INNOVATION CENTER FOR U.S. DAIRY
HEALTHY PEOPLE • HEALTHY PRODUCTS • HEALTHY PLANET

U.S. Dairy Sustainability Report

2023–2024

PROGRESS UPDATE TO 2050 GOALS

Contents

About This Report

The 2023–2024 U.S. Dairy Sustainability Report is the tenth progress report published by the Innovation Center for U.S. Dairy® (Innovation Center). The reporting period covers calendar years 2023 and 2024, except where clearly noted. The principles in the Global Reporting Initiative's Universal Standards informed report development. Future reporting is expected to continue to occur biennially.

This report is available at usdairy.com/about-us/innovation-center. We welcome your feedback on this report and the U.S. dairy industry's sustainability efforts. Please contact us at InnovationCenter@USDairy.com.

Founded by Dairy Management Inc. (DMI), the Innovation Center for U.S. Dairy is an organization that works with leaders from across the dairy value chain to align on precompetitive priorities, drive progress and speak with one voice. DMI and its related organizations work to increase sales and demand for dairy through research, education and innovation, and to maintain confidence in dairy foods, farms and businesses. DMI manages the dairy checkoff which was created by American dairy farmers and is funded by the nation's dairy farm families and those that import dairy into the U.S. DMI, the Innovation Center for U.S. Dairy and its related organizations cannot and do not seek to influence governmental policy or action.

Welcome

Behind every glass of milk, slice of cheese or scoop of dairy protein is a network of people committed to something bigger: nourishing people today while safeguarding the shared resources that will sustain tomorrow. That dual responsibility, to feed communities while caring for the land, animals and natural resources that make it all possible, is the lifeblood of U.S. dairy. And today, it carries new urgency in a world where over 700 million people face undernourishment, and where safe, sustainable and affordable food has never been more critical.

At the heart of it all is a simple truth—the strength of our sustainability journey comes from proving our values through action, not just words. Dairy's progress is built on credible results and the practical know-how that comes from decades of doing the work, and by the humility to continually improve and aim higher. In part, that momentum is fueled by the power of precompetitive collaboration through the Innovation Center for U.S. Dairy. The challenges and opportunities we face demand every voice, every skill and every commitment working together for solutions that lift the entire category. Because when we unite behind a common purpose, we raise the bar for what's possible.

This shared vision is reflected throughout our Sustainability Report, which chronicles two years of progress across the U.S. dairy community. It is both a record of action and a measure of accountability, showing where we stand, where we are headed, and the results that matter to our customers, communities and stakeholders.

Among the proof points in this report, a few stand out as milestone achievements that reflect our collective commitment to action. We invested in nutrition leadership—from building a research roadmap and amplifying dairy's role in health and well-being to supporting food security through partnerships that delivered 1.5 billion dairy servings to families in need. We advanced the science that guides our progress, developing a peer-reviewed life cycle assessment that offers the most complete picture yet of U.S. dairy's greenhouse gas footprint and baseline for future measurement. We also refined our focus with an updated, third-party verified national materiality assessment, applying a double materiality lens to better understand both our impact and the risks and opportunities ahead. And for the first time, we are issuing industry-level reporting against our 2050 Environmental Stewardship Goals, delivering on the promise we made five years ago to measure and share our results transparently.

The progress in these pages is grounded in data, shared vision, and the daily efforts of people who bring dairy to life. These achievements build on many decades of improvement in efficiency, productivity and sustainability—progress that is part of dairy's DNA and underpinned by the U.S. Dairy Stewardship Commitment, our unifying framework for advancing and demonstrating impact as an industry. It's why our expectations are high, why our practices lead the world, and why we continue to push the boundaries of what's possible. We have shown that nutritional impact, environmental gains and economic viability can—and must—advance together.

Tomorrow's food system will demand more nutrition, more responsibility and more resilience, with reliable access to the essentials that sustain growth at its foundation. Rising to that challenge means continuing to pursue environmental stewardship not as an end in itself, but because protecting our resources is what allows us to nourish people—a need that must remain at the center of our work.

Every decision reflected in this report began with the same question: *Will this help us nourish people and protect what makes that possible?* We will keep asking it—because the answers shape not only our future, but the future of those who count on us most.

Barbara S. O'Brien

Barbara O'Brien
President and CEO, Innovation Center for U.S. Dairy
President and CEO, Dairy Management Inc.

Dennis Rodenbaugh
Chair, Innovation Center for U.S. Dairy
Board of Directors
President and CEO, Dairy Farmers of America, Inc.

Executive Summary

The 2023–2024 U.S. Dairy Sustainability Report documents industry progress across priority areas during a two-year period, demonstrating an ongoing commitment to sustainably nourishing people, planet and communities. Information reported reflects progress in 2023–2024, unless otherwise noted. This report also includes the first update on the industry 2050 Environmental Stewardship Goals, reflecting historical trends and progress from 2020 to 2025.

Advance Well-Being

Delivering dairy nutrition that meets emerging and personalized health needs

13
essential nutrients in milk support key areas of health and wellness

>9,000
experts engaged through the Dairy Nourishes Network

>850 million
pounds of dairy distributed through the Feeding America network

↓ 57%
fewer added sugar levels in flavored milk sold in schools since 2006

GO TO CHAPTER

Regenerate the Environment

Optimizing dairy solutions that enhance natural resources and ecosystems

↓ 2.5%
GHG emissions intensity decrease (cradle to processing gate) from 2020 to 2025, while absolute emissions increased 2.1% and milk production increased 4.7%

↓ 2.2%
absolute GHG emissions decrease (processing) from 2020 to 2025

↓ 14.7%
GHG emission intensity decrease (cradle to farm gate) from 2007 to 2025, with 1.4% decrease from 2020 to 2025

94%
average waste diversion rate among Stewardship Commitment adopters

GO TO CHAPTER

Care for Our Animals and Communities

Ensuring healthy animals, a vibrant workforce and safe, high-quality dairy foods

99%
U.S. milk production in FARM Animal Care

↑ 62%
improvement reported in workforce safety among Stewardship Commitment adopters from 2021 to 2024

>550
food safety professionals in processing trained

~$780 billion
contributed to U.S. economy and over 3 million American jobs

GO TO CHAPTER

About U.S. Dairy

An Industry Snapshot

U.S. dairy has long played a significant role in our nation's food system, communities and economy. Today, that role continues to grow, as the industry advances environmental stewardship, supports local livelihoods and contributes to responsible growth globally.

>96%
of U.S. households consume dairy foods[1]

~$780 billion
in overall economic contributions[2]

Dairy foods provide
~52% of the calcium,
~51% of the vitamin D and
~17% of the protein
consumed by Americans[3]

Dairy farms are at the heart of the dairy industry, working to produce raw milk across all 50 states

>9 million
milk cows in the U.S., producing on average ~24,000 pounds of milk per cow annually[4]

>225 billion
pounds of milk produced across ~24,000 dairy farms[5]

Dairy cooperatives unite farmers and collect, process and market milk on their behalf

87%
of the market share for U.S. milk and milk products is accounted by dairy co-ops[6]

>$63 billion
value of milk and milk products sold through U.S. dairy co-ops (2022)[6]

Dairy processors and manufacturers transform raw milk into a wide range of dairy products

~175,000
employed in key dairy segments, among >1 million direct jobs within the U.S. dairy industry[2]

$8.2 billion
in dairy products exported to 145 countries in 2024[2]

1 Your Dairy Checkoff. (2024, October 2). How many households are buying dairy? https://www.dairycheckoff.com/news/checkoff-news/how-many-households-are-buying-dairy
2 International Dairy Foods Association. (n.d.). Dairy Delivers. International Dairy Foods Association. https://www.idfa.org/dairydelivers#map
3 U.S. Dairy. (n.d.). Dairy nutrition. https://www.usdairy.com/dairy-nutrition
4 United States Department of Agriculture, National Agricultural Statistics Service. (2025, January 24). Milk production (Report No. MKPR 01-24). https://downloads.usda.library.cornell.edu/usda-esmis/files/h989r321c/ww72d629z/cz30rp422/mkpr0125.pdf
5 United States Department of Agriculture, Economic Research Service. (2025, January 8). Dairy – Background. https://www.ers.usda.gov/topics/animal-products/dairy/background
6 Whitt, C. (2024, November 26). Overview of dairy cooperatives (CRS Report No. R48285). Congressional Research Service. https://www.congress.gov/crs-product/R48285

About the Innovation Center for U.S. Dairy

The Innovation Center for U.S. Dairy ("Innovation Center") is a voluntary organization that works precompetitively with and through the dairy value chain to foster collaboration and progress to build a healthy and sustainable future for the dairy community, the people it serves and the planet we all share.

Established in 2008 through the leadership and ongoing support of dairy farmers, the Innovation Center unites farmers, cooperatives, processors and buyers to address precompetitive priorities that strengthen and build trust in the U.S. dairy sector. While farmers continue to fund the mission at the heart of the Innovation Center, dairy companies also contribute by funding specific programs and initiatives that advance shared industry goals.

Rooted in farmer leadership and guided by the voices and perspectives of industry leaders, the Innovation Center builds alignment, sets shared priorities and accelerates best practices on topics most important for a thriving U.S. dairy community, from modern wellness and environmental stewardship to food safety and animal care. It is also a springboard for participants to implement meaningful improvements within their own operations while helping dairy remain essential, trusted and sustainable for generations to come.

Through expert-led committees and task forces, the Innovation Center draws on research and data, and develops tools and resources to support long-term business viability and trust. Its Board of Directors includes CEOs and executives of leading dairy cooperatives, processors and national dairy organizations, and as of October 2025, represented 27 organizations supplying more than 66% of U.S. milk production.

Dairy Sustainability Alliance®

The Innovation Center's Dairy Sustainability Alliance® is a multi-stakeholder group consisting of companies and organizations across the dairy community as well as stakeholders who want to contribute to dairy's social responsibility journey. Through two in-person meetings each year, in addition to webinars and newsletters, Dairy Sustainability Alliance members share knowledge and collaborate on challenges and opportunities to accelerate progress toward common sustainability goals, while contributing to the long-term viability of the U.S. dairy industry.

The Dairy Sustainability Alliance is a key vehicle for convening the broader U.S. dairy value chain and is often the entry point for companies and organizations interested in engaging with Innovation Center initiatives. Dairy Sustainability Alliance membership is free and open to companies and organizations that are committed to U.S. dairy's sustainability leadership.

>200
member companies of the Dairy Sustainability Alliance with ~40 dairy farmer representatives

>950
total stakeholders reached through the Dairy Sustainability Alliance

Sustainable Agriculture Summit

The annual Sustainable Agriculture Summit is the premier sustainability event created for and by agriculture. Co-hosted by the Innovation Center and Field to Market: The Alliance for Sustainable Agriculture, in partnership with other national agriculture organizations, the event convenes the collective food and agriculture value chain to learn, develop and advance a shared vision for a sustainable and resilient U.S. food system. In 2024, the Summit celebrated its 10th anniversary and hosted a record number of more than 970 attendees.

U.S. Dairy Stewardship Commitment

The U.S. Dairy Stewardship Commitment was developed by the Innovation Center to recognize and empower the U.S. dairy community to advance and demonstrate sustainability progress through aligned action and reporting as an industry. Adopting companies agree to meet defined standards and report on performance across priority areas including animal care, environmental stewardship, food safety and more. Adopted by companies representing the majority of U.S. milk production, the Stewardship Commitment signals to customers, investors and other stakeholders that participating dairy businesses are unified under a standard of continuous improvement, credible reporting and shared accountability.

The Stewardship Commitment not only helps adopters measure and communicate their impact, it also provides a platform for acting together as an industry to accelerate meaningful change, providing confidence that U.S. dairy is nourishing people responsibly and sustainably. By enabling consistent, aggregated reporting across the value chain, the Stewardship Commitment helps demonstrate U.S. dairy's collective progress, strengthening trust in the category while reinforcing the leadership of the companies contributing to it.

U.S. Dairy STEWARDSHIP COMMITMENT® Innovation Center for U.S. Dairy

Throughout this report and in the Appendix, data reported by U.S. Dairy Stewardship Commitment adopters is featured. Performance data for the 2023 and 2024 calendar years reflects the collective results of 35 organizations, representing approximately 76% of U.S. milk production. These organizations are referred to as "reporting adopters."

2023–2024 AGGREGATED DATA REPORTED BY REPORTING ADOPTERS ▸

For a consistent view of progress over time, we also highlight results from a cohort of 29 organizations that reported in 2021, 2022, 2023 and 2024. This group is referred to as "legacy adopters" and represents nearly 74% of U.S. milk production.

2021–2024 PERFORMANCE DATA REPORTED BY LEGACY ADOPTERS ▸

Stewardship Commitment Adopters

Over 77%
of U.S. milk production is represented by Stewardship Commitment adopters

101 · ACTUS NUTRITION · Agri-Mark Family Dairy Farms · AGROPUR · ampi · bel for all for good · Bongards Creameries · Cayuga · California Dairies inc. · DFA Dairy Farmers of America · Darigold · First District Association · Foremost Farms USA · FranklinFoods · Glanbia · Grande · Great Lakes Cheese · Great Lakes Milk Products · Hilmar · Hood · Idaho Milk Products · Kroger · Land O'Lakes Inc. · Leprino · Lone Star Milk Producers · Maola · MMPA · Northwest Dairy Association Darigold · Organic Family Farms Co-op · Prairie Farms · Proliant Dairy Ingredients · Schreiber · Select Milk Producers, Inc. · Shehadey Family Foods, LLC · Southeast Milk Inc. · Tillamook · USDA Since 1960 · UNC Dairy · Valley Queen We Make Dairy · Wapsie Valley Creamery Since 1906

U.S. Dairy Materiality Assessment

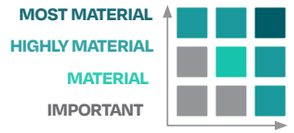
To identify and guide sustainability priorities in the U.S. dairy industry, the Innovation Center conducted the first national materiality assessment in 2018, which reflected the sustainability topics that mattered most from field-to-processor gate. Building from the second materiality assessment conducted in 2021, the 2025 U.S. Dairy Materiality Assessment adopted the approach of double materiality—incorporating materiality guidance from sustainability standards—and received third-party verification for the first time. The double materiality approach expanded the assessment to consider U.S. dairy's impact as well as the financial risks and opportunities.

As with the previous materiality assessments, stakeholders and experts within and outside the U.S. dairy value chain were engaged to strengthen the assessment of U.S. dairy's impacts, risks and opportunities. The results, research and insights continue to inform strategy and guide industry efforts, including those driven by the Innovation Center. The national assessment also shaped new resources such as a Materiality Assessment Guide and supplemental resources to support U.S. dairy companies when conducting their own assessments. The new suite of resources were informed by a pilot exercise with Idaho Milk Products and designed to support a clear, adaptable and verifiable process.

This assessment reinforced topics that U.S. dairy has prioritized for decades, while deepening an understanding of other topics and their associated impacts, risks and opportunities. The incorporation of the financial risk and opportunity assessment underscored the critical connection between sustainability and long-term economic viability of farmers and the industry.

MATRIX KEY

Topics are listed in alphabetical order within the grids associated with their prioritization tier.



For more information, please access the 2025 U.S. Dairy Materiality Assessment Report here.

Advance Well-Being

U.S. dairy has an established track record of unlocking transformative good for both people and planet. Through the industry's ability to deliver nutrition and meet personal health needs, and its capability to enhance food and nutrition security, U.S. dairy is uniquely positioned to advance well-being for individuals and communities at large.

Overview

Dairy delivers many essential nutrients to our bodies. The variety of nutrient-rich dairy foods available offers something for almost everyone's wellness and taste needs throughout their lives. Research supports eating dairy as part of an overall healthy diet to help reduce the risk of chronic diseases, maintain a healthy gut and immune function and help sustain energy. Emerging evidence points to dairy's capabilities in inflammation reduction, digestive health, cognition improvement and calming of the nervous system.[1]

Beyond dairy's nutritional value, dairy is a cost-effective and efficient source of nourishment, making it a vital component in advancing community well-being and resilience. Enabling reliable and consistent access to dairy—particularly for youth and underserved markets—is an effective investment in both current and long-term public health. At a time when affordable and sustainable nutrition to benefit public and planetary health has never been more important to our world, dairy foods contribute to the solution to address nutrition security, health disparities and well-being.

That's why the dairy community is collaborating to deliver daily nutrition that meets emerging and personalized health needs across life stages, to clearly communicate dairy's benefits to health and wellness professionals and consumers alike, and to ensure everyone in our communities can access and enjoy these benefits. By supporting individual health, dairy plays a crucial role in building resilient communities where everyone can thrive.

INDUSTRY COLLABORATION

In June 2023, the Innovation Center board of directors formed the Health and Well-Being Committee to advance an industry-wide vision and strategy that strengthens U.S. dairy's role in advancing well-being for all. This committee is comprised of cooperatives, brands and processors, industry associations, and farmers, and is supported by staff representatives from Dairy Management Inc. (DMI), the Innovation Center and the NDC.

A key part of this committee's work is focusing on industry action with scientific, research-backed communications and related tools to support consumer health goals and interests, including the emerging view of "food as medicine." The committee also identifies trusted third parties to support the development and dissemination of science-supported information and resources.

With more than 100 years of experience and a staff of registered dietitian nutritionists, nutrition scientists and communication experts, the National Dairy Council (NDC) is a leading non-profit focused on dairy nutrition research and education organization. Founded and funded by dairy farmers and importers, NDC has been, and will continue to be, committed to providing science-based education about the nutrition and health benefits that dairy foods provide, while bringing to life the dairy community's shared vision of a healthy, sustainable world.

1 Innovation Center for U.S. Dairy. U.S. Dairy Health and Wellness Playbook. [Unpublished internal document].

Health and Nutrition

Dairy's Nutritional Benefits

Dairy provides a key pathway to better health outcomes, from meeting the growth and development needs of young children to playing a role in helping reduce the risk of chronic disease. Dairy foods are nutrient-rich and provide a unique nutrient package that is difficult to replace with other foods. Milk is a good or excellent source of 13 essential nutrients, including high quality protein, calcium, phosphorus, potassium, zinc, selenium, iodine, and vitamins A, D, B2, B3, B5 and B12.[2] Importantly, consuming dairy as part of a healthy diet can help reduce the risk of chronic diseases. Studies indicate that eating dairy foods is associated with a lower risk for type 2 diabetes and cardiovascular disease, reduced blood pressure, neutral to lower levels of inflammation, and improved bone health.[3]

These benefits help explain dairy's transformative capabilities: dairy is a nutrient-dense food playing an important role in overall health and well-being, addressing individual consumer physical, mental and emotional needs.

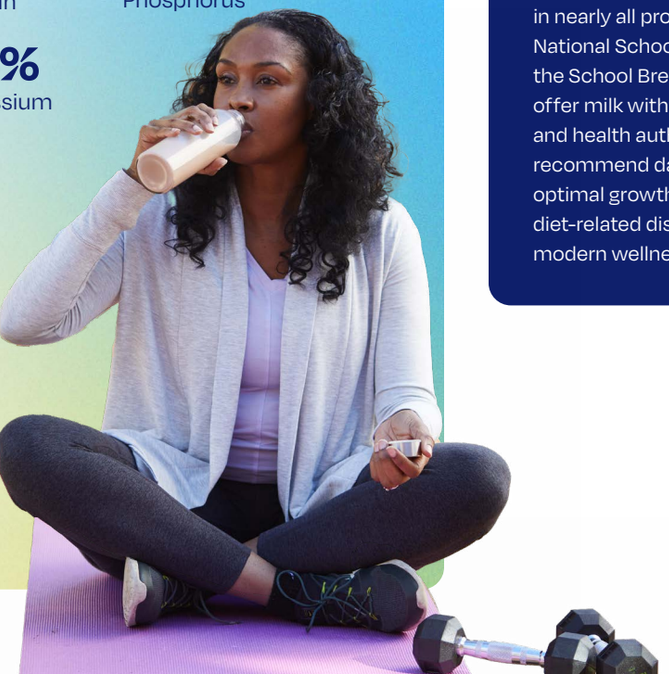
HEALTHY EATING

The 2020–2025 Dietary Guidelines for Americans (DGA) highlights the significant role that dairy plays in healthy eating patterns throughout life,[4] providing myriad benefits[5] associated with:

- BONE HEALTH
- GUT HEALTH
- LOWER RISK FOR CHRONIC DISEASE LINKED WITH INFLAMMATION
- IMMUNE SYSTEM FUNCTION
- DECREASED RISK OF TYPE 2 DIABETES
- LOWER RISK FOR CARDIOVASCULAR DISEASE

IN THE AVERAGE AMERICAN DIET, MILK, CHEESE AND YOGURT COMBINED SUPPLY:[6]

52% Calcium	**51%** Vitamin D
29% Vitamin A	**28%** Vitamin B2
17% Protein	**27%** Phosphorus
14% Potassium	



U.S. Health Authorities Recognize U.S. Dairy's Health Benefits

The benefits of dairy are recognized by the federal government and by healthcare professionals. The 2020–2025 DGA, produced by the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services, recommends three servings of dairy every day for adults and older children and adolescents. Additionally, USDA's Food and Nutrition Services, which operates food assistance programs nationally, includes dairy as a required or optional component in nearly all programs. For example, the National School Lunch Program (NSLP) and the School Breakfast Program (SBP) must offer milk with each meal.[7] Leading medical and health authorities recognize and recommend dairy for its important role in optimal growth and development, reducing diet-related diseases and for meeting the modern wellness interests of consumers.

