FARM-LEVEL COMPARISON OF MILK PRODUCTION IN MEXICO AND THE UNITED STATES

When analyzing milk production in Mexico, its diversity is quickly realized. Dairy farms in Mexico range from large modern specialized Holstein operations to small unspecialized operations using crossbred animals in dual-purpose production systems (SAGAR, Hallberg, et al.). Weather conditions range from the arid regions of North-Central Mexico to the humid tropics of the Southeast. Milk marketing systems include large national milk cooperatives, regional cattle associations, farmers selling fresh milk door-to-door and farmers selling directly to proprietary processors (McClain and Harris). These factors combine to create a much wider variety of conditions under which milk is produced and marketed in Mexico compared to the United States.

Each year the Agricultural and Food Policy Center (AFPC) at Texas A&M University and the Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri and Iowa State University cooperate to develop a baseline outlook for U.S. agriculture including the dairy industry. This outlook is utilized to project the economic performance of representative farms including dairies developed in major U.S. milk producing regions.

This concept has been applied to the Mexican dairy industry as a means of determining its competitiveness, likely future growth, and the resulting prospects for exports. Contacts were developed in the major milk producing regions selected for analysis. The regions were selected based upon their importance in milk production from each of the three production systems discussed previously. Tables 1 and 2 provides a description of key characteristics of each of the Mexican panel dairy farms. Table 3 provides a description of

some of the important characteristics of the six panel dairy farms from the United States used for this comparison.

RESULTS

Figure 1 reports expenses, receipts and net cash income in 1996 for the seven specialized Mexican panel dairy farms. Expenses, receipts and net income results in 1996 for the six representative dairies from the United States are illustrated in Figure 2.

Figures 1 and 2 indicate that the specialized dairies in Mexico have the potential for being fully competitive with comparable well-managed dairies in the United States. Facing changes in their government support price policies and the highest feed prices in many years, U.S. dairies have not performed as well as in years past (Knutson et al.). Although the U.S. dairies still receive higher cash receipts, the Mexican farms generate comparatively greater net cash incomes (Figures 1 and 2).

The DLCS350 farm had a net income of $80,390 while the DLCS1280 had a net income of $599,482. This translates into a net income per cow of $230 and $468, respectively. There are several reasons that the DLCS1280 farm performs much better relative to DLCS350. Despite having better labor productivity (Figure 3), DLCS350 required a much higher level of cash receipts to cover feed costs. Our analysis indicated that feed costs comprised 60 percent of cash receipts for DLCS350 while DLCS1280 contributed only 40 percent of cash receipts to purchased feed. Another factor is that DLCS1280 realizes benefits to producing a much larger share of feed needs.

When looking at Figure 1, it is clear that the two farms in Torreon generate much

higher net incomes compared to their counterparts in Delicias. Current analysis shows that TORR300 and TORR2000 achieve $768 and $606 in net cash income per cow. This is accomplished in part by higher production per cow, lower feed costs due to a greater involvement in farming, and a higher labor productivity. In addition, favorable climate conditions help enhance mik yields as well as forage yields, despite the fact that they rely heavily on irrigation.

Queretaro represents a much different climate for milk production. Higher rainfall and humidity levels as well as lower temperatures result in a much lower milk yield. As a result, labor productivity is much lower when compared to the other Specialized farms (Figure 3). When directly comparing DLCS350, TORR300, the QTRO350 farm generates a much lower net income per cow of $142 for a total net income of $49,000 (Figure 1). While QTRO600 and QTRO1200 generate much better net incomes per cow than QTRO350, they do not compare that favorably with the large farms in Delicias and Torreon.

When compared to dairies of similar size in the United States, the net incomes per cow are much higher. For example, although the CA1710 generates cash receipts of $2656 per cow, net income per cow is $351 compared to $468 for DLCS1280 and $606 for TORR2000. Despite lower net incomes, the U.S. farms have much higher labor productivity measures (Figure 3). The higher net incomes experienced by the Mexican farms despite lower labor productivity measures is is likely a reflection of the fact that the Mexican government sets retail prices politically and prevents its milk producers from being fully exposed to international marketing forces.

Figure 4 reports the expense, receipt and net cash income in 1996 for the three semi-

specialized (MTNZ25, MTNZ54, and PLQE60) and one non-specialized (MTNZ100) representative Mexican dairy farms located in the humid tropics. The results from Figure 4 indicate that the net cash income levels achieved in 1995 by the four tropical dairies were, from a milk production standpoint, below a level that would be considered economically viable in the United States. As previously discussed, however, these farms represent two production systems that are still important to Mexico's overall milk production.

While only one of these farms (MTNZ54) receives additional income from crop sales, all four of the tropical dairies depend on livestock sales to a much higher degree than the specialized dairies. For example, MTNZ25 receives 23 percent of its receipts from the sale of livestock while MTNZ54 receives approximately 46 percent. MTNZ100 is even less dependent upon the sale of milk as it receives 64 percent of its receipts from livestock sales (Table 12). With 28 percent of total receipts coming from livestock sales, PLQE60 still experiences a negative net cash income in 1996 (Figure 4).

