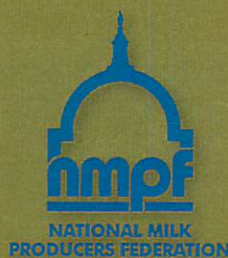


THE ECONOMIC IMPACTS OF IMMIGRATION
ON U.S. DAIRY FARMS



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THE ECONOMIC IMPACTS OF IMMIGRATION ON U.S. DAIRY FARMS

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Introduction

Immigrant labor has become an increasingly important component of many U.S. agricultural enterprises. The USDA's Economic Research Service has estimated that nearly one-half of U.S. meat processing industry employees are foreign born of Hispanic origin. A similar proportion of crop production workers are estimated to be foreign born as well. The American Farm Bureau Federation estimates that without migrant labor, up to 20 percent of U.S. fresh fruit, vegetable, and nursery production would shift to other countries. With increased enforcement of U.S. immigration regulations and lack of Congressional action to resolve immigration issues, the prospects of reduced labor availability have adversely affected many sectors of U.S. agriculture. Dairy farming is no exception.

The purpose of this study is to estimate the economic impacts of immigrant labor on U.S. dairy farms and related sectors of the economy. Specific objectives include 1) assess the role and importance of hired immigrant labor to U.S. dairy farms; 2) estimate the effects of immigrant labor losses on U.S. milk production, farms and herd size; and 3) estimate the economic impacts of immigrant labor losses on economic output, value-added and employment in the U.S. dairy sector and supporting industries.

In order to accomplish these objectives, three separate analyses were completed. First, a national survey of dairy farmers was conducted to determine the relative importance of immigrant labor to individual dairy farms. Second, economic analysis was used to estimate the likely losses in milk production and reductions in herd size and farms associated with reductions in immigrant workers on dairy farms. Finally, input/output analysis was used to examine how varying levels of labor losses would reduce industry sales, value-added and jobs. These losses were estimated not only for the dairy farm sector, but also for those sectors that supply inputs and services to dairy farms.

The results of this study are reported in the following sections. The first section reports the survey results. The second section reports labor impacts on milk production, herd size and retail milk prices. The third section reports results of the input/output analysis. The last section contains a summary and conclusions of the report.

Executive Summary

- National Survey of 5,005 Dairy Farms, With Responses from 47 States
- 50% of Surveyed Farms Use Immigrant Labor and 62% of the Nation's Milk Supply (Based on the Farms Surveyed) Comes from Farms Using Immigrant Labor
- Dairy Farm Workers Are Paid An Average Wage of \$10/hour and With Non-Wage Benefits Included, An Annual Equivalent Compensation of \$31,500
- Dairy Farms Employed an Estimated 138,000 Full-Time Equivalent Workers in 2008: 41%, or 57,000 of Those, Were Estimated of Foreign Origin, Primarily from Mexico
- Eliminating Immigrant Labor Would Reduce the US Dairy Herd by 1.34 Million Head, Milk Production by 29.5 Billion Pounds and the Number of Farms by 4,532. Retail Milk Prices Would Increase by an Estimated 61%
- Eliminating Immigrant Labor in Dairy Farms Would Reduce U.S. Economic Output by \$22 Billion and 133,000 Workers, Both Immigrant and Native-Born, Would Lose Their Jobs
- Slightly More than One-half of Losses Noted Above Would Occur in Input Supply Sectors and Services Provided to Dairy Farms



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Results of Dairy Farm Survey

The number of farmers responding to each question or part of a question is reported. These results represent active dairy farms that had at least 50 milking cows and provided responses for the 2008 herd size. Farms with less than 50 cows were excluded from analysis because even though these smaller farms account for 46.8 percent of all U.S. dairy farms, they represent only 7.4 percent of milking cows and 6.7 percent of milk production. Further, farms with less than 50 cows rarely utilize hired labor. The inclusion of the smaller farms that did not use hired labor would, therefore, bias the results.

Dairy farmers were asked how long they had been involved in dairying, when their current milking facility was built, and how they acquired their farm. The average number of years in dairying was reported to be 32 and milking facilities were built, on average, in 1974 (table 1). Nearly 70 percent of the farms in the survey were acquired through purchase, with another one quarter either being inherited or rented.

