

Increasing Dairy Base with Millionaire Model Dairy Farms

A.S. Leaflet R2098

Larry Tranel, Iowa State University
dairy extension field specialist

Summary and Implications

Those in the dairy industry need to recognize and promote dairy's importance to the rest of the economy as each cow generates approximately \$13,000 in economic activity in the form of jobs, goods and services created by a cow, along with paying taxes on the profits generated. Few recognize the ability of young producers especially to profit strongly with dairy as a career. For example, families in NE Iowa in 2000 and 2002 garnered approximately \$100,000 net return to labor after an equity charge milking 100-140 cows with low/mediocre milk prices. In 2004, with much higher milk prices, the five model farms averaged \$153,314 net return to labor with a decent quality of life as well, while one family, a seasonal dairy, achieved \$244,141 net return to labor. Thus, it is quite possible to milk the dairy industry for high levels of profit.

Introduction

It is important for people to aspire towards models and goals they would most like to become. The same is true for beginning as well as established dairy producers to help them attain the industry and quality of life standards where they realistically can and want to be in their dairy operation. Most producers want to be profitable with a good quality of life, which the dairy industry can provide quite well for those producers who can manage cost and income structures relative to risks.

The intent of this paper is to assist the dairy industry in their supportive roles to dairy producers whose desire is to dairy in a non-traditional manner. The most popular non-traditional manners this author has had the privilege to support in my Extension work has been through use of a combination of low cost, labor efficient facilities; modified seasonal calving; cross-bred dairy cattle and management intensive grazing.

These non-traditional methods have been incorporated by ISU Extension's Model Farms over the past 3-12 years. These five model farms reside in Iowa and Wisconsin and closely resemble a low cost, modified seasonal, labor efficient, profitable grazing model designed by this author in 1991. This model has been continually fine-tuned but the overriding goal was to create millionaire dairy producers within a 20-25 year time frame. In addition, each of the model farms are very cost conscious relative to income generation and analyze their dairy farm financial records

annually or bi-annually through the Dairy TRANS 4.0 computerized financial analysis.¹

Since using a non-traditional path to success, the model farms report challenges from their agri-business suppliers with their non-conventional production practices. It is hoped this paper can increase understanding of a very profitable, non-conventional means of producing milk. The base business of the model farms is one person milking 80 cows on 80 acres using a low-cost parlor and freestalls, modified seasonal calving, crossbred dairy cattle and rotational grazing. The model farms have expanded cows and acreages with many variations of the base.

The Dairy Millionaire Base Business with Vision and Mission

The dairy millionaire base business begins (Farm #3 of the Model Farms) with a long term vision and mission, of which an example follows:

- **VISION:** "To achieve long term financial security while conducting our affairs in stewardship of our faith, family, friends and farm."
- **MISSION:** "To operate a simple, enjoyable dairy operation managed by 1 to 1.5 persons, which provides sufficient income for:
 - 1) Living Expenses, so we can enjoy quality of life, without off-farm income.
 - 2) Profitable Investment, so we can retire comfortably and assist next generation.
 - 3) All Farm Capital, so we can develop farm more profitably and efficiently.
 - 4) All Farm Expenses, so we can remain liquid and solvent during operations.

