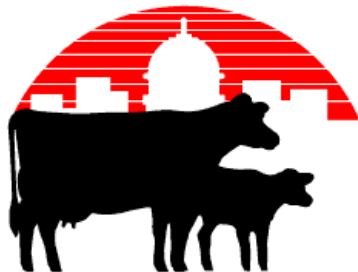


# 1999 Wisconsin Dairy Modernization Project

## *Final Results Report*

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## Background

The dairy industry is going through a major restructuring. Dairy operators are incorporating modern technologies to help improve their efficiency and the quality of life of their families and workers. An extensive mail survey of dairy farms in Wisconsin, which expanded during the past five years, was conducted in the spring of 1999. The goal of this research is to determine what changes producers have made and how satisfied they are with these changes. The results from this survey will help guide other producers considering changes to their operations.

Data provided by Wisconsin DHI was utilized to identify Wisconsin herds on DHI test that expanded between 1994 and 1998. Herds were selected if herd size had increased by at least 50% for smaller herds (60-100 cows) or at least 40% for larger herds (> 100 cows). To identify other herds that had expanded herd size but were not DHI members, a letter was sent to all members of Professional Dairy Producers of Wisconsin (PDPW) asking for their willingness to cooperate in the survey. Of the 694 farms that received the survey, 604 were located through DHI, 95 through the PDPW letter, and 50 through referrals (some herds were listed in multiple sources). 694 surveys were mailed on April 5, 1999 and a follow-up mailing of postcards were sent to those who had not responded by April 15. County Extension agents were asked to help producers complete the surveys or to encourage dairy producers to complete the survey.

Overall, 48% (336) of the surveys were returned. Since some of the respondents did not meet survey criteria, returned unusable questionnaires, or declined to participate, 44% (302) surveys were used in this analysis. Herd summary information from AgSource DHI was combined with the survey data when available. Herds were categorized based on current herd size, magnitude of expansion, and type of expansion. Herd size categories were established so that all herds were divided into five equal-sized categories. Each category contains approximately 60 herds and includes herds with 60 to 105 cows, 106-145 cows, etc. For many questions, producers were asked to indicate their satisfaction with particular aspects of their operation by choosing a number in a scale from 1 (very dissatisfied) to 5 (very satisfied). These "satisfaction values" were averaged and are summarized in the following pages. In this report, some tables will contain an "N=xx" which indicates the number of producers who responded to a question in a particular category. Means within rows or columns, that differ ( $P < 0.05$ ), are denoted with superscripts a, b, c, etc.

This report provides of the results of the analysis of the survey. Hopefully it will give insight to the producers who may be considering an expansion. The results summarized indicate what facility and management options have been chosen by Wisconsin producers who have expanded and the production trends associated with these options and the producers satisfaction with their choices.

We would like to thank the following people or groups for their assistance in this project:

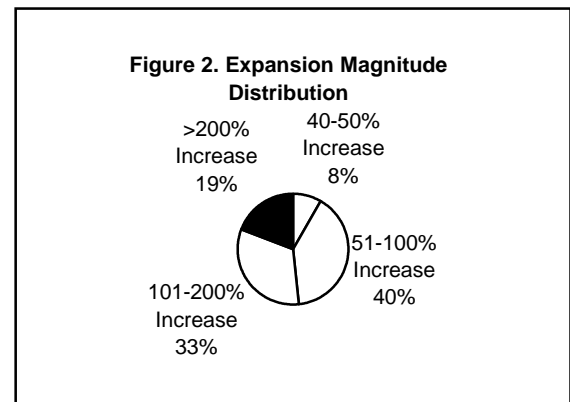
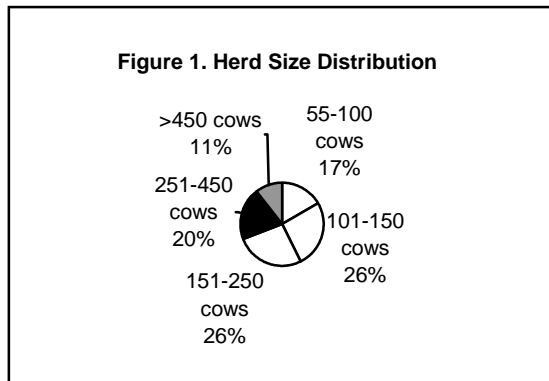
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## Herd Characteristics

Table 1 shows that the average herd in this survey more than doubled its size (from 102 to 252 cows) in the five-year period from 1994 to 1998. 57% of the herds in this survey have more than 150 cows. Herd size includes milking and dry cows. By comparison, the average herd in Wisconsin had 60 cows in 1998, and the average Wisconsin DHI herd had 71 cows. Most producers in the survey appear to still be in the process of expanding as indicated by the average long-term goal of 453 cows. Figure 1 shows the distribution of these herds based on number of cows. Figure 2 demonstrates the distribution of herds based on the extent of the herd's expansion during this period.

**Table 1. Average Herd Size of Sample Herds**

1994	Before Most Recent Expansion	Now	Long-Term Goal
102 Cows	136 Cows	252 Cows	453 Cows



Herd summary information from AgSource DHI was available for 243 of the Holstein herds in the data set. This information has been summarized in Table 2. Milk production increased for these herds from 1994 to 1998 (rolling herd average milk increased by 1853 pounds, ME milk increased by 1957 pounds, and peak milk increased by 5 pounds). Reproductive performance seems to decrease as shown by a 0.6-month increase in calving interval and a 14-day increase in days open.

**Table 2. Herd Summary Averages**

	1998	1994	Change
Herds, no.	252	252	
Median herd size	180	80	+100
RHA milk, lbs.	21956 ± 195 <sup>a</sup>	20103 ± 187 <sup>b</sup>	+1853
ME milk, lbs.	23698 ± 198 <sup>a</sup>	21741 ± 189 <sup>b</sup>	+1957
Peak milk, lbs.	88.6 ± 0.6 <sup>a</sup>	83.6 ± 0.6 <sup>b</sup>	+5
Linear SCS	2.91 ± 0.03	*	*
Days dry	61 ± 1 <sup>b</sup>	63 ± 1 <sup>a</sup>	-2
Calving interval, months	13.8 ± 0.1 <sup>a</sup>	13.2 ± 0.0 <sup>b</sup>	+0.6
Days open	140 ± 2 <sup>a</sup>	126 ± 2 <sup>b</sup>	+14
Age at first calving	26.1 ± 0.1	*	*
Culling rate, %	33.2 ± 0.7	*	*

A common question asked by producers considering an expansion is “Should I start with all new facilities or modify what I have?” Most producers (72%) who responded to this survey indicated they used existing facilities along with some new facilities. It appears that producers using all new facilities have higher production and greater satisfaction with net farm income, personal health, disposable household income, and time away from the farm (Table 3). Producers who built all new facilities achieved the lowest average culling rate and had the highest overall farm labor efficiency based on their average cows per full-time equivalent number of employees. Producers who did not change facility type felt they had better neighbor relations than those who built all new facilities. It is interesting to note that producers expanding without adding new facilities saw the largest production increase.

