

## Wisconsin Dairy Modernization Survey 2006

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### Introduction

Wisconsin dairy farms have been evolving rapidly in recent years. Unlike western dairies, the Wisconsin dairy sector is still comprised of relatively small farms owned and managed by family members from up to three generations. More than 10,000 Wisconsin dairies are still milking in stall barns. However, things are changing quickly. Wisconsin dairy producers are constantly making investments in new and more efficient facilities and equipment. In Spring 2006 the Center for Dairy Profitability conducted a survey of Wisconsin producers to learn which production practices are being used most frequently and to measure producer satisfaction with their modernization experiences.

This survey focused on Wisconsin AgSource producers whose average herd size (from AgSource production records) had increased by at least 25% between 2001 and 2005. Surveys were mailed to 660 Wisconsin producers, and 280 usable responses were collected. This survey is a continuation of dairy herd modernization survey work conducted by Dr. Roger Palmer and Jeff Bewley in 2000. Where appropriate, the results from Dr. Palmer's survey are compared with the averages from the current survey.

Modernization is a continuous process. New technologies have become widely available. It is rare to find a dairy producer who has not made some changes in production practices in recent years. Some producers are undergoing major structural changes every year. Figure 1 displays the percentage of farms that expanded in each of the past several years. Of the 280 survey respondents, slightly more than 40% implemented their major changes in 2004-2005 – recently enough that the full economic impact of the changes may not yet have been fully realized. Strong milk prices were not the only reason for expansion, as this period had both very high milk prices in 2001 and 2004 and very low milk prices in 2002 and 2003.

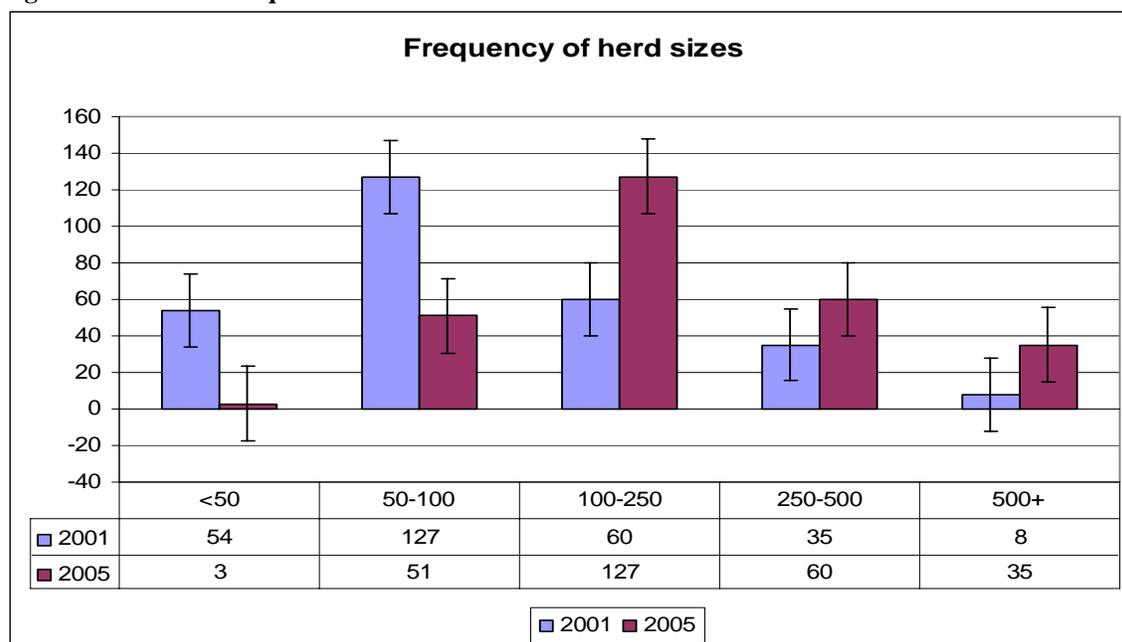
For many questions, producers were asked to indicate their satisfaction with various aspects of their farm by choosing a number on a scale from 1 (very dissatisfied) to 5 (very satisfied). These “satisfaction values” were averaged and summarized in the following pages. Standard deviations are also reported for each measure of satisfaction. This is a statistical measure of the amount of variation in the responses.

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<sup>1</sup> The author would like to thank AgSource Cooperative Services, the University of Wisconsin - River Falls Survey Lab, and all the producers who took time to participate in this study. The late Dr. Roger Palmer and Jeff Bewley developed and conducted the original baseline modernization survey in 2000. This project is a follow-up survey, funded by a grant from the Dairy Industry Revitalization project.

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**Figure 1. Herd size frequencies 2001 & 2005.**



In 2001 the average herd size of the survey respondents was 134.5 cows. By 2005 the average has grown to 239 cows per farm, and the projected average size in 2011 will be 395 cows. Sixteen percent of the respondents expanded their herds without making modifications to their existing facilities, while 14 percent built all new facilities. The remaining 70 percent said they have expanded by using a combination of existing and new facilities.

Breed information was reported for 261 farms. There were 252 Holstein herds, four Jersey herds, two Brown Swiss herds, and one Guernsey herd. Average cow numbers ranged from less than 50 to more than 2,000 head. Figure 1 is a histogram illustrating the distribution of herd sizes. There were 181 farms with less than 100 cows in 2001 and only 54 in that group in 2005. These figures are consistent with the Wisconsin Statistical Reporting System survey which shows a fairly rapid decline in the number of dairy farms with less than 50 cows.

Herd summary information from AgSource DHI was available for all respondents. This information has been summarized in Table 1. Due to storage limitations, AgSource herd summary information was not available prior to December of 2003.

**Table 1. Wisconsin AgSource Dairy Production Record Summary Characteristics.**

	Dec-05	St. Dev.	Dec-03	St. Dev.
Rolling Hrd Avg	23,246	3,753	22,496	3,688
Avg ME Milk	25,281	3,823	24,520	3,796
Avg Peak Milk	93.45	12.78	90.86	12.37
Avg Linear Score	2.80	0.46	2.98	0.46
Calving Interval (DHIA)	13.97	0.82	13.89	0.95
Culling Rate (DHIA)	0.31	0.11	NA	NA
Avg Days Dry	60.84	9.87	62.99	9.89
Avg Number of Cows	279.3	314.2	222.1	251.5
Avg Calving Age (mos)	43.75	4.91	43.61	5.16

In December of 2005, the largest number of herds was in the 100-250 cow range. Within this sample many producers said they are likely to increase herd sizes by 50% or more in the next five years.

Table 2 lists the expansion methods used and the overall operator satisfaction measures reported.

