. USDA uses Milk Equivalent Total Solids based on a 40% milk fat & 60% solids not fat (SNF) to estimate how many pounds of milk fat or how many pounds of skim solids it takes to make one pound of product.

- Biofuels (including biodiesel [measure B20 and B100 use separately] and ethanol [measure E85 and E10 separately])
- Geothermal
- Hydrogen-based intermediate energy
- Hydro energy
- Biogas digester systems
- Solar
- Wind

Over the years, producers can identify total energy saved by efforts to reduce energy use and improve energy intensity, taking into consideration energy saved due to redesign, conversion and retrofitting of equipment, and changes in employee behavior.

Producers could choose to report energy saved per year.

Producers can use results from energy audits to identify energy and costs savings.

5. Definitions

Conservation and intensity improvements: Organizational or technological innovations that allow a process or task to be carried out at a reduced level of energy use. This includes process redesign, the conversion and retrofitting of equipment (e.g., energy efficient lighting), or the elimination of unnecessary energy use due to changes in behavior (e.g., turning off equipment when it is not being used). (GRI G3.1 and updated to make relevant for farm)

Energy intensity: The ratio of energy consumption to unit of production (e.g., cwt) (following Tanaka 2009).

On-farm energy: Forms of energy that cross the farm's boundaries. It can be consumed either by the farm within its boundaries, or it can be sold or exported to another user. Energy can appear in either primary (e.g., natural gas for heating) or intermediate (e.g., electricity for lighting) forms. It can be purchased, extracted (e.g., coal, natural gas, oil), harvested (e.g., biomass energy), collected (e.g., solar, wind) or brought into the farm's boundaries by other means. (*Definition from GRI G3.1 and updated to make relevant for farm)*

Off-farm energy: Energy produced outside the farm's boundary that is consumed to supply energy for the farm's intermediate energy needs (e.g., electricity or heating and cooling). The most common example is fuel consumed outside the farm's boundary in order to generate electricity to be used inside the farm's boundary.

Primary source: The initial form of energy that is consumed to satisfy the farm's energy demand. This energy is used either to provide final energy services (e.g., space heating, transport) or to produce intermediate forms of energy such as burning coal for production of electricity and heat. Examples of primary energy include nonrenewable sources such as coal, natural gas, oil and nuclear energy. It also includes renewable sources such as biomass, solar, wind, geothermal and hydro energy. Primary energy might be consumed on-site (e.g., natural gas to heat the farm's buildings) or off-site (e.g., natural gas consumed by the power plants that provide electricity to the farm's facilities). (*Definition from GRI G3.1 and updated to make relevant for farm*)

Renewable energy sources: Energy sources capable of being replenished within a short time through ecological cycles (as opposed to resources such as minerals, metals, oil, gas and coal that do not renew in short time periods). Such energy sources include the sun, wind, moving water, organic plant and waste material (biomass), and the earth's heat (geothermal). (*Definition from U.S. EPA 2011*)

6. Documentation

On-farm annual milk production can be calculated from milk checks.

7. Resources

- Innovation Center for U.S. Dairy. 2012. SaveEnergy website. http://www.usdairy.com/saveenergy

- U.S. Environmental Protection Agency (U.S. EPA). 2009. Fuel Economy Impact Analysis of RFG. 2007-08-14. U.S. Environmental Protection Agency, Washington, D.C.
- U.S. Environmental Protection Agency (U.S. EPA). 2011. Green Power Market - Green Power Defined: Renewable energy and green power — what's the difference? U.S. Environmental Protection Agency, Washington, D.C., accessed Jan. 26, 2012, http://www.epa.gov/greenpower/gpmarket/index.htm.
- U.S. Department of Energy (U.S. DOE). 2009. Alternative Fuels and Advanced Vehicles Data Center. Fuel Properties. U.S. Department of Energy, Washington, D.C. Available online at: www.afdc.energy.gov/afdc/fuels/properties.html.
- A. Brush, E. Masanet and E. Worrell. 2011. Energy Efficiency Improvement and Cost Saving Opportunities for the Dairy Processing Industry. Environmental Energy Technologies Division, Ernest Orlando Lawrence Berkeley National Laboratory, Sponsored by the U.S. Environmental Protection Agency.
- K. Tanaka. 2008. Assessing Measures of Energy Efficiency Performance and their Application in Industry. International Energy Agency, Paris, France.
- T. Vellinga, C. Opio, B. Henderson, and S. Henning, with P. Gerber. 2010. Greenhouse Gas Emissions from the Dairy Sector A Life Cycle Assessment. Food and Agriculture Organization of the United Nations, Rome.
- For more information about ways to conserve energy or improve energy intensity, visit the Save Energy Program of the Innovation Center for U.S. Dairy developed in collaboration with NRCS, at: http://www.usdairy.com/saveenergy/Pages/default.aspx.

2. Greenhouse Gas Emissions

Why Measure GHG Emissions?

The dairy industry has committed to reducing its GHG emissions by 25 percent by 2020. In order for the industry to meet this goal, the Innovation Center is developing the Guide and Smart Tools to help dairy producers, processors/cooperatives, as well as fleet managers, estimate and understand their carbon footprint. Reducing emissions will not only help meet environmental sustainability goals; in many cases, it will also strengthen the economic sustainability of dairy farms. Several practices could reduce GHG emissions—ranging from maintenance or replacement of equipment, to changing the feed ratios of the cows, to the generation of renewable energy through installation of an anaerobic digester—while potentially providing cost savings and additional revenue for the producer.

Furthermore, an assessment of emissions can be used to evaluate the potential financial opportunities associated with different offset trading systems and the reputational risks of the dairy industry's association with GHG emissions. There are several national and international GHG offset markets, both mandatory and voluntary, that reward the reduction of GHG emissions and in which dairy producers can participate.

Scope of the Indicators

As Figure 1 shows, GHGs are emitted during the different stages of the dairy value chain. The indicator in this section focuses on the GHG emissions intensity related to activities on the dairy farm in the barn and milking parlor as well as through on- and/or off-farm feed production.

Greenhouse Gas Intensity - Primary Farm GHG 1

1. Relevance

When compared internationally, U.S. dairy farms have the lowest average GHG intensity. Each gallon of fluid milk consumed in the U.S. required an average of 17.6 lb of CO_2e to be emitted.[21] U.S. producers have achieved this through a long history of increasing milk production efficiency. Further reductions in GHG intensity can be achieved through increasing milk yield per cow while reducing GHG emissions; especially regarding enteric emissions and those associated with manure handling and processing, as well as breeding and cow comfort programs. Reducing the GHG intensity (a reduction of intensity means less GHG impact per unit of production) on the farm improves the life cycle performance of dairy products for many environmental attributes and can help reduce environmental impacts beyond GHG emissions.

2. Metric

Total GHG emissions (t CO_2e)/unit of milk production (FPCM)

Unit of milk production can include:

- Cwt (hundred weight for milk in pounds) (FPCM)
- Gallon of milk (FPCM)
- Kg of milk (FPCM)

Producers can use Farm Smart™ to measure this indicator.

3. Calculation and Reporting

3.1 Measure GHG emissions

Different calculators are available to calculate GHG emissions at the farm level.

Producers can use the Farm Smart™ tool to estimate the direct GHG emissions associated with on-farm milk and crop production, as well as the indirect GHG emissions associated with off-farm feed production.

Farm Smart is available at www.USdairy.com/FarmSmart.

If another calculator is used, please indicate which one.

3.2 Measure Total Annual Production

Measure total annual milk production as a unit of production. Unit of production can include:[c]

- Cwt (hundred weight for milk in pounds) (FPCM)
- Gallon of milk (FPCM)
- Kg of milk (FPCM)

3.3 Report GHG intensity

Report total GHG emissions per unit of annual milk production.

Producers can use Farm Smart to calculate Greenhouse Gas Intensity.

4. Optional Measurement Considerations

None

5. Definitions

Greenhouse gas emissions (GHG): The six main GHG emissions are:

- Carbon dioxide (CO2)
- Methane (CH4)
- Nitrous oxide (N2O)
- Hydro fluorocarbons (HFCs- a group of several compounds)
- Perfluorocarbons (PFCs- a group of several compounds)
- Sulphur hexafluoride (SF6)

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[c]Although a nutrient density base unit such fat and protein corrected milk [FPCM: 1 kg = raw milk (kg) * (0.337 + 0.116 * Fat content (%) + 0.06 * Protein content (%)] (Vellinga, et al., 2010) has been suggested, there is not yet a food industry standard for assessing nutrient density. USDA uses Milk Equivalent Total Solids based on a 40% milk fat & 60% solids not fat (SNF) to estimate how many pounds of milk fat or how many pounds of skim solids it takes to make one pound of product.

Direct emissions: Emissions from sources that are owned or controlled by the farm. For example, direct GHG emissions would arise from burning fuel for energy or from energy used to grow crops within the farm's operational boundaries. Also, emissions from manure and enteric emissions from the cow are included.

Indirect emissions: Emissions that result from the activities on the farm but are generated at sources owned or controlled by another organization or farm outside the farm's boundaries. In the context of this indicator, indirect emissions refer to GHG emissions from the generation of electricity, heat or steam that is imported and consumed by the farm or emissions from energy used during growing of crops purchased by the producers. For most farms, electricity and energy used to grow crops that the producer purchased may be the main sources of indirect emissions.

Carbon dioxide equivalent (CO_2e): CO_2 (carbon dioxide) equivalent is the measure used to compare the emissions from various greenhouse gases based on their global warming potential (GWP). The CO_2 equivalent for a gas is derived by multiplying the tonnes of the gas by the associated GWP, assuming a 100-year time frame. Appendix 2 lists the GWP values from the Intergovernmental Panel on Climate Change (IPCC).

6. Documentation

See documentation for GHG. On-farm, annual milk production can be calculated from milk checks.