Table 1. Dairy Farm Characteristics

	Years in Dairying	Year Built	Rent	Inherit	Purchase	Other	Multiple Responses
				<i>(percentage of farms)</i>			
National Average	32	1974	11.4%	14.2%	69.3%	4.3%	0.7%
Respondents	1,333	1,307	1,262				

The average dairy herd size of the farms surveyed during 2008 was 297 milking cows, up from 262 in 2006 (table 2). As a result, the average milk production per farm was 6.43 million pounds per year. Milk production for each farm was estimated based on average milk production by state and herd size (National Agricultural Statistical Service).

Table 2. Herd Size and Production

	Average Herd Size			Average Production		
	2006	2007	2008	2006	2007	2008
	<i>(Cows/Farm)</i>			<i>(Million Lbs./Farm)</i>		
National Average	262	278	297	5.46	5.88	6.43
Respondents =	1,320	1,332	1,344	1,319	1,332	1,344



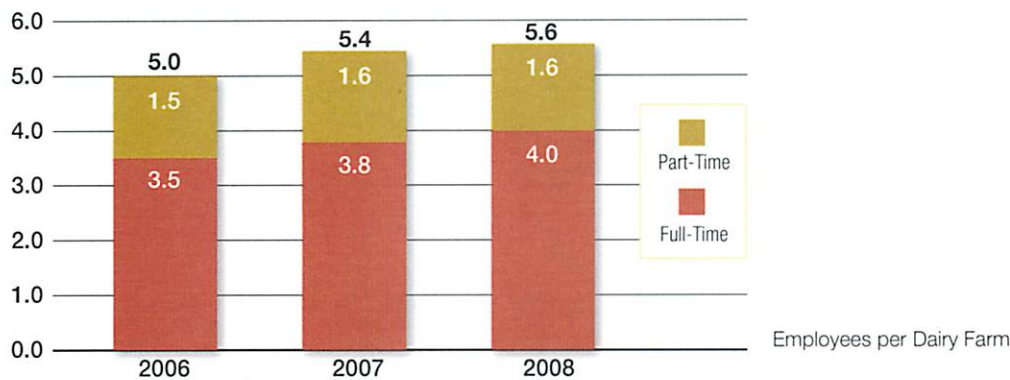
About 78 percent (34.2 plus 43.9 percent) of the farms surveyed are dependent on dairying as their major source of income (figure 1). More than 40 percent of milk is produced by farmers who receive all of their income from dairying, while another third of farmers receive at least 75 percent of total income from dairying. Only one-fifth of surveyed farms received more than 25 percent of income from non-dairy sources.

Dairies reported that the number of hired workers had risen during the last three years, from five to nearly six workers per farm (figure 2). Four workers were reported to be full-time with just over one and a half worker being part-time. The increasing trend during the past three years shows most of the growth occurring in full-time employment which rose by 0.5 workers.

Figure 1: Income from Dairy Farming



Figure 2: Workers on Dairy Farms Average, 2006–2008



For 2008, surveyed dairy farms reported that an average of 3.2 workers per farm were of domestic origin and 2.0 workers per farm were of foreign origin, for a total of 5.2 workers per farm (table 3). However, about 62 percent of milk on these same farms was produced by immigrant workers. Of those workers of foreign origin, 98 percent were from Mexico. Others of foreign origin were from Central and South America. These results suggest a slight upward trend in the use of both domestic and immigrant dairy labor, while the share of milk produced by immigrant labor has increased by one percent since 2006. Approximately 47 percent of all farms surveyed reported the use of immigrant labor. Results in Figure 3 and Table 3 are different because not everyone who responded to the question regarding hired labor responded to the following question about the origin of that hired labor.