**Table 2. Expansion methods used.**

Production Data From Dec 2005	Cows Only	All New Facilities	Combination of old and new	Total or Ave.
# of observations	47	36	187	270
Herd Size 2001 # of Milking Cows	102	211	129	136
Avg Number of Cows 2003	234	242	220	225
Avg Number of Cows 2005	293	313	276	284
Personal Satisfaction (scale 1 low -5 very high)	3.79	4.00	4.01	3.97
Std. Dev. of Personal Satisfaction	1.12	0.96	0.85	0.92
Satisfaction with time away from farm	2.70	3.42	3.26	3.18
Std. Dev. Time away from farm	1.33	1.40	1.19	1.27

Satisfaction scores are reported on a scale from 1 to 5 with a 1 being very unsatisfied and a 5 being very satisfied. Personal satisfaction scores were not statistically significant either by method of expansion or by herd size. Table 3 reports the over-all personal satisfaction level with the expansion experience. The mean satisfaction was highest for the smallest and largest herd sizes but was not statistically significant.

**Table 3. Overall satisfaction by herd size.**

Sorted on 2005 herd size	<50	50-100	100-250	250-500	>500 Cows	Total or Ave.
Overall Personal Satisfaction	4.33	3.81	3.92	4.07	4.19	3.98
Overall Time away from farm	3.67	3.02	3.13	3.26	3.42	3.18
Rolling Herd Avg 2003	19,249	19,797	22,498	23,363	25,185	22,503
Rolling Herd Avg 2005	19,899	20,355	23,344	24,354	25,500	23,274
No. of Cows 2003	43	63	129	278	733	225
No. of Cows 2005	47	81	160	339	915	284
No. of Observations	3	48	123	57	35	266

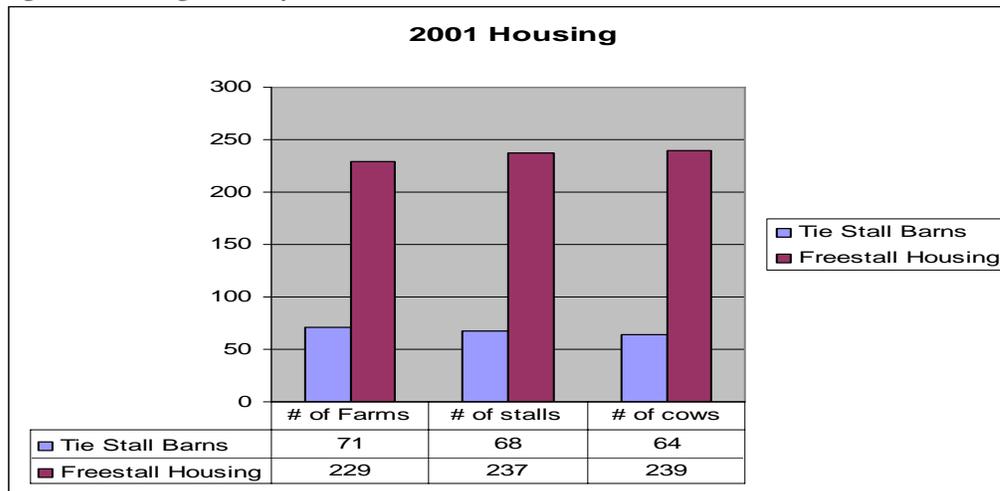
### Dairy Cattle Housing as of 2001

As shown in Figure 2, 71 producers reported using tie stall barns and 229 were using freestalls in 2001. The tie stall barns reported an average of 68 stalls and were milking 64 cows. The freestall operators had an average of 237 stalls and 239 cows. Some of the tie

stall users in 2001 switched to all new freestall housing during the span of this survey. It is not known how many of the existing tie stall barns were remodeled into low cost parlors.

The freestall producers reported stocking their facilities at slightly more than 100% of capacity while the stall barns averaged 90%. Very few producers plan to continue using tie stall or stanchion housing in the future.

**Figure 2. Average Facility Size – Tie Stall/Stanchion and Freestall Barns.**



### Milking Systems and Labor Usage

Many modernization projects included the addition of or improvement to an existing dairy parlor. By the end of 2005, there were 71 producers using stall barns with pipeline technology and 29 reported milking in flat barn parlors. Of the 29 flat barns, 18 were walk-thru flat barn designs and 11 were back-out designs.

One hundred seventy-four producers reported milking in pit parlors. These were evenly split between old and new facilities. Reported parlor configurations were as follows: 15 parabone, 107 parallel, 51 herringbone and 1 rotary parlor.

Table 4 reports the average number of people, number of milking hours and the milking times/day for various milking systems. The average milking time and milking frequency were very similar for herds less than 50 cows. However, the length of the milking cycle, and the frequency of milking consistently increased with herd size. For example, the herds between 250 and 500 cows averaged 6.53 hours/cycle and 3 cycles/day. The herds greater than 500 cows averaged 7.44 hours/cycle and 2.90 cycles/day. These parlors are making nearly continuous use of the milking facilities.

It is interesting to note that flat barn parlors did not appear to increase milking labor efficiency over pipelines, and those farms using remodeled facilities did not report any significant difference in labor efficiency when compared with completely new facilities.

Table 4. Milking Labor Usage

Herd Code		Pipeline / Stanchions	Flat Barn Remodel	Pit Parlor Remodel	Pit Parlor New Facility	Total or Ave.
<50 Cows	# People milking	2.0	1.7	1.7	1.8	1.9
	# Milk Hours	1.92	2.10	1.75	2.13	1.92
	# Times/Day Milking	2.00	2.00	2.00	2.00	2.00
	lbs./cow/day	68	70	64	69	67
	% culled/per yr.	21.16	20.25	21.86	16.50	20.65
	# Milking Cows 2001	42	45	46	50	44
	# Milking Cows 2005	68	96	96	124	83
	# Milking Cows 2011 goal	103	145	164	95	121
# of observations	26	5	10	5	46	
50-100 Cows	# People milking	2.3	2.1	2.0	2.1	2.1
	# Milk Hours	2.30	2.22	2.27	2.64	2.38
	# Times/Day Milking	2.08	2.00	2.15	2.18	2.12
	lbs./cow/day	71	72	73	73	72
	% culled/per yr.	22.21	22.75	25.48	25.45	24.19
	# Milking Cows 2001	68	67	76	75	73
	# Milking Cows 2005	105	108	142	162	133
	# Milking Cows 2011 goal	142	111	185	286	199
# of observations	40	8	41	34	123	
100-250 Cows	# People milking	2.5	2.4	2.2	2.3	2.3
	# Milk Hours	3.88	4.31	4.12	4.01	4.09
	# Times/Day Milking	2.25	2.40	2.46	2.58	2.48
	lbs./cow/day	72	76	76	78	77
	% culled/per yr.	25.00	30.50	29.54	28.96	29.25
	# Milking Cows 2001	130	159	159	160	158
	# Milking Cows 2005	195	255	253	393	302
	# Milking Cows 2011 goal	348	418	392	704	502
# of observations	4	10	26	24	64	
250-500 Cows	# People milking		2.0	3.8	3.1	3.2
	# Milk Hours		8.00	5.42	6.53	6.38
	# Times/Day Milking		2.50	2.67	3.00	2.88
	lbs./cow/day		75	73	81	78
	% culled/per yr.		32.50	29.17	30.53	30.36
	# Milking Cows 2001		290	318	392	366
	# Milking Cows 2005		530	588	695	656
	# Milking Cows 2011 goal		900	870	1018	971
# of observations		2	6	17	25	
> 500 Cows	# People milking				5.4	5.4
	# Milk Hours				7.44	7.44
	# Times/Day Milking				2.90	2.90
	lbs./cow/day				84	84
	% culled/per yr.				32.40	32.40
	# Milking Cows 2001				946	946
	# Milking Cows 2005				1535	1535
	# Milking Cows 2011 goal				2460	2460
# of observations				5	5	
Total # People milking		2.2	2.1	2.2	2.5	2.3
Total # Milk Hours		2.25	3.46	3.01	4.04	3.18
Total # Times/Day Milking		2.06	2.20	2.27	2.49	2.28
Total lbs./cow/day		70	74	73	76	73
Total % culled/per yr.		22.00	26.38	26.87	27.59	25.88
Total # Milking Cows 2001		62	117	116	214	133
Total # Milking Cows 2005		96	198	204	413	242
Total # Milking Cows 2011 goal		140	330	308	690	392
Total # of observations		70	25	83	85	263