For an additional comparison of the eleven representative farms in Mexico, a "breakeven" price was computed that would reflect each farms ability to meet its operating costs as well as cover the principal on any debt and provide for a minimum in family living expenditures. Therefore, this breakeven price uses ending cash balance to better illustrate each farms ability to cash flow. Table 14 presents breakeven prices that would be necessary for each of the farms to retain a positive ending cash balance in 1996. A positive cash balance represents the farms ability to pay operating expenses, interest and principal on all debt, taxes, as well as family living expenses.

At a debt level of 10 percent, the minimum price necessary for the specialized

Mexican dairies to maintain a positive cash balance ranges from $6.39/cwt for TORR300 to $8.49/cwt for DLCS350. When the debt level is increased to 30 percent, TORR300 still maintains the lowest breakeven price at $7.62/cwt, a 19.24 percent increase. The highest breakeven price among the specialized Mexican dairies increases 37 percent to $11.05/cwt and belongs to QTRO350. While the U.S. specialized dairies show a higher breakeven price, their impact from an increase in the debt level is much lower than for the Mexican farms. This is the result of lower interest

rates and improved access to capital. For Mexican producers, their governments continued control over the monetary market results in greater uncertainty in their capital markets.

With a 10 percent debt level, three of the tropical dairies have a breakeven price comparable to the specialized dairies. The fact that income from beef sales is such an important part of the total income for these dairies makes the breakeven price less meaningful. Computing a breakeven price using only on the milk price, only provides a partial understanding of the farms ability to withstand additional debt. Table 13 however, indicates that even as an approximation, tropical dairies are far less able to withstand higher debt levels. For example, when the debt level is increased from 10 to 30 percent, the breakeven price for the tropical dairies increase an average of 88 percent.

Some differences resulted from the comparison of panels in the specialized production system. Favorable climate for milk production, more reliable supplies of feed, broader adoption of new technology and services, and more aggressive management practices place the large Northern dairies of Delicias and Torreon at an economic advantage over their counterparts in the El Bajio. As the latest technology and management practices are adopted,

these differences are expected to minimize.

Previous studies have suggested that the non-specialized dairies provide the greatest potential for growth in Mexico's milk production (Hallberg, et al, and Shulthies and Schwart). This study, however, clearly indicates that, under the technology currently applied, the large specialized dairies of Northern Mexico are much more profitable and provide for more optimism for growth than the Semi- and Non-specialized dairies in the tropics. Dairying in the tropics, under the current low input/output schemes, seem less economically attractive from the milk production standpoint. However, the system provides enough flexibility for beef producers to increase their necessary cash flow during part of the year at low cost and less dependence on inputs. The lack of intensification does not allow a rapid development of the tropical systems.

CONCLUSIONS

Conducting an analysis of the Mexican dairy industry requires some understanding of the diversity this represents. Depending on which region of Mexico the dairy is operating, the producer may face remarkably different circumstances. Mexican dairies utilize more distinctly different production systems than found in the United States. This is largely due to Mexico's varied climates, milk marketing infrastructure, technology adoption, and financial constraints faced by farmers.

Despite recent economic adversity and shifting government policies, population growth and the potential for rising incomes make the market for dairy products in Mexico attractive. Further support from more open markets as a result of trade agreements such as NAFTA may provide more reason for optimism. The results indicate that there are few

differences in the level of management and technology utilization between the specialized dairies of Mexico and the Southwestern United States. The primary differences are higher unit costs of production for the U.S. farms while the Mexican farms suffer from adverse macroeconomic conditions such as lack of capital which has resulted in very high interest rates and inflation rates. Under these circumstances, the Mexican farms can generate large net incomes; however, the lack of access to credit limits their planning needs and expansion.

Still, the potential for growth in Mexico's dairy industry is most dependent upon the ability of Mexico's political leadership to create favorable economic conditions for its producers. Mexican producers have been greatly limited by high levels of inflation, high interest rates, the lack of credit, and government control of retail milk prices. Monetary and fiscal policies that keep inflation in check and stabilize financial markets are essential for Mexico to experience growth in its dairy industry. In addition, further loosening of retail price controls would allow Mexico's milk producers to compete on an unsubsidized world market. Current competition between domestically produced milk and highly subsidized, imported powdered milk in the face of retail price controls limits their competitiveness.

Whether or not favorable conditions for growth in Mexico's milk industry appear, someone will have to meet the needs of a growing market for dairy products. Close proximity, market access under NAFTA, and excess milk capacity make the United States a likely supplier for Mexico. The extent of this market for U.S. producers depends largely upon the economic and political futures of both countries. Favorable economic conditions and continued efforts at free trade could see benefits for producers on both sides of the border.

REFERENCES

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Figure 1

Figure 2

Figure 3

Figure 4

Table 1. Characteristics of Specialized Panel Dairy Farms in Mexico.