7. Resources

- Farm Smart™, available at www.usdairy.com/FarmSmart
- Thoma et. al, Greenhouse Gas Emissions of Fluid Milk in the U.S., University of Arkansas, 2010. Available at: http://www.usdairy.com/Sustainability. ww.usdairy.com/Sustainability

  U.S. Environmental Production Agency (US EPA). 2012. DRAFT Inventory of U.S. Greenhouse Gas Emissions and Sinks. U.S. Environmental Protection Agency, Washington, D.C. Available online at: http://epa.gov/climatechange/emissions/usinventoryreport.html.
- Carbon Offsets. Available at: http://www.forest-trends.org/documents/files/doc_2828.pdf.
- Find and learn more about the Life Cycle Assessment commissioned by the Innovation Center for U.S. Dairy: http://www.usdairy.com/Sustainability/Science/Pages/Science-Layout-2.aspx

Our Cows

1. Animal Care

Why Measure Animal Care?

Animal care is a key consideration for all dairy farms—an animal's health and well-being is a key indicator of its performance and therefore the profitability and success of the farm. In recent years, consumer interest in animal wellbeing has greatly increased.[22] The Center for Food Integrity conducted a survey that revealed Americans consider humane farm animal treatment to be more important than worker care, but less important than other topics, such as cost of food and food safety.[23] Such findings have led to the development of multiple guidelines and certification programs that help promote practices that ensure proper animal care on dairy farms. The effort to document and communicate animal care practices also helps to build consumer confidence in agriculture.[24]

A typical dairy farm maintains the health of the dairy cattle by providing appropriate nutrition, housing, and disease prevention and detection along with well-designed treatment programs. These programs are usually developed through consultation with a qualified veterinarian and often include a Herd Health Plan (HHP).

Nationally, the National Milk Producers Federation (NMPF) has created the National Dairy FARM Program: Farmers Assuring Responsible Management™ (FARM), which outlines best management practices for animal care. The animal care indicators and metrics in the Guide align closely with the FARM program, creating the potential for reporting and communication efficiencies for cooperatives or producers currently utilizing the FARM program.

If a producer is participating in the FARM program or an equivalent animal care guideline program (as defined in Animal Care Guidelines (Primary Farm Animal Care 1) section 5. Definitions), the producer only needs to complete Animal Care Guidelines (Primary Farm Animal Care 1) and does not need to also complete the Veterinary Care (Primary Farm Animal Care 2) and Herd Health (Primary Farm Animal Care 3) indicators.

The Guide also gives consideration to producers who may not currently utilize the FARM program or an equivalent animal care guideline program, by providing the Veterinary Care (Primary Farm Animal Care 2) and Herd Health (Primary Farm Animal Care 3) indicators. These Indicators provide a mechanism for producers to use to communicate with customers or other stakeholders in more detail about their animal care practices.

Scope of the Indicators

The animal care indicators encompass the animals' environment, handling and treatment, as well as herd health and management of special needs animals. The scope of the indicators includes on-farm practices associated with cow-calf operations and proper handling and care of newborn calves, through end of life practices including treating diseased and injured animals and euthanasia. The animal care indicators are limited to on-farm cattle production and management practices.

Animal Care Guidelines - Primary Farm Animal Care 1

1. Relevance

Animal care is an important part of livestock based agriculture. High standards of animal care have been linked with increases in milk production and quality. Animal care guidelines measure the animal's facilities, handling, treatment, and nutrition. Consumer interest in animal care has increased over time and measuring standards of animal care and frequency of adoption by producers helps address consumer demand for transparency.[25]

2. Metric

Participation in the FARM program or an equivalent animal care guideline program

3. Calculation and Reporting

3.1 Identify and report animal care practices.

Does the farm currently participate in the National Dairy FARM Program: Farmers Assuring Responsible Management (FARM) program or an equivalent animal care guideline program? (Yes/No)

3.1a: If yes, report the name of the animal care program you are currently using.

If yes, completion of Veterinary Care (Primary Farm Animal Care 2) and Herd Health (Primary Farm Animal Care 3) is not necessary as these indicators are already included in the FARM program or an equivalent animal care guideline program.

See 5. Definitions for criteria of equivalent animal care guideline programs.

4. Optional Measurement Considerations

None

5. Definitions

Equivalent animal care guidelines shall be determined by the following criteria:

- Guidelines are verified by an independent third party
- Guidelines are supported by members of the dairy industry
- Guidelines must include the following aspects of animal care:
  - Veterinary-Client-Patient Relationship
  - Standard Operating Procedures (SOPs)
  - Euthanasia
  - On-Farm Evaluation

Examples of equivalent animal care guideline programs are included in the 7. Additional Resources section.

6. Documentation

Enrollment or participation verified by the animal care guidelines administrating organization.

7. Additional Resources

- National Milk Producers Federation. 2010. The National Dairy FARM Program: Farmers Assuring Responsible Management Manual. http://www.nationaldairyfarm.com/sites/default/files/AnimalCareManual_JUN_VIEW.pdf\
- Northwest Sustainable Dairies. 2009. Animal Care and Welfare. http://www.northwestsustainabledairies.com/assets/pdfs/animal_care-and-welfare.pdf
- American Humane Association. 2010. Animal Welfare Standards for Dairy Cattle.

Veterinary Care - Primary Farm Animal Care 2

Note: If the response to Animal Care Guidelines (Primary Farm Animal Care 1) is "yes", it is not necessary to also report this Indicator.

1. Relevance

Individual animal and herd health is an important aspect of animal care. In order to have proper care, access to trained veterinarians is crucial to prevent disease, treat sick animals, and promote a healthy herd. Reporting a farm's relationship with a certified veterinarian can account for both the overall safety of the farm's dairy animals and the milk produced on-farm.[26]

2. Metric

Established Veterinary-Client-Patient Relationship (VCPR)

3. Calculation and Reporting

3.1 Identify and report veterinary relationship with farm

Does the farm have a Veterinary-Client-Patient Relationship as defined by American Veterinary Medical Association (AVMA)? (Yes/No)

4. Optional Measurement Considerations

None

5. Definitions

Veterinary-Client-Patient Relationship (VCPR): The Veterinarian-Client-Patient Relationship is the basis for interaction among veterinarians, their clients, and their patients. A VCPR exists when all of the following conditions have been met:

- The veterinarian has assumed responsibility for making clinical judgments regarding the health of the animal(s) and the need for medical treatment, and the client has agreed to follow the veterinarian's instructions.
- The veterinarian has sufficient knowledge of the animal(s) to initiate at least a general or preliminary diagnosis of the medical condition of the animal(s). This means that the veterinarian has recently seen and is personally acquainted with the keeping and care of the animal(s) by virtue of an examination of the animal(s), or by medically appropriate and timely visits to the premises where the animal(s) are kept.
- The veterinarian is readily available, or has arranged for emergency coverage, for follow-up evaluation in the event of adverse reactions or the failure of the treatment regimen.

6. Documentation

Documentation is a written statement between the farm and the veterinarian acknowledging a current Veterinary-Client-Patient Relationship or veterinary bills for services provided within the reporting period. A sample VCPR form is available at the FARM program website (see 7. Additional Resources).

7. Additional Resources

- American Veterinary Medical Association. 2010. Principles of Veterinary Medical Ethics of the AVMA. http://www.avma.org/issues/policy/ethics.asp
- National Milk Producers Federation. 2010. Veterinary Client/Patient Relationship Validation Form. Accessed on July 2, 2012 at: http://www.nationaldairyfarm.com/sites/default/files/VCPR%20form_FARM%20version.pdf

Herd Health - Primary Farm Animal Care 3

***Note**: If the response to Animal Care Guidelines (Primary Farm Animal Care 1) is "yes", it is not necessary to also report this Indicator.*

1. Relevance

The health of cattle on a dairy is essential and is dependent on good husbandry practices. An effective Herd Health Plan (HHP) details standard operating procedures (SOPs) to help ensure good animal husbandry and disease/injury prevention, rapid diagnosis, and quick decision-making on necessary treatment of sick or injured dairy cattle. SOPs help to guide a farm's efforts towards uniform animal care practices. SOPs typically include preventive safety and medical measures, training staff in animal care practices, animal identification systems, good sanitation, euthanasia guidelines, animal nutrition protocols and regular milking routines. Creating a Herd Health Plan and documenting farm SOPs helps to create a reduced stress environment for animals and ensure the implementation of animal care practices throughout the farm.[27]

2. Metric

Implementation of a Herd Health Plan with standard operating procedures

3. Calculation and Reporting

3.1 Identify if the farm has a Herd Health Plan

Does the farm have a written Herd Health Plan developed in consultation with a herd veterinarian? (Yes/No)

3.2 Identify and report the standard operating procedures included in the HHP

3.2.1 Report which of the following SOPs are included in the farm's HHP:

a. Vaccination (Yes/No)
b. Newborn calf management (Yes/No)
c. Euthanasia including directives on what cow and how the procedure is to be performed (Yes/No)
d. Non-ambulatory animal management (Yes/No)
e. Dehorning (Yes/No)
f. Castration (Yes/No)
g. Extra (supernumerary) teat removal (Yes/No)
h. Diseased or injured cattle treatment (Yes/No)
i. Prevention, detection and action for common diseases, and parasite and pest control (Yes/No)
j. Special needs animals (Yes/No)

3.2.2. Report which of the following practices are included in the HHP:

a. SOPs are available to employees and posted in the native languages of employees assigned animal care responsibilities (Yes/No)
b. The farm documents employee training for new and existing employees at least on an annual basis (Yes/No)
c. An emergency plan is readily available to address animal care needs arising from unique circumstances such as fire or natural disaster (Yes/No)
d. Each animal is permanently identified (Yes/No)
e. A record keeping system is used for animal care and management decision-making (Yes/No)
f. There is a specific milking routine followed to ensure udder health and milk quality (Yes/No)

3.3 Identify and report animal nutrition practices

Report which of the following practices regarding animal nutrition are included in the HHP:

a. The farm works with a third party nutritionist or dairy extension officer regarding nutrition (Yes/No)
b. The farm has a daily feeding schedule (Yes/No)

c. The farm has feeding plans and schedules for calves and special need animals (Yes/No)
d. The farm trains employees in charge of animal feeding in proper nutrition and feed composition (Yes/No)
e. The farm provides access to clean water (continuous access to fresh water or water provided at least twice a day or as necessary to maintain proper hydration) and feed (not restricted from feed for more than four hours at one time) (Yes/No)
f. The farm has a record keeping system for animal nutrition (Yes/No)

4. Optional Measurement Considerations

None

5. Definitions

Newborn: The young of the domestic cow, from birth up until the calf begins to eat only dry feed rations, usually around 6-to-10 weeks of age.