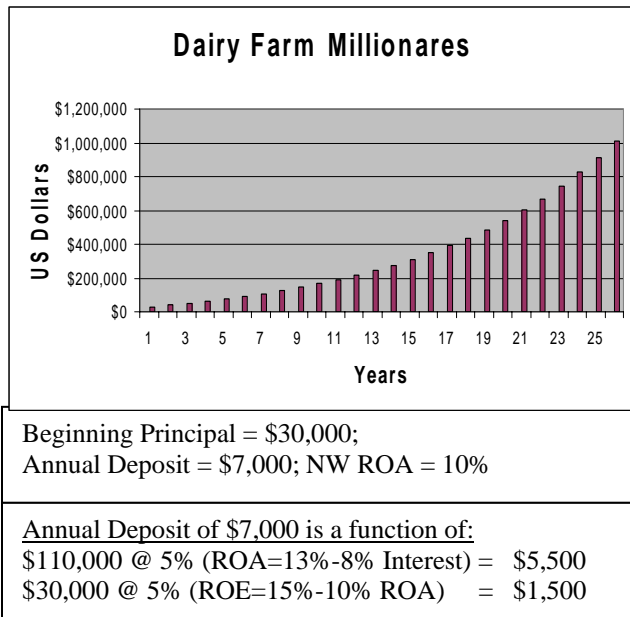
The long term financial security is based on profitable financial investment in a dairy operation. The 80 cows on 80 acres base model dairy farm begins in a cash rent-buy feed arrangement that uses corn silage purchase contracts and rents dairy facilities and land at going rates. The dairy operation generates enough income to pay for family living but also generates a good return on assets and equity after labor (family living) expenses to profitably reinvest back into the business (paying down principal). The example dairy farm generates an approximate return on assets of 13% and an approximate return of 15% on return on equity based on the following asset and debt levels.

Iowa State University Animal Industry Report 2006

In order to develop the base business, a Summary Loan Request to borrow \$110,000 for:

- | | |
|---------------------------------------|----------------|
| a) Cows, 80 cows at \$1,500 or | \$120,000 |
| b) Machinery: | |
| --Tractor | \$4,300 |
| --Skid Steer | \$3,600 |
| --Manure Spreader | \$3,000 |
| --4 Wheeler | \$1,200 |
| --Rake | \$500 |
| --Haybine | <u>\$2,400</u> |
| Total Machinery | \$15,000 |
| c) Capital Improvements (rented farm) | <u>\$5,000</u> |
| | \$140,000 |
| d) Capital on Hand | \$30,000 |
| Goal < 80% Borrowed | |

The following graph depicts a long term goal of the base dairy operation:



Thus, the base dairy operation must garner \$30,000 of Net Worth from labor or other arrangement such as “sharemilking” prior to operating the base business in order to obtain a loan. Then, with wise use of credit, a willing dairy farm leasor (until farm ownership is an option), protection against disease and disaster, and cost control measures coupled with dairy farm management skills, the base operation is positioned to earn the desired returns for both labor and investment into the base dairy business. Then, during the 20-30 year time frame, the net worth of the base operation exceeds the \$1 million mark, thus creating a dairy millionaire family.

The model farm generates approximately \$43,500 return to labor which is just barely enough return above family living (\$25,000) to make the principal payment before taxes. So, there are two and potentially three cash flow issues early on that need to be addressed. The first issue is if income projections are low, expenses are high

causing a problem paying the principal or other expenses. Second, we have the taxable income issue which is highly variable due to family structure so difficult to predict. And third, years one and two have the cash drain for necessary replacements in the operation until the producers’ own heifers come into the milking string. The base analysis is a fully operating dairy in year three complete with own replacements. These realities point to a reality where even profitable operations may have difficulty starting up under present asset and cashflow lending requirements. Thus, without assistance from beginning farmer loan programs and other family, community, government or industry support may be needed. Profit and business based lending versus cash flow and asset lending requirements is an issue for many new and transitioning dairy producers.

Even so, with the difficulties in start-up dairies but also coupled with other situations involved with dairy farm investing, three of the five model farms report being able to attain the \$1 million dollar net worth mark within the early 15-20 year ranges of this time frame due to land, cattle and other investment decisions over and above the base dairy business.

Low Cost, Labor Efficient Facilities

The traditional stanchion or tie-stall barn is not a labor efficient means of milking cows. Milking efficiency tends to double (2:1 ratio) as producers move from stall barn milking to pit parlor milking while feeding efficiency tends to increase five-fold (5:1 ratio) from stall barn feeding to freestall feeding. Due to the reduced labor demands of feeding dairy cows on pasture, sizeable additional labor efficiencies can be gained in pasture based systems due to less mechanical feed harvest and manure handling needed.

