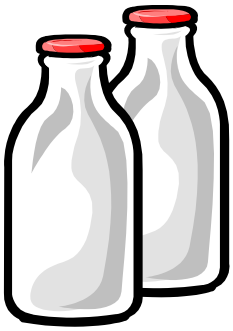
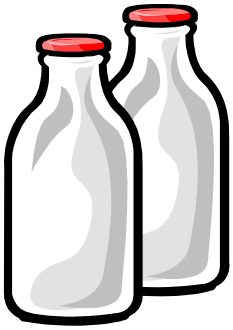
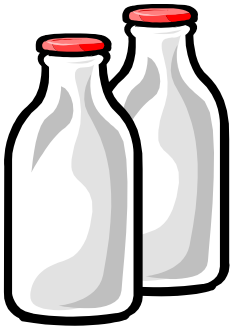


Maine's Dairy Industry

Assessment of the Current Situation and Economic Impact of the Industry



Maine State Planning Office
March 2003



Maine State Planning Office

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March 2003

Summary

1. Situation:

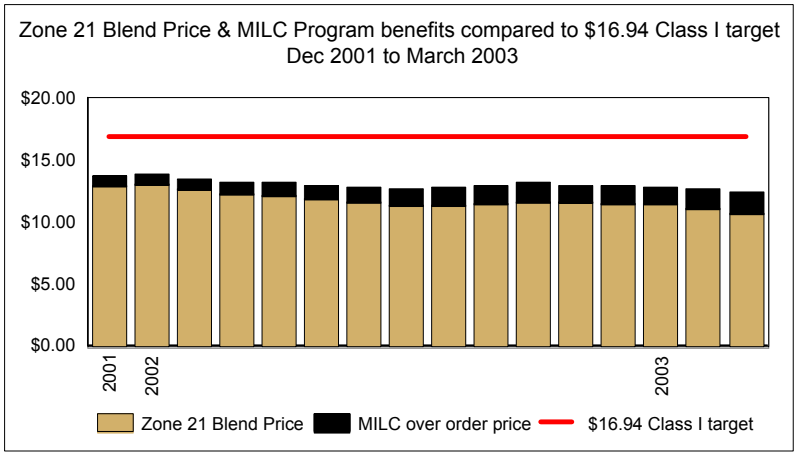
Maine's dairy industry has suffered for many years from depressed pricing. Milk produced on Maine farms today is worth approximately the same as in the mid 1970's. After some improvement in 2001, milk prices in dropped sharply in 2002 and have continued to drop during the first quarter of 2003.

The move from low but relatively stable milk prices to the current situation is largely due to changes in the '96 farm bill that sought to move the industry toward a market oriented system where farm gate prices are influenced by the price of cheese and butter futures traded on the Chicago Mercantile Exchange. Since then farmers have faced greater price fluctuations from month to month that make it difficult to project income and adjust expenditures accordingly. As with most industries, in slow economic times inventories rise and prices begin to drop. The value of butter and cheese at the CME has plummeted since 2001, and along with it, the farm price.

Though farms need at least $15 per hundredweight (cwt) of milk to cover cash expenses (and $17 to $22 to cover long-term costs, according to various studies), the blend price received in December, 2002 averaged $11.92. For smaller farms that received MILC payments for all of their milk, the price was $13.13 per hundredweight. The income deficit on Maine dairy farms (difference between the cost of production and the current price) was nearly $15 million in 2002, conservatively assuming cost of production at $15 cwt, and rises above $32 million at $17 cwt.

Typically demand side policies and systems have been used to impact farm prices, largely because of the highly perishable nature of fluid milk, an inelastic market, and the need to ensure an ample supply of fluid milk regionally. In the Northeast, various systems of over-order pricing have been engaged. The two most recent federal programs, the Northeast Dairy Compact and its replacement, the MILC program, have provided increased revenue to Maine's milk producers but both fall far short of bringing prices up to a minimal level to cover production costs.

Pricing mechanisms have not succeeded in achieving milk prices that reach production costs. The Northeast Dairy Compact offered an element of stability in a period when milk prices were becoming more variable from month to month. The compact increased the income on Maine dairy farms by $15 million during its operation from July 1997 through Sept. 2001. Even so, because the formula works off the base price of fluid milk, prices had dropped so low that the added

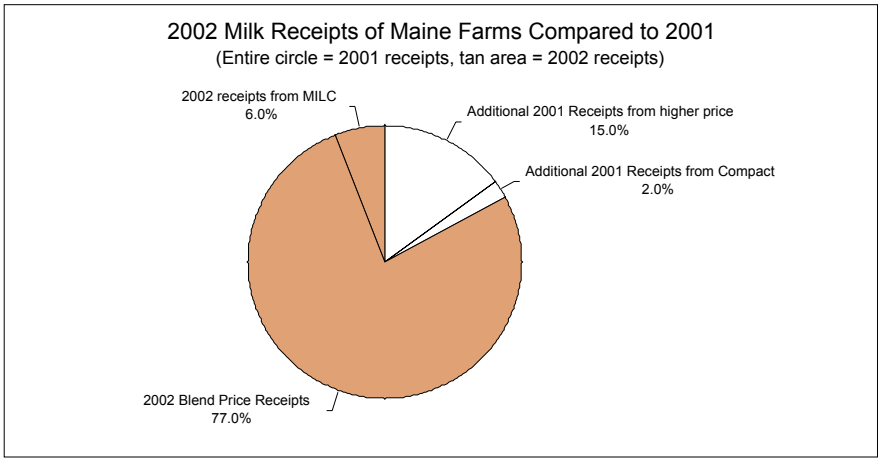


income supplied by the Compact filled less than half of the gap between the blend price and the minimal $15-$17 per cwt needed by farms to break even.

With the expiration of the Northeast Dairy Compact in October 2001, its demise compounded the effect of the already depressed milk price for Maine's dairy industry. The Compact was replaced with a nationwide Milk Income Loss Contract (MILC). This program continued the benefits of the Compact for farms producing less than 2.4 million pounds of milk annually. For farms producing more, only the first 2.4m lbs were covered. In 2002, the effect of imposing the cap meant that approximately a quarter of the milk produced in Maine was in excess of the 2.4 m lbs. per farm cap. An estimated 81 larger producers received between $3 and $4 million less for their milk. Since prices continued to fall through the year, their losses accelerated.

The combination of depressed prices to all farms and reduced benefits under the MILC program to larger dairy farms has reduced receipts of Maine dairy farms by nearly $20 million in 2002 compared to 2001. The losses have placed the industry in a dire situation. Many Maine dairy farms are highly leveraged and their creditors are becoming impatient. Others have no cash for planting feed crops this spring. Some still have outstanding debt from last spring. A number are considering going out of business rather than go further in debt this spring.

Industries that serve the dairy industry already report measurable impacts on their businesses. Agway, one of the major suppliers of grain, seed and fertilizer to dairy farms, reported that their accounts receivable in February 2003 was four times that in the same month last year. The Farm Credit Association, a major lender to Maine dairy farms, estimated that half of the dairy farms in New England were financially stressed in 2000 with the Compact in place. Since then prices have dropped precipitously. They estimated that if the benefits of the compact alone were taken out of the picture, 70% of the farms would be stressed, 47% severely so.



2. <u>Impact</u>:

<u>Maine's dairy industry is important to the State's economy, landscape and environment</u>. Maine's 412 dairy farms produce $100 million in milk annually. They employ more than 1200 people full time and hire many additional seasonal laborers. At least another 1200-1500 jobs rely directly on Maine's dairy farms. Dairy farms support a milk processing industry that includes

several full-scale milk plants and a handful of specialty processors. They also support a farm infrastructure that includes feed grain facilities, farm equipment dealers, cattle dealers, milk haulers, supply stores, repair shops, refrigeration technicians, testing facilities, veterinarians, livestock breeders, and dozens of other businesses. Three of these, the milk plants, haulers and grain facilities depend almost entirely on the dairy industry.

Maine is at risk of losing infrastructure vital to a viable dairy industry if milk revenues are not improved. Maine farmers are becoming increasingly concerned. Where dozens of small dairy processors once existed, only three major ones serve Maine today. Likewise, there are three major suppliers of feed grain left. The remaining veterinarians, cattle breeders, equipment dealers and repair shops are too distant to make dairy farming feasible in some regions of the state, and the growing distance to reach those that remain has increased the cost of doing business. What was once a strong industry statewide has become concentrated in central Maine today. With so few of the essential services operating today, the critical mass of farms necessary to maintain the state's dairy infrastructure is at risk if more are lost.

The dairy industry contributes "priceless" wildlife habitat, open space, and land access to the recreation and tourism industries. Increasing losses in the dairy industry impact all other parts of the economy, but none as much as the tourism and recreation sectors. Farms create scenic vistas across cleared land essential to the tourism and outdoor recreation industries. The value of their contribution is widely recognized and acknowledged but has not been quantified.

Dairy farms are land intensive operations and vital to Maine's working rural landscape. Concentrated in central Maine, more than a quarter million acres are in dairy farms. Dairy farms and farms that produce livestock feed hold approximately a third of Maine's cropland. As the number of farms decline, ownership of farmland shifts into non-farm ownership and is more likely to be converted to other uses. For most farmers, the equity in their land is their only retirement fund and they have little choice but to sell out in order to retire.

The land that dairy farms need most – hay and forage land – has for the past two decades been lost at a far greater pace than any other type of farmland, already making the supply of land for a viable dairy industry tight in some parts of the State. Loss of farms may loosen the land supply for others initially but over time, it too will pass out of the farm community. Farms already rely heavily on land owned by others (accounting for 40% of the land farmed today) and are increasingly at risk of losing access to the land they need to remain a viable industry.

Dairy farms are central to maintaining open space and to reducing sprawl and its costs. As farms are lost, much of the farmland is converted, contributing to sprawl. Sprawl has been demonstrated to increase the cost of services at all levels of government, whether it is the demand for new schools, improved roads to handle increasing traffic, increased public safety needs, or the need for municipal services. Farms are a major contributor to the local tax base in small towns and require far less in services than they pay in local taxes. In small towns, especially those in struggling and declining areas, the loss of a farm represents a significant loss to the local economy and the local tax base.

3. Economic Value:

Every dollar of dairy farm income in Maine creates an additional $1.82 in output in other sectors of the economy. Every million dollars of increase in receipts creates 46 new jobs in the State. Thus, if Maine dairy farms had received $17 cwt for their milk last year instead of $12-$13

cwt, the additional $33 million they would have received would have created an additional $55 million in final demand and nearly 200 jobs in other sectors. If milk prices in 2003 remain at last year's level, the Maine economy will forego comparable gains again this year as well.

The US Department of Commerce RIMS II economic model was used for this analysis. It creates final demand and output driven multipliers for industry sectors and measures the effect of changes in a given industry on earnings and employment (full and part time) in other industries.

