

## ERS Peer Review Plan

Preliminary Title: Precision Dairy Farming, Robotic Milking, and Profitability in the United States

Type of Report (ERR, EIB, EB) ERR

Agency: Economic Research Service [X] Influential Scientific Information  
USDA [ ] Highly Influential Scientific Assessment

Agency Contact: Kelly Maguire, kelly.b.maguire@usda.gov

Subject of Review: Modern precision dairying, including a wide array of sensors, data analytics, and automation technologies like robotic milking, help operators implement cow level—rather than herd level—management practices. Use of one or more of these technologies can reduce average costs and increase milk yields per cow. USDA’s Agricultural Resource Management Survey shows that U.S. adoption of precision dairy technologies related to milking, reproduction, and data systems increased steadily between 2000 and 2021. Some studies indicate these technologies are profitable under certain circumstances, though none have provided aggregate estimates using detailed data from a representative sample of U.S. dairies. This report classifies and overviews several precision dairy technologies, while documenting their increasing use relative to conventional technologies and the characteristics of operators and farms that use them. Building on this information, we develop an econometric model to estimate the impacts of precision technologies on dairy profitability, controlling for farm size and infrastructure, demographics, high speed internet access, and other factors. The analysis is the first to quantify that the use of more than one non-robotic milking, reproductive, or data systems technologies affects dairies’ net returns. Robotic milking has a similar profitability effect.

Purpose of Review: The purpose of the review is to ensure the high-quality of the economic analysis, transparent explanation of methods, objective interpretation of results, and effective communication to the intended audience.

Type of Review: [ ] Panel Review [X] Individual Reviewers  
[ ] Alternative Process (Briefly Explain):

Timing of Review (Est.): Start: 11/04/2024 Completed: 3/6/2025

Number of Reviewers: [ ] 3 or fewer [X] 4 to 10 [ ] More than 10

Primary Disciplines/Types of Expertise Needed for Review: Economists

Reviewers selected by: [X] Agency [ ] Designated Outside

