



FARM Environmental Stewardship Evaluation Preparation Guide

2020-2023
Version 2



FARM Environmental Stewardship

About FARM Environmental Stewardship

U.S. dairy farmers have a long history of being environmental stewards. Our challenge is to show customers and consumers how we're continuing to make progress in improving environmental outcomes. The Farmers Assuring Responsible Management (FARM) Environmental Stewardship Program area helps track and communicate a farm's environmental achievements. The online tool, combined with the program's resources, assist you with pursuing continuous improvement in ways that make business sense. Version 2 of the program focuses on greenhouse gas (GHG) emissions, energy use and nutrient management plans.

Scientific Support

FARM Environmental Stewardship estimates farm-level GHG emissions and energy intensity using a scientific, peer-reviewed model.¹ The model relies on methodology from the internationally recognized Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories. FARM also leverages life cycle assessment (LCA) research conducted by the dairy industry in collaboration with the University of Arkansas. LCA research calculates the total environmental footprint of products from an entire chain of production. The model is scientifically robust – it explains 98% of the variability in total GHG footprint across farms – while only requiring a limited amount of farm data.

The data needed to estimate GHG emissions and energy use intensity include:



Milk Production



Herd Data



Rations



Manure Management



Energy Use

The evaluation results are life cycle based – in other words, they represent all of the GHG emissions and energy use associated with the farm's milk production, from the point of resource extraction ('cradle') to the farm gate. For example, the GHG emissions associated with energy use represent emissions from drilling or mining the energy source, processing the fuel, and burning it on the farm.

GHG results are reported in pounds of carbon dioxide (CO₂) equivalent per pound of fat and protein corrected milk (FPCM). FPCM normalizes milk to the same scale, so farms can track their results consistently even if milk output changes year to year. With each Environmental Stewardship evaluation, farmers, cooperatives and processors can assess change over time, identify areas of operational improvement, and report progress to their customers.

The Innovation Center for U.S. Dairy, part of Dairy Management Inc., developed the model that powers FARM Environmental Stewardship. The Innovation Center's environmental research team leads scientific research to keep the model current with the latest scientific advancements. They regularly collaborate with researchers from leading academic and research institutions, both domestically and internationally.

Governance

FARM Environmental Stewardship is updated every three years, with scientific updates released between version cycles as needed.



Second-Party Evaluation

A FARM Environmental Stewardship evaluation involves data collection to estimate a farm's environmental footprint. A second-party evaluator is trained to collect on-farm environmental data consistently and impartially. The second-party evaluator also assists in interpreting the results.

How Often are Evaluations Conducted?

Participating facilities may undergo a second-party evaluation at a frequency determined in collaboration with the FARM Program participant (the co-op or processor through which the farm is participating). Evaluations must be scheduled in advance and are not to be conducted unannounced.

Who Conducts Second-Party Evaluations?

Second-party evaluations are conducted by certified individuals who complete and pass a training program specific to the current version cycle. Evaluators must recertify each version cycle.



Program Expectations

Dairy Farmer

- Assist evaluator in completing the evaluation as needed
- Provide data or information that the evaluator requests to the best of the farm's ability
- If records or data are unavailable, note the data gap to the evaluator

Evaluator

- Complete the FARM Environmental Stewardship training to gain competency in conducting evaluations
- Understand relevant FARM resources, including the User Guide and Reference Manual
- Follow all safety guidelines and employ proper biosecurity protocols as set by the individual farmer
- Maintain and safeguard the farm's confidential information
- Communicate evaluation expectations to farmers
- Use reasonable estimates and record assumptions when there are data gaps
- Be polite and courteous
- Share and help interpret results with the dairy farmer

¹ Asselin-Balençona, A.C., Popp, J., Henderson, A., Heller, M., Thoma G., Jolliet, O. 2013. Dairy farm greenhouse gas impacts: A parsimonious model for a farmer's decision support tool. Int Dairy J. 31:S65-S77.

