Planning a Milking Center

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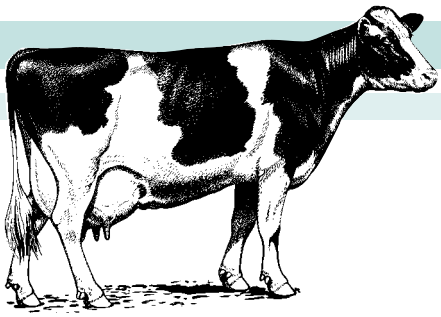

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The milking center is approximately one-third to one-half the total cost of dairy cattle housing. Therefore, its design, type, size, and degree of mechanization is important. This guide discusses factors important in planning present and future expansion.

Number of Cows

A milking parlor has a life expectancy of 10 to 20 years. Therefore, consider not only the present number of cows, but also the total herd size for the next 10 to 20 years. If future herd expansion will be completed within five years, it is usually more economical to design the expansion into the parlor when it is constructed.

Total Hours of Use and Milking Frequency

A milking parlor sized for use only 4 to 5 hours a day will be more expensive to build per cow than if the parlor operates 18 to 20 hours per day. For example, a 250-cow dairy, milking two times a day, could be milked in a double-4 herringbone parlor in a 6-hour shift, or milked in a double-10 herringbone in a 3-hour shift. The cost of a double-4 is approximately $90,000, while a double-10 is $180,000. Fewer hours of use may be desirable if farm personnel also have other duties, such as crop production, feeding, animal health, and raising replacements. The milking parlor can be used 20 to 21 hours a day to milk cows. Allow time to milk fresh cows and hospital cows, if a hospital barn is not available. Plan total milking time to accommodate present needs and future expansion; it is much easier to plan for future expansion versus remodeling an existing barn.

Number of Operators

The number of operators may be influenced by the availability of personnel or the pre-milking hygiene routine management desires. Most small herringbone parlors D-4 to D-8, and even a few D-12 to D-16, are operated by one operator. One-person parlors are more efficient in the number of cows per labor hour. The disadvantage of one-operator parlors is the milking has to stop between groups of cows to allow for group change.

Two-or-more-operator parlors have the advantage of continuous operation even during group change, when one operator is late for the milking shift, or when a short emergency requires one operator to leave the parlor. The disadvantage is that it is more difficult for the owner to assess poor operator performance or quality standards, and the number of cows per labor hour will be less.

Personal Preference

Dairy owners usually have a personal preference for a certain parlor type. Many times this personal preference conflicts with the number of cows to be milked, length of the milking shift, and financial resources. Dairy producers should visit as many types of parlors as possible and make a final decision after having an opportunity to

review all types, not just the oldest or newest.

When visiting different types of parlors, plan sufficient time for evaluating equipment, cow comfort, operator comfort, and safety. When evaluating a parlor type or equipment, keep in mind that proper milking procedures can be practiced regardless of the parlor type.

Milking Parlor Types and Performance

Milking parlors are available in various types and sizes. Parlor type influences building size, cow traffic to and from the parlor, milking routines, and degree of mechanization. With proper management, good milking procedures can be practiced regardless of parlor type or size.

Side-Open Parlor

Side-open parlors are also referred to as diagonal and tandem parlors. They have been used for over 60 years, and before the introduction of the herringbone stall, they were the most popular elevated milking stall. Many early side-open parlors were designed with a single row. In the past 20 years, however, the preferred design has been a double row, which allows an operator to use more stalls with less travel.

Cows enter and exit the stalls individually, so the slow-milking cow does not delay milking of other cows. On dairy farms that have only one group of milking cows and where there is a great variation in milk production within the group, the side-open parlor is often the parlor of choice.

Mechanizations commonly used in side-open parlors are power entrance and exit gates and detachers. Grain feeding is more common in side-opening parlors, which have single-cow movement, than in herringbone and parallel parlors, which have group cow movement. Crowd gates also will help with cow movement from the holding pen to the milking stall. Because the distance between cows varies from 8 feet 6 inches to 9 feet 8 inches, the number of stalls in a side-open parlor is limited to 4 to 8 for one operator, or 8 to 12 for two operators.

Over the past several years, efforts have been made to mechanize cow entry from the holding pen to the milking stall. When the detacher is removed from a cow in the milking stall, the exit gate opens and electric eyes or proximity switches indicate when the cow has exited the stall. Their signal closes the exit gate, opens the entry gate, and opens the gate in the holding pen, allowing the next cow to enter the empty stall. The operator then goes to the stall and attaches the unit.