## Milking System Satisfaction

Overall, respondents were very satisfied with their milking systems as shown in Table 5. When stratified by herd size and parlor type, the pipeline satisfaction levels appear to be the lowest. This is especially true of the average “comfort of milker” responses.

**Table 5. Milking system satisfaction levels (scale 1=very unsatisfied to 5=very satisfied).**

Herd size	Average satisfaction with:	Pipeline / Stanchions	Flat Barn Remodel	Pit Parlor Remodel	Pit Parlor New Facility	Total or Ave.
<b>&lt;50 Cows</b>	Physical Comfort of Milker	3.00	3.20	4.80	3.60	3.48
	Milk Quality-SCC+Bacteria Counts	3.58	4.40	4.30	3.60	3.83
	Cleanliness and Ease	3.85	3.80	4.50	3.80	3.98
	Safety of operator	3.69	3.40	4.80	4.00	3.93
	# of Milking Cows 2001	42.12	44.60	46.30	50.00	44.02
	# of responses	26	5	10	5	46
<b>50-100 Cows</b>	Physical Comfort of Milker	2.48	3.50	4.56	4.47	3.79
	Milk Quality-SCC+Bacteria Counts	3.35	3.88	4.00	3.94	3.76
	Cleanliness and Ease	3.63	3.38	4.15	4.24	3.95
	Safety of operator	3.33	3.50	4.51	4.53	4.07
	# of Milking Cows 2001	68.38	67.00	76.22	75.09	72.76
	# of responses	40	8	41	34	123
<b>100-250 Cows</b>	Physical Comfort of Milker	1.50	3.44	4.08	4.42	3.95
	Milk Quality-SCC+Bacteria Counts	2.50	3.78	3.73	4.17	3.83
	Cleanliness and Ease	3.75	4.00	3.73	4.21	3.95
	Safety of operator	3.00	3.44	4.08	4.58	4.11
	# of Milking Cows 2001	130.00	158.50	159.46	160.42	157.83
	# of responses	4	10	26	24	64
<b>250-500 Cows</b>	Physical Comfort of Milker		4.50	4.00	4.00	4.04
	Milk Quality-SCC+Bacteria Counts		4.00	3.17	4.06	3.84
	Cleanliness and Ease		3.00	3.17	4.00	3.72
	Safety of operator		4.00	4.00	4.53	4.36
	# of Milking Cows 2001		290.00	318.33	391.88	366.08
	# of responses		2	6	17	25
<b>&gt; 500 Cows</b>	Physical Comfort of Milker				3.80	3.80
	Milk Quality-SCC+Bacteria Counts				4.20	4.20
	Cleanliness and Ease				3.60	3.60
	Safety of operator				4.40	4.40
	Herd Size 2001 # of Milking Cows				946.00	946.00
	# of responses				5	5
Total Physical Comfort of Milker		2.61	3.50	4.40	4.27	3.80
Total Milk Quality-SCC+Bacteria Counts		3.39	3.96	3.89	4.02	3.81
Total Cleanliness and Ease		3.71	3.67	3.99	4.12	3.93
Total Safety of operator		3.44	3.50	4.37	4.51	4.09
Total Avg. # of Milking Cows 2001		62.14	116.96	116.19	214.23	133.26
Total # of responses		70	25	83	85	263

The overall average number of people involved in a milking shift was 2.25 of which 1.66 were family members. The average milking shift was 3.165 hours with an extra ¾ hour required for clean-up.

Overall milking system satisfaction measures were as follows:

**Table 6. Overall satisfaction with parlor features. (1=very unsatisfied, 5=very satisfied)**

Overall Parlor Satisfaction (all respondents)	Mean	Std. Dev.	N
Time Spent Milking	3.73	1.125	275
Physical Comfort of Milker	3.81	1.245	275
Milk Quality-SCC+Bacteria Counts	3.79	1.116	275
Cleanliness and Ease	3.89	1.029	275
Safety of Operator	4.07	1.030	275

No statistical difference existed between mean satisfaction levels reported for milking time, physical comfort, milk quality, and cleanliness scores. The satisfaction level with milker safety was statistically significant at a 95% confidence level. As shown in Table 7, the mean satisfaction levels for only those herds reporting recent parlor upgrades was much higher with both the physical comfort of milkers and operator safety receiving scores above 4.7 on a scale of 1 to 5.

**Table 7. Satisfaction levels for recently upgraded parlor users only.**

Only Recently Updated Parlors	Mean	Std. Dev.	N
Time Spent Milking	4.60	0.79	121
Physical Comfort of Milker	4.71	0.82	122
Milk Quality-SCC+Bacteria Counts	4.22	1.07	121
Cleanliness and Ease	4.43	0.93	122
Safety of operator	4.72	0.73	122

### Housing Facilities

Seventy-one farms used tie stalls or stanchion barns with an average of 68 stalls and 64 cows/farm. For those using stanchion barns, 35 reported bedding with straw, 19 used mattresses, 8 used sand, and 7 used other bedding options.

There were 229 producers using freestall housing with an average of 237 stalls. Of this total, 145 constructed all new freestall facilities, 14 were remodeled existing structures and 61 were using a combination of both existing and some new free stall facilities.

Sand was the most common bedding used (59.2%) followed by mattresses (28.5%). Ten farms reported using sawdust and eighteen reported other options including shavings and digested manure. More than three quarters of the farms reported doing daily manure scraping, while 19% reported using alley scrapers and just 2.6% used slatted floors.

There were 31 two-row barns, 53 three-row barns, 78 four-row barns and 52 six-row barns. One hundred forty-three farms reported using drive-thru feeding, while 48 farms chose drive-by feeding and 28 reported outside feeding.

