



Making a change from a conventional dairy to a management intensive grass-based one lets this Nebraska farmer run a profitable operation milking 90 cows. This manageably-sized farm provides a viable alternative to the large-scale confinement model.

Can Smaller Be Better? A Comparison of Grass-Based and Conventional Dairy Farming

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The Mike Wichman Dairy Farm

After 12 years of milking Mike Wichman was in a situation familiar to many dairy farmers. His old stanchion barn was run down and in need of repair. The continuously grazed native-grass pastures did fine when the grass was growing, but the cost of winter feed and grain diminished profits enough to prevent him from rebuilding. In 1985 he decided to participate in the federal government's Dairy Buyout Program, and quit the dairy business.

During the next seven years Mike read about managed grazing systems and followed the Holistic Management course guidelines for identifying resources, choosing landscapes and improving quality life. (See the box on page 24 for more details about Holistic Management.) What he read inspired him to try a seasonal, grass-based dairy system.

What Mike Left Behind

The conventional approach to dairying in the U.S. is a confinement system where the cows don't move much—they just eat and produce milk. Feed is processed and brought to the cattle. Facilities are built to protect the animals (and the farmers) from the elements, to harvest the milk, to process and deliver feed, and to catch and manage manure and other animal waste. Production per cow is maximized to offset the high investment. University of Nebraska-Lincoln (UNL) animal science dairy specialists estimate this modern dairy model requires an investment of

\$3,000 per cow. Because of the small profit margins per cow, a herd size of 1,500 animals is considered the minimum today—up from 1,000 five years ago.

That low profit margin per cow also mandates high production per cow, and many animals are culled early in their milking career because of low or substandard milk production.

Stress and disease also take their toll, making it necessary for many confinement systems to replace over a third of their animals each year.

The milk processing industry favors these large confinement systems because they produce larger volumes of milk on a consistent basis.

delivery system.

This model focuses on maximizing natural resources and profits while making a minimum financial investment. Optimum, rather than maximum, production goals reduce the number of cows that need to be culled for low production or health reasons. Each cow's productive life is longer, which minimizes the number of replacements needed to maintain the herd. Excess heifers can be sold for two to three times as much as a mature culled cow.

Good for the environment as well as the cows, a well-managed system of continuous grass production reduces erosion, encourages water infiltration, builds

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Let the Cows Do Some of the Work

In a grass-based dairy the animals typically walk to the pasture, eat grass and walk back to the barn to be milked. The pasture is managed intensively by quickly rotating cows through small paddocks. This allows the grass to recover before the cows graze it again, increasing the quality and quantity of forage produced. The high quality forage replaces purchased feeds, and the cows become their own feed

soil organic matter levels, and recycles manure.

Ideally, production should match natural cycles. Breeding, calving, milking and animal development are synchronized, which simplifies management. For instance, group calving facilitates herd replacements. Mistakes, however, can affect large groups of animals.

Grass doesn't grow year round in Nebraska, but cows don't give milk for 12 months either. Matching the cows' lactation peri-

od to the forage growth cycle takes advantage of high quality forage when it's available. Ideally, the cows are dry in the winter. This reduces feed costs and gives the farmer a break in the winter, but milk income isn't available to cover winter costs.

Surfing that Learning Curve

After the seven-year absence mandated by the Dairy Buyout Program, Mike purchased a 160-acre, light-soiled farm and re-entered the milking business. He converted an existing calving barn into a milk parlor, and installed a pivot irrigation system to maintain native grass production and quality.

He divided the farm into small paddocks with high tensile fences. White clover was frost seeded into the native grass to increase the energy of the forage, and nitrogen fertilizer was added to increase forage production.

Mike was one of a select few in his area using management intensive grazing for dairy. "There just isn't a lot of help out there for the grass-based dairy

farmer," Mike notes, "We have to learn by ourselves or from each other, and we are a small group." He was pretty high on the learning curve, and found himself with a high debt load that was keeping him from investing in the production end of the business. He sold the land and equipment to an investor and leased it back, giving him some working capital.

20/20 Hindsight

Mike is a pioneer in grass-based dairying. "I guess I am and I have made all the mistakes possible to prove it," he responds.