In Europe, pre-milking hygiene is minimal with cows on pasture; pre-dip, wiping, and stripping are not practiced on the majority of herds. Therefore, the pre-milking hygiene is reduced or, in some cases, completely eliminated. Post-milking spray is also done in the return lane, thus eliminating the need for the operator to go to the cow at the end of the milking. Therefore, the number of cows milked per hour in side-open parlors will be greater under European conditions than under U.S. conditions. This discrepancy holds true also for herringbone, parallel, and rotary parlors.

Presently, there are only a few auto-tandem parlors in the U.S. in herds over 300 cows. Unless U.S. dairy producers adopt the same minimal pre-milking hygiene routines and automate the post-spray in the return lanes, parlor performance in the U.S. will be less than milking machine companies advertise, as they base parlor perfor-

Table 1. Cow throughput in cows per hour[a] for side-opening parlors under good management (typical U.S. pre-milking hygiene). Mechanization: power-operated entrance and exit gates, crowd gates, and detachers.

	Mechanization	Number of operators	Slow operator (cows/hr)	Efficient operator (cows/hr)
D-2	None	1	25	35
D-2	Partial	1	40	50
D-3	None	2	50	63
D-3	Partial	2	50	63
D-4	None	2	56	70
D-4	Partial	2	65	76
D-4	Auto-tandem	1	52	65
D-5	None	2	62	76
D-5	Partial	2	71	82
D-5	Auto-tandem	1	60	75
D-6	Partial	2	75	90

[a]Steady state throughput; parlor set-up, clean-up, and group change not included.

mance information on European practices. Table 1 summarizes some limited data on auto-tandem parlors in herds over 300 cows, with herd average milk production between 22,000 to 26,000 pounds of milk per year. The average number of cows per stall per hour was 6.3 to 6.5.

Rotary Parlors

Three types of rotary parlors are used in the U.S. The rotary tandem is based largely on European design. *The rotating herringbone* is originally a Russian concept, with significant engineering design changes from sources in Australia, New Zealand, and Europe. The *turnstile* design was developed in New Zealand. Dairy producers in the U.S. showed greatest interest in rotary parlors during the early 1970s; by 1980, approximately 175 rotary parlors had been constructed and were being used on U.S. dairy farms.

The majority of rotary parlor installations in the 1970s were imported rotary platforms, some complete with milking equipment and with very few adaptations for typical U.S. milking procedures. Annual maintenance costs were higher than for other milking systems, such as herringbone and side-opening parlors. The major reason for the higher maintenance cost was that U.S. cows and milking procedures put more stress on the equipment than it was designed for. The body weight of U.S. cows is higher than European cows, causing more problems with platform wear, welds, support wheels, and bearings; also, U.S. producers use the parlors longer on a daily basis, causing additional stress.

The performance of U.S. rotary parlors is usually less efficient than European, Australian, or New Zealand parlors. The major reasons for this difference are: (1) higher milk production in the U.S., which requires a larger platform or more rotation time, and; (2) pre-milking hygiene in the U.S. is more complex. For example, in New Zealand a 28-stall rotary parlor would be operated by two operators, one stripping and attaching the unit and the second detaching and post-dipping. This is a common routine with cows coming from pasture management systems. The platform rotates at 15 seconds per stall, or 240 cows per hour with a 7-minute rotation. Under U.S. housing conditions, a full pre-milking hygiene routine of pre-strip, dry wipe, and attach would either require slowing the platform to 30 seconds per cow (120 cows per hour), or having two operators at the entrance for cow preparation, for a total of three operators.

In the past few years, several new rotary designs such as the *floating concrete platform* have been installed, reducing annual maintenance costs. These units hold 20 to 30 stalls for two operators or 40 to 50 stalls for three or more operators. Cow throughput information based upon parlor performance data gathered in the 1970s and again in 1991 to 1993 is presented in Table 2.

Herringbone Parlors

Herringbone parlors vary in size from double-4 to double-30. In herringbone parlors, cows are handled in groups. The distance between udders is 38 to 45 inches per cow, thus reducing operator walking distance and overall parlor length compared to side-opening parlors.

Polygon and *trigon* parlors are configurations of multi-sided parlors using herringbone stalls. A considerable number have been built since the 1970s. The trigon, a three-sided herringbone with 12 to 24 stalls, is more efficient than double-row herringbone parlors with standard exit and the same number of stalls. Polygon parlors are 4-sided parlors with 16 to 40 herringbone stalls and are used in large herds. Like the trigon, polygon parlors are more efficient than double-row herringbone parlors with standard exit and the same number of stalls. With the development of *rapid-exit* herringbone parlors in the late 1980s, fewer trigons and polygons were built.

