

Profitability of U.S. Dairy Farms¹

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Trends in U.S. Milk Production

We are interested in the profitability of dairy farms in various regions of the U.S., but good and detailed economic data is difficult to obtain. A proxy for (future) profitability of milk production in different regions may be the trends in where the milk is produced.

Some recent data on milk production trends were published by USDA-ERS in June 2002. This document, *The Changing Landscape of U.S. Milk Production*, is can be found on their website <http://www.ers.usda.gov/publications/sb978/>.

USDA distinguishes between 10 production regions in the U.S.: Northeast, Lake States, Corn Belt, Northern Plains, Appalachian, Southeast, Delta States, Southern Plains, Mountain, and Pacific. The Southeast includes South Carolina, Georgia, Alabama, and Florida. See figure 1 and table 1.

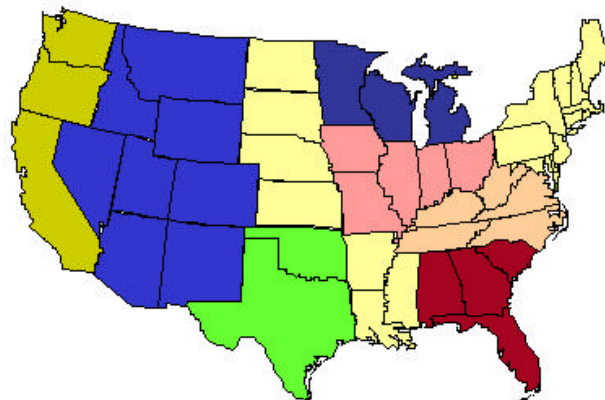


Figure 1. USDA's 10 production regions.

The number of operations with milk cows in the U.S. changed from 334,180 in 1980 to 105,250 in 2000.

Table 1. Trends in number of operations with milk cows, number of dairy cows, and total milk production¹

USDA Product. Region	Operations with milk cows			Dairy cows ²			Milk production ³		
	1980	1990	2000	1980	1990	2000	1980	1990	2000
Northeast	54,440	36,370	23,390	2,170	1,863	1,681	26,139	27,223	29,506
Lake States	81,500	56,000	33,000	3,072	2,781	2,178	36,885	39,451	38,457
Corn Belt	55,400	32,200	18,400	1,434	1,172	896	15,880	16,775	15,112
Northern Plains	22,900	11,300	5,100	496	421	319	5,253	5,379	5,107
Appalachian	42,700	17,500	7,800	798	642	435	8,415	8,073	6,450
Southeast	13,000	5,100	1,880	430	368	292	4,546	4,926	4,611
Delta States	13,500	5,600	2,180	286	212	136	2,569	2,506	1,773
Southern Plains	17,700	9,100	4,400	428	487	439	4,735	6,784	7,030
Mountain	18,900	9,770	4,570	479	565	970	6,131	9,486	19,954
Pacific	14,140	9,720	4,530	1,206	1,483	1,869	17,853	27,118	39,657
United States	334,180	192,660	105,250	10,799	9,993	9,206	128,406	147,721	167,657

¹ Source: Blayney, D. P. 2002. *The Changing Landscape of U.S. Milk Production*. USDA-ERS Statistical Bulletin No. SB978. 30 pp.

² thousands.

³ million pounds.

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This is a loss of 69%. For the Southeast, these numbers were 13,000 in 1980, 5100 in 1990, and 1880 in 2000. This loss is even greater, with 86% less operations in those 20 years. In 2000, the Southeast accounted for 1.8% of all operations with milk cows in the U.S., where this was 3.9% in 1980. All regions show large losses in the number of operations with milk cows.

Operations with milk cows can be considered dairy farms, but milk production is not the main activity on many of these operations. The trend in specialized dairy farms is similar, but USDA's data is not as current.

The number of dairy cows has decreased as well over time, but a lot less dramatically. In 1980, some 10.8 million dairy cows were counted in the U.S., 430,000 (4.0%) of them in the Southeast. In 2000, the total number of dairy cows was 9.2 million, with 292,000 in the Southeast (3.2%).

Where the number of dairy cows decreased in all regions east of the Mississippi, growth took place in the West. For example, compared to 1980, the number of dairy cows more than doubled in the Mountain region and increased by 55% in the Pacific region.