One hundred seventy-five producers (75%) are using cooling fans, and sprinklers are being used by 36% of the farms.

For those reporting new or altered housing since 2001, satisfaction with bedding usage was significantly lower than all other factors measured. The analysis of variance by herd size is as follows:

**Table 8. Satisfaction levels for producers with altered housing since 2001. (1=low, 5=high sat.)**

Factor	Mean	St. Dev.	N
Cow Comfort	4.67	.797	120
Cow Cleanliness	4.24	.857	114
Hock Damage	4.51	.832	119
Teat Damage	4.51	.851	115
Udder Health	4.42	.858	115
Feed Intake	4.41	.806	119
Moving Animals	4.50	.775	121
Bedding Use	3.90	1.069	117

For those respondents that changed housing since 2001, ninety-six switched from tie stall or stanchion housing. Twelve said they switched from loose housing, and 28 added to or remodeled older freestall facilities. Satisfaction levels were very high for all factors except bedding usage.

The reported bedding types used were as follows:

**Table 9. Reported frequencies of use of various bedding materials.**

Bedding Type	Stall Barns	%	Freestall Barns	%
Straw	35	50.7	0	0
Mattresses	19	27.5	65	28.5
Sand	8	11.6	135	59.2
Other	7	10.1	28	12.2

### Feeding Strategies

Obviously, as herds expand, feed storage requirements increase. Compared to 2001 about half the farms are using custom planting and more than two-thirds are using some custom harvesting. On a scale from 1 to 5, with 5 meaning “much more” and 1 meaning “much less”, the average response was 3.30 for custom planting and 3.61 for custom harvesting. While these numbers are not statistically significant, it does appear that producers are trending toward more TMR usage, a higher corn silage diet and away from pasture usage.

Reported changes in the feeding program were as follows:

**Table 10. Changes in feeding system post modernization.**

1=Much Less, 5=Much More	Average	St Dev.	N
Use of TMR	3.46	.84	236
Percent Corn Silage in Diet	3.67	.75	262
Use of Pasture	2.50	1.05	154
Overfeeding to encourage intake	3.96	.76	231
Do you use a nutritional consultant?	Yes = 264	No = 10	274

The average farm reported an increased use of total mixed rations and an increased use of corn silage in the diet. Use of pasture decreased for the 154 farms that reported using pasture. More use of overfeeding to encourage feed intake was reported. Perhaps the most surprising statistic was the fact that 264 farms reported using a nutritional consultant to balance their rations!

One hundred fifty-three producers reported using Posilac (rBST) while one hundred twenty-four did not.

Table 11 reports satisfaction levels with the feeding program changes.

**Table 11. Average reported satisfaction levels with feeding methods.**

Satisfaction Levels 1=very unsatisfied, 5=very satisfied	Average	St. Dev.	N
Use of TMR	4.52	.72	258
Percent Corn Silage in Diet	4.20	0.83	271
Use of Pasture	3.62	1.18	120
Overfeeding to encourage intake	3.73	.86	207
Nutritional Consultant	4.25	.89	268

TMR satisfaction levels were very high with an average of 4.52 out of a possible 5. Satisfaction with the nutritional consultants was also very high with an average of 4.25. Average satisfaction with pasture usage and over-feeding were both lower, but not statistically significant.

In Table 12, respondents reported on how much their feed systems have changed since 2001, with 1 meaning much less and 5 meaning much more. Bunkers, trenches and storage bag use have all increased while upright silo use remains unchanged.

**Table 12. Usage changes in feed storage techniques. (1=much less, 5=much more)**

Reported changes in feed storage	Average	St. Dev.	N
Use of upright silos	2.51	1.01	237
Use of pads or piles	3.64	1.27	73
Use of bunkers or trenches	4.04	.90	89
Use of storage bags	3.99	1.20	223

In Table 13, satisfaction with bunkers or trenches (4.28) appears to be much higher than with upright silos (3.68) and slightly higher than storage bags. Overall feed quality satisfaction was very high with an average of 4.36 on a scale from 1 to 5.

**Table 13. Satisfaction with feed storage changes. (1=very unsatisfied, 5=very satisfied)**

Reported changes in feed storage	Average	St. Dev.	N
Use of upright silos	3.68	1.14	213
Use of pads or piles	3.58	1.29	67
Use of bunkers or trenches	4.28	.81	85
Use of storage bags	3.88	1.07	209
Amount of feed wastage	3.73	1.06	271
Overall feed quality	4.36	.74	275

### Labor Management

Measuring farm labor use is always problematic. It is especially difficult to obtain accurate estimates of the amount of family labor associated with a business. As herd sizes have increased the reported labor requirements have increased, but not at the same rate. In effect, fewer workers are managing more cows.

Table 14 contains a summary of the average number of family and hired employees in 2001 along with the number of non-family employees working in 2005.

**Table 14. Average Labor Requirements.**

<b># people involved in the management and farm work of this operation</b>	<b>Mean</b>	<b>St. Dev.</b>	<b>N</b>
# of Family members employed (2001)	2.77	1.27	277
Total Hrs./week Family (2001)	141.25	71.77	231
# Non-family managers (2001)	1.71	0.79	49
Total Hrs/week Non-family Managers (2001)	80.33	57.79	39
# Non-Family Employees (2001)	3.33	3.56	165
Total Hrs./week Non-Family Employees (2001)	142.84	187.79	142
Total # People (2001)	5.05	3.41	271
Total Hrs./Week of all people (2001)	243.10	181.25	230
# Employees Part-Time (2001)	2.07	1.68	124
# Employees Full-Time (2001)	3.47	3.96	107
# Employees Part-Time (2005)	2.16	1.75	161
# Employees Full-Time (2005)	4.86	5.56	151

The average herd size in 2001 was 134.5 milking animals. By 2005 the average had increased to 239 animals. Obviously, the total amount of labor has increased. On a per milking animal basis, the average reported labor requirements have declined.

In Table 15, respondents report that non-family workers now contribute more to the total labor pool. Managers are spending more time hiring, training and managing the non-family workforce.

**Table 15. Average amount of labor required/farm.**

<b>Labor time changes since 2001 (1=much less, 5=much more)</b>	<b>Mean</b>	<b>St. Dev</b>	<b>N</b>
Time/Farm Work	3.17	0.92	277
Hiring, Training and Managing	3.47	1.01	260
Family Farm Work	3.11	1.02	269
Non-Family Work	3.66	1.12	258

Table 16 reports the average satisfaction levels with time spent on farm work, hiring, family workload and other personnel issues. In general, labor issues were not perceived as a major point of concern. The quality of and availability of job applicants received the lowest satisfaction level and had the highest variation in response.