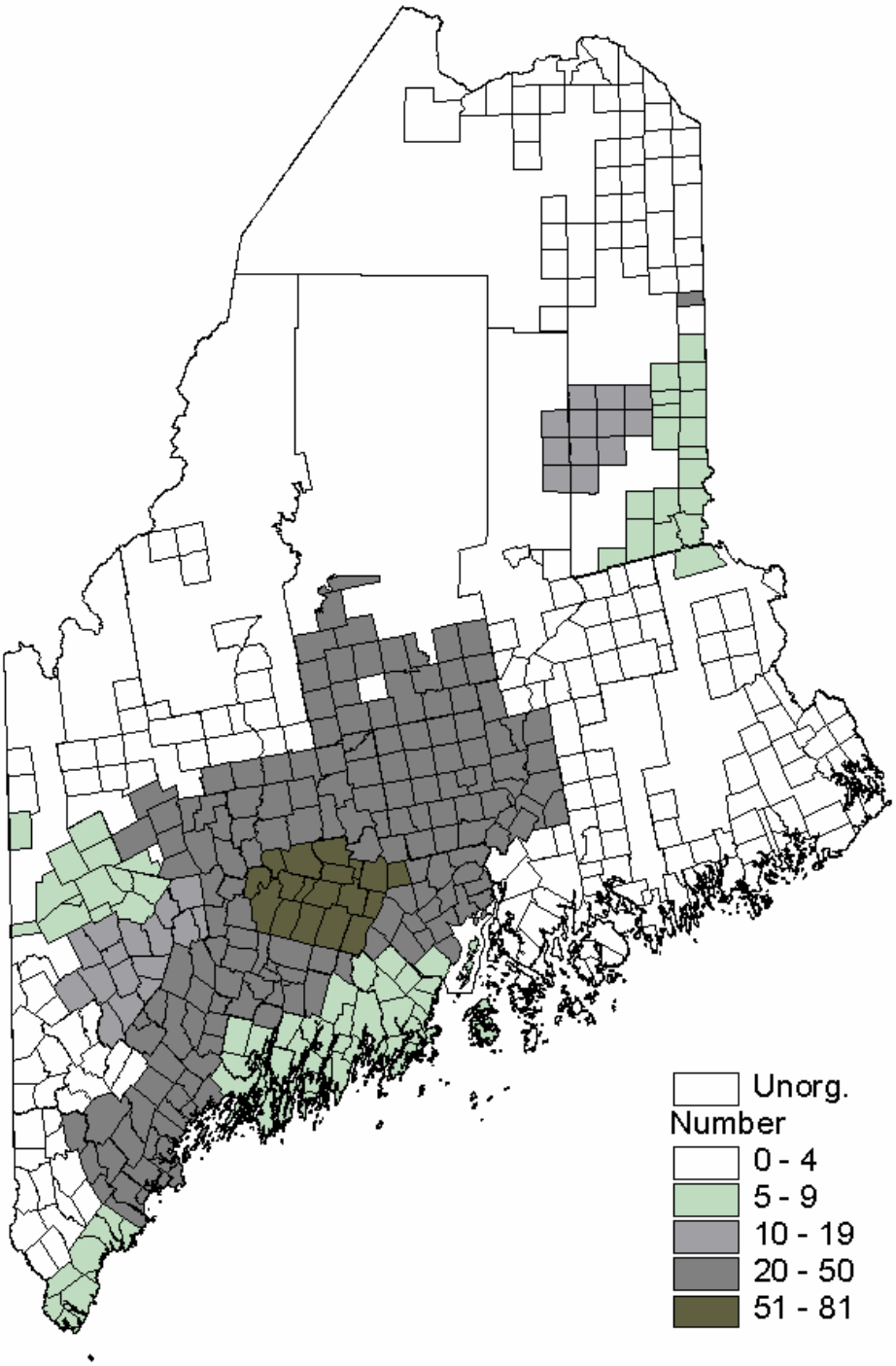
It is difficult to predict how many farms may actually leave dairying in the coming year or two, or how much of the State's milk production they will represent. It is also difficult to predict the amount of loss that would cause a milk plant or feed grain facility to close. Several scenarios were measured. Given the multipliers in the RIMS II model used for this analysis, if milk receipts decline by $20 million it would have an effect of losing over 500 jobs. If the loss were $30 million in milk receipts, the result would be a loss of 753 jobs, including both full and part time.

The greatest losses would be felt by the agriculture sector itself, primarily in agricultural services, including veterinarians, livestock breeders, suppliers of lime, fertilizer, seed, chemicals, dairy barn supplies, and other goods and services. Outside of the agricultural sector, the greatest impact is to milk processing, feed mills, and milk haulers (classified in the food processing and transportation sectors). The RMS II economic multipliers indicate significant impact on the transportation sector, reflecting the need for fewer milk haulers to move milk from farm to processing plant.

The model understates the impact on the feed grain and dairy processing industries because it cannot account for unique circumstances, such as the level of dependence between Maine dairy farms and the state's feed grain and milk processing facilities. As a demand-driven model, the underlying assumption is that the plants will stay in operation because consumers will still want milk and feed grain facilities will operate because there will still be a need for grain. In reality, Maine's feed mills almost exclusively supply the state's poultry and dairy industries, and therefore a decline in poultry or dairy would affect feed grain facilities. Maine's milk plants primarily process milk from Maine farms and distribute milk it to Maine consumers. Losses of milk from Maine would either (1) result in downsizing, which would have a negative impact on plant viability since they would operate their facilities below capacity, (2) cause plants to import more milk from out of state in order to continue to supply consumer demand, or (3) cause plants to cease to operate.

Overall, in spite of the drawbacks in the nature of the RIMS II economic model, it demonstrates the importance of Maine's dairy industry in direct economic impact. Data also indicate that dairy farms provide the State with additional values beyond milk and the cash receipts and spending it represents.

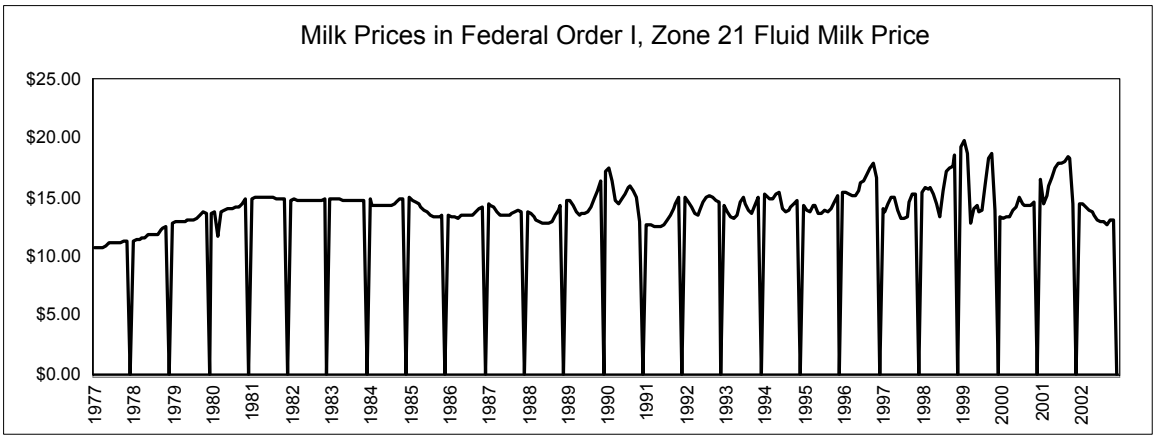
Concentration of Dairy Farms in 1997, by Extended Community



Assessment of the Maine Dairy Industry:
Current Situation and Economic Impact of the Industry

1. Background: Milk Prices and Components of Milk Pricing Policy

Pricing: At the core of the current crisis is the milk pricing mechanism. The price of milk is highly regulated and involves a complex set of pricing factors that are influenced by federal and state policies. It is in part market-determined, and in part publicly administered through a wide variety of pricing regulations. The 1996 farm bill sought to move away from federal systems and toward a more market driven system based on futures and options contracts. The results have been mixed. Analysis by the USDA[i] has since found that as the role of price support programs has been reduced, milk price volatility has increased. In the northeast, milk prices have moved from a relatively stable situation to a situation of significant fluctuations from month to month and year to year.



Cheese and butter futures traded on the Chicago Mercantile Exchange are today the primary pricing gauge used by USDA federal market orders to determine farmer payments for the milk they produce. The value of butter and cheese at the CME has plummeted since 2001. Since most milk is processed into butter and cheese once the demand for fluid milk met, the prices at which they trade are extremely important to dairy farmers. The decline in prices began with the tragic events of Sept. 11, 2001. Because people ate out and traveled less in the months that followed, consumption of cheese and butter at restaurants and in other food service systems dropped off sharply. The continued lack of economic growth since then has caused prices to keep falling.

As with most industries, inventories rise in slow economic times. Unlike other industries, cows do not simply stop producing when inventory piles up. Caught in the bind of declining prices, the result is usually an acceleration of the trend toward larger and larger farms. Some

farms, usually smaller ones, will go out of business and others (usually larger ones) will increase their production in an attempt to gain efficiencies through lowing per unit costs.

In Maine the pricing process is especially complex because two systems are at work. Milk prices received by Maine dairy farmers are based on the prices set in the northeast by the federal market order system. Federal market orders establish prices based on a number of factors. The primary factor is the price of fluid milk and the portion of milk that is consumed by the public as fluid milk in relation to all other dairy products. The Class I price (price received for fluid milk products) is the highest[ii]. A "blend" price is figured based on the ratio of utilization. Though Maine is not part of the Federal Order I, the state's dairy industry is highly impacted by it. Much of the milk produced in Maine is sold subject to the Federal Market Order because the rules require any plant shipping 25% of its production into regions regulated by a Federal Order be subject to the prices set by that Order. These farms receive the blend price less a zone differential on Class I milk.

For the farms selling to Maine processors, another system is at work. The Maine Milk Commission is responsible for establishing minimum wholesale and retail prices for milk handled by Maine processors. It does not establish a farm price, though a farm price is in effect created by the process used to establish the minimum wholesale price. The minimum wholesale price is set by the Commission by determining the price of milk to the farm (the northeast federal market Class 1 price is used) plus the "dealer margin" and any other assessments or costs. Approximately 55% of the milk processed by plants in Maine is sold in Maine and subject to Maine law. The balance is subject to the federal order.

The base price of milk set by the Northeast federal order has been eroding. Milk production has increased rapidly in other regions of the nation that have not historically been strong milk producers (Texas, California, New Mexico, Idaho, etc). The growth is in part due to lower production costs (subsidized water, lower freight rates to obtain feed grain, etc.) in the south and west, and in part to fundamental changes in the federal tax policy during the Reagan administration that accelerated the growth in large corporate farms, often with herds of as large as 10-12,000 cows. The imbalance resulting from increased production in these regions impact the base price of milk across the nation, including the Northeast Market (Federal Order I)[iii]. Because dairy farming in Maine and other New England states remains typically a small family farm operation and does not have many of the advantages of the regions where milk production has been increasing, various systems of over-order pricing have been engaged.

A second factor effecting milk prices for Maine dairy farmers and limiting Maine's capacity to respond is that most milk produced in Maine is regarded and regulated as federal order milk because it is processed by companies whose headquarters are not in Maine or by plants pooled under the federal order. The jurisdiction of the Maine Milk Commission is limited to milk processed and sold in Maine. Less than half of the milk from Maine dairy farms, and only 55% of the milk handled by Maine dairies is considered "Maine Market". The capacity of the Milk Commission to gain more control over milk prices in Maine is limited by Interstate Commerce Clause restrictions that apply when the milk travels across state lines. This, in effect, requires that any plant shipping 25% of its production into regions regulated under the federal system must pay the federal minimum price.

It is due to the Commerce clause restrictions that the 50 cent increase in the minimum price of milk added by the Commission in late January can be applied only to milk processed and sold in Maine and will add 23 cents per cwt to the farm price and will be distributed by the

Maine Milk Pool. The Commission estimates that the added assessment will increase the income of a 100-cow herd by $360 per month that the premium is in effect. In March, the Commission voted to increase the amount to $.90 per cwt. This amount returns $.427 per cwt to the farms.

Price Stabilization Strategies: Both federal and state programs have been created to ensure a base price for Maine dairy farms. In the 1980's Maine established the Maine Milk Pool, which sought to even out the disparity between prices received by farms selling milk to Maine processors and those selling their milk to processors regulated under the federal order. Fraught with legal battles and other problems, the benefits fluctuated and as the number of Maine processors dwindled, so did the impact. The pool has survived its challengers and is still the State's mechanism for distributing funds to all Maine dairy farms.

In the early 1990's the northeast compact was first established. It sought to stabilize prices to farms in the range of $15 per cwt. When this temporary compact expired, the Maine legislature acted to establish a "tax" on milk processed in Maine that was distributed to farmers. Though the outcome sought was to assess a fee per gallon processed and distribute it to the farms, ICC rules prevented state assessments on milk controlled under a federal order. Therefore, Maine lawmakers voted a "tax" on milk sold in Maine. As a tax, the revenues were collected and deposited in the general fund. A separate law enabled money from the general fund to be distributed to dairy farms to stabilize the base price they received for their milk. The state system was abandoned when the Northeast Dairy Compact was adopted in the 1996 farm bill.