Despite the decrease in the number of dairy cows, the total milk production in the U.S. has increased from 128 billion pounds in 1980 to 168 billion pounds in 2000. This is, of course, the result of an increase in milk produced per cow. The Southeast's share of the total milk production was 4.5 billion pounds in 1980 (3.5%) and 4.6 billion pounds in 2000 (2.8%). On the other hand, the milk produced in the Mountain regions more than tripled and the milk produced in the Pacific region more than doubled in those 20 years.

In summary, the Southeast lost more than its share of operations with milk cows, dairy cows, and volume of milk produced. The growth in cow numbers and volume occurred primarily in the West.

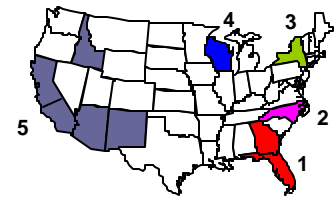
Although these statistics are not favorable for the Southeast, they do not tell the whole story. For example, they do not show that the growth in the West occurred because all those farms are more profitable than the ones here in the Southeast. Therefore, let's look at some of the data on milk production economics that is available across the U.S.

Comparison of Milk Production Economics Across the U.S.

We have year 2000 economic data available from five sources for nine regions in the U.S. The sources are: 1) Dairy Business Analysis Project, 2) North Carolina State University, 3) New York Farm Business Summary, 4) Wisconsin Center for Dairy Profitability, 5) Moore Stephens Frazer and Torbet (an accounting and consulting firm in California). The regions are: 1) Florida and Georgia (DBAP), 2) North Carolina, 3) New York, 4) Wisconsin, 5) Idaho, 6) San Joaquin Valley, 7) Southern California, 8) Arizona, and 9) New Mexico. See figure 2.

Year 2000 Economic Comparison

Sources:



- 1 Florida / Georgia Dairy Business Analysis Project
- 2 North Carolina State University
- 3 New York Farm Business Summary
- 4 Wisconsin Center for Dairy Profitability
- 5 Moore Stephens Frazer and Torbet, LLP

Figure 2. Five sources for economic data on milk production economics.

All these five sources calculate revenues and costs, including accrual adjustments for inventory, accounts receivables and payables, and prepaid expenses. Still, some of the results may differ from source to source because different assumptions may be made or the calculations can be done in more than one way. One example of possible differences is the valuation of assets. Basically, assets can be valued at market price or kept reasonably constant over time. This latter approach is taken in DBAP, so that changes in a dairy's profitability from year to year are the result of management and prices other than for assets. The revenue and cost results shown here should be quite comparable, however.

All sources show average results for that particular region. Although the averages show the general direction, the variation within a region is probably a better indicator for what can be accomplished with good (or not so good) management. Unfortunately, very little information about variation is available, except for FL/GA.

Another thing to keep in mind when comparing averages is that they are often based

on a small sample of all the dairies in that region.

The results for Idaho were based on only 8 farms while Wisconsin had 605 farms in their sample. Ideally, such a sample is a good representation of all the dairies, but that is not necessary always the case. For example, the larger or more progressive farms may or may not be overly represented in the results because they are or are not more willing to share their financial data.

Table 2. Economics of milk production in nine regions in the U.S. in 2000.

Variable	Florida, Georgia	North Carolina	New York	Wisconsin	Idaho	San Joaquin Valley	Southern California	Arizona	New Mexico
Number of farms	22	9	66	605	8	18	21	9	9
Milk sales / cwt	16.68	14.98	13.32	11.76	11.40	11.88	12.04	12.07	12.06
Total revenues / cwt	18.03	17.37	15.58	12.33	11.76	12.28	12.34	12.33	12.39
Feed cost / cwt	7.35	5.76	4.58	?	4.76	5.17	5.26	5.82	5.22
Labor cost / cwt	2.74	1.58	2.62	2.44	1.25	1.15	1.29	1.28	1.15
Total cost / cwt	17.03	15.08	14.92	11.13	10.65	11.33	11.24	12.21	11.46
NFIFO / cwt ¹	1.00	2.29	0.66	1.20	1.11	0.95	1.10	0.12	0.93
Assets / cow	4,460	6,995	6,179	7,911	2,071	2,463	2,367	2,961	1,616
Return on assets (%)	7.0	5.7	3.8	3.5	6.0	3.3	3.7	0.6	4.7

¹ Net Farm Income From Operations

With these cautions in mind, let's look at average milk sold per cwt as the major driver for revenue (table 2). Milk sales per cow were the highest in FL/GA at \$16.68 / cwt. The range within the 22 sampled FL/GA farms was \$14.47 to \$18.37. North Carolina was second with \$14.98. The lowest average milk sold / cwt was reported in Idaho, at \$11.40.