2 U.S. Department of Agriculture FoodData Central. https://fdc.nal.usda.gov/. Mean values calculated from database entries across all fat levels of plain vitamin D-fortified fluid milk in Legacy, Foundation, and Survey (FNDDS) FDC ID: 746782, 781084, 171265, 171267, 781089, 746778, 170872, 781092, 746772, 171269, 781093, 746776, 2020.
3 Executive Summary, State of Food Security and Dairy, October 2024.
4 U.S. Department of Agriculture, U.S. Department of Health and Human Services. "Dietary Guidelines for Americans."
5 State of the Science Dairy Foods and Health. https://www.dietaryguidelines.gov U.S. Dairy.
6 Based on the average American diet. [Source: National Dairy Council. "National Dairy Council Quick-Reference Guide." https://www.usdairy.com/getmedia/7f24626b-c08b-459a-b964-7a8478c88cd0/NDC-Quick-Reference-Guide-2022.pdf?ext=.pdf U.S. Dairy.]
7 U.S. Department of Agriculture, Food and Nutrition Service. (n.d.). Child Nutrition Tables. USDA. https://www.fns.usda.gov/cn/fluid-milk-requirements-schools

Translating Science and Research for Innovation and Impact

Many people are actively working to improve their physical and emotional health, viewing food and beverages as key tools in that journey. The concept of "food as medicine" continues to gain traction. A comprehensive health and wellness landscape study[8] revealed that consumers increasingly seek personalized nutrition solutions. They spend $350 billion to support their health and wellness needs, yet more than half of that spending fails to meet their needs, leading to dissatisfaction.[8] U.S. dairy has an opportunity to further drive a positive impact by supporting consumers' health and wellness goals, and the dairy community is helping inform consumers about all the ways that dairy can be a solution in delivering desired health benefits.

U.S. dairy farmers, through the NDC, have invested for decades in scientific research about the role dairy plays in health and well-being. U.S. dairy has an opportunity to further drive a positive impact by supporting consumers' health and wellness goals, and the dairy community is helping inform consumers about all the ways that dairy can be a solution in delivering desired health benefits.

Expanded efforts include advancing nutrition research, building strategic partnerships, and equipping stakeholders with science-backed messaging across key wellness areas. These initiatives not only strengthen the industry's ability to meet consumer health needs but also help individuals and communities move toward greater health and well-being.

Ongoing research and updated resources equip the U.S. dairy community to share dairy's science-backed benefits and help consumers personalize their health and wellness:

GROW AND PERFORM
highlights dairy's functional benefits for bone health, athletic performance and sustained energy. Research shows that dairy helps maximize muscle potential and energy levels, all while supporting a balanced diet.

FIRST 1,000 DAYS
highlights the benefits of eating dairy during pregnancy, infancy and toddlerhood. Research shows that consuming dairy in this window supports brain and neurocognitive development, maternal health, pregnancy outcomes and more.

HEALTHY HEART AND WEIGHT
focuses on heart health, metabolic health and weight management. It addresses concerns about weight and downstream health effects such as heart disease and high cholesterol, and the role that dairy can play in helping individuals meet such goals.

SYSTEMS SUPERCHARGE
focuses on digestive health, joint health and mobility, and overall wellness. Research shows that dairy can support and help strengthen the immune system.

MENTAL AND EMOTIONAL HEALTH AND WELLNESS
addresses the desire for greater focus, productivity, and mental clarity through food and beverage choices. Researchers are exploring dairy's role in enhancing mental and emotional well-being.

8 "Health and Wellness Landscape Study." Unpublished internal document. Innovation Center for U.S. Dairy, 2024.

Health and Nutrition Accelerated Through Collaboration and Partnerships

U.S. dairy works with a variety of subject matter experts and organizations that offer independent, trusted perspectives on dairy's role in nutrition and modern wellness.

Network of 9,000 Health and Wellness Professionals and Experts Expands Access to Research and Resources

Launched in 2019, the NDC's **Dairy Nourishes Network** amplifies nutrition science and educational resources about dairy's role in nourishing people and communities and its responsible production. This network of more than 9,000 food, nutrition, health and wellness professionals, and sustainable food systems experts expands access to the latest research, resources and tools.

The Innovation Center also organized events in 2023 and 2024 to create a space for exchange and learning, and to spark interest in the potential for dairy health and wellness innovation:

- Hosted an interactive Dynamic Dialogue with health leaders to share perspectives and build understanding of dairy's benefits in the "Grow and Perform," "Healthy Heart and Weight" and "Systems Supercharge" territories.
- Conducted four interactive industry insights webinars to share new research and resources on dairy's health and wellness benefits with U.S. dairy cooperatives and processors.

Physician Education About Dairy Benefits

In 2024, the **National Medical Association** (NMA) released a scientific supplement endorsing the consumption of dairy by the African American population for health and wellness benefits.[9] Since publication, the NDC has continued an ongoing partnership with NMA to provide education and outreach to NMA physicians across all states and regions, reaching over 600 physicians in 2024. Additionally, through an NDC educational grant, the **American Academy of Pediatrics** selected a Program Advisory Council (PAC) to develop a Physician Education Program for nutrition education, focused on the dietary needs of children aged 2–18 in order to reach and teach more pediatricians about nutrition fundamentals, including the health and wellness benefits of dairy.

>80,000 Healthcare Professionals Reached Through Collaboration with Mayo Clinic

With more No. 1 rankings than any other hospital, according to U.S. News & World Report, the **Mayo Clinic** is the largest integrated, not-for-profit medical group practice in the world. In 2022, Dairy Management Inc. entered a formal five-year collaboration with the Mayo Clinic, in a memorandum of understanding alongside the Innovation Center and the NDC. Supported by scientists, registered dietitians, Mayo Clinic physicians and health professionals, this collaboration explores research and consumer outreach efforts to improve public health, such as research about the impact of dairy foods on cardiovascular health and metabolic conditions, and how dairy research can support digital platforms consumers use to manage their wellness. In 2023, more than 80,000 healthcare professionals were reached through this collaboration with the Mayo Clinic.

9 Comerford, K., Lawson, Y., Young, M., Knight, M., McKinney, K., Mpasi, P., & Mitchell, E. (2024). Executive summary: The role of dairy food intake for improving health among Black Americans across the life continuum. *Journal of Nutritional Biochemistry*, 122, 109365. https://doi.org/10.1016/j.jnma.2024.01.026

Food/Nutrition Security and Accessibility

In the U.S., approximately one in seven households experience food insecurity, with nearly one in five children affected. In 2023, food insecurity increased measurably, affecting 13.5% of households (18 million), up from 12.8% (17 million) in 2022. Food insecurity disproportionately impacts communities of color and varies by location, with rates higher in rural areas.[10]

"Nutrition security" emphasizes the importance of both the quantity and quality of food intake, highlighting the need for consistent access to nutritious, affordable foods essential for optimal health. Despite efforts to mitigate hunger, food-insecure households often have poorer-quality diets, spending less on food and purchasing items of lower nutritional value.[11]

Dairy is a solution to both food and nutrition security concerns. Dairy food and beverages, such as milk, cheese and yogurt, provide a unique nutrient package that cannot be easily replaced with other foods. Additionally, dairy is affordable: an 8-ounce serving of regular milk costs $0.23 cents,[12] and a serving of lactose-free milk costs $0.55 cents.[13]

Given these benefits, U.S. dairy envisions a future where people facing food insecurity have reliable and consistent access to dairy's nutritional value. In fact, U.S. dairy has a long track record of working alongside the public, private and non-profit sectors, providing nutrient-dense foods to those in need to address immediate hunger and promote long-term health and well-being. These efforts help build resilient communities where everyone can thrive, regardless of their economic status.

INDUSTRY COLLABORATION

Food Security Task Force

Formed in 2020, the Food Security Task Force is an important vehicle through which the dairy industry is collaborating to increase access to dairy for those facing food insecurity. The Innovation Center partnered with Feeding America to co-host regional dairy symposia to foster relationships between the dairy industry and food banks, and to address barriers to getting dairy into these facilities. The Food Security Task Force works to promote best practices between food banks and dairy processors and to expand dairy purchasing programs to provide a more consistent supply of dairy to those facing food insecurity.

10 Rabbitt, M.P., Reed-Jones, M., Hales, L.J., & Burke, M.P. (2024). *Household food security in the United States in 2023.* (Report No. ERR-337). U.S. Department of Agriculture, Economic Research Service. https://doi.org/10.32747/2023.8134351.ers

11 Larson, N., Laska, M. N., & Neumark-Sztainer, D. (2020). Food insecurity, diet quality, home food availability, and health risk behaviors among emerging adults: Findings from the EAT 2010–2018 study. American Journal of Public Health, 110(9), 1422–1428. https://doi.org/10.2105/AJPH.2020.305783

12 Based on U.S. average price of unflavored, conventional milk (non-organic, full lactose, no additional health enhancements such as omega or A2), private label + branded milk, 1 gal. [Source: Circana Group, L.P. Rolling 52 weeks through 10-08-23].

13 Based on U.S. 1% white lactose-free milk (based on a half gallon), private label + branded milk. [Source: Circana Group, L.P. Rolling 52 weeks through 7-16-23].

Working Together to Advance Nutrition Security

The dairy community has been dedicated to combating food insecurity for many decades. Many collaborations, projects and partnerships speak to this effort, and include a wide variety of dairy stakeholders from individual dairy farmers and cooperatives to processors and trade groups.

The NDC formed a partnership with Feeding America in 2012 to educate a variety of audiences about food insecurity and increase access to dairy products in food banks. The partnership evolved over the subsequent decade and, in 2020, the Innovation Center formed a Food Security Task Force to increase access to dairy for those facing food insecurity.

In 2024, Feeding America distributed 445 million pounds of dairy, equivalent to 1.5 billion servings, through its network, representing a nearly 10% increase compared to 2023. Despite declines following the pandemic, the current distribution amount is still 79% higher than the pre-pandemic period in 2018.[14]

1.5 billion
servings of dairy distributed through the Feeding America network in 2024

>850 million
pounds of dairy distributed through the Feeding America network in 2023 and 2024

Millions of Pounds of Dairy Distributed in the Feeding America Network

Source: Dairy Nourishes America partnership, March 2025 update.
* Totals may not sum due to rounding.

14 National Dairy Council. Dairy Distribution through Feeding America 2018–2024.

Dairy Nourishes America Mobilizes >200 Stakeholders to Increase Access to Dairy in Food Banks

In 2024, the Innovation Center and Feeding America launched the Dairy Nourishes America Toolkit, a compilation of effective methods for increasing access to dairy in food banks. The toolkit, which is updated on an ongoing basis, contains a variety of useful information including best practices and safety guidelines related to working with dairy products, and examples of how food banks and the dairy community work together to source dairy products for those in need of food assistance.

Feeding America, in partnership with the Innovation Center, hosted the Dairy Nourishes America (DNA) Western Symposium in San Diego, Calif., in 2023, and the Eastern Symposium in Rochester, N.Y., in 2024. The two symposiums gathered more than 200 stakeholders from across 31 states to address the issues and opportunities surrounding the distribution of dairy to food-insecure communities. Attendees built connections, created partnerships and broke through barriers to drive action that will positively impact communities through dairy.

CASE STUDY

Illinois Partnership Delivers >25,000 Gallons of Milk to Local Food Banks Every Month

Milk2MyPlate is a partnership between Feeding America food banks and local milk processors that provides a steady supply of fresh, full-dated milk to food banks and their agency partners at an affordable price. The program leverages milk processors' existing production and delivery protocols to enable turnkey implementation and execution. Adding milk to the diets of the people served by food banks helps fulfill the Dairy Group requirement of the USDA's current MyPlate nutrition guide.

The Northern Illinois Food Bank and its partner, Prairie Farms, established Milk2MyPlate within their network, and continue to grow and expand the program. As of March 2025, nearly 60 partners across 12 counties are participating, delivering a total of more than 25,000 gallons of milk through these partners every month. Through this partnership, Prairie Farms and the Northern Illinois Food Bank provide much-needed milk to food-insecure families on a consistent basis, making an important impact within their local communities.

Expanding Nutritious Milk Access in Schools

School meals are one of the largest and most widespread social safety nets benefiting children. Nearly 30 million children and adolescents participate in federal school meal programs, including breakfast and lunch. Through the National School Lunch Program (NSLP) and School Breakfast Program (SBP), nutritious meals and after-school snacks are provided to more than half the nation's primary and secondary school students.[15] Research shows that school meals are the most nutritious food source for American schoolchildren, and dairy is the leading source of protein, calcium, vitamin D and potassium for American children. Further, dairy milk provides children with better bone health, a lower risk for type 2 diabetes and a lower risk for cardiovascular disease.

Schools may currently offer fat-free and low-fat (1% fat) milk, flavored and unflavored, in reimbursable school lunches and breakfasts and for sale as a competitive beverage.[16] However, between 68% and 94% of school-age children are failing to consume the recommended levels of dairy.[17] Research shows that children who drink flavored milk consume more milk and therefore have significantly higher intakes of vitamin D, calcium, potassium and other nutrients.[18]

INDUSTRY COLLABORATION

School Milk Action Team

Launched in 2024, the Innovation Center's School Milk Action Team was created to firestart solutions to ensuring excellent school milk experience. Over the last year, this team focused on different facets of opportunities including product and packaging, procurement and bidding, as well as future state reliable distribution.

IDFA Healthy School Milk Commitment

Led by the International Dairy Foods Association (IDFA), the IDFA Healthy School Milk Commitment is a pledge by dairy companies to deliver milk's 13 essential nutrients to America's students while reducing calories and added sugars in flavored milk. Beginning with the 2025–2026 school year, 37 school milk processors representing approximately 95% of the school milk volume in the U.S. are committing to provide healthy, nutritious school milk options with no more than 10 grams of added sugar per 8 fluid ounce serving.[19]

According to the latest survey among school milk processors conducted by IDFA and Prime Consulting, the level of added sugars in flavored milk products has declined by 57% since 2006, as milk processors signed on to IDFA's Healthy School Milk Commitment and began reformulating products in advance of the 2025 school year. Calories associated with flavored milk have also declined during that same period as well, from 166 to 123 calories per 8-ounce serving, or nearly 30%.[18] Since 2023, dairy companies have reformulated 24 individual products. Flavored milk provides students with one of the most complete nutrient packages while contributing less than 4% of added sugars in the diets of children aged 2–18.

In 2024, the White House recognized the Healthy School Milk Commitment during a special event announcing the National Strategy on Hunger, Nutrition and Health. Meanwhile, parents of school-age children continue to be big supporters of offering flavored milk in schools. In a 2023 survey by Morning Consult commissioned by IDFA, among a sample of 441 parents with children in public schools, 90% believe providing milk to children for public school meals is important for their daily nutritional intake, and 89% agree that non-fat or low-fat flavored milk should remain an option in public school meals.[20]

SINCE 2006:

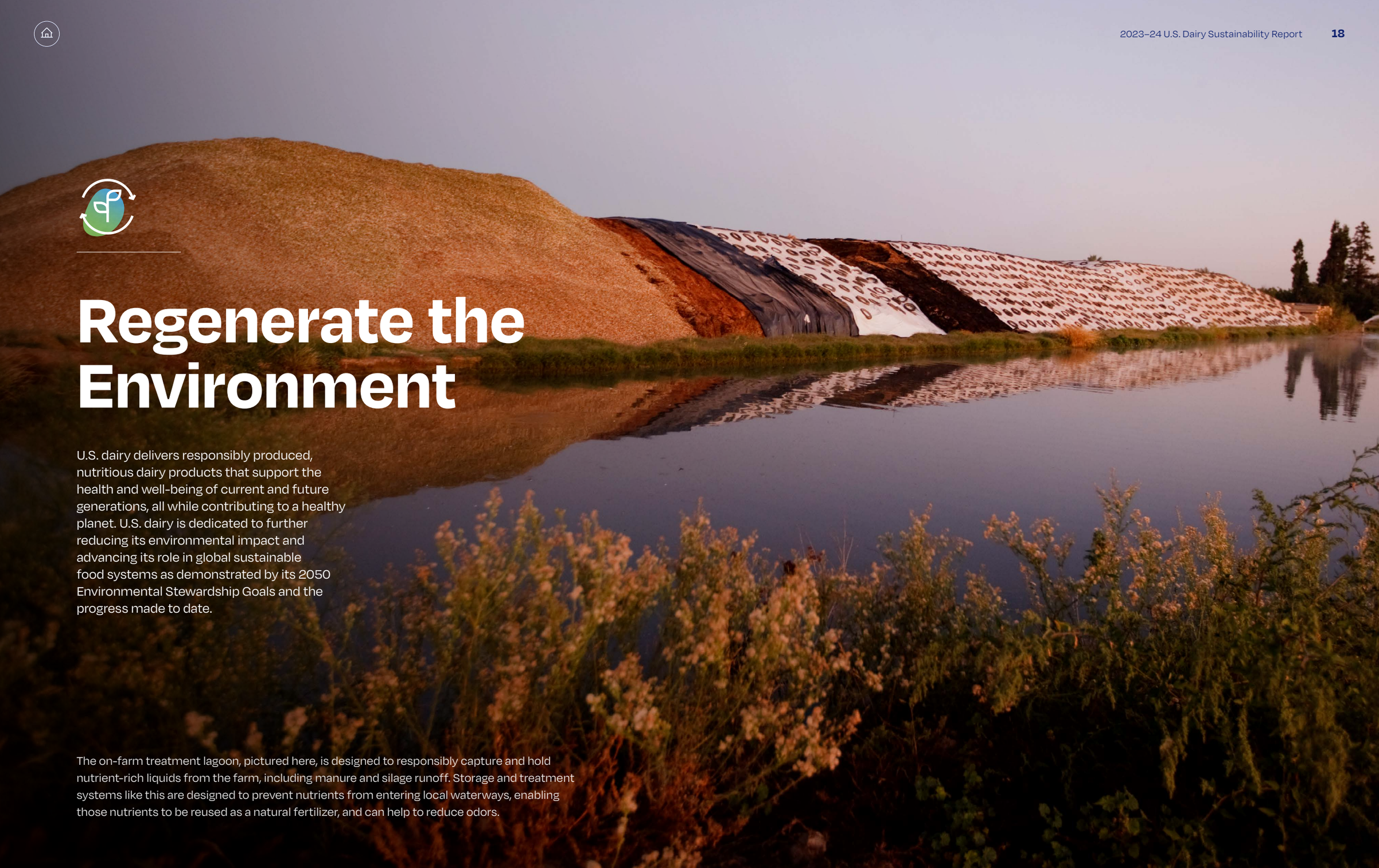
↓ ~57%
reduction in added sugars in flavored milk products sold at schools

↓ ~30%
reduction in calories associated with flavored milk, per 8-ounce servings

15 U.S. Department of Agriculture, Food and Nutrition Service. (n.d.). Child Nutrition Tables. USDA. https://www.fns.usda.gov/pd/child-nutrition-tables
16 U.S. Department of Agriculture, Food and Nutrition Service. (2024, April 24). Milk (Updates to the school nutrition standards). USDA. https://www.fns.usda.gov/cn/school-nutrition-standards-updates/milk
17 International Dairy Foods Association. (n.d.). Whole milk in school meals. https://www.idfa.org/whole-milk-in-school-meals
18 Ricklefs-Johnson, K., & Pikosky, M. A. (2023). Perspective: The benefits of including flavored milk in healthy dietary patterns. Advances in Nutrition, 14(5), 959–972. https://doi.org/10.1016/j.advnut.2023.06.002
19 International Dairy Foods Association. Dairy companies slash added sugars by nearly 60% in school milk as new school year begins. https://www.idfa.org/news/dairy-companies-slash-added-sugars-by-nearly-60-in-school-milk-as-new-school-year-begins
20 International Dairy Foods Association-Morning Consult Poll. (June 2023). https://www.idfa.org/resources/polling-of-parents-with-children-in-public-school-0723

Regenerate the Environment

U.S. dairy delivers responsibly produced, nutritious dairy products that support the health and well-being of current and future generations, all while contributing to a healthy planet. U.S. dairy is dedicated to further reducing its environmental impact and advancing its role in global sustainable food systems as demonstrated by its 2050 Environmental Stewardship Goals and the progress made to date.



The on-farm treatment lagoon, pictured here, is designed to responsibly capture and hold nutrient-rich liquids from the farm, including manure and silage runoff. Storage and treatment systems like this are designed to prevent nutrients from entering local waterways, enabling those nutrients to be reused as a natural fertilizer, and can help to reduce odors.

Overview

The U.S. dairy community understands that environmental stewardship is fundamental to the long-term viability of farms, the resilience of the global food system and the health of the planet. As stewards of the land and natural resources, dairy farmers bring a deep-rooted, multi-generational commitment to practices that protect and enhance the environment for future generations.

Across the entire dairy value chain, collaborative efforts are underway to reduce environmental impacts while upholding high standards of animal care and milk quality. U.S. dairy is advancing science-driven solutions that are both innovative and grounded in long-standing agricultural traditions, focusing on areas such as soil health, water conservation, greenhouse gas (GHG) reduction, and circularity.

These efforts are guided by the industry's 2050 Environmental Stewardship Goals and the U.S. Dairy Stewardship Commitment, underscoring the principle that producing nutritious food and protecting the environment are mutually reinforcing objectives. By continuously measuring progress, identifying practical pathways and engaging in cross-sector collaboration, the industry is driving meaningful environmental outcomes.

Industry Aligns on Definition of Regenerative Dairy

In 2024, the U.S. dairy industry, in collaboration with stakeholders and experts, further refined its shared understanding of regenerative agriculture as it applies to dairy systems. Regenerative dairy is defined as an approach that supports cow health and well-being and continuous environmental improvements across multiple areas such as soil health, water quality and quantity, biodiversity, GHG emissions, and air quality, while maintaining and improving productivity and economic viability. Grounded in science-based principles and aligned with global standards, this definition provides a foundation for the industry's ongoing work and communications around regenerative practices.

Custom-Build Online Platform Developed to Support Industry Progress

To inform the adoption of sustainability and regenerative practices on farms, the U.S. dairy checkoff launched the Dairy Conservation Navigator in 2024. The online resource hub is designed to support a broad network of professionals who advise farmers—such as veterinarians, nutritionists, conservationists and others—by providing science-based information on sustainable practices and technologies. The platform simplifies complex sustainability topics and delivers tailored, actionable solutions, helping bridge the gap between growing environmental expectations and the need for practical, trustworthy resources.

INDUSTRY COLLABORATION

The Innovation Center's Environmental Stewardship Committee convenes farmers, cooperatives, processors and dairy association representatives to help guide the industry's environmental strategy. The committee leverages research and analysis, best practices and tools to equip the industry, inspire action and build momentum toward these goals.

Researchers and scientists support the work by conducting research, modeling and measurement projects that help the industry identify and address knowledge gaps, evaluate trade-offs and ultimately demonstrate impact. Science plays a critical role in the industry's strategic vision and is conducted by subject matter experts who are passionate about working on behalf of farmers to provide a strong foundation for progress.

