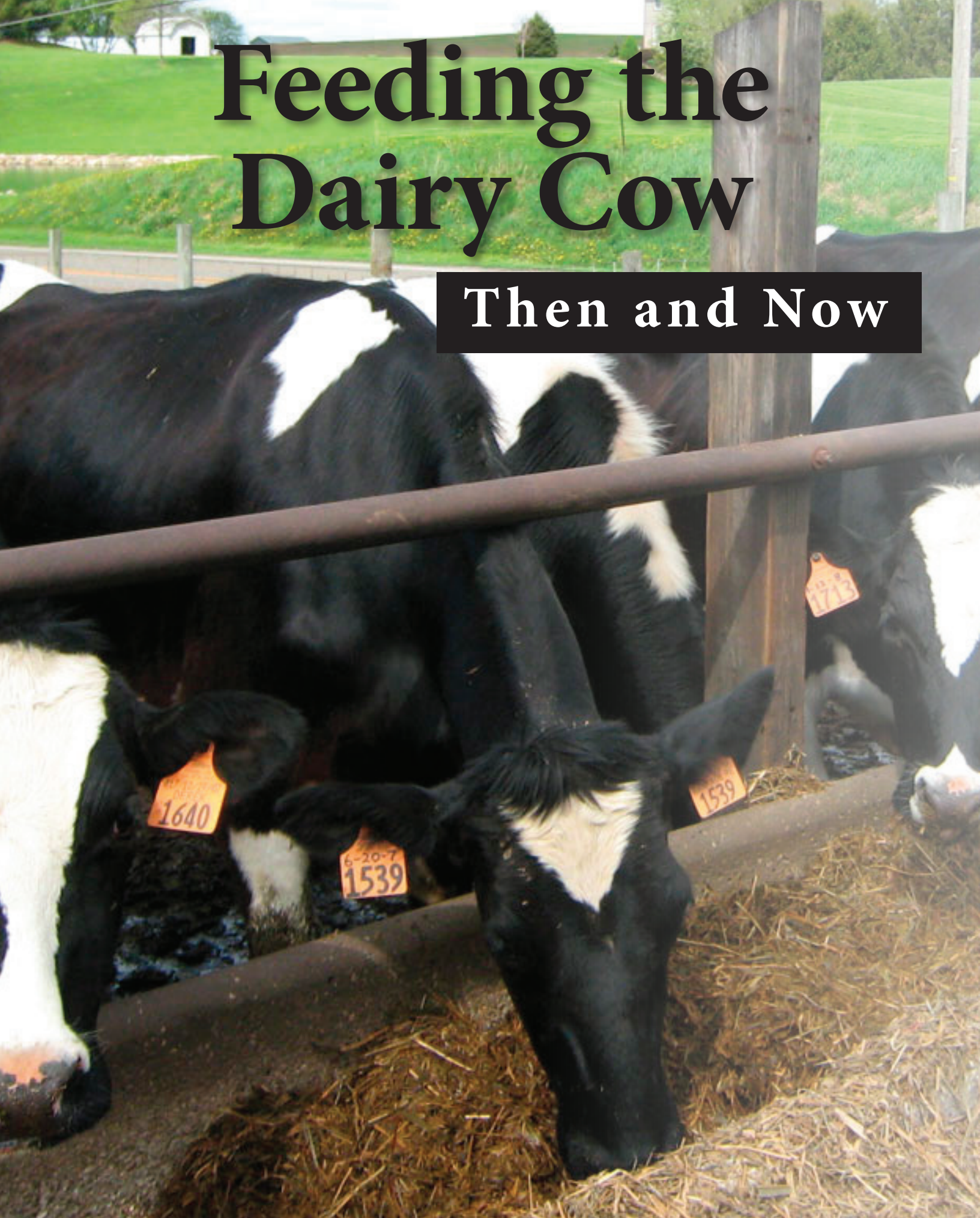


# Feeding the Dairy Cow

Then and Now



The farmer's responsibility is to manage the dairy cow to keep her healthy and productive. In the beginning, this meant putting her on the best pasture he could. The dairy cow's job was to use her superpower to turn the grass she grazed into milk (and to drop manure to build the soil).

## Pasture

Dairy farming began on homesteads where farmers milked their own cows for their family. As homesteads became villages, and fewer people owned enough land to keep cows, dairies produced milk for local residents. Most dairies had no more than a few dozen cows.