**Table 16. Average satisfaction levels with farm labor issues.**

<b>Satisfaction level with current labor situation (1=very dissatisfied, 5=very satisfied)</b>	<b>Mean</b>	<b>St. Dev</b>	<b>N</b>
Time on Farm Work	3.47	1.02	277
Hiring, Training and Managing	3.43	0.96	252
Family Farm Work	3.49	0.97	265
Availability of Employees	3.30	1.20	245
Quality of Job Applicants	3.09	1.16	240
Employee Morale and Attitude	3.65	1.01	246
Quality of Work	3.61	0.98	230
Labor Efficiency	3.44	1.00	266
Ability to get work done	3.71	0.99	271

## Replacement Sources and Animal Health

Most replacement animals are raised on the farm with some raised by custom growers.

Sixty-seven farms reported using custom heifer raisers with an average of 173 heifers/year. One hundred seventy-nine farms reported using bedded pens to raise their heifers, and 118 farms reported using freestall barns to raise an average of 111 heifers/year.

**Table 17. Average satisfaction with replacement programs.**

<b>Satisfaction with replacement program (1=very dissatisfied, 5=very satisfied)</b>	<b>Average</b>	<b>St. Dev.</b>	<b>N</b>
Experience with raising own heifers	4.26	.87	265
Experience with custom heifer raisers	3.21	1.17	142
Experience with purchased heifers	3.32	1.00	196
Cost of replacement heifers	2.61	1.08	205
Size and condition of replacements	3.91	.91	253
Health of replacements	3.99	.85	253

The highest level of satisfaction was from homegrown heifers. The cost of replacement heifers was the only factor reported with a less than average satisfaction level.

**Table 18. Frequencies of major and minor disease incidence.**

<b>How has expansion affected the incidence of these diseases?</b>	<b>Major Increase</b>	<b>Minor Increase</b>
BVD	1.87%	8.61%
Salmonella	4.91%	15.47%
Hairy Heel Warts	15.61%	37.17%
Johne's Disease	5.22%	22.76%
Abortions	1.87%	19.85%
Death Losses	4.12%	29.96%

As herds expand in size, the disease threats increase. Of farms responding, 15.61% reported major increases in hairy heel wart problems, and minor increases were observed by an additional 37.17% of the farms. Johne's disease was the next most frequently cited problem with 5.22% observing a major increase and 22.76% reporting a minor increase of the disease.

## Animal Handling Facilities

As herd sizes increase, the need for safe and efficient animal handling methods does too. Self-locking manger stalls were reported by more than half of the farms. They were used for breeding purposes (142), veterinarian activities (139), injections (112), selecting cows for dry off, selling, etc. (66) and for hoof care (29).

Palpation rails were reported on 54 farms. When present, they were used for breeding (37), veterinary activities (52), injections (29), cow selection (17) and hoof care (10). Other methods mentioned for animal handling included handling chute (77), accessing cows in the parlor (84), catching animals in the parlor return lanes (70) and cornering animals in pen or freestall (79).

No statistically significant difference was noted in the satisfaction levels of head locks, palpation rails and other restraining methods. Initial cost of the self-locking manger stalls (head locks) was noted as a concern.

**Table 19. Satisfaction with head locks.**

Satisfaction levels reported for the self locks 1=very dissatisfied, 5=very satisfied	Average	St. Dev.	N
Initial Cost	3.63	.96	163
Labor Efficiency	4.44	.79	163
Ease of use / comfort of workers	4.36	.77	161
Worker Safety	4.31	.85	162

**Table 20. Satisfaction with palpation rails.**

Satisfaction levels for the palpation rails 1=very dissatisfied, 5=very satisfied	Average	St. Dev.	N
Initial Cost	4.45	.90	55
Labor Efficiency	4.28	.74	54
Ease of use / comfort of workers	4.13	.78	54
Worker Safety	4.15	.86	54

**Table 21. Satisfaction with other animal restraining methods.**

Satisfaction levels for other methods of animal handling 1=very dissatisfied, 5=very satisfied	Average	St. Dev.	N
Initial Cost	4.10	.88	161
Labor Efficiency	3.46	1.05	167
Ease of use / comfort of workers	3.43	1.06	168
Worker Safety	3.43	1.10	168

Producers reported using a variety of maternity facilities. Group calving pens were cited most often, followed by pastures and individual calving pens. More than half also mentioned freestall barns. Table 22 contains the average responses.

**Table 22. Maternity facilities.**

Individual calving pens 1=none 2=some 3=most 4=all	Average	St. Dev.	N
Individual calving pens	2.41	.95	195
Group Calving pens	2.55	1.12	207
Pasture or outside lot	1.88	.75	196
Freestall barn	1.40	.63	151
Other	2.20	1.10	5

**Table 23. Satisfaction with maternity facilities.**

Satisfaction with Maternity Facilities 1=very dissatisfied, 5=very satisfied	Average	St. Dev.	N
Cow health	3.82	.98	275
Calf health	3.75	.97	271
Labor use	3.69	1.04	270

Twelve farms reported using only natural service bulls, and seven farms used mostly natural service. The vast majority reported using mostly AI (63) or AI exclusively (191).

Several financial incentive programs are available from the state. The most frequently mentioned programs used were the Dairy 2020 early planning grants (78), followed by the Wisconsin dairy investment credit program (72). The milk volume premium program reported 29 participants, and the Grow Wisconsin Dairy program was mentioned 26 times.

**Table 24. Over-all modernization satisfaction level.**

Overall satisfaction with dairy expansion (dairy operation) 1=very dissatisfied, 5=very satisfied	Average	St. Dev.	N
Milk production level	3.67	1.01	275
Culling rate	3.34	1.04	272
Animal health (general)	3.75	.85	275
Heat Detection	3.59	.91	275
Conception rates	3.45	.96	275
Calving interval	3.45	.93	275
Milk Quality	3.77	.98	275