2050 Environmental Stewardship Goals and Progress Snapshot

The 2050 Environmental Stewardship Goals build on a decades-long commitment to producing nutritious dairy foods that sustainably feed a growing population. Launched in 2020, the goals were shaped through an extensive stakeholder and public comment process, guided by representative leadership across the dairy value chain, including farmers, cooperatives, processors and retailers. They were further informed by a materiality assessment that prioritized the issues posing the greatest opportunities for the industry. Importantly, the goals are designed to aggregate and reflect the broad work happening across farms, businesses and communities, providing a unified way to represent U.S. dairy's leadership in responsible production to its consumers and stakeholders.

A five-year[1] progress update on these value chain-driven goals can be found below and in the following pages. This update draws on multiple data streams, including national-level life cycle assessments, reporting from Stewardship Commitment adopters, and peer-reviewed research. Together, these sources provide a comprehensive view, the breadth of industry action and the depth of science guiding the industry's path forward.

Select "Read More" for each goal to dive deeper and learn more about the industry's progress:

Achieve GHG Neutrality

↓ 2.5%
decrease in GHG emissions intensity from cradle-to-processing gate since 2020, while milk production increased 4.7%.

↓ 14.7%
reduction in GHG emissions per unit of milk within U.S. dairy's milk production from 2007 to 2025.

↑ ~3-fold
increase in fossil fuel energy displaced by biogas production from 2020 to 2025.

↓ 2.2%
approximate decrease in GHG emissions from dairy processing from 2020 to 2025.

READ MORE

Optimize Water Use While Maximizing Recycling

A water use and recycling measurement strategy has been developed to estimate, monitor and enable progress towards the industry's goal.

33
processors collaborated to build the Dairy Processing Water Savings Opportunities guidance to help processors identify and implement strategies to conserve, capture and recycle water by product type.

↑ 20%
improvement in water efficiency during processing reported by legacy adopters of the Stewardship Commitment from 2021 to 2024.

↓ 30%
decline in on-farm water consumption per liter of milk from 2007 to 2017.

READ MORE

Improve Water Quality by Optimizing Utilization of Manure and Nutrients

A measurement strategy to monitor water quality outcomes from field-to-processor gate has been developed to enable progress towards the industry's goal.

94%
of Stewardship Commitment adopters have a policy, program and/or monitoring system in place to ensure routine compliance with industrial or storm water permit parameters.

Modeling efforts strongly suggest that U.S. dairy's contribution to nitrogen leaching, nitrogen runoff and phosphorus runoff decreased substantially between 1971 and 2020 (Rotz et al., 2024).

From managing nutrient runoff on farms to treating wastewater at processing facilities, dairy producers and processors comply with stringent federal and state regulations.

READ MORE

1 The time boundary is from 2020 to 2025. Data sources were updated to 2025, 2024 and 2023 where possible. However, certain data inputs remain unchanged from 2020 due to limited availability of updated information.

GHG Emissions and Energy

Driven by the value chain, U.S. dairy is working collectively to achieve GHG neutrality at the field, farm and processor levels by balancing GHG emissions with reductions and removals, as defined by the Intergovernmental Panel on Climate Change (IPCC). Its stakeholders are striving to significantly reduce emissions industry-wide and sequester carbon by scaling technologies and agricultural practices that increase resource use efficiency and resilience. Because there is no one-size-fits-all solution, numerous partnerships, collaborations, committees, forums and industry-wide events encourage the sharing of ideas and information across the value chain. In this way, U.S. dairy is bringing actionable measures to farms, processors, dairy customers and consumers in support of this goal.

New Life Cycle Assessments Establish Baseline

U.S. dairy is committed to reporting on the industry's GHG emissions—at a national level—every five years. Since announcing its industry-wide goals in 2020, U.S. dairy has invested and focused on establishing a robust baseline to measure and report progress, following best practices and incorporating the latest science and data available. Two life cycle assessments (LCAs) were commissioned to enable industry alignment on methods, metrics and terminologies, provide a national GHG emissions baseline to which companies can compare their individual GHG emissions footprints, and better understand U.S. dairy's GHG emissions footprint for insight into potential mitigation strategies.

Leveraging a top-down, national-level GHG emissions analysis, the innovative approach to these LCAs enhances transparency, replicability and comprehensiveness. While many LCAs rely on survey-based methods to collect primary data, which can be resource intensive and increase potential variability in results, the new LCAs use publicly available, primary data collected by USDA and other agencies in combination with data from remote sensing technologies such as satellite imagery.[2] This method uses recently published empirical models to estimate GHG emissions associated with regionally representative management practices at the field, farm and processor levels. The approach conforms with GHG emissions reporting guidance, such as the International Organization for Standardization (ISO), International Dairy Federation (IDF), the Food and Agriculture Organization of the United Nations (FAO), and the GHG Protocol Land Sector and Removals (LSRS). A peer-reviewed scientific publication describing the methods and results in significant detail, including uncertainty ranges and sensitivity analyses, can be found in the journal *Environmental Science and Technology*.[2]

The Innovation Center has outlined its intention to transition, in future years, from the use of a top-down GHG emissions assessment to a bottom-up approach incorporating aggregated, anonymized data from FARM Environmental Stewardship and the U.S. Dairy Stewardship Commitment's Processor Stewardship Reporting Tool, contingent upon sufficient data availability. The use of primary data from such sources will strengthen estimates of progress.

2 Pelton, R., Tricarico, J., Bernal, F., de Ondarza, M. B., & Kurt, T. (2025). Spatially resolved greenhouse gas emissions of U.S. milk production in 2020. *Environmental Science & Technology, 59*(19). https://pubs.acs.org/doi/10.1021/acs.est.5c12673

PROGRESS TO 2050

Progress to GHG Neutrality by 2050

U.S. dairy continues to produce high-quality, nutrient-dense products for a growing global population while significantly enhancing resource-use efficiency and demonstrating environmental progress.

The scope of the data presented is from cradle-to-processor gate.[3]

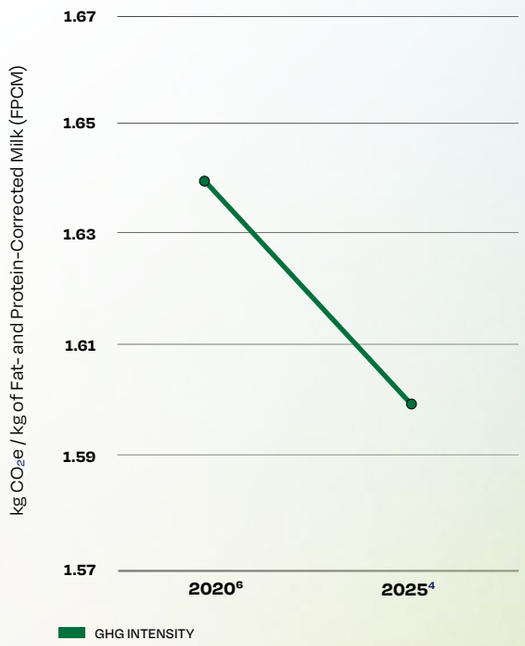
Feed Production: Crops such as corn, alfalfa hay and soybeans feed dairy cows

Milk Production: Dairy cows are housed, fed and milked on dairy farms

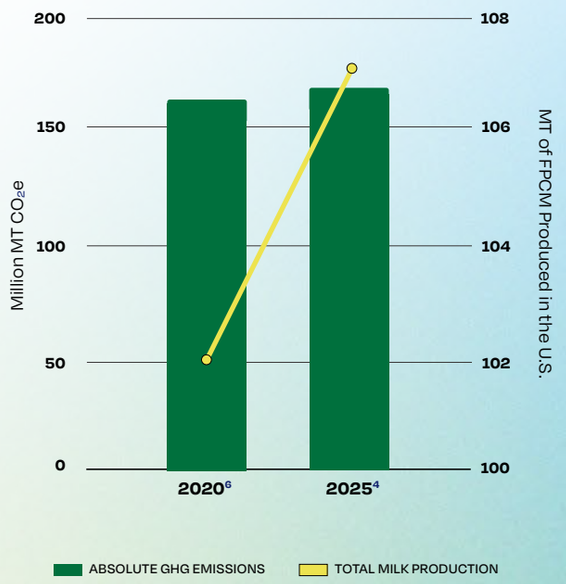
Milk Transportation: Milk is transported from farm to processor in insulated tanker trucks

Dairy Processing: Processing plants bottle milk and turn milk into cheese, yogurt and other dairy products

U.S. DAIRY'S GHG INTENSITY DECREASED BY 2.5% FROM 2020 TO 2025[4,5]



ABSOLUTE EMISSIONS ONLY INCREASED 2.1%, WHILE MILK PRODUCTION INCREASED 4.7%[5]



3 The scope is from cradle-to-processor gate, with the boundary being the physical areas used in dairy production including feed, farm and processing facilities (Pelton et al., 2025a,b). The scope of the assessment ends at the processor gate and does not include distribution to retail or food service industry.
4 Data sources were updated to 2025, 2024 and 2023 where possible. However, certain data inputs remain unchanged from 2020 due to limited availability of updated information.
5 Weighted average across 99.96% of dairy products.
6 Pelton, R, Bernal, F, Kurt, T. (2025). Comprehensive spatial greenhouse gas emissions from U.S. dairy products [Manuscript submitted for publication].

Measuring, Reducing and Removing Emissions at Field and Farm

Cradle-to-farm gate GHG emissions intensity decreased by 1.4% since baseline year 2020, from an average of 1.30 kg CO_2e / kg FPCM to 1.28 kg CO_2e / kg FPCM, as estimated using the updated LCA methods. This progress is a culmination of industry investments in research, technological advancements, partnerships and collaboration.

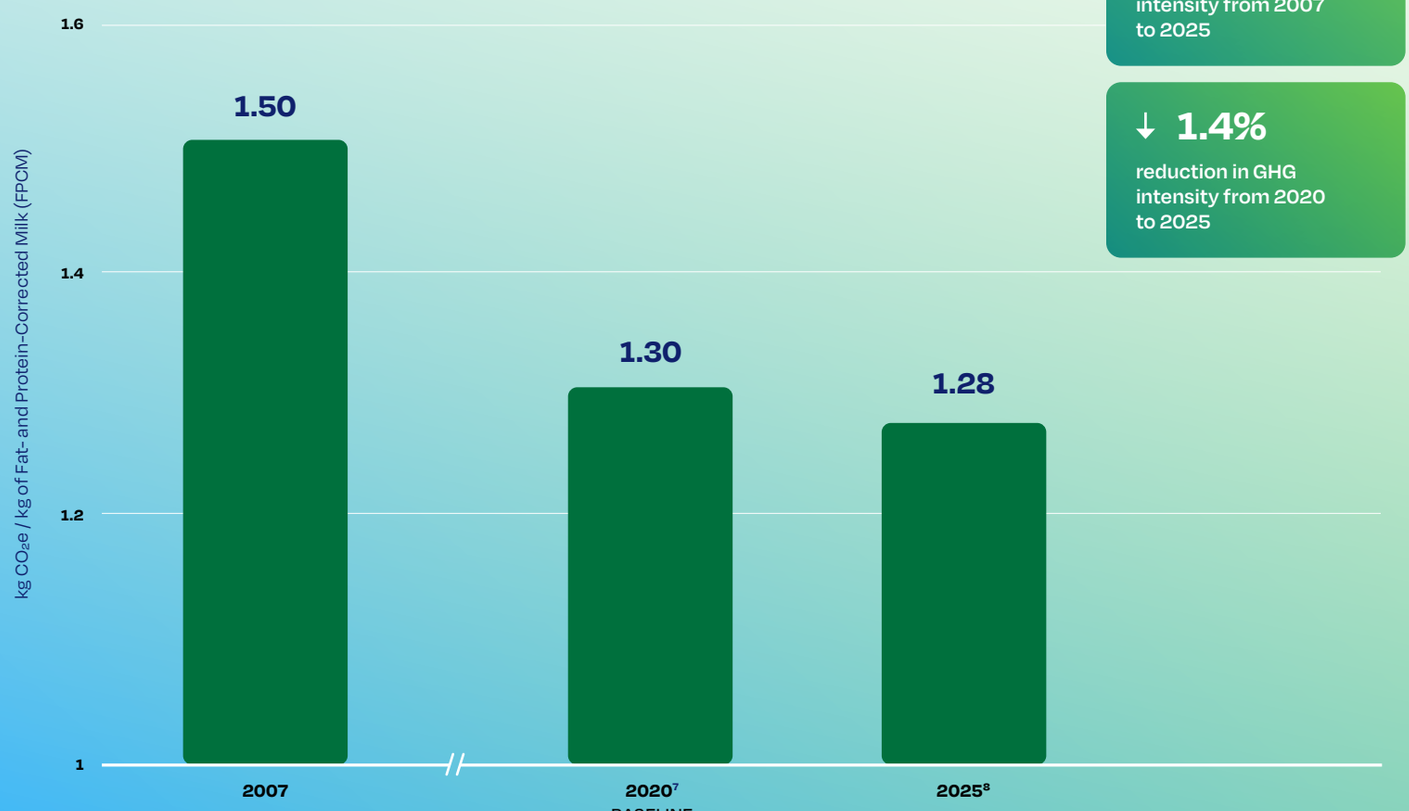
Given the relatively short five-year reporting window (2020–2025[7]) and challenges synchronizing updates with the availability of data, a retrospective analysis was conducted to better understand U.S. dairy's environmental progress from 2007 to 2020.

From 2007 to 2020, GHG emissions intensity associated with fluid milk production decreased approximately 13%.[7] During this period, absolute emissions associated with raw milk production increased only 10%, from 121 to 132 million MT CO_2e, while milk production increased an impressive 27%, from approximately 81 million MT FPCM to 102 million MT FPCM (approximately 186 billion lbs. to 223 billion lbs.; USDA NASS).[7] The results are consistent with other studies which indicate that GHG emissions intensity for fluid milk production in the U.S. has decreased substantially over time (Rotz et al., 2024; Capper and Cady, 2020).

GHG emissions intensity associated with fluid milk production in the U.S. decreased by more than 14 .7% since 2007, while milk production increased 31% from 2007 to 2025—underscoring dairy farmers' commitment to continuous environmental improvement.

PROGRESS TO 2050

Steady Decrease in Cradle-to-Farm Gate GHG Emissions Intensity



↓ 14 .7%
reduction in GHG intensity from 2007 to 2025

↓ 1.4%
reduction in GHG intensity from 2020 to 2025

7 Pelton, R., Tricarico, J., Bernal, F., de Ondarza, M. B., & Kurt, T. (2025). Spatially resolved greenhouse gas emissions of U.S. milk production in 2020. *Environmental Science & Technology, 59*(19). https://pubs.acs.org/doi/10.1021/acs.est.5c12673.

8 Data sources were updated to 2025, 2024 and 2023 where possible. However, certain data inputs remain unchanged from 2020 due to limited availability of updated information.

PROGRESS TO 2050

Highlights

The cradle-to-farm gate LCA underscored that, while there is not a one-size solution for all farms, the industry is focusing on areas that matter most. U.S. dairy continues to research, invest and scale projects to reduce the industry's on-farm GHG footprint across four key areas: enteric methane, feed production, manure management and energy. The pathway to GHG neutrality for U.S. dairy continues to be refined and will become clearer as measurement capabilities, proven projects and economic drivers are harnessed.

The 2020 farm gate LCA estimated emissions reductions from specific on-farm practices including:

Anaerobic Digestion

Anaerobic digestion is the process by which microorganisms break down organic materials—such as dairy manure—in oxygen-deprived environments. Anaerobic digestion can effectively reduce GHG emissions while providing renewable sources of natural gas and electricity.

Between 2007 and 2020, virtually all regions saw substantial increases in the proportion of total dairy cow manure managed with anaerobic digestion, with notable increases in the Pacific Northwest (1.30% to 15.50%), the Intermountain region (0.10% to 6.40%),[9] the West (0.60% to 10.50%), New England (3.50% to 10.50%), the Upper Midwest (1.40% to 6.00%) and the Northeast (1.40% to 6.40%).[9]

Anaerobic digesters with biogas capture and utilization provide emissions offset credits (i.e., energy displacement) averaging 532 ,000 MT CO_2e in 2020, which reduces the 2020 cradle-to-farmgate footprint 0.4% across the industry and up to 0.8% in high-adoption areas.[9]

Energy displacement increased from ~532,000 MT CO_2e displaced per year in 2020, to ~1.5 million MT CO_2e displaced per year in 2025.[9]

Carbon Sequestration

Carbon sequestration refers to the process by which plants, such as animal feed crops, absorb CO_2 from the atmosphere and store it within soils. Soil carbon storage capacity depends on the soil type, precipitation amount and other factors. Carbon can also be released to the atmosphere when soil is disturbed—an issue of permanence. Conservation practices such as minimum or no-tilling and cover cropping promote carbon sequestration.

Carbon sequestration achieved by dairy producers increased 5.5% between 2007 and 2020, from approximately 1.88 million MT to 1.98 million MT CO_2e, accounting for a 1.4% reduction of the 2020 cradle-to-farmgate GHG emissions footprint.[9]

↑ ~3-fold
increase in fossil fuel energy displacement from biogas production from 2020 to 2025

↓ 1.4%
reduction of cradle-to-farmgate emissions from carbon sequestration from 2020 to 2025

Over 400
anaerobic digesters are managing dairy manure in the U.S. as of 2024

1.5 million MT CO_2e
displaced by anaerobic digesters with biogas capture and utilization in 2025

9 Pelton, R., Tricarico, J., Bernal, F., de Ondarza, M. B., & Kurt, T. (2025). Spatially resolved greenhouse gas emissions of U.S. milk production in 2020. *Environmental Science & Technology, 59*(19). https://pubs.acs.org/doi/10.1021/acs.est.5c12673.

Emissions Measurement With the FARM Environmental Stewardship Program

A key strategy to advancing progress is ensuring that farmers are equipped with the tools and resources to track, assess and communicate environmental achievements and progress. Launched in 2017, the Farmers Assuring Responsible Management Environmental Stewardship program is a farm-level environmental assessment and customer assurance program. **Since program inception in 2017, more than 6,000 assessments were completed on farms ranging in size from 10 to more than 35,000 lactating cows.**

Version 3 of the FARM Environmental Stewardship (FARM ES) program launched in October 2024, equipping dairy farmers with a scientifically robust tool that assesses the impact of conservation practices and technologies within the context of their individual operations. FARM ES version 3 uses the Ruminant Farm Systems (RuFaS) model, a whole-farm, process-based model that estimates farm-level GHG emissions and energy intensity. Created in collaboration among subject-matter experts at USDA-ARS, Cornell University, the University of Wisconsin, Colorado State University, Sustainability Science and other institutions, with support from DMI and other organizations, RuFaS simulates dairy farm processes and operations, starting with individual cows, and enables FARM ES users to conduct "what if" scenario-planning analyses. **As a fully documented, open-source model that is continually improved, RuFaS represents one of the most advanced, fit-for-purpose whole-farm environmental models available in the agriculture sector.**

As a result, FARM ES version 3 offers farmers an advanced, more refined output compared to previous versions of the program, including estimates of carbon sequestration, the ability to analyze the environmental and milk productivity impacts of various practices and technologies, and a detailed farm footprint. Dairy farmers can understand their farm footprint by feed, manure, enteric and energy sources, as well as by GHG type.

FARM ES results can be aggregated by dairy cooperatives and processors for reporting Scope 3 emissions to dairy buyers, in which case individual farm data are anonymized. FARM ES version 3 is a turning point as dairy farmers, cooperatives and processors continue to advance their sustainability efforts in ways that make the most sense for their business.

CASE STUDY

Advancing Climate Goals Through FARM ES at California Dairies, Inc.

California Dairies, Inc. (CDI) is a leading U.S. dairy cooperative, co-owned by more than 280 California dairy families. As part of its climate strategy, CDI is actively participating in the FARM ES program to measure and reduce GHG emissions at the farm level. CDI is conducting FARM ES evaluations on half of its member-owner farms each year and aggregates the results to monitor progress toward its climate goals. Already, 66% of CDI milk is produced on farms implementing at least one methane-reducing project, and over 75% of the electricity used on member farms comes from renewable or carbon-free sources. CDI is driving measurable reductions in its environmental footprint while supporting the long-term sustainability of its farms.

INDUSTRY COLLABORATION

CEO Task Force on GHG Accounting

Current Scope 3 GHG accounting, disclosure and goal-setting frameworks tend to prioritize uniformity, emphasizing consistency, traceability and prescriptive methodologies across all sectors. While this benefits comparability and reporting, it often overlooks fundamental operational and scientific differences between sectors, risking the undervaluation of innovative, science-backed and scalable mitigation solutions.

To address this challenge, the Innovation Center established a CEO-level Task Force on GHG Accounting in 2022 to build industry alignment and promote a more practical and flexible approach—one that enables climate action, increases transparency and reduces complexity. The Task Force developed a unified position reflecting key opportunities and principles, and submitted comments to the GHG Protocol's public consultation in early 2023, which were supported by nearly 40 additional U.S. dairy stakeholders.

The Task Force continues to engage with relevant organizations to drive change and ensure sector-specific realities are better represented in evolving standards. Complementing this work, the Innovation Center and National Milk Producers Federation also participates in the Value Change Initiative Food & Agriculture Working Group, a global forum where technical experts collaborate to address Scope 3 accounting barriers and engage with leading entities like GHG Protocol and the Science Based Targets initiative (SBTi).

Research and Insights for Emissions Reduction Solutions

Through research and on-farm pilots, U.S. dairy is identifying the most promising solutions, practices and technologies that will close knowledge gaps, advance innovative solutions and accelerate progress toward its goal of GHG neutrality. As part of this effort, U.S. dairy has identified pathways for the necessary research, data collection and modeling to inform a landscape assessment of what's possible and what's needed to inform economically viable farmer action.