**Table 3. Operation Performance and Satisfaction by “Type of Expansion”**

	No new facilities	Some new facilities	All new facilities
Herds, no.	31	218	53
1998 mean herd size	109	216	483
1994 mean herd size	61	97	145
1998 RHA milk, lbs	20503 <sup>c</sup>	21920 <sup>b</sup>	23218 <sup>a</sup>
1994 RHA milk, lbs	17985 <sup>b</sup>	20300 <sup>a</sup>	20897 <sup>a</sup>
Change in RHA	2519 <sup>a</sup>	1658 <sup>b</sup>	2321 <sup>ab</sup>
Linear SCS	3.07	2.89	2.82
Calving interval	14.0	13.6	14.0
Age at first calving	26.9 <sup>a</sup>	26.0 <sup>b</sup>	25.7 <sup>b</sup>
Culling rate	34.7 <sup>ab</sup>	33.7 <sup>a</sup>	29.2 <sup>b</sup>
Cows per FTE	30 ± <sup>c</sup>	38 <sup>b</sup>	52 <sup>a</sup>
Heat detection *	3.32 <sup>b</sup>	3.56 <sup>b</sup>	3.87 <sup>a</sup>
Production costs per cwt. *	3.61 <sup>b</sup>	3.66 <sup>b</sup>	4.04 <sup>a</sup>
Net farm income *	3.26 <sup>b</sup>	3.59 <sup>b</sup>	4.04 <sup>a</sup>
Neighbor relations *	4.29 <sup>a</sup>	3.95 <sup>ab</sup>	3.77 <sup>b</sup>
Personal health *	3.32 <sup>c</sup>	3.78 <sup>b</sup>	4.23 <sup>a</sup>
Disposable household income *	3.23 <sup>b</sup>	3.59 <sup>b</sup>	4.08 <sup>a</sup>
Time away from the farm *	2.71 <sup>c</sup>	3.29 <sup>b</sup>	3.79 <sup>a</sup>
Overall quality of life *	3.65 <sup>b</sup>	3.82 <sup>ab</sup>	4.06 <sup>a</sup>

<sup>a,b,c,d</sup> Means within rows with different superscripts differ (P < 0.05).

\*Average satisfaction reported on a scale from 1 (very dissatisfied) to 5 (very satisfied).

Another frequently asked question among producers considering expansion is “How big should I get?” As mentioned earlier, herds were divided into five categories by herd size (Table 4). The average 1998 herd size for the herds in each of these categories were 86, 126, 183, 272 and 597, respectively. The average milk production per cow increased as herd size increased. The average rolling herd average for the larger herds was 4347 pounds higher than the smaller herds. Production increases from 1994 to 1998 was similar across all size categories. Larger herds tended to calve animals at a younger age than the smaller herds. The overall farm labor efficiency, as measured in cows per full time equivalent, increased with herd size. The largest and smallest herds averaged 51 and 27 cows/FTE, respectively. Part of this difference is due to the larger number of acres of land farmed by the smaller herds, 3.38 and 2.31 acres

per cow. Larger producers appear to be more satisfied than their small herd counterparts in all areas except neighbor relations. Larger producers reported significantly higher satisfaction with net farm income, personal satisfaction with their role, personal health, disposable household income and time away from the farm. It is interesting that when they were asked about their overall quality of life the largest and smallest herd size groups reported the highest ratings. The herds in the intermediate size (106-145 and 146-220 cows) tended to be less satisfied. When operation performance and satisfaction were summarized by the magnitude of expansion, results were very similar to the herd size summary (i.e. herds with the greatest magnitude of expansion had high production and appeared to be more satisfied with income and personal satisfaction).

**Table 4. Operation Performance and Satisfaction by “Herd Size”**

Herd Size (number of cows)	60-105	106-145	146-220	221-360	> 360
Herds, no.	61	62	59	60	60
1998 mean herd size	86	126	183	272	597
1994 mean herd size	47	71	90	107	197
1998 RHA milk, lbs	19766 <sup>d</sup>	21642 <sup>c</sup>	22370 <sup>bc</sup>	22737 <sup>b</sup>	24113 <sup>a</sup>
1994 RHA milk, lbs	18136 <sup>d</sup>	19643 <sup>c</sup>	20690 <sup>b</sup>	20894 <sup>ab</sup>	21998 <sup>a</sup>
Change in RHA	1660 <sup>a</sup>	2017 <sup>a</sup>	1725 <sup>a</sup>	1843 <sup>a</sup>	2115 <sup>a</sup>
Linear SCS	3.03 <sup>a</sup>	2.96 <sup>ab</sup>	2.83 <sup>b</sup>	2.85 <sup>ab</sup>	2.80 <sup>b</sup>
Days open	130 <sup>b</sup>	136 <sup>ab</sup>	143 <sup>a</sup>	136 <sup>ab</sup>	143 <sup>a</sup>
Days dry	64 <sup>a</sup>	61 <sup>ab</sup>	60 <sup>b</sup>	61 <sup>ab</sup>	61 <sup>ab</sup>
Age at first calving	26.8 <sup>a</sup>	26.2 <sup>a</sup>	26.3 <sup>a</sup>	25.4 <sup>b</sup>	25.2 <sup>b</sup>
Culling rate	31.5	33.5	33.4	35.1	32.4
Cows per FTE	27 <sup>c</sup>	34 <sup>b</sup>	40 <sup>b</sup>	49 <sup>a</sup>	51 <sup>a</sup>
Acres per cow	3.38 <sup>a</sup>	3.37 <sup>a</sup>	2.64 <sup>b</sup>	2.61 <sup>b</sup>	2.31 <sup>b</sup>
Milk production level *	3.53 <sup>b</sup>	3.55 <sup>b</sup>	3.97 <sup>a</sup>	3.82 <sup>ab</sup>	3.92 <sup>a</sup>
Heat detection *	3.48 <sup>b</sup>	3.37 <sup>b</sup>	3.60 <sup>ab</sup>	3.58 <sup>ab</sup>	3.92 <sup>a</sup>
Conception rate *	3.39 <sup>ab</sup>	3.23 <sup>b</sup>	3.48 <sup>ab</sup>	3.22 <sup>b</sup>	3.55 <sup>a</sup>
Calving interval *	3.44 <sup>ab</sup>	3.26 <sup>b</sup>	3.50 <sup>ab</sup>	3.37 <sup>ab</sup>	3.62 <sup>a</sup>
Milk quality *	3.64 <sup>ab</sup>	3.58 <sup>b</sup>	3.91 <sup>a</sup>	3.73 <sup>ab</sup>	3.88 <sup>ab</sup>
Production costs *	3.53 <sup>bc</sup>	3.50 <sup>c</sup>	3.83 <sup>ab</sup>	3.71 <sup>bc</sup>	4.03 <sup>a</sup>
Net farm income *	3.26 <sup>b</sup>	3.33 <sup>b</sup>	3.77 <sup>a</sup>	3.73 <sup>a</sup>	4.10 <sup>a</sup>
Neighbor relations *	4.13 <sup>a</sup>	3.97 <sup>ab</sup>	3.88 <sup>ab</sup>	4.02 <sup>ab</sup>	3.78 <sup>b</sup>
Personal satisfaction with my role *	3.98 <sup>b</sup>	3.92 <sup>b</sup>	4.03 <sup>ab</sup>	4.10 <sup>ab</sup>	4.30 <sup>a</sup>
Personal health *	3.38 <sup>c</sup>	3.65 <sup>bc</sup>	3.71 <sup>bc</sup>	4.02 <sup>ab</sup>	4.30 <sup>a</sup>
Disposable household income *	3.33 <sup>c</sup>	3.39 <sup>c</sup>	3.55 <sup>bc</sup>	3.87 <sup>ab</sup>	4.12 <sup>a</sup>
Relationship with spouse and family *	4.08 <sup>ab</sup>	3.80 <sup>b</sup>	4.07 <sup>ab</sup>	4.17 <sup>a</sup>	4.08 <sup>ab</sup>
Time away from the farm *	2.85 <sup>b</sup>	3.02 <sup>b</sup>	3.22 <sup>b</sup>	3.63 <sup>a</sup>	3.88 <sup>a</sup>
Overall quality of life *	3.75 <sup>bc</sup>	3.60 <sup>c</sup>	3.69 <sup>c</sup>	4.03 <sup>ab</sup>	4.13 <sup>a</sup>