Table 3. Dairy Hired Labor by Origin

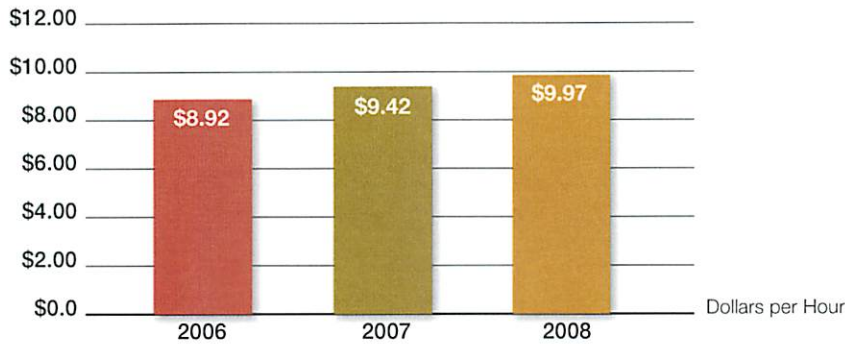
	2006	2007	2008
	<i>(Average Number of Employees)</i>		
U.S. Origin	3.0	3.0	3.2
Foreign Origin	1.7	1.9	2.0
Total Number of Employees	4.7	4.9	5.2
Respondents =	1,041	1,058	1,073



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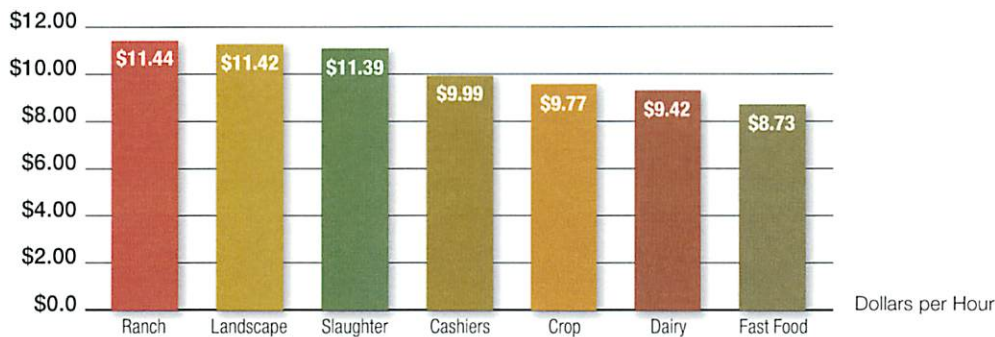
Dairy farmers reported an hourly wage paid to workers of nearly \$10 in 2008 (figure 3). Hourly wages paid by U.S. dairies have risen about six percent per year from 2006 to 2008. This represents an increase of about 12 percent since 2006.

Figure 3: Dairy Farm Wages



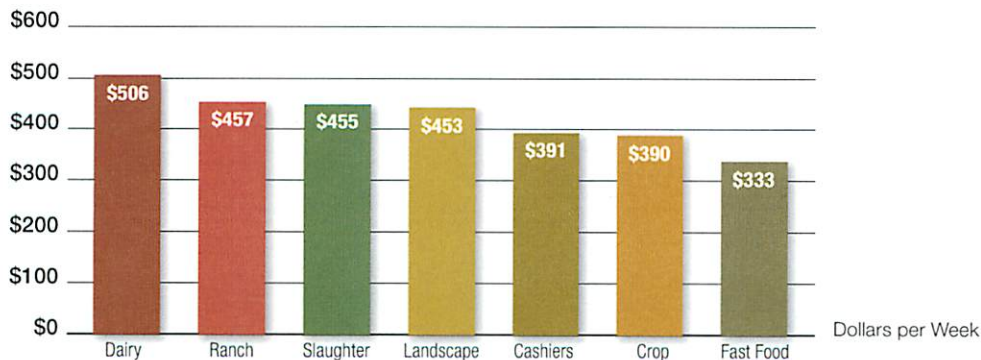
Dairy hourly wages compare favorably to most other agricultural occupations, but are lower than some, such as ranch and landscape (figure 4).