The revenues from milk sold primarily determine total revenue. No wonder then that the FL/GA average was the highest at \$18.03 / cwt, while the FL/GA range was \$15.61 to \$23.14. Lowest was again Idaho at \$11.76.

An important driver for total cost is feed cost. The highest average feed cost were reported by FL/GA at \$7.35 / cwt. The range was large, from a low of \$4.96 to \$10.79 / cwt. New York reported the lowest average feed cost, \$4.58 / cwt.

Labor cost was the lowest out West. New Mexico's and the San Joaquin Valley averaged \$1.15 / cwt. FL/GA reported the highest average

labor cost, at \$2.74 / cwt. The FL/GA range was wide, from \$1.31 to \$4.15 / cwt. Six regions had labor costs of \$1.58 or lower.

To nobody's surprise, total cost was also the highest in FL/GA at an average of \$17.03. The range reported was very wide, from \$13.28 to \$21.75 / cwt. Six regions had average total cost of less than \$12.50. Idaho's total costs were the lowest at \$10.65.

Total revenue minus total cost is net farm income from operations (NFIFO). This is a major indicator of profitability. The highest NFIFO was reported by North Carolina, on average \$2.29 / cwt. FL/GA was in the middle of the pack, at \$1.00 / cwt. The variation in FL/GA was tremendous. The lowest NFIFO / cwt was -\$5.26 / cwt (a loss) to \$4.41 / cwt (gain).

Wisconsin recorded the highest available assets / cow of \$7,911. The lowest assets / cow were found in the Western states, where New Mexico was the lowest at \$1,616. The assets in FL/GA were the fourth highest at \$4,460.

Again was the range in FL/GA large: from \$1658 to \$9714.

Another indicator of profitability is the rate of return on assets (ROA). ROA is calculated as (NFIFO + interest paid – value of unpaid management) / average total assets. For 2000, FL/GA reported the highest average ROA, at 7.0% per year. The range observed was again large, from –7.2% to 22.9%. Eight regions had ROAs of at least 3.3%, but Arizona’s ROA was only 0.6%.

These results show that cost and revenue are higher in Florida than in other regions of the country, but that our profitability is competitive.

Some of the characteristics of the most profitable FL/GA dairies are presented with preliminary DBAP 2001 results.

DBAP 2001 Preliminary Results

Preliminary results from DBAP 2001 are shown in table 3. These data are preliminary because data for some farms is still collected and minor adjustments to these results will be made for the final results. The data was collected on 26 dairies in Florida, 10 in Georgia, and 1 in Alabama. The Top 6 dairies are the six dairies with the highest net farm income from operations / cwt in 2001.

Table 3. Preliminary DBAP 2001 results.

Variable	Average	Top 6
Number of farms	37	6
Number of cows	819	835
Milk / cow (lbs)	16,863	18,281
Assets / cow (\$)	5,108	5,584
Milk sales / cwt (\$)	18.27	17.71
Total revenues / cwt (\$)	20.25	20.63
Purchased feed cost / cwt (\$)	7.26	5.31
Labor cost / cwt (\$)	2.71	1.88
Total cost / cwt (\$)	18.07	15.56
NFIFO ¹ / cwt (\$)	2.14	5.07
Rate of return on assets (%)	7.7	15.3

¹ Net farm income from operations / cwt.

The Top 6 earned their profitability by primarily cost control. Total cost for the Top 6 was on average \$15.56 / cwt. This was \$2.51 lower than the average of all 37 dairies.

Lower cost was especially reported for labor (\$1.88 versus \$2.71) and purchased feed (\$5.31 versus \$7.26). Total revenue for the Top 6 was \$0.38 / cwt higher than the average.