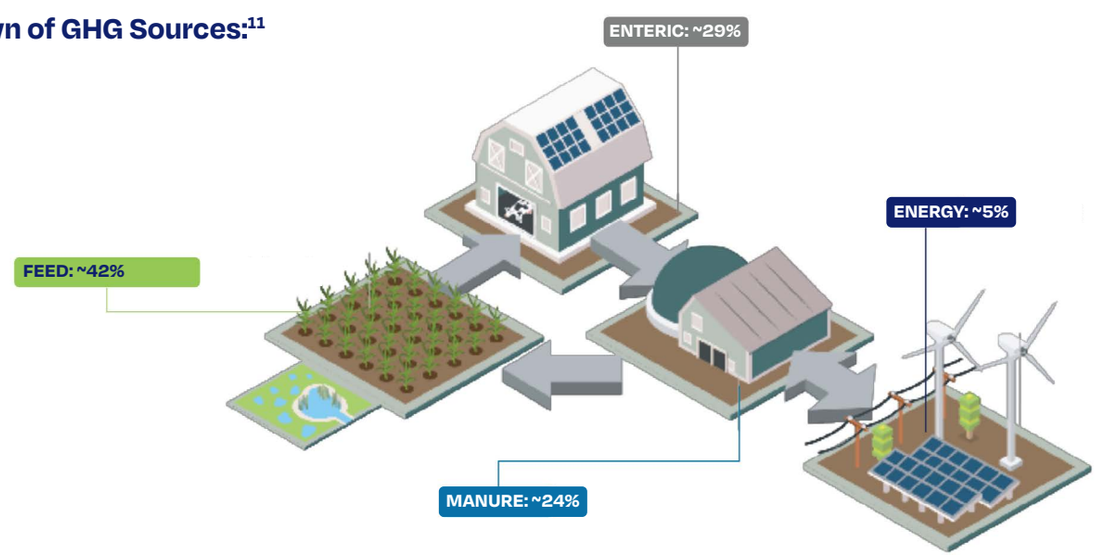
Other major research initiatives supported by DMI and the Innovation Center include the Dairy Soil and Water Regeneration (DSWR) project and the recently announced Health, Efficiency and Resource Dynamics (HERD) Initiative. The HERD Initiative, a collaboration between DMI, the Foundation for Food & Agriculture Research (FFAR) and Zoetis, will examine the role of animal health in U.S. dairy environmental and economic outcomes. Cows are at the heart of dairy production and available evidence[10] suggests that animal health could be a significant lever for enhancing environmental progress.

>$7 Million Awarded through the Greener Cattle Initiative to Close Research Gaps on Enteric Methane Emissions Reductions

Developing options to reduce livestock enteric methane emissions begins with discovery research. The Greener Cattle Initiative is a five-year, public-private collaboration to drive new research and provide effective, scalable and commercially feasible solutions to reduce methane emissions from dairy and beef cattle. The research focuses on five distinct areas: dairy cow nutrition, rumen microbiome, dairy cow genetics, sensing and data technology, and socioeconomic analysis. As a vehicle for collaboration and exposure to new ideas, the program leverages resources and de-risks research and development. Experts from across the value chain inform the program priorities and project funding decisions. Participants include the Innovation Center for U.S. Dairy, FFAR, ADM, the Council on Dairy Cattle Breeding, Elanco, Genus, Global Methane Hub, JBS, National DHIA, Nestlé, and the New Zealand Agricultural Greenhouse Gas Research Centre. The Greener Cattle Initiative has already proven to be an effective leveraging mechanism to address research gaps.

The program—partially funded by dairy farmers—has awarded over $7 million, with more in the pipeline, for research that represents a tenfold return on investment for dairy farmers. Grants awarded include a project on genomic selection for low-emitting cows that will phenotype approximately 4,000 cows. In September 2023, the Greener Cattle Initiative awarded a $3.3 million grant to Francisco Peñagaricano, UW–Madison assistant professor of animal and dairy sciences, for his project that takes a three-pronged approach: using genetics to selectively breed cattle that produce lower methane emissions; developing a milk-based test that can predict a cow's methane emissions; and exploring the rumen microbiome for possible dietary or other interventions.

Estimated Breakdown of GHG Sources:[11]



10 Kyriazakis, I., et al. (2024). Improve animal health to reduce livestock emissions: Quantifying an open goal. Proceedings of the Royal Society B: Biological Sciences, 291(2027), 1–12. https://doi.org/10.1098/rspb.2024.0675

11 Please note these are approximate percentages. Source: Pelton, R., Tricarico, J., Bernal, F., de Ondarza, M. B., & Kurt, T. (2025). Spatially resolved greenhouse gas emissions of U.S. milk production in 2020. *Environmental Science & Technology, 59*(19). https://pubs.acs.org/doi/10.1021/acs.est.5c12673

Collaboration and Partnerships Scale On-Farm Emission Reductions

U.S. dairy is collaborating to take the knowledge and insights gained from research, analysis and on-farm pilots to support widespread farmer adoption of environmentally sustainable practices and technologies. Since the industry goals were announced in 2020, more than $100 million has been committed by partners to support DMI- or Innovation Center-driven programs that empower sustainability action, with nearly $60 million distributed throughout 2023 and 2024. Together, the tools, projects and collaborative efforts contribute to providing more information, increasing technical assistance and addressing economic challenges for accelerating voluntary adoption.

Dairy Feed in Focus: Nearly 8,000 MT CO_2e Reduced and $4 Million Attracted

The **Dairy Feed in Focus** program launched in 2021 to scale the adoption of best management practices in feed and forage production that have environmental and economic benefits for farms of all sizes. Success in this program requires coordination between project partners—often buyers and/or processors of dairy—and farmers and their cooperatives. Partners involved in the program include DMI, the Innovation Center and The Nature Conservancy, with funding support from supply chain partners including Nestlé and Syngenta. Additional partners have joined, including General Mills, Domino's and Walmart/Sam's Club.

In 2024, more than 40 farms of different sizes and regions participated, representing approximately 50,000 acres and 45,000 cows. As of May 2025, Feed in Focus has attracted over $4 million in technical assistance and has provided over $1.7 million in direct incentives to farmers. From program inception through May 2025, the program helped reduce nearly 8,000 tons of CO_2e.

To support the implementation of these projects, a **Dairy Feed in Focus Practice Guidebook** was updated in January 2024 with support from The Nature Conservancy and DMI. The guide is a resource for producers and service providers on the potential environmental benefits and considerations for the successful implementation of field and farm practices.

Financing Dairy Climate Solutions: New Report and Pilot Advance On-Farm Emissions Reductions

Developing scalable financial solutions will help farmers make economically viable sustainability investments on their dairy farms. To that end, the Innovation Center and the Environmental Defense Fund collaborated to publish the Financing Dairy Climate Solutions report in 2024. The report outlines eight financial models designed to overcome financial barriers associated with the adoption of on-farm technologies that can reduce GHG emissions. The report activates collaboration and builds a common language between financial institutions and the dairy sector.

In 2024, DMI, Midwest Dairy and Lasso launched a pilot to support farmers with grant applications at no cost. The pilot attracted overwhelming interest and was able to fully support 12 farmers through the grant identification, writing and application process. Based on its success and popularity among farmers, the program is expanding its scope in 2025 to further support grant applications in other regions. DMI also worked with Lasso to build a searchable national and local grants database highlighting opportunities available to dairy farmers, along with a Grant Funding 101 resource guide sharing best practices when applying for grants and working with grant writers.

CASE STUDY

Maola Secures Over $100 Million for On-Farm Sustainability Initiatives

Maola is a cooperative of family-owned dairy farms dedicated to producing high-quality, local dairy. Through strong partnerships, Maola farmers secured over $100 million in support for on-farm initiatives that improve environmental outcomes while strengthening farm operations. These projects range from constructing modern animal housing and stabilizing erosion-prone areas to planting thousands of trees to protect local waterways. In 2024, Maola farms emitted 8.09% fewer GHG emissions than the national average, reflecting the impact of widespread adoption of practices like cover cropping, no-till farming, anaerobic digesters, manure injection, riparian buffers and environmental assessments. Together, these efforts showcase Maola's commitment to continuous improvement and its role as a pioneer in climate-smart dairy farming.

Measuring and Reducing Dairy Processing Emissions

While U.S. dairy's processing GHG footprint is approximately 20% of the industry's total from cradle-to-processing gate, U.S. dairy cooperatives and processors are committed to doing their part in support of the industry's goal to achieve GHG neutrality.

An updated farm gate-to-processor gate life cycle assessment completed in 2025 provided a renewed 2020 baseline of processing-specific GHG emissions.[12]

This new assessment analyzed the GHG impact of 33 unique dairy products and ingredients processed and manufactured across the country. The boundary includes emissions impact from transportation of milk to the processing facility, energy consumption and refrigeration during primary and secondary processing, and packaging.

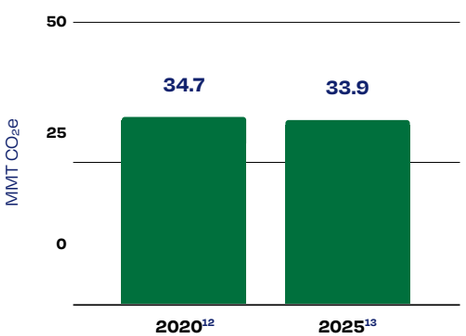
This in-depth product-level analysis provides a robust, science-based baseline for dairy cooperatives and processors to measure and compare their performance, and identify targeted improvement opportunities that yield emission reductions at scale.

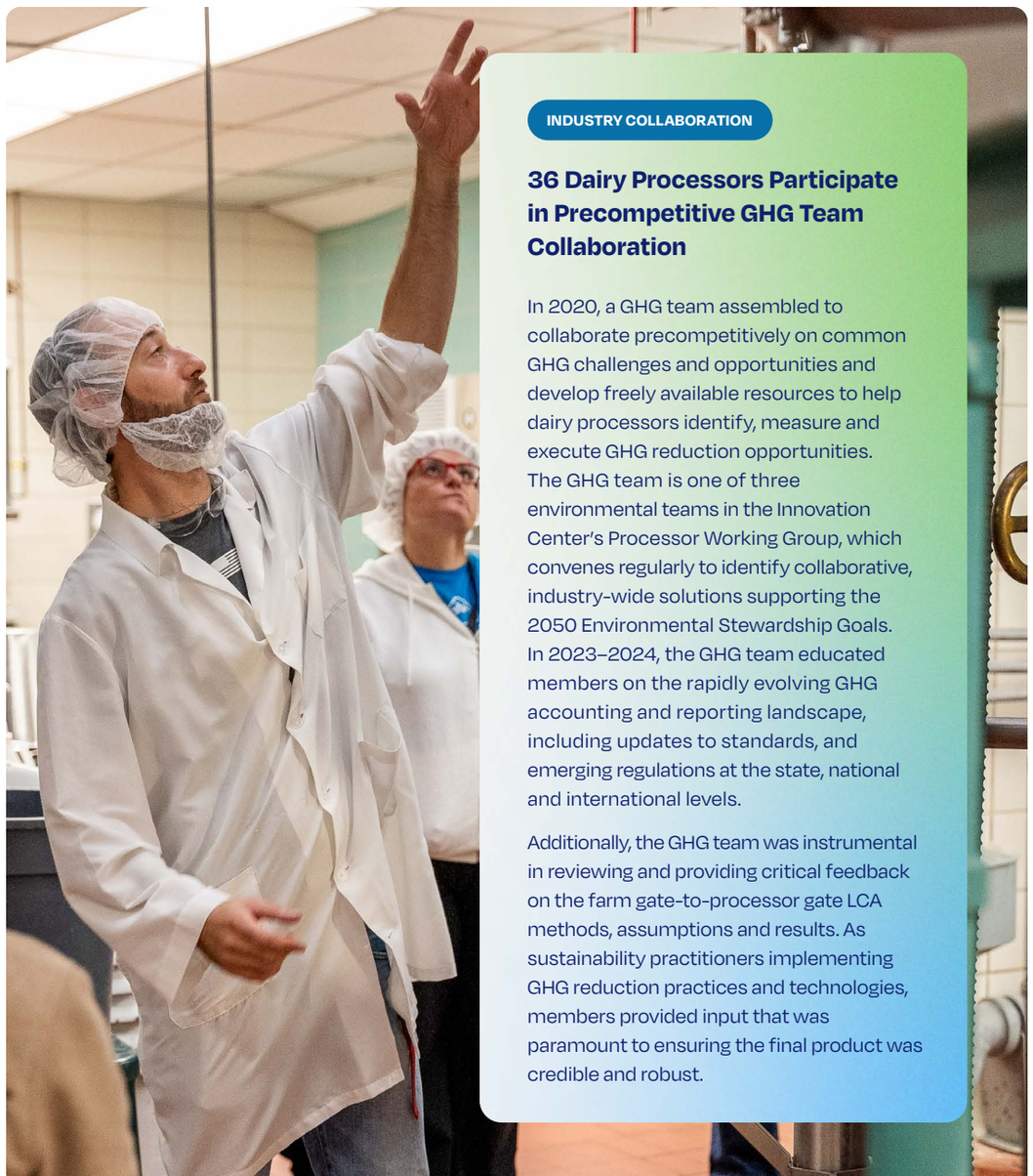
From 2020 to 2025,[13] the absolute GHG emissions from dairy processing, specifically, decreased approximately 2.2%. In the same time period, U.S. milk production grew by 4.7%, and dairy production (measured in pounds of final product) decreased by approximately 4.1%. Shifts in consumer demand and changes in product mix can significantly influence total dairy production as well as the dairy processing GHG footprint over time.

↓ 2.2%

approximate decrease in GHG emissions from dairy processing from 2020 to 2025[13]

PROCESSING ONLY GHG EMISSIONS





INDUSTRY COLLABORATION

36 Dairy Processors Participate in Precompetitive GHG Team Collaboration

In 2020, a GHG team assembled to collaborate precompetitively on common GHG challenges and opportunities and develop freely available resources to help dairy processors identify, measure and execute GHG reduction opportunities. The GHG team is one of three environmental teams in the Innovation Center's Processor Working Group, which convenes regularly to identify collaborative, industry-wide solutions supporting the 2050 Environmental Stewardship Goals. In 2023–2024, the GHG team educated members on the rapidly evolving GHG accounting and reporting landscape, including updates to standards, and emerging regulations at the state, national and international levels.

Additionally, the GHG team was instrumental in reviewing and providing critical feedback on the farm gate-to-processor gate LCA methods, assumptions and results. As sustainability practitioners implementing GHG reduction practices and technologies, members provided input that was paramount to ensuring the final product was credible and robust.

12 Pelton, R, Bernal, F, Kurt, T. (2025). Comprehensive spatial greenhouse gas emissions from U.S. dairy products [Manuscript submitted for publication].
13 Data sources were updated to 2025, 2024 and 2023 where possible. However, certain data inputs remain unchanged from 2020 due to limited availability of updated information.

Investments in Technology and Practices

While many practices and technologies can largely apply to dairy processors nationally, it is important to note that no two dairy processing facilities are the same. Like dairy farms, every processing location has unique aspects driven by geography, products produced, process technologies and more. As outlined in the Dairy Processor GHG Reduction Opportunities Guidance, processors have several avenues to consider for reducing their GHG footprints.

In conjunction with the LCAs, U.S. dairy is also developing a decarbonization roadmap that illustrates potential combinations of technologies and practices that can enable dairy processors to cost effectively reduce GHG emissions. Because dairy processing can be energy intensive, the most cost-effective GHG interventions include upgrades to make compressors, heat pumps and condensers more energy efficient, optimizing pipe insulation, installing automated controls, and LED lighting retrofits. Other GHG reduction opportunities exist, such as boiler upgrades, combined heat and power systems, and onsite solar, although these can often be cost prohibitive in the short term and require larger investments.

PROGRESS TO 2050

Progress Reported by Stewardship Commitment Adopters

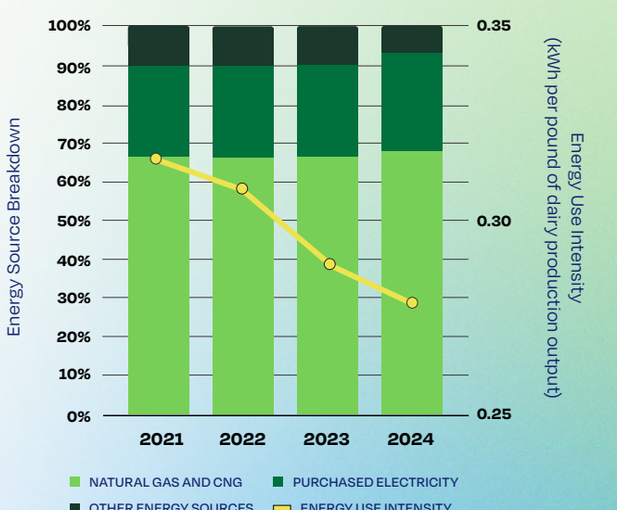
U.S. dairy companies that are adopters of the U.S. Dairy Stewardship Commitment report their emissions on an annual basis and have been doing so through the Processor Stewardship Reporting Tool since its launch in 2020. The reported emissions are aggregated to provide an industry-level view of progress. The Innovation Center developed resources for dairy companies, including Scope 1 and 2 Inventory Guidance, Scope 3 Inventory Guidance, and Processor Emissions Reduction Opportunities.

The accuracy, quality and completeness of this data continues to improve, and remains a focus for adopters in their annual sustainability reporting. The GHG intensity data reported by Stewardship Commitment adopters has been temporarily omitted from this year's report while validation work is underway. To ensure that data reported is both credible and decision-useful, adopters of the U.S. Dairy Stewardship Commitment remain fully committed to measuring, improving and transparently reporting their GHG performance. Once the data has been reviewed and validated, it will be included in future reports as part of our ongoing commitment to accountability and continuous improvement.

Legacy adopters of the Stewardship Commitment representing approximately 74% of U.S. milk production reported a 13% reduction in energy use intensity within processing facilities since 2021.

13%
reduction in energy use intensity reported by legacy adopters from 2021 to 2024

13%
increase in grid electricity generated from renewable sources reported by legacy adopters from 2021 to 2024



Building Efficiency and Processing Infrastructure Efficiency

Whether through HVAC, lighting or boiler upgrades, processors have a variety of options to reduce Scope 1 and 2 emissions through efficiency measures.

CASE STUDY

Tillamook Deploys Reverse Osmosis, Saving 1.4 Million kWh per year[14]

As part of the cheesemaking process, curds are separated from whey. The liquid whey is then concentrated—typically through evaporation—to produce a powder used in nutritional supplements and animal feed. To increase the plant's ability to receive more whey, Tillamook County Creamery Association invested in improving efficiency at this stage and optimized the volume of production flowing through the whey plant's reverse osmosis unit.

By increasing the volume of solids captured, the company reduced energy demand and saved approximately 1.4 million kWh per year. Additional operational fine tuning of equipment flow rates of steam helped yield an additional 900,000 kWh in annual energy savings. By adjusting system controls to meet exact demand from incoming product, the team achieved lower steam and electricity consumption and yielded over 2 million kWhs per year in energy reduction.

Renewable Energy

Procuring and/or producing renewable energy is an option for processors to significantly lower their Scope 2 emissions, often at a competitive expense to traditional energy sources such as natural gas, oil and coal.

CASE STUDY

Great Lakes Cheese Invests in Renewable Energy Sources[15]

Great Lakes Cheese's commitment to reducing GHG emissions is evident through its participation in a Virtual Power Purchase Agreement (VPPA), which enables the company to source renewable energy generated by a wind farm in Marion County, Kansas. The VPPA was facilitated by Walmart, and Great Lakes Cheese is joined by several other companies that signed the agreement.

In 2024, Great Lakes Cheese's participation in the VPPA accounted for 35% of the company's energy usage. Over the agreement's term, it is expected that 250,000 megawatt-hours of renewable power will be generated—the equivalent of avoiding emissions from more than 458,000 gasoline-powered passenger cars driven in a year.

CASE STUDY

United Dairymen of Arizona's Milk Hauling Fleet Reduces Emissions[16]

United Dairymen of Arizona (UDA) is accelerating its sustainability efforts by transitioning its milk-hauling fleet to compressed natural gas (CNG) trucks. As of 2024, 31 CNG trucks are in operation, with a goal of 69 by 2034. The switch to CNG not only reduces GHG emissions but also lowers fuel costs, improves air quality and supports local job creation. Backed by its Board of Directors, UDA formed partnerships with six carrier companies, including Ozinga Energy, Duco Geo Solutions and Shull Transportation, to fully transition their fleets to natural gas. UDA is also leveraging renewable natural gas (RNG) sourced from landfill digesters through a partnership with Waste Management, creating a more circular and sustainable fuel system.

The shift to CNG is central to UDA's goal of cutting total emissions by 50% by 2030 under the SBTi. Since October 2024, the transition has already reduced transportation-related CO_2 emissions by 7%. Once the full fleet is converted, UDA anticipates up to a 82.3% reduction in transportation emissions.

14 Tillamook. *2023 Stewardship Report*. https://www.tillamook.com/stewardship-report/environmental-action
15 Sources: International Dairy Foods Association. (n.d.). International Dairy Food's Association (IDFA)'s post. https://www.linkedin.com/posts/idfa_as-we-continue-our-celebration-of-earth-day-activity-7321205438555869186-udMO/ and Walmart. (2022). Gigaton PPA: Walmart, Ørsted and Schneider Electric announce first cohort for renewable energy supply chain program. https://corporate.walmart.com/news/2022/10/18/gigaton-ppa-walmart-rsted-and-schneider-electric-announce-first-cohort-for-renewable-energy-supply-chain-program
16 United Dairymen of Arizona. https://stewardship.uda.coop/environment

Water Use and Recycling

As water availability varies regionally, dairy farmers and processors are working to increase efficiency across milk production and processing. While management approaches are tailored to individual operations and locations throughout the U.S., practices such as water reuse and recycling are common on dairy farms and in processing plants.

The dairy community manages water as a shared essential natural resource. U.S. dairy's blue water use accounts for approximately 3% of the nation's freshwater withdrawal. While the full dairy value chain relies on water, approximately 97% of U.S. dairy's water use occurs during feed production. Less than 3% of U.S. dairy's total water use is used for milk production, processing and other purposes.[17]

PROGRESS TO 2050

U.S. dairy is committed to optimizing its water use and increasing recycling by 2050 across field, farm and processor, and has a track record of water use efficiency improvements:

- According to Rotz et al., (2024), the intensity of blue water use at the field and farm level decreased by approximately 50% between 1971 and 2020. The authors attribute this progress primarily to conversion from furrow irrigation to center pivot irrigation systems, along with improvements in cattle feed efficiency.[18] Other research supports this trend, as Capper et al., (2009) note an approximate 30% decline in on-farm water consumption per liter of milk from 2007 to 2017.[19]
- For dairy processing, legacy adopters of the U.S. Dairy Stewardship Commitment, representing nearly 74% of U.S. milk production, reported a 20% improvement in water withdrawal intensity since 2021. For more information, see page 33.

