

Costs For Wisconsin Dairies Using Rotational Grazing Practices: New Evidence From Agricultural Resource Management Survey Data

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Advocates for pasture-based dairying argue that this dairy production system requires less capital and labor resources than conventional, confinement-based, dairy systems. These reduced resource needs are supposed to translate into higher profits because lower use of capital and labor means lower production costs. Data for Wisconsin dairies obtained in 2000 as a part of the Agricultural Resource Management Survey (ARMS) presented on the web site of the Economic Research Service of the United States Department of Agriculture (ERS-USDA) do not appear to support the commonly held belief, however. The data generally show that in Wisconsin the lower costs of productions tend to be observed for conventional dairies, not grazing operations.

THE DATA

Table 1 contains the means and standard errors for cost and return data, on a per hundredweight basis, that can be downloaded from the ERS-USDA web site. (<http://www.ers.usda.gov/data/arms/app/Cost.aspx>) These data are from the subsection of the ERS-USDA web site containing the ARMS data, labeled “Tailored Reports”, where one can obtain various cost and return data for dairy and other commodities on a state by state basis. At present these data are only available for 2000 but sometime in the coming year data should be available for 2005.

The Table 1 data are presented on the basis of herd size and whether rotational grazing practices are employed on the dairies. This sorting of the data was done using classification criteria embedded in the ERS-USDA web site. Four herd size categories are specified: Small – less than 50 cows; Medium – 50 to 199 cows; Large – 200 to 499 cows; and Very Large – 500 or more cows. Only Small and Medium sized herds were

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reported for Wisconsin which means the available data set for 2000 did not contain reportable data for farms with 200 or more cows.

The “Rotational Grazing” classification is the preset production practice identified in the database website while the “Conventional” label pertains to all other dairy farms in the sample. According to the 2000 ARMS enumerators’ manual, farms in the Rotational Grazing category have “pastures divided and fenced into several paddocks, with the size of the paddocks adjusted to herd size so that livestock requirements will be met and the pasture maintained at a productive level.”

According to William McBride of ERS-USDA, data for a total of 118 dairy farms for the year of 2000 are available in the ARMS data set for Wisconsin. Fifteen of these farms are classified as rotational grazing operations and the remaining 103 dairy farms are conventional operations. Of the 15 rotational grazing operations, a third of them (5) are small in size and the other two-thirds (10) are medium sized. Similarly about a third of the conventional dairies (31) are small and roughly two-thirds are medium sized.

COMPARISON OF RETURNS DATA

The first two rows of data in Table 1 reflect the incomes for the various farms in the sample. All of these farms have reported milk income of \$11.86 per CWT (Hundredweight) This suggests all these farms, on average, received the same price for milk. The differences in income, therefore, have to be explained by sales of calves and cows or other farming activities.

Somewhat surprisingly, the highest levels of income per CWT of milk are reported for the smallest herds. The expectation is that the herds in the Small category would at best earn the same returns as the herds in the Medium category. However, the smaller are reported to have the higher incomes. In addition the farms with small herds practicing rotational grazing are reported to have greater incomes than the same size herds using conventional dairy production practices.

COMPARISON OF OPERATING COSTS DATA

Operating costs are the variable costs of production for the dairy farms in the sample. These costs contain no labor costs – hired or unpaid operator – or capital costs. Thus, these operating costs are an indication of the minimum prices that dairy producers would need to receive for milk, in the short-run, in order to be willing to stay in the business of producing milk.

Somewhat surprisingly, the average operating costs for rotational grazing dairies with smaller herds are about 90 cents higher than they are for small herds using conventional production practices. The expectation is for the grazing operations’ average operating

costs to be lower since less is spent on feed, bedding, manure handling, etc. This higher average operating cost for the rotational grazing dairies is also observed for the Medium sized herds. However the difference between the rotational grazing and the conventional herds is only about a 25 cents per CWT for the medium sized herds. The higher average operating costs for pasture-based systems may be the result of lower levels of milk production per cow for these dairy systems. This is conjecture, however, because no production data is available for analysis.

ANALYSIS OF ALLOCATED COSTS DATA

Allocated costs are labor, capital and other overhead costs that do not vary regardless of how much milk is produced per cow. In the long run, these costs have to be covered if a dairy is to stay in business. In the short run, however, it is possible for a dairy to continue to operate even if all labor and capital costs are not covered.

The machinery and equipment recovery costs for conventional dairies with small herds are greater than those for both small and medium sized dairies using rotational grazing. The lower capital recovery costs for the rotational grazing dairies are expected given that less machinery and equipment is used in these dairy systems. Surprisingly, the capital recovery costs for the rotational grazing herds are not the lowest, however. The medium sized conventional dairies have capital recovery costs that are almost \$1.25 per CWT lower than those for the rotational grazing herds.