Special-Needs Animals: Sick, injured, or non-ambulatory animals.

Standard Operating Procedures (SOPs): SOPs are instructions for various aspects of animal care on the dairy. While SOPs can be verbal, written SOPs are preferred for consistency in communication to employees. The SOPs provide enough detail to ensure that all employees empowered with a specific animal care assignment (consistent with their job description and training) can routinely and consistently perform their animal care duties. SOPs should be reviewed at least annually and updated as necessary.

6. Documentation

Documentation is a written statement Herd Health Plan (HHP). A sample HHP form is available at the FARM program website (see 7. Additional Resources).

7. Additional Resources

> National Milk Producers Federation. 2010. Herd Health Plan Template. Available at: http://www.nationaldairyfarm.com/animal-care-resources.html

> Virginia Tech with U.S.D.A. cooperating. 2009. DHA Somatic Cell Program Guidelines. http://pubs.ext.vt.edu/404/404-228/404-228.html

Phase 1
DRAFT PROCESSOR AND MANUFACTURER INDICATORS

List of Phase 1 PM Indicators

Indicator	Metric	Page	GRI G3.1
Our Planet			
Energy Intensity - Primary PM Energy 1	For (milk) processing: Total energy use (converted to MMBTU)/ unit of (milk) processed For dairy product manufacturing: Total energy use (converted to MMBTU)/ unit of output	42	EN3, EN4
Greenhouse Gas Intensity - Primary PM GHG 1	For milk processer: Total GHG emission (metric tonnes CO_2e)/ unit of (milk) processed For dairy manufacturer: Total GHG emission (metric tonnes CO_2e)/ unit of output	49	EN16
Water Use - Primary PM Water 1	Percentage of total water withdrawn/consumed by source	53	EN8
Water Efficiency - Primary PM Water 2	For milk processer: Total water use/unit of (milk) processed For dairy manufacturer: Total water use/unit of output	54	EN8
Water Discharge and Quality - Primary PM Water 3	Percentage of water discharges compliant with regulations	55	EN21
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Employment Opportunities - Primary PM Employees 1	Number of jobs supplied	60	
Employee Benefits - Primary PM Employees 2	Number of indirect and non-monetary benefits received by employees	62	
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Employee Engagement in Health and Safety Management - Primary PM Employees 4	Number of opportunities for workers to participate in, and percentage of employees who participated, in developing, implementing and managing health and safety initiatives and the levels in the corporation at which these programs operate	65	

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Introduction

Scope of the Indicators

Processor and manufacturer (PM) indicators currently cover operations in all 50 states and independent territories.

The energy, GHG and water indicators for processors and manufacturers cover transportation of milk from the farm to the processing plants, and from processing plants to retail or service centers, as well as the processing and manufacturing operations. Following the guidance from the GRI G3.1 Sustainability Reporting Guidelines, dairy companies should explain in their sustainability communications the boundaries of the reported information. If the scope or boundary of the reported information differs from the scope of the energy, GHG or water indicators, the dairy company should explain the difference and rationale for deviating from the Guide indicators. In addition, dairy companies should consult the guidance in the GRI Guidelines regarding defining report content and quality of reported information.

The indicators can be used by fluid milk processors, as well as dairy product manufacturers (e.g., cheese, yogurt, ice cream). Over the coming years, more specific dairy-product-related components may be added to these indicators to increase accuracy and relevance.

Audience and Usage

The PM Indicators are created for dairy processors and manufacturers in the United States and independent territories. The indicators are intended to inform dairy companies and other stakeholders about what is important to measure and how to do so.

Measuring sustainability indicators at the dairy processor and manufacturer level supports identification of business risks, while also offering opportunities for cost reduction and income generation. Processors and manufacturers have opportunities to enhance their leadership in sustainability through the verification and communication of their sustainability performance to stakeholders, which also enhances the overall reputation of the dairy industry.

Dairy companies can use the energy, GHG, and water indicators to evaluate performance within their company over time.

The PM Indicators are aligned with tools developed by the Innovation Center and others, which processors and manufacturers can use to assess risks and opportunities for improvements and costs savings. The indicators for processors and manufacturers are intended to communicate to a range of stakeholders for the purposes of:

- Informing stakeholders about the most important aspects of plant and transportation operations and decision-making in the context of a sustainable dairy sector.
- Inviting stakeholders to review, pilot and provide feedback on these indicators so that the indicators can be improved with respect to accuracy and relevance to the dairy sector.

Dairy companies can use Plant Smart™ to calculate the energy and greenhouse gas intensity indicators.

These indicators, in their current format, should not be used to benchmark dairy companies against other companies. *The metrics do not include standardized allocations of input, outputs and processes; therefore, comparisons between different dairy companies could lead to false interpretations regarding the performance of these companies.*

Context

When communicating the information about a processor's or manufacturer's sustainability performance, it is important to provide readers with contextual information, including

management strategies, priorities, and risks and opportunities related to the environmental, community and economic topics in this Guide. The contextual information enables stakeholders and reviewers to understand the dairy company, its operational systems and the situation in which it operates more fully.

To provide this information in sustainability communications, processors and manufacturers are encouraged to use the Standard Disclosures and Disclosures on Management Approaches for each indicator topic from the GRI G3.1 Sustainability Reporting Guidelines.

Our Planet

1. Energy Indicators

Why Measure Energy?

The measurement of energy within a dairy plant is an essential part of energy management programs. Understanding the energy flows within a plant can support plant managers in identification of inefficiencies and energy reduction opportunities. Energy is a frequently managed attribute as part of sustainability programs due to the environmental impacts, including GHG emissions, of the production and usage of energy sources. In addition to reducing carbon footprints, processors and manufacturers strategically track energy in order to reduce costs. Controlling energy costs and improving energy efficiency can increase economic viability. The benefits of improved energy management include reduced operating costs, increased productivity, reduced regulatory issues (including air pollution and GHG emissions regulations), reduced vulnerability to energy price volatility, and enhanced reputation with buyers and consumers.

Scope of the Indicators

The energy intensity indicator includes measurements of direct energy (energy that is used during transportation of milk from the farm to the processing plants, and from processing plants to retail or service centers, as well as during the processing and manufacturing operations) as well as indirect energy (energy that has been used upstream in the supply chain for the production of energy that is purchased and consumed by the dairy company for plant or truck operations) reported as total energy use per unit of output.

The indicator should be used to measure and report at the company level, aggregating the totals from all facilitates. Companies should explain if all facilities are included in the indicators.

Dairy companies can use Plant Smart^{TM} to calculate the energy intensity indicator.

Energy Intensity - Primary PM Energy 1

1. Relevance

This indicator reveals the relative energy intensity of a dairy company, or amount of energy used to produce a specific quantity of the product. If tracked over time, it can demonstrate the results of proactive efforts to improve energy intensity by introduction of new technologies and/or energy management practices. The use of improved energy practices or technology can directly reduce operational costs and a company's future dependency on nonrenewable energy sources. Better energy performance could be a key strategy for reducing GHG emissions and reducing impacts from the extraction and processing of energy. However, the energy intensity should be analyzed in context of the company's operations and production outputs; an improved intensity ratio is not a direct indication of reduced GHG emissions and therefore should be analyzed with care.

This energy intensity indicator can be used internally by dairy companies to compare the ratios over various time intervals. This indicator, in its current form, should not be used to benchmark the dairy company against other companies. The metrics do not include standardized allocations of input, outputs and processes, and therefore comparisons between different dairy companies could lead to false interpretations regarding the performance of these companies. When comparing the energy intensity of the plants within the same company, the methods of measurements used in each plant need to be the same. Some companies may process or produce nondairy products in the plants. In that case, the company should indicate whether nondairy products were included or excluded in the measurement and reporting.

2. Metric

Companies can choose between two metrics:

Total energy use (converted to MMBTU) / unit of (milk) processed

Total energy use (converted to MMBTU) / unit of output

Unit of processing or output can include:

- Gallon (milk, ice cream, frozen or other products)
- Pound of product (cheese, butter, etc.)
- Kg of milk or other products

3. Calculation and Reporting

3.1 Measure direct energy use

Total energy use in MMBTUs per year for the company should be calculated and reported using the following equation. Use the conversion factors in the table on the following page to calculate MMBTUs.

Total direct energy consumption = Direct primary energy purchased + Direct primary energy produced – Direct primary energy sold

Assess the amount of primary energy purchased by the dairy company's operation and transportation in MMBTUs. This includes energy sources such as:

- Direct nonrenewable energy sources, including:
  - Coal
  - Natural gas (including compressed natural gas [CNG], liquefied natural gas [LNG])
  - Fuels from crude oil: gasoline, diesel, liquefied petroleum gas (LPG), butane, propane, ethane, etc.
- Direct renewable energy sources, including:
  - Biomass-based intermediate energy
  - Biofuels, including biodiesel (measure B20 and B100 use separately) and ethanol (measure E85 and E10 separately)
  - Geothermal
  - Hydrogen-based intermediate energy
  - Hydro energy

- Biogas digesters
- Solar
- Wind

Assess the amounts of primary energy sources produced by processor and manufacturing operations for consumption in the company in MMBTUs. This can include electricity generated from biogas digesters, wind and solar installations, etc.