The farmer milked twice a day and knew which cows were pregnant, which were lactating, which were dry and he could supplement nutritional needs by hand. It was laborious and not very scientific. The complexities of the rumen were not known, nor the real requirements for vitamins, minerals, enzymes, amino acids, fats and proteins.

Pasture, if managed carefully, can provide most of forage for dairy cows. The advantages of grazing include:

- Less cow-direct labor for the farmer
- Decreased resource needs and risks for procuring forage
- Less manure handling
- Less bedding need
- Better cow health from grazing
- Better milk quality from grass/feed ratios

However, there are limitations to pasture-based feeding, which include:

- Costs and labor of pasture and fencing maintenance
- Supplementing the cows' diet to maximize their health and productivity

- Weather-related constraints on grazing (short season, drought, flood)

Dairy cattle can sustain themselves on grass and hay, but those bred to produce milk are less able to put fat on their backs, even in low stress environments with abundant grazing.

"It is very difficult to fatten up a cow that produces a lot of milk. A good dairy cow ... looks like ... skin and bones to the untrained eye." Steven Judge, Researcher & Writer

A lot has changed.

*"Dairy cattle can sustain themselves on grass and hay, but those bred to produce milk are less able to put fat on their backs"*

## Total Mixed Ration

Cows are ruminants, built to thrive on fibrous flora, such as grass and hay, but they can also do well on mixed rations. Total mixed rations (TMR) consist of forage and grain ingredients blended together to specific nutrient concentration. Mixed rations should be formulated in consideration of the nutritional requirements of the top third of the cows in each group.

## Advantages

The efficient feeding of a mixed ration exerts a positive influence on cow health, milk production and herd management.

The advantages to feeding dairy cows a total mixed ration include:

- Cows consume the desired forages
- Cows get the optimum ratio of forage and grain
- A lower risk of digestive disturbance
- Improved feed efficiency and

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less waste  
In addition, there are some potential advantages:

- A mixed ration may include commodity feeds for cost savings
- Less labor may be required for feeding
- The ration may be mixed and delivered with high accuracy

Indoor feeding based on a mixed ration has been proven to increase flow and decrease milking time while delivering individual nutrition for each cow.

### Disadvantages

Because efficient mixed ration feeding depends on feeding cows according to their production stage, it is preferable to group cows. This is not feasible in small herds and can also be limited by the size and configuration of the barn. The most common result of feeding all cows the same ration is some cows may over eat while others may not get the nutrition they need.

The University of Michigan offers the following guidelines for grouping and moving cows on mixed rations.

### Grouping Cows

- Group cows by their production stage
- Add more groupings as herd size increases
- Separate first-calf heifers due to their smaller size,

growth requirements and lower competitiveness to reduce stress and ensure adequate consumption

- A week after calving, put fresh cows in a high production group for about three months
- When milk output falls, move those cows to a lower production group until their body condition improves.

Properly formulated rations should support the cow and offset dramatic falls in her milk production.

### Moving Cows

- Cows do best when they're moved in small groups instead of individually
- Moves at feeding time minimize social interactions and related stresses
- Regularly scheduled moves are easier than erratic moves
- Move cows in consideration of their production state
- Try to limit heat detection to one group
- Increase grain allotment by five pounds for a few days after moving

### Automated Feeding

Automated systems are easy to install and operate, low maintenance or maintenance free and designed for multiple types of feed. Automation has brought comfort, convenience and precision to the care and

feeding of dairy's cash cows.

No one system fits every operation, but chances are there's a system for every operation. First and foremost, the purpose of automated feeding is to deliver feedstuffs to the cows, individually or in groups, at greater efficiency than that possible by grazing and/or hand-feeding. Every dollar a farmer invests in automation should return dividends over time in ever-increasing efficiency and profitability.

"Feeding is the largest single cost on a dairy farm, representing up to 50 percent of total running costs. Feeding tasks are, after milking, the most time-consuming activity. Getting the right amount of feed, at the right time, to your dairy herd is key to animal health, to good reproduction performance, and to farm profitability.

Having an automatic system do the work is vital to farmers' lifestyle and to optimal farm management." DeLaval Director Fernando Mazeris

Dairy interests—university ag departments, government agencies, agricultural institutions, research facilities, private companies—have invested large sums to understand the dairy cow and the dairy business.

As research grows, they develop products and refine technologies to improve cow health and bolster farm profitability.

### Parlor Feeders

Parlor feeders are used in feed areas as well as the milking stall. For milking, they dispense a small amount of feed into the milking stall to facilitate quick and easy loading. The cow walks in and while she eats, she's milked. Tests have shown higher levels of oxytocin when cows are fed during milking.