The priorities of low cost facilities are the same as high cost facilities. **Cow comfort** is “*priority one*” realizing shortcomings in cow comfort can be a most costly mistake as cows make milk best when lying down. **Dry matter intake** is “*priority two*” as proper feed bunk design, feed quality and type, lighting, ventilation and good quality and quantity of water means profit as each pound of dry matter intake above maintenance is worth 2.5 pounds of milk. **Labor Efficiency** is “*priority three*” so if operations don’t flow well labor-wise, identify and eliminate bottlenecks in facilities and management.

Remodeling dairy barns to a parlor and holding area has made sense to many producers. With limited financial resources available, it is recommended to spend available resources on cow comfort, dry matter intake and labor efficiency priorities first. Typically, this means putting necessary financial resources towards a well designed remodeled shed of some sort or a new freestall barn as that is where the cows spend most of their time.

Although many producers are very successfully converting tie stall barns into a milking parlor, not all tie stall barns make good remodeling projects. But, there are many advantages to consider this option first.

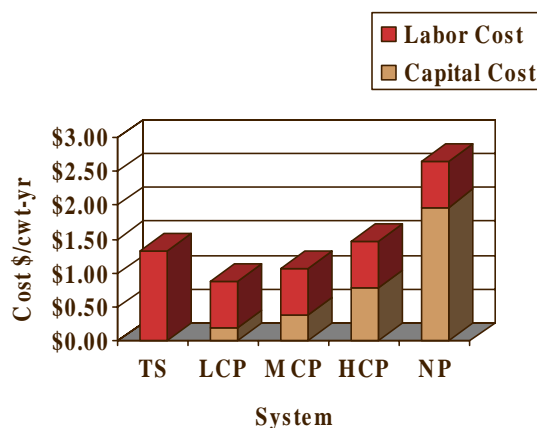
- The milk house system is already in place adjacent to the parlor.
- Cost savings on the parlor could allow proper investment in freestalls.
- If designed correctly, cow flow and milking efficiency need not be sacrificed contrary to some opinions.
- Swing units can be employed initially by using present 2" line double-looped with 2% slope to incorporate a swing eight or swing ten parlor.
- Many stall barns are sized to handle a swing 8-16 parlor with holding area for a 100-150 cow herd.
- The payback of a parlor in labor savings (time and back/knee bends) can be rapid. Some low cost parlors have less total costs (\$800/stall) than others have in annual costs with paybacks in less than one year.
- Labor savings could make a low cost parlor cost effective even if only used for 3-5 years in a transition phase.

It is important for aspiring dairy farm millionaires to invest wisely in the most productive assets early in the career. Thus, the milking system is to be considered wisely. With all costs considered, aspiring producers may not be able to afford milking in a stall barn early in their career due to labor inefficiencies in both milking and feeding, though short term cash flow may prevent parlor construction as well. On the other hand, producers might not best invest in a medium or high cost parlor either due to financial risk relative to return. A low-cost parlor built in an existing building might be the most cost-effective and labor efficient means of milking the cows, depending on housing options.

Typically, too much money is spent on parlors to be able to pay help or self a decent wage. In a low cost parlor, the cost to milk cows often ranges from \$0.65- \$1.00 per hundredweight, a rate competitive with best in world. Most milking parlors going in today are greater than \$2.00-\$2.50 per hundredweight which obviously makes a significant difference on profit, especially return to labor. Consider the following example:

18,000 lbs milk, \$10/hour labor, 120 cows

- Tie Stall (TS)
 - \$35,040/year labor
- Low Cost Remodeled Parlor (LCP)
 - \$25,000-capital (\$4,250 annual)
 - \$14,600/year labor
- Medium Cost Remodeled Parlor (MCP)
 - \$50,000-capital (\$8,500 annual)
 - \$14,600/year labor
- High Cost Remodeled Parlor (HCP)
 - \$100,000-capital (\$17,000 annual)
 - \$14,600/year labor
- New Parlor
 - \$250,000 (\$42,500 annual) (NP)
 - \$14,600/year labor



