



The intersection of on-farm animal welfare evaluation and technology integration as the future of animal-based indicators for animal welfare measurement: an example from the United States

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More than a decade ago, the U.S. dairy industry recognized that meeting the nutritional needs of a growing and diversified population requires a sustainable food system with transparent production practices and proof points. To address these needs, the U.S. dairy industry formed the National Dairy Farmers Assuring Responsible Management (FARM) Program. This program commits U.S. dairy farmers to high-quality, on-farm management practices in animal care, antibiotic stewardship, biosecurity, environmental stewardship and workforce development. FARM's transparency provides consumers with confidence that their dairy products are produced in keeping with the highest level of science-based metrics and best practices. The FARM Animal Care program is comprised of three components: best management practice manuals, second-party farm evaluations and third-party verification. A key component to evaluating animal care through the second-party farm evaluations includes scoring animal-based indicators for animal welfare. Those indicators scored include: body condition, hygiene, hock and knee lesions, locomotion and broken tails. With the advancement of precision technology available to U.S. dairy herds, FARM is working to overlay the data these technologies provide with the animal-based indicator scoring systems. In turn, program implementation burden on dairy farmers, cooperatives and processors will be eased while providing more objective, animal-based data to support demonstrating U.S. dairy's commitment to animal welfare.

Abstract

Keywords: Social responsibility, animal welfare, animal care, precision technology.

In 2009, the National Milk Producers Federation with support from the U.S. levy program Dairy Management Inc. developed the National Dairy Farmers Assuring Responsible Management (FARM) Program¹. FARM is open to all U.S. dairy farmers, cooperatives and processors. The Innovation Center for U.S. Dairy coordinated alignment behind the FARM Program as the industry-wide social responsibility program for on-farm production. The goal is to assure dairy consumers and customers that dairy farmers care for the animals, workforce and land in a humane and ethical manner.

Introduction

Through FARM Animal Care, the U.S. dairy industry has embraced on-farm evaluations to assess animal welfare through various science-driven standards and best practices, instilling a commitment to continuous improvement. It also identifies areas of risk and liability to the industry in terms of consumer perception.

Material and methods

As the world's first Animal Care program to meet the International Organization for Standardization Technical Specification requirements for the World Organization for Animal Health dairy cattle welfare standards, FARM Animal Care provides assurances throughout the supply chain regarding on-farm animal welfare through three primary components: best management practice manuals, second-party farm evaluations conducted by trained and certified evaluators and independent third-party verification to demonstrate the program's integrity.

The best practices and standards that make up the FARM Program are required to have a scientific and technical basis. These standards are reviewed every three years to ensure that the program is keeping up with the latest science-based recommendations. Best management practice manuals, including the Animal Care Reference Manual² and the Milk and Dairy Beef Drug Residue Manual³, provide a comprehensive set of expectations and are educational tools and resources for farms as they develop on-farm best management practices.

The second-party farm evaluation follows a standardized protocol and evaluation rubric based upon current FARM Program standards and best practices. Trained and certified evaluators conduct triennial on-farm evaluations include interviews with farm owners and employees, review of content and implementation of written protocols, and evaluation of animal-based indicators for animal welfare.