a,b,c,d Means within rows with different superscripts differ (P < 0.05).

\*Average satisfaction reported on a scale from 1 (very dissatisfied) to 5 (very satisfied).

## Facilities

Seventy two percent of the producers in this survey used a combination of modified and new facilities, while 18% built all new facilities with the remaining producers making no major changes of facility type. Not surprisingly, the primary change in housing type was from the traditional stanchion or tie-stall barn to modern freestall barns. Figure 3 shows the distribution of herds by barn type and by freestall barn type.

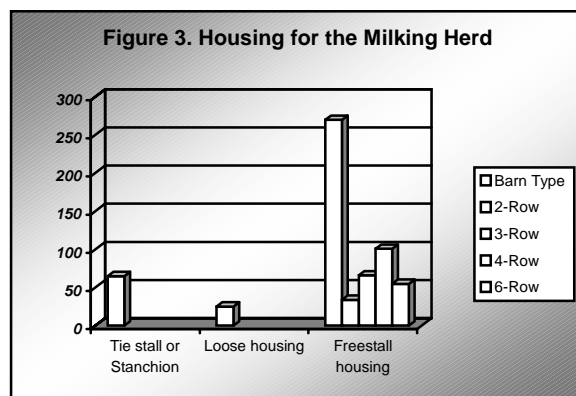


Table 5 shows that for all herds with freestall barns, the 4-row design had the highest average milk production average per cow (22,938 pounds), lowest average linear score (2.78), and highest feed intake satisfaction (4.40), along with having the highest stocking rate (111%). These numeric averages, although not statistically significant, show a trend that becomes more obvious when only new freestall barns with drive-through feeding are examined. Cost per stall varies by barn type and is influenced by combining new and remodeled facilities.

**Table 5. Freestall Barn Type**

	2-Row	3-Row	4-Row	6-Row
Herds, no.	17	60	96	55
1998 median herd size	144	130	240	320
1998 RHA milk, lbs	22291 <sup>ab</sup>	21528 <sup>b</sup>	22938 <sup>a</sup>	22469 <sup>ab</sup>
1994 RHA milk, lbs	19861 <sup>ab</sup>	19765 <sup>b</sup>	20994 <sup>a</sup>	20852 <sup>ab</sup>
Change in RHA	2431	1764	1944	1617
Stocking rate (%)	104	103	111	104
Linear SCS	2.82	2.87	2.78	2.97
Cows per FTE	35 <sup>b</sup>	38 <sup>b</sup>	44 <sup>ab</sup>	47 <sup>a</sup>
Cow comfort *	4.00 <sup>b</sup>	4.67 <sup>a</sup>	4.54 <sup>a</sup>	4.50 <sup>a</sup>
Cow cleanliness *	3.88 <sup>b</sup>	4.50 <sup>a</sup>	4.33 <sup>a</sup>	4.39 <sup>a</sup>
Feed intake *	4.29	4.21	4.40	4.35
Ability to move animals *	4.12 <sup>ab</sup>	4.11 <sup>b</sup>	4.30 <sup>ab</sup>	4.57 <sup>a</sup>
Feeding convenience *	3.82 <sup>b</sup>	4.53 <sup>a</sup>	4.55 <sup>a</sup>	4.74 <sup>a</sup>
Cost per stall	\$712 <sup>b</sup>	\$908 <sup>b</sup>	\$1120 <sup>a</sup>	\$1215 <sup>a</sup>

<sup>a,b,c,d</sup> Means within rows with different superscripts differ ( $P < 0.05$ ).

\*Average satisfaction reported on a scale from 1 (very dissatisfied) to 5 (very satisfied).

Herd performance and producer satisfactions seem to differ between freestall feed delivery designs (Table 6). Producers who chose barns with drive-through feeding were more satisfied with feeding convenience and manure management than those that chose other options. Their 1998 milk production was significantly higher compared to outside feeding. Their overall farm labor efficiency (45 vs. 37 cows/FTE) and ability to move animals was better than producers with drive-by facilities. The average cost per stall was highest for the drive-through group, which in part may reflect the fact that many of the drive-by and outside feeding barns were retro-fits of existing structures.