**Figure 3. Variance of overall modernization satisfaction levels.**

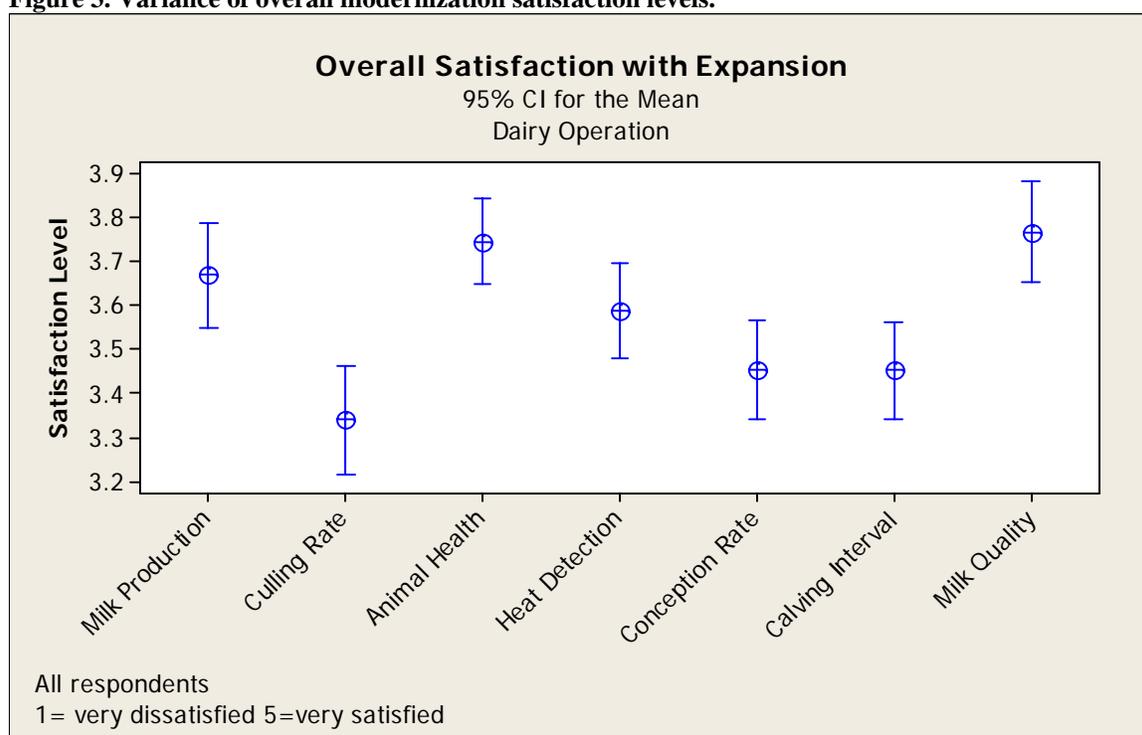


Figure 3 displays the means and confidence intervals for the satisfaction measures reported in Table 24. The mean satisfaction levels with herd culling rates were significantly different from milk production, heat detection, animal health and milk quality at a 95% confidence level. Mean satisfaction levels were not significantly different between culling rates, conception rates and calving intervals.

**Table 25. Personal satisfaction levels.**

Overall satisfaction with dairy expansion (personal life) 1=very dissatisfied, 5=very satisfied	Average	St. Dev.	N
Neighbor relations	4.01	.93	275
Personal satisfaction with my role	3.97	.92	274
Personal health (knees, back, etc)	3.54	1.19	275
Disposable income	3.34	1.15	274
Relationship with spouse & family	4.00	.99	269
Time away from the farm	3.17	1.26	273
Overall quality of life	3.77	1.05	274

**Figure 4. Variance of overall satisfaction with modernization.**

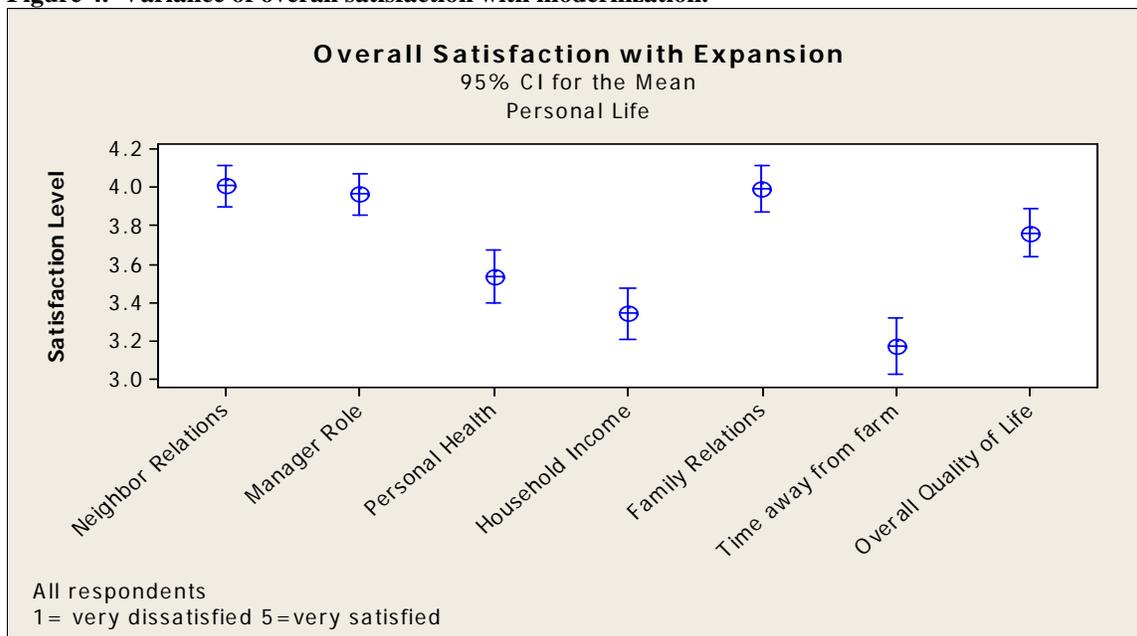


Figure 4 displays the means and confidence intervals for the satisfaction scores reported in Table 25. Neighbor relations, family relations and the manger’s role were all significantly higher than satisfaction with personal health, household income and time away from the farm.

Table 26 shows the responses to the question “Why did you decide to modernize?” The year 2000 responses are from the original Palmer/Bewley survey. The frequencies appear higher for the year 2000 survey because multiple responses were allowed. In both surveys the desire to increase profitability was listed most often. Labor efficiency increased in importance in 2005, and the need to work family members into the business declined in 2005. This reminds us that as farms increase in size, the family labor pool may already be fully utilized and more off-farm help is required to meet the needs of the expanded operation.

**Table 26. Reasons cited for modernization and frequency .**

Reasons for expanding (select all that apply)	%	# responses 2000	%	# responses 2005
To increase profitability	89	265	71	184
To allow family members to join the business	73	217	46	118
To improve physical working conditions	69	207	62	159
To get time away from the farm	61	181	47	121
To improve labor efficiency	34	103	61	157
Other	17	52	16	40

Table 27 summarizes the reported difficulty associated with various aspects of farm modernization. Construction over-runs were mentioned as either most difficult or second most difficult by 73 farms. A closely related and frequently mentioned topic was “working with contractors”. Procuring feed was the least difficult task.

**Table 27. Difficulty of modernization .**

<b>From 1 (Most difficult) to 5 (least difficult) rate each of these tasks</b>	<b>mean</b>	<b>st dev</b>	<b>count</b>	<b>most difficult</b>	<b>2nd most difficult</b>
Permitting/Zoning	3.85	1.26	237	14	22
Financing and loan procurement	3.72	1.15	241	11	24
Working w/contractors	3.53	1.13	239	16	24
Facility design and site selection	3.72	1.00	239	2	29
Construction and Cost Overruns	3.18	1.15	240	15	57
Finding Labor	3.53	1.16	237	15	25
Managing Labor	3.45	1.08	235	9	34
Labor Turnover	3.52	1.11	233	12	24
Finding Animals	3.65	1.07	237	6	31
Procuring Feed	3.96	0.95	239	5	8
Animal Health-Udder	3.70	0.99	241	5	21
Animal Health-Feet and Legs	3.41	1.03	240	5	43
Animal Health-Reproduction	3.49	1.00	241	6	29

In Table 28 a very large majority of the producers said they had no regrets about the expansion and would do it again. Only 8.33% said they would not. About half said they would do it exactly the same if given the chance. Over 26% said they would do it faster, and 18% said they would have grown even larger if starting over again.