The lower capital recovery cost for the medium sized conventional dairies suggests that these dairies are spreading their higher total capital costs across more total pounds of milk production. These farms are apparently doing this by producing more milk per cow than rotational grazing herds. This is the only way the conventional dairy herds could have lower average capital recovery costs than for grazing herds and higher overall investments in capital.

Grazing also said to require less labor than conventional dairy systems. Thus one would expect the labor costs per hundredweight of milk for grazing dairies to be less than the labor costs for conventional dairies. However the data show that, on a per hundredweight basis, the labor costs for all rotational dairies are \$6 to \$8 higher than the labor costs for conventional dairy operations with medium sized herds. These conventional dairies have a labor cost of a little less than \$4 per hundred weight, but the labor costs for small and medium sized grazing dairies are roughly \$12 and \$10, respectively.

COMPARING THE ERS-USDA DATA WITH OTHER INFORMATION ON PASTURE-BASED DAIRYING

The ERS-USDA data are inconsistent with conclusions highlighted in an article appearing in the summer 2006 issue of *The College of Agricultural and Life Sciences Quarterly*. The article, which discusses a report authored by Tom Kriegl and Ruth McNair (K&M) entitled, "Pastures of Plenty", states that managed grazing techniques, such as rotational grazing, result in lower costs of production per hundredweight for dairies. These conclusions are based on farm-level records data for the years of 2001 and 2002, while the ERS-USDA data in Table 1 are for 2000. These differences in the years when the analyses were performed could explain why there are some differences in the ways the costs for grazing operations compare to the costs of production for conventional dairy farms.

The major difference between the costs reported by ERS-USDA and those underlying the conclusions of the other study relates to labor. The ERS-USDA data include measures of labor costs but the other analysis of grazing dairies presents neither estimates of labor costs nor measures of the quantities of labor used on dairies. This lack of labor information in the K&M study is important because it means this study gives no evidence of whether in fact grazing results in lower total costs of production. In contrast, the ERS-USDA dairy data gives a more complete accounting of the costs of conventional and grass-based dairy systems which includes labor costs. As such the ERS-USDA data are more useful in making determinations about the relative profitability of dairies using conventional practices and those using grazing techniques.

CONCLUSIONS

Cost and return data available from the ERS-USDA show that in the year 2000, rotational grazing did not offer dairy producers any significant cost savings or competitive advantages that could otherwise be enjoyed with conventional dairy systems in Wisconsin. The average operating costs were slightly lower for conventional dairies, while capital costs were lowest for moderate sized conventional dairies. In addition, labor costs for moderate sized conventional dairies were also shown to be well below the labor costs for all rotational grazing dairies.

The ERS-USDA cost and return data raise some questions about the findings of a Wisconsin based study that has been receiving considerable attention because of its assertions that pasture-based dairying farms earn more profit per cow or pound of milk produced. A comparison of the Kriegl and McNair report and the ERS-USDA survey data shows that the former study is not quite as complete as the latter study because no information is offered about labor usage for various dairy systems. This lack of information about labor is a problem for the Kriegl and McNair study because it fails to account for a fundamental cost of operating a dairy farm. In the absence of this labor

cost information, nothing meaningful can be said about the profitability of dairy operations. The ERS-USDA data set is a good example of all the cost and return data that need to be considered when evaluating the economic performance of farming systems or enterprises. In the future other studies comparing grazing dairies and conventional dairies should probably include the same measures as are reported by the ERS-USDA so that all factors of production, including labor, are considered. Such an analysis should be possible in 2007 when the dairy cost and return data for the year of 2005 are available on the ERS-USDA web site.

The labor costs contained in the ERS-USDA data set reported for grazing operations and smaller conventional dairies are quite high and perhaps a little suspect. More research probably needs to be done to determine if labor costs on these dairies are as high as reported. Unfortunately it is difficult to perform this research because labor data is typically not recorded by the operators of smaller dairy farms. This information gap has to be bridged, however, if we are to be able to accurately determine the true cost of producing milk on dairy farms where all or most of the labor used on the operation is unpaid family labor.

Table 1: Selected Cost and Return Data (Per CWT), By Farm Type and Herd Size, For Wisconsin Dairies in 2000

Source: ERS-USDA Farm Business and Household Survey Data (Customized From ARMS)

Item	Rotational Grazing				Conventional			
	Small		Medium		Small		Medium	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error
Dairy total gross value of production	16.96	23.29	14.19	0.18	15.20	0.53	13.85	0.12
Milk	11.86	0.01	11.87	0.01	11.87	0.01	11.87	0.00
Total operating costs	9.70	2.02	8.28	0.76	8.80	0.41	8.02	0.33
Total allocated overhead	19.02	7.65	17.33	3.12	20.51	2.99	9.98	0.52
Opportunity cost of unpaid labor	12.14	17.62	9.98	3.17	13.17	2.91	3.91	0.34
Capital recovery of machinery and equipment	5.37	1.13	5.37	0.35	6.05	0.37	4.13	0.21
Total costs listed	28.72	6.69	25.61	3.69	29.31	3.28	18.00	0.76