↓ 30%

decline in on-farm water consumption per liter of milk from 2007 to 2017

↓ 20%

reduction in water withdrawal intensity since 2021 reported by legacy adopters of the U.S. Dairy Stewardship Commitment

Progress Towards 2050 Goal Starts With Measurement

Comprehensive datasets corresponding to the scope and boundary of U S. dairy's water use footprint (from field and farm through processing), are not publicly available. The Innovation Center is committed to developing and implementing a robust water use and recycling measurement strategy to track industry progress towards the goal to optimize water use while maximizing recycling by 2050.

Improvements in water use efficiency enable the dairy industry to maintain or increase production using less water, supporting long-term food and nutrition security without depleting water resources. Water use measurement strategies need to account for not only water withdrawn from surface and groundwater sources but also water returned to the watershed through infiltration and recharge (i.e., water balance). A substantial amount of water on dairy farms and within dairy processing facilities is reused or recycled often multiple times, further contributing to the efficient use of this critical resource.

Water management is a complex task, and the industry's water measurement and reporting strategy must consider many factors and complexities to be credible. Estimating water balance needs to account for local precipitation amount and timing, irrigation practices and technologies, groundwater and surface water sources as well as pressures (i.e., scarcity), local hydrology characteristics, and other factors. In addition, water rights and regulations vary significantly by state and can be influenced by interstate compacts, changing policies and shifting jurisdictions.

Given these constraints, it is important for farmers to understand their individual operations in terms of water use efficiency and opportunities for improvement, in addition to estimating water use efficiency at a national level to demonstrate industry-wide progress over time. At the level of the individual farm, scientists at DMI are exploring the potential to develop a water use efficiency model that could enable scenario planning and inform decision making.

After consulting with a variety of stakeholders throughout 2023–2025, the Innovation Center developed a draft process for estimating national level, industry-wide water use efficiency and is receiving third-party feedback. U.S. dairy's national water use and recycling measurement strategy will follow LCA methodologies, conforming with IDF, FAO and ISO methodologies, and will have a scope of cradle-to-processor gate, with a geographical boundary of the area used in feed production, farming and processing. Results will be aggregated at a national level, starting with a baseline year of 2020. As the measurement strategy advances, progress updates on this goal will be reported.

Processing-specific data reported by adopters of the U.S. Dairy Stewardship Commitment, in addition to other external third-party data sources, will inform the analysis and model to estimate water use efficiency during processing.

17 Rotz, A., Stout, R., Leytem, A., Feyereisen, G., Waldrip, H., Thoma, G., Holly, M., Bjorneberg, D., Baker, J., Vadas, P. & Kleinman, P. (2021). Environmental assessment of United States dairy farms. *Journal of Cleaner Production, 315*, p. 128153.

18 Rotz, C. A., Beegle, D., Bernard, J. K., Leytem, A., Feyereisen, G., Hagevoort, R., Harrison, J., Aksland, G., & Thoma, G. (2024). Fifty years of environmental progress for United States dairy farms. *Journal of Dairy Science, 107*(6), 3651–3668. https://doi.org/10.3168/jds.2023-24472

19 Capper, J. L., Cady, R. A., & Bauman, D. E. (2009). The environmental impact of dairy production: 1944 compared with 2007. *Journal of Animal Science, 87*(6), 2160–2167. https://doi.org/10.2527/jas.2009-1781.

On-Farm Water Efficiency

Dairy farmers do not take an ounce of water for granted. In fact, the typical journey of a single drop of water on a dairy farm is complex. Whether used to clean milking equipment, keep cows hydrated, or grow crops, farmers across the United States work with local communities and researchers to continually optimize their water usage.

Water plays many roles on a farm. For example, water is typically used to help chill milk from 101°F to 38°F. Many farmers choose to re-use the same water as a safe drinking option for their cows. Dairy farmers may choose to re-use the water to rinse cow manure from their barns, enriching the water with a natural fertilizer that can be recycled to grow crops for feed. Recycling water decreases overall usage and consumption, saving farmers money while improving their environmental and community impact.

CASE STUDY

McCarty Family Farms Recovers and Reuses Water From Farm to Plant[20]

McCarty Family Farms, a B-Corp certified dairy farm located in Kansas, takes great care when it comes to water re-use and recovery. The farm operates a state-of-the-art milk condensing plant on-site, where the milk's natural water is extracted before the milk is transported to a dairy processing company. The reclaimed water is then used to clean and maintain the processing plant, clean the barns, irrigate crop land, and be consumed by the cows. Through this innovative approach and technology, McCarty Family Farms is able to reclaim approximately 158 million gallons of water annually.

20 Sources: Dairy Management, Inc. https://www.usdairy.com/news-articles/dairy-farm-water-usage and McCarty Family Farms. Creating a positive environmental impact. https://www.mccartyfamilyfarms.com/environmentalimpact

Dairy Processing Approach to Water Management

Water is a vital resource in dairy processing, essential for sanitation, product formulation, cooling and more. Operating under a robust framework of environmental regulations, processors routinely undergo inspections, testing and reporting to ensure compliance. Through ongoing efforts to reduce water use and invest in operational efficiencies, U.S. dairy processors are committed to safeguarding shared water resources.

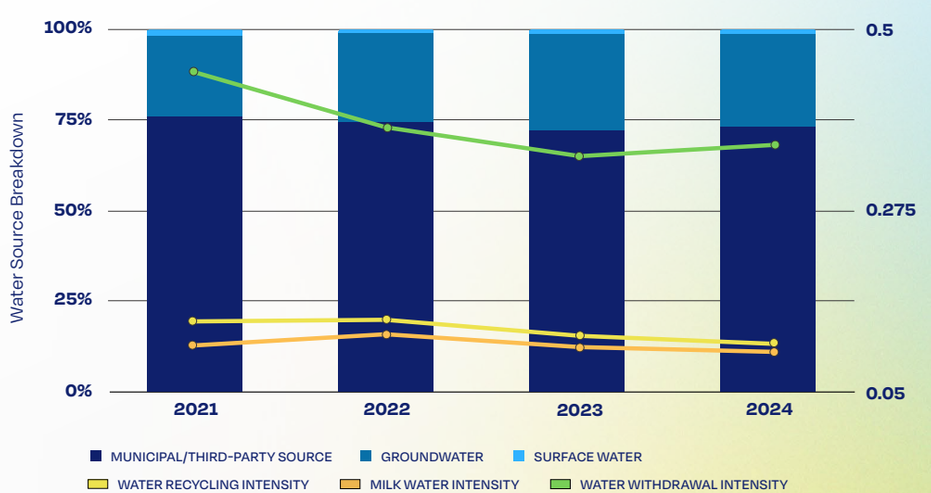
PROGRESS TO 2050

Progress Reported by Stewardship Commitment Adopters

Since announcing the industry's goal to optimize water use and increase recycling in 2020, U.S. dairy cooperatives and processors that adopted the U.S. Dairy Stewardship Commitment have consistently measured and reported key water performance indicators in the Processor Stewardship Reporting Tool. Now with four years of aggregated data, the industry can analyze water performance trends and track processor performance toward the 2050 goals.

U.S. dairy cooperatives and processors that reported data as part of the Stewardship Commitment since 2021 are referred to as legacy adopters. The legacy adopters, which represent approximately 74% of U.S. milk production, demonstrated a 20% improvement in water withdrawal intensity from 2021 to 2024.

WATER WITHDRAWAL AND RECYCLING FROM 2021 TO 2024



↓ 20%
reduction in water withdrawal intensity reported by legacy adopters from 2021 to 2024

INDUSTRY COLLABORATION

33 Processors Comprise Processor Working Group Water Team

The Processor Working Group water team collaborates on shared challenges, opportunities and best practices related to in-plant water stewardship and develops precompetitive resources to help processors improve their water management practices. For example, the water team developed the Dairy Processing Water Savings Opportunities guidance to help processors identify and implement strategies to conserve, capture and recycle water by product type. The guidance was developed in consultation with industry water experts to ensure best practices are included.

CASE STUDY

Hilmar Cheese Company Reuses Nearly 100% of Milk Water[21]

Hilmar Cheese Company employs a comprehensive water management strategy across its manufacturing facilities. Nearly 100% of the water originally contained in the milk it processes is captured and reused. During production of cheese, whey protein, lactose and animal feed, Hilmar recovers and purifies the remaining water for reuse in equipment cleaning, facility sanitation, and boiler steam generation. Used wash water is then directed to on-site or local water reclamation and biogas facilities, where it is treated and converted into biogas. The recycled water is further repurposed for landscaping and crop irrigation, supporting both operational efficiency and environmental stewardship.

21 Hilmar Cheese Company Sources: 2023 Corporate Sustainability Report. https://www.hilmar.com/wp-content/uploads/2023/07/Hilmar-Cheese-Corporate-Sustainability-Report.pdf and the Sustainability page of their website https://www.hilmar.com/sustainability/

Water Quality and Nutrient Management

Water quality is critical for thriving dairy production systems—from farms to processors—and is a shared priority for the U.S. dairy industry and broader society. U.S. dairy actively manages water quality during feed production, milk production and dairy processing to protect surrounding communities and the general public. The Innovation Center set a 2050 goal to improve water quality by optimizing the utilization of manure and nutrients.

Properly managed water quality practices are essential to meet and maintain regulatory requirements. From managing nutrient runoff on farms to treating wastewater at processing facilities, dairy producers and processors comply with stringent federal and state regulations, such as the Clean Water Act administered by the U.S. Environmental Protection Agency (EPA). These regulations most often require dairy operations and processing plants to obtain permits, which regulate wastewater volume and pollutant levels. Many states have additional permitting, nutrient management, or water monitoring requirements specific to dairy operations.

U.S. dairy is committed to improving water quality by optimizing the utilization of manure and nutrients by 2050.

Progress Towards 2050 Goal Starts With Measurement

Reporting aggregated water quality outcomes at a national level, especially from cradle-to-farm gate, has limitations in informing meaningful action at a local or regional level, given the specificity of external factors and production practices involved. Estimating water quality outcomes associated with different agricultural practices is complex due to a variety of factors such as the topography, soil type, geology, precipitation events, surrounding ecosystem, and practices of other users within the same watershed. Factors directly attributed to dairy production include manure collection, treatment, storage and application practices, crop rotation and nutrient uptake rates, feed production practices such as cover cropping and conservation tillage, field management and drainage, the use of buffer strips and other edge-of-field practices, among other factors.

To address these measurement challenges, the Innovation Center aims to model water quality outcomes at an individual farm level. Enabling farmers and farm advisors to model water quality outcomes in the context of their operational and local conditions is critically important, along with the ability to understand how different management practices impact water quality and production outcomes.

To this end, the Innovation Center is exploring an opportunity to build the capability to model farm-level water quality outcomes in collaboration with the team at RuFaS, so that producers and farm advisors can understand the impacts of different practices on water quality outcomes in the context of other trade-offs within

their production system. In collaboration with external scientists, the process of integrating the water quality measures and outcomes into the RuFaS model has been initiated. Once complete, the model will be validated and refined against available empirical research and expert input, as appropriate.

Processing-specific data reported by adopters of the U.S. Dairy Stewardship Commitment will be leveraged, in addition to other external third-party data sources, to estimate water quality outcomes during processing.

As the measurement strategy advances, national-level progress updates on this goal will be reported.

On-Farm Water Quality Practices

While dairy farmers have limited influence over field-specific practices for feeds grown by suppliers, they have direct operational control over feeds they grow. Farms develop and use nutrient management plans and other practices to protect air, soil and water quality. Effective nutrient and manure management supports water quality while delivering multiple co-benefits such as increasing water-holding capacity and organic carbon content of soil, which can also improve crop productivity.

Dairy farmers across the country demonstrate field practices, edge-of-field practices, manure handling and nutrient management technology can reduce runoff and protect the quality of the water that leaves the farm.

Techniques include:

- Nutrient management plans to identify and document opportunities to reduce runoff
- No-till farming to reduce soil erosion and increase water filtration and soil retention of organic matter
- Planting cover crops to optimize feed production and retain soil nutrients for better health
- Installation of buffer strips to minimize runoff into waterways
- Sub-surface application of manure to incorporate nutrients into the soil with minimal exposure to water runoff
- Using precision agriculture techniques to preserve soil nutrients and water quality

PROGRESS TO 2050

On-Farm Improvements in Water Quality

The Innovation Center reviewed potential contributors to water quality outcomes, informed by scientists and industry experts, and established consensus on two priorities for measurement and reporting, given their potential to have negative ecosystem impacts: (1) sediment, and (2) nutrients, specifically nitrogen and phosphorus.

The two primary routes by which sediment and nutrients find their way into watersheds are through runoff and leaching. Runoff occurs when precipitation (in the form of rain, snowmelt or irrigation) exceeds the soil's capacity to absorb water, with the excess water flowing into the watershed or basin. Leaching is the downward movement of water and dissolved substances into groundwater. Sediment is almost solely an issue of erosion and runoff, whereas nitrogen and phosphorus have the potential to access surface or groundwater through either runoff or leaching.

Modeling efforts strongly suggest that U.S. dairy's contribution to nitrogen leaching, nitrogen runoff and phosphorus runoff—both soluble and "legacy" phosphorus contained within sediment—decreased substantially between 1971 and 2020.[22]

CASE STUDY

Maryland Dairy Farm Restores 14,000 Feet of Streams and Plants 60,000 Trees to Protect Chesapeake Bay[23]

Located within the Chesapeake Bay watershed, Long Green Farms in Rising Sun, Maryland, is committed to being a responsible steward of the waterways that flow through the farm. The farm employs a number of best practices to manage water runoff from rainfall events, including a covered, heavy-use area with manure storage and a non-eroding surface in areas used by animals. In addition, the farm reforested pastureland near a waterway to improve its riparian buffer through a partnership with the Alliance for the Chesapeake Bay. This is complemented by another effort with the Appalachian Stream Restoration and Wetland Studies to reconstruct more than 14,000 linear feet of streams and plant approximately 60,000 trees. These initiatives support overall water quality and water management in a large watershed that is home to millions of people.[24]

CASE STUDY

Trinkler Dairy Optimizes Water Quality and Reduces Water Usage by 36%

Trinkler Dairy in Northern California partnered with Sustainable Conservation, Netafirm and UC-Davis to evaluate and verify the economic viability of the dairy's irrigation system. The innovative manure sub-surface irrigation system monitors and tests impacts on GHG emissions, water savings and water quality. The project led to a 36% reduction in water usage, a reduction in nitrogen application and a five-fold decrease in nitrous oxide emissions. The water savings led to a net financial benefit. This type of research is necessary for understanding yields, environmental impacts and financial feasibility.

22 Rotz, C. A., Beegle, D., Bernard, J. K., Leytem, A., Feyereisen, G., Hagevoort, R., Harrison, J., Aksland, G., & Thoma, G. (2024). Fifty years of environmental progress for United States dairy farms. *Journal of Dairy Science, 107*(6), 3651–3668. https://www.journalofdairyscience.org/article/S0022-0302(24)00010-9/fulltext

23 Long Green Farms. Conservation efforts. https://www.longgreenfarms.com/conservation-and-sustainability

24 National Oceanic and Atmospheric Administration https://www.fisheries.noaa.gov/topic/chesapeake-bay

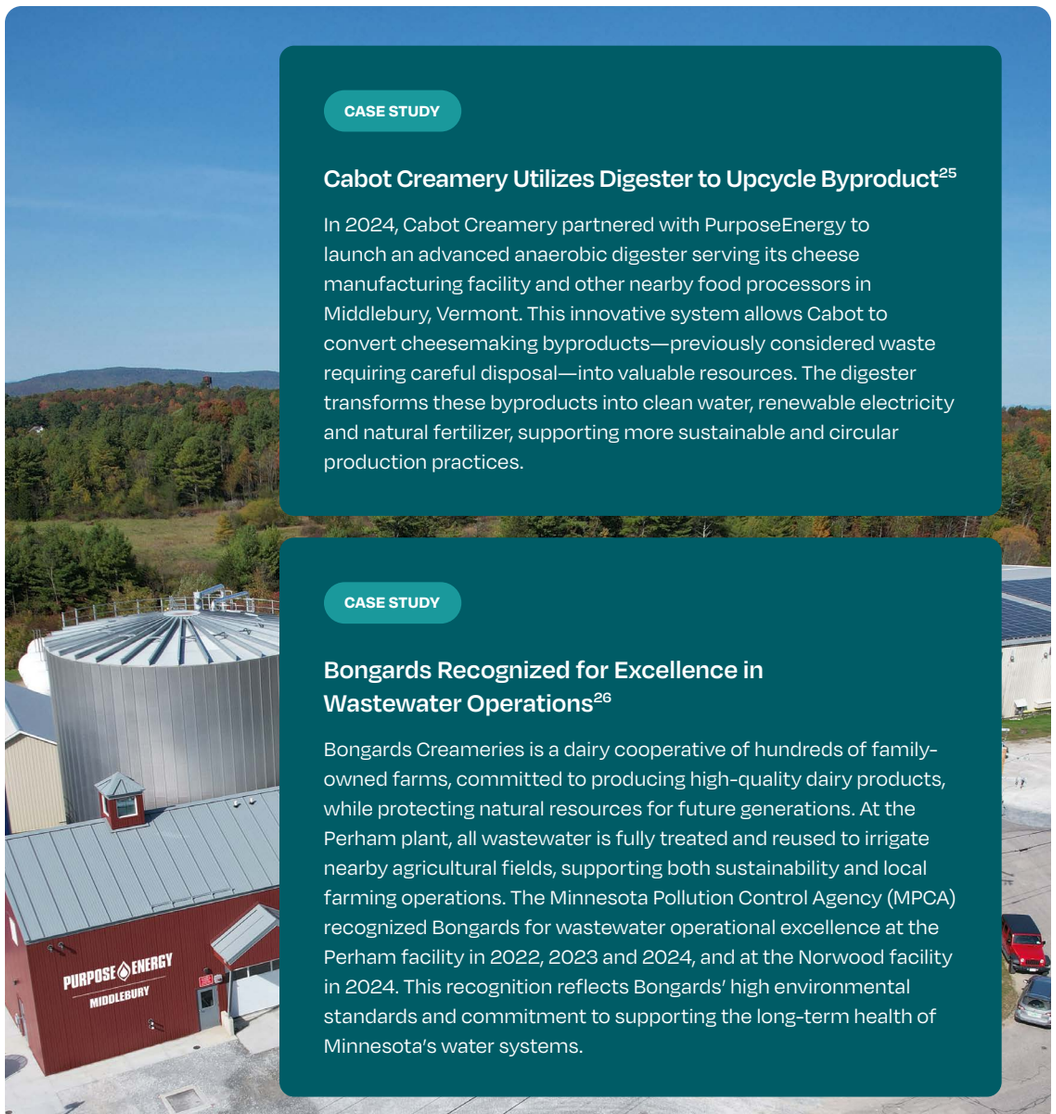
Processing Water Quality Practices

At the processing level, effluent treatment and discharge practices are highly regulated and more accessible to modification and oversight. Dairy processors implement policies, procedures or monitoring systems to ensure compliance with related standards and regulations.

Dairy wastewater treatment is a complex process resulting from a wide variety of product types such as milk, yogurt, cheese, cream, butter and ice cream. Treatment systems typically combine several stages—ranging from pre-screening and dissolved air flotation to more advanced technologies—tailored to the specific composition and flow rate of the wastewater. Due to the variability in production processes and wastewater characteristics, each processing facility requires a customized approach.

Proper characterization of the wastewater is essential to designing an effective and sustainable treatment system. A well-planned combination of technologies ensures compliance with environmental discharge regulations and supports water reuse strategies. Treated wastewater can be released into municipal sewage systems, discharged into the natural environment, or stored for external waste management—options that are heavily influenced by cost, local regulations, and environmental considerations.

Wastewater reuse represents the most sustainable option, although it demands more advanced infrastructure. When reclaimed properly, wastewater can support non-potable uses such as irrigation or equipment washing, reducing the demand on freshwater resources. Investing in efficient, site-specific treatment systems supports efforts to meet the industry's goal of improving water quality.



CASE STUDY

Cabot Creamery Utilizes Digester to Upcycle Byproduct[25]

In 2024, Cabot Creamery partnered with PurposeEnergy to launch an advanced anaerobic digester serving its cheese manufacturing facility and other nearby food processors in Middlebury, Vermont. This innovative system allows Cabot to convert cheesemaking byproducts—previously considered waste requiring careful disposal—into valuable resources. The digester transforms these byproducts into clean water, renewable electricity and natural fertilizer, supporting more sustainable and circular production practices.

CASE STUDY

Bongards Recognized for Excellence in Wastewater Operations[26]

Bongards Creameries is a dairy cooperative of hundreds of family-owned farms, committed to producing high-quality dairy products, while protecting natural resources for future generations. At the Perham plant, all wastewater is fully treated and reused to irrigate nearby agricultural fields, supporting both sustainability and local farming operations. The Minnesota Pollution Control Agency (MPCA) recognized Bongards for wastewater operational excellence at the Perham facility in 2022, 2023 and 2024, and at the Norwood facility in 2024. This recognition reflects Bongards' high environmental standards and commitment to supporting the long-term health of Minnesota's water systems.

PROGRESS TO 2050

Progress Reported by Stewardship Commitment Adopters

Since announcing the industry's goal to improve water quality in 2020, U.S. dairy cooperatives and processors that adopted the Stewardship Commitment have been reporting on water quality at processing levels, including discharge volume, as well as policies, programs and monitoring systems to ensure water quality compliance. Reported by adopters representing approximately 76% of U.S. milk production in 2024, the scope of this data covers the water quality efforts within their processing operations. Visit the Appendix to learn more.

25 Cabot Creamery. Environmental highlights. https://cabotcreamery.com/blogs/community/impact-in-depth#environmental-highlights

26 Bongards. Committed to a greener future. https://www.bongards.com/about/sustainability/

Healthy Ecosystems

U.S. dairy farmers have long recognized their role within ecosystems and how their management practices related to soil, water, nutrients and biodiversity can support overall ecosystem health. For this reason, farmers and the entire dairy community understand the responsibility that comes with being in the heart of a natural ecosystem. This responsibility extends to the role that U.S. dairy has in driving the research, pilots, best practices and innovations that support the health of ecosystems and contribute toward the creation of a sustainable food system.

