



Environmental Stewardship

# EVALUATION PREPARATION GUIDE

► VERSION 3



**The National Dairy Farmers Assuring Responsible Management (FARM) Program is open to all farms, milk processors and cooperatives, and helps ensure the success of the entire industry by demonstrating to customers and consumers that U.S. dairy farmers are committed to producing the best milk with integrity.**

National Milk Producers Federation (NMPF) with support from Dairy Management, Inc. (DMI), established the FARM Program in 2009. Through the Innovation Center for U.S. Dairy, the dairy community has aligned behind FARM as the industry-wide, on-farm social responsibility program. Over the years, the FARM Program has expanded to provide resources and guidelines in its five program areas: Animal Care, Antibiotic Stewardship, Biosecurity, Workforce Development and Environmental Stewardship.

U.S. dairy farmers have a long history of being good environmental stewards. Our challenge is to show customers and consumers how the industry continues to make progress in improving environmental outcomes. The FARM Environmental Stewardship (FARM ES) program area helps track and communicate a farm's environmental achievements.

The online tool, combined with the program's resources, assist farms with pursuing continuous improvement in ways that make business sense. Version 3 of the program focuses on greenhouse gas (GHG) emissions, energy use and nutrient management plans as well as enabling farm-level insights through what-if scenarios.

An optional addition to the FARM Environmental Stewardship evaluation is available, addressing field and dairy-level conservation activities to capture a more holistic sustainability story.



©2025 National Milk Producers Federation

This manual is not a legal document and is intended for educational purposes only.

Dairy farmers are individually responsible for determining and complying with all requirements of local, state and federal laws.





## ► GOVERNANCE

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

The FARM Environmental Stewardship Task Force is composed of farmers, co-op and processor staff, and other subject matter experts. They guide program development and strategic direction.

The NMPF Environmental Committee reviews recommendations from the Task Force for new metrics and changes in program requirements. Such recommendations are subject to approval from the NMPF Board of Directors.

**FIGURE 1**

Governance Groups with Percentage of Farmer Representation in Each

<b>NMPF Board of Directors</b> (Approval)	<b>60%</b>
<b>NMPF Environmental Committee</b> (Recommendations)	<b>30%</b>
<b>Environmental Stewardship Task Force</b> (Guidance/Input & Ambassadors)	<b>36%</b>

## ► 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?

The FARM Program does not require a specific frequency of evaluations. A FARM Program participant (the co-op or processor through which a farm is participating) can work with its facilities to establish a regular cadence for evaluations (e.g. every three years). Grant programs or supply chain projects that facilities opt into may have requirements on how often to conduct evaluations. 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 retake the online, self-paced training annually to maintain their certification.

## ► THE SCIENCE BEHIND FARM ENVIRONMENTAL STEWARDSHIP VERSION 3

FARM Environmental Stewardship Version 3 uses the [Ruminant Farm Systems \(RuFaS\) model](#) as its engine for measuring a farm's GHG footprint. RuFaS is a whole-farm system model to simulate dairy farm production and environmental impact.

As a whole-system, process-based model, RuFaS accounts for physical, chemical, and biologic cycles which enables impacts and changes to be reflected across the whole farm system. By using the farm's location to pull relevant soil, temperature, and precipitation, the baseline footprint as well as "what-if" scenarios are tailored specifically to the farm.

The platform offers the ability to run "what-if" scenario analyses of management, practice, and technology options.

### WITH THIS NEW SCIENTIFIC ENGINE, FARM ES WILL BENEFIT OVER TIME

- Updated science to foster continued credibility:
  - Science is peer-reviewed, published, with ongoing scientific journal submissions
  - Full model will be open-source with documentation to support transparency
  - Model will integrate updates over time to stay current with latest research
- Leverages the expertise of researchers from across the country, including from the USDA Agricultural Research Service, Cornell University, University of California Davis, University of Wisconsin–Madison, Colorado State University, and more.