**Table 6. Freestall Feed Delivery Design**

	Drive-through	Drive-by	Outside Feeding
Herds, no.	155	44	19
1998 median herd size	245	144	125
1998 RHA milk, lbs	22657 <sup>a</sup>	21608 <sup>ab</sup>	20981 <sup>b</sup>
1994 RHA milk, lbs	20941 <sup>a</sup>	19711 <sup>b</sup>	18719 <sup>b</sup>
Change in RHA	1715	1897	2262
Cows per FTE	45 <sup>a</sup>	37 <sup>b</sup>	40 <sup>ab</sup>
Feed intake *	4.38	4.14	4.26
Ability to move animals *	4.38 <sup>a</sup>	4.02 <sup>b</sup>	4.16 <sup>ab</sup>
Manure management *	3.94 <sup>a</sup>	3.55 <sup>b</sup>	3.26 <sup>b</sup>
Feeding convenience *	4.73 <sup>a</sup>	4.36 <sup>b</sup>	3.74 <sup>c</sup>
Cost per stall	\$1196 <sup>a</sup>	\$877 <sup>b</sup>	\$522 <sup>c</sup>

Like Table 5, Table 7 summarizes production and satisfaction values for different freestall barn types except only newly constructed barns with drive-through feeding were included. By adding these qualifications, bias created by including remodeled facilities or other feeding strategies is removed. Similar trends are shown as in Table 5 except for cost per stall of different barn types. 1998 Milk production per cow was significantly higher for the 4-row barn (+1911 pounds per cow per year) and the average linear somatic cell count score was lower. The 4-row barns were stocked heavier (9% more) and producers reported higher satisfaction with feed intake and cow comfort. Interestingly, producers reported spending only a few dollars more per stall (+\$23/stall) for their 4-row barns than those that chose the 6-row option. Since these barns had a higher stocked rate, the actual cost per cow was less (\$1103 vs. \$1177 per cow).

**Table 7. Freestall Barn Type (New barns with drive-through feeding only)**

	4 - R o w	6 - R o w
Herds, no.	53	42
1998 median herd size	245	247
Rolling Herd Average 1998	23,644 <sup>a</sup>	21,733 <sup>b</sup>
Change in RHA	1974	1382
Stocking rate (%)	112 <sup>a</sup>	103 <sup>b</sup>
Average Linear Score	2.73 <sup>b</sup>	2.96 <sup>a</sup>
Feed intake satisfaction *	4.47	4.33
Cow Comfort *	4.66	4.45
Cost per Stall	\$1235	\$1212

Selection of freestall bases, surfaces, and bedding types is very important. Often producers need to choose between sand and mattress based freestalls. The DHI records, for the producers who responded to this survey, show no significant difference in milk production or somatic cell counts between those using sand or mattresses after their expansion (Table 8). Producers using sand seem to be more satisfied with cow comfort issues, and less satisfied with manure management and bedding issues than those using mattresses. Sand users reported significantly higher satisfaction scores for cow cleanliness and hock damage, whereas mattress users reported significantly higher satisfaction with bedding use and cost and manure management. The average cost per stall was higher for mattress based stall users, part of which would be the initial cost of the mattress. Although not significantly different, herds with mattress based stalls seem to have higher overall labor efficiency (45 vs. 40 cows/FTE). Culling rates were similar with a slight numeric advantage to sand users.

**Table 8. Freestall Bedding Type**

	Mattresses	Sand
Herds, no.	69	145
1998 median herd size	265	195
1998 RHA milk, lbs	22519	22539
Change in RHA	1587	2071
Linear SCS	2.88	2.80
Cows per FTE	45	40
Culling rate (%)	34	32
Cow comfort *	4.42	4.55
Cow cleanliness *	4.12 <sup>b</sup>	4.47 <sup>a</sup>
Hock damage *	4.22 <sup>b</sup>	4.72 <sup>a</sup>
Teat damage *	4.48	4.59
Udder health *	4.09	4.31
Bedding usage and cost *	4.25 <sup>a</sup>	3.95 <sup>b</sup>
Manure management *	4.32 <sup>a</sup>	3.43 <sup>b</sup>
Cost per stall	\$1306 <sup>a</sup>	\$946 <sup>b</sup>

a,b,c,d Means within rows with different superscripts differ (P < 0.05).

\*Average satisfaction reported on a scale from 1 (very dissatisfied) to 5 (very satisfied).

Table 9 examines the effect of overstocking of all new freestall barns. Herds were categorized by stocking rate. Interestingly there was no significant difference in 1998 RHA milk production and a trend toward higher production with higher stocking rates. Part of this effect may be explained by results shown in Table 7, which indicated that herds with 4-row barns were being stocked at a higher rate and had higher milk production levels. When 4-row barn users were analyzed separately, their production did not change significantly with stocking rate. An analysis of culling rate did not show any significant difference in culling level (31, 38, 32, 31, 31 and 30% respectively) for the categories shown. The cost per stall reported did not differ by category, but when cost per cow was calculated using stocking rate information it varied substantially.

**Table 9. Stocking Rate of New Freestall Barns**

	<b>Under capacity</b>	<b>At capacity</b>	<b>1-10% over crowded</b>	<b>11-20% over crowded</b>	<b>21-30% over crowded</b>	<b>&gt;30% over crowded</b>
Herds, no.	46	4	46	37	16	8
1998 median herd size	128	115	263	275	373	230
1998 RHA milk, lbs.	21501	20693	22743	22768	22244	23297
1994 RHA milk, lbs.	19621 <sup>b</sup>	19123 <sup>ab</sup>	21075 <sup>a</sup>	21128 <sup>a</sup>	20032 <sup>ab</sup>	21682 <sup>ab</sup>
Change in RHA	1879	1570	1668	1640	2211	1615
Cow comfort *	4.49	5.00	4.57	4.65	4.44	4.50
Feed intake *	4.33	5.00	4.35	4.43	4.50	4.13
Cost per stall	\$1076	\$1183	\$1162	\$1174	\$916	\$1192
Cost per cow	\$1266 <sup>a</sup>	\$1183 <sup>abc</sup>	\$1094 <sup>ab</sup>	\$988 <sup>bc</sup>	\$708 <sup>c</sup>	\$793 <sup>abc</sup>

<sup>a,b,c,d</sup> Means within rows with different superscripts differ (P < 0.05).

\*Average satisfaction reported on a scale from 1 (very dissatisfied) to 5 (very satisfied).

Table 10 examines the use of fans and sprinklers in freestall barns to cool animals. Only 37% of producers report using fans and only 18% report using sprinklers. Average 1998 RHA milk was significantly higher for producers who used either or both fans and sprinklers (+1164, +2143 and +1581 pounds, respectively for the categories shown). Interestingly producers using cooling equipment didn't report higher satisfaction with cow comfort and producers not using cooling equipment were more satisfied with cow cleanliness than those using both.

**Table 10. Use of Fans and Sprinklers.**

	<b>Fans and Sprinklers</b>	<b>Fans</b>	<b>Sprinklers</b>	<b>Neither</b>
Herds, no.	28	59	18	139
1998 median herd size	243	283	203	190
1998 RHA milk, lbs	22964 <sup>a</sup>	23943 <sup>a</sup>	23381 <sup>a</sup>	21800 <sup>b</sup>
1994 RHA milk, lbs	20841	21309	20993	20183
Change in RHA milk	2123	2634	2388	1627
Linear SCS	2.82	2.71	2.78	2.87
Cow comfort *	4.42	4.33	4.29	4.56
Cow cleanliness *	4.14 <sup>b</sup>	4.39 <sup>ab</sup>	4.32 <sup>ab</sup>	4.43 <sup>a</sup>

<sup>a,b,c,d</sup> Means within rows with different superscripts differ (P < 0.05).