Results

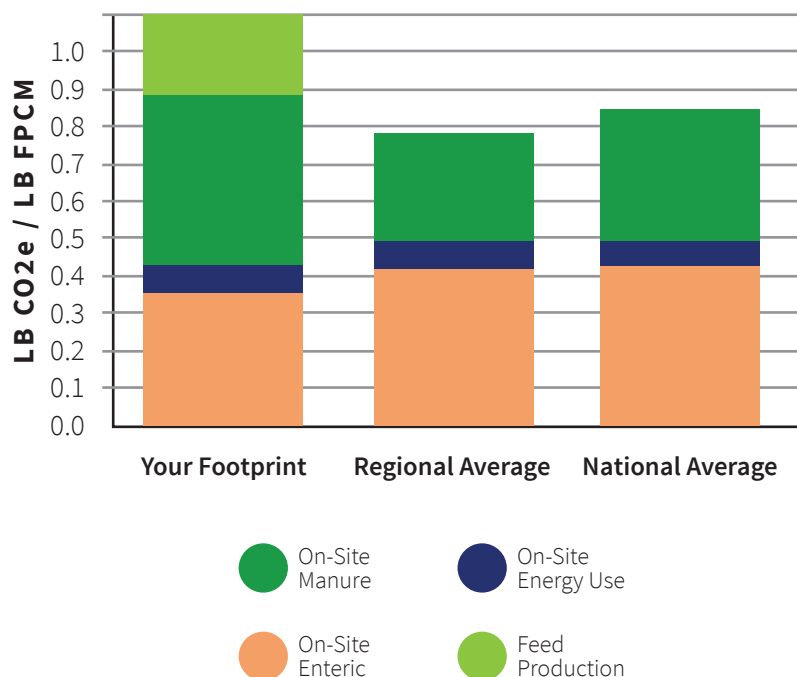
FARM Environmental Stewardship estimates the farm's GHG and energy use footprints. See Figure 1 for example results. The total GHG footprint is divided based on where the emissions come from:

- Feed production
- On-site enteric (emissions from the cow's digestive processes)
- On-site manure
- On-site energy use

The energy results are divided into feed production and on-site energy. "On-site" refers to dairy activities on the farm. If the operation purchases feed and doesn't engage in feed production activities, the output will still generate an estimate for the environmental impacts of the purchased feed.

Results are compared to regional and national averages. These averages come from the industry's LCA research. Benchmarks for feed production emissions are not available in FARM Environmental Stewardship Version 2.

Figure 1. Example: Your Farm Greenhouse Gas Emissions



Continuous Improvement

Use the [FARM Environmental Stewardship Reference Manual](#) as a guide for identifying continuous improvement opportunities (see Figure 2). If results are higher in a particular GHG category, focus on that section of the manual. Each section gives tips and considerations for how you can improve your farm's footprint in ways that make business sense.

Reference the complete FARM Environmental Stewardship Reference Manual at:
nationaldairyfarm.com/wp-content/uploads/2018/10/ES-Reference-Manual.pdf

Figure 2. Guide to Navigating the FARM Environmental Stewardship Reference Manual

Emissions Type	Relevant Reference Manual Chapter(s)	Chapter Page	Example Topic Areas Covered
All	Chapter 2: Moving Forward	Page 8	<ul style="list-style-type: none"> • Selecting a specialist/vendor • Financing options
On-Site Enteric	Chapter 3: Feed Chapter 4: Productivity	Page 16 Page 38	<ul style="list-style-type: none"> • Ration formulation • Feeding • Herd health
On-Site Manure	Chapter 3: Feed Chapter 5: Manure	Page 16 Page 58	<ul style="list-style-type: none"> • Manure storage and treatment options • Ration formulation
On-Site Energy Use	Chapter 6: Energy	Page 72	<ul style="list-style-type: none"> • Energy efficiency options for milking, ventilation and lighting

Version 2 Checklist



FARM Environmental Stewardship collects data on milk production, herd data, rations, manure management, and energy use (see Figure 3). This data should represent a 12-month period, specified by the evaluator.