### THE DATA NEEDED TO ESTIMATE GHG EMISSIONS AND ENERGY USE INTENSITY INCLUDE

- Milk production records
- Herd data
- Ration information
- Manure management systems
- Energy use

### OPTIONAL DATA ENTRIES INCLUDE

- Animal management
- Field practices

Results are offered in pounds of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) per pound of Fat- and Protein-Corrected Milk (FPCM). This represents how many GHG emissions are emitted for the farm to produce one pound of FPCM. It includes both emissions that occur at the farm itself (e.g. fuel use) as well as emissions that occurred upstream (e.g. purchased feed production emissions).

Because the results are scaled by pounds of milk, the farm can compare results over time, even when total milk output changes. Since year-to-year improvement can be hard to see, the goal is to capture long term trends, not focus on the yearly ups and downs.







## CONSERVATION PRACTICE QUESTIONNAIRE

To further capture a more holistic sustainability story, the FARM program launched the Conservation Practice Questionnaire (CPQ) in 2022 as an optional add-on to the FARM ES evaluation. The questionnaire was developed with stakeholder feedback and on-farm piloting. It addresses areas covered in the dairy industry's 2050 environmental stewardship goals, highlighting field and dairy-level conservation practices including but not limited to:

- Participation in conservation programs like National Resources Conservation Service Environmental Quality Incentives Program (NCRS EQIP) or supply chain projects
- Water recycling and stewardship
- Use of byproducts for bedding or ration
- Use of energy saving technologies like LED lights, variable frequency drives (VFDs), plate coolers, etc.
- Implementation of field-level conservation practices like cover crops, no-till, crop rotation, etc.
- Pest management strategies

Organizations that participate in FARM Environmental Stewardship can use aggregate data from the questionnaire as a lens into the natural resource stewardship of participating dairy farmers and to respond to customer and consumer inquiries. Organizations may choose not to use the CPQ with no impact on its participation in FARM Environmental Stewardship otherwise.

## ► 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

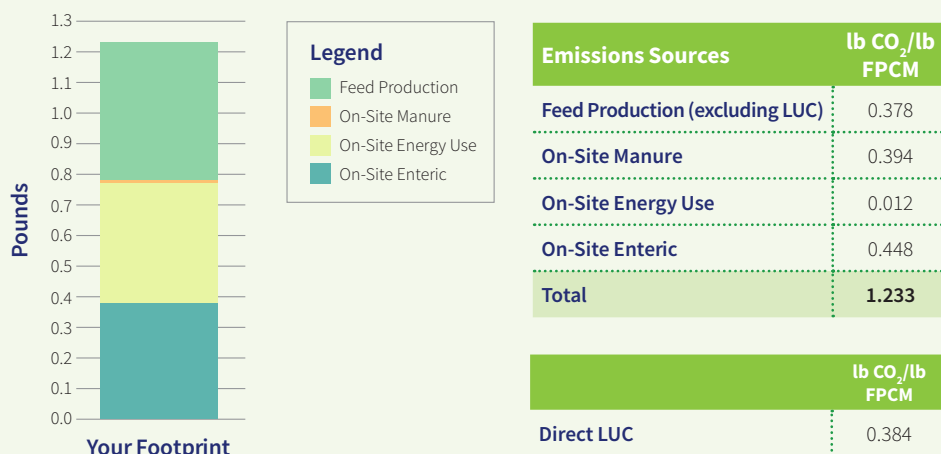
- Complete the FARM Environmental Stewardship Version 3 training to gain competency in conducting evaluations
- Understand relevant FARM resources, including the User Guide and Reference Manual
- Follow all safety guidelines and employ proper biosecurity protocols as set by the individual farmer
- Maintain and safeguard the farm's confidential information
- Communicate evaluation expectation 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

## ► RESULTS

FARM Environmental Stewardship estimates the farm's GHG and energy use footprints. (See Figure 2 for example results.)