Though not always recommend depending on labor availability and construction skills, many producers have built or remodeled their own low-cost parlor. All of the model farms agree, the milking parlor is a key first step to a profitable dairy operation due to the labor efficiency it provides. This labor efficiency, along with labor efficiencies of the grazing system, allows the average model farm to handle 70-80 cows per full time labor equivalent.

Modified Seasonal Calving

A 1995 UW-Extension economic model concluded “pasture based, year-round calving and pasture based, seasonal spring calving systems increased both profit and returns to labor over confinement, year-round calving systems.” In practice though, grazing financial data reports lower total income from the totally seasonal herds on average, while the modified seasonal herds are included with the average grazing data.

Four of the model farms take a modified approach to seasonal calving in that the aim is for the majority of cows (50-90%) to calve in the March-June time period with a secondary aim of calving the remainder in the September-October time period. One model farm (#4) does not milk for one month during the winter. The seasonal and modified seasonal approach seems to capture grouped labor and management efficiencies, especially in feeding and breeding.

The major issue for seasonality of dairy production has not been lower prices during the spring flush, but the difficulty in getting the cows to calve within the same time period each year. The success of getting this done has been a serious challenge and continues to be so. A major reason why the model farms have implemented cross-breeding programs has been due to the reproductive benefits the hybrid vigor provides, in an effort to remain in a modified seasonal system.

Cross-Bred Dairy Cattle

The five model farms have all taken the approach to cross-breed their dairy herd, mostly with a Holstein, Jersey or Holstein-Jersey cross for the base with other breeds as

well creating a lot of variability amongst the herds. These producers all remark on the benefit of the crosses in reducing culling rates while improving reproduction and maintaining acceptable levels of production. This is an area that needs considerable improvement for long term genetic gains. Research on cross-bred cattle and development of long term cross-breeding plans to realize hybrid vigor in a three or four way cross-breeding program is direly needed.

Preliminary data reveals about a 6.5% increase in production of combined fat and protein on certain crosses while increasing longevity, health and reproductive traits 10%. The average cull rate on the five model farms ranges from 10%-17%. This low cull rate contributes greatly to profitability by means of herd growth or addition non-cull cattle sales for these herds. These economic benefits are significant to the overall profitability of the model farms.

Management Intensive Grazing

Labor efficiency is not only an important function of dairy facilities but also an important function of feeding programs. A very labor and cost effective means of feeding dairy cows and heifers is through the use of management intensive grazing. Many studies suggest that quality pasture reduces input costs and increases net returns. Benefits cited include: 1) increased yield and quality of forage; 2) decreased purchased feed; 3) decreased equipment and fuel; 4) decreased manure handling and bedding; 5) better animal health; and 6) reduced labor to feed or harvest the forage. The cost-effectiveness can also be true for raising dairy heifers.

A UW-Extension economic model concludes, "with all the variables and potential returns taken into account, rotationally grazed pastures have potential on many dairy farms as the cheapest way to get high quality feed into the dairy cow." Data from the Great Lakes states, plus Iowa and Missouri, confirms the typical profit advantage of the rotationally grazed pasture systems even with less milk production per cow.

A wide variety of grazing management strategies are employed with regards to species, grazing technique, etc. However, all five model farms would be considered serious rotational grazers meaning that dairy cows typically would see a fresh break of high quality pasture after each milking.

A major area of recognition for each of these model farms is not to expect the dairy cows, especially the larger breed cows, to effectively consume all forage dry matter from the pasture. Typically, three to six pounds of forage dry matter are supplemented by means of corn silage, dry hay, haylage or baleage. A typical level of corn silage grown tends to be 1/3rd acre of corn silage grown or purchased per cow. The total number of acres on these model farms range from one to two acres/ cow. Thus, all five model farms focus mainly on pasture and other forage production, leaving the production and delivery of most grain and other supplement to other producers or agri-business.