The full list of data is found in the Version 2 Data Collection sheet:
nationaldairyfarm.com/producer-resources/environment

Figure 3. FARM Environmental Stewardship Version 2 Data Checklist

Requested Data	Source Examples
MILK PRODUCTION	
Total annual milk production (lbs) Annual avg protein and fat content	DHIA, dairy record management system, milk shipment records
HERD PROFILE	
Annual avg # of lactating and dry cows Avg % dry Annual avg # of heifers and calves raised on farm/off farm Annual # and avg weight of mature cows culled for beef Annual # and avg weight of calves sold for beef	Herd management software
ENERGY USE	
Annual total energy used for the dairy farm: electricity, diesel, biodiesel, fuel oil, natural gas, propane, gasoline Total solar/wind generated on-site (If applicable)	Utility bills, energy usage logs, purchase records
FEED	
Time spent on pasture for lactating, dry and youngstock (if applicable)	Grazing records, nutrient management plan
Avg daily DMI for the production period (lbs/day) for lactating herd	Nutritionist, feed management software, dairy record management system
% ration makeup on a dry matter basis	Nutritionist, feed management software, dairy record management system
NUTRIENT MANAGEMENT PLANS	
Type of written plan: nutrient management plan, comprehensive nutrient management plan, or manure management plan Whether farm implements and maintains it	Nutrient management plans
MANURE MANAGEMENT SYSTEMS	
Type of manure management system(s) and approximate % of manure going to each system Solid-liquid separators (If applicable): type, separation efficiency, how solid/liquid fraction is managed Anaerobic digester (If applicable): volatile solids conversion efficiency, how effluent is management, % of generated heat/electricity utilized	Nutrient management plan, anaerobic digester company, solid-liquid separator manufacturer

Manure Management Systems

FARM Environmental Stewardship uses manure management system descriptions from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Use Figure 4 as a guide, as system names vary by region.

Figure 4. Types of Manure Management Systems

System	Description
Daily spread	Manure is collected and land applied within 24 hours.
Solid storage	Storage of manure, often for several months, in unconfined piles or stacks.
Dry lot	A paved or unpaved open confinement area without any significant vegetative cover where accumulating manure may be removed periodically.
Liquid/slurry with natural crust	Often in earthen structures, basins or tanks. Slurry is usually between 5% and 15% dry matter. There is little added water. A natural crust is allowed to form.
Liquid/slurry without natural crust	Often in earthen structures, basins or tanks. Slurry is usually between 5% and 15% dry matter. There is little added water. A natural crust is NOT allowed to form.
Uncovered anaerobic lagoon	Lagoons combine waste stabilization, treatment and storage. Water is added. Solids volume is typically less than 5%. Uncovered lagoons are open to the ambient air.
Covered anaerobic lagoon	Lagoons combine waste stabilization, treatment and storage. Water is added. Solids volume is typically less than 5%. Uncovered lagoons are open to the ambient air.
Pit storage less than 1 month	Usually with little or no added water, collected below a slatted floor, with storage less than one month.
Pit storage greater than 1 month	Usually with little or no added water, collected below a slatted floor, with storage greater than one month.
Deep bedding less than 1 month	Bedding is continually added to absorb moisture over a production cycle less than one month (aka bedded pack).
Deep bedding greater than 1 month	Bedding is continually added to absorb moisture over a production cycle greater than one month (aka bedded pack).
Composting in-vessel or static	In-vessel: typically in an enclosed channel, with forced aeration and continuous mixing. Static pile: in piles with forced aeration but no mixing.
Composting intensive with forced aeration	Composting in windrows with regular (daily, 2 to 3 times per week, or weekly depending on stage) turning for mixing and aeration.
Composting natural aeration	Composting in windrows with infrequent turning for mixing and aeration, often with installed pipes for passive aeration (no blower or other forced air).
Aerobic treatment with forced aeration	Liquid handling with the addition of oxygen through forced aeration.
Aerobic treatment with natural aeration	Liquid handling with the addition of oxygen through natural aeration, such as facultative ponds and wetland systems that rely on photosynthesis.
Anaerobic digester	Encourages the bacterial decomposition of manure in the absence of oxygen, producing biogas, which is collected and utilized or flared.
Solid-liquid separation	Processing technology that partially separates the solids from liquid manure using gravity or mechanical systems.