	DLCS350	DLCS1280	TORR300	TORR2000	QTRO350	QTRO600	QTRO1200
Total Cropland (Acres)	176	1665	308	1320	440	550	572
Acres Owned	110	1243	198	1320	440	550	572
Acres Leased	66	422	110	0	0	0	0
Total Pasture (Acres)	20	0	22	22	0	0	0
Acres Owned	20	0	22	22	0	0	0
Acres Leased	0	0	0	0	0	0	0
Assets ($1000)							
Total	689,971	3,873,760	781,717	4,445,620	1, 766,722	2,516,838	3,428,021
Real Estate	241,760	2,257,120	381,333	1,894,133	1,325,333	1,640,000	1,971,200
Machinery	41,600	257,280	65,280	273,920	93,056	143,291	143,291
Other & Livestock	406,611	1,359,360	335,104	2,277,567	348,333	733,547	1,313,530
1995 Livestock							
Dairy Cows	350	1280	300	2000	250	600	1200
Cwt/Cow/Year	200	210	208	212	130	198	184
1995 Gross Receipts*							
Total	692,219	2,781,359	647,357	4,293,547	572,537	1,281,205	2,209,496
Milk	648,853	2,488,901	576,700	3,918,400	421,312	1,098,037	2,037,568
	93.74%	89.49%	89.09%	91.26%	73.59%	85.70%	92.22%
Dairy Cattle	43,366	283,392	60,916	319,147	74,479	92,849	124,994
	6.26%	10.19%	9.41%	7.43%	13.01%	7.25%	5.66%
Crops	0	9,067	9,741	56,000	76,745	90,320	46,933
	0.0%	0.33%	1.50%	1.30%	13.40%	7.05%	2.12%
1995 Planted Acreage**							
Total	176	1637	385	1760	638	726	572
Alfalfa	110	651	154	880	242	154	154
Corn Silage	66	563	154	440	154	264	220
Oats	0	273	0	88	132	110	22
Ryegrass	0	150	77	264	66	110	110
Sorghum Silage	0	0	0	0	44	88	66
Clover	0	0	0	88	0	0	0

*Receipts for 1995 are included to indicate the relative importance of each enterprise to the farm. Percents indicate the fraction of total receipts accounted for by the livestock categories and crops.

**Acreage for 1995 are included to indicate the relative importance of each enterprise to the farm; these values reflect acreage reduction percentages that year. Total planted acreage may exceed total cropland available due to double cropping. Percents indicate the fraction of total planted acreage accounted for by the crop.

Table 2. Characteristics of Semi-Specialized and Non-Specialized Panel Dairy Farms in Mexico.

	MTNZ25	MTNZ54	MTNZ100	PLQE60
Total Cropland (Acres)	2	8	0	0
Acres Owned	2	8	0	0
Acres Leased	0	0	0	0
Total Pasture (Acres)	42	86	330	304
Acres Owned	42	86	330	304
Acres Leased	0	0	0	0
Assets ($1000)				
Total	46,000	80,224	208,682	194,554
Real Estate	37,067	55,937	156,800	161,312
Machinery	307	2,822	7,546	10,645
Other & Livestock	8,626	21,465	44,336	22,597
1995 Livestock				
Dairy Cows	25	54	100	60
Cwt/Cow/Year	36	40	10	21
1995 Gross Receipts*				
Total	8,100	31,137	18,673	11,998
Milk	6,202	14,817	6,796	8,618
	76.58%	47.59%	36.40%	71.83%
Dairy Cattle	1,897	14,240	11,876	3,380
	23.42%	45.73%	63.60%	28.17%
Crops	0	2,080	0	0
	0.0%	6.68%	0.0%	0.0%
1995 Planted Acreage**				
Total	2.2	10.4	330	0
Napier Grass	2.2	0	0	0
Taiwan Grass	0	6	0	0
Corn Silage	0	2.2	0	0
Improved Pasture	0	2.2	330	304

*Receipts for 1995 are included to indicate the relative importance of each enterprise to the farm. Percents indicate the fraction of total receipts accounted for by the livestock categories and crops.
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Table 3

Table 4. Milk Prices Necessary to Maintain a Positive Cash Balance in 1996

	10% Debt Level	30% Debt Level	Percent Change
Specialized Farms			
DLCS350	8.49	9.34	10.01
DLCS1280	7.45	8.76	17.58
TORR300	6.39	7.62	19.24
TORR2000	7.10	8.15	14.78
QTRO350	8.08	11.05	36.75
QTRO600	7.63	9.10	19.26
QTRO1200	8.21	9.38	14.25
NMD2000	12.48	12.78	2.40
CAD1710	9.41	9.70	3.08
TXCD400	14.51	14.90	2.68
TXCD825	12.43	12.71	2.25
TXED210	11.84	12.20	3.04
TXED650	12.92	13.28	2.79
Tropical Farms			
MTNZ25	8.13	12.40	52.52
MTNZ54	5.83	8.86	51.97
MTNZ100	10.25	28.51	278.15
PLQE60	17.90	30.42	169.94