### Standalone Feeders

Several mechanized grain-feeding systems are available to replace or

supplement the parlor grain feeding system. These systems are designed to dispense supplements to cows appropriate to their stage (pregnant, lactating, dry). The more advanced feeders record and report each cow's body condition and dispense feed accordingly.

### Free-choice, electronic grain feeders

These units allow cows equipped with an identification unit (typically a magnet, key or chain) to enter a feeding area. These systems do not monitor or restrict the cow's amount of access time or grain consumption. Free-choice feeders require oversight to prevent the stress of over-feeding and related digestive problems. The advantages of these systems are their lower cost and maintenance due to their simplicity.

### Preset or computerized grain feeders

These systems do control the amount of grain an individual cow can consume during a set period of time. Computerized systems cost more, the price varying according to the volume of feed they hold and the complexity of features desired. Computerized feeder features include:

- A print-out to show each cow's total daily grain consumption
- Identification of cows that do not consume their allotted grain
- Capacity to dispense the grain over a preset time
- Capacity to dispense more than one ration mix
- Milk collection data for each cow
- Individual health reading for each cow
- An alert system to signal malfunction or power interruption

*(continued on next page)*

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## Feed Mixers

The stationary mixer feeder typically features a vertical auger, a discharge door and can mix feed volumes from the 250 to 500 cubic foot range to the eight to 14 cubic meter range. Self-propelled mixer feeders combine the speed of self-propulsion with the efficiency of a silage-cutting system. These feeders can be set to mix distinct rations for multiple groups of cows.

## Silage Cutters and Distributors

A silage cutter is equipped with heavy-duty knives and a hydraulic



bypass system to provide adequate pressure for cutting rough plant matter. Some can cut silage blocks up to 3.4 feet in depth. A cutter typically operates on top of a distributor that dispenses the silage to the feed area saving the farmer labor and time.

## Feeding Robots

Feeding robots come in suspended and wheeled types. The former move around by a suspension system by which they move vertically and horizontally to avoid obstacles while dispensing feed. The latter move around on wheels and require more attention from the farmer. Feeding robots typically have mixing augers and cross-conveyor belts that allow dispensing on two sides. They can be configured to work as a system with a stationary feed mixer, a feed kitchen with feed floors or with

storage bunkers. In addition, they can be loaded to scatter bedding in stalls and resting areas.

## Feed Scrapers

These broad blade/broom type devices are designed to pass through feeding areas and push scattered feed back towards the cows on a preset basis. With a continuous supply of scraped (refreshed) feed, cows eat more, which increases herd health and milk production. Feed scrapers are designed to fold up and drop into a crevice or lay flat to allow traffic in the aisle.

“Between improved mixing and feeding equipment technology, competent ruminant nutritionists, computerized ration formulation and diet modeling, along with the services from private and commercial laboratories that provide extensive information on feed quality, today’s commercial dairy farmers should never wonder how to maximize or improve milk production.” John Hibma, Farming Magazine

## Calves

The feeding of dairy cows can be done with automated systems, too. Researchers have learned that calves that attain weaning weight quickly will outperform their peers throughout their lives. Automatic calf feeders support this by allowing instinctual, on-demand feeding that allows calves to move around

freely, which ensures good physical development and future production quality.

An automated calf feeder provides warm, adjustable milk formulations delivered through a nipple. This supports the calf’s instinct to suckle, which aids digestion while supplying nutritive balance and absorption. Each calf’s consumption is monitored and compiled.

## Advantages of Automated Feeding

Feeding technologies evolved as farmers needed ways to feed their cows more efficiently without compromising their health and milk production. Because dairy cows go through three stages and over- or under-feeding during one stage can have deleterious effects on another, it is increasingly important to achieve a high degree of accuracy in feeding. Automated feeding allows for the individual calibration of feed for each cow in the herd. Automation compiles information to the farmer apprised in real time of each cow’s body condition, feed consumption, milk production, milk quality and more.

Many feeding systems have smart features with built-in diagnostics that allow two-way connectivity between mobile phones and the internet. For example, a farmer can send a text message to his feeding system to adjust a cow’s feed. He can access feeding records and receive reports on his phone.

The system monitors all records, sends alerts when unprogrammed changes are detected and backs up all data. Since data is kept in real time, cows can be checked remotely and in the event of an alarm, response can be made immediately. Mechanically, automated feeding systems ensure the thorough and exact mixing of all food stuffs and supplements which ensures that cows consume all their feed.

