FARM ES Scientific Background
September 2021

MODEL OVERVIEW

FARM ES estimates farm-level greenhouse gas (GHG) emissions and energy intensity. It uses a scientific, peer-reviewed model based on IPCC Tier 2 methods and life cycle assessment (LCA) research.

The model that powers FARM ES was developed with findings and methods from the dairy industry's LCA. The simplified model explains 98% of the variability in total footprint across farms while necessitating a more limited amount of input data. Input data includes milk production records, herd data, rations, manure management, and energy use.

The LCA was conducted in compliance with ISO 14040:2006 and 14044:2006 standards, with the exception that a single impact assessment method, global warming potential, was adopted. ISO standards call for a wider range of impact assessment categories. FARM ES is also consistent with the International Dairy Federations' 2015 guidance, A common carbon footprint for the dairy sector, except that land use change is currently excluded.

The GHG footprint results are provided in pounds of carbon dioxide (CO_2) equivalent per pound of fat and protein corrected milk (FPCM). FPCM normalizes milk to the same scale, using the National Research Council (NRC, 2001) approach for fat and protein corrected milk, so that farms can track their results consistently even if milk output changes year to year.

Version 2 of the tool, released in 2020, contained important scientific updates and new data inputs including updated crop emissions factors, a breakdown of greenhouse gas emissions by gas type, a metric on the use of nutrient management plans, and the ability to capture the benefits of solid-liquid separation, and solar and wind energy.

SCOPE 3 REPORTING

FARM ES is the recognized method in Scope 3 GHG Inventory Guidance for U.S. Dairy Cooperatives and Processors to collect Purchased Goods and Services GHG emissions. The guidance went through World Resources Institute (WRI) review and carries the 'Built on GHG Protocol' Mark, signifying its alignment with the Corporate Value Chain (Scope 3) Standard. This enables FARM ES to facilitate reporting to CDP and other environmental reporting initiatives because the GHG Protocol is the most globally accepted carbon accounting methodology. Additionally, FARM ES output data is accepted by The Sustainability Consortium and Walmart's Project Gigaton.