Figure 4: Hourly Wage Comparison, 2007



However, when weekly or annual equivalent compensation is calculated, dairy farm workers are more highly compensated compared to other agricultural occupations. Employees on dairy farms average 54 hours of work per week compared to only 30 to 39 for other occupations. Thus, weekly salary comparisons show that dairy workers average \$506 per week compared to \$333 for fast food and \$457 for ranch workers (figure 5). As a result, dairy workers were paid \$26,312/year during 2007 compared to \$17,316 for fast food and \$23,754 for ranch employees. For 2008, the dairy employee earned an average wage of \$27,840 for the year based on an average weekly wage of \$535.

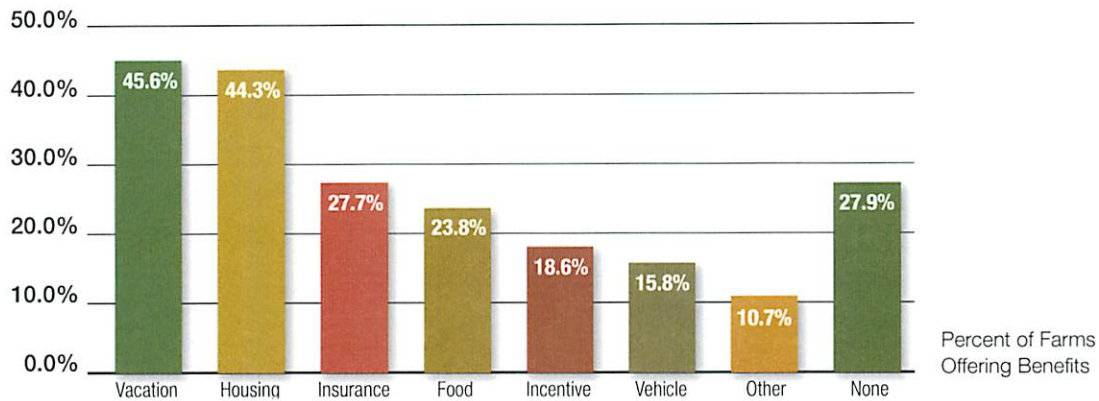
Figure 5: Weekly Salary Comparison, 2007





Non-wage benefits are also an important aspect of dairy farm workers' compensation. Nearly three-fourths of dairy farms reported providing at least one non-wage benefit to workers (figure 6). Vacation and housing were the two most prevalent non-wage benefits, followed by insurance, food, incentive pay, and use of a vehicle. Only 28 percent of farms did not provide any non-wage benefits.

Figure 6: Non-Wage Benefits on Dairy Farms



While difficult to quantify, non-wage benefits do enhance dairy employees' quality of life as well as disposable incomes. When asked in the survey, the question requesting information on total compensation including benefits was not answered consistently by respondents. However, average compensation was determined during a series of four validation meetings held with dairy farmers in four regions around the United States. In those meetings, average compensation was reported to be \$30,288 during 2007 and \$31,521 during 2008. Therefore, non-wage benefits represent nearly \$3,700 per year above the 2008 average salary of \$27,840. On a weekly basis, the calculated value of non-wage benefits to dairy employees was about \$71 per week, or an equivalent wage increase of \$1.32 per hour.

Dairy farmers were asked if they have experienced a labor shortage during recent years, if they expect a shortage during 2009, and what those shortages were. About one-fifth of the dairies surveyed reported a labor shortage at some time during the past two years (table 4). The shortage experienced was about 26 percent. For 2009, about 19 percent of dairies are expecting labor shortages of 28 percent.

Table 4. Labor Shortages – Experienced and Expected

	Experienced a Labor Shortage during Past Two Years (% of Farms)	Level of Shortage Experienced during Past Two Years (%)	Anticipate a Labor Shortage in 2009 (% of Farms)	Level of Shortage Anticipated during 2009 (%)
National Average	20.5%	26.4%	18.7%	28.2%
Respondents =	1,257	245	1,240	220



Analysis of Labor Loss Effects on Herd Size, Milk Production and Prices

Survey data were used to estimate the impacts of foreign labor losses on U.S. milk production and herd size. These simulations use 2007 USDA-NASS data as the baseline and assume that domestic labor use remains constant. Survey results were extrapolated from regional estimates to reflect national impacts.