FIGURE 2

### Example: Your Farm Greenhouse Gas Emissions



### 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

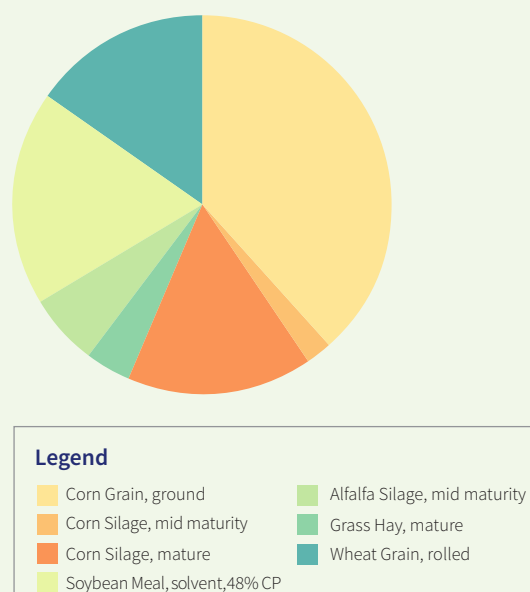
\*On-site refers to dairy activities on the farm. If the operation purchases feed and doesn't engage in feed production activities, the output will still generate an estimate for the environmental impacts of the purchased feed.

### THE REPORT OFFERS ADDITIONAL INSIGHTS INTO A FARM'S FOOTPRINT

- The **Feed Production Insights** section provides breakdowns of the farm's feed production emissions by ration ingredient.
- The **Relative Contribution to Emissions** graph compares the contribution of each Ingredient to Feed Production Emissions Relative to its Contribution to Dry Matter Intake (DMI). 1.0 means percentage of DMI = percentage of emissions. If an ingredient's ratio is above 1.0, it means that it contributes a disproportionate percentage of emissions compared to how much of the ration it makes up.
- **Homegrown Feed Emissions** section offers insights on emissions and sequestration from crops planted on the farm. The results of this section are based on the model's current calculations, which are undergoing updates.
- **Milk Allocation Factor** represents how much of the GHG footprint is assigned to milk production versus beef production. It is incorporated into the footprint results at the top of the data input list part of the report.
- The **Data Input List** documents the data that was input into the FARM ES report for future reference.

FIGURE 3

### Feed Production Emissions by Ration Ingredient







## ► CONTINUOUS IMPROVEMENT

To further explore potential continuous improvement opportunities, farmers and evaluators can run ‘what-if’ scenarios in FARM ES Version 3 to consider different management practices and technologies. Farmers can work with their evaluators to change one or more of the data inputs and then see the impact on the footprint results.

The FARM Environmental Stewardship Reference Manual can be used as a guide for identifying continuous improvement opportunities. 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.

The [Dairy Conservation Navigator](#), created by DMI, is an online platform, built to consolidate science-based information

on dairy conservation topics, practices and technologies that reduce a farm’s footprint. The Navigator explains complex sustainability topics through the Learning Hub, which provides training materials and resources to support farm advisors and information sharing. It also features definitions of over 80 common conservation practices and technologies, providing practical insights on their economic and management impacts. Access the Navigator: <https://www.dairyconservation.org/>

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"> <li>• Selecting a specialist/vendor</li> <li>• Financing options</li> </ul>
Feed Production	Not covered in the Reference Manual	N/A	N/A
On-Site Enteric	Chapter 3: Feed Chapter 4: Productivity	Page 16 Page 38	<ul style="list-style-type: none"> <li>• Ration formulation</li> <li>• Feeding</li> <li>• Herd health</li> </ul>
On-Site Energy Use	Chapter 6: Energy	Page 72	<ul style="list-style-type: none"> <li>• Energy efficiency options for milking, ventilation and lighting</li> </ul>
On-Site Manure	Chapter 3: Feed Chapter 5: Manure	Page 16 Page 58	<ul style="list-style-type: none"> <li>• Manure storage and treatment options</li> <li>• Ration formulation</li> </ul>

## ➤ AFTER THE EVALUATION

### EVALUATION FEEDBACK

The FARM Program values feedback as it considers future updates and resources. After participating in an evaluation, we encourage all dairy farmers and managers to complete a feedback form found on our website:

<https://nationaldairyfarm.com/national-dairy-farm-evaluation-feedback-form/>

### 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 or reach out to [dairyfarm@nmpf.org](mailto:dairyfarm@nmpf.org) 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. Collection, protection and use of data is outlined in the FARM Program [Privacy Policy](#) and [Terms of Service](#). 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. Visit the FARM database: <https://eval.nationaldairyfarm.com/>

## ➤ VERSION 3 CHECKLIST

FARM Environmental Stewardship collects data on milk production, herd data, rations, manure management, and energy use. This data should represent a 12-month period, specified by the evaluator. The following list contains the majority of the data captured in FARM ES Version 3, but some questions trigger follow-up information that may not be captured here:

DATA	DATA SOURCE EXAMPLES
<b>Milk Production</b> <ul style="list-style-type: none"><li>• Total annual milk production (lbs)</li><li>• Annual avg protein and fat content (%)</li></ul>	DHIA, dairy record management system, milk shipment records
<b>Herd Profile</b> <ul style="list-style-type: none"><li>• Total adult herd (running herd avg of lactating + dry cows)</li><li>• Annual avg on-site pre-weaned calves</li><li>• Annual avg off-site or purchased pre-weaned calves</li><li>• Annual avg on-site post-weaned heifers</li><li>• Annual avg off-site or purchased post-weaned heifers</li><li>• Adult animals sold (%)</li><li>• Adult animals that died (%)</li></ul>	Herd management software (DairyComp, PCDart)
<b>Herd Profile: Optional</b> <ul style="list-style-type: none"><li>• Times milked per day (default - 3)</li><li>• Breed (default – Holstein)</li></ul>	Herd management software (DairyComp, PCDart)



DATA	DATA SOURCE EXAMPLES
<b>Animal Management: Optional</b> <ul style="list-style-type: none"> <li>• Still birth rate (default – 6.5%)</li> <li>• Avg days of weaning (default – 60 days)</li> <li>• Calves born as replacements (default – 40%)</li> <li>• Age of first breeding (default – 40 days)</li> <li>• Heifer breeding method (default – ED)</li> <li>• Heifer breeding method details (conception, detection rate)</li> <li>• Cow breeding method (default – ED)</li> <li>• Cow breeding method details (conception, detection rate)</li> <li>• Calving details (dry period)</li> <li>• Breeding and milk production culls</li> <li>• Other culling information</li> </ul>	Herd management software (DairyComp, PCDart)
<b>Feed</b> <ul style="list-style-type: none"> <li>• Lactating cow ration feed ingredients</li> <li>• For each ingredient: <ul style="list-style-type: none"> <li>— Amount fed (lbs/day) either as-fed or dry matter basis</li> <li>— Homegrown, purchased, or both</li> </ul> </li> </ul>	Nutritionist, feed management software, dairy record management system
<b>Feed: Optional</b> <ul style="list-style-type: none"> <li>• Calf ration details</li> <li>• Heifer ration details</li> <li>• Dry cow ration details</li> </ul>	Nutritionist, feed management software, dairy record management system
<b>Nutrient Management Plan</b> <ul style="list-style-type: none"> <li>• If the farm has a plan, type of written plan <ul style="list-style-type: none"> <li>— Whether farm implements and maintains it</li> </ul> </li> </ul>	Nutrient management plan
<b>Manure</b> <i>For each manure management system/animal group</i> <ul style="list-style-type: none"> <li>• Housing type</li> <li>• Months per year (if relevant)</li> <li>• Bedding type</li> <li>• Pen type</li> <li>• Barn type</li> <li>• Manure handling</li> <li>• Manure separation (solid-liquid separation)</li> <li>• Manure treatment (anaerobic digestion)</li> <li>• Manure storage</li> </ul>	Nutrient management plan, anaerobic digester company, solid-liquid separator manufacturer
<b>Energy</b> <ul style="list-style-type: none"> <li>• Annual total electricity use</li> <li>• Annual total fuel use</li> <li>• Annual total renewable energy generated (solar, wind, digester)</li> <li>• Annual total carbon/renewable energy credits</li> </ul>	Utility bills, energy usage logs, purchase records
<b>Field Management: Optional</b> <ul style="list-style-type: none"> <li>• Manure details, nutrient content (if known)</li> <li>• Fertilizer details, nutrient content</li> <li>• For each field, need five years of crop data including: <ul style="list-style-type: none"> <li>— Number of acres managed</li> <li>— Planting, harvest, manure application, fertilizer application, and tillage information</li> </ul> </li> </ul>	Nutrient management plan, field management software



## ► MEASURING PROGRESS

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.