After the Evaluation

Evaluation Feedback

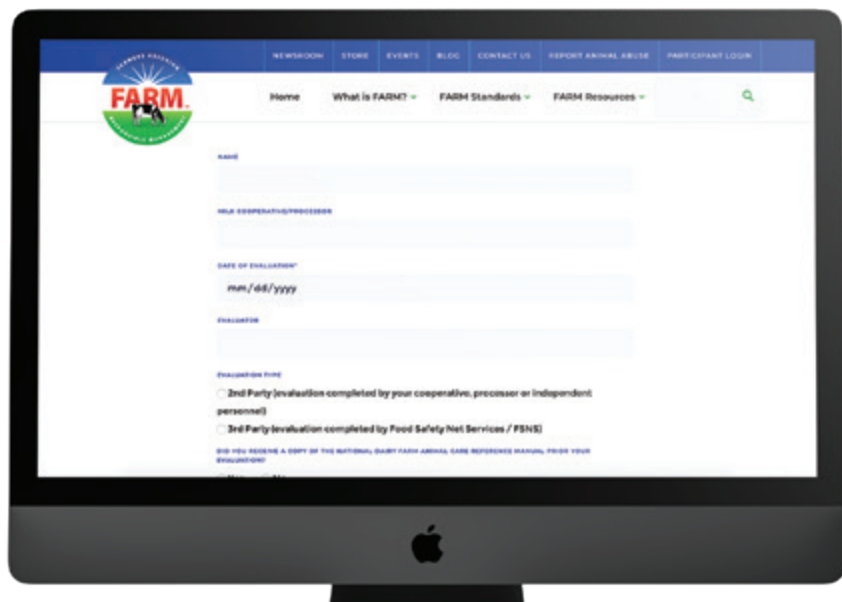
The FARM Program values feedback as it influences future standards and processes. After participating in an evaluation, we encourage all dairy farmers and managers to complete a feedback form found on our website: nationaldairyfarm.com/evaluationfeedback.

FARM Database Access

All dairy farms and evaluators have access to review their completed evaluations within the password-secured FARM database. Contact your second-party evaluator to create an account.

Data Privacy

The farm's personal information is private. The FARM Program and the Innovation Center for U.S. Dairy only use aggregated, anonymous results in public-facing reports. Talk to your evaluator to find out more about how your co-op or processor uses FARM Environmental Stewardship data. Some co-ops and processors use aggregated, anonymous results to answer customer questionnaires about on-farm sustainability.



Measuring Progress



Industry Leadership

The Innovation Center for U.S. Dairy uses anonymized data from FARM Environmental Stewardship to measure the industry's progress toward meeting industry-wide environmental goals. As a result, the industry can continue to demonstrate dairy's leadership on environmental issues.

Supply Chain Communications

Dairy buyers ask cooperatives and dairy processors to provide aggregated farm-level data on GHG emissions to help them measure the environmental footprint of their products. Cooperatives and dairy processors can use FARM Environmental Stewardship to collect on-farm GHG emissions data in a consistent and streamlined way; helping dairy farmers and the entire dairy value chain demonstrate our commitment to environmentally responsible production.

Resources



The FARM Environmental Stewardship Program area helps track and communicate a dairy farm's environmental achievements. The program provides tools and resources for farmers to measure and improve their environmental footprint.

Learn more: nationaldairyfarm.com