Assess the amount of primary energy sold (if any) by processor operations to users other than the company in MMBTUs.

3.2 Measure indirect energy use

Utility bills commonly use the units of kilowatt-hour (kWh) for electricity; therefore, use the conversion factors in the table below to convert energy units to MMBTU.

Processors and Manufacturers can use Plant Smart™ to calculate this indicator.

Note: These units are in terms of "site-energy" (which does not include the impact of power plant efficiency and fuel type) and not 'source-energy'.

Electricity	**MMBTU[1]**
kilowatt-hour	0.003412
megawatt-hour	34.1214
gigawatt-hour	3412.1
[1]From GRI G3.1	

Assess the amount of intermediate energy purchased and consumed from sources external to the dairy company in MMBTUs. This includes intermediate energy purchased and consumed from nonrenewable energy sources, including:

- Electricity
- Hot water
- Chilled water
- Steam
- Nuclear energy
- Other forms of imported energy

Units	MMBTU
Coal	
tonne (metric)	24.6432
ton (short)	22.3590
ton (long)	25.0413
Crude Oil	
barrel	5.8954
tonne (metric)	42.4622
ton (short)	38.5193
ton (long)	43.1446
Gasoline	
U.S. gallon	0.1185
tonne (metric)	42,463,154.8
Diesel	
U.S. gallon	0.1308
tonne (metric)	41.0689
Fuel Oil	
U.S. gallon	0.1365
tonne (metric)	38.0928
Natural Gas	
therm	0.1000
1000 cubic feet	1.0470
1000 cubic meters	36.9743
Biofuel (B10)[2]	
U.S. gallon	0.1273
Biofuel (B100)[2]	
U.S. gallon	0.1183
Electricity	
kilowatt-hour	0.003412
megawatt-hour	3.412
gigawatt-hour	3412.1
Ethanol (E100)[3]	
U.S. gallon	0.0761
Ethanol (E85)[3]	
U.S. gallon	0.0818

[1] All conversion factors were derived from conversion factors in GRI G3.1 Guidelines unless otherwise cited
[2] U.S. EPA, 2009
[3] U.S. DOE, 2009.

Intermediate energy purchased and consumed from renewable energy sources including:

- Solar
- Wind
- Geothermal
- Hydro energy
- Biomass based intermediate energy
- Hydrogen based intermediate energy

3.3 Measure total energy used

Assess the total energy used for the company per year as the sum total direct and indirect energy use.

3.4 Measure total annual production

Assess the total annual volume of fluid milk processed, and/or total annual dairy product output.

Companies can use Plant Smart™ to calculate this indicator.

3.5 Report the energy intensity

Report the total energy used in MMBTUs per unit of (milk) processed or per unit or output.

Indicate whether nondairy products were included or excluded in the measurement and reporting.

4. Optional Measurement Considerations

Consider reporting energy consumption in MMBTUs in total and broken down by renewable primary energy source as an additional information point for the company.

Renewable energy sources include:

- Biomass based intermediate energy
- Biofuels (including biodiesel (measure B20 and B100 use separately) and ethanol (measure E85 and E10 separately)
- Geothermal
- Hydrogen based intermediate energy
- Hydro energy
- Biogas digesters
- Solar
- Wind

5. Definitions

Direct Energy: Forms of energy that cross the plant's boundaries. It is consumed either by the plant within its boundaries, or it can be exported to another user. Energy can appear in either primary (e.g., natural gas for heating) or intermediate (e.g., electricity for lighting) forms. It can be purchased, extracted (e.g., coal, natural gas, oil), harvested (e.g., biomass energy), collected (e.g., solar, wind) or brought into the plant's boundaries by other means. *(Definition from GRI G3.1 Guidelines and updated to make relevant to dairy plants)*

Primary source: The initial form of energy is consumed to satisfy the processing plant's energy demand. This energy is used either to provide final energy services (e.g., space heating, transport) or to produce intermediate forms of energy such as electricity and heat. Examples of primary energy include nonrenewable sources such as coal, natural gas, oil and nuclear energy. It also includes renewable sources such as biomass, solar, wind, geothermal and hydro energy. Primary energy might be consumed on-site (e.g., natural gas to heat the processing plant's buildings) or off-site (e.g., natural gas consumed by the power plants that provide electricity to the processing plant's facilities). *(Definition from GRI G3.1 Guidelines and updated to make relevant to processors and manufacturers)*

Renewable energy sources: Energy sources capable of being replenished within a short time through ecological cycles (as opposed to resources such as minerals, metals, oil, gas and coal that do not renew in short time periods). Such energy sources include the sun, wind, moving water, organic plant and waste material (biomass), and the earth's heat (geothermal). *(Definition from U.S. EPA 2011)*

Indirect Energy: Energy produced outside the company's boundary that is consumed to supply energy for the organization's intermediate energy needs (e.g., electricity or heating and cooling). The most common example is fuel consumed outside the company's boundary in order to generate electricity to be used inside the company's boundary. (*Definition from GRI G3.1 and updated to make relevant for processors and manufacturers)*

Intermediate energy: Forms of energy that are produced by converting primary energy into other forms. For most companies, electricity will be the only significant form of intermediate energy. *(Definition from GRI G3.1 and updated to make relevant for processors and manufacturers)*

Renewable energy sources: Energy sources capable of being replenished within a short time through ecological cycles (as opposed to resources such as minerals, metals, oil, gas, and coal that do not renew in short time periods). Such energy sources include the sun, wind, moving water, organic plant and waste material (biomass), and the earth's heat (geothermal). *(Definition from US EPA 2011)*

Energy intensity: Energy consumption per unit of product.

6. Documentation

Energy use information can be obtained by reviewing invoices, measured or calculated heat/fuel accounting, estimations, etc. Amounts of MMBTUs can be taken directly from invoices and delivery notes, or can be converted using energy units multiplied by conversion factors in the Calculation and Reporting section. *(Definition from GRI G3.1 Guidelines and updated to make relevant for processors and manufacturers).*

For a dairy processing or manufacturing plant, annual dairy product production can be calculated from annual sales.

7. Resources

- Plant Smart™. Available at www.USdairy.com/PlantSmart
- T. Vellinga, C. Opio, B. Henderson and S. Henning, with P. Gerber. 2010. Greenhouse Gas Emissions from the Dairy Sector A Life Cycle Assessment. Food and Agriculture Organization of the United Nations, Rome.

- U.S. Environmental Protection Agency (U.S. EPA). 2011. ENERGY STAR Focus on Energy Efficiency in Dairy Processing,*energystar.gov/index.cfm?c=in_focus.bus_dairy_processing*.

Dairy fluid milk processors and ice-cream manufacturers can use the U.S EPA ENERGY STAR® Processing Plant Energy Performance Indicator Tool for fluid milk and ice create to calculate energy intensity.

2. Greenhouse Gas Emissions

Why Measure GHG Emissions?

The dairy industry has committed to reducing its GHG emissions by 25 percent by 2020. In order to understand the industry's progress toward its goal, emissions from dairy plants should be estimated and reported. Processing accounts for 2.50 lb. CO_2e of the 17.6 lb. CO_2e, per gallon of milk consumed in the U.S., which represents approximately 14 percent of the total.[28] Measuring carbon footprints can support dairy companies in identifying ways to reduce their GHG emissions and other environmental sustainability goals, but in many cases will also strengthen the economic sustainability of processing facilities. Several practices that reduce GHG emissions, such as increasing energy efficiency, also provide cost savings to the processor. An evaluation of emissions can be used to assess the reputational risks of dairy companies' association with GHG emissions.

As Figure 1 - Primary Sources for Greenhouse Gas Emissions in U.S. Fluid Milk shows, GHGs are emitted across all stages of the dairy supply chain. The indicators in this section focus on GHGs at the processor and manufacturer level.

Scope of the Indicators

The GHG intensity indicator measures direct and indirect GHG emissions in line with Scope 1 and Scope 2 of the WRI/WBCSD GHG protocol.[29] Scope 3 indirect GHG emissions are currently not covered by the indicator for fluid milk processors and dairy product manufacturers. The reporting of GHG intensity is the total (Scope 1 + Scope 2) GHG emissions per unit of output.

The indicators should be used to measure and report at the company level, aggregating the totals from facilitates. Companies should explain if all facilities are included in the indicators.

Dairy companies can use Plant Smart™ to calculate the greenhouse gas intensity indicator.

Greenhouse Gas Intensity - Primary PM GHG 1

1. Relevance

Dairy processors and manufacturers can reduce GHG emissions by using energy efficient materials and processing equipment and establishing energy conservation measures. Improving GHG intensity can reduce costs, improve the life cycle performance of dairy products, and can reduce other environmental impacts.

This intensity indicator can be used internally by dairy companies to compare the ratios over various time intervals. This indicator, in its current form, should not be used to benchmark the dairy company against other companies. The metrics do not include standardized allocations of input, outputs and processes, and therefore comparisons between different dairy companies could lead to false interpretations regarding the performance of these companies. When comparing the intensity of the plants within the same company, the methods of measurements used in each plant need to be the same. Some companies may process or produce nondairy products in the plants. In that case, the company should indicate whether nondairy products were included or excluded in the measurement and reporting.

2. Metric

Total GHG emissions (metric tonnes CO_2e) / unit of (milk) processed

Total GHG emissions (metric tonnes CO_2e) / unit of output

Unit of processing or output can include:

- Gallon (milk, ice cream or other frozen products)
- Pound of product (cheese, butter, etc.)
- Kg of milk

3. Calculation and Reporting

3.1 Measure GHG emissions

Processors should indicate the method used to estimate GHG emissions from among the following choices:

- Direct measurement (e.g., continuous online GHG analyzers)
- Calculation based on site-specific data (e.g., fuel use)
- Calculation based on default data
- Estimations (If estimations are used due to a lack of default figures, indicate which basis figures were obtained.)

