A GUIDE TO

Feed Management: Enhancing Sustainability by Reducing Feed Loss

KEY TAKEAWAYS

Producing feed is a resource-intensive process. Optimizing feed management and minimizing feed loss can reduce the environmental footprint of dairy farms.

Feed loss or shrink includes a loss of feed quantity (dry matter) and a loss of feed quality (nutritional quality, palatability, impacts on animal health & productivity).

There are opportunities during harvest, storage, and feed out to reduce feed loss, preserve feed quality, and improve the sustainability of dairy farms.

REFERENCES

1. Lawrence, 2023. Forage opportunities to combat rising costs. Progressive Dairy. https://hdl.handle.net/1813/112844

HOW IS FEED PRODUCTION, STORAGE, AND MANAGEMENT RELATED TO SUSTAINABILITY?

Feed is resource intensive to grow, harvest, and purchase. Therefore, it is important to minimize loss, shrink, waste, spoilage, and poor quality.

Feed production is part of the circular economy of dairy farms. Forages are grown on the farm then fed to cows, the manure fertilizes the fields, and crop rotation with perennials can be beneficial to the land.

Feed management impacts a farm's environmental footprint through effects on:

- Animal health and production
- Enteric methane emissions
- Acres under cultivation for animal feed production
- Required feed purchases and trucking
- Impact on local waterways due to silage effluent

WHAT IS SHRINK?

Shrink refers to the loss of feed, both the direct loss of feed quantity and the indirect loss of feed quality. This can happen during harvest, storage, handling, or feed out.

Biological shrink refers to the loss that happens during fermentation. A small percentage of biological shrink is inevitable as fermentation microbes consume a portion of the feed for energy. Biological shrink in fermented forages can near 10%.[1]

Other causes of shrink include: spoilage due to poor fermentation, rain, wind, and inaccuracy during feeding.

The impact of shrink on the acreage needed to support a herd can be calculated using the PRO-DAIRY Forage Acreage Needs Calculator.

Scan the QR code to access the calculator!

WHAT IS HIGH QUALITY FORAGE AND WHY IS IT IMPORTANT?

High quality forage meets the nutritional needs of the animal and balances the correct amount of fiber and digestibility. There are two components:

- **Lab analysis** refers to the nutritional components of the feed (e.g., protein, starch).
- **Feed value** refers to overall quality as a feed (e.g., stability when removed from the bunk, contamination, toxins, molds).

Forage quality drives ration composition, can dictate the need to purchase additional feeds or supplements, and is economically important for farms. High quality forage is also critically important for cows to stay healthy and produce milk efficiently.

Dairy farms can improve sustainability by preserving both forage quantity (minimizing shrink) and forage quality (preserving nutritional components and feed value).

OPPORTUNITIES: MANAGING FORAGE QUALITY AND FEED SYSTEMS

STAGE	FOCUS AREA	MAXIMIXING QUALITY AND REDUCING LOSS
Forage harvest	Plant maturity	Timing is critical when it comes to harvesting forages. Harvest at the optimal stage of maturity to preserve feed nutrient content.
	Plant moisture	Harvesting at the correct moisture content is essential to facilitate fermentation, minimize effluent, and prevent spoilage.
	Processing of Forage (length of cut, kernel processing)	Cutting forage too long or too short can impact bunk packing and fermentation. Unprocessed corn kernels pass through into manure. It is important to maintain machines and not rush.
Forage storage	Density	Forages must be compacted to the correct density to remove oxygen. This creates an anaerobic environment for fermentation. Note: This is often an area where dairy farms can improve, particularly when using horizontal silos.
	Fermentation (inoculants)	Inoculants can help to speed up fermentation and ensure the forage ferments evenly and remains stable. Attention should be paid to distributing inoculants evenly.
	Excluding oxygen & water (bunk density, oxygen limiting plastic covers)	Oxygen and water are detrimental to fermentation. Achieving a high density can help to minimize oxygen and utilizing waterproof covers can keep outside sources of moisture away from forage.
	Storage size (matching bunk size to herd size)	It is important to match the size of storage to the needs of the farm. This ensures feed is accessible and bunks are not overfilled which can lead to loss and safety hazards.
Feed systems and feed out	Planning	Design appropriately sized feed storage areas that protect from the wind, elements, and pests. Utilize bins, bays, commodity sheds, or closed sheds where appropriate.
	Inventory management	Keep track of inventory and shrink. For example, weigh all feed as it enters the farm so losses can be calculated using on-farm feed inventory software.
	Accuracy	Ensure equipment is maintained and calibrated regularly. Measure the nutrient composition and moisture of forages routinely and adjust ration formulation accordingly.
	Optimization	Work with experts to formulate your ration. Monitor dry matter intake to ensure the nutritional requirements of animals are being met. Optimize the use of home-grown feeds to minimize the need for purchased feed.

THE BOTTOM LINE

It is important to minimize feed loss to ensure the time, resources, and energy used to grow feed is not wasted. Farmers can talk to nutritionists, forage specialists, and other farm advisors about making changes to their harvest, storage, and feed out practices. Improvements can reduce feed loss, maintain feed quality, and support the sustainability of the dairy sector.