The Compact was in place from mid 1997 through October 2001. The 2002 Farm Bill did away with the compact and established in its place a new dairy stabilization program, the Milk Income Loss Contract (MILC). The MILC program, designed to stabilize small family farms, provides no benefits for milk produced in excess of 2.4 million lbs per year per farm. Smaller Maine farms would continue to receive the same benefit as under the former Compact. In some months, farmers may have a higher benefit and see less fluctuation in price because the new rules establish a flat utilization factor in place of the actual utilization ratio that changes monthly. In Maine, 81 farms have an annual production in excess of 2.4 million lbs. An estimated 150 million pounds of milk is not covered by the new program. This amounts to nearly one in five dairy farms and a quarter of the milk produced in Maine.

Several proposals are currently before the legislature to assist the industry, the major proposal being to reinstitute the "tax" program in Maine that was in effect before the Compact was included in the '96 farm bill. The proposed legislation seeks to address the problem of depressed prices as well as the gap in coverage left by the MILC program by providing farms with half of the difference between $17 per cwt and the zone 21 blend price.

2. Cost of Producing Milk in Maine

Milk production costs vary with farm size and farm structure. The USDA computed the cost of milk production in the northeast US to be $18.94 per cwt in 1999. Data for 2000 and 2001

Costs and Returns of Milk Production in the Northeast

	1993	1994	1995	1996	1997	1998	1999
Total, economic costs	16.81	17.68	18.89	19.00	20.30	19.31	18.94
Residual returns	-2.12	-2.76	-4.35	-2.61	-5.35	-2.52	-2.59

are not comparable. The USDA has since established new regions. The Northeast was combined with other northern states to create the Northern Crescent. Cost of production in the larger region for 2000 and 2001 were $20.33 and $20.58 respectively.

Maine's production costs have been regarded as higher than the northeast average due primarily to the higher cost of fuel and utilities. Higher maintenance costs for older facilities and higher taxes are also factors.

A study conducted at the University of Maine by Timothy Dalton[iv] provides a more recent and closer look at Maine's dairy farms. The data is based on a survey conducted in 2002 that included 27% of producers. The study found differences in costs related to debt structure, production practices and other factors related to farm size and scale of operation. Dalton was also able to ascertain a break-even short term price necessary to cover operating and overhead and a long term price necessary to cover all costs. Although farmers may survive at short-term breakeven prices, they cannot remain in business without recovering some of their long term costs (return on investment, depreciation) over time. His analysis concluded the cost of production for a typical Maine farm was $15.81 in the short term to cover cash expenses and $21.77 to cover all costs.

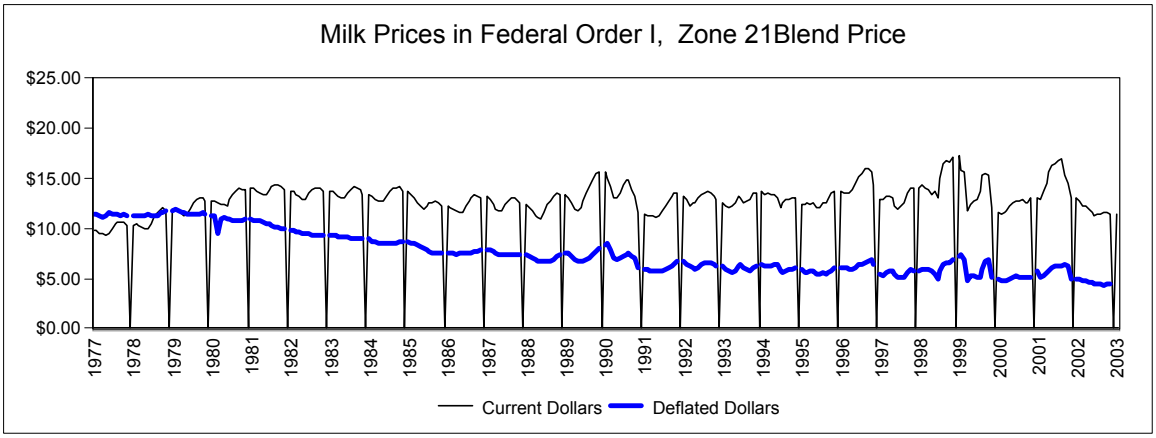
Break-Even Price per Cwt.

	Small Farm	Medium Farm	Large Farm
Short term (cash expenses only)	$16.18	$15.59	$13.12
Long term (all economic costs)	$22.29	$21.56	$17.58

Because of the variation in farms and resulting variation in what is considered a minimum price to cover basic production costs, the analysis in this paper compares impacts on income at $15 per cwt and at $17 per cwt.

3. Price Trends

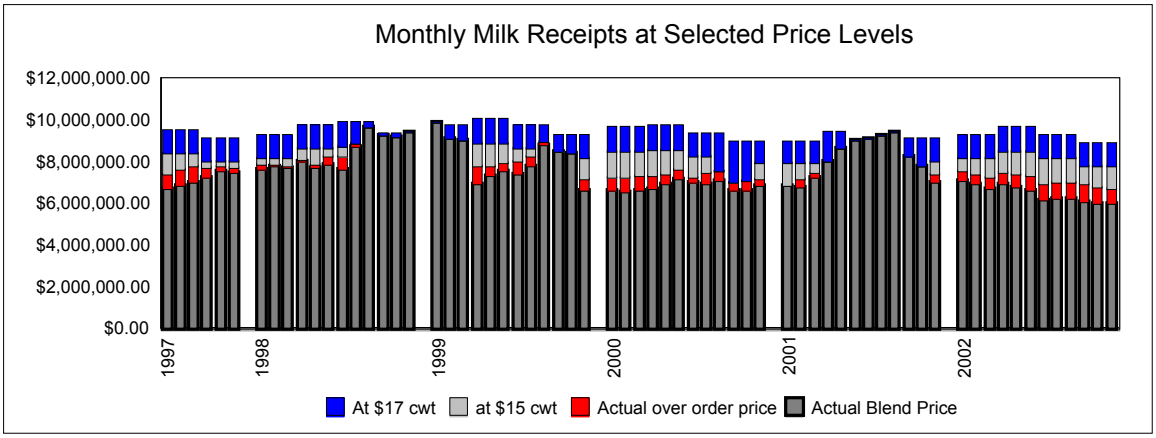
Prices received by Maine dairy farms for their milk have held well below the cost of production for many years, and are today at approximately the same level as during the mid



1970's while costs of operating have gone up. The price of milk in 1977 averaged $11 per cwt. Adjusted for inflation, the real value of milk in 2002 was only $4.40 per cwt compared to 1977 prices.

During the last 5 years (1998-2002), the Zone 21 blend price reached or passed $15 only in 17 months. In only three of those months, it passed $17. Since September 2001, the price of milk has dropped from $17.04 (after addition of the MILC payment) to a low of $11.33 in July 2002, and ended the year with $11.92 in December. This amounts to a 30% drop in income in a few short months.

Milk receipts below the cost of production represent a significant loss to the economic viability of the dairy industry and to the rural economy. The income loss on Maine farms during the 6 ½ year period of the Compact and MILC program (from mid 1997 through 2002) due to prices below the cost of production (assuming hypothetical production cost of $15 cwt) was over $30 million. Had farms received $17 cwt, receipts would have increased by more than $100 million over the period. In 2002 alone, the income deficit (difference between $15 cwt and the actual blend price plus effect of the compact) would have stood at $11 million, but was increased to over $14 million by the shift to the MILC program. (See Table 3 in appendix).

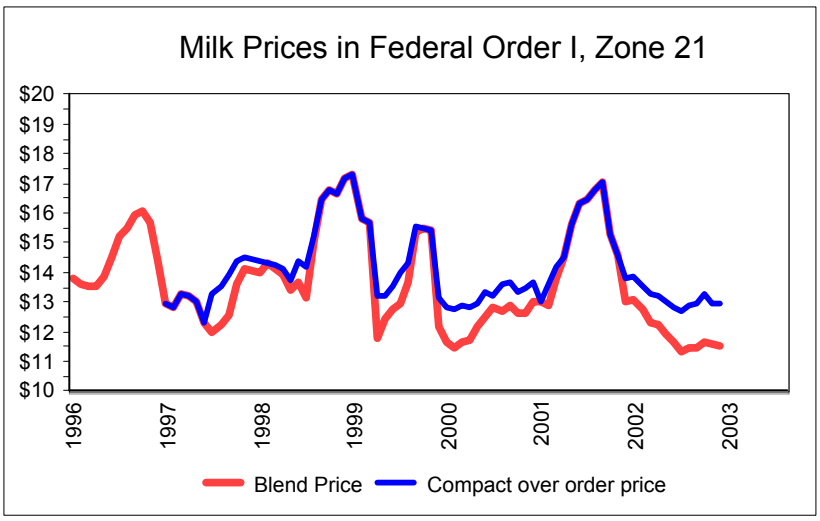


4. Comparison of the Effect of the Northeast Dairy Compact and the Milk Income Loss Compact (MILC)

The Northeast Dairy Compact established a price for fluid milk (Class I) of $16.94 per hundredweight (cwt). When milk sold at less than $16.94, the dairy compact kicked in and made up the difference. During its operation between July 1997 and October 2001 the Class I price was below the $16.94 target 75% of the time. Since dairy farms producing under the federal order receive a blend price, the adjustment made by the Compact applied only to the portion of the milk that went to Class I use (approximately 45%). Maine farmers are further impacted by distance from plant. Most receive the "Zone 21" price which is $0.72 per cwt below the city plant price.

Maine dairy farms received a total of $15 million above the Zone 21 blend price over the duration of the compact. (See Table 2 in appendix). The program helped lessen the impact of the

lowest price months. On average, the compact raised the farm price by 58 cents per cwt, not enough to cover production costs. (See Table 3 in appendix).



In 2002 the average price of Class I fluid milk was $2 less per cwt. than the previous year. Had the compact remained in effect, Maine farms would have received an additional $8 million for their milk. The cap imposed by the MILC program reduced the amount to approximately $5.8m million. Some of the largest farms exceeded the production cap within the first few months of the year and received no benefit from the MILC program for the remainder of the year's production. Since prices continued to fall through the year, their losses accelerated.

In 2002, the Zone 21 blend price fell from a high of $13.09 in January to $11.52 by December. For the farms producing 2.4 lbs or less, the MILC program raised their income by an average of $1.21 per cwt for the year. This brought their average price to $12.95, still well below the cost of production.

While both the Compact and the MILC program that replaced it have provided increased revenue to Maine's milk producers, both fall far short of bringing prices up to a minimal level to cover production costs.

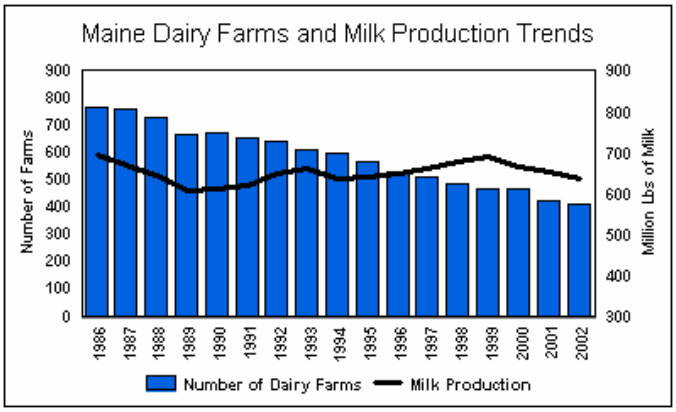
5. Farms and Production Trends

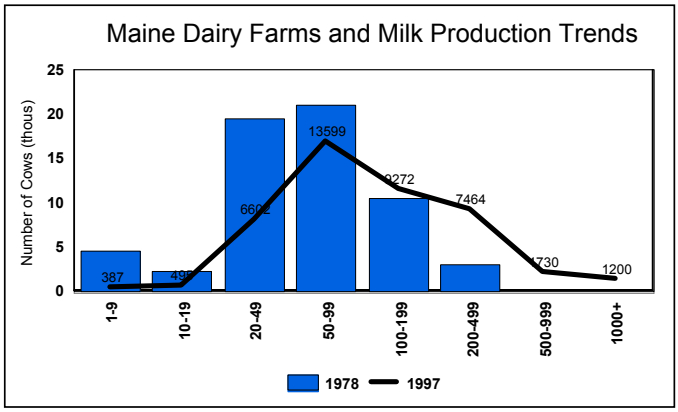
The number of commercial dairy farms in Maine has been declining at a steady pace. Milk production has remained relatively unchanged, largely due to increases in production per cow and as larger farms continue to increase their herd size in an effort to remain competitive.