In 2022, the FARM Environmental Stewardship program released the Conservation Practice Questionnaire (CPQ), which covers environmental topics such as biodiversity, soil health and water. As of May 2025, 843 CPQ evaluations were completed by dairy farms, reporting the following:

77%
of responding farms recycle water, with the vast majority of those reusing plate cooler water

>50%
of responding farms manage land or habitat for beneficial purposes such as for pollinator, threatened or endangered species, or other wildlife habitats

The CPQ also asks about field conservation practices in cases where the dairy farmer plays a role in production decisions for the pastureland or cropland used to produce the dairy's feed or forage:

92%
of responding farms use at least one field conservation practice, with 63% of farms planting cover crops and 52% using grassed waterways

Soil Health and Quality

Dairy farms are doing their part to improve soil health by increasing organic matter through manure-based products, using no-till practices and planting cover crops. One of the many ways that the U.S. dairy community is taking action to promote soil health is through the **Dairy Soil and Water Regeneration (DSWR) project**, the largest soil health research project on working dairies in the U.S. The six-year project, launched in 2023, focuses on elucidating soil health, agronomic yield, GHG and water quality benefits of practices like cover cropping, conservation tillage, and the field-application of novel manure-based products resulting from the separation of fine solids from manure.

The project's activities are split into three overall tasks:

Task 1: General assessment to provide a scientific baseline on soil carbon sequestration and soil health on dairy farm fields across a range of cropping practices.
Task 2: Field research to measure the environmental benefits of field manure use and soil health practices.
Task 3: Communications with farmers and engagement with stakeholders, modelers, researchers, NGOs and the general public.

In total, 17 unique sub-projects are underway in collaboration with eight different leading dairy research institutions in six production regions across the country. DSWR is supported by a $10 million grant from FFAR with contributions from Nestlé, Starbucks, Newtrient and DMI.

Biodiversity

Biodiversity is the variety and variability of all living things within an agricultural ecosystem and has a direct influence on dairy farms and their productivity. Feed and milk production depend on the natural resources that healthy ecosystems provide, such as fertile soil, clean groundwater, and essential minerals.

Dairy farming can positively contribute to biodiversity due to its unique potential to protect and enhance biodiversity, on-farm and beyond, through management practices. For example, one of the co-products of dairy production is a natural organic fertilizer, which, when applied appropriately, supports soil biodiversity and serves as a vital nutrient source for crops. This practice reduces the reliance on synthetic fertilizers, thereby promoting more sustainable agricultural practices.

CASE STUDY

Farmers for Sustainable Food Records 369,000 Tons of Soil Saved[27]

Farmers for Sustainable Food (FSF) is a collaborative, non-profit organization that promotes and supports farmer-led solutions to today's environmental challenges. FSF's annual conservation survey documented conservation practices and farmers' dedication to bettering soil quality for the seventh consecutive year. In 2024, 257 farmers, representing over 275,000 acres and 378,000 head of livestock, participated in the survey. Farmers reported reducing sediment loss by nearly 369,000 tons, equivalent to over 36,000 dump trucks' worth of soil.

CASE STUDY

100% of Cayuga Milk's Farms Assess Biodiversity

Cayuga Milk, a farmer-owned company in New York, delivers dairy ingredients while protecting the land for future generations. 100% of their farms are biodiversity-assessed annually, with a focus on soil health, nutrient balance and carbon reduction. The annual reviews bring together industry experts and farm advisors to examine and identify areas of improvement.

27 Farmers for Sustainable Food. (2025, April). 2024 Progress Report [PDF]. https://farmersforsustainablefood.com/wp-content/uploads/2025/04/2024_FSF_Progress-Report.pdf

Circularity

The U.S. dairy community has implemented circular practices for decades and remains committed to sharing those practices and further advancing its role in doing more with less while reducing waste. From a sustainability perspective, circularity refers to a set of practices and behaviors that make efficient use of resources and minimize waste throughout a product's or material's life cycle. This contrasts with a linear model of consumption, where resources are used for production, and then a product is used and thrown away.[28]

Resource recovery and materials and packaging are material topics in the U.S. dairy materiality assessment. In response, a team was established within the Processor Working Group to identify, discuss and advance strategies to address product and ingredient packaging, recyclability, waste stream mitigation and much more. The team is comprised of 38 U.S. dairy companies.

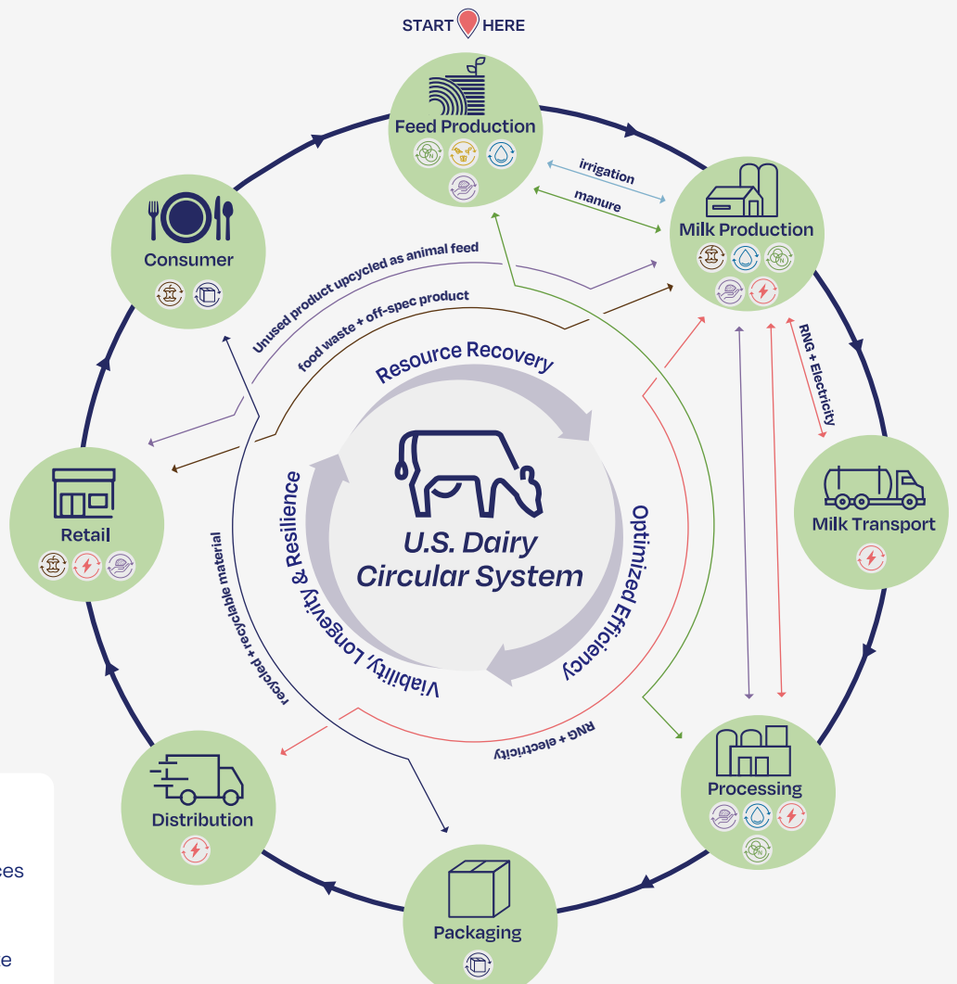
In 2024, the Innovation Center's Processor Working Group circularity team developed a Circularity Framework for the industry. This framework, while not exhaustive of every system, provides a unified perspective to communicate U.S. dairy's essential role in the circular economy.

U.S. dairy defines circularity as:

U.S. dairy, from field-to-processor gate, seeks to maximize resource efficiency and minimize waste. The industry can achieve a circular system through innovative and impactful collaboration that expands societal benefits.

Circularity for U.S. dairy will:

- **Ensure new technologies, processes and assets prioritize and maximize mutually beneficial resource recovery**
- **Design existing processes and assets to optimize efficiency and upcycling opportunities**
- **Invest in farm viability, longevity and resilience by bolstering ecosystem services, enhancing biodiversity and generating economic returns**



KEY

- Animal Feed
- Nutrients
- Recycled/Recyclable Packaging
- Regenerative Practices
- Renewable Energy
- Upcycled Food Waste
- Water Reuse

28 McKinsey & Company. (2024). *What is circularity?* https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-circularity

Sustainable Packaging and Materials

Packaging can be found nearly everywhere in daily life, from plastic bottles and bags to aluminum cans, cardboard boxes, and much more. Sustainable packaging is packaging designed to lessen its environmental impacts. Packaging that is designed to be lighter weight and efficient requires less raw material use overall.[29] Packaging that can be reused, recycled, or composted can result in reductions of both materials destined for landfills and GHG emissions.

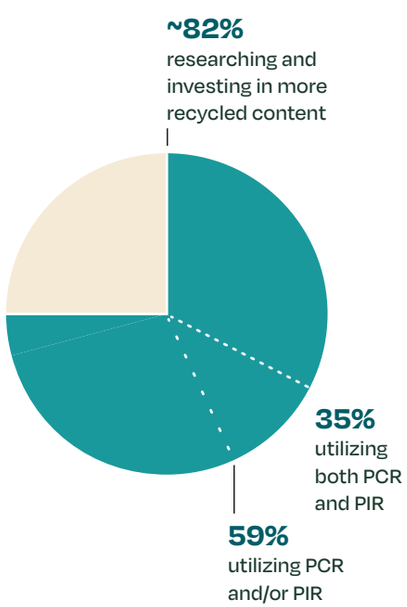
U.S. dairy is precompetitively collaborating to share innovative practices in an effort to reduce overall materials used, maximize recyclability and integrate recyclable materials into new packaging. Recognizing the positive environmental impact associated with the use of sustainable packaging, the Innovation Center for U.S. Dairy, through the U.S. Dairy Stewardship Commitment, introduced metrics in 2022 to track efforts related to recycled content, material optimization and material utilization.

In 2024, 34 reporting adopters of the Stewardship Commitment reported on their sustainable packaging journey:

RECYCLED CONTENT

~82%

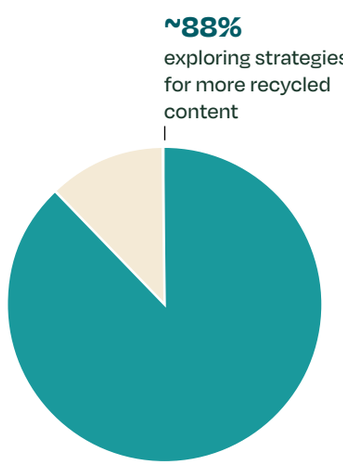
of the processors indicated they are researching and/or investing in the use of post-consumer recycled (PCR) and/or post-industrial recycled (PIR) content for primary and/or secondary product packaging. Of those, 59% reported they are currently utilizing PCR and/or PIR, with 35% using both.



MATERIAL OPTIMIZATION

~88%

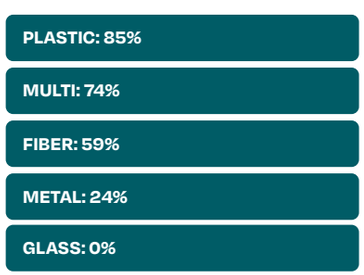
are exploring strategies to reduce or replace non-recyclable and/or non-compostable components in their packaging, with the majority selecting one or more of the following steps to indicate how far along they are in the process: (a) research and development, (b) supplier engagement, (c) pilots, (d) cost evaluation, (e) operationalized.



RECYCLABILITY AND COMPOSTABILITY

Processors reported a variety of packaging materials across fiber, metal, plastics and multi-material categories for their primary, secondary and tertiary packaging. The data indicates that many of the materials used in dairy product packaging are readily recyclable and/or contain recycled content.

Primary Packaging: Percentage of reporting adopters that are utilizing the following materials as a primary material in packaging.



29 Environmental Protection Agency. (n.d.). Sustainable Packaging. https://www.epa.gov/smm/sustainable-packaging

Waste and Resource Recovery

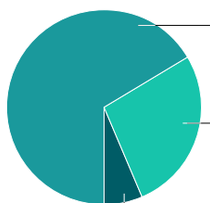
U.S. dairy continues to demonstrate creativity, innovation and resourcefulness in thoughtful reuse of waste and other resources. For example, when food waste might otherwise end up in a landfill and generate GHG emissions, dairy farms and processors often collaborate to identify financially viable solutions to repurpose it.

Stewardship Commitment Adopters Divert 94% of Waste from Landfill in 2024

Since 2021, adopters of the Stewardship Commitment reported their waste disposal methods, including the percentage of food/organics repurposed to feed people or animals or for industrial purposes.

In 2024, reporting adopters demonstrated a 94% waste diversion rate

2024 WASTE DISPOSAL BY WASTE STREAM



66.4%	Food/organics donated to feed hungry people or repurposed as animal feed and non-food recycled or composted
27.3%	Food/organics repurposed for industrial uses or compost and non-food repurposed for energy recovery
6.3%	Waste sent to landfill or incineration without recapturing energy

Below are examples of waste and resource recovery occurring in the U.S. dairy value chain:

UPCYCLING FOOD WASTE

Dairy cows are adept at consuming food byproducts, such as almond hulls, cottonseed, distiller's grains, citrus pulp and others. Depending on the location of the farm, these byproducts can make up nearly 40% of a cow's feed,[30] offering notable benefits. For example, feeding byproducts to cows helps avoid about 60% of the GHG emissions that would occur if the byproducts were incinerated in landfills.[30]

CONVERTING MANURE SOLIDS TO BEDDING

Maintaining a bed that is clean and comfortable for the cow is a primary goal in any dairy farm and helps lead to improved animal health and improved milk quality and production efficiency. Manure solid bedding, after being separated and cleaned, is increasingly common and a circular option. It works particularly well in more arid climates.

REUSING WATER ON-FARM

Dairy farms use water to cool milk, cool cows, dispose of manure and more. Water can be reused multiple times to support these processes. For more information about these practices, visit page 32.

CASE STUDY

Schreiber Foods Acts on Its Commitment to Zero Waste to Landfill[31]

As part of its sustainability strategy, Schreiber Foods has committed to zero waste to landfill globally and a 50% reduction in food waste stemming from its operations, both by 2030. At the company's Grand Rapids, Mich., manufacturing plant, team members work with a supplier that utilizes specialized equipment to convert waste that would otherwise end up in a landfill. The supplier can crush packaging containing protein drinks and milk and separate out the liquid, which is then converted into animal feed and provided to local farms. To promote innovation related to resource recovery, Schreiber has also invested in a start-up company, Brightly, which calculates carbon credits from methane emissions avoided by food rescue activities. A significant portion of the proceeds generated from these credits is then donated to non-profit food rescue organizations.

30 UC Davis CLEAR Center. (2022). *Dairy cows – the original upcyclers.* https://clear.ucdavis.edu/explainers/dairy-cows-original-upcyclers
31 Schreiber Foods. (2024). Doing Good Through Food report. https://www.schreiberfoods.com/responsibility/

Care for Our Animals and Communities

Dairy's social responsibility includes ensuring healthy animals, fostering a vibrant workforce and producing safe, high-quality dairy foods.

Overview

Caring for animals, supporting the dairy sector's workforce and ensuring food safety during the production of high-quality dairy products are among the top priorities for dairy farms and companies. U.S. dairy recognizes the importance of continuously investing and demonstrating its commitment in these topics in a transparent and robust manner.

INDUSTRY COLLABORATION

U.S. dairy has a long history of collaborating to drive positive impact throughout the value chain and in the communities where dairy production and processing takes place. Several organizations and industry-level committees support U.S. dairy with regards to caring for animals and communities, including:

The Innovation Center's Animal Care Committee and **Food Safety Committee** convene leaders across the industry to precompetitively collaborate on these topics.

The National Milk Producers Federation (NMPF) manages the **National Dairy Farmers Assuring Responsible Management (FARM)** program, and its Animal Care and Workforce Development Programs support and provide tools to deliver high-quality standards that U.S. dairy farmers use to care for animals and workers.

The International Dairy Foods Association (IDFA) supports the industry by advancing science-based food safety standards, fostering collaboration among technology and innovation experts, promoting workforce development through people-focused strategies, and measuring the industry's economic impact.

Animal Care

The U.S. dairy community recognizes and shares society's commitment to animal care. Dairy farms, cooperatives and processors understand that responsible cow care is not only central to high-quality milk production, but also essential to the integrity and sustainability of the entire dairy value chain.

FARM Animal Care

Animal care is not only vital to every dairy farm operation, it also has long been an industry-level priority. A cornerstone of this work is the National Dairy Farmers Assuring Responsible Management (FARM) Animal Care Program, operated by the National Milk Producers Federation (NMPF).

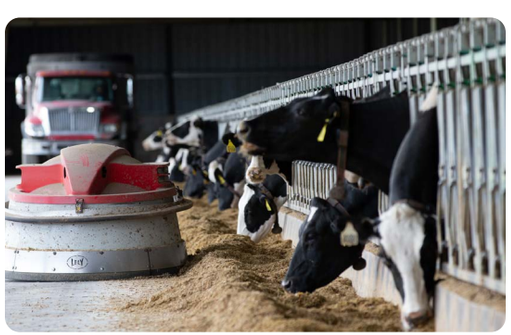
This voluntary yet widely adopted program—covering more than 99% of U.S. milk production—establishes rigorous, science-based animal welfare standards. Adherence to these standards is demonstrated through second-party evaluations and a statistically significant sample of third-party verification audits, ensuring accountability and continuous improvement. In addition to Animal Care, the FARM Program also includes programs on Antibiotic Stewardship and Biosecurity, which further reinforce the industry's commitment to herd health and responsible management.

Over 99%

of U.S. milk production participates in the FARM Animal Care program.

New Version of FARM Animal Care Launched in 2024

The FARM Animal Care Version 5 standards went into effect in July 2024, reflecting the industry's commitment to continuous improvement in animal care. These updated standards are the result of a comprehensive and collaborative process led by the NMPF. Approved by the NMPF Board of Directors in June 2023, Version 5 incorporates meaningful refinements developed through engagement with over 85 individual farmers, veterinarians, animal scientists, and cooperative and processor staff. The standards were informed by relevant scientific research, industry discussions, and more than 300 public comments submitted during a six-week comment period. All participating dairy farms are expected to complete a Version 5 evaluation by December 2027.



Key Components of the FARM Animal Care Program

Built on science, industry consensus, and continuous improvement, the FARM Animal Care program addresses the most critical aspects of animal welfare and reflects best practices broadly supported across the dairy community. Key components of the program reinforce a shared commitment to animal care and help establish a culture of accountability:

COW CARE AGREEMENTS outline expectations for responsible animal treatment and are required for all farm employees, both family and non-family.

CONTINUOUS EDUCATION AND TRAINING are core program elements. Topics include care of pre-weaned calves, safe animal handling, and assessing animal fitness for transport. Farms must document their employee education efforts as part of the evaluation process.

MANDATORY CORRECTIVE ACTION PLANS (MCAPs) require that the standard is met within nine months or less as determined by the program participant. Failure to meet this standard within this allotted time frame will result in the facility being placed on "Conditional Certification." If standards are not met after an additional 60 days, then the facility is classified as "Conditionally Decertified." A program participant will be delisted from FARM if they continue to procure milk from a "Conditionally Decertified" facility.

VETERINARIAN-CLIENT-PATIENT RELATIONSHIPS (VCPR) are required, including an annual veterinary review of the farm's Herd Health Plan to ensure animal health and nutrition protocols are current and effective. As of March 2025, over 70% of facilities had a valid, signed VCPR form.

ON-FARM EVALUATIONS AND VERIFICATION:

1. **Second-party evaluations** are conducted by certified FARM program evaluators within the farm's cooperative or processor network.
2. **Third-party evaluations** occur on a regular cycle and involve trained, independent experts who assess a representative sample of farms. These evaluations ensure program integrity and verify that implementation meets FARM's rigorous standards.

CONTINUOUS IMPROVEMENT PLANS (CIPs) require that action is taken to meet the standard within a minimum of three years or less as determined by the program participant. Similar to MCAPs, failure to meet standards within the allotted timeframe can result in the program participant being delisted from FARM.

Alignment With Animal Welfare Frameworks

The FARM Animal Care Program is the **first livestock animal care program globally recognized by the ISO Animal Welfare Management standards**. It also aligns with international best practices by undergoing a formal standards review and update every three years. Updates to the program include input from dairy farmers, veterinarians, animal scientists, cooperatives and processors—ensuring the program remains current with emerging science and evolving expectations.

Five Domains

The FARM Animal Care Program draws on globally recognized models, such as the Five Domains, which provide a structured approach to meeting the physical, behavioral and emotional needs of animals under human care. Below are key areas where the FARM Program aligns:

NUTRITION

Proper nutrition is central to cow health and welfare. The FARM program requires that all animals have access to clean water and sufficient, nutritious feed to support maintenance, growth and well-being. Additional accommodations are made for pre-weaned calves and nonambulatory animals to ensure their specific nutritional needs are met.

ENVIRONMENT

The physical environment significantly impacts animal comfort and welfare. FARM standards ensure animals have access to a clean, dry and well-ventilated resting area that protects them from extreme temperatures. Adequate space, bedding and the ability to interact with other cattle are also core expectations.

HEALTH

Each participating farm must have a comprehensive Herd Health Plan, developed and reviewed annually in partnership with a veterinarian. Farms are also required to maintain at least two years of treatment records for common illnesses to support effective health management and traceability.

BEHAVIOR

The FARM program promotes conditions that allow cows to express natural behaviors. This includes access to daily exercise (weather permitting for outdoor animals) and management practices that respect the animals' behavioral needs.

MENTAL WELL-BEING

The mental state of animals—such as their ability to avoid fear, distress and anxiety—is a critical component of welfare. The FARM Animal Care Program integrates a robust set of standards designed to reduce stress and support cow comfort, from environmental management to human-animal interaction standards.