Dairy Farm Models—Financial Goal Setting and Industry's Role

If this non-traditional system is truly profitable and well balanced with a decent quality of life, how can the dairy industry increase client base by educating new and transitioning producers of a potentially more profit method of milk production that carries less risk? Can or should Extension and agri-business be involved in dairy industry development as a means of economic and community development?

If this is a mode and role for the industry to develop new clients, a high need to begin is professional development, practical experience and an open-mindedness of non-traditional milk production systems such as those outlined here as the first step. This is in no way saying that other means of milk production cannot meet the profit and quality of life levels as these non-traditional model farms. However, in 1996 a Wisconsin survey showed trends toward non-traditional methods that new producers were using grazing at twice the rate as producers as a whole and nearly 46% of new farmers indicated they planned to use improved pastures to obtain feed for their milking herd in the future.

The second step is to encourage and promote the industry which provides employment to agri-business as every nine cows supports one job in the economy. Part of this encouragement and promotion must be to the upcoming generation of dairy producers, who need long term vision of how to balance the risk and profit equation of dairy herd investment. Realistic financial and operational management plans for new producers' success needs long term vision.

For example, beginning from age 12-25 or whenever, aspiring producers need opportunity and desire to turn their labor (sweat equity) into cash net worth for cattle loans or cows, hopefully towards \$30,000 by age 22-27 or so. This \$30,000 net worth becomes the base for a cattle loan and use of borrowed money to help create wealth from age 22-45 in a profitable dairy operation. Age 45-50 people tend to become less risky and creative with less desire for physical labor so the goal then might become more of managing assets while assisting the next generation. From age 50-60, hopefully the desired financial security and freedom is attained--one continues in dairying if they want to, not because they have to. And yes, there can be that kind of profit in dairy as the model farms are well on their way to attaining those goals.

The five farms represented by the Model Farms are those deemed by this author to have a good quality of life, have good decision-making skills, are financially astute, and have a positive attitude toward their future in the dairy industry. The model farms have agreed to share their financial data in regards to assets, incomes and expenses for the benefit of others, except for principal and interest. Thus, without that line item, any comparison to other data sets needs to be done prior to interest. Both their interest cost and equity charge are included in their equity cost as a

charge against all the assets as if the farms were debt free. In 2002, the interest charge was added to the equity but in 2004 the equity charge was the same rate across all assets meaning return on assets and equity are equal in 2004.

The average milk production in 2004 was 16,566, very similar to the top 50% of the average grazier in the Great Lakes states data. This same data show graziers on average are earning more net farm income per cow with lower milk production averages than their confinement counterparts.

Financial efficiencies are best compared with rate of return on assets averaging 12.32% for the model farms in 2002. The lowest return farm of 6.02% in 2002 was the highest return farm in 2000 in the 14% range. Another major financial efficiency ratio is rate of return on equity which averaged 16.8%.

There are two means of creating profits in dairy. The first is the operating profit margin defined as the difference between price and cost per unit or dollar of output (Price-Cost). The average operating profit margin was 23.7% which again is very competitive with the industry goal, but ranged from 12.9% to 39.21%. The second means of creating profits in dairy is with the same profit margin, sell more volume, i.e. Profit = (Price-Cost) x Volume. This is depicted by the asset turnover ratio. These model farms all tend to possess considerable strength in this area with an average of 59.86%, well above industry standards. At this level, these farms are grossing enough income to pay for all the assets on the dairy in 1.72 years. An industry average would be closer to 30%. Multiplying operating profit margin by asset turnover ratio equals rate of return on assets. The Dairy TRANS profit performance rating averaged 96.37% with the goal being 100% ranking these model producers with the best in the industry.