Over the two decades between the 1978 and 1997 censuses of agriculture, the number of dairy farms was nearly cut in half while the average size of milk herds grew from 30 to 60 head. Milk production per cow increased by 46% due to improved genetics, nutrition, and other technological changes. However, Maine farms did not simply double their herd size. Farms became fewer and larger. The number of farms with smaller herds declined while other farms increased

Census Year	Total Milk Production (Milion Lbs)	Number of Milk Cows (thous)	Production per Cow (lbs)
1965	660	79	8350
1970	619	62	9984
1975	629	61	10311
1978	641	58	11052
1982	727	58	12534
1987	670	48	13958
1992	650	41	15659
1997	662	40	16146
1998	680	39	16585
1999	689	39	16805
2000	668	39	17128
2001	654	39	17211
2002	638	39	
Pct change,			
1978-1997	3.3%	-31.0%	46.1%
1997-2001	-1.2%	-2.5%	6.6%

their herds from 100 head to 500 head, some to over 1000 head.

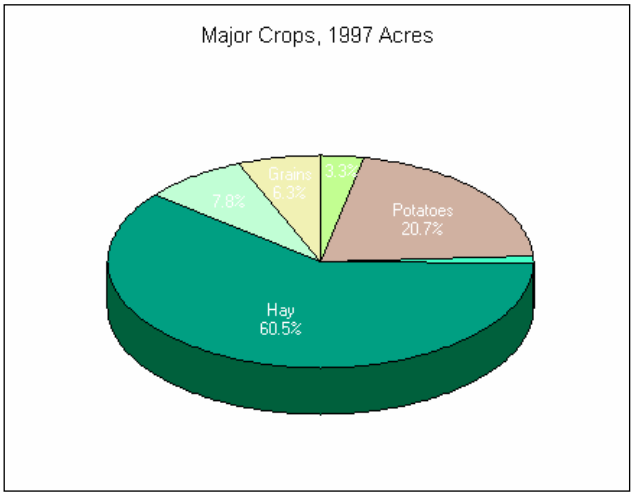




6. Farmland

Dairy farms are land intensive. They are the stewards of more farmland than any other type of farming. The 1997 Census of Agriculture showed that hay and forage production accounted for over half of the cropland in use in Maine[v]. The average dairy farm has 266 acres in production, compared to an average of 105 acres per farm for all farms.

Dairy farms require a large amount of land to produce feed for their cows. In addition to dairy farms, another 1,038 Maine farms are classified as hay & silage producers and another 428 farms reported sales of hay and forage crops in addition to their major farm crop. Among them, approximately 250,000 acres are used as pasture and cropland producing feed for livestock.

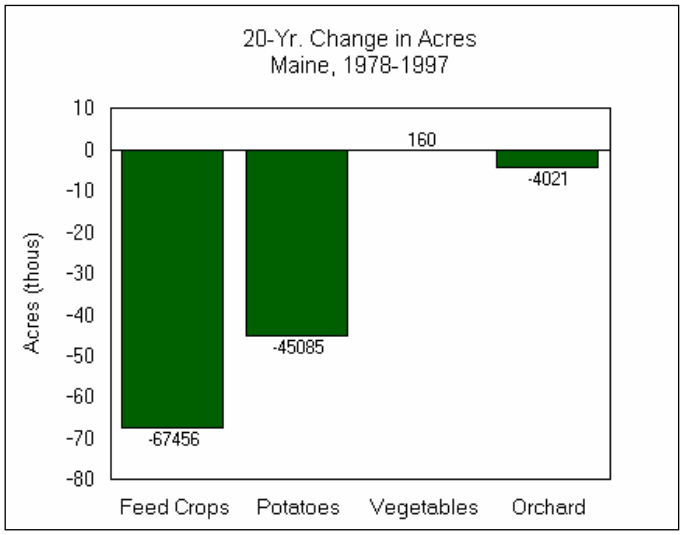


The acres of farmland in Maine has been declining. Over the past two decades 201,000 acres of farmland in Maine has been lost, including 102,000 acres of cropland and 99,000 acres of pasture. The USDA national resources inventory[vi], conducted every 5 years, shows an acceleration of the pace at which non-federal rural land is being developed.

In Maine, between 1992 and 1997, the inventory found that 168,000 acres were converted in the 5-year period. An average of 33,560 acres of land had been converted to development uses each year, compared to an annual average of just over 9,000 acres per year during the previous 10 years.

Rural land of all types is being lost to other uses. Maine has 56,000 fewer acres in forests than it had in 1982. There are 102,000 fewer acres of cropland and 99,000 fewer acres of pasture, and 77,000 fewer acres of other rural lands. In all, Maine has lost 304,000 acres of rural land since 1982, 260,000 of it to development.

The greatest loss has been in acres used to produce hay and other livestock feed. Over the 20 years between 1978 and 1987 nearly 70,000 acres of land used to produce livestock feed was lost. All counties except Knox, Sagadahoc and Piscataquis have lost acres.



7. Value of the Dairy Industry in the Maine economy

The dairy industry is a vital part of Maine's economy, especially in rural communities in central Maine, though its reach is statewide. Changes in the dairy industry extend beyond the farms to other sectors of the industry, first to dairy processors, feed suppliers, equipment dealers, veterinarians, and the like. There are also important secondary impacts to other industries, especially those for whom the natural environment plays a central role, such as the tourism and recreation industries. Final demand effects filter throughout the economy. Loss of dairy farms also has major land use impacts and implications for sprawl costs.

Economic Impacts and Costs:

Primary Impacts. Several economic models have been created to measure the multiplier effect of changes in individual sectors of the economy on all other sectors. Each model works in a slightly different manner, measures different kinds and levels of effects, and thus yields different multipliers, though overall the results are comparable. Using the RIMS II economic model to measure the impact of changes in the dairy industry in Maine, the impact of an increase of $20 million in farm receipts has a multiplier effect on final demand of $36 million throughout the economy, or $1.82 for every dollar of receipts to the industry. For every $1 million added to the industry, 46 jobs are gained.

A loss of $20 million would result not only in the loss of the cash itself and the growth foregone by the industry, but will also generate an output driven multiplier of 25 lost jobs for every $1 million in lost receipts.

It is difficult to predict how many farms may actually leave dairying in the coming year or two and how much of the State's milk production they will represent. Likewise the amount of loss that would cause a milk plant or feed grain facility to close is not fully known.

The Northeast Farm Credit Association computed the impact of price regulations on the financial viability of 2,787 dairy farms in the New England area served by Farm Credit[vii]. They concluded that half of their borrowers were experiencing financial stress in 2000 with the Compact in place. For over half of those (27%) the level of stress was rated "major or severe". If neither the Compact nor the MILC program that ultimately replaced it were to have been put in place, they estimated that 70% of the farms would have been experiencing financial stress, 47% having major or severe stress.

The Northeast Dairy Compact Commission attempted to project the loss of dairy farms in the northeast over the 2 year period following the demise of the Compact were it to not be renewed or replaced by another comparable system[viii]. This analysis assumed a base rate of exit of dairy farms in New England at 4.4%. Without the compact or a similar program, the Commission projected the loss of farms to increase from 120 to 312 farms in the first year and from 105 to 296 in the second year. This analysis was conducted prior to the precipitous drop in prices to levels below which neither the Compact nor the MILC program could provide sufficient relief.

Given the multipliers in the RIMS II model, if total milk receipts drop by $20 million due to farms ceasing to operate, it would have an additional effect of $5 million in lost earnings and a loss of 502 jobs. If the loss is $30 million in milk receipts, the result would be a loss of $7.4 million in earnings and loss of 753 full and part time jobs.

Depressed milk prices have cost Maine dairy farms heavily in lost revenues. Had farmers received a blend price of $15 cwt in the months when the price fell below last year, dairy farms would have received an additional $15 million in 2002. The model indicates that it would have created $27 million in additional economic activity and 680 new jobs. If the price had reached $17 per cwt, still barely enough for farms to break even, an additional $33 million in milk receipts would have stimulated an additional $60 m in the Maine economy and created 1,500 full and part time jobs.

The RIMS II economic model was used to measure the impact of several events or possible events, including the effect of the revenues added by the Northeast Dairy Compact and the MILC program, as well as the effect of depressed milk prices and losses that may be incurred by potential losses of farms. The model could similarly be used to compute the overall effect of the loss of a milk plant. (See Table 4 in the appendix).

Secondary Impacts. Secondary impacts take two forms. One is the tangible changes in final demand in other sectors of the economy that result from to each change in output of the dairy industry. These effects are measured by economic models in terms of employment and earnings. The second kind of impact is less tangible because is not easily measured, though it is widely known, and includes such effects as the impact on the tax base in rural communities, the cost to municipalities of accommodating sprawl, and the effect on the recreation and tourism industries. Though they have little directly to do with agricultural production, these industries are primary "users" of the environment agriculture provides.

a. Sector losses measured by RIMS II. For every $1 million loss in dairy farm income, 21 jobs are lost in agriculture and an additional three are lost in other sectors of the economy. At this rate, a loss of $20 million in farm income would result in a loss of 472 jobs, 63 outside of the agricultural sector.

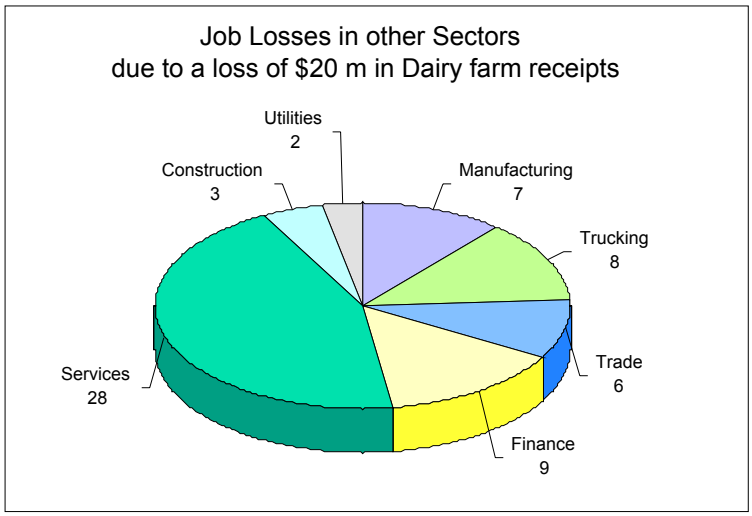
Most of the impact is shown in the agricultural sector itself. Although dairying is a year round job, dairy farms hire seasonal labor for harvesting hay and silage. Agriculture as an industry has a very high portion of part time and seasonal employment relative to the economy as a whole. While it is expected that losses in the industry will reduce employment, the total losses predicted by the model are high because of the portion of seasonal and part time employment.

The greatest losses are to the agriculture sector, primarily in agricultural services, including veterinarians, livestock breeders, suppliers of lime, fertilizer, seed, chemicals, dairy barn supplies, and other custom services.

The greatest impacts outside of the agricultural sector are to milk processing, feed mills, and milk haulers. In 2001 the Maine Dept. of Labor reported 510 persons employed in dairy processing plants. Because the number of firms is small in most of the industry sub sectors, the total number of jobs affected is not available, but is estimated to be over 1,000.

Of the 63 jobs the RIMS II model identifies as lost outside of agriculture, the largest losses directly related to dairy farming (eight of the 63 jobs) are shown in the trucking industry as would be expected since fewer milk haulers would be needed to move milk from farm to processing plant.

The model indicates a loss of seven jobs in manufacturing, only 2 of them in food processing. Because of the nature of the dairy industry in Maine, job losses would very likely be much higher. Both milk processing and grain facilities are classified by the Department of Labor as components of the food processing sector of manufacturing. In Maine, both rely directly on Maine dairy farms.