CASE STUDY

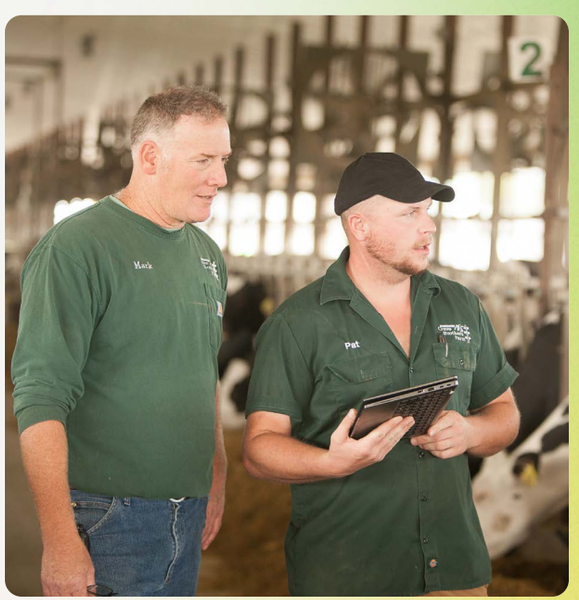
Meet the Winner of the 2024 Farm Excellence Award in Animal Care and Antibiotic Stewardship

Carlson Dairy, established in 1891 in Pennock, Minn., has grown from a small operation milking eight cows to a multi-generational family farm milking 2,000 cows today. A member of First District Association, the dairy prioritizes continuous improvement through the FARM Animal Care Program, employee training, and clear protocols in both English and Spanish. Working closely with its veterinary clinic, Carlson Dairy emphasizes responsible antibiotic use and preventive health practices, resulting in healthier cows and strengthened animal care.

FARM Biosecurity

The FARM Biosecurity Program equips dairy farmers with critical tools to safeguard their herds and operations against infectious diseases. Supported through a cooperative agreement with the USDA, the program helps producers create both routine and enhanced biosecurity plans tailored to their specific needs.

The value of these resources is underscored during the emergence of the H5N1 virus in dairy cattle, as the program plays a vital role in the industry's response. FARM provides timely, science-based information, readily-available tools and practical guidance to help producers manage risks and protect both animal and public health during this unprecedented event.



FARM Antibiotic Stewardship

The responsible and judicious use of antibiotics protects the health of dairy cows and ensures the safety of milk. The FARM Antibiotic Stewardship Program plays a critical role in promoting the responsible and judicious use of antibiotics on dairy farms. By providing science-based guidance and practical tools, the program supports dairy producers, employees and veterinarians in making informed decisions that protect animal health and food safety.

A key resource is FARM's Milk & Dairy Beef Drug Residue Prevention Manual, updated most recently in June 2024. This comprehensive guide, along with its companion pocket version, serves as an essential reference for identifying approved antibiotics and implementing best practices to prevent antibiotic residues in milk and meat. To further support on-farm implementation, the program also offers customizable templates for treatment records and vaccination logs.

As a strict safety measure, the U.S. regulates that any milk that tests positive for antibiotic residues is prohibited from entering the food supply and is discarded.

99.95%
of bulk milk tanker samples have tested free of antibiotics since 1995

↓ 96%
decrease in bulk milk tanker antibiotic residues since 1995, with the lowest ever incidence in 2024

No samples of pasteurized fluid milk or milk products tested positive for residues. Any milk that tests positive for antibiotic residues is destroyed and cannot be sold for human consumption.

99.99%
of 3.35 million bulk tanker samples tested free of antibiotics in 2024

Food Safety and Product Quality

Food safety and product quality are foundational to both the social responsibility and economic resilience of U.S. dairy. As stewards of public health, U.S. dairy companies are committed to protecting consumers and maintaining trust through continuous improvement and proactive measures, beyond the strict regulations that govern all aspects of production, processing and distribution.

Since 2010, the Innovation Center has regularly convened industry leaders and food safety experts to share best-in-class practices, promote scientific research and develop practical tools and guidance, including the U.S. Dairy Traceability Guidelines and Guidance on Controlling Pathogens in Dairy Processing Environments. This collaborative effort builds on a long-standing tradition of industry-led efforts, including historic initiatives like the Pasteurized Milk Ordinance and the 3-A Sanitary Equipment Standards, and collaboration through trade associations.

Monthly meetings of the Innovation Center's Food Safety Operating Committee enable dairy processors to exchange knowledge, advance traceability efforts and explore next-generation technologies. This collaborative forum not only improves individual practices but also reinforces the value of collective action for the greater good.

To address the variable needs of the dairy industry, specialized sub-teams focus on targeted support and training. For instance, the Artisan Ice Cream Food Safety Advisory Team was launched in 2019 to serve small-scale ice cream producers, while the Artisan Cheese Food Safety Team—developed in partnership with the American Cheese Society—supports the growing artisanal and farmstead cheese community.

Through ongoing collaboration and shared commitment, the U.S. dairy industry continues to raise the bar on food safety, helping ensure the long-term sustainability, quality and integrity of dairy foods across domestic and global markets.

Stewardship Commitment Adopters Demonstrate Commitment to Food Safety and Product Quality

Reporting adopters of the U.S. Dairy Stewardship Commitment in 2024, representing approximately 76% of U.S. milk production, confirmed the following:

100%
adopt and apply food safety plans which they regularly update, and follow the guidance in the Innovation Center's Food Safety and Traceability Guidance documents

100%
have validated, verifiable food safety programs and management systems

100%
are frequently reassessing food safety programs to ensure efficacy and updates

Food Safety Culture

With a continued focus on food safety culture, U.S. dairy regularly engages in workshops, webinars and in-person trainings.

>120 workshops

were held since 2011 to train more than

5,250

individuals from dairy processors of all sizes.

"One of the best workshops I have attended. Everyone should attend at some point. The team exercises were great, along with the discussions as a class. All instructors are very helpful and know what they are talking about."

— Cassaundra Edwards, Tillamook County Creamery Assocation

IDFA Food Safety Leadership Award

The IDFA Food Safety Leadership Award recognizes outstanding leadership and efforts by individuals, groups or organizations within its membership to enhance food safety.

In 2023, the food safety team from **Schreiber Foods, Inc.** received this award for their contributions leading industry efforts to develop fermentation risk assessments for yogurt and cream cheese, researching how to better reduce mold on cheese, developing rapid pathogen testing and much more.

In 2024, Rob Shumaker of **Great Lakes Cheese** received this award for his work with IDFA's Food Safety Committee and the University of Wisconsin to determine various food safety risk factors in cheese production, and his continued leadership to protect public health.

Highlights From Workshops, Webinars and Trainings

Dairy Plant Food Safety Workshops are designed to help dairy processing facilities improve pathogen control practices, including environmental monitoring, sanitation and sanitary design.

8

workshops convened **390 processing employees** for lectures, Q&A sessions and hands-on exercises, in 2023–24.

Dairy Supplier Management Food Safety Workshops are designed by dairy industry professionals for dairy companies and their suppliers to help identify, quantify and mitigate risks from ingredients, packaging, equipment and services.

3

workshops brought together companies and suppliers to **learn how to assess supplies for food safety hazards** and **determine appropriate prevention and mitigation measures**, in 2023–24.

Artisan Dairy Processor Coaching Workshops provide hands-on coaching to help develop food safety plans and programs for the farmstead, artisan and small dairy processors driving growth in dairy. Online courses for both cheese and ice cream are also available for this audience.

6

workshops were held with the support of a USDA NIFA grant **reaching 132 owners and managers of small companies**, in 2023–24.

A Foreign Material Prevention in Dairy Products webinar was held in 2024 to share newly developed guidance and proven best practices for effective foreign material controls, including but not limited to supplier controls, inspection and detection systems.

>250

people attended the webinar on Foreign Material Prevention. The "Foreign Materials Prevention Equation" and recommended best practices for each element of the equation were also presented to over 200 attendees at the 2025 CheeseCon conference.

Workforce Development

The U.S. dairy industry is committed to fostering safe and positive work environments, recognizing that its success depends on a skilled, motivated and engaged workforce. Priorities include workplace health and safety, employee attraction and retention, and programs that promote worker well-being. These practices are subject to federal and state regulations and are sometimes evaluated through customer supplier management programs.

Attracting, developing and retaining talent is foundational to the industry's long-term economic viability and social responsibility. Dairy organizations actively manage their human capital strategies, with many aiming to be employers of choice. Industry-wide initiatives, such as the National Dairy FARM Workforce Development program and the International Dairy Foods Association's Workforce and Leadership Development initiatives, provide resources and promote best practices.

89%
of evaluated farms conduct a formal new employee orientation[2]

97%
of evaluated farms have an established process for employees to report safety concerns[3]

On-Farm Workforce Development

Human resource and safety management can look different given each dairy's unique context and circumstances. Approximately 40% of dairy farms employ non-family employees, and there are 130,000 non-family employees on dairy farms.[1] According to the U.S. Bureau of Labor Statistics (2023), U.S. dairy farms improved the incidence rate of non-fatal injuries or illnesses by over 44% from 2017 to 2023.[2]

As of year-end 2024,
1,079
evaluations on farms representing over 13,700 employees were completed since program inception, with
752 evaluations taking place in 2023–24.

FARM Workforce Development

The **FARM Workforce Development (WFD) program**, administered by NMPF, provides resources, training and guides to help dairy farmers enhance safety management practices, increase worker engagement and reduce employee turnover. Resources cover areas such as hiring and recruitment practices, safety management and emergency planning, as well as training and development. FARM WFD has developed an on-farm second-party evaluation tool to help farms learn about human resources and safety management best practices; identify which best practices will be most useful to implement on their farm; and track improvement over time. FARM WFD evaluators assess on-farm human resources and safety practices that support continuous improvement.

Where applicable, the evaluation tool encourages policies and processes to be recorded in writing, which should be shared with employees. For example, the contents of an employee handbook should be shared with employees during a new employee orientation. Moreover, the evaluation tool provides a framework for effective communication and creating a positive workplace culture through such means as holding staff meetings, checking in with new employees, and developing grievance procedures.

Version 2 of FARM Workforce Development Launched

FARM Workforce Development Version 2 debuted in July 2024 with minor updates. The evaluation has been restructured to group questions of similar themes more effectively and contains seven additional questions to build on communication and performance management practices.

Version 2 was developed with input from the FARM Workforce Development Task Force, ensuring farmer, subject matter expert and industry feedback was captured to fit the needs of the industry. Evaluator trainings for Version 2 began in 2024, with 86 evaluators certified in 2024.

1 Texas A&M Center for North American Studies. (March 2020). A National Survey of Hiring, Compensation and Employee Treatment Practices on U.S. Dairy Farms. https://nationaldairyfarm.com/wp-content/uploads/2020/07/Nationwide-Dairy-Labor-Survey_FARM-Workforce-Development.pdf

2 U.S. Bureau of Labor Statistics. (2024). Injuries, Illnesses, and Fatalities: Survey of Occupational Injuries and Illnesses Data. Survey of Occupational Injuries and Illnesses Data: U.S. Bureau of Labor Statistics. https://www.bls.gov/iif/nonfatal-injuries-and-illnesses-tables.htm. Review included Table 1. Incidence rates of nonfatal occupational injuries and illnesses by industry and case types, annual reports data by industry and Table A-1. Fatal occupational injuries by industry and event or exposure, all United States for Crop production/Oilseed and grain farming (1111), Dairy cattle and milk production (11212), Dairy product manufacturing (NAICS 311500).

3 Data only reflect the evaluations completed through 2024 and are not nationally representative. Farms with only family employees (zero non-family employees) are not required to respond to every question.

Upskilling the Farmers of the Future

The **National Young Cooperators (YC) Program**, managed by the National Milk Producers Federation (NMPF), has supported beginning dairy farmers for 75 years through leadership development and educational programming. Targeting farmers under age 45, the program enhances farm profitability and resilience by offering year-round in-person and virtual training. The YC Program operates within NMPF's extensive network of cooperatives, ensuring wide reach and impact. Leadership is fostered at both local and national levels, with many current industry leaders emerging from the program.

Free HR and Worker Safety Resources

As part of the FARM Workforce Development program, free and accessible resources are available for download.

From dairy farm employee management to worker safety, the suite of educational materials is designed to help farmers who want basic human resources tools and safety practices for their employees. Many of these resources are also available in Spanish.

CASE STUDY

Meet the Winner of the 2024 FARM Excellence Award in Workforce Development

Founded in the late 1890s in Ellington, Conn., Oakridge Dairy is a member of Dairy Farmers of America, milking approximately 2,550 cows and employing around 50 people. Committed to being the "farm of the future," Oakridge prioritizes workforce development through the FARM program, using its resources to enhance employee training, safety and engagement. Over the past year, the farm conducted monthly trainings on 13 operational topics to support continuous improvement and worker well-being.

Oakridge fosters a supportive work environment that extends beyond the farm, including employee-led activities like a soccer team. Their mission centers on producing safe, healthy food while delivering lasting value to employees, owners and the community.

Workforce Programs for Dairy Processors

The future of the dairy industry and its ability to remain globally competitive depends on the entire value chain developing the workforce of the future and cultivating the next generation of leaders. A wide range of career opportunities, from production and quality control to maintenance and administration, are available in dairy processing.

IDFA's Workforce and Leadership Development Initiatives equip dairy processors with the knowledge, tools and talent to develop a stable, connected and well-supported workforce. These include:

NEXTGEN LEADERSHIP PROGRAM

The NextGen Leadership Program provides mid- to senior-level dairy professionals with the knowledge and networking opportunities to become future leaders in the dairy industry. Since its inception in 2019, 163 leaders, including six current dairy business CEOs, have completed the program.

IDFA WORKFORCE COMMITTEE

The IDFA Workforce Committee convenes more than 100 human resource professionals for virtual and in-person gatherings, networking opportunities, webinars and other learning and knowledge-sharing experiences for its members.

WOMEN IN DAIRY

Women in Dairy works to improve recruiting, retention and gender equality of the most qualified applicants within the U.S. dairy sector through data-based metrics and tools, C-suite engagement, and by fostering networking and professional and leadership development for its 1,100 members.

At the 2024 World Dairy Summit in Paris, IDFA's Women in Dairy program won an innovation award for women's empowerment given by the International Dairy Federation (IDF). Such awards celebrate the global dairy sector's commitment to innovation, showcasing forward-thinking initiatives that enhance efficiency and align with the United Nation's Sustainable Development Goals (UN SDGs).

Additionally, IDFA hosts two conferences every year that support its programs and mission to ensure members have the tools and resources they need to innovate and thrive.

IDFA LEADERSHIP SYMPOSIUM

The IDFA Leadership Symposium provides a forum for rising leaders to collaborate with fellow industry change-makers, build their leadership skills and prepare for the next step in their leadership journey.

IDFA WOMEN'S SUMMIT

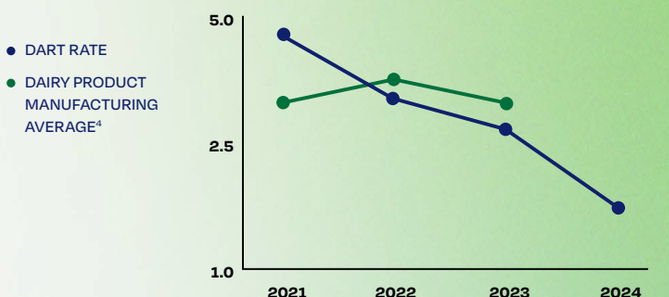
The IDFA Women's Summit brings several dozen women to the nation's capital for three days of networking, learning and advocating for the U.S. dairy industry. The event is designed for attendees of all backgrounds to participate in sessions to continue building their leadership skills and network, all while advancing gender equality.

Stewardship Commitment Adopters Prioritize Workforce Health and Safety

Reporting adopters of the U.S. Dairy Stewardship Commitment, representing approximately 76% of U.S. milk production, reported the following for 2024:

- Of the nearly 85,194 of jobs supplied by adopters, ~98.3% are full-time as of Dec. 31, 2024.
- A vast majority of adopters provide several benefits to their employees, such as health insurance with employee contribution, 401(k) retirement plan options, and other benefits such as tuition/education reimbursement, company-provided vehicles, life insurance and more.
- The days of restricted work activity or job transfer (DART) rate continues to decrease.
- 88% of reporting adopters reported using leading indicators to measure and encourage safe worker behavior. Leading indicators are predictive measures reflecting the effectiveness of an organization's safety and health activities.

Legacy adopters, representing ~74% of U.S. milk production, reported a 62% decrease in the DART rate from 2021 to 2024.



METRIC	2021	2022	2023	2024
DART RATE Days of restricted work activity or job transfer (DART) rate	4.47	3.45	2.96	1.71

Notes: Metric reports incident rate of days away from work, job transfer, or restriction cases, as reported to the U.S. Occupational Safety and Health Administration. DART rate is reported for the aggregate: Total number of DART incidents / total employee hours worked × 200,000.

METRIC	2021	2022	2023	2024
LEADING INDICATOR USE Percentage of processors reporting use of leading indicators to measure and encourage safe worker behavior	86.6%	88.5%	88.8%	96.6%

Notes: Leading indicators are predictive measures reflecting the effectiveness of an organization's safety and health activities. They can prompt proactive, preventive action to address a failure or hazard before it leads to an incident (https://www.osha.gov/leading-indicators).

CASE STUDY

Building Great Teams at Foremost Farms

Foremost Farms is committed to fostering a collaborative and supportive work environment where employees can thrive. In 2023, the cooperative introduced the Building Great Teams with DiSC® program to enhance communication and teamwork across the organization. The program uses the Everything DiSC® assessment to help employees better understand their workplace preferences and develop strategies for working more effectively with others.

Since its launch, 113 employees completed the training, with 85% reporting they were extremely or very satisfied with the experience. By promoting self-awareness and stronger interpersonal relationships, the DiSC program supports both personal and professional growth while reinforcing Foremost Farms' cooperative value of "One Team."

4 U.S. Bureau of Labor Statistics (BLS). Dairy Product Manufacturing (NAICS 3115) average shown with 95% confidence interval high-low range. Please note the 2024 data has not been published.

Community and Economic Impact

U.S. dairy has a long-standing tradition of supporting the well-being of communities across the country. While the nutrient-rich foods it provides are essential to lifelong health and nourishment, the industry's positive impact extends far beyond nutrition.

Through job creation, local economic investment, and continuous innovation in products and manufacturing, U.S. dairy contributes meaningfully to economic vitality. The industry also plays an active role in addressing community needs by donating food, providing financial support, volunteering time and sharing professional expertise.

This commitment to community engagement is central to how U.S. dairy fosters lasting relationships and trust with a wide range of stakeholders—including neighbors, employees and non-profit organizations. By strengthening these connections, the industry not only enhances its social impact but also reinforces its role as a responsible and valued community partner.

Economic Contributions

The U.S. dairy sector is a vital contributor to the national economy, delivering both direct and indirect economic value at the local, state and federal levels. In 2025, the International Dairy Foods Association (IDFA) released its updated *Dairy Delivers®* report, reaffirming the U.S. dairy industry's powerful role in the national economy and local communities. According to the report, the industry supports over 3 million American jobs, contributes nearly $198 billion in wages and generates almost $780 billion in total economic impact.[5] *Dairy Delivers®* also highlights dairy's contributions to tax revenue, trade and community well-being, demonstrating how the industry sustains livelihoods and strengthens rural and urban economies across the country.

In rural communities in particular, dairy farms and processing facilities play a critical role in sustaining economic resilience. These operations not only provide stable employment but also drive demand in related industries such as animal nutrition, veterinary care, equipment maintenance and financial services. For example, research from Minnesota found that the average dairy farm supports 11 jobs and generates approximately $1.6 million in local economic activity—highlighting the far-reaching impact of dairy production on rural livelihoods and economies.[6]

Access the *Dairy Delivers®* tool here to explore dairy's economic impact by state, congressional district and industry segment.

KEY HIGHLIGHTS:

3.05 million
total U.S. jobs supported by the dairy industry

$197.6 billion
in wages

$779.45 billion
in total economic impact

$83 billion
in combined federal, state and local taxes

$8.2 billion
in total annual exports

5 International Dairy Foods Association. (2025, June 9). *Dairy Delivers®*: U.S. dairy economic impact report. https://www.idfa.org/dairydelivers

6 Roberts, M., Hadrich, J., & Tuck, B. (2020). The role of dairy farmers in Minnesota's economy. University of Minnesota Extension. https://extension.umn.edu

Community Impact and Engagement

U.S. dairy companies and their partners are committed and active participants in local communities.

Activating Community Impact Nationwide

The U.S. dairy industry works collaboratively across the nation to support food banks and ensure access to affordable, nutritious food for those in need. Dairy farmers, cooperatives, processors and retailers come together through partnerships with organizations like Feeding America to donate fresh milk, cheese, yogurt and other dairy products. These efforts are bolstered by donation and reimbursement initiatives that help to bridge the gap between surplus supply and food insecurity by streamlining the donation process and offsetting costs. By leveraging a national network and infrastructure, the dairy community plays a vital role in delivering essential nutrients to underserved populations across the country. To learn more, see the section on Food/Nutrition Security and Accessibility here.