### 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 ES 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.



## ➤ MANURE MANAGEMENT GLOSSARY

FARM Environmental Stewardship defines manure management and handling practices by the descriptions below. Use the table as a guide, since system names vary by region. Links are included for additional information on each management practice.

MANURE MANAGEMENT/ HANDLING SYSTEMS	DESCRIPTION
<b>Daily Spread</b>	Manure is collected and land applied within 24 hours. <a href="https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf">https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf</a>
<b>Solid Stack</b>	The storage of manure, typically for a period of several months, in unconfined piles or stacks. Manure can be stacked due to the presence of bedding material or loss of moisture by evaporation. This choice should be chosen for separated manure solids that are stacked for a short period of time before use. <a href="https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf">https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf</a>
<b>Composting</b>	Biological oxidation of solid waste, including manure, usually with bedding or another organic carbon source. See below for different types of composting. <a href="https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf">https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf</a>
<b>Slurry Storage Underfloor</b>	Collection and storage of manure usually with little or no added water, typically below a slatted floor in a barn, usually emptied a few times a year. <a href="https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf">https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf</a>
<b>Slurry with Crust</b>	Manure stored in structures like a basin or tank, usually between 5% and 15% dry matter. There is little added water, and a natural crust is allowed to form. <a href="https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf">https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf</a>
<b>Slurry without Crust</b>	Manure stored in structures like a basin or tank, usually between 5% and 15% dry matter. There is little added water, and a natural crust is NOT allowed to form. <a href="https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf">https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf</a>
<b>Covered Anaerobic Lagoon</b>	Manure stored in structures like a basin or tank with a cover, usually with a solids volume of less than 5%. Typically, the storage found in systems where effluent from a solid-liquid separator is stored or a dairy that uses flushing to clean alleys and pens. <a href="https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf">https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf</a>
<b>Uncovered Anaerobic Lagoon</b>	Manure stored in structures like a basin or tank, usually with a solids volume of less than 5%. Typically, the storage found in systems where effluent from a solid-liquid separator is stored or a dairy that uses flushing to clean alleys and pens. Uncovered lagoons are open to the air. <a href="https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf">https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf</a>
<b>Cap and Flare</b>	Cap and flare systems involve a gas-tight plastic membrane covering the surface of manure storage structures to capture emissions and keep rainwater out. Gas collected from under the cover can be combusted in a flare to reduce greenhouse gas emissions. <a href="https://ecommons.cornell.edu/server/api/core/bitstreams/8586a845-6ed2-4c50-bab8-03b46a95d02b/content">https://ecommons.cornell.edu/server/api/core/bitstreams/8586a845-6ed2-4c50-bab8-03b46a95d02b/content</a>
<b>Anaerobic Digester</b>	Encourages the bacterial decomposition of manure in the absence of oxygen, producing biogas, which is collected and utilized. <a href="https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf">https://www.nrcs.usda.gov/sites/default/files/2022-09/Glossary.pdf</a>
<b>Flush</b>	Flush systems use water to flush manure from alleyways. The water and manure are then collected, and solids are usually separated with mechanical or gravity systems before the wastewater is recycled and used again. <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9165779/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9165779/</a>



703.243.6111 | [dairyfarm@nmpf.org](mailto:dairyfarm@nmpf.org)

Learn more at the FARM website: [nationaldairyfarm.com](http://nationaldairyfarm.com).

©2025 National Dairy FARM Program. All rights reserved.