<u>The model severely understates the impact on the feed grain and dairy processing industries</u>. Because the model measures final demand, the low job loss shown by the model for feed grain and milk processing is a function of assumptions within the model's formulas that do not account for the high level of interdependence between the dairy industry and these two industries within the State. Multiplier formulas in the model reflect the consumer demand for milk, not the source of the milk, and operate on the assumption that the plants will stay in

operation because consumers will still want milk and feed grain facilities will operate because there will still be a need for grain.

In reality, feed grains exist in Maine, not because there is an available supply of grain, but because it is needed to feed Maine livestock. Maine's feed mills almost exclusively supply the state's poultry and dairy industries. The situation for milk processing is similar. Maine's dairies primarily process milk from Maine farms and distribute milk to Maine consumers. Losses of milk from Maine would cause plants to (1) downsize, which would have a negative impact on plant viability since they would operate their facilities below capacity, (2) import more milk from out of state, or (3) cease to operate.

The RIMS II model allocates the greatest impact to areas of consumer spending. Output of the dairy industry flows throughout the economy as purchased inputs and wages. Ultimately, the wages and purchases end up as in the pockets of workers along the way who use it to buy groceries, cars, and other consumer goods, where the money is finally used to support jobs in the retail and service sectors, in banking, insurance, and health care, and other places where consumers spend their money directly and indirectly.

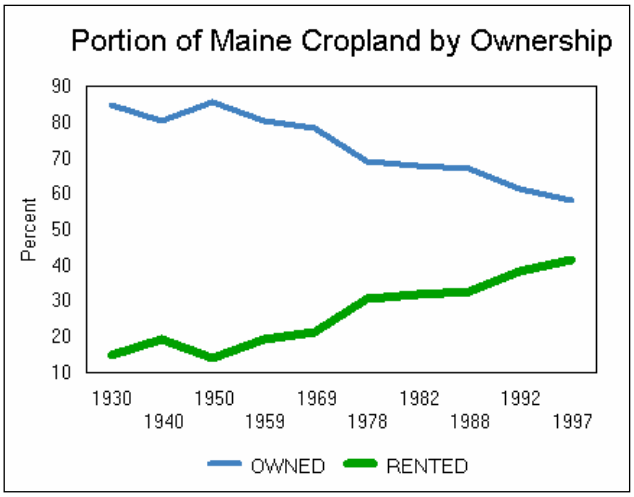
b. Other industry sector losses: The presence of operating dairy farms is important to other industries such as tourism and recreation because of the open spaces and scenic views they provide. They provide land in Maine's developed regions for hunting, fishing, snowmobile trails and other outdoor recreation and sightseeing activities. Though these industries will be directly affected by changes in the dairy industry, the impact is not reflected fully in the multipliers of the RIMS II economic model.

Table 6 in the appendix indicates the level of impact of changes in the dairy industry on employment in other sectors of the economy at various levels of gain or loss in dairy farm receipts. However, as noted, it does not reflect the direct impact on grain facilities and milk processing plants nor does it measure the effect on the recreation and tourism industries that rely on farms for the open space, scenic, wildlife, and environmental values necessary to their industry.

Land use Impacts and Sprawl Costs

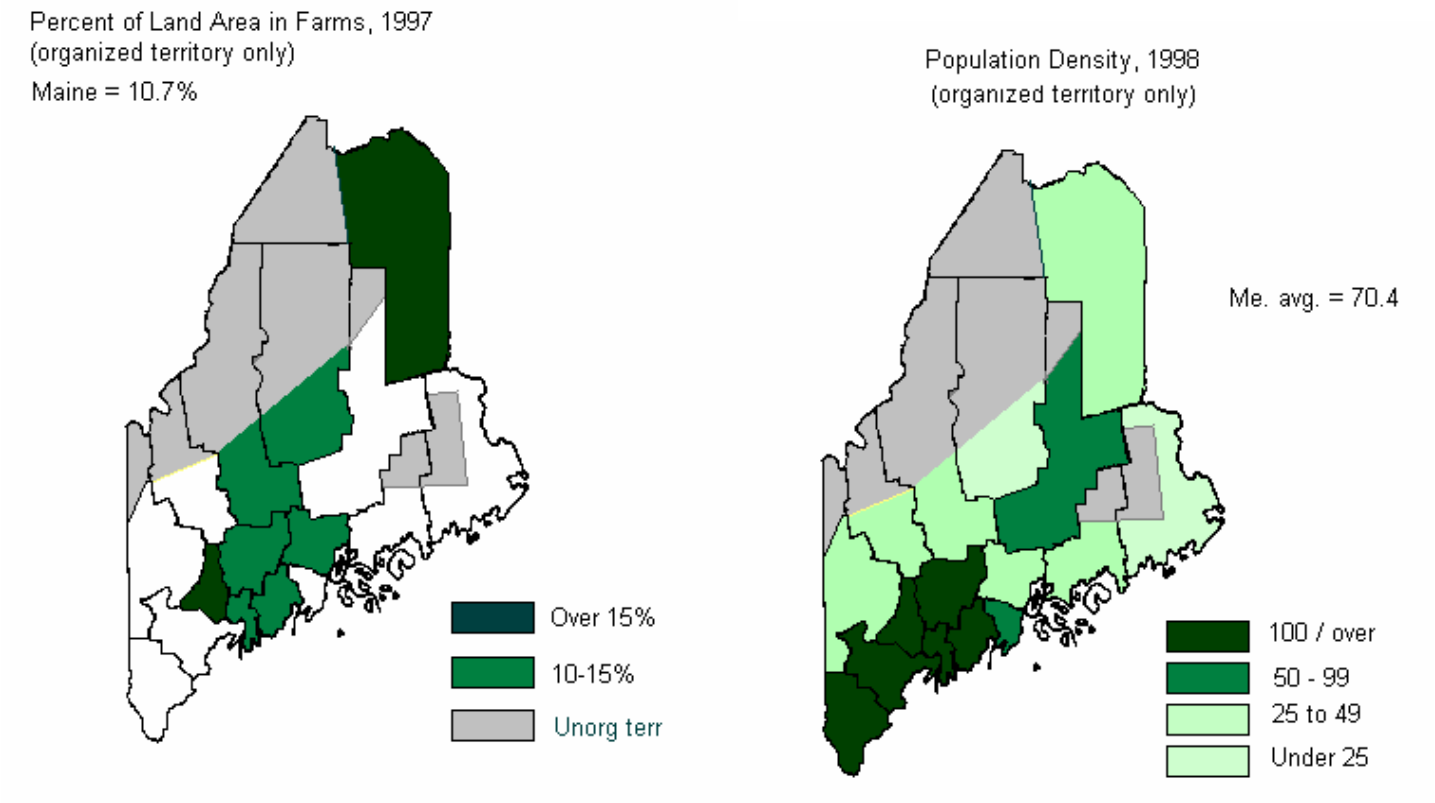
Though dairy farms are widespread throughout the State, Maine's dairy industry is concentrated in central Maine, roughly from Auburn to Bangor. Most are located in what is generally considered to be the "path of sprawl", i.e., in communities where development uses of land are increasing most rapidly. Land in dairy farms is under greater pressure for development than other types of land and is being lost at a faster rate because dairy farms contain the type of land most desirable for development (cleared land, relatively flat, and with well drained soils).

As the number of farms decline, ownership of farmland shifts into non-farm ownership. Loss of ownership is the first step in the "impermanence syndrome" of land access. In the absence of control over the land by those who farm it, the land is more likely to be converted to other uses. Depressed farm receipts have kept farms out of the land



market for many years and farms have come to increasingly rely on land they don't own.

Forty percent of the land farmed today is not owned by the farmers that farm it. Maine farms are at risk of losing access to the



land they need to remain a viable industry.

Farms provide substantial acres of essential habitat for a diversity of wildlife by maintaining large tracts of undeveloped land in a mixture of forest, field and crops that provide ideal conditions with ample food, water, shelter and a safe place for animals to raise their young. Farms are especially important to maintaining wildlife habitat in the more populated regions of the State where development has begun to crowd out habitat and some species are becoming scarce or their range limited.

The wildlife habitat offered by farms make wildlife related recreational activities such as hunting, fishing, bird watching, and other activities of wildlife enthusiasts possible. When farms are lost, not only is there a decline in habitat and in wildlife. Land leaves farming and begins to be transferred to non farm ownership and carved into smaller parcels. More land is posted from public access, new development limits the amount of area where it is safe to hunt, and opportunities for such recreational activity are lost.

Farms provide the open space and scenic views essential to other forms of outdoor recreation and to the tourism industry. They provide land in developed parts of the State for snowmobile trails, skiing, hiking, and other outdoor recreation and sightseeing activities. Dairy farms hold a special place in their contribution to tourism. Because they require a large amount of hay and forage land, dairy farms offer large open spaces and in many locations, spectacular views

of distant mountains and lakes as well as defining the rural character of many small towns by their barns, hayfields and herds of cows grazing along the roadside.

The public receives many "priceless" benefits from dairy farms. Farms are not compensated for their contribution to wildlife habitat or for the values they contribute to tourism and recreational interests in Maine. In fact, they could be considered as being charged for their contribution. Farms pay substantial local property taxes well beyond the cost of the services they require. There have been numerous studies of the cost of local services and of who pays for them and who benefits. On average, the research has shown that farms pay more than $1.30 for every dollar of services they require, i.e., pay a third more than their "fair share".

Dairy farms are central to reducing sprawl and its costs. Land used for production of hay and other livestock feed has been disappearing at a rate far greater than other kinds of agricultural land over the past two decades. As farms are lost, much of the farmland is converted, contributing to sprawl. While farms consistently require less in municipal services than they pay in local taxes, sprawl has been demonstrated to increase the cost of services at all levels of government, whether it be the demand for new schools, improved roads to handle increasing traffic, increased public safety needs, or the need for municipal services.

The loss of farmland affects communities and regions differently. In developed regions, the loss of a farm may have minimal fiscal impact to the community. Rather, its impact is the loss of open space and community character. In struggling and declining areas, the loss of a single farm represents a significant loss to the local economy and the local tax base.

Additional Resources & References:

Fishing, Farming and Forestry: Resources for the Future, March 2001, Maine State Planning Office. Part III D. Fragility of the Resource Base for Natural Resource Industries

Agricultural Land Loss, Background Paper, Maine State Planning Office

The Economic Value of Maine Agriculture, Maine State Planning Office, paper presented to the AgCom Strategic Planning Committee, 1998

Density-Related Public Costs, American Farmland Trust

Farming on the Edge: Sprawling Development Threatens America's Best Farmland, American Farmland Trust, 2002

The Cost of Sprawl, Maine State Planning Office

Changing Patterns of Development and Land Use in Maine: An Examination of Implications and Costs, Maine State Planning Office

The Cost of Producing Milk in Maine: A Report based upon the 2002 Dairy Cost of Production Survey, University of Maine, Orono, Department of Resource Economics and Policy, Dalton, Timothy J., February 2003

Milk Pricing in the United States, Alden Manchester and Don Playney, Economic Research Service, USDA, Agriculture Information Bulletin No. 761

Annual Milk Production Bulletin, Donald Nickerson, Market Administrator, Agricultural Marketing Service (AMS), USDA

Agri-Mark, Inc.

Agricultural Marketing Service (AMS), USDA

Economic Research Service (ERS), USDA

Maine Department of Agriculture & Maine Milk Commission

Maine Department of Labor, Covered Employment Statistics

Northeast Federal Market Administrator's Office

Northeast Dairy Compact Commission

US Census of Agriculture, Maine

Endnotes

[i] Milk Pricing in the United States, Alden Manchester and Don Playney, Economic Research Service, USDA, Agriculture Information Bulletin No. 761.

[ii] Milk Utilization Classes: Simply described, milk is priced according to a ratio that compares the amount of milk used to produce to four categories of dairy products.
Class I: the portion consumed as fluid milk products
Class II: the portion that is made into cottage cheese, yogurt, ice cream and other products with a relatively short shelf life,
Class III: the portion that is made into products such as hard cheese with longer shelf life,
Class IV: the amount of excess remaining that is stored as powdered milk and milk products).

[iii] Annual Milk Production Bulletin, Donald Nickerson, Market Administrator, Agricultural Marketing Service (AMS) USDA

[iv] Dalton, Timothy J., The Cost of Producing Milk in Maine: A Report based upon the 2002 Dairy Cost of Production Survey, University of Maine, Orono, Department of Resource Economics and Policy, February 2003.