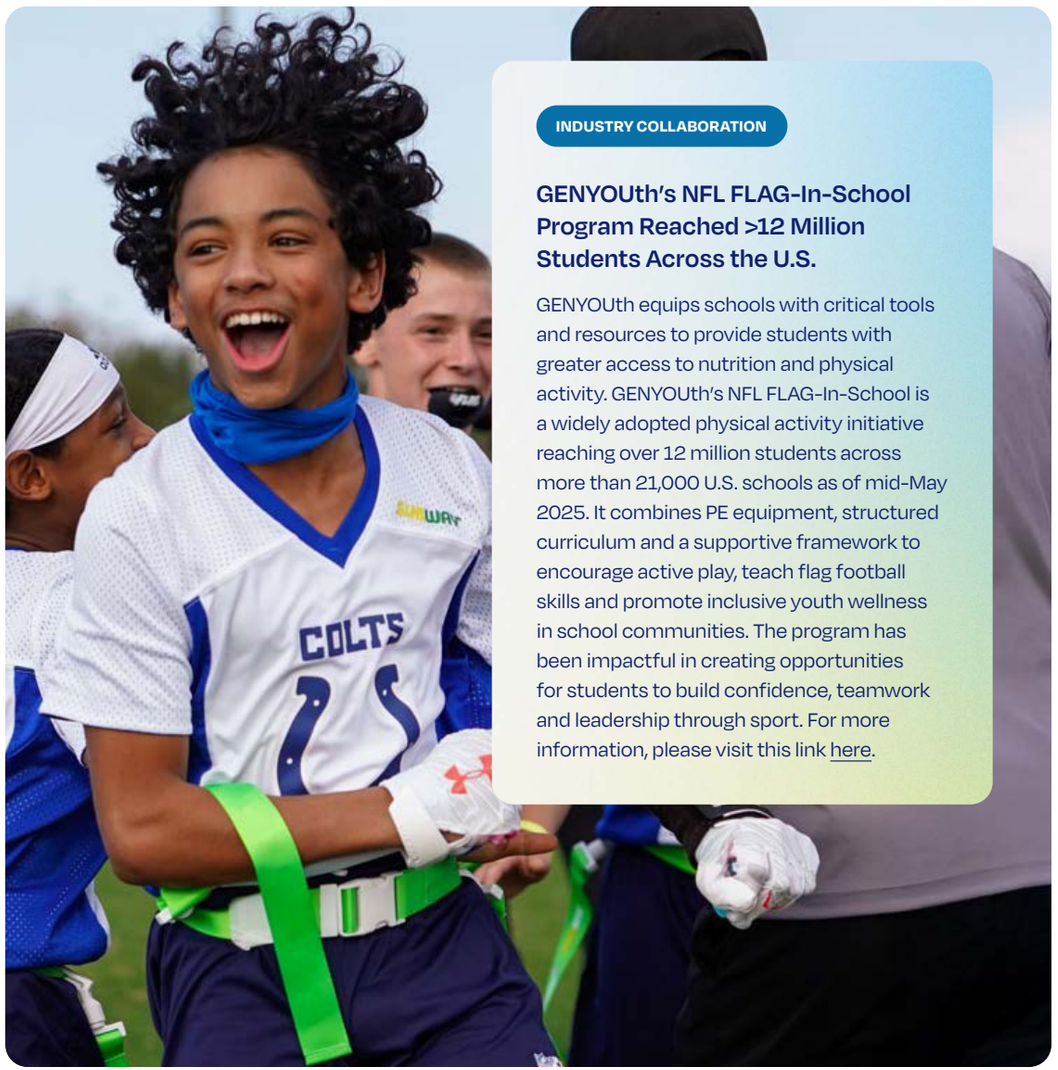
Engaging Locally With Communities

The U.S. dairy industry is deeply rooted in local communities through a variety of initiatives that support health, education and economic development. Dairy farmers often host on-farm events, school visits and educational programs to help families and students learn about agriculture, sustainability and where their food comes from. Many also partner with local schools and support youth organizations like 4-H and FFA.

CASE STUDY

Land O'Lakes Expands Its 2030 Zero Hunger Goal to 15 Million Pounds of Product Donations[7]

In 2023, Land O'Lakes surpassed its original 2030 goal of donating 3 million pounds of product through in-kind contributions. This milestone was achieved through a multi-faceted approach focused on both increasing food access and minimizing waste. One key initiative involves a partnership with Feeding America, through which Land O'Lakes produces macaroni and cheese and other dairy-based products specifically for donation. Additionally, a new collaboration with technology company Spoiler Alert is helping the organization more effectively manage short-dated inventory. This innovation enables faster distribution of quality food to food banks and secondary markets, while also reducing food waste across the supply chain. Building on the success of these efforts, Land O'Lakes revised its target and is now working toward a more ambitious goal: donating 15 million pounds of product by 2030.



INDUSTRY COLLABORATION

GENYOUth's NFL FLAG-In-School Program Reached >12 Million Students Across the U.S.

GENYOUth equips schools with critical tools and resources to provide students with greater access to nutrition and physical activity. GENYOUth's NFL FLAG-In-School is a widely adopted physical activity initiative reaching over 12 million students across more than 21,000 U.S. schools as of mid-May 2025. It combines PE equipment, structured curriculum and a supportive framework to encourage active play, teach flag football skills and promote inclusive youth wellness in school communities. The program has been impactful in creating opportunities for students to build confidence, teamwork and leadership through sport. For more information, please visit this link here.

7 Land O'Lakes, Inc. (2024). 2023 Community impact report [PDF]. https://storcpkenticomedia.blob.core.windows.net/media/lolinc/media/impact/23-community-impact-report.pdf

Appendix

U.S. Dairy Stewardship Commitment

Adopters of the U.S. Dairy Stewardship Commitment with dairy processing operations are required to report into the Processor Stewardship Report Tool (PSRT) annually as a term of adoption. The PSRT provides a credible, consistent and cost-effective way to collect, calculate and report processor sustainability data within the Stewardship Commitment. Reporting adopters enter their data into the PSRT, by facility or at the corporate level. Harbor, A Terracon Company, which developed the PSRT, annually aggregates data from each Reporting Adopter into an industry data report. Harbor performed a quality review for data consistency and calculation accuracy. Harbor did not verify the data submitted by each processor. Governing this reporting process, the Processor Stewardship Reporting LLC Oversight Committee helps ensure its security, credibility and transparency. Operating under the Processor Stewardship Reporting LLC, the committee oversees data integrity, reviews reported metrics and helps align reporting with industry priorities to reinforce trust in U.S. dairy's sustainability leadership.

The intensity-based metrics report values per pound of dairy production at the processing level. The intensity measures support general assessments of changes in collective performance; however, the metrics do not enable like-for-like comparisons across annual results. In addition to annual differences in the aggregate base, the production profiles of processors also can change from year to year. For more information on the metrics and methodologies, please refer to the Dairy Processor Handbook for details or contact Stewardship.Commitment@dairy.org.

2023–2024 Aggregated Data

The data tables cover the performance for the 2023 and 2024 calendar years, representing processing locations for the 35 and 34 adopting companies, respectively. These adopters will be referred to throughout the report as "reporting adopters".

The accuracy, quality and completeness of this data continues to remain a focus for adopters in their annual sustainability reporting. The GHG intensity data reported by Stewardship Commitment adopters has been temporarily omitted from this year's report while validation work is underway. To ensure that data reported is both credible and decision-useful, adopters of the Stewardship Commitment remain fully committed to measuring, improving and transparently reporting their GHG performance. Once the data has been reviewed and validated, it will be included in future reports as part of our ongoing commitment to accountability and continuous improvement.

	2023	2024
U.S. MILK PRODUCTION REPRESENTED (%)	**~75%**	**~76%**
PRODUCT CATEGORIES REPRESENTED (% OF U.S. MILK PRODUCTION)		
Butter	76.6%	73.5%
Cheese	91.9%	93.3%
Condensed Milk	115.9%[1]	94.6%
Fluid Milk	83.3%	87.1%
Frozen Dairy	128.3%[1]	106.6%[1]
Milk Powder	95.7%	89.8%
Sour Cream/Cottage Cheese	29.2%	32.2%
Whey Permeate Powder	72.0%	80.9%
Whey Powder	65.8%	64.5%
Yogurt	46.9%	13.3%

1 Percentages that exceed 100% are due to differences between processor and USDA product categorizations. For example, USDA differentiates dairy production across more granular categories than are used in the reporting tool.

2023–2024 Aggregated Data (continued)

	2023	2024
ENVIRONMENTAL		
ENERGY	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**	**Reporting adopters that submitted and validated this data represented ~76% of U.S. milk production**
Energy Use Intensity: kWh per pound of dairy production output	0.288	0.275
Energy Use Intensity: MMBtu per pound of production output	0.0009	0.0009
Energy Source Breakdown (%):		
Natural Gas and Compressed Natural Gas (CNG)	66.2%	67.5%
Purchased Electricity	23.8%	25.4%
Other Energy Sources	10.0%	7.2%
Renewable Energy (%): Percentage of grid electricity generated from renewable sources	32.9%	34.1%
Renewable Energy: Percentage of reporting adopters with a power purchasing agreement or renewable energy credit that defines how the electricity purchased is sourced	24.1%	27.6%
WATER USE AND RECYCLING	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**	**Reporting adopters that submitted and validated this data represented ~76% of U.S. milk production**
Water Withdrawal Intensity: Gallons per pound of production output	0.343	0.357
Water Withdrawal Breakdown by Source (%):		
Municipal/third-party source	71.5%	72.4%
Groundwater	27.7%	26.8%
Surface water	0.8%	0.8%
Water Recycled Intensity: Gallons captured for reuse + milk water per pound of production output	0.124	0.122
Produced Water/Milk Water: Gallons captured from milk per pound of production output	0.101	0.097
Surplus Water: Discharge volume—Water withdrawn per pound of production output	0.066	0.056
WATER QUALITY	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**	**Reporting adopters that submitted and validated this data represented ~76% of U.S. milk production**
Water Quality: Percentage of adopters with a policy, program or monitoring system that ensures routine compliance with industrial or storm water permit parameters	91.4%	94.1%

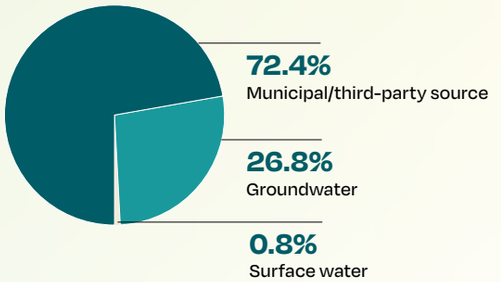
~34%

of grid electricity generated from renewable sources among reporting adopters in 2024

~28%

of reporting adopters in 2024 have a power purchasing agreement or purchased renewable energy credits

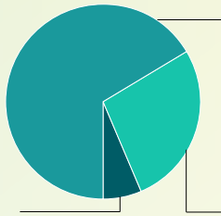
2024 WATER WITHDRAWAL BREAKDOWN



2023–2024 Aggregated Data (continued)

	2023	2024
ENVIRONMENTAL (CONTINUED)		
WASTE AND RESOURCE RECOVERY	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**	**Reporting adopters that submitted and validated this data represented ~76% of U.S. milk production**
Waste Diversion Rate (%): Percentage of waste diverted from landfill and incineration without energy recovery	95.2%	93.8%
Waste Disposal by Waste Stream (%):		
Category 2: Food/organics donated to feed hungry people or repurposed as animal feed and non-food recycled or composted	73.3%	66.4%
Category 3: Food/organics repurposed for industrial uses or compost and non-food repurposed for energy recovery	22.0%	27.3%
Category 4: Waste sent to landfill or incineration without recapturing energy	4.8%	6.3%
SUSTAINABLE PACKAGING AND MATERIALS	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**
Recycled Content (%): Percentage of reporting adopters that are researching and/or investing in use of post-consumer recycled (PCR) and/ or post-industrial recycled (PIR)	77.1%	82.4%
Recycled Content Utilization (%): Percentage of reporting adopters that are utilizing post-consumer recycled (PCR) and/or post-industry recycled (PIR) content for primary and/or secondary packaging	57.1%	58.8%
Material Optimization (%): Percentage of reporting adopters that are exploring strategies to reduce or replace non-recyclable and/or non-compostable components in packaging	74.3%	88.0%
Sustainable Packaging (%): Percentage of reporting adopters that are taking action in each step of the sustainable packaging journey		
Supplier Engagement	60.0%	64.7%
Research and Development	42.9%	47.1%
Cost Evaluation	42.9%	47.1%
Pilots	42.9%	50.0%
Operationalized	17.1%	26.5%

2024 WASTE DISPOSAL BY WASTE STREAM:



66.4%
Food/organics donated to feed hungry people or repurposed as animal feed and non-food recycled or composted

6.3%
Waste sent to landfill or incineration without recapturing energy

27.3%
Food/organics repurposed for industrial uses or compost and non-food repurposed for energy recovery

In 2024, reporting adopters demonstrated a 94% diversion rate

~82%
of the processors indicated they are researching and/or investing in the use of post-consumer recycled (PCR) and/ or post-industrial recycled (PIR) content for primary and/or secondary product packaging. Of those, 59% reported they are currently utilizing PCR and/or PIR, with 35% using both.

~88%
are exploring strategies to reduce or replace non-recyclable and/or noncompostable components in their packaging, with the majority selecting one or more of the following steps to indicate how far along they are in the process: (a) research and development, (b) supplier engagement, (c) pilots, (d) cost evaluation, (e) operationalized.

2023–2024 Aggregated Data (continued)

	2023	2024
ENVIRONMENTAL (CONTINUED)		
Primary Packaging (%): Percentage of reporting adopters that are utilizing the following materials as a primary material in packaging		
Fiber	42.9%	58.8%
Glass	0.0%	0.0%
Metal	68.6%	85.3%
Multi	25.7%	23.5%
Plastic	65.7%	73.5%
Secondary Packaging (%): Percentage of reporting adopters that are utilizing the following materials as a secondary material in packaging		
Fiber	71.4%	79.4%
Glass	0.0%	0.0%
Metal	45.7%	47.1%
Multi	5.7%	5.9%
Plastic	28.6%	20.6%
Tertiary Packaging (%): Percentage of reporting adopters that are utilizing the following materials as a tertiary material in packaging		
Fiber	68.6%	73.5%
Glass	0.0%	0.0%
Metal	48.6%	61.8%
Multi	0.0%	0.0%
Plastic	14.3%	14.7%
SOCIAL		
FOOD SAFETY AND PRODUCT QUALITY	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**	**Reporting adopters that submitted and validated this data represented ~76% of U.S. milk production**
Traceability (%): Processors committed to the voluntary U.S. Dairy Traceability Guidelines	100%	100%
Food Safety (%): Percentage of legacy adopters that have validated, verifiable food safety programs and management systems	100%	100%
Food Safety (%): Percentage of legacy adopters that frequently reassess food safety programs to ensure efficacy and updates	100%	100%

100%

of reporting adopters apply food safety plans which they regularly update, and follow the guidance in the Innovation Center's Food Safety and Traceability Guidance documents in 2024

100%

of reporting adopters have validated, verifiable food safety programs and management systems in 2024

100%

of reporting adopters are frequently reassessing food safety programs to ensure efficacy and updates in 2024

2023–2024 Aggregated Data (continued)

	2023	2024
SOCIAL (CONTINUED)		
WORKFORCE DEVELOPMENT	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**
Workforce: Total number of jobs supplied	85,046	85,194
Workforce (%): Full-time jobs of the total number of jobs supplied	97.9%	98.3%
Employee Benefits (%): Percentage of reporting adopters that offer the following benefits		
Health insurance with employer contribution	94.3%	91.2%
Health insurance without employer contribution	8.6%	8.8%
401k or comparable retirement plan	91.4%	88.2%
Produced/processed products	22.9%	11.8%
Other e.g., free products, tuition/education reimbursement, company vehicles, life insurance, wellness programs, financial advisory services, and company housing	80.0%	70.6%
WORKER HEALTH AND SAFETY	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**	**Reporting adopters that submitted and validated this data represented ~76% of U.S. milk production**
DART Rate: Days of restricted work activity or job transfer rate	2.83	1.73
Leading Indicator Use (%)[2]: Percentage of U.S. milk production using leading indicators to measure and encourage safe worker behavior	85.0%	88.2%
COMMUNITY CONTRIBUTIONS[3]	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**	**Reporting adopters that submitted and validated this data represented ~75% of U.S. milk production**
Volunteering: Number of employee volunteer hours	194,662	73,504
Product Donations by Product Type (%):		
Milk	64.6%	31.5%
Cheese	6.7%	7.4%
Other	28.7%	61.1%
Monetary Donations ($)	$15,973,563	$14,582,658

85,194
total jobs supplied in 2024

~88%
of reporting adopters used leading indicators to measure and encourage safe worker behavior in 2024

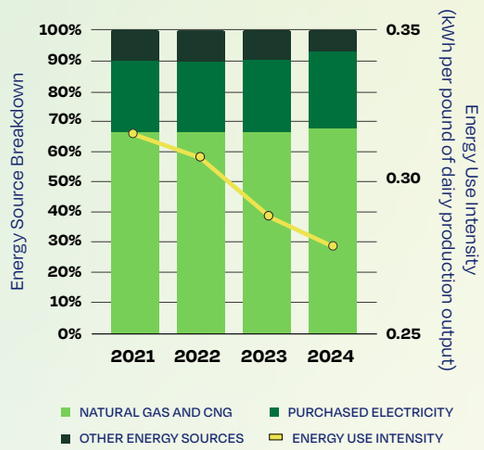
>$14 million
reported in monetary donations in 2024

2 Leading indicators are predictive measures reflecting the effectiveness of an organization's safety and health activities. They can prompt proactive, preventive action to address a failure or hazard before it leads to an incident (https://www.osha.gov/leading-indicators).
3 Reporting adopters are only required to report one community contribution metric. Therefore, aggregated data in this section does not reflect all philanthropic efforts conducted by each adopter, rather just those they chose to report.

2021–2024 Performance Data

To provide a consistent data set for reviewing collective progress over time, this section presents the data and results for 29 U.S. Dairy Stewardship Commitment adopters that reported in 2021, 2022, 2023 and 2024. This cohort of adopters will be referred throughout the report as "legacy adopters," which represent 73.7% of U.S. milk production as of year-end 2024.

	2021	2022	2023	2024
ENVIRONMENTAL				
ENERGY				
Energy Use Intensity: kWh per pound of production output	0.318	0.310	0.292	0.277
Energy Use Intensity: MMBtu per pound of production output	0.0010	0.0010	0.0009	0.0009
Renewable Energy: Percentage of grid electricity that is generated from renewable sources	30.1%	30.0%	32.9%	34.1%
WATER USE AND RECYCLING				
Water Withdrawal Intensity: Gallons per pound of production output	0.449	0.380	0.344	0.358
Water Withdrawal Breakdown by Source (%):				
Municipal/third-party source	76.2%	74.7%	72.4%	73.4%
Groundwater	22.5%	24.6%	26.8%	25.8%
Surface water	1.3%	0.7%	0.8%	0.8%
Water Recycled Intensity: Gallons captured for reuse + milk water per pound of production output	0.138	0.139	0.118	0.113
Produced Water/Milk Water: Gallons captured from milk per pound of production output	0.108	0.122	0.106	0.100
Surplus Water: Discharge volume—Water withdrawn per pound of production output	0.053	0.070	0.063	0.058
WATER QUALITY				
Water Quality: Percentage of adopters with a policy, program or monitoring system that ensures routine compliance with industrial or storm water permit parameters	97%	93%	97%	100%
WASTE AND RESOURCE RECOVERY				
Waste Diversion Rate (%): Percentage of waste diverted from landfill and incineration without energy recovery	93.8%	94.6%	95.0%	93.6%



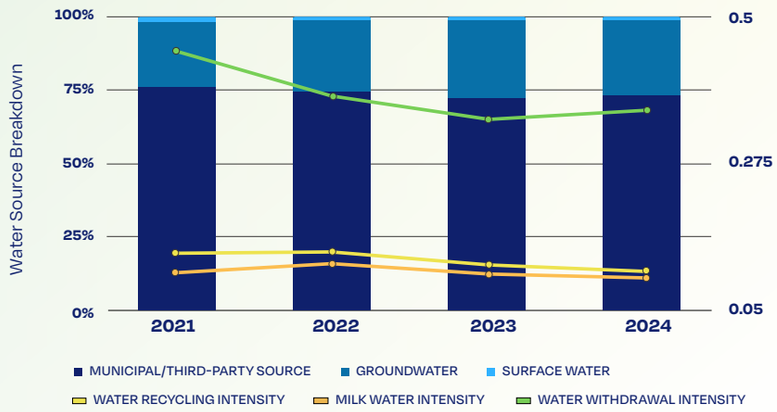
↓13%

reduction in energy use intensity reported by legacy adopters from 2021 to 2024

↓ 20%

reduction in water withdrawal intensity reported by legacy adopters from 2021 to 2024

WATER WITHDRAWAL AND RECYCLING FROM 2021 TO 2024



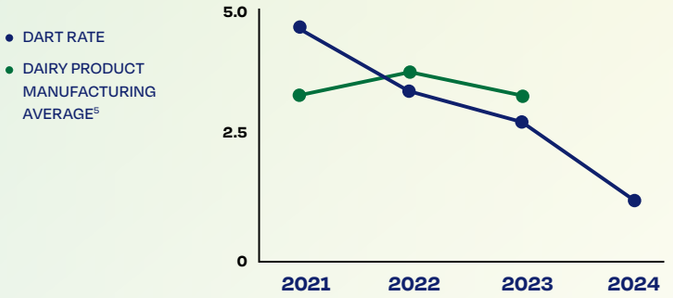
2021–2024 Performance Data (continued)

	2021	2022	2023	2024
ENVIRONMENTAL (CONTINUED)				
Waste Disposal by Waste Stream (%):				
Category 2: Food/organics donated to feed hungry people or repurposed as animal feed and non-food recycled or composted	61.3%	70.5%	73.0%	67.2%
Category 3: Food/organics repurposed for industrial uses or compost and non-food repurposed for energy recovery	32.5%	24.1%	22.0%	26.4%
Category 4: Waste sent to landfill or incineration without recapturing energy	6.3%	5.4%	5.0%	6.4%
SOCIAL				
FOOD SAFETY AND PRODUCT QUALITY				
Traceability (%): Percentage of legacy adopters committed to the voluntary U.S. Dairy Traceability Guidelines	100%	100%	100%	100%
Food Safety (%): Percentage of legacy adopters that have validated, verifiable food safety programs and management systems	100%	100%	100%	100%
Food Safety (%): Percentage of legacy adopters that frequently reassess food safety programs to ensure efficacy and updates	100%	100%	100%	100%
WORKER HEALTH AND SAFETY				
DART Rate: Days of restricted work activity or job transfer rate	4.47	3.45	2.96	1.71
Leading Indicator Use (%)[4]: Percentage of U.S. milk production using leading indicators to measure and encourage safe worker behavior	86.6%	88.5%	88.8%	96.6%

94%
average waste diversion rate reported by legacy adopters from 2021 to 2024

↑ 12%
increase in legacy adopters using leading indicators for worker health and safety from 2021 to 2024

Legacy adopters, representing ~74% of U.S. milk production, reported a 62% decrease in the DART rate from 2021 to 2024.



4 Leading indicators are predictive measures reflecting the effectiveness of an organization's safety and health activities. They can prompt proactive, preventive action to address a failure or hazard before it leads to an incident (https://www.osha.gov/leading-indicators).
5 U.S. Bureau of Labor Statistics (BLS). Dairy Product Manufacturing (NAICS 3115) average shown with 95% confidence interval high-low range. Please note the 2024 data has not been published.

INNOVATION CENTER FOR U.S. DAIRY

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