Assess Scope 1 (direct) GHG emissions from all sources owned or controlled by the processor, including:

- On-site generation of electricity, heat, or steam
- Fugitive refrigerant leaks from plant (not including ammonia)
- Fuel use from transportation of milk from the farm to the processing facility
- Fuel use from transportation of dairy products to distribution or retailer facilities, and transportation of materials, supplies and waste related to dairy products
- Fugitive refrigerant leaks from distribution fleet

Assess Scope 2 (indirect) GHG emissions from all sources, including:

- Consumption of purchased electricity, heat or steam

3.2 Measure total annual production

Assess the total annual volume of fluid milk processed, and/or total annual dairy product output.

3.3 Report

Assess total GHG emissions (Scope 1 and Scope 2) and annual total product output per year for the company.

Indicate whether nondairy products were included or excluded in the measurement and reporting.

Dairy companies can use Plant Smart™ to calculate this indicator.

4. Optional Measurement Considerations

None

5. Definitions

Direct emissions (Scope 1): Emissions from sources that are owned or controlled by the processor or dairy product manufacturer. For example, direct emissions related to combustion would arise from burning fuel for energy within the processor's operational boundaries.

Indirect emissions (Scope 2): This includes emissions that result from processor activities but are generated at sources owned or controlled by other businesses. In this context, indirect emissions refer to GHG emissions from the generation of electricity, heat or steam that is imported and consumed by the processor.

Carbon dioxide equivalent: CO_2 (carbon dioxide) equivalent is the measure used to compare the emissions from various GHGs based on their global warming potential (GWP). The CO_2 equivalent for a gas is derived by multiplying the tonnes of the gas by the associated GWP, assuming a 100-year time frame. The GWP values from the Intergovernmental Panel on Climate Change (IPCC) are listed in the Appendix.

6. Documentation

GHG Scope 1 and Scope 2 emissions resulting from direct and indirect energy use can be calculated using the measurements in the Energy Intensity indicator.

Annual amounts of milk used to produce a product can be calculated based on milk checks to producers.

7. Resources

- Plant Smart™. Available at: www.USDairy.com/PlantSmart.
- U.S. Environmental Production Agency (U.S. EPA). 2012. DRAFT Inventory of U.S. Greenhouse Gas Emissions and Sinks. U.S. Environmental Protection Agency, Washington, D.C., http://epa.gov/climatechange/emissions/usinventoryreport.html.
- Find and learn more about the Life Cycle Assessment commissioned by the Innovation Center for U.S. Dairy: http://www.usdairy.com/Sustainability/Science/Pages/Science-Layout-2.aspx

3. Water

Why Measure Water?

Water is a finite resource under increasing pressure from human activities as well as changing climates. Water use is directly linked to other local, regional and national sustainability and environmental impacts. For example, water availability and quality has implications to human health, economy, (food) security and ecosystems.

Water management by companies is increasingly important and includes a variety of practices to reduce the volume of water used and impacts on water quality. Knowledge is increasing about safe levels of water withdrawal, efficient use and water quality management. Dairy plants track water consumption through the use of meters to identify ways to improve production efficiency. In addition, dairy plants monitor the quality of water that is leaving the plants.

Scope of the Indicators

The water indicators cover the direct water use and water quality impacts of dairy processing and manufacturing plants.

The indicators should be used to measure and report at company level, aggregating the totals from facilitates. Companies should explain if all facilities are included in the indicators.

Water Use - Primary PM Water 1

1. Relevance

The systematic effort to monitor and improve the efficient use of water in the company is directly linked to water use costs. Total water use can indicate the level of risk posed by disruptions to water supplies or increases in the cost of water. Clean freshwater is becoming increasingly scarce, and can impact production processes that rely on large volumes of water. In regions where water sources are highly restricted, the company's water consumption patterns also can influence relations with other stakeholders.

This indicator can be used to report to GRI G3.1 EN8.

2. Metric

Total water use as the percentage withdrawn and consumed by source

3. Calculation and Reporting

3.1 Measure

Assess the total volume of water withdrawn and consumed from any water source that was either used directly by the company or provided through intermediaries such as water utilities. This includes the abstraction of cooling water.

3.2 Report

Report the total volume of water use in percentages by the sources for the company per year in the table below.

Water Use From Source	% of Total Water Withdrawn	% of Total Water Consumed
Surface water, including water from wetlands, rivers, lakes and oceans		
Ground water		
Rainwater collected directly and stored by the reporting organization (includes snow and ice melt water)		
Wastewater from another organization		
Municipal water supplies or other water utilities (and source)		
Totals:		

4. Optional Measurement Considerations

None

5. Definitions

Total water withdrawal: The sum of all water withdrawn within the boundaries of the reporting organization from all sources (including surface water, ground water, collected rainwater and municipal water supply) for any use over the course of the reporting period. Water may be returned to local sources, but not necessarily in the same ratio contribution as from the drawn sources (GRI 3.1, with additions). If a municipality is involved, information about the supply source will need to be collected and included in the water accounting. Water provided by a municipality, but not listed elsewhere in the reported water use as being derived from a specific source remains classified as the municipal water supply.

Total water consumption: The sum of all water used within the boundaries of the company from all sources (including surface water, ground water, collected rainwater and municipal water supply) for any use over the course of the reporting period. (GRI G.3.1)

6. Documentation

Information on water use can be obtained from water meters, water bills, calculations derived from other available water data or (if neither water meters nor bills or reference data exist) the company's own estimates.

7. Resources

- Framework for an EPA Safe and Sustainable Water Resources Research Program, EPA, June 2, 2011, accessed March 25, 2012, http://www.epa.gov/research/priorities/docs/SSWRFramework.pdf

Water Efficiency - Primary PM Water 2

1. Relevance

Measuring water efficiency allows for comparison of water use per unit of output over time. Depending on the context in which a dairy plant operates, understanding the efficiency of its water use can be a key part of a water management plan. Analyzing water efficiency data can identify opportunities for improved production processes and cost savings.

This efficiency indicator can be used by dairy companies to compare the ratios over various time intervals within the company. This indicator, in its current form, should not be used to benchmark the dairy company against other companies. The metrics do not include standardized allocations of input, outputs and processes, and therefore comparisons between different dairy companies could lead to false interpretations regarding the performance of these companies. When comparing the efficiency of the plants within the same company, the methods of measurements used in each plant need to be the same. Some companies may process or produce non-dairy products in the plants. In that case, the company should indicate whether nondairy products were included or excluded in the measurement and reporting.

2. Metric

Total water use / unit of (milk) processed

Total water use / unit of output

Unit of processing or output can include:

- Gallon (milk, ice cream or other frozen product)
- Pound of product (cheese, butter, etc.)
- Kg of milk

3. Calculation and Reporting

3.1 Measure and report water efficiency

Assess and report total water use (the amount of water withdrawn + consumed) for the company per year by using the table in the water use indicator and total of milk processed or unit of output.

Indicate whether nondairy products were included or excluded in the measurement and reporting.

4. Optional Measurement Considerations

None

5. Definitions

Gallons of Water Used: This is the volume of water brought into the plant's boundaries and excludes recycled water within the system.

6. Documentation

Information on water use can be obtained from water meters, water bills, calculations derived from other available water data or (if neither water meters nor bills or reference data exist) the company's own estimates. Annual amounts of milk used to produce a product can be calculated based on plant receipts of milk, milk-based ingredients and associated water.

7. Resources

- J.R. Danalewich, T.G. Papagiannis, R.L. Belyea, M.E. Tumbleson and L. Raskin, "Characterization of dairy waste streams, current treatment practices, and potential for biological nutrient removal," Wat. Res.32 (12)(1998): 3555-3568.
- "Water for Life," DEFRA, http://www.defra.gov.uk/environment/quality/water/legislation/whitepaper/.
- F.X. Milan, D. Nutter and G.Thoma, Invited Review: Environmental Impacts of Dairy Processing and Products: a Review," Journal of Dairy Science. 94(9) (2011):4243-4254.

Water Discharge and Quality - Primary PM Water 3

1. Relevance

Measuring the percentage of permits complied with for water discharged by a company is a key indicator to assess risks and opportunities for improvement.

The systematic effort to monitor and improve the efficient discharge to a water source or land by the company is directly linked to water disposal costs. Permits can also indicate the level of risk posed by disruptions to the affected water source quality or increases in the cost of water treatment before discharge. In regions where discharges to water sources are highly restricted, the company's water disposal patterns also can influence relations with stakeholders.

2. Metric

Percentage of permits complied with for water discharge

3. Calculation and Reporting

3.1 Measure

Determine the total number of required water permits and the total number of permits the company is in compliance with.

Percentage of permits complied with for water discharge = Total number of permits complied with / total number of required permits

3.2 Report

Report the percentage of permits complied with by the company per year.

4. Optional Measurement Considerations

Measure wastewater efficiency as wastewater disposal to milk processed (or dairy product output) ratio. This ratio can be used to assess and manage efficiency within the company over several time intervals; it should not be used to report or benchmark against different companies.

Wastewater-to-Milk Processed (or dairy product output) Ratio = Gallons of Wastewater disposed / Unit of Milk Processed (or dairy product output)

Unit of processing or output can include:

- Gallon (milk, ice cream or other frozen product)
- Pound of product (cheese, butter, etc.)
- Kg of milk

5. Definitions

Total water discharge: The sum of water effluents discharged over the course of the reporting period to subsurface waters, surface waters, sewers that lead to rivers, oceans, lakes, wetlands, treatment facilities, and ground water either through:

- A defined discharge point (point source discharge);
- Over land in a dispersed or undefined manner (nonpoint source discharge); or
- Wastewater removed from the reporting organization via truck. Discharge of collected rainwater and domestic sewage is not regarded as water discharge.