[v] Note: This chart does not include Christmas Trees and Nursery Production. It does not include berries because the total berry acreage in Maine isn't disclosed (there are 23,000 acres of blueberries grown in Maine). Also not included are acres in pasture.

[vi] USDA, NRCS, National Resources Inventory, 1997.

[vii] Northeast Farm Credit Association, James Putnam II, First Pioneer Farm Credit.

[viii] Northeast Dairy Compact Commission, Projected Loss of Dairy Farms in New England With and Without the Compact.

Maine's Dairy Industry

Assessment of the Current Situation and Economic Impact of the Industry

Maine State Planning Office
March 2003

APPENDICES

A. Tables

1 Effect of Dairy Stabilization Programs on Milk Prices in Federal Order I

2 Calculated Benefit of the Compact on Maine Farms

3 Calculated Income Loss in Months below Cost of Production (measured at $15 cwt and at $17 cwt)

4 Summary Effects of Changes in Milk Receipts to Maine Farms resulting from various industry changes.

5 Total Change in the Number of Jobs by Industry that results from a $1 million change in output by the Dairy Farm Products Industry (RIMS II Code 1.01) in Maine (in 2002 dollars)

6 Effects of Changes in Milk Receipts to Maine Farms resulting from various industry changes, on Earnings and Employment in other Sectors of the Maine Economy

B. Additional Resources & References

Table 1

Effect of Dairy Stabilization Programs on Milk Prices in Federal Order I

	Compact Over-order Class I Price ($)	Federal Class I Zone I Price ($)	Compact Over-order Obligation Price ($)	Statistical Uniform Price Suffolk Co	Federal Blend Zone 21 Price ($)	Compact Producer Price ($)	Combined Producer Price ($)
COMPACT PRICE/BLEND PRICE TOTAL PRODUCER PRICE JANUARY 1997- DECEMBER 1997							
97 6mo	16.94	15.00	2.04	13.81	13.09	0.93	14.02
98 avg	16.94	16.78	0.67	15.61	14.89	0.25	15.15
99 avg	16.94	16.90	1.20	14.95	14.23	0.49	14.72
00 avg	16.94	14.80	2.14	13.04	12.32	0.90	13.22
01 avg	16.94	16.25	0.40	14.90	14.18	0.13	14.31
02 avgMILC	16.94	14.26	2.68	12.64	11.92	1.21	13.13
Jan-97	N/A	14.85	N/A	13.68	12.96	N/A	12.96
Feb-97	N/A	14.58	N/A	13.57	12.85	N/A	12.85
Mar-97	N/A	15.18	N/A	13.98	13.26	N/A	13.26
Apr-97	N/A	15.70	N/A	13.96	13.24	N/A	13.24
May-97	N/A	15.73	N/A	13.77	13.05	N/A	13.05
Jun-97	N/A	14.68	N/A	13.04	12.32	N/A	12.32
Jul-97	16.94	13.94	3.00	12.69	11.97	1.28	13.25
Aug-97	16.94	13.98	2.96	12.98	12.26	1.31	13.57
Sep-97	16.94	14.10	2.84	13.26	12.54	1.36	13.90
Oct-97	16.94	15.10	1.63	14.32	13.60	0.81	14.41
Nov-97	16.94	16.03	0.91	14.82	14.10	0.44	14.54
Dec-97	16.94	16.87	0.87	14.78	14.06	0.40	14.46
Avg	16.94	15.00	2.04	13.81	13.09	0.93	14.02
Jan-98	16.94	16.20	0.74	14.74	14.02	0.34	14.36
Feb-98	16.94	16.53	0.42	15.02	14.30	0.04	14.34
Mar-98	16.94	16.49	0.45	14.82	14.10	0.16	14.26
Apr-98	16.94	16.56	0.38	14.68	13.96	0.14	14.10
May-98	16.94	16.05	0.89	14.10	13.38	0.33	13.71
Jun-98	16.94	15.25	1.69	14.40	13.68	0.71	14.39
Jul-98	16.94	14.12	2.82	13.86	13.14	1.02	14.16
Aug-98	16.94	16.34	0.60	15.72	15.00	0.24	15.24
Sep-98	16.94	18.01	0.00	17.19	16.47	0.00	16.47
Oct-98	16.94	18.23	0.00	17.48	16.76	0.00	16.76
Nov-98	16.94	18.34	0.00	17.39	16.67	0.00	16.67
Dec-98	16.94	19.28	0.00	17.90	17.18	0.00	17.18
Avg	16.94	16.78	0.67	15.61	14.89	0.25	15.14
Jan-99	16.94	20.08	0.00	18.01	17.29	0.00	17.29
Feb-99	16.94	20.58	0.00	16.54	15.82	0.00	15.82
Mar-99	16.94	19.51	0.00	16.41	15.69	0.00	15.69
Apr-99	16.94	13.51	3.43	12.48	11.76	1.43	13.19
May-99	16.94	14.86	2.08	13.14	12.42	0.82	13.24
Jun-99	16.94	15.05	1.89	13.51	12.79	0.73	13.52
Jul-99	16.94	14.50	2.44	13.69	12.97	1.01	13.98
Aug-99	16.94	14.65	2.28	14.36	13.64	0.70	14.34
Sep-99	16.94	16.83	0.11	16.06	15.34	0.21	15.55
Oct-99	16.94	19.03	0.00	16.19	15.47	0.00	15.47
Nov-99	16.94	19.50	0.00	16.13	15.41	0.00	15.41
Dec-99	16.94	14.73	2.21	12.87	12.15	1.00	13.15
Avg	16.94	16.90	1.20	14.95	14.23	0.49	14.72

	Compact Over-order Class I Price ($)	Federal Class I Zone I Price ($)	Compact Over-order Obligation Price ($)	Statistical Uniform Price Suffolk Co	Federal Blend Zone 21 Price ($)	Compact Producer Price ($)	Combined Producer Price ($)
contd							
Jan-00	16.94	14.15	2.79	12.35	11.63	1.21	12.84
Feb-00	16.94	13.96	2.98	12.21	11.49	1.29	12.78
Mar-00	16.94	14.09	2.85	12.39	11.67	1.23	12.90
Apr-00	16.94	14.18	2.76	12.46	11.74	1.11	12.85
May-00	16.94	14.73	2.21	12.90	12.18	0.80	12.98
Jun-00	16.94	14.95	1.99	13.25	12.53	0.80	13.33
Jul-00	16.94	15.71	1.23	13.52	12.80	0.43	13.23
Aug-00	16.94	15.20	1.74	13.39	12.67	0.91	13.58
Sep-00	16.94	15.09	1.85	13.63	12.91	0.76	13.67
Oct-00	16.94	15.14	1.80	13.32	12.60	0.74	13.34
Nov-00	16.94	15.07	1.87	13.36	12.64	0.82	13.46
Dec-00	16.94	15.38	1.56	13.72	13.00	0.65	13.65
Avg	16.94	14.80	2.14	13.04	12.32	0.90	13.22
				13.04	12.32		
Jan-01	16.94	17.24	0.00	13.76	13.04	0.00	13.04
Feb-01	16.94	15.19	1.75	13.62	12.90	0.68	13.58
Mar-01	16.94	15.90	1.04	14.50	13.78	0.39	14.17
Apr-01	16.94	16.69	0.25	15.24	14.52	0.00	14.52
May-01	16.94	17.46	0.00	16.32	15.60	0.00	15.60
Jun-01	16.94	18.24	0.00	17.08	16.36	0.00	16.36
Jul-01	16.94	18.59	0.00	17.21	16.49	0.00	16.49
Aug-01	16.94	18.65	0.00	17.53	16.81	0.00	16.81
Sep-01	16.94	18.81	0.00	17.76	17.04	0.00	17.04
Oct-01	16.94	19.18	0.00	16.04	15.32	0.00	15.32
Nov-01	16.94	19.01	0.00	15.28	14.56	0.00	14.56
MILC PROGRAM PRICE/BLEND PRICE TOTAL PRODUCER PRICE JANUARY 1997- DECEMBER 1997							
Dec-01	16.94	15.23	$1.71	13.72	13.00	0.77	13.77
Avg	16.94	17.52	0.40	15.67	14.95	0.15	15.10
2002							
Jan	16.94	15.21	$1.73	13.81	13.09	0.78	13.87
Feb	16.94	15.20	$1.74	13.48	12.76	0.78	13.54
Mar	16.94	14.87	$2.07	13.05	12.33	0.93	13.26
Apr	16.94	14.72	$2.22	12.94	12.22	1.00	13.22
May	16.94	14.51	$2.43	12.63	11.91	1.09	13.00
Jun	16.94	14.28	$2.66	12.38	11.66	1.20	12.86
Jul	16.94	13.87	$3.07	12.05	11.33	1.38	12.71
Aug	16.94	13.73	$3.21	12.16	11.44	1.44	12.88
Sep	16.94	13.71	$3.23	12.20	11.48	1.45	12.93
Oct	16.94	13.40	$3.54	12.40	11.68	1.59	13.27
Nov	16.94	13.85	$3.09	12.31	11.59	1.39	12.98
Dec	16.94	13.77	$3.17	12.24	11.52	1.43	12.95
Avg	16.94	14.26	2.68	12.64	11.92	$1.21	13.13

Note: 2002 figures are for milk produced below the 2.4 m lbs cap in the MILC program. On farms that produced over 2.4 m lbs, all milk in excess of the cap received only the blend price.

	Compact Over-order Class I Price ($)	Federal Class I Zone I Price ($)	Compact Over-order Obligation Price ($)	Statistical Uniform Price Suffolk Co	Federal Blend Zone 21 Price ($)	Compact Producer Price ($)	Combined Producer Price ($)
cont'd							
2003							
Jan	16.94	$13.81	$3.13	12.19	11.47	1.41	12.88
Feb	16.94	$13.48	$3.46	11.78	11.08	1.56	12.64
Mar	16.94	$13.06	$3.46	11.40	10.68	1.75	12.43
Apr	16.94	$12.78	$4.16	11.45	10.73	$1.87	12.60
May*	16.94	$13.01	$3.93	11.63	10.91	$1.77	12.68
Jun*	16.94	$13.23	$3.71	12.06	11.34	1.67	13.01
Jul*	16.94	$13.69	$3.25	12.76	12.04	1.46	13.50
Aug*	16.94	$14.50	$2.44	13.62	12.90	1.10	14.00
Sep*	16.94	$15.35	$1.59	14.48	13.76	0.72	14.48
Oct*	16.94	$17.12	$0.00	15.40	14.68	0	14.68
Nov*	16.94	$17.33	$0.00	15.49	14.77	0	14.77
Dec*	16.94	$17.24	$0.00	15.08	14.36	0	14.36
Avg	14.60	$14.55	$0.05	13.11	12.39	1.11	13.50

* 2003 prices - Table includes Agri-Mark Forecast - May-Dec.

USDA's Forecast: - for August thru December, 2003

Aug	16.94	$14.50	$2.44	1.10
Sep	16.94	15.35	$1.59	0.72
Oct	16.94	15.00	$1.94	0.87
Nov	16.94	14.50	$2.44	1.10
Dec	16.94	14.50	$2.44	1.10
Avg	16.94	13.91	$3.03	1.37

Sources: Federal Milk Market Administrator, New England Marketing Area
www.dairycompact.org
Agri-Mark Inc.

