



Figure 1. Innovative ways for labor-efficient calf rearing.

Facilitating Low-Overhead Dairy Grazing for the Upper Midwest: Profitable, Environmental, and Prosocial Farming

Wallace Center and Winrock International, along with partners Dairy Grazing Apprenticeship and Food System 6, are working together on a new project to expand the use of low-overhead dairy grazing. Low-overhead dairy grazing can give farmers greater flexibility and profitability, as well as contribute to quantifiable environmental and social benefits. This project will assess the full set of potential benefits, including water quality and net GHG reduction, animal health and food safety, rural community health, farm worker safety and pathways to ownership. Innovative financing mechanisms will reflect the full set of benefits that this system can deliver. This document serves as an overview of the context of dairy in the region and a brief description of the benefits of low-overhead dairy grazing.

Context: Recent Trajectory of U.S. Dairy

The dairy sector has been the backbone of rural communities across the Dairybelt (i.e. the states from Maine to Minnesota) since early in the 20th Century. The dramatic loss of dairy farms throughout the region over the past 30 years has contributed to an unraveling of the fabric of its rural communities. An important driver of this trend has been extreme volatility and a downward trend in real (i.e. inflation-adjusted) farmgate milk prices. In response, many remaining dairy farms have greatly increased herd size and milk production per cow; “get big or get out” has been the clear writing on the proverbial wall. Farmers who have followed this path have generally demonstrated an impressive application of science,



Wallace Center
AT WINROCK INTERNATIONAL



technology, and management to consistently produce an average of over 25,000 lbs. of milk per cow per year in herds with thousands of cows.

Unfortunately, there are a host of vexing issues associated with the increasing trend toward large modern confinement-feeding dairy farms. These farms are very capital-intensive and the resulting level of assets (and debt) per cow necessitates maximum milk production per cow. Very high grain-to-forage ratios increase the incidence of metabolic disorders, result in increased use of antibiotics, and increase culling rates. The very high capital requirements preclude most farm workers from becoming farm owners. From an environmental perspective, large modern dairy farms, often import much more nutrients (e.g. grain and fertilizer) onto the farm than the farm's land base can assimilate. The more extreme the nutrient imbalance the greater the risk for nutrient loss to ground and surface water. Greenhouse gas emissions per acre of land can be relatively high under this system, although can be relatively low per unit of milk production.

The financial structure of the traditional dairy farm results in cashflow concerns becoming paramount over profitability. The farm cannot continue to operate if it cannot service its debt (i.e. make its principal and interest payments). The path to positive cashflow for most dairy farms is more cows and maximum milk production per cow. A basic tenet of economics states that when the price paid for a product goes up, producers will respond by producing more and when prices go down, they will produce less by switching to produce another product. On the surface, the dairy sector seems to defy this law of economics with farmers choosing to add more cows (when possible) when prices go up and when prices go down. A closer look reveals that this is a result of high levels of capital tied up in a system that is only designed to produce one product, milk, and may be contributing to the increasingly volatile and downward trend in milk prices.

Low-Overhead Dairy Grazing: Characteristics and Benefits

Low-overhead dairy grazing has a different financial structure that allows it to avoid many of the problems faced by traditional and large modern dairy farms. The low-overhead dairy grazing system is an adaptation of the New Zealand dairy grazing system that can work across the Dairybelt. This system is characterized by (1) maximum nutrient intake from grazed pasture, (2) a high through-put milking system that can efficiently accommodate a herd of at least

200-300 cows, and (3) the minimum necessary investment in buildings and machinery. Farms with this system should be able to greatly reduce both variable and fixed (overhead) costs of production and be profitable over a much wider set of milk and feed prices than traditional or large modern confinement dairy farms.

Feed costs, which include the costs of producing and purchasing feed, are almost always the single largest operating expense on any U.S. dairy farm, which makes feed efficiency (i.e. minimizing feed costs per unit of milk produced) exceptionally important. Dairy grazing focuses on maximizing the herd's nutrient intake from grazed pasture which is one of the lowest cost sources of nutrients. Supplemental grain feeding will boost milk production and profits in most cases (although some farms receive a price premium for not feeding grain). The grazing season in the Dairybelt is from May through October and can be extended by stockpiling forages. Stored forages will be required for feeding in the non-grazing months, but the amount (and cost) is significantly less than feeding stored forages year-round.



Figure 2. Swing parlor allows quicker milking.

Labor is often a very constraining resource on dairy farms and is a major expense. Labor efficiency can be gauged by milk sold per full-time equivalent (FTE) worker and a minimum for large modern dairy farms is to sell at least 1.2 million pounds of milk per FTE. Grazing operations generally produce significantly less milk per cow than confinement-feeding operations and, therefore, need a large herd size to be able to ship more than 1 million lbs per FTE. There are several ways in which grazing operations can be labor efficient. First, having cows graze for much of their feed and spread much of their manure at the same time is an important labor savings and improves farm safety. Second, many low-overhead dairy grazing operations use a seasonal calving schedule to concentrate time-consuming activities, such as calving, calf-rearing (see Figure 1), weaning, and breeding into discrete windows of time. Third and very importantly, the use of high-throughput milking parlors (see Figure 2) allow a larger herd to be milked relatively quickly (i.e. up to 100 cows per hour per person).

As discussed above, the capital requirements of most dairy farms create high fixed costs of production. By minimizing the cost of cow housing and machinery for fieldwork and farm operations, the low-overhead dairy grazing operation has the potential to greatly reduce its fixed and total costs of production. A lower cost structure will not only allow a farm to be profitable at lower milk prices, it also can reduce the likelihood that cashflow concerns (often driven by debt service payments) overshadow decision-making about profitability. A farm with less assets tied up in dairy-specific buildings could more easily pivot toward beef production when milk prices become too low. This project will help farmers to better understand how they can create a low-overhead dairy grazing system. There are likely to be benefits from this system both within the farm and outside of its borders. Productive permanent pasture holds soil and nutrients in place better than cropland and the pasture sward gets denser over time with proper grazing management. Well-managed pastures will sequester carbon from the atmosphere and hold it in the soil which can help to mitigate global climate change. Grazing cows tend to have less incidence of disease, require less frequent antibiotic treatment, and have longer useful life in the herd.

From an economic perspective, the low-overhead dairy grazing farm should be able to pivot its production more easily to beef, dairy heifers, or production of other ruminants when milk prices become too low and pivot back into dairy when prices recover. The lower-overhead structure should also

make it easier for younger and/or under-served farmers (including those starting as farm workers) to become farm owners. This project will examine the use of sharemilking contracts, a common practice on New Zealand grazing dairies, in which farm workers build equity on the path to becoming farm owners.

This project will create the necessary business plans and prospectuses and explore innovative financing mechanisms that reflect the environmental and social benefits of this system. We will conduct education and outreach to farmers, landowners, lenders, and others. At the end of this project, the gates will be open and the laneways nicely graded for the transition to a truly sustainable dairy production system for the Upper Midwest and Great Lakes regions.