Wastewater-to-milk processed ratio: This is the efficiency of wastewater discharged per unit of milk processed or dairy product output by the company. It can be used to assess efficiency within the company over several time intervals; it should not be used to benchmark against different companies.

6. Documentation

Information sources about the volume of water discharged by the reporting organization include flow meters (point-source discharges or when discharges are released through a pipe) and regulatory permits. (GRI G3.1)

7. Resources

- U.S. EPA, Water Quality Standards Handbook: Second Edition, http://water.epa.gov/scitech/swguidance/standards/handbook/index.cfm.
- Stockholm Convention on Persistent Organic Pollutants (POPs), 2001, http://chm.pops.int/Home/tabid/2121/mctl/ViewDetails/EventModID/871/EventID/230/xmid/6921/Default.aspx.

Water Recycling and Reuse - Secondary PM Water 4

1. Relevance

Reporting the total volume of water recycled contributes to an understanding of the overall scale of avoided impacts and risks associated with the company's water use. The total volume recycled provides an indication of the company's relative size and importance as a recycler of water, and provides a baseline figure for other calculations relating to recycling efficiency and water reuse.

The systematic effort to monitor and improve the efficient reuse of water in the company is directly linked to water consumption costs. Clean freshwater is becoming increasingly scarce, and can impact production processes that rely on large volumes of water. In regions where water sources are highly restricted, the company's water recycling patterns also can influence positively relations with other stakeholders. (GRI G3.1)

This is an optional indicator. Processors and manufacturers can choose to report this indicator to support their stories about water conservation and efficiency management practices.

This indicator can be used to report to GRI G3.1 EN10.

2. Metric

Percentage and total volume of water recycled and reused

3. Calculation and Reporting

3.1 Measure

This indicator measures both water that was treated prior to reuse and water that was not treated prior to reuse. Gray water (i.e., collected rainwater and wastewater generated by nonseptic water collection) is included.

Calculate the volume of recycled/reused water based on the volume of water demand satisfied by recycled/reused water rather than further withdrawals. For example, if the company has a production cycle that requires 200 gallons of water per cycle, the company withdraws 200 gallons of water for one production process cycle and then reuses it for an additional three cycles. The total volume of water recycled/reused for that process is 600 gallons. (GRI G3.1)

Water Recycled	Gal./Yr.	% of Total Water Recycled
Water removed from processing milk and use again on-site (e.g., cow water)		
Wastewater recycled back in the same process or higher use of recycled water in the process cycle		
Wastewater recycled/reused in a different process, but within the same facility		
Wastewater reused at another of the reporting organization's facilities		
Total:		100%

3.2 Report

Report the total volume of water recycled/ reused by the company in gallons per year and also as a percentage of the total water withdrawn. (GRI G3.1)

4. Optional Measurement Considerations

Report water recycled per gallon of milk processed or dairy product output. This ratio can be used to assess efficiency within the company over several time intervals; it should not be used to benchmark against different companies.

Recycled Water-to-Milk Processed (or dairy product output) Ratio = Gallons of Water Recycled / Unit of Milk Processed (or dairy product output)

Unit of processing or output can include:

- Gallon (milk, ice cream or other frozen product)
- Pound of product (cheese, butter, etc.)
- kg of milk

5. Definitions

Recycling/Reuse: The act of processing used water/wastewater through another cycle before discharge to final treatment and/or discharge to the environment. In general, there are three types of water recycling/reuse:

- Wastewater recycled back in the same process or higher use of recycled water in the process cycle;
- Wastewater recycled/reused in a different process, but within the same facility; and
- Wastewater reused at another of the company's facilities. (GRI G3.1)

Recycled water-use-to-milk processed ratio: Efficiency of recycled water per unit of milk processed or dairy product output.

6. Documentation

Information can be obtained from water meters, water bills or (if neither water meters nor bills exist) calculations based on a water audit or inventory, or from water retailer.

7. Resources

- N. Stenekes, H.K. Colebatch, T. D. Waite and N.J. Ashbolt, "Risk and governance in water recycling, public acceptance revisited," 2006. Sci. Tech. and Human Values (2006): 31(2) 107-134.

Our Employees

1. Working Conditions

Why Measure Working Conditions?

Labor management is a closely watched sustainability component by external stakeholders to help ensure employee safety and quality of life, as well as an area monitored closely by the processors themselves as employee productivity is essential to profitability and business success. In a recent randomized global survey by GRI on reporting on community impacts, 79% of North American companies report on some topic directly related to working conditions.[30]

Dairy processing and manufacturing operations rely on factory workers to convert raw milk into safe products for human consumption with manufactured products ranging from pasteurized and ultra high temperature (UHT) processing milk to value-added dairy products such as yogurt, butter and cheese. The sustainability of the dairy industry depends upon the availability and retention of quality dairy plant employees.

Scope of the Indicators

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 or Job Transfer is an indicator for processors and manufacturers with 11 or more employees, but it is suggested for smaller processors and manufacturers to complete and communicate in their sustainability reports if they have access to the necessary information.

Employment Opportunities - Primary PM Employees 1

1. Relevance

Dairy processing and manufacturing provides many jobs. In some leading dairy states, jobs in dairy processing can be a leading multiplier and contributor to community development. Processing and manufacturing jobs includes all those involved in the production, packing, and shipment of dairy products within the United State. Understanding the number of jobs created by dairy processing and manufacturing helps to generate a picture of the overall economic impact of dairy processing and manufacturing in terms of the opportunities and support it provides to local employees and communities.

2. Metric

Total number of jobs supplied

3. Calculation and Reporting

3.1 Identify the total number of employees and consultants.

Assess the number of full-time and part-time employees using the table provided. Identify the number of consultants using the table provided. Supply chain workers are not included in this metric.

3.2 Report the total number of employees and consultants hired by type of category if applicable (full-time or part-time).

Report the numbers per category by using the tables included.

Employees Hired	Number
Number of Full-Time Employees	
Number of Part-Time Employees	
Total Number of Employees (include both full-and part-time employees)	

Type of Consultants Hired	Number
Accounting	
Communications	
Engineering	
Food Safety	
Information Technology	
Labeling	
Mechanical/Equipment	
Nutrition	
Regulatory	
Waste Management	
Other Types (Please List)	
Total Number of Consultants	

4. Optional Measurement Considerations

None

5. Definitions

Employee: Any one person of legal working age who receives a salary or wages.

Full-time: The Fair Labor Standards Act (FLSA) does not define full-time employment or part-time employment. This is a matter generally to be determined by the employer. To apply a consistent definition for the purpose of measurement, a full-time

employee is anyone who works 40 hours a week or more.

Part-time: The FLSA does not define full-time employment or part-time employment. This is a matter generally to be determined by the employer. To apply a consistent definition for the purpose of measurement, a part-time employee is anyone who works less than 40 hours a week or more.

Consultant: The FLSA does not define consultant. For the purpose of measurement, a consultant is someone employed externally, either by a firm or self-employed, whose expertise is provided on a temporary basis for a fee.

6. Documentation

Information on employee numbers and salary can typically be obtained from a processing and/or manufacturer's Human Resources department and payroll.

7. Additional Resources

- Economic Research Service. U.S. Department of Agriculture. May 2010. Local Food Systems: Concepts, Impacts and Issues. http://www.ers.usda.gov/Publications/ERR97/ERR97_ReportSummary.pdf
- Land Stewardship Project. 2009. Multiple Benefits of Agriculture and Pasture-Raised Livestock. http://www.landstewardshipproject.org/programs_mba.html

Employee Benefits - Primary PM Employees 2

1. Relevance

Reporting employee benefits provides a measure of the company's investment in human resources and the minimum benefits it offers to its full-time employees. The quality of benefits for full-time staff is a key factor in retaining employees. Employee benefits can be both indirect and non-monetary compensation and include health insurance, retirement plans, housing, processed products, use of company vehicles, employee discounts, to name a few. Employee benefits also helps to maintain employee morale and productivity.[31]

2. Metric

Number of indirect and non-monetary benefits received by employees

3. Calculation and Reporting

3.1. Identify and report benefits offered to all employees.

Assess the number of full-time and part-time employees receiving the benefit.

3.2. Report benefits received by full-time or part-time employees by using the following table.

Report the number of full-time and part-time employees receiving the benefit. Total the number of employees receiving the benefit by adding both full- and part-time employees.

Employee Benefits	**Number of Full-Time Employees Receiving this Benefit**	**Number of Part-Time Employees Receiving this Benefit**	**Total Number of Employees** (include both full-and part-time employees)
Health insurance without employer contribution			
Health insurance with employer contribution			
401k (or comparable retirement plan)			
Housing			
Produced/Processed products (milk/produce)			
Use of company vehicles			
Other – please specify			

4. Other Measurement Considerations

None

5. Definitions

Employee: Anyone person of legal working age who receives a salary or wages.

Full-time: The FLSA does not define full-time employment or part-time employment. This is a matter generally to be determined by the employer. To apply a consistent definition for the purpose of measurement, a full-time employee is anyone who works 40 hours a week or more.

Part-time: The FLSA does not define full-time employment or part-time employment. This is a matter generally to be determined by the employer. To apply a consistent definition for the purpose of measurement, a part-time employee is anyone who works less than 40 hours a week or more.

Indirect compensation: normally have a cash cost to the employer but the employee may not realize or know the cash value. Some indirect compensation is mandated such as social security contributions. Other indirect compensation includes benefits like health insurance, retirement program contributions, moving allowances, auto and travel allowances, professional or association memberships, etc. These items are highly variable.

Non-monetary compensation: Items that reduce an employee's personal cost of living, but are difficult to assign a dollar value. Use of a farm vehicle and tools, continuing education opportunities, products from the processing facility may be examples.

6. Documentation

Potential sources of information include benefit summaries, employee orientation materials and employee contracts.