Table 2
Calculated Benefit of the Compact: Maine farms

	Production: Million lbs	Receipts at Blend price Zone 21	Net Gain	Total Receipts
97 avg-6mo	330.00	43,197,000	3,069,000	46,266,000
98 avg	680.00	101,252,000	1,700,000	103,020,000
99 avg	689.00	98,044,700	3,376,100	101,420,800
00 avg	668.00	82,297,600	6,012,000	88,309,600
01 avg	654.00	92,737,200	981,000	93,587,400
02 avg*	638p	76,049,600	7,696,141	83,745,741
@75%of '02	478.50	76,049,600	5,772,106	81,821,706

* if all milk qualified, no 2.4m cap

	Production: Million lbs Monthly	Compact Over order amount ($)	Return from Compact	Return from Blend Price	Total Receipts
NORTHEAST DAIRY COMPACT PERIOD					
1997	56.3	1.28	721,067	6,743,100	7,464,167
(last	56.3	1.31	737,967	6,906,467	7,644,433
6 mo.)	56.3	1.36	766,133	7,064,200	7,830,333
	53.7	0.81	434,700	7,298,667	7,733,367
	53.7	0.44	236,133	7,567,000	7,803,133
	53.7	0.40	214,667	7,545,533	7,760,200
			3,110,667	**43,124,967**	**46,235,633**
1998	55.0	0.34	187,000	7,711,000	7,898,000
	55.0	0.04	22,000	7,865,000	7,887,000
	55.0	0.16	88,000	7,755,000	7,843,000
	57.7	0.14	80,733	8,050,267	8,131,000
	57.7	0.33	190,300	7,715,800	7,906,100
	57.7	0.71	409,433	7,888,800	8,298,233
	58.7	1.02	598,400	7,708,800	8,307,200
	58.7	0.24	140,800	8,800,000	8,940,800
	58.7	0.00	0	9,662,400	9,662,400
	55.3	0.00	0	9,273,867	9,273,867
	55.3	0.00	0	9,224,067	9,224,067
	55.3	0.00	0	9,506,267	9,506,267
	680.0		**1,716,667**	**101,161,267**	**102,877,933**
1999	57.7	0.00	0	9,970,567	9,970,567
	57.7	0.00	0	9,122,867	9,122,867
	57.7	0.00	0	9,047,900	9,047,900
	59.3	1.43	848,467	6,977,600	7,826,067
	59.3	0.82	486,533	7,369,200	7,855,733
	59.3	0.73	433,133	7,588,733	8,021,867
	57.7	1.01	582,433	7,479,367	8,061,800
	57.7	0.70	403,667	7,865,733	8,269,400
	57.7	0.21	121,100	8,846,067	8,967,167
	55.0	0.00	0	8,508,500	8,508,500
	55.0	0.00	0	8,475,500	8,475,500
	55.0	1.00	550,000	6,682,500	7,232,500
	689.0		**3,425,333**	**97,934,533**	**101,359,867**

2000	57.0	1.21	689,700	6,629,100	7,318,800
	57.0	1.29	735,300	6,549,300	7,284,600
	57.0	1.23	701,100	6,651,900	7,353,000
	57.3	1.11	636,400	6,730,933	7,367,333
	57.3	0.80	458,667	6,983,200	7,441,867
	57.3	0.80	458,667	7,183,867	7,642,533
	55.3	0.43	237,933	7,082,667	7,320,600
	55.3	0.91	503,533	7,010,733	7,514,267
	55.3	0.76	420,533	7,143,533	7,564,067
	53.0	0.74	392,200	6,678,000	7,070,200
	53.0	0.82	434,600	6,699,200	7,133,800
	53.0	0.65	344,500	6,890,000	7,234,500
	668.0		**6,013,133**	**82,232,433**	**88,245,567**
2001	53.0	0.00	0	6,911,200	6,911,200
	53.0	0.68	360,400	6,837,000	7,197,400
	53.0	0.39	206,700	7,303,400	7,510,100
	55.7		0	8,082,800	8,082,800
	55.7		0	8,684,000	8,684,000
	55.7		0	9,107,067	9,107,067
	55.3		0	9,124,467	9,124,467
	55.3		0	9,301,533	9,301,533
	55.3		0	9,428,800	9,428,800
	54.0		0	8,272,800	8,272,800
	54.0		0	7,862,400	7,862,400
MILC PROGRAM PERIOD					
	54.0	0.77	415,800	7,020,000	7,435,530
	654.0		**982,900**	**97,935,467**	**98,918,097**
2002	if applied to all milk:				
164	54.7	0.78	425,580	7,155,867	7,581,447
	54.7	0.78	428,040	6,975,467	7,403,507
	54.7	0.93	509,220	6,740,400	7,249,620
171	57.0	1.00	569,430	6,965,400	7,534,830
	57.0	1.09	623,295	6,788,700	7,411,995
	57.0	1.20	682,290	6,646,200	7,328,490
	54.7	1.38	755,220	6,193,733	6,948,953
164	54.7	1.44	789,660	6,253,867	7,043,527
	54.7	1.45	794,580	6,275,733	7,070,313
	52.3	1.59	833,670	6,112,533	6,946,203
157	52.3	1.39	727,695	6,065,433	6,793,128
	52.3	1.43	748,367	6,028,800	6,777,167
	656.0		**7,887,047**	**78,202,133**	**86,089,180**
2003		1.41			
		1.56			
		1.75			

Table 3

Calculated Income Loss in Months below Cost of Production

	Production (m lbs)	Difference per cwt @ $15 Base	@$17 Base	Total Deficit @ $15 Base	Total Deficit @$17 Base
1997	330.00	0.98	2.98	3,234,000	9,834,000
1998	680.00	0.00	1.85	0	12,580,000
1999	689.00	0.28	2.28	1,929,200	15,709,200
2000	668.00	1.78	3.78	11,890,400	25,250,400
2001	654.00	0.00	2.69	0	17,592,600
2002	638.00	1.87	3.87	11,954,259	24,714,259
@25%of '02	159.50	3.08	5.08	2,988,565	8,102,600
Total loss based on 25% of milk over 2.4m in 2002:				31,996,424	113,783,059

	Production (m lbs)	Difference per cwt: @ $15 Base	@$17 Base	Total Income Loss @ $15 Base	@$17 Base
1997	56.3	1.75	3.75	985,833	2,112,500
(final	56.3	1.43	3.43	805,567	1,932,233
6 mo.)	56.3	1.10	3.10	619,667	1,746,333
	53.7	0.59	2.59	316,633	1,389,967
	53.7	0.46	2.46	246,867	1,320,200
	53.7	0.54	2.54	289,800	1,363,133
				3,264,367	**9,864,367**
1998	55.0	0.64	2.64	352,000	1,452,000
	55.0	0.66	2.66	363,000	1,463,000
	55.0	0.74	2.74	407,000	1,507,000
	57.7	0.90	2.90	519,000	1,672,333
	57.7	1.29	3.29	743,900	1,897,233
	57.7	0.61	2.61	351,767	1,505,100
	58.7	0.84	2.84	492,800	1,666,133
	58.7	0.00	1.76	0	1,032,533
	58.7	0.00	0.53	0	310,933
	55.3	0.00	0.24	0	132,800
	55.3	0.00	0.33	0	182,600
	55.3	0.00	0.00	0	0
				3,229,467	**12,821,667**
1999	57.7	0.00	0.00	0	0
	57.7	0.00	1.18	0	680,467
	57.7	0.00	1.31	0	755,433
	59.3	1.81	3.81	1,073,933	2,260,600
	59.3	1.76	3.76	1,044,267	2,230,933
	59.3	1.48	3.48	878,133	2,064,800
	57.7	1.02	3.02	588,200	1,741,533
	57.7	0.66	2.66	380,600	1,533,933
	57.7	0.00	1.45	0	836,167
	55.0	0.00	1.53	0	841,500
	55.0	0.00	1.59	0	874,500
	55.0	1.85	3.85	1,017,500	2,117,500
				4,982,633	**15,937,367**

Table 4

Summary Effects of Changes in Milk Receipts to Maine Farms
Resulting from various Industry Changes

Industry Sector: Farm Products & Agricultural, Forestry & Fishing Services
Sub-sector 1.01: Dairy Farm Products
RIIMS II (Regional Impact Model)

PART 1
Impact of Gains and Potential Gains

	Total Industry Impact	Effect of Over Order Prices			Effect of LD338	Effect of Price Improvement	
		Total ('97-01)	Effect on '02 prices of:				
		Compact Benefit	Compact Benefit	MILC Benefit		to $17cwt	to $15 cwt
	Effect of:						
	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7
	$100 m	$15 m	$8 m	$6 m	$12 m	$33 M	$15 M
Final Demand Multipliers							
Output Dollars ($m)	182.440	27.366	14.595	10.946	21.893	60.205	27.366
Earnings ($m)	44.990	6.749	3.599	2.699	5.399	14.847	6.749
Employment	5130.0	769.5	410.4	307.8	615.6	1692.9	769.500
Adjusted Employment	4576.8	686.5	366.1	274.6	549.2	1510.3	686.519
Initial Change in Output Dollars ($m)	100.0	15.0	8.0	6.0	12.0	33.0	15.0
Total Change in Output Dollars ($m)	282.4	42.4	22.6	16.9	33.9	93.2	42.4
Direct Effect Multipliers							
Earnings ($m)		32.237	17.193	12.895	25.789	70.920	32.237
Employment		20.196	10.771	8.078	16.157	44.431	20.196
Adjusted Employment		18.018	9.610	7.207	14.414	39.640	18.018

	Final Demand Multipliers	Output Driven Multipliers:	Direct Effect Multipliers
Output Dollars	1.8244	1.000	-
Earnings	0.4499	0.247	2.1491
Employment	51.3	28.119	1.346
Adjusted Employment	45.8	25.1	1.2

Definitons:

Final Demand Multipliers
Output: Dollar change in output in other sectors from $1 change in output delivered to final demand by the dairy sector.
Earnings: Dollar change in earnings of households in other sectors from $1 change in output delivered to final demand by the dairy sector.
Employment: Total change in jobs in other sectors from $1 m change in output delivered to final deman by the dairy sector.

Direct Effect Multipliers
Earnings: Total dollar change in household earnings employed in other sectors from $1 change in earnings of households in the dairy industry
Employment: Total change in jobs in other sectors resulting from a change of 1 job in the dairy sector

Output Driven Multipliers
Output: Change = the actual dollars of output foregone by the affected industry.
Earnings: Final demand earnings divided by the final demand output multiplier.
Employment: Final demand employment divided by the final demand output multiplier.

Inflation adjustment = .8921623 (CPI-U, 1997-2002)

Summary Effects of Changes in Milk Receipts to Maine Farms
Resulting from various Industry Changes

Industry Sector: Farm Products & Agricultural, Forestry & Fishing Services
Sub-sector 1.01: Dairy Farm Products
RIIMS II (Regional Impact Model)

PART 2
Impact of Losses and Potential Losses

	Total Industry Impact	Additional Effect of Depressed Milk Price Income loss in 2002 after effect of MILC						Effect of Loss of Farms:		
	Effect of:	To Blend Below $15	To MILC 2.4m lb cap	Total	Blend Below $17	To MILC 2.4m lb cap	Total	Various Levels of Loss: Loss of milk receipts:		
		Col 8	Col 9	Col 10	Col 11	Col 12	Col 13	Col 14	Col 15	Col 16
	$100 m	$12 m	$3 m	$15 m	$25 M	$8 m	$33 m	$10 m	$20 m	$30 m
Output-Driven Multipliers										
Output Dollars	-100.000	-12.000	3.000	-15.000	-25.000	-8.000	-33.000	-10.000	-20.000	-30.000
Earnings in '97$	-24.660	-2.959	0.740	-3.699	-6.165	-1.973	-8.138	-2.466	-4.932	-7.398
Employment	-2811.9	-337.4	84.4	-421.8	-703.0	-225.0	-927.9	-281.2	-562.4	-843.6
Adjusted Employment	-2508.7	-301.0	75.3	-225.8	-627.2	-200.7	-827.9	-250.9	-501.7	-752.6

Column Entries:

Col 1 Total Industry Impact, at estimated receipts of $100 m
Col 2 Effect of actual additonal receipts of Maine Dairy Farms under the Northeast Dairy Compact
Col 3 Additonal Receipts from the Compact had it been in effect in 2002
Col 4 Actual additional receipts of Maine farms under the Milk Income Loss Contract (MILC)
Col 5 Effect of adding projected $12 m to farm receipts anticipated under method proposed in LD338
Col 6 Effect of a price increase to $17 cwt, adding $33m to farm receipts
Col 7 Effect of a price increase to $15 cwt, adding $15 m to farm receipts
Col 8-13 Effect of income loss due to depressed milk prices (compared at $15 cwt and at $17 cwt and 2.4m lb cap in MILC program)
8 Loss of $12 m from months when the Blend Price in Federal Order 1 fell below $15 cwt
9 Additional loss of $3 m on farms whose production exceded the 2.4 m lb production cap
10 Total effect of prices below $15 cwt