**Table 28. Would you do it again?**

<b>Knowing what you do now, would you do it again?</b>	<b>Percent Responding 2000</b>	<b>Percent Responding 2005</b>
No, would not do it again	5.86%	8.33%
Yes, slower	5.52%	5.16%
Yes, the same way	51.03%	49.60%
Yes, only faster	28.97%	26.98%
Yes, only bigger	22.76%	17.86%

### Open-ended questions

Three open-ended questions were asked at the end of the survey. 1) What was the best choice made in your expansion? 2.) What was the worst choice made in your expansion? 3.) Knowing what you know now, what advice would you give other producers? Appendix 1 contains the comments in detail.

The most often mentioned positive modernization feature was the parlor. Sixty-seven producers mentioned the parlor or related attributes. Eleven farmers specifically mentioned retrofitted parlors as their best choice. The next most often mentioned expansion choice was freestall barns with fifty-two responses referring to new barns and/or sand bedding. References to increased labor efficiency and flexibility were made in 16 surveys. Several producers sited increased efficiencies in feeding and manure handling.

Construction problems were the most frequently mentioned problem areas. Sixty-eight surveys mentioned various problems encountered during the construction of new facilities. Nine specifically mentioned parlor costs and design issues as problems, and six said they built too small. Two producers had problems with contractor bankruptcies and five reported a poor contractor experience. Communicating with contractors before and during the construction phase can be critical to the success of the project. A few respondents suggested withholding the final payment until all work is done. To be fair, other respondents specifically mentioned their positive experiences working with building contractors and consultants.

Twenty-nine producers mentioned business planning and communication problems. Six felt they had waited too long to modernize and four felt they now had limited future expansion room. A few farmers cited budget constraints and budget over-runs. Three producers mentioned inter-personal communication problems.

The most common advice for others considering expansion was: “Visit lots of farms.” This was mentioned thirty-eight times. As a group, producers are very willing to share their modernization ideas and experiences. Many other suggestions were included, but none was repeated as frequently.

### Conclusion

This paper is a first attempt to summarize the results of the 2006 questionnaire. Future papers will examine specific investment decisions and satisfaction levels regarding parlors and housing design in more detail.

Dairy herds in this survey range in size from less than 50 cows to more than 2,000 cows. Although their operations varied in size, most producers are very positive about their modernization experiences and are planning to stay in the business for the foreseeable future. It is unlikely that they will be selling the business in the next five years or decreasing their cow numbers. Of the 255 who answered this part of the questionnaire, 94 (37%) felt it was likely or very likely that they would expand by at least 50% in the next five years, and 45 (18%) felt it was likely that they would increase their present herd size by at least 100%. Clearly, pressures to modernize will continue in the future.

**Table 29. Perceived likelihood of future change.**

In the next 5 years, how likely is it that you will:	Mean	st dev	n	very likely	likely	no feeling	unlikely	Very unlikely
Sell the farm	4.41	0.92	250	5	8	21	61	155
Decrease herd size	4.50	0.83	252	4	5	15	65	163
Keep the same herd size	3.22	1.45	249	43	50	27	68	61
Increase by at least 50%	3.32	1.48	255	36	58	33	45	83
Increase by at least 100%	3.93	1.36	252	24	21	35	40	132

The Wisconsin dairy industry is constantly competing for resources with other agricultural and non-agricultural land uses. Recent legislative rules have been enacted to help assure a consistent process for the permitting of future large livestock facilities in the state. The bulk of Wisconsin dairy producers are well below the required permitting size. However, if current trends continue, the competition for suitable building sites will increase.

In the past decade, Wisconsin dairy farmers have been operating their businesses as well as investing in appreciating assets. During this period of historically low interest rates and high milk prices, it was easy to lose sight of where changes in farm net worth came from. It is especially difficult to measure the incremental profitability from additional investments in farm infrastructure during a single accounting year. Despite this challenge, the survey respondents have committed to stay in dairy production for the foreseeable future.

Eighty-six percent said it was unlikely that they would sell the farm in the next five years, and ninety percent indicated they were unlikely to decrease cow numbers. However, as the industry continues to consolidate and profit margins are squeezed, their continued sustainability will require the adoption of more efficient production methods. As dairy farms become larger and more specialized, the importance of careful succession planning, estate planning and team development will increase dramatically. Complete and accurate records will be required for business planning, regulatory compliance and equitable and profitable succession planning.

The University of Wisconsin Center for Dairy Profitability has developed a number of resource papers, financial benchmark reports and interactive CDs for use by producers contemplating modernization. The Center's web address is <http://cdp.wisc.edu>. Papers on dairy parlor modernization, dairy business profitability and methods for calculating cost of dairy production can be downloaded from the web. The AgFA database of Wisconsin dairy farm financial records is unique resource for obtaining Wisconsin financial benchmark figures. In addition, there are tools for financial forecasting and several electronic spreadsheet templates for short-term decision-making. Finally, CDs containing motion video of working low cost parlors and slide libraries of hundreds of parlor ideas can be ordered from CDP for \$10/copy.

The UWEX Dairy Team is another resource available to Wisconsin producers. The team is comprised of Extension specialists and agents with experience and expertise in working with families in the pre-construction phase of a dairy modernization project. The team members can assist in matching producers with appropriate cost sharing programs and/or identifying other producers who have completed a modernization process and would be willing to share experiences.

There are many ways to be successful and competitive on Wisconsin dairy farms. Those who have modernized recently recommend careful preparation and planning before committing to a modernization project. The key is to choose a system that will make full use of your resources and complement your management style. A bright future awaits business-minded dairy producers in this state.