\*Average satisfaction reported on a scale from 1 (very dissatisfied) to 5 (very satisfied).

Table 11 compares manure removal methods. Almost 80% of respondents reported using a tractor to scrape barns as their primary manure handling method. Their reported freestall barn cost per stall was significantly less than producers selecting slats and numerically less than alley scraper or flush removal methods. Overall farm labor efficiency, as measured in cows per FTE, was significantly higher for alley scrapers.

**Table 11. Manure Removal Method**

	Tractor Scrape	Alley Scrapers	Slats	Flush
Herds, no.	189	26	17	5
1998 median herd size	205	283	370	545
Cows per FTE	42 <sup>b</sup>	50 <sup>a</sup>	43 <sup>ab</sup>	38 <sup>ab</sup>
Manure management *	3.55 <sup>b</sup>	4.39 <sup>a</sup>	4.65 <sup>a</sup>	5.00 <sup>a</sup>
Bedding usage and cost *	3.95 <sup>b</sup>	4.39 <sup>a</sup>	4.41 <sup>a</sup>	4.20 <sup>ab</sup>
Cost per stall	\$986 <sup>b</sup>	\$1111 <sup>b</sup>	\$1458 <sup>a</sup>	\$1095 <sup>ab</sup>

<sup>a,b,c,d</sup> Means within rows with different superscripts differ (P < 0.05).

\*Average satisfaction reported on a scale from 1 (very dissatisfied) to 5 (very satisfied).

As herds expand, feed storage requirements increase. Table 12 shows the satisfaction with different feed storage types. Satisfaction with bunkers or trenches appears to be much higher (4.37) than with upright silos (3.54) or flat pads (3.43) and storage bags (3.73).

**Table 12. Feed Storage**

Feed Storage System	Upright silos	Flat pads for piles	Bunkers or trenches	Storage bags
<b>Satisfaction *</b>	3.54 <sup>b</sup> (N=253)	3.43 <sup>b</sup> (N=108)	4.37 <sup>a</sup> (N=156)	3.73 <sup>b</sup> (N=171)

<sup>a,b,c,d</sup> Means within rows with different superscripts differ (P < 0.05).

\*Average satisfaction reported on a scale from 1 (very dissatisfied) to 5 (very satisfied).

Table 13 shows the reported feed acquisition strategy and a calculated value of acres per cow of land farmed by respondents. Producers who reported raising all of their forage and grain farmed, on the average, 3.99 acres per cow. At the other extreme were producers who reported buying most of their forage, all of their grain and averaged 1.05 acres per cow.

**Table 13 Feed Acquisition Strategies and Acres per cow Farmed.**

		Forages			
		Raised all	Raised most	Bought Half	Bought Most
Grains	Raised all	3.99 (N=90)	3.28 (N=17)		
	Raised most	2.79 (N=28)	2.80 (N=34)	2.21 (N=1)	
	Bought half	2.32 (N=19)	2.10 (N=23)	2.14 (N=3)	
	Bought most	2.08 (N=7)	1.97 (N=19)	1.89 (N=5)	
	Bought all	2.40 (N=14)	1.94 (N=13)	1.09 (N=10)	1.05 (N=4)

Most of the Wisconsin producers that expanded or are thinking about expanding their dairy operation had or have a stall barn with pipeline milking system and must change their milking system to support the larger herd size. Table 14 lists the milking system options normally considered by these dairy producers and are listed by their relative capital investment cost. Most (59%) of the producers in this study reported using some type of a pit parlor while 22% milk in a traditional stall barn. Of those with pit parlors, 58% milk in parallel parlors and 37% have herringbone parlors. Flat barn parlors were predominately of the walk-through type (79%). Herds selecting the three cheaper options were generally smaller in size and probably chose those options to keep capital investment per cow down. Pit parlors in a new building were chosen by herds that were larger before expansion and were probably in their second phase of the expansion process and could justify the additional costs associated with building a new parlor complex.

Labor efficiency in this study was measured in two ways. The overall efficiency of the farm operation was expressed as cows per full time equivalent and the milking system's labor efficiency by cows per worker hour. Labor efficiency increased with each category and was the highest for the pit parlor in new building option. The average cows per worker hour was 21 for stall barn with pipeline systems, 27 for flat parlors in old barn, 34 for pit parlor in old barn and 43 for pit parlor in new building. This increase in parlor efficiency appeared to relate to the overall efficiency of the farming operation since the cows per FTE increased with each milking system type and only the difference between the pit parlor in old barn and pit parlor in new building were not significantly different. Very little difference was found in the number of workers used for milking. All milking system types averaged between 2.0 and 2.4 workers and only the pit parlor in old barn was significantly different than stall barn with pipeline users.

**Table 14. Milking Facility Performance**

	<b>Stall barn with pipeline</b>	<b>Flat parlor in old barn</b>	<b>Pit parlor in old barn</b>	<b>Pit parlor in new building</b>
Herds, no.	65	52	73	107
1998 mean herd size	117	157	212	411
1994 mean herd size	62	71	95	148
1998 RHA milk, lbs	20684 <sup>c</sup>	21397 <sup>bc</sup>	22207 <sup>ab</sup>	23073 <sup>a</sup>
Change in RHA	1929	1773	1721	2019
Linear SCS	3.02 <sup>a</sup>	2.97 <sup>ab</sup>	2.86 <sup>ab</sup>	2.78 <sup>b</sup>
Cows per FTE	29 <sup>c</sup>	38 <sup>b</sup>	43 <sup>ab</sup>	45 <sup>a</sup>
Number milking units	7 <sup>d</sup>	9 <sup>c</sup>	14 <sup>b</sup>	20 <sup>a</sup>
Number workers	2.4 <sup>a</sup>	2.2 <sup>ab</sup>	2.0 <sup>b</sup>	2.1 <sup>ab</sup>
Time to milk one shift, hr	2.21 <sup>c</sup>	2.64 <sup>bc</sup>	3.04 <sup>b</sup>	4.15 <sup>a</sup>
Cows per hour	47 <sup>c</sup>	55 <sup>bc</sup>	61 <sup>b</sup>	83 <sup>a</sup>
Cows per worker hour	21 <sup>d</sup>	27 <sup>c</sup>	34 <sup>b</sup>	43 <sup>a</sup>
Time spent milking *	3.03 <sup>c</sup>	3.92 <sup>ab</sup>	3.78 <sup>b</sup>	4.12 <sup>a</sup>
Physical comfort of milker*	2.45 <sup>c</sup>	3.83 <sup>b</sup>	4.10 <sup>ab</sup>	4.32 <sup>a</sup>
Milk quality *	3.28 <sup>b</sup>	3.75 <sup>a</sup>	3.66 <sup>a</sup>	3.70 <sup>a</sup>
Cleanliness and ease of setup *	3.55 <sup>b</sup>	3.54 <sup>b</sup>	3.75 <sup>ab</sup>	3.97 <sup>a</sup>
Safety of operator *	3.31 <sup>c</sup>	3.40 <sup>c</sup>	4.01 <sup>b</sup>	4.38 <sup>a</sup>
Cost per milking unit	\$4191 <sup>b</sup>	\$4954 <sup>b</sup>	\$6500 <sup>b</sup>	\$15832 <sup>a</sup>