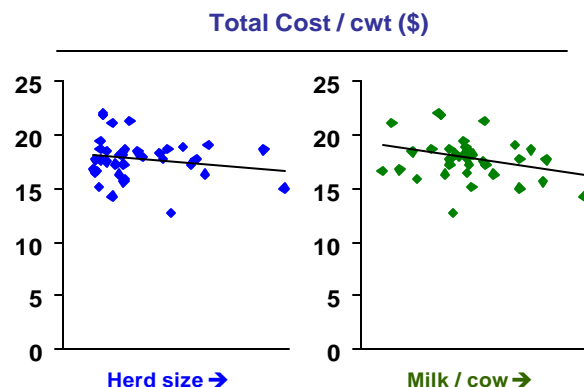


Figure 3. Total cost /cwt by herd size and milk / cow (DBAP 2001).

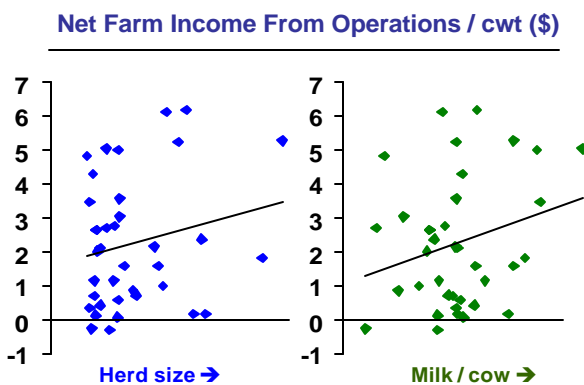


Figure 4. Net farm income from operations / cwt by herd size and milk / cow (DBAP 2001).

Figure 3 shows that larger herds had on average lower total cost / cwt, but the variation is large. Herd size is not the primary factor driving total cost / cwt. Also higher milk yield / cow is not always a guarantee that the total cost / cwt is lower.

Figure 4 shows that net farm income from operations / cwt is related to herd size and milk / cow, but notice the large variation. Larger herd sizes and more milk / cow do not necessarily result in higher profitability.

Net Farm Income From Operations / cwt (\$)

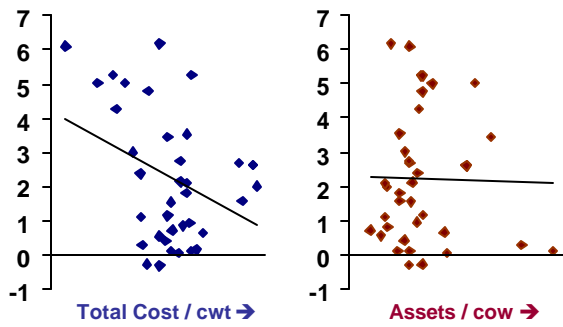


Figure 5. Net farm income from operations / cwt by total cost / cwt and assets / cow (DBAP 2001).

Rate of Return on Assets (%)

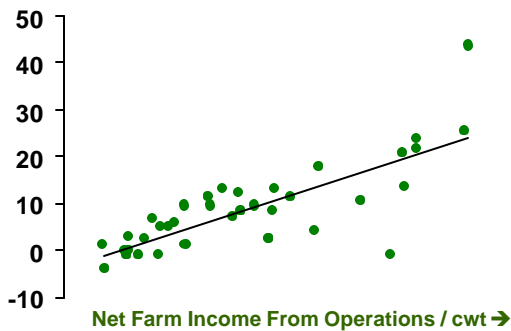


Figure 6. Two indicators of profitability. Rate of return on assets by net farm income from operations / cwt (DBAP 2001).

Net farm income from operations is on average higher with lower total cost, but again there is quite a range. The Top 6 (the 6 highest dots in figure 5) are not the six herds with the lowest cost. Assets / cow is hardly correlated with net farm income from operations / cwt.

Net farm income from operations / cwt is in general an indicator for another indicator of profitability, rate of return on assets. Yet, there are farms that do well according to one indicator and not so well according to the other (figure 6).

Summary

Trends of operations with milk cows, dairy cows, and total volume of milk produced for the last 20 years show that the Southeast is losing more than its share. Growth in cow numbers and the volume of milk produced occurred primarily in western states.

Economic data suggest that the total revenues and total cost of producing milk is the highest in the Southeast, compared to eight other regions in the U.S. The profitability in the Southeast is on average competitive with those other regions.

A large variation in profitability exists between dairies in the Southeast. Profitable milk production is not reserved for large herds or high milk yield / cow. The variability shows that the Southeast still holds opportunity for well-managed herds.