Knowing what he knows after 15 years in this location, Mike would have picked land with better soil. He would prefer to have his operation located on sub-irrigated meadows instead of the sandy soil he now uses for grazing. The pivot, which is necessary for the light soils, costs too much to operate and maintain. And the extra fertilizer needed is not just expensive—it may be causing health and breeding problems for the herd.

The application of nitrogen

fertilizer has caused a copper deficiency in his animals. The symptoms include lack of cycling and foot problems. Because of the breeding problems, Mike is milking year-round, but he now supplements copper and hopes to return to seasonal milking in the future.

"With a better soil base," Mike notes, "I could avoid a lot of irrigation and fertilizer expenses."

Cutting costs goes a long way to increase profits, but sufficient milk production is also critical. Milk prices have rebounded, so Mike decided to invest the extra money to supplement with grain to increase milk production per cow, rather than increasing herd size.

Mike started with Holsteins, the standard of the confinement-dairy industry, but thinks other breeds of cattle are better suited for grazing. He'd recommend Jerseys or a Jersey/Holstein-cross. The crossbreeds are cheaper and produce more milk than purebred Jerseys.

Fine-tuning and Experimentation

Mike continues to explore

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Chart #3: Managed Grazing v. Confinement

	Mike's Operation per cow	Confinement Operation* per cow
Income:		
Milk sales	\$1993.13	\$2925.39
Calf & cull cow sales	199.69	123.96
Expenses:		
Feeding expense	\$664.37	\$1238.23
Breeding expense	72.15	27.07
Calf & vet expense	4.63	188.75
Utilities	95.39	26.28
Insurance	33.63	14.07
Hired labor & machine	54.81	229.69
Supplies	39.97	95.39

options to increase his profit and improve his business. He plans to harvest all the winter feed for the cows instead of buying it. Getting the herd back to a spring calving period will also improve his profitability because more animals will be producing milk while the grass quality is at its prime. Growing calves out to sell them as yearlings or feeders, instead of selling them as new-borns, is too labor and time intensive right now, but is an option for the future.

Mike has experimented with different milking schedules. Earlier this spring he tried once-a-day milking, then switched to milking every 16 hours. He has returned to twice-a-day milking.

He'd like to get into a specialty market, and says, "I'm afraid that being small in an area with little competition for my milk, the processor will abandon us small producers for the sake of the larger herds. We need to be thinking of ways we can compete without adding large investments in cows to raise volume."

The Bottom Line

Mike got the same price for his milk as the UNL farms listed. With relatively high milk prices (\$13.96 per hundredweight) in 1999, the dairy operation was quite profitable for Mike.

A couple of the above entries need some explanation. The calf and vet expense almost looks like a mistake, but Mike's expenses for vet services since he began his grass-based operation are practically nothing each year. Feeding expenses include purchased feed and grain on the UNL side; Mike's side includes seed, fertilizer and irrigation expenses. Mike's hired labor and machine expenses covered help with feed production, while the UNL's entry covered help with milking.

While milk sales per cow were lower for Mike, his expenses were considerably lower. With about 90 cows on pasture, Mike's total milk production was 12,437 hundredweight at a cost of \$97,221, which works out to \$7.81 in costs per hundredweight. The conventional herd average listed in the

These 1999 figures (at left) are the latest numbers for comparison with a conventional operation from *Nebraska Farm and Ranch Business Management Annual Report*. Land charges and pivot expenses are included in Mike's numbers, but were converted to cost/cow figures to match the UNL numbers.

This isn't a comprehensive outline of income and profit, but just gives an idea of how the operations differ. Interest expense was not included because Mike leases his farm. Neither includes family labor or management.

UNL Farm and Ranch Business Management Report is \$13.73 per hundredweight. With production costs of almost \$6 less, Mike is better able to withstand a low-priced period than conventionally managed herds.

The most compelling numbers are the profits. The average for the UNL farms listed was \$3,136.61 per cow gross income, minus \$2,882.68 in expenses, for a total profit of \$253.93 per cow. Compare that with Mike's operation: \$2,192.82 gross income less \$1,080.23 in expenses, for a total of \$1,112.36 profit per cow. Mike grossed \$197,354 in 1999, with a net income of \$100.133.

These numbers reflect well on Mike's management, but also show that small-scale grass-based dairy farms can be more profitable than the current model of large-scale confinement operations.