Thus, as evidenced by these model farms, dairy grazing can be a very competitive method of milk production and also very competitive with other avenues of employment for many potential dairy producers. In addition, these models have gained profitability with a quality of life which most say is grazing's biggest advantage over confinement systems and even non-farm employment opportunities.

2004 Update of Model Grazing Farms

In 2004, these same farms were analyzed to compare to low milk price year (2002) to a high milk price year (2004). Each dairy farm reaped tremendous profits ranging from \$83,379 return to labor for the start-up farm completing its second year to \$244,141 for a seasonal dairy grazing herd. Returns to assets ranged from 17.59% to 51.23%, the latter which was the low capital start-up on a rented farm.

Thus, the consistent and profitable success of these model dairy grazing farms serve as a source of learning and inspiration for those new and transitioning dairy producers wanting to achieve their farming dream for profit and quality of life in a dairy production career.

Developing a “non-traditional” Dairy Model — 10 Step Process

1. The first resource (Dairy CALC) used by this author includes estimating feed needs relative to potential cow numbers and a given land base with varying crop and purchased feed options. Depending on cow weights, feed wastage, cull rates and heifer weights, users can begin to determine options of how to best feed dairy cows on this particular farm. This author typically recommends setting up grazing systems permanently or semi-permanently at about an acre per cow, realizing a 1st crop harvest may need to be done and other land may be needed by mid-summer. The other crop benchmark used frequently is one-quarter to one-third of an acre of corn silage per cow if grown profitably in the area. It is also recognized that low versus high land price areas often determine the most profitable mix. Being short on land in high priced areas and long on land in low priced areas or vice versa could be a strategy that could heavily impact profits.
2. Once potential cow numbers are determined, the second step is to relate the potential cow numbers with a given set of facilities on the farm in question. If potential cow numbers are higher than facilities allow, consideration of remodeling or adding facilities is the next step. If potential cow numbers are lower than facilities allow, consider alternative feed sources for a better match.
3. The third step is to consider labor resources needed and labor resource options. If your goal is to do all the labor with oneself or with one's family, then cow numbers might need to be limited. If hired labor is an option, the more profitable models tend to match the cow numbers, feed and facility resources with various mixes of labor possibilities.
4. Step four used by this author is to do a Dairy TRANS budget analysis. The goal is to make financial decisions using a whole farm approach and to be able to “budget with the benchmarks.” Dairy TRANS assists in determining profitable efficiencies while benchmarking relative to industry goals.
5. Step five is optional depending on financial situation but involves use of a monthly cash flow budget program to assist producers with the critical “cash flow” issues which need managing more often than annually, especially for new start-ups and seasonal production.
6. Step six involves working with mentors which is not easy in all areas. Good mentoring happens with grazers-edge (an internet list), pasture walks, farm visits, grazing conferences, Extension programs and other means of learning.

7. The seventh step could be a dairy program at a college or university or a shorter program like the Wisconsin School for Beginning Dairy Farmers or the NE Iowa Dairy Foundation's Program for New or Transitioning Dairy Producers. In addition, ISU Extension periodically runs classes on grazing and has publications.

8. Making sure the would-be operation is labor efficient is the eighth step that can heavily impact profits. Considering facilities that could be retrofitted to employ low-cost parlors and freestalls. Extension personnel can do a facility assessment.

9. The ninth step would be to develop the plan and put it in writing. The plan should be complete with goals on finances, production, profitability, labor, facilities, land and cattle along with pertinent family and quality of life impacts.

10. Step ten involves putting the key people and resources together to get started. They are a multitude of resources especially in getting beginner farmers started so look around to Extension, NRCS, Farm Service Agency and others who could serve in consultant roles.

For more information on this program, model farm numbers and comparisons, and assistance, contact Larry Tranel at 563-583-6496 (tranel@iastate.edu).

ⁱ Tranel, L.F, 2002, Dairy TRANS 4.0 software. Iowa State University Extension.