7. Additional Resources

- U.S. Bureau of Labor Statistics. Employee Benefits Survey http://www.bls.gov/ncs/ebs/

Industry Examples:

- Ben and Jerry's. 2009. Social & Environmental Assessment Report (SEAR): Workplace http://www.benjerry.com/company/sear/2009/sear09_9.0.cfm
- Turkey Hill Dairy. 2012. Benefits http://www.turkeyhill.com/careers/benefits.asp.

Employee Retention - Primary PM Employees 3

1. Relevance

Improving employee retention reduces the amount of time spent in employee training and allows the plant to build a group of experienced employees. On the other hand, high employee turnover can indicate dissatisfaction among employees, or may signal a fundamental change in a plant or company's core operations (e.g. new manager, ownership change). In addition, working to ensure high employee retention is in the company's best economic interest.

2. Metric

Total number of employees who have been employed during the past year and percentage of employees who have been employed for 5, 10, and 20 years

3. Calculation and Reporting

3.1 Measure and report

Assess and report the total number of employees employed during the reporting period (usually the last calendar year), by using the table provided.

Percentages should be calculated using the total employee numbers at the end of the reporting period, usually the last calendar year.

4. Other Measurement Considerations

None

5. Definitions

Turnover: Number of employees who leave the farm voluntarily or due to dismissal, retirement or death.

Retention: Number of employees who continue to be willfully employed.

6. Documentation

Potential sources of information include payroll.

7. Additional Resources

- UC Davis Agriculture and Natural Resources. 2003. Labor Management In Agriculture: Ch 16 Employee Turnover http://ucce.ucdavis.edu/files/repositoryfiles/16-67536.pdf

Total Number and Percentage of Employees Retained		
Years Employed	**Number of Employees by Years Employed**	**Percentage of Employees by Years Employed**
> 20 years		
20 – 10 years		
5 – 10 years		
5 < years		

Employee Engagement in Health and Safety Management - Primary PM Employees 4

1. Relevance

An occupational health and safety committee and/or program with employee representation and leadership can facilitate a positive and proactive health and safety culture. Involving workers in developing, implementing and managing health and safety initiatives can drive improvement of health and safety in the workplace.

2. Metric

Number of opportunities for workers to participate in, and percentage of employees who participated, in developing, implementing and managing health and safety initiatives and the levels in the corporation at which these programs operate

3. Calculation and Reporting

3.1 Identify and report formal health and safety committees and/or programs.

Identify and report the number of committees and/or programs available within the company, which helps to monitor and advise occupational health and safety at the facility level or higher, which have workforce representation and involvement.

3.2 Measure and report employee participation.

Report the percentage of total employees represented or participating on the formal health and safety committee and/or programs.

3.3 Identify and report the level(s) at which the committee(s)/programs operate.

Report the level(s) at which the committee(s)/programs operate (e.g. facility level and/or at multiple facilities, region, group, or company levels). This may be the result of a formal policy, procedure, or informal practice with the company.

4. Other Measurement Considerations

It is encouraged to note whether training is done in employees' native languages.

5. Definitions

None

6. Documentation

Potential sources of information include organizational procedures and minutes of occupational health and safety committee(s).

7. Additional Resources

- International Dairy Foods Association (IDFA). Worker Safety. http://www.idfa.org/resource-center/plant-operations/worker-safety/
- International Finance Corporation. 2007. Environmental, Health, and Safety Guidelines for Dairy Processing. http://www1.ifc.org/wps/wcm/connect/534a1a8048855373af34ff6a6515bb18/Final%2B-%2BDairy%2BProcessing.pdf?MOD=AJPERES
- Western Center for Agricultural Health and Safety University of California, Davis. 2010. Dairy Safety Training Guide. http://agcenter.ucdavis.edu/AgDoc/DairyGuide/dairy_guide_eng.pdf

Days of Restricted Work Activity or Job Transfer - Primary PM Employees 5

1. Relevance

Occupational health and safety hazards for dairy processing facilities are similar to those of other industrial facilities with the possibility of physical hazards, biological hazards, chemical hazards and exposure to heat, cold and radiation being specifically associated with dairy processing operations.[32]

2. Metric

Days of restricted work activity or job transfer (DART) rate

3. Calculation and Reporting

3.1 Calculate and Report DART Rate

Use Occupational Safety and Health Administration (OSHA) Form 300, included in OSHA Forms for Recording Work-Related Injuries and Illnesses (see 7. Additional Resources) to calculate the DART rate. Companies with eleven or more employees will have already completed this form and will just need to complete the following calculations:

(Number of entries in Column H + Column I) x 200,000 ÷ Number of hours worked by all employees = DART incidence rate

4. Other Measurement Considerations

If a plant is not required to report a DART rate, consider completing the worksheet in Form 300.

5. Definitions

None

6. Documentation

OSHA Forms for Recording Work-Related Injuries and Illnesses.

Employee records, employee contracts, attendance records, and accident records will provide relevant data for this indicator.

7. Additional Resources

- OSHA. 2012. Form 300A Forms for Recording Work-Related Injuries and Illnesses http://www.osha.gov/recordkeeping/new-osha300form1-1-04.pdf
- International Finance Corporation. World Bank Group. April 2007. Environmental, Health, and Safety Guidelines Dairy Processing. Accessed at http://www1.ifc.org/wps/wcm/connect/534a1a8048855373af34ff6a6515bb18/Final%2B-%2BDairy%2BProcessing.pdf?MOD=AJPERES
- Bureau of Labor Statistics. 2012. Injuries, Illnesses & Fatalities http://www.bls.gov/iif/oshsum.htm
- American Conference of Governmental Industrial Hygienists. 2012. Defining the Science of Occupational and Environmental Health. www.acgih.org

Our Communities

2. Community Contributions

Why Measure Community Contribution Impacts?

Dairy processors and manufacturers contribute to their 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:

- Community engagement by employers and employees to service organizations, churches and schools
- Charitable contributions
- General contributions and capacity building to support the overall vitality of many rural communities

Additionally, employees of dairy processors and manufacturers often play crucial leadership roles in their communities, serving in local government, fire departments and school boards, and participating in community and youth programs. Dairy processors and manufacturers often provide scholarships for college students, grant funding to local community projects and get involved in community volunteering and charitable efforts. It is important that processors and manufacturers have a way to measure and communicate the impacts they have on their community.

Scope of the Indicators

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

Educational Opportunities is a secondary indicator that processors and manufacturers are encouraged to complete and communicate in their sustainability reports if they have access to the necessary information.

Community Volunteering/Capacity Building - Primary PM Community 1

1. Relevance

Dairy processors and manufacturers can have significant impacts on their local communities. Through volunteer efforts, dairy processors and manufacturers become engaged in community and national projects and create a positive view of their company. Volunteer efforts can include company-wide projects, as well as individual employee efforts on behalf of the company. Through volunteering, dairy processors and manufacturers create a positive relationship with their local surroundings while promoting public service.

2. Metric

Volunteer activities performed by all paid employees

3. Calculation and Reporting

3.1 Describe volunteer activities

Provide a narrative description of volunteer activities for all employees (including manager/owner) who are paid to participate during the past year.

4. Other Measurement Considerations

Report the total number of hours volunteered by all employees (including manager/owner) who are paid to participate in volunteer activities for the reporting year. The table provides a template for this optional reporting.

5. Definitions

Volunteering: Donation of time or services to an outside organization without expectation of pay in furtherance of humanitarian objectives.[33]

6. Documentation

Log of volunteered hours.

Optional Measurement Considerations	
Type of Service	**Hours Volunteered**
Civic Organizations	
Emergency Services (e.g., ambulance, fire department)	
Industry Organizations	
Local Government	
Non-Profit	
Religious	
School	
Youth Group	
Other	
Total Hours Volunteered	

7. Additional Resources

- DOL. 2012. FLSA Advisor: Volunteers http://www.dol.gov/elaws/esa/flsa/docs/volunteers.asp

  Industry Examples:

  - Ben and Jerry's. 2009. Giving Back & Community. http://www.benjerry.com/company/sear/2009/sear09_10.0.cfm
  - Oakhurst Dairy. 2012. Our Community. http://www.oakhurstdairy.com/community/efforts.php
  - Tillamook. 2012. Our Story. http://www.tillamook.com/ourstory/index.html

Monetary and Product Donations - Primary PM Community 2

1. Relevance

Dairy processors and manufacturers often support communities through monetary and product donations. Monetary donations can include sports and event sponsorships, scholarships and awards, non-profit donations, etc. Monetary efforts help to support local efforts and generate a strong relationship between dairy processors and manufacturers and their communities. Company product donations are also a large component of supporting philanthropic efforts. Product donations can include donations of cheese, yogurt, ice cream, butter, and other finished products to fundraising events, soup kitchens, and other local and national causes. By donating products dairy processors and manufacturers support community efforts while promoting dairy products and the industry as a whole, all while strengthening community ties to the company.

2. Metric

Monetary and product donation activities

3. Calculation and Reporting

3.1 Describe monetary donation activities.

Provide a narrative description of monetary donation activities for the past year.

3.2 Describe product donation activities.

Provide a narrative description of product donation activities for the past year.

4. Optional Measurement Considerations

Report the total monetary and product donation dollar value for all donation activities during the past reporting year. Detailing these numbers as a total figure or broken out by donation recipient is the respondent's discretion. A sample table is included.

Optional Measurement Consideration			
Organization, Event, Sponsorship	**Monetary or Type of Product**	**Amount Donated/ Product Donated**	**Market Value of Product (Optional)**
Total Amount Donated		**Total Value of Products Donated**	

5. Definitions

Monetary Contributions: Financial contributions to outside organizations. Examples of monetary donations include sports and event sponsorships, scholarships and awards, and nonprofit donations.

Product Contributions: Donation of consumer-ready product to outside organizations without expectation of remuneration. Examples include donations of cheese, yogurt, ice cream, butter, and other finished products to fundraising events, soup kitchens, and other local and national causes.

6. Documentation

Information on monetary donations can be found in financial records, product donations can be found in product inventories.