11 Loss of $25 m from months when the Blend Price in Federal Order 1 fell below $17 cwt
12 Additional loss of $8 m on farms whose production exceded the 2.4 m lb production cap
13 Total effect of prices below $17 cwt

Col 14-16 Effect of declines in Dairy Farm Receipts of $10, $20, and $30 m

Table 5

Total Change in number of jobs by industry that results from a $1 million change in output by the "Dairy Farm Products Industry" (RIMS II Code 1.01) in Maine in 2002 dollars

	Final Demand Multiplier	Direct Effect Multiplier
Farm and agricultural services, forestry, and fishing:		
Farm products and agricultural, forestry, and fishing services	37.3980	20.4988
Forestry and fishing products	0.0535	0.0293
Mining:		
Coal mining	0.0000	0.0000
Oil and gas extraction	0.0000	0.0000
Metal mining and nonmetallic minerals, except fuels	0.0004	0.0002
Construction:		
Construction	0.3073	0.1685
Manufacturing:		
Food and kindred products and tobacco products	0.1754	0.0961
Textile mill products	0.0298	0.0163
Apparel and other textile products	0.0354	0.0194
Paper and allied products	0.0274	0.0150
Printing and publishing	0.0933	0.0512
Chemicals,allied products and petroleum & coal products	0.0529	0.0290
Rubber, misc.plastic products, leather and leather products	0.0302	0.0166
Lumber and wood products, furniture and fixtures	0.0538	0.0295
Stone, clay, and glass products	0.0087	0.0047
Primary metal industries	0.0007	0.0004
Fabricated metal products	0.0175	0.0096
Industrial machinery and equipment	0.0137	0.0075
Electronic and other electric equipment	0.0125	0.0068
Motor vehicles and equipment	0.0018	0.0010
Other transportation equipment	0.0050	0.0027
Instruments and related products	0.0058	0.0032
Miscellaneous manufacturing industries	0.0250	0.0137
Transportation and public utilities:*		
Transportation	0.7625	0.4180
Communications	0.0689	0.0378
Electric, gas, and sanitary services	0.0805	0.0441
Wholesale and retail trade:		
Wholesale trade	0.2033	0.1114
Retail trade	0.2694	0.1477
Finance, insurance, and real estate:		
Depository and nondepository institutions, security and commodity	0.2558	0.1402
Insurance	0.2266	0.1242
Real estate	0.3328	0.1824
Services:		
Hotels, other lodging, amusement and recreation services, motion p	0.3460	0.1896
Personal services	0.1792	0.0982
Business services	0.5671	0.3108
Eating and drinking places	0.5348	0.2931
Health services	0.1742	0.0955
Miscellaneous services	0.7268	0.3984
Households:		
Households	0.0925	0.0507
Total, all other sectors:	5.6245	3.0829
Farm products and agricultural, forestry, and fishing services	37.4515	20.5281
Total, all sectors	43.0760	23.611

Source: US Dept. Of Commerce; Bureau of Economic Analysis RIMS II multipliers for Maine (1997). Adjusted to 2002 dollars.

Table 6

Effects of Changes in Milk Receipts to Maine Farms
Resulting from various Industry Changes

Industry Sector: Farm Products & Agricultural, Forestry & Fishing Services
Sub-sector 1.01: Dairy Farm Products
RIIMS II (Regional Impact Model)

Data = Total Change in number of jobs by industry that results from a $1 million change in output by the "Dairy Farm Products Industry" (RIMS II Code 1.01)

PART 1

Final Demand Multipliers - Changes in output (Jobs) from Increased Farm Receipts

		Effect of Over Order Prices			Effect of	Effect of	
		Total ('97-01)	Effect on '02 prices of:		LD338	Price Improvement	
	Final Demand Multiplier in $ '02	Compact Benefit	Compact	MILC		to $17cwt	to $15 cwt
		$15 m	$8 m	$6 m	$12 m	$33 M	$15 M
Farm and agricultural services, forestry, and fishing:	FDMultiplier						
Farm products and agricultural, forestry, and fishing services	37.3980	560.970	299.184	224.388	448.776	1234.135	560.970
Forestry and fishing products	0.0535	0.803	0.428	0.321	0.642	1.766	0.803
Mining:							
Coal mining	0.0000	0.000	0.000	0.000	0.000	0.000	0.000
Oil and gas extraction	0.0000	0.000	0.000	0.000	0.000	0.000	0.000
Metal mining and nonmetallic minerals, except fuels	0.0004	0.005	0.003	0.002	0.004	0.012	0.005
Construction:							
Construction	0.3073	4.610	2.459	1.844	3.688	10.143	4.610
Manufacturing:							
Food and kindred products and tobacco products	0.1754	2.631	1.403	1.052	2.105	5.788	2.631
Textile mill products	0.0298	0.447	0.238	0.179	0.358	0.983	0.447
Apparel and other textile products	0.0354	0.531	0.283	0.213	0.425	1.169	0.531
Paper and allied products	0.0274	0.411	0.219	0.164	0.329	0.904	0.411
Printing and publishing	0.0933	1.400	0.747	0.560	1.120	3.080	1.400
Chemicals,allied products and petroleum & coal products	0.0529	0.794	0.423	0.317	0.635	1.746	0.794
Rubber, misc.plastic products, leather and leather products	0.0302	0.454	0.242	0.181	0.363	0.998	0.454
Lumber and wood products, furniture and fixtures	0.0538	0.807	0.430	0.323	0.646	1.775	0.807
Stone, clay, and glass products	0.0087	0.130	0.069	0.052	0.104	0.286	0.130
Primary metal industries	0.0007	0.011	0.006	0.004	0.009	0.024	0.011
Fabricated metal products	0.0175	0.262	0.140	0.105	0.210	0.577	0.262
Industrial machinery and equipment	0.0137	0.206	0.110	0.082	0.165	0.453	0.206
Electronic and other electric equipment	0.0125	0.187	0.100	0.075	0.150	0.412	0.187
Motor vehicles and equipment	0.0018	0.027	0.014	0.011	0.021	0.059	0.027
Other transportation equipment	0.0050	0.075	0.040	0.030	0.060	0.165	0.075
Instruments and related products	0.0058	0.087	0.046	0.035	0.070	0.191	0.087
Miscellaneous manufacturing industries	0.0250	0.375	0.200	0.150	0.300	0.824	0.375
Transportation and public utilities:*							
Transportation	0.7625	11.438	6.100	4.575	9.150	25.164	11.438
Communications	0.0689	1.033	0.551	0.413	0.826	2.273	1.033
Electric, gas, and sanitary services	0.0805	1.207	0.644	0.483	0.966	2.656	1.207
Wholesale and retail trade:							
Wholesale trade	0.2033	3.050	1.627	1.220	2.440	6.710	3.050
Retail trade	0.2694	4.041	2.155	1.617	3.233	8.891	4.041
Finance, insurance, and real estate:							
Depository & nondepository institutions, security & commodity brokers	0.2558	3.837	2.046	1.535	3.069	8.441	3.837
Insurance	0.2266	3.399	1.813	1.360	2.719	7.478	3.399
Real estate	0.3328	4.992	2.662	1.997	3.993	10.982	4.992
Services:							
Hotels, other lodging, amusement, recreation services, motion pictures	0.3460	5.190	2.768	2.076	4.152	11.417	5.190
Personal services	0.1792	2.689	1.434	1.075	2.151	5.915	2.689
Business services	0.5671	8.506	4.536	3.402	6.805	18.713	8.506
Eating and drinking places	0.5348	8.021	4.278	3.209	6.417	17.647	8.021
Health services	0.1742	2.614	1.394	1.045	2.091	5.750	2.614
Miscellaneous services	0.7268	10.901	5.814	4.361	8.721	23.983	10.901
Households:							
Households	0.0925	1.388	0.740	0.555	1.110	3.053	1.388
	5.678	83.782	44.684	33.513	67.026	184.321	83.782
Farm products and agricultural, forestry, and fishing services	37.3980	560.970	299.184	224.388	448.776	1234.135	560.970
	43.076	644.752	343.868	257.901	515.802	1418.455	644.752

Source: US Dept. Of Commerce; Bureau of Economic Analysis RIMS II multipliers for Maine (1997).
Adjusted to 2002 dollars.

Effects of Changes in Milk Receipts to Maine Farms
Resulting from various Industry Changes

Industry Sector: Farm Products & Agricultural, Forestry & Fishing Services
Sub-sector 1.01: Dairy Farm Products
RIIMS II (Regional Impact Model)

Data = Total Change in number of jobs by industry that results from a $1 million change in output by the "Dairy Farm Products Industry" (RIMS II Code 1.01)

PART 2

Output Driven Multipliers - Change in output (Jobs) from Decreases in Farm Receipts

		Effect of Loss of Farms: At various levels		
		Loss of milk receipts:		
	Output Driven Multiplier	$10 m	$20 m	$30 M
Farm and agricultural services, forestry, and fishing:				
Farm products and agricultural, forestry, and fishing services	20.4988	204.988	409.976	614.964
Forestry and fishing products	0.0293	0.293	0.587	0.880
Mining:				
Coal mining	0.0000	0.000	0.000	0.000
Oil and gas extraction	0.0000	0.000	0.000	0.000
Metal mining and nonmetallic minerals, except fuels	0.0002	0.002	0.004	0.006
Construction:				
Construction	0.1685	1.685	3.369	5.054
Manufacturing:				
Food and kindred products and tobacco products	0.0961	0.961	1.923	2.884
Textile mill products	0.0163	0.163	0.327	0.490
Apparel and other textile products	0.0194	0.194	0.388	0.582
Paper and allied products	0.0150	0.150	0.300	0.450
Printing and publishing	0.0512	0.512	1.023	1.535
Chemicals,allied products and petroleum & coal products	0.0290	0.290	0.580	0.870
Rubber, misc.plastic products, leather and leather products	0.0166	0.166	0.332	0.497
Lumber and wood products, furniture and fixtures	0.0295	0.295	0.590	0.885
Stone, clay, and glass products	0.0047	0.047	0.095	0.142
Primary metal industries	0.0004	0.004	0.008	0.012
Fabricated metal products	0.0096	0.096	0.192	0.288
Industrial machinery and equipment	0.0075	0.075	0.151	0.226
Electronic and other electric equipment	0.0068	0.068	0.137	0.205
Motor vehicles and equipment	0.0010	0.010	0.020	0.029
Other transportation equipment	0.0027	0.027	0.055	0.082
Instruments and related products	0.0032	0.032	0.064	0.095
Miscellaneous manufacturing industries	0.0137	0.137	0.274	0.411
Transportation and public utilities:*				
Transportation	0.4180	4.180	8.359	12.539
Communications	0.0378	0.378	0.755	1.133
Electric, gas, and sanitary services	0.0441	0.441	0.882	1.323
Wholesale and retail trade:				
Wholesale trade	0.1114	1.114	2.229	3.343
Retail trade	0.1477	1.477	2.954	4.430
Finance, insurance, and real estate:				
Depository & nondepository institutions, security & commodity brokers	0.1402	1.402	2.804	4.206
Insurance	0.1242	1.242	2.484	3.726
Real estate	0.1824	1.824	3.648	5.472
Services:				
Hotels, other lodging, amusement, recreation services, motion pictures	0.1896	1.896	3.793	5.689
Personal services	0.0982	0.982	1.965	2.947
Business services	0.3108	3.108	6.216	9.325
Eating and drinking places	0.2931	2.931	5.862	8.794
Health services	0.0955	0.955	1.910	2.865
Miscellaneous services	0.3984	3.984	7.967	11.951
Households:				
Households	0.0507	0.507	1.014	1.521
	3.1122	31.122	62.245	93.367
Farm products and agricultural, forestry, and fishing services	20.4988	204.988	409.976	614.964
	23.6111	236.111	472.221	708.332

Source: US Dept. Of Commerce; Bureau of Economic Analysis RIMS II multipliers for Maine (1997).
Adjusted to 2002 dollars.

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Northeast Federal Market Administrator's Office

Northeast Dairy Compact Commission

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