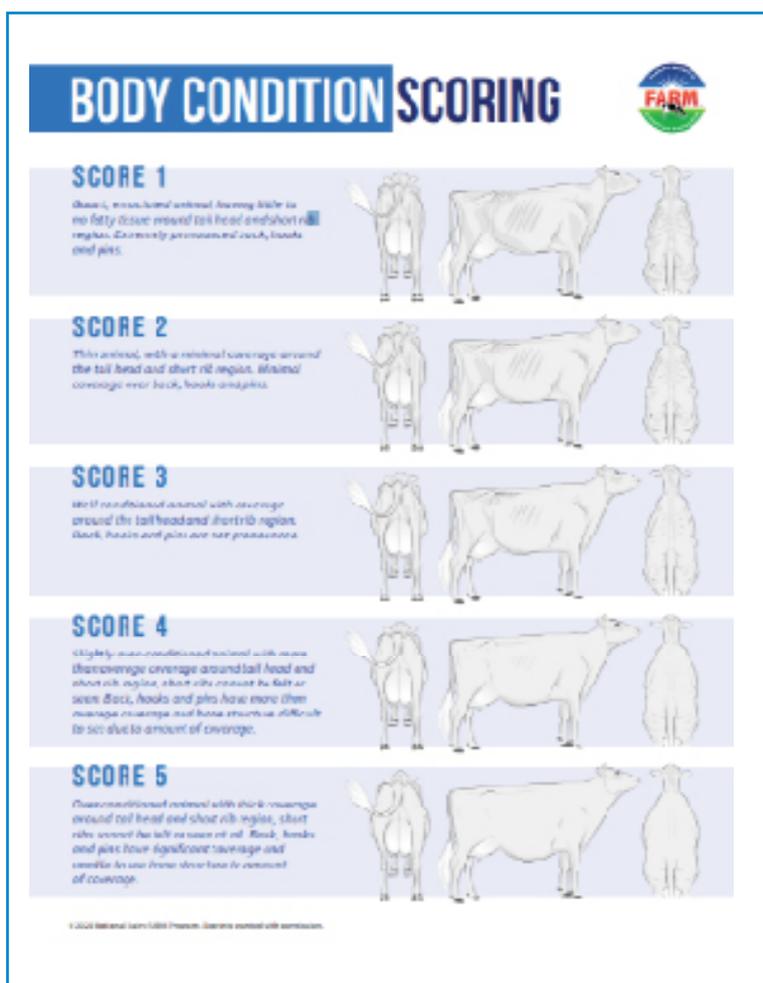


Figure 1. Body Condition Scoring Guide.

The animal-based indicators for animal welfare, each having a unique scoring system with industry benchmark, are conducted through observation of individual animals. These include:

- Body Condition Score – an indicator for nutritionally adequacy.
- Hygiene Score – an indicator for sanitation and cleanliness.
- Locomotion Score – an indicator for hoof and leg health.
- Hock and Knee Lesion Score – an indicator for resting area conditions.
- Broken Tail – an indicator for stockmanship.

In order to ensure consistency in the evaluation of these animal-based indicators, a number of evaluator scoring guides have been developed (Image 1 and 2) that serve as a reference during second-party evaluation animal-based observation.

Newer on-farm technology data streams, ranging from in-line milk quality readers to animal activity monitoring, will be incorporated into FARM Animal Care as an overlay for key animal welfare indicators augmenting existing on-farm evaluations.

The third component of FARM Animal Care is a third-party verification process. This process helps to demonstrate program integrity by objectively evaluating the consistency and accuracy of farm evaluators and the program itself. This process, too, would be greatly enhanced by the integration of on-farm technology data streams.

Robust adoption has allowed the U.S. dairy industry a unified approach to animal welfare. In its fourth iteration, FARM Animal Care participation includes 99% of U.S. milk production from dairy farmers in 49 states – 31,000+ dairy farm participants from 130+ dairy cooperatives and processors.

In Version 4.0 of FARM Animal Care, benchmarks for animal-based observations have been set based upon previous program version data collection and scientific literature review. The benchmarks⁴ are outlined in Image 3 and designates which age classes these respective measures are evaluated. Some age classes have been found to be at lesser risk for locomotion, hock and knee lesions and broken tail incidence and therefore, are not evaluated. Animal-based observations scores and benchmark achievement is determined within each respective age classes i.e. 90% benchmark for hygiene is a goal for lactating cows, pre-weaned calves, post-weaned heifers and dry cows respectively instead of 90% cumulatively in all age classes.

In Version 3.0 of the program, FARM data demonstrated the animal observation benchmark standards were met on the majority of all herds evaluated. On 33,000 facilities evaluated throughout the entire program cycle (2017-2019) are listed in table 1.

Version 4.0 of FARM Animal Care, that has been in place since January 1, 2020, demonstrates similar trends in the majority of facilities evaluated meeting animal observation benchmarks in all age classes for specific animal-based measures. On 3,100 facilities evaluated to date, the results are reported in table 2.

Recognizing the risk of subjectivity that exists when individual evaluators are assessing these animal-based measures, the integration of precision on-farm technology data streams for animal-based measures, will enhance the objectivity of these data points. This will further support the overall consistency in the assessment of animal welfare providing stronger, unified assurances for the supply chain.

Results

Table 1. Version 3.0 Animal-Based Observation Standard Compliance at time of a facility evaluation.