The simulations indicate that as a result of a 50 percent loss of foreign labor, U.S. milk production would decline by 14.7 billion pounds, or 7.9 percent from the baseline of 185.6 billion pounds reported for 2007 (tables 5 and 6). A complete loss of foreign labor would reduce milk production by 29.5 billion pounds, or 15.9 percent.

Foreign labor losses of 50 percent would reduce the U.S. dairy herd by 673,053 head (table 5). The full elimination of foreign workers would result in the loss of 1.34 million head in the U.S. dairy herd. Using the reported average dairy farm herd size of 297 cows, a 50 percent reduction in the availability of foreign labor would result in a loss of 2,266 dairy farms while a complete loss of labor would result in a loss of 4,532 farms.

Table 5. Impacts of Labor-Loss on U.S. Dairies

	National Tool <i>Baseline</i>	50% Labor Loss	100% Labor Loss
Impact on Dairy Herd Size <i>(Head of Cattle)</i>	9,224,000	-673,053	-1,342,848
Impact on Number of Dairy Farms	71,150	-2,266	-4,532
Impact on Milk Production <i>(Million Pounds)</i>	185,600	-14,749	-29,498

Lower milk supplies also have major implications for the level of retail milk prices. This analysis assumes that the domestic labor force is constant and that the responsiveness of the quantity of milk demanded at retail has a negative relationship with price of -0.26 (Huang). Or, if retail prices rise by 1 percent, the quantity of milk demanded by consumers would decline by 0.26 percent. Conversely, by taking the reciprocal of -0.26, it follows that if the availability of milk at retail declines by 1 percent, retail milk prices would rise by 3.86 percent.

As a result, a 50 percent reduction in foreign labor would raise retail milk prices by 30.6 percent. Eliminating all foreign labor would result in a 61.1 percent increase in retail milk prices (table 6). These higher prices may induce substitution to other foods and beverages or increase dependence on foreign milk products.

Table 6. Impacts of Labor Loss on U.S. Milk Production and Prices

	50% Labor Loss	100% Labor Loss
Loss of Dairy Farms	-2,266	-4,532
Decrease in Milk Production	-7.9%	-15.9%
Increase in Retail Milk Price	30.6%	61.1%



Results of Input/Output Analysis

Input/Output Analysis is often used to assess the economic impacts of changes in industry sales or employment on a particular sector or cluster of sectors. The objective of this study was to estimate the economic impacts of losses in foreign labor on the dairy farm sector. The general approach was to estimate the impacts of a specified percentage reduction in foreign labor and its subsequent effects on fluid milk sales by dairy farms. In order to accurately estimate these impacts, it was necessary to estimate the number of workers employed by U.S. dairy farms. These economic impacts were estimated separately from the simulation analysis in the previous section and the results are not interrelated.

Dairy Farm Employment

The number of workers employed by U.S. dairy farms is not reported by the U.S. Department of Agriculture or the U.S. Department of Labor. It was, therefore, necessary to estimate dairy farm employment. U.S. dairy farm employment was estimated for 2008. Using responses of dairy farmers regarding the number of employees, it was possible to estimate 2008 full-time equivalent employment for each region in the United States.

Within each region, the average number of employees by herd size as reported by survey participants was applied to the total number of operations by herd size as reported by NASS. In an effort to estimate full-time equivalent workers, reported part-time employees were treated as one-half of a full-time employee. Totals for each region were then added to obtain U.S. total dairy employment. This approach assumes that immigrant workers do not enter the United States for part-time employment. Therefore, these estimates of employment reflect full-time equivalent jobs.

An estimated 138,124 full-time equivalent employees were estimated to be working on U.S. dairies in 2008 (table 7). U.S. dairy employment is divided into two groups: employees who were born in the United States and those who were not. Of the total number of employees, 80,978 or 58.6 percent were estimated to be of U.S. origin and 57,146 or 41.4 percent were estimated to be of foreign origin.

Origin was determined by first estimating the number of foreign-born employees in each region. This was done by multiplying the survey-reported percentage of foreign employees for each herd size by the total number of employees for each corresponding herd size by region. To obtain U.S. born employment, foreign-born employment was subtracted from total employment for each herd size in each region.