Table 14 also indicates the somatic cell count level of herds with pit parlors in new buildings were significantly lower than milking in a stall barn with pipeline, but not significantly lower than flat barn parlors or pit parlors in old barns. The number of milking units increased with each parlor type. Pit parlors were the largest with 20 units per farm. On the average, cows per milker unit tend to increase with each milking facility type (16.7, 17.4, 15.1 and 20.6, respectively). This ability to more fully utilize the milking facility is a characteristic of highly profitable farms. On the average, time spent milking for these different milking facility types (3.03 to 4.12 hours per day) indicates most producers have overbuilt their milking facility for current needs and have excess milking capacity to support future herd size growth. Producers milking in pit parlors were more satisfied with time spent milking, milk quality and safety of operator than people milk in stall barn with pipeline. Flat barn parlors were preferred over stall barn with pipeline for time spent milking, physical comfort of the milker and milk quality.

Most producers using pit parlors reported using herringbone or parallel parlor designs (Table 15). A few producers reported using the auto-tandem parlor design. Milk production levels, somatic cell count levels, labor efficiency levels, and user satisfaction scored were not significantly different. This is partially due to the small number of auto-tandem parlors and the similarity in performance expected from parallel and herringbone parlors. Auto-tandem parlors had less milking units, higher turns per hour and cost more per milking unit which would be expected of a milking system that handles animals individually rather than as groups. The average cost per stall of herringbone parlors was less than parallel parlors and was probably caused by a higher percentage of herringbone parlors in old buildings and the availability of used herringbone equipment. Although not significantly significant, parallel parlors tended to have high labor efficiency values.

**Table 15. Pit Parlors**

	<b>Auto-Tandem</b>	<b>Herringbone</b>	<b>Parallel</b>
Herds, no.	7	67	104
1998 median herd size	190	275	245
1998 RHA milk, lbs	22146	22715	22721
1994 RHA milk, lbs	20143	20984	20840
Change in RHA	2003	1832	1880
Linear somatic cell score	2.76	2.81	2.82
Cows per FTE	33	43	46
Number stalls	10 <sup>b</sup>	18 <sup>a</sup>	19 <sup>a</sup>
Number milking units	10 <sup>b</sup>	17 <sup>a</sup>	18 <sup>a</sup>
Number workers	2.1	2.0	2.2
Time to milk one shift, hr	2.93 <sup>ab</sup>	4.16 <sup>a</sup>	3.48 <sup>b</sup>
Extra time to set-up and clean-up, hr	0.63	0.82	0.81
Cows per hour	60	71	75
Cows per worker hour	30	38	40
Turns per hour	6.20 <sup>a</sup>	4.13 <sup>b</sup>	4.44 <sup>b</sup>
Time spent milking *	4.00	3.89	4.02
Physical comfort of milker*	4.71	4.05	4.30
Milk quality *	3.71	3.74	3.62
Cleanliness and ease of setup *	4.14	3.85	3.88
Safety of operator *	4.14	3.85	3.88
Cost per milking unit	\$17268 <sup>a</sup>	\$8944 <sup>b</sup>	\$13201 <sup>a</sup>

## Animal Management Practices

A primary objective of this survey was to determine user satisfaction with different animal restraint systems (Table 16). Both self-locking manger stalls and palpation rails received high ratings for ease of use, comfort of worker, and labor efficiency. Only a few herds (27) reported only using palpation rails, whereas, 102 herds reported using only self locks to handle their animals. The only satisfaction difference was relating to initial cost.

**Table 16. Animal Restraint Systems Factors**

	Self-locking manger stalls	Palpation rails
Herds, no.	102	27
1998 median herd size	349	276
1998 RHA milk, lbs.	22,962	23,244
Change in RHA	1787	1954
Cows per FTE	45	44
Feed intake *	4.38	4.31
Initial Cost *	3.71 <sup>b</sup>	4.73 <sup>a</sup>
Ease of use/comfort of worker *	4.52	4.42
Labor efficiency *	4.51	4.38
Worker safety *	4.40	4.54

<sup>a,b,c,d</sup> Means within rows with different superscripts differ ( $P < 0.05$ ).

\*Average satisfaction reported on a scale from 1 (very dissatisfied) to 5 (very satisfied).

Table 17 shows the production and user satisfaction with calving cows in individual pens or on a group calving bedding pack. The only significant producer perception difference was an advantage for calf health using individual pens. The overall labor efficiency dairy farms, as defined by cows per FTE, was higher for herds using group calving (40 vs. 46 cows/FTE).

**Table 17. Maternity Area Satisfaction**

	Individual calving pens	Group calving on bedding pack
Herds, no.	80	105
1998 median herd size	200	245
1998 RHA milk, lbs.	22784	22701
Change in RHA milk	2039	1938
Cows per FTE	40 <sup>b</sup>	46 <sup>a</sup>
Cow health *	3.93	3.69
Calf health *	4.04 <sup>a</sup>	3.60 <sup>b</sup>
Labor use *	3.83	3.63

<sup>a,b,c,d</sup> Means within rows with different superscripts differ ( $P < 0.05$ ).

\*Average satisfaction reported on a scale from 1 (very dissatisfied) to 5 (very satisfied).

Table 18 shows the percentage of herds using individual pens or group calving on bedding pack to freshen animals. Herds with 106 to 145 cows seem to be most likely to use individual calving pens and the use of a group calving area to freshen cows seems to increase with herd size.

**Table 18. Maternity Area by Herd Size \***

Maternity area type	60 to 105	106 to 145	146 to 220	221 to 360	>360
Individual calving pens	33%	48%	33%	34%	35%
Group calving on bedding pack	19%	33%	50%	53%	70%

\* Includes herds which selected having “most” or “all” animals calve in a particular location.

Table 19 demonstrates that as herds become larger they appear to utilize custom heifer raisers more to rear their replacements. Twenty nine percent of herds larger than 360 cows have most or all of their heifers custom raised while only 7% of herds with 60 to 105 cows use custom heifer raising to this degree.