Benchmark	Standard Met	Standard Not Met
Hygiene: ≥ 90% all animals score 2 or less	69.3%	30.7%
Locomotion: ≥ 95% lactating and dry cows score 2 or less	98.0%	2.0%
Body condition: ≥ 99% all animals score 2 or higher	98.3%	1.7%
Hock and Knee Lesion: ≥ 95% lactating and dry cows score 2 or less	95.8%	4.2%

Table 2. Version 4.0 Animal-Based Observation Standard Compliance at time of a facility evaluation.

	Hygiene: ≥ 90% score 2 or less		
	Standard Met	Standard Not Met	N/A
Pre-weaned calves	74.1%	3.4%	22.4%
Post-weaned heifers	59.7%	24.8%	15.5%
Pre-fresh heifers/dry cows	79.0%	10.0%	11.0%
Lactating Cows	89.7%	9.6%	0.7%
	Body Condition: ≥ 99% score 2 or higher		
	Standard Met	Standard Not Met	N/A
Pre-weaned calves	77.0%	0.5%	22.5%
Post-weaned heifers	83.6%	0.9%	15.5%
Lactating cows	97.7%	1.5%	0.8%
	Locomotion: ≥ 95% score 2 or less		
	Standard Met	Standard Not Met	N/A
Lactating cows	96.9%	1.9%	1.2%
	Hock Lesion: ≥ 95% score 2 or less		
	Standard Met	Standard Not Met	N/A
Lactating cows	94.5%	4.7%	0.8%
	Knee Lesion: ≥ 95% score 2 or less		
	Standard Met	Standard Not Met	N/A
Lactating cows	98.5%	0.6%	0.9%
	Broken Tails: ≥ 95% do not have broken tails		
	Standard Met	Standard Not Met	N/A
Lactating Cows	80.0%	17.8%	2.2%

*N/A indicates age class is housed off-site or all animals in age class were unable to be scored

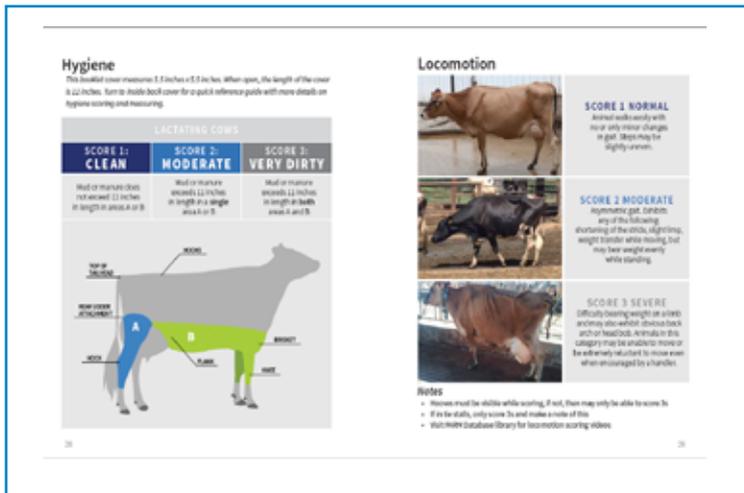


Figure 2. Evaluator Pocket Guide.

	Hygiene	Body Condition Score†	Locomotion†	Hocks†	Knees†	Broken Tails†
Benchmark to Meet	90% or more observed animals score 2 or less on the FARM Program Hygiene Scorecard	99% or more of observed animals have a body condition score of 2 or greater on FARM Body Condition Scorecard	95% or more of the lactating herd score 2 or less on the FARM Locomotion Scorecard	95% or more of the lactating herd score 2 or less on the FARM Hock Scorecard	95% or more of the lactating herd score 2 or less on the FARM Knee Scorecard	95% or more of lactating animals do not have broken tails
Lactating Cows	✓	✓	✓	✓	✓	✓
Pre-Weaned Calves (heifers, bulls, steers)	✓ (3 days of age and older)	✓ (3 days of age and older)				
Post-Weaned Heifers	✓	✓				
Pre-Fresh Cows and Heifers/Dry Cows	✓					

Figure 3. FARM Outcomes-Based Animal Based Observations with benchmarks for each animal age class.

Conclusion

Animal care is a constant commitment for dairy farm owners, managers and their employees. A science-based, industry-wide social responsibility effort such as the U.S. National Dairy FARM Program creates a framework for on-farm animal care and fosters a culture of continuous improvement. The Program's adoption of precision technology data streams will further ease the implementation burden on dairy farmers and cooperatives and processors while providing more objective, animal-based data to support demonstrating U.S. dairy's commitment to animal welfare.

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