Table 7. U.S. Dairy Hired Labor, 2008 (*Full-time equivalent*)

Total Employees	U.S. Origin <i>(Number of Jobs)</i>	Foreign Origin	Percent Foreign <i>(%)</i>
138,124	80,978	57,146	41.4%

Estimated employment by region and by origin within region based on national survey results.

Results of Input/Output Analysis

IMPLAN was used to estimate the baseline and to assess the economic impacts of immigrant labor on the U.S. dairy farms and related sectors. IMPLAN is an input-output system of the U.S. economy that includes national, regional, state and county impacts. Economic multipliers for each sector of the economy are used to estimate how a change in one sector affects output, value-added and employment in other sectors of the economy.

Output refers to total sales for a sector such as dairy. Value-added is employee compensation, proprietor income, rents and royalties, and payment of indirect business taxes, and is a component of output. Value-added is often referred to as income or gross state product. IMPLAN is maintained by a private sector firm, Minnesota IMPLAN Group (MIG). Employment is reported as number of total jobs.



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Average U.S. dairy sales for the 2005 to 2007 time period reported by NASS were \$28.7 billion (table 8). This time period was the most recent available at the time of this analysis. An additional \$12.5 billion in sales was estimated by IMPLAN and generated through purchases of inputs and services from supporting sectors, while \$6.9 billion was induced by household purchases from income earned by households in the dairy industry and its supporting sectors. As a result, the U.S. dairy farm sector was estimated to have a total economic impact of \$48.1 billion.

Table 8. Baseline of Economic Activity Supported by the U.S. Dairy Farm Sector

	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
	<i>(Million Dollars)</i>			
Output	\$28,690	\$12,498	\$6,907	\$48,095
Value-Added	\$8,921	\$6,685	\$4,041	\$19,647
	<i>(Number of Jobs)</i>			
Employment	138,124	105,775	57,474	301,374

Value-added is the part of output that includes employee compensation, proprietor income, royalties, rents and payment of indirect business taxes, such as fuel. Of the \$28.7 billion in output attributed to dairy farms, \$8.9 billion is considered to be value-added. Another \$6.7 billion in value-added is attributed to input suppliers and other sectors that support dairy production, while \$4.0 billion in value-added is due to household spending. As a result, total value-added attributed to the dairy sector is \$19.6 billion. It is important to reiterate that value-added is included in total output and therefore, should not be added to output.

It was estimated that U.S. dairies required 138,124 full-time equivalent employees annually for the 2005 to 2007 time period. Another 105,775 workers were employed by input and service sectors, while another 57,474 workers were employed as a result of induced spending by households related to the dairy industry. As a result, the U.S. dairy industry supports a total of 301,374 full-time equivalent employees.

The permanent loss of significant portions or all foreign labor would have major negative economic impacts on the U.S. dairy sector. A 50 percent labor loss would be expected to reduce fluid milk sales by dairies by \$6.7 billion for a total economic loss to the U.S. economy of \$11.2 billion (table 9). The majority of the losses occurring off the dairy farm (\$3.0 billion), would be due to declining purchases by dairies from sectors that support dairy farm operations such as input supply (fuel and feed), transportation, real estate and wholesale trade.

A complete loss of foreign labor would reduce dairy fluid milk sales by \$13.3 billion, or 46.5 percent, and result in total economic losses to the U.S. economy of \$22.4 billion. Nearly \$6 billion of these losses would occur in sectors supporting dairy farm operations, while another \$3 billion would be lost due to reduced household income in dairy operations and supporting sectors.

Table 9. Economic Impacts on Output of Loss of Foreign Labor on U.S. Dairies

	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
	<i>(Million Dollars)</i>			
Baseline	\$28,690	\$12,498	\$6,907	\$48,095
50% Loss in Foreign Labor	-\$6,668	-\$2,977	-\$1,538	-\$11,183
100% Loss in Foreign Labor	-\$13,336	-\$5,953	-\$3,076	-\$22,365



There would also be substantial losses in value-added due to a loss in foreign labor. For a 50 percent foreign labor loss, value-added in the dairy sector would decline by \$2.1 billion while the total decrease in value-added would be \$4.6 billion (table 10). Eliminating foreign labor would reduce dairy farm value-added by \$4.1 billion. Corresponding total value-added losses would reach about \$9 billion.