**Table 19. Custom Heifer Raising by Herd Size**

Amount	60 to 105	106 to 145	146 to 220	221 to 360	>360
Most or All	7%	22%	28%	28%	29%

As herds expand, they must determine how additional animals will be obtained. Table 20 shows that most expanding herds purchased heifers before they calved (66%) or bought mature animals (63%). The practice of buying heifers “after they have calved” is interesting to note since 21% of producers reported using this practice.

**Table 20. Type of Animals Purchased**

Where did the additional animals come from?	No. Herds	%
Bought bred heifers before they calved	198	66%
Bought mature animals	188	63%
Grew from within	145	48%
Bought bred heifers which had recently calved	64	21%
Bought calves/heifers and raised them	50	17%

Bio-security measures taken to prevent disease introduction by purchased animals is shown in Table 21. It appears that most producers are visually inspecting the animals (91%), vaccinated their existing herd (67%) and vaccinated incoming cattle (51% after and 49% before movement) while fewer producers are isolating (27%) and blood testing (21%) incoming animals.

**Table 21. Biosecurity Practices Used**

What practices were used to minimize health problems with new animals?	No. Herds	%
Visually inspected animals before purchase	238	91%
Increased level of vaccination in existing herd	177	67%
Vaccinated incoming cattle after moving them	134	51%
Vaccinated incoming cattle before moving them	129	49%
Examined individual somatic cell count records	110	42%
Isolated animals after moving them	72	27%
Examined individual cow health records	67	26%
Blood tested animals before purchase	56	21%
Did bulk tank cultures before purchase	39	15%

Table 22 shows the average 1998 DHI RHA milk production for herds milking two times or three times per day and herds reporting using or not using bST in their herd. Sixty eight percent of the herds in the survey reported using bST on an average of 58% of the milking herd. Average milk production is highest for herds milked 3x and use bST and lowest for herds milked 2x and not using bST. The differences shown imply a 12.8 to 14.3% increase from 3x milking and a 9.8 to 11.3% increase from the use of bST, with an additive effect of about 24.1% for both practices.

**Table 22. Milking Frequency and BST use.**

RHA Milk	2x	3x	2x-3x Difference
No bST	19,830 <sup>c</sup>	22,672 <sup>ab</sup>	+2842 (+14.3%)
bST	22,078 <sup>b</sup>	24,607 <sup>a</sup>	+2529 (+12.8%)
bST Difference	+2248 (+11.3%)	+1935 (+9.8%)	+4777 (+24.1%)

In this survey, 42% of producers indicate using a bull in their breeding program. Table 23 shows production and reproductive performance of herds based on their level of AI use. 1998 DHI milk production was significantly higher for herds using all or mostly AI than herds using mostly natural service. Herds using all or mostly natural service had significantly larger changes in milk production averages between 1994 and 1998. Calving interval is significantly lower for herds using all natural service than herds using mostly or all AI. Care should be exercised when reviewing these data since such a small number of the herds use a high percentage of natural service compared to those using a high percentage AI. As a generalization the numbers do tend to indicate higher production levels for herds using mostly AI and some reproductive advantages to herds using natural service.

**Table 23. Herd Performance by Level of AI Use**

	Level of AI Use			
	All natural	Mostly natural	Mostly AI	All AI
Herds, no.	14	12	71	143
1998 median herd size	222	186	349	206
1994 median herd size	67	80	90	76
1998 RHA milk, lbs	21319 <sup>ab</sup>	19677 <sup>b</sup>	22069 <sup>a</sup>	22075 <sup>a</sup>
1994 RHA milk, lbs	18329 <sup>b</sup>	17931 <sup>b</sup>	20462 <sup>a</sup>	20245 <sup>a</sup>
Change in RHA	3088 <sup>a</sup>	1746 <sup>ab</sup>	1607 <sup>b</sup>	1868 <sup>b</sup>
Calving interval, months	13.0 <sup>b</sup>	13.7 <sup>ab</sup>	13.9 <sup>a</sup>	13.7 <sup>a</sup>
Days open	122 <sup>b</sup>	129 <sup>ab</sup>	144 <sup>a</sup>	136 <sup>ab</sup>
Days dry	59 <sup>ab</sup>	65 <sup>a</sup>	64 <sup>a</sup>	60 <sup>b</sup>

## Labor

This survey shows an increasing number of full-time (1.29 to 6.89) and part-time (1.48 to 4.85) hired employees with increasing herd size (Table 24). However, there no significant difference between herds concerning hours worked per week per person (46 to 52). Farms with larger herds appear to be achieving better labor efficiency since yearly hours per cow decreases from 111 for smaller herds to 56 for larger herds and cows per full time equivalent increased from 27 to 51 cows. Herds with 221 to 360 and greater than 360 cows had significantly higher cows per FTE and lower yearly hours per cow than other size groups. Part of the difference in the overall labor efficiency of farms may be caused by the amount of cropping done by each group. The average acres per cow for each group shows significantly less acres per cow for larger herds. Although this may be a factor in the difference in overall labor efficiency it is doubtful that it explains the large differences found.

An analysis of producer satisfaction questions showed that owners of larger herds felt they and their family spent less time doing farm work and more time hiring, training and managing employees. Larger herds were more satisfied with their ability to find good farm employees, training and supervising them. They were also happier with their ability to get the necessary farm work done.

**Table 24. Labor Usage**

<i>Labor Related Factors</i>	<i>60 to 105</i>	<i>106 to 145</i>	<i>146 to 220</i>	<i>221 to 360</i>	<i>&gt; 360</i>
Number Family Members	2.93 (N=61)	3.10 (N=62)	3.20 (N=59)	3.28 (N=60)	3.52 (N=58)
Number Full-time Employees	1.29 (N=7)	1.38 (N=29)	2.03 (N=36)	2.62 (N=47)	6.89 (N=55)
Number Part-time Employees	1.48 (N=23)	1.84 (N=38)	2.91 (N=40)	3.18 (N=50)	4.85 (N=47)
Total Hours per Person per week	52	48	46	46	48
Yearly Hours per Cow	111 <sup>a</sup>	84 <sup>b</sup>	72 <sup>c</sup>	60 <sup>d</sup>	56 <sup>d</sup>
Cows per Full Time Equivalent	27 <sup>c</sup>	34 <sup>b</sup>	40 <sup>b</sup>	49 <sup>a</sup>	51 <sup>a</sup>
Acres per cow	3.3 <sup>a</sup>	3.3 <sup>a</sup>	2.6 <sup>b</sup>	2.6 <sup>b</sup>	2.3 <sup>b</sup>

Table 25 shows the average wages reported by survey respondents for different employee classifications. Full time herd managers were the highest paid employees. For employees paid on a monthly basis, full-time non-milkers were the next highest paid followed by full-time milkers, other part-time workers, and part-time milkers. For employees paid on a hourly basis, full-time milkers were the next highest paid followed by full-time non-milkers, part-time milkers, and other part-time employees. Managers tended to be paid monthly salaries rather than hourly like other job classifications. Established employees received higher wages than new employees.

