

Organizing milk harvest: A producer perspective on infrastructure and human resources

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Abstract

One of the major considerations in operating a dairy production enterprise is the development and execution of a strategy for milk harvest. The production of milk as a business enterprise is generally governed by commodity based financial considerations. That is, the price of the final product is driven by the relationship between supply and demand. Both price and cost associated with the final product will be cyclical, and producers with lowest cost will, on average, gain market share over time just as those with high cost will lose market share over economic cycles and may exit the business. Thus, the major consideration in organizing milk harvest is how strategic decisions will affect the final cost of the product. Some of the costs associated with the milking center can be considered direct costs while other aspects of the strategy can be considered indirect costs or opportunities. There are still other less tangible aspects of the harvest strategy that may not impact costs directly or indirectly at the milking center, but nonetheless have a bearing on what may be considered success in dairy production on a broader human scale.

Key words: commodity, direct costs, indirect costs, intangibles, success

Introduction

The author has more than 3 decades of experience in the dairy industry as a veterinarian and producer, as well as service in roles in dairy processing and agriculture finance organizations of significant size. One of the primary conclusions born of this experience is that there is more than one method of approaching almost any aspect of dairy production that can lead to successful outcomes. The goal of this paper is to put forth analytical methods to examine and evaluate strategies for organizing milk harvest rather than to issue any statement about a particular strategy being inherently superior to any other. Opportunities and challenges will vary from farm-to-farm which will lead to unique solutions in many cases.

Modeling costs and opportunities at the milking center

Direct costs

Occupancy cost and labor consumption are the major direct costs associated with milk harvest. For proper analysis, metrics need to be standardized in order to make comparisons among alternative strategies. Since revenue is measured in milk hundred weights, it would follow that costs should be denominated in a corresponding metric. In the case of labor consumption, which is the larger of the direct costs on a per cwt basis, this is

further complicated by variation in shift length, regional pay rates, consideration of overtime rules by jurisdiction among different farms. For these reasons, the author proposes that for the purposes of standardization for comparisons, the metric that can be useful is pounds of milk or cwt per FTE (full time equivalent) where FTE is equal to eight hours of labor. For an example comparison, a 120-bale rotary loading at 3.4 seconds (750+ cows per hour) using 9 personnel per 12-hour shift to move and milk cows that ships 550,000 pounds of marketable milk per day yields 20,370 pounds of milk per FTE (9 persons per 12-hour shift with two shifts per day is equal to 27 FTE per day in the denominator while daily production of 550,000 pounds of milk serves as the numerator).

A double 25 parallel performing at 3 turns per hour (150 cows per hour) using 2 personnel per 10-hour shift to move and milk cows and ships 100,000 pounds of marketable milk yields 20,000 pounds of milk per FTE (2 persons per 10-hour shift with 2 shifts per day is equal to 5 FTE in the denominator while daily production of 100,000 pounds serves as the numerator).

Occupancy costs are somewhat easier to standardize but perhaps no less complicated. Financial analysis of any aspect of dairy production is aided by access to GAAP (generally accepted accounting practices) reporting.¹

However, in most GAAP compliant reporting, occupancy or capital costs are lumped for the entire production system and do not call out these costs by enterprise. It is therefore necessary to devise a hand calculation for the milking center itself from other information available in the report. Interest, depreciation and amortization are the operative terms when analyzing this aspect of the milking center costs. Depreciation is particularly tricky since there are rigid conventions for reporting that may not accurately reflect the reality on the ground for any individual operation. In general, a reasonable strategy for analysis would be to look at the value of the original investment and then subtracting the residual value (if any) at the end of the reasonably expected useful life. This is further complicated by the fact that different aspects of the original investment will have different useful lives. The shell of a milking center will have a longer useful life than the equipment and automation. Use of an estimated blended rate of depreciation can simplify the analysis and retain the usefulness and relative accuracy of the analysis. In addition to depreciation, the time value of the money allocated to the infrastructure must be considered. This is referred to as the capitalization rate and considers the cost of leverage capital as well as a reasonable risk weighted return to capital invested by the operator. In the current environment, a reasonable capitalization rate would be 7.5%. While a complete example analysis is beyond the scope of this paper, it may be reasonable to estimate that a blended depreciation period for a milking center might be 14 years with the potential for zero

residual value. This would seem to suggest that the cost for this category would then be 7.1% per annum of the original investment from depreciation and 7.5% of half of the original investment for an interest cost over the useful life since the investment is being depreciated from full cost to zero over the useful period. This means that on average, over the 14 years of useful life, you are experiencing 7.5% capital cost of half of the original investment.

As an example, using this methodology, a 6-million-dollar investment in a 120-bale rotary with a 14-year useful life at a 7.5% cap rate has a per diem cost of \$1,778. If that milking center produces 550,000# of marketable milk daily, then the occupancy cost of the center is equal to \$0.32 per cwt. Likewise, a greenfield double 25 parallel might have a per diem of \$1,248 and an occupancy cost of \$0.41/cwt.

Notice that labor consumption is the larger of the 2 direct costs by a factor of 2 and should be the more significant consideration when devising milk harvest strategies.

There are other direct costs at the milking center such as use of dips, sanitation chemicals and supplies, but these costs individually are less significant than labor and occupancy costs.

Indirect costs and opportunities

The milking center represents the potential to have positive and negative effects on other aspects of the dairy enterprise. Mastitis may be the most frequent and costly disease state for dairy animals and incidence is largely driven by events and practices in the milking center. Early detection is of paramount importance for this disease and there is no better surveillance system than the human resources and technology available at the milking center. The causes of down cows and the catastrophic economic and welfare consequences this has on individual animals are most frequently associated with the milking center and specifically with the movement of animals to and from the unit attachment point. All of this has an associated effect on herd removal rates and the average salvage value of the removals. It is the opinion of the author that these indirect costs may compete in magnitude financially with the direct costs at the milking center.

Less tangible considerations for the milking center

While it is beyond both the scope of this paper and the expertise of the author, there is the opportunity to consider less quantitative aspects of harvest that may nonetheless have significant impact on what may be considered success on a dairy. Humans may tend to perform at a higher level under certain regimes and cultures in the workplace. An environment that fosters human instincts such as empathy and compassion in the milking center may also lead to greater cooperation and innovation throughout the dairy operation. If failure is the norm there, that can become a culture that permeates other aspects of the operation, just as an expectation of thriving and excellence at harvest can become the expectation throughout. As the historical labor model on dairy farms changes, this may become a larger part of harvest strategy analysis. Certainly, it is true that the modern consumer has different expectations for human to animal and human to human interactions in the workplace than was historically the case.

Conclusion

While the direct costs incurred at the milking center do not represent the largest of production cost categories such as economic feed efficiency, there can be no doubt about the magnitude of positive or negative effect on overall success on a dairy farm that emanates from harvest. Serious consideration of individual circumstances related to harvest strategies will be a well-rewarded endeavor.

References

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