Table 10. Economic Impacts on Value-Added of Loss of Foreign Labor on U.S. Dairies

	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
	<i>(Million Dollars)</i>			
Baseline	\$8,921	\$6,685	\$4,041	\$19,647
50% Loss in Foreign Labor	-\$2,073	-\$1,595	-\$899	-\$4,568
100% Loss in Foreign Labor	-\$4,147	-\$3,191	-\$1,797	-\$9,135

Fluid milk sales by U.S. dairy farms support more jobs off the farm than on it. U.S. dairies employ 138,124 workers annually, while 163,249 workers are employed in sectors that either support dairy farms by supplying inputs or services or are dependent upon household spending by dairy farms or other sectors (table 11). Therefore, a reduction in the availability of foreign labor on dairy farms would have substantial off-farm impacts.

A 50 percent loss in foreign labor would result in 28,573 fewer dairy jobs and 37,758 fewer jobs in supporting sectors for total job losses of 66,331. A complete loss in foreign labor on U.S. dairy farms would mean that 57,146 fewer people would work on U.S. dairies and 75,517 fewer would be employed in supporting sectors for a nationwide total job loss of 132,663.

Table 11. Economic Impacts on Employment of Loss of Foreign Labor in the U.S. Dairy Farm Sector

	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
	<i>(Number of Jobs)</i>			
Baseline	138,124	105,775	57,474	301,373
50% Loss in Foreign Labor	-28,573	-25,215	-12,543	-66,331
100% Loss in Foreign Labor	-57,146	-50,431	-25,086	-132,663



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Summary and Conclusions

A national survey of 5,005 dairy farms was conducted to examine the role and importance of hired immigrant labor. Immigrant labor is a major contributor to the economic viability of nearly one-half of the dairy farms surveyed. These dairy farms average number of workers is 5.2, with 2.0 of foreign origin and 3.2 domestic.

Dairy farm workers were paid an average of \$10/hour in 2008, up about 12 percent from 2006. With almost three-fourths of all dairy farms providing additional (non-wage) benefits, such as vacation, housing, insurance and food, total annual compensation for each worker receiving non-wage benefits was slightly more than \$31,500. Dairy farm workers received a higher level of total compensation than most other agricultural occupations.

It was estimated that dairy farms employ about 138,124 full-time equivalent workers, with 57,474 being immigrants. Eliminating one-half of those immigrant workers would reduce U.S. dairy herd size by 671,424 cows, leading to a 14.7 billion pound decline in milk production and 2,266 fewer farms. As a result, retail milk prices would rise by about one-third. Total elimination of immigrant labor would reduce herd size by 1.34 million cows, lower milk production by 29.5 billion pounds, and 4,532 farms. As a result, retail milk prices would increase by 61 percent.

Economic impact analysis indicated that a 50 percent loss of immigrant labor would lower U.S. dairy farm sales by \$6.7 billion and reduce total economic output by \$11.2 billion nationwide. Elimination of all immigrant labor would reduce dairy farm sales by \$13.3 billion and total economic output by \$22.4 billion. Removing 29,000 immigrant dairy workers – 50 percent of the total employed in U.S. dairies – would result in a total loss of 66,331 jobs. Removing all 57,000 immigrating dairy workers would cost nearly 133,000 U.S. jobs, those held by immigrant and native-born U.S. workers alike.

Nearly one-half of all farms surveyed indicated that they utilized immigrant labor in some capacity on the farm. Immigrant labor also accounted for an estimated 62 percent of the milk production. As dependence on immigrant labor has increased, it has become more important to identify and document their role to the dairy farm and related sectors of the U.S. economy. The role of immigrant labor on U.S. dairies is substantial and appears to be increasing as producers seek greater production efficiency in a dynamic global environment.