**Table 25. Average Wages**

	New Employees				Established Employees			
	\$/hr	N	\$/mo	N	\$/hr	N	\$/mo	N
Managers (full time)	\$8.48	22	\$2275	34	\$10.58	21	\$2307	54
Non-milkers (full time)	\$7.18	76	\$1762	21	\$8.53	77	\$2019	27
Milkers (full time)	\$7.32	131	\$1596	16	\$8.87	132	\$1779	29
Milkers (part time)	\$6.80	162	\$750	4	\$7.96	147	\$984	8
Other (part time)	\$6.37	113	\$963	4	\$7.59	104	\$950	4

Table 26 shows the types and frequencies of benefits provided to employees of surveyed herds. The most common benefits are paid vacations and health insurance.

**Table 26. Employee Benefits**

Benefits provided to full-time employees	Number Herds
Paid vacation time	144
Health Insurance	143
Milk or Meat	107
Housing	89
Other	38
Profit-sharing	24
Allow employee owned animals in herd	20
Retirement Plan	19
Share of calves born	7

## Expansion

Table 27 shows the response frequency of survey respondents when asked their most important reason for expansion. The most frequent response was to increase their farms profitability. The other responses are listed below. It is interesting that 34% of the herds expanded to allow a family member to join the operation. This is a large percentage considering the fact that many families do not have family members at a career decision age.

**Table 27. Reasons for Expansion**

Why did you decide to expand your herd? *	No. Herds	%
To increase our farm's profitability	265	89%
To improve labor efficiency	217	73%
To improve physical working conditions for operators	207	69%
To get time away from the farm (by allowing us to bring in more hired help)	181	61%
To allow a family member to join the operation	103	34%
Other	52	17%

\*Percentages do not add up to 100% because multiple answers could be selected

Table 28 shows the response to the question posed to respondents, if another producer asked you about your expansion project, "Knowing what you know now, would you do it again, how would you respond?" This question was overwhelmingly answered in the positive. All but 6% of the respondents would do it again. Of them, 66% would do it the same way and over half would do it quicker and/or bigger.

**Table 28. Satisfaction with Expansion Choice**

If another producer asked you about your expansion project, "knowing what you know now, would you do it again?". How would you respond?	Number of Herds	% of Herds
<b>Answer given:</b>		
Yes, the same way	148	51%
Yes, only quicker	84	29%
Yes, only bigger	66	23%
Yes, but slower	17	6%
No	16	6%

## Producer Comments

The survey was designed to collect categorical and numerical data that could be analyzed. However, the “comments” section of the survey has proven to be very interesting. This comments area allowed the user to write anything felt to be of importance. Comments were manually arranged by categories. When respondents wrote about more than one topic, their comments were placed in multiple categories. Below, you can see the top responses to those questions with the number of respondents for each category listed in parenthesis. Almost all of the advice given has to do with the planning process. Defining family goals, using of outside consultants and keeping an open mind are underlying messages from those that have been through the process.

**Table 29. Advice on Expansion**

<b>Based on what you learned what advice would you give others considering expansion?</b>	
Plan, Plan, Plan. Consider future needs. Research, do homework (N=53)	Importance of manure storage/handling (N=20)
Visit farms (N=35)	Employee management/labor issues (N=18)
Use consultants (N=29)	Hire reputable builders/contractors (N=12)
Importance of cash flow/loan availability/financial planning (N=27)	Focus on labor efficiency and profitability (N=12)
Take time/don't hurry/go slow (N=25)	Be open-minded/flexible/willing to change (N=12)
Take advice from farmers/consultants (N=23)	Importance of biosecurity/keeping vaccinations updated (N=10)
Know yourself, your family, your goals (N=20)	Become a people manager rather than a cow manager (N=8)

Table 30 contains the responses producers volunteered when asked to look back and tell about their “best” and “worst” choices. Switching to a milking parlor and freestall facility is obviously the best choice of the majority and their choice of manure handling was the worst of the worsts. These comments seem to echo previous results discussed in that producers perceive sand bedding to be superior for cow comfort, but realize it complicates manure handling.

**Table 30. Indicate the best and worst expansion choices you made.**

<b>Best Expansion Choice</b>	<b>Worst Expansion Choice</b>
Switching to parlor/change to new parlor/efficiency of parlor (N=80)	Manure handling (N=41)
Switching to freestalls/building new freestall barn (N=68)	Not hiring contractor/contractor performance (N=17)
Sand (N=36)	Loans/cost overruns (N=13)
TMR/feeding convenience (N=27)	Disease introduction (N=10)
Employee relations/labor efficiency/working conditions (N=24)	Facility design-curtains, sidewall, ventilation, size, etc. (N=10)
Economics/profitability/cash flow/loans (N=21)	Planning/timing problems (N=8)
Family time/time off (N=19)	Building without future in mind (N=8)

Table 31 contains selected producer comments that were volunteered by producers on the survey form and summarized by common themes.

## **Table 31: Selected Producer Comments Expressing Common Themes**

### **General**

- You learn more with your ears open and mouth shut.
- Be positive always, but also temper that with realism and common sense.
- Goal setting and communication amongst partners is critical.

### **Visiting Other Farms**

- Take your video camera, notepad, and tape measure. Talk to the people who work on the dairy.
- When visiting other operations, ask, “What would you do differently?”

### **Planning**

- Plan, plan, plan.
- Really go slow. See other setups. Ask how they adapted.
- Plan before you break ground. Look to the future. Don't limit your options.

### **Consultants**

- Surround yourself with a team of experts and listen to them. Invest money in sound advice.
- Don't believe everything a consultant tells you. After it is all done, it is your farm, not theirs, so the decisions need to make sense to you.

### **Employees**

- You will be a people not a cow manager.
- Listen to your help, they usually have valuable ideas.
- Create safe and happy working conditions.
- Have systems, SOP (Standard Operating Procedures), employee policies in place.
- Take management classes to learn how to manage people.

### **Economics**

- Don't cut corners on cost if quality is important.
- Figure an additional 25% cost when budgeting your first year's startup cost.
- Do a financial analysis and long-range planning.
- Don't forget about replacements of expansion cattle that you need for 2 years.

### **Cows**

- Stay on good vaccination program.
- Buy heifers for replacements, not cows.
- Cow comfort (treat a cow like you treat yourself).
- Cash flow consideration-good cows that are managed well will pay you back.

### **Facilities**

- Manure storage and removal is a priority.
- Study suitability of site very hard first-don't be afraid to move.
- Don't overspend on fancy buildings and equipment.
- Avoid winter construction.