7. Additional Resources

Industry Examples:

- Ben and Jerry's. 2009. Giving Back & Community. http://www.benjerry.com/company/sear/2009/sear09_10.0.cfm
- Oakhurst Dairy. 2012. Our Community. http://www.oakhurstdairy.com/community/efforts.php

- Tillamook. 2012. Our Story. http://www.tillamook.com/ourstory/index.html
- NMPF. 2012. Scholarships. http://www.nmpf.org/about-nmpf/nmpf-national-dairy-leadership-scholarship-program

Educational Opportunities - Secondary PM Community 3

1. Relevance

In order to contribute to their communities and enhance agricultural education, dairy processors and manufacturers may engage in educational opportunities at, or beyond the plant, factory, or facility. Educational opportunities may include factory tours, demonstrations, self-guided tours, and informational events. Educational efforts help the local community and outside visitors feel more engaged in and informed about a processor or manufacturer's operations and the dairy industry as a whole.[34] Additionally, educational programming provides field trip opportunities for local schools and programs. Measuring education programming helps to demonstrate a processor or manufacturer's efforts in community outreach and education.

Plants that engage in educational activities can choose to report this secondary indicator. However, not all plants are designed for educational tours (e.g., operating in remote areas, safety concerns) or for other reasons are not engaged in educational activities.

2. Metric

Educational events per year and the total number of participants

3. Calculation and Reporting

3.1 Report the total number of educational events and or hosted or sponsored by the plant during the past reporting period.
Report and describe educational events held on- or off-site and the number of times the event occurred in the past year in the table below.

3.2 Report the total number of participants during the past reporting period.
Calculate and report the total number of people who participated in educational events held on- or off-site.

4. Other Measurement Considerations

None

5. Definitions

Volunteering: Donation of time or services to an outside organization without expectation of pay in furtherance of humanitarian objectives.[35]

6. Documentation

Educational events may be recorded on a calendar of events or in communications with organizations such as schools and community organizations.

Educational Opportunity (includes tours, demonstrations, self-guided tours, and informational events)	**Number of Participants**	**Number of Times Held (if applicable)**
Totals:		

7. Additional Resources

Industry Examples

- Ben and Jerry's. 2012. Waterbury Factory. http://www.benjerry.com/scoop-shops/factory-tours/
- Tillamook. 2012. Cheese Factory. http://www.tillamook.com/cheesefactory/index.html
- DOL. 2012. FLSA Advisor: Volunteers http://www.dol.gov/elaws/esa/flsa/docs/volunteers.asp/

REFERENCE

Glossary

Indicator
An indicator is qualitative or quantitative information about results or outcomes associated with the farm or company that is comparable and demonstrates change over time. It is a communication about performance of a farm or dairy company related to a particular sustainability topic, characteristic, or condition that enables people to make decisions or value judgments about this performance.

Metric
A metric is data or information that indicate or reflect the condition of an indicator. It gives the definition on how to measure and respond to the indicator. It supports producers or processors to measure the sustainability outcome.

Primary Indicator
Primary indicators are those indicators identified in the Guide to be of interest to most stakeholders and assumed to be relevant unless deemed otherwise on the basis of the GRI Reporting Guidelines (to be used by dairy companies) or as indicated by the tools for producers.

Secondary Indicator
Secondary indicators are those indicators identified in Sustainability Measurement and Reporting Guide that represent emerging practices, or address topics that may be relevant to some farms or dairy companies but not generally for a majority. Or, these indicators can be used to communicate best practices and stories to support the primary indicators.

Supply Chain
The supply chain is the network that produces, handles, and distributes a product. The dairy supply chain can be broadly divided into 8 stages: feed production, milk production, delivery to processor, processing, packaging, distribution, retail, consumption and disposal.

Sustainability
Sustainability means providing consumers with the nutritious dairy products they want, in a way that makes the industry, people, and the earth economically, environmentally, and socially better – now and for future generations.

Sustainability Report
Sustainability reporting is the practice of measuring, disclosing, and being accountable for organizational performance while working towards the goal of sustainable development. A sustainability report provides a balanced and reasonable representation of the sustainability performance of the reporting organization, including both positive and negative contributions. (GRI G3.1)

Appendices

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Appendix 2. IPCC Global Warming Potential Values

The Intergovernmental Panel on Climate Change (IPCC) provides the generally accepted values for GWP.

Industrial Designation or Common Name (years)	Chemical Formula	Lifetime (years)	Radiative Efficiency (W m–2 ppb–1)	Global Warming Potential for Given Time Horizon	
				Secondary Assessment Report 100-yr	100-yr
Carbon dioxide	CO_2	See below[a]	[b]1.4x10–5	1	1
Methane[c]	CH_4	*12*[c]	3.7x10–4	21	25
Nitrous oxide	N_2O	114	3.03x10–3	310	298
Substances controlled by the Montreal Protocol					
CFC-11	CCl_3F	45	0.25	3,800	4,750
CFC-12	CCl_2F_2	100	0.32	8,100	10,900
CFC-13	$CClF_3$	640	0.25		14,400
CFC-113	CCl_2FCClF_2	85	0.3	4,800	6,130
CFC-114	$CClF_2CClF_2$	300	0.31		10,000
CFC-115	$CClF_2CF_3$	1,700	0.18		7,370
Halon-1301	$CBrF_3$	65	0.32	5,400	7,140
Halon-1211	$CBrClF_2$	16	0.3		1,890
Halon-2402	$CBrF_2CBrF_2$	20	0.33		1,640
Carbon tetrachloride	CCl_4	26	0.13	1,400	1,400
Methyl bromide	CH_3Br	0.7	0.01		5
Methyl chloroform	CH_3CCl_3	5	0.06		146
HCFC-22	$CHClF_2$	12	0.2	1,500	1,810
HCFC-123	$CHCl_2CF_3$	1.3	0.14	90	77
HCFC-124	$CHClFCF_3$	5.8	0.22	470	609
HCFC-141b	CH_3CCl_2F	9.3	0.14		725
HCFC-142b	CH_3CClF_2	17.9	0.2	1,800	2,310
HCFC-225ca	$CHCl_2CF_2CF_3$	1.9	0.2		122
HCFC-225cb	$CHClFCF_2CCl$	5.8	0.32		595

Industrial Designation or Common Name (years)	Chemical Formula	Lifetime (years)	Radiative Efficiency (W m–2 ppb–1)	Global Warming Potential for Given Time Horizon	
				Secondary Assessment Report 100-yr	100-yr
	F_2				
Hydrofluorocarbons					
HFC-23	CHF_3	270	0.19	11,700	14,800
HFC-32	CH_2F_2	4.9	0.11	650	675
HFC-125	CHF_2CF_3	29	0.23	2,800	3,500
HFC-134a	CH_2FCF_3	14	0.16	1,300	1,430
HFC-143a	CH_3CF_3	52	0.13	3,800	4,470
HFC-152a	CH_3CHF_2	1.4	0.09	140	124
HFC-227ea	CF_3CHFCF_3	34.2	0.26	2,900	3,220
HFC-236fa	$CF_3CH_2CF_3$	240	0.28	6,300	9,810
HFC-245fa	$CHF_2CH_2CF_3$	7.6	0.28		1030
HFC-365mfc	$CH_3CF_2CH_2CF_3$	8.6	0.21		794
HFC-43-10mee	$CF_3CHFCHFCF_2CF_3$	15.9	0.4	1,300	1,640
Perfluorinated compounds					
Sulphur hexafluoride	SF_6	3,200	0.52	23,900	22,800
Nitrogen trifluoride	NF_3	740	0.21		17,200
PFC-14	CF_4	50,000	0.10	6,500	7,390
PFC-116	C_2F_6	10,000	0.26	9,200	12,200
PFC-218		2,600	0.26	7,000	8,830

Industrial Designation or Common Name (years)	Chemical Formula	Lifetime (years)	Radiative Efficiency (W m–2 ppb–1)	Global Warming Potential for Given Time Horizon	
				Secondary Assessment Report 100-yr	100-yr
PFC-318		3,200	0.32	8,700	10,300
PFC-3-1-10		2,600	0.33	7,000	8,860
PFC-4-1-12		4,100	0.41		9,160
PFC-5-1-14		3,200	0.49	7,400	9,300
PFC-9-1-18		>1,000d	0.56		>7,500
trifluoromethyl sulphur pentafluoride		800	0.57		17,700
Fluorinated ethers					
HFE-125		136	0.44	13,800	14,900
HFE-134		26	0.45	12,200	6,320
HFE-143a		4.3	0.27	2,630	756
HCFE-235da2		2.6	0.38	1,230	350
HFE-245cb2		5.1	0.32	2,440	708
HFE-245fa2		4.9	0.31	2,280	659
HFE-254cb2		2.6	0.28	1,260	359
HFE-347mcc3		5.2	0.34	1,980	575
HFE-347pcf2		7.1	0.25	1,900	580
HFE-356pcc3		0.33	0.93	386	110
HFE-449sl (HFE-7100)		3.8	0.31	1,040	297
HFE-569sf2 (HFE-7200)		0.77	0.3	207	59
HFE-43-10pccc124 (H-Galden 1040x)		6.3	1.37	6,320	1,870
HFE-236ca12 (HG-		12.1	0.66	8,000	2,800

Industrial Designation or Common Name (years)	Chemical Formula	Lifetime (years)	Radiative Efficiency (W m–2 ppb–1)	Global Warming Potential for Given Time Horizon	
				Secondary Assessment Report 100-yr	100-yr
10)					
HFE-338pcc13 (HG-01)		6.2	0.87	5,100	1,500
Perfluoropolyethers					
PFPMIE		800	0.65	7,620	10,300
Hydrocarbons and other compounds – Direct Effects					
Dimethylether		0.015	0.02		1
Methylene chloride		0.38	0.03		8.7
Methyl chloride		1.0	0.01		13

Source with Endnotes: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

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