## Appendix A. Responses to open ended questions (Frequency of response in parentheses; Responses 5 or greater in bold)

### Best Expansion Choices

Bulk tank (1)

Cleaner cows (1)

Compost bedding (1)

Good Consultants and contractors (2)

Cow comfort (2)

Drive-by feeding, Hispanic labor (1)

Efficient feeding (2)

#### **Freestall barn and related responses (52)**

##### **Freestall barn (23)**

4 row barn, alley scrapers, and headlocks (1)

4 row barn, heifer pens (1)

54" stalls (1)

##### **Sand Bedding (19)**

##### **Headlocks (7)**

Financing (4)

Housing

Alley scrapers and manure mgt (1)

Heifer barn (2)

Curtains (1)

New facilities (2)

Stall size (2)

Special needs / new facilities (1)

Transition cow facilities (1)

Tunnel ventilation (1)

Use existing facilities (2)

Bedded pack (2)

Curtains (1)

Hired accountant (1)

Internal expansion (3)

Manure handling (4)

New location – not cobbled together (1)

#### **Parlor and related responses (67)**

##### **Parlor (50)**

Flat barn (2)

##### **Retrofit parlor (11)**

Rotary parlor (1)

Automatic takeoffs (1)

Pulsates (1)

3x milking (1)

#### **Labor-related responses (16)**

Labor efficiency (3)

People (1)

Planning (3)

Time off (2)

Free time (2)

Use a team (1)

Family labor (1)

Working conditions (2)

More personal time (1)

### Worst things learned from expansion

Bedded pack (1)

#### **Construction-related responses (68)**

Timing (season) (3)

Alley scrapers (1)

Being your own contractor (1)

Bankrupt contractors (2)

##### **Built too small (6)**

Contractor completion dates (1)

Completion dates (1)

Cracking concrete (sand) (1)

Electrical problems (1)

#### **Parlor costs and design issues (9)**

Automatic takeoffs in parlor (1)

Site selection for parlor (1)

Site selection general (1)

#### **Poor contractor experience (5)**

Excavation problems (1)

Freestall ceiling installation (1)

Freestall too small (1)

Concrete labor (2) was it worth it?

Heifer barn too small (1)

Larger holding area (1)

Larger office and wash area (2)

Flat barn setup (2)

Flat barn during transition (1)

Inefficient during transition (1)

Inside feeding not adequate (1)

More cement (1)

Mattresses (1)

Milk line too small (1)

Milking system (2)

Bigger holding area (1)

Not large enough (1)

Three row barns and mattresses (1)

Should have built 4 row barn (1)

Should have built new (1)

Should have chosen drive by feeding

Should have switched to sand bedding (3)

Should have used trusses instead of rafters (1)

More repairs than anticipated (1)

Grates (1)

Renovation expensive (1)

Worked with existing buildings (1)

Water in the barns (1)

#### **Herd Health / Population Issues (19)**

Foot & Leg problems (2)

Cattle management (1)

Cow care time constraints (1)

Cow identity (1)

Cow transitions to freestall (1)

Needed more heifers at startup (1)

Not operating at capacity (1)

#### **Populating new facilities (7)**

High cattle costs (1)

Biosecurity (3)

#### **Labor-related responses (15)**

Hired labor issues (1)

Labor pains (1)

#### **Personnel (6)**

Extra working hours (1)

Rushed during construction (1)

Switching cows is labor intensive (1)

Double platooning (3)

Shoulder pain (1)

#### **Business Planning/Communications Responses (29)**

Inter-personal communications (3)

Budget constraints (3)

Limited involvement with business plan (1)

Extra debt (1)

- Cash flow planning (1)
- More planning (2)
- Budget over runs (2)
- Mixed results with consultants (2)
- Permitting (1)
- Need additional cropland (1)
- Limited future expansion room (4)
- Waited too long to expand (6)**
- Features too small (1)
- Bulk tank too large (1)
- Manure Issues (17)**
- Sand laden manure issues (2)
- Manure (15)**

***Based upon what you've learned, what advice would you give others?***

**Visit lots of farms! (38)**

- Always anticipate worst case income and expense scenario (1)
- Anticipate cost over-runs (1)
- Assemble a complementary team (1)
- Assess your priorities (1)
- Be available during the construction phase (1)
- Begin with end in mind (1)
- It's a better quality of life (1)
- Bigger isn't necessarily better (1)
- Biosecurity is critical (1)
- Build the transition barn first (1)
- Buy good animals (1)
- Careful planning saves big headaches (1)
- Careful selection of new animals is difficult (1)
- Cash flow is critical (1)
- Cattle acquisition options are important (1)
- Pay attention to cattle handling (1)
- Choose a plan that works for you (1)
- Choose your own destiny (1)
- Connect to lenders that have dairy experience (1)
- Consider retrofitting existing facilities (1)
- Consider a good feasibility study (1)
- Consider fully populating the new barn with additional cows (1)
- Consider growing into the expansion (1)
- Consider a low cost parlor option (1)
- Consider management intensive grazing (1)
- Consider the pros and cons of hiring additional labor (1)
- Consider switching to organic production (1)
- Do it now if you plan to stay in business for 10 years (1)
- Do things that increase milk production (1)
- Don't bother (1)
- Don't ignore possible –relocation instead of expansion (1)
- Don't ignore possible 1031 exchange (1)
- Don't overcrowd freestall (1)
- Don't scrimp on essentials. Correcting problems later is very expensive (1)
- Don't stress the cows (1)
- Choose a double 8 over swing 8 parlors (1)
- It's easier to buy than to expand (1)
- Choose an efficient milking system (1)
- Emphasis on dry cows and transition cows (1)

- Emphasis on profitability (1)
- Expand from internal growth (3)
- Expand gradually (1)
- Expand only after you've peaked out the potential for the current operation (1)
- Expansion isn't for short term solutions (1)
- Family teamwork is important (1)
- Farm vs. manage people (1)
- Financial planning and good people are critical (1)
- Financial tracking is important (1)
- Fire forced our decision to expand. I would not have otherwise. (1)
- Recommend freestall barns (1)
- Get out of stanchions (1)
- Gets the parlor going soon (1)
- Grow to the capacity of the family labor force. (1)
- Hire experienced people (1)
- Hold back money until contractors are truly finished with the job (1)
- Keep focused on your objectives (1)
- Leave room for further expansion (1)
- Recommend Dairycomp 305 (herd record keeping software) (1)
- Like headlocks and water meters in the barn (1)
- Locate a good contractor (1)
- Develop efficient feeding and milking systems (1)
- Low milk prices can be discouraging at times (1)
- Make cows comfortable (1)
- Make sure the community has dairy in its plans for the future (1)
- Manage people (4)
- Manure issues (1)
- MVP not worth the hassle (1)
- Need a commitment from the next generation (1)
- Pick a good site (1)
- Plan ahead and buy only what you need (1)
- Plan for all expanded facilities (1)
- Spend at least a year planning (1)
- Plan for the long term (1)
- A positive attitude is important (1)
- Proceed slowly, but keep the cows comfortable (1)
- Quit the pipeline. What a dumb way to make a living. I would never go back to a pipeline system. (1)
- Build the whole system (parlor and freestall) at once (1)
- Recommend parlor & utility room. Sand bedding (1)
- Use sand bedding. Make sure to build your dairy big enough. Get in touch with a good consultant (1)
- Secure cropland first (1)
- Secure off farm health insurance (1)
- Select the best people to build your team (1)
- Take it slowly (1)
- Take time to decide (1)
- Time off is highly valuable (1)
- Use consultants and plan carefully (1)
- Use hired help when available (1)
- Use local contractors and include specific completion dates (1)
- Use man passes and coordinate between excavator and contractor (1)
- Keep cost down where possible, work in steps but don't cut corners. (1)