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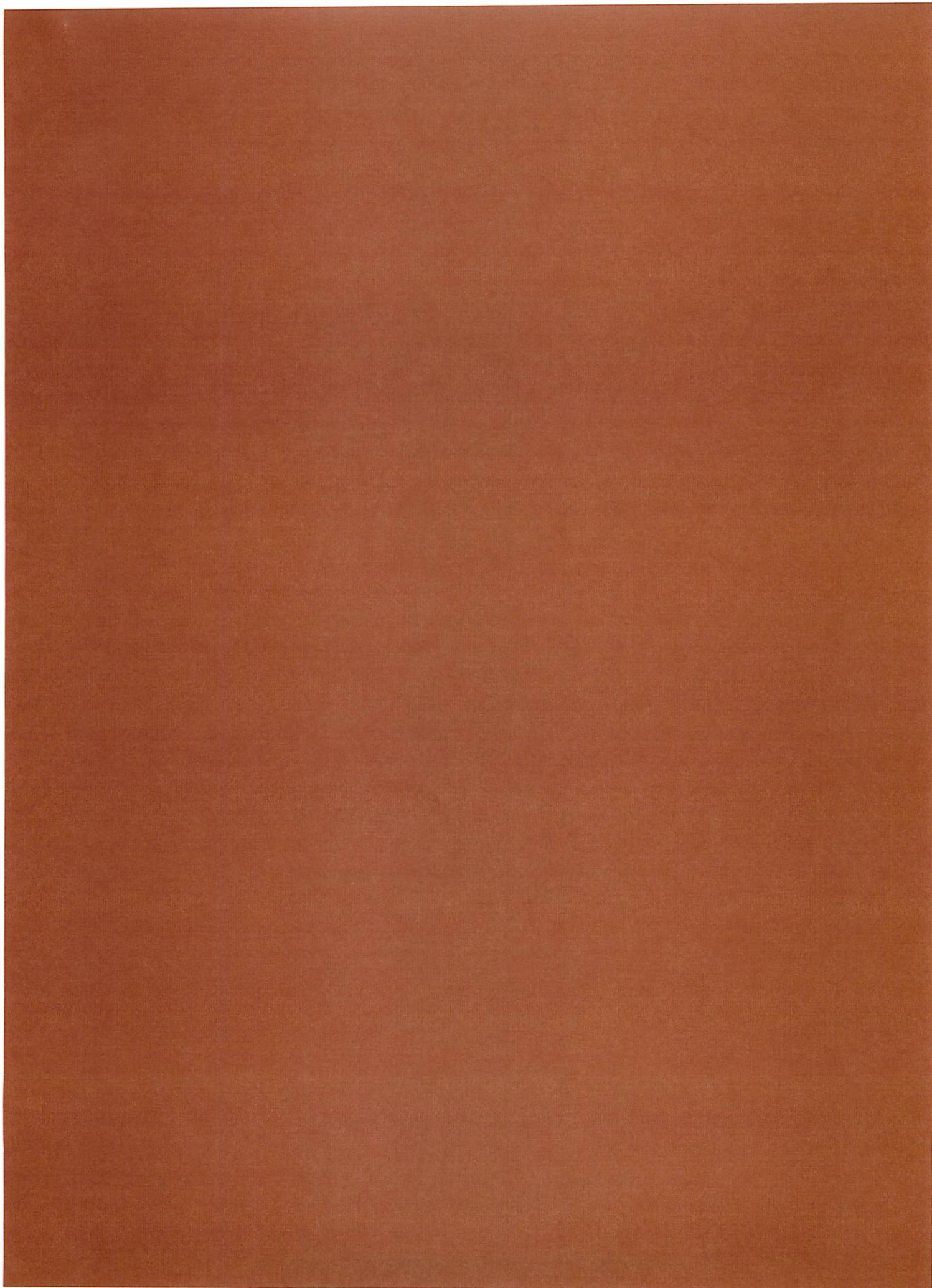
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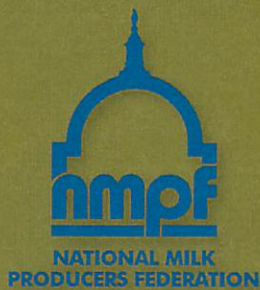
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