The majority of herringbone parlors larger than double-8 are equipped with rapid-exit stalls. The rapid-exit stall was designed to increase parlor efficiency by releasing all cows from one side of the parlor simultaneously in a direction perpendicular to the entrance lane, thus decreasing operator time to release and exit cows. Time and motion data on rapid-exit

Table 2. Cow throughput in cows per hour[a] rotary parlors under good management (U.S. conditions). Mechanization: power-operated entrance and exit gates, crowd gates, and detachers.

Parlor size and type	Number of operators	Cows per hour[a]
8-stall tandem[b]	1	58
17-stall turnstile[b]	2	96
13-stall herringbone[b]	2	69
20-stall tandem[b]	3	118
24-stall turnstile[c]	2.5	145
26-stall turnstile[c]	2	180
40-stall herringbone[c]	3	194-205
48-stall herringbone[c]	3	190

[a]Steady state throughput; parlor set-up, clean-up, and group change not included.
[b]Bickert and Armstrong 1977.
[c]Armstrong 1992.

parlors indicate that rapid-exit herringbone parlors reduce exit time and increase milking parlor efficiency when compared to standard-exit parlors (Table 3).

Table 3. Cow throughput (cows per hour)[a] for herringbone parlors under good management.[b] Equipment: power-operated gates, crowd gates, and detachers.

Parlor size	No. of operators	Standard-exit (cows/hr)	Rapid-exit (cows/hr)
Double-10	1	49-92	60-101
Double-12	2	84-115	92-124
Double-12	1	——	88-110
Double-16	2	96-127	104-151
Double-16	1	——	123-128
Double-20	2	130-163	145-180
Double-20	3	——	136-192
Double-24	2	——	170-205

[a]Steady state throughput; parlor set-up, clean-up, and group change not included.
[b]Source: Armstrong 1988.

Table 4. Cow throughput in cows per hour[a] for parallel parlors under good management. Mechanization: power-operated entrance and exit gates, crowd gates, and detachers.

Parlor size	No. of operators	Range (cows/hr)
D-10	1	84-91
D-12	1	72-106
D-14	1	110-121
D-16b	2	108-161
D-20	1	122-128
D-20	2	155-215
D-20b	3	170-243
D-24	2	143-235
D-25	2	175-240
D-30	3	268-274
D-35	3	306-378
D-40	4	296-401

[a]Steady state throughput; parlor set-up, clean-up, and group change not included.
[b]No detachers.

Parallel Parlors

In 1980, a dairy producer in Marengo, Ohio, (Mason Farms Ltd.) built the first parallel parlor in the U.S. Since then, several versions have been built and marketed throughout the U.S. Most major dairy equipment manufacturers offer parallel stall options.

The steady state throughput performance of parallel parlors is listed in Table 4. Milk production in these parlors averaged 66 pounds per cow per day. The average number of turn-arounds per hour was 4.2.

Comparison of Parallel and Herringbone Parlor Performance. Table 5 compares standardized steady state throughput data for parallel and herringbone parlors. Note that the parallel parlor system has a shorter entry time, a time that improves with a wider entry lane and shorter walking distances. Parallel parlors have a cow entry lane width of 38 inches or more, while herringbone stall entrance widths vary from 27 to 35 inches. Also, removing the grates speeds cow entry.

Stall units, or distances between udder centers, measure only 25 to 29 inches in a parallel parlor configuration (as compared to 38 to 45 inches in the herringbone), reducing walking distance by as much as 35 percent. Times for routines, such as udder preparation, attachment, and post-milking spray or dip are, therefore, lower. When added together, these time savings indicate a 4 percent advantage for parallel parlors over herringbone parlors with the same number of stalls.

The difference in performance between herringbone and parallel parlors is very small in parlors with less than 20 stalls per side, but the difference becomes significant in parlors with more than 20 stalls per side. The most substantial performance improvement in the parallel parlor can be achieved by adding more stalls to reduce operator idle / waiting time.

Parabone Parlors

Parabone parlor is a term usually given to a herringbone parlor with cows located

Table 5. Standardized steady state throughputs and routine times for double-20 herringbone and parallel parlors with two operators, rapid-exit, detachers, crowd gate, and three times milking.

Routine	Double-20 herringbone (sec/cow)	Double-20 parallel (sec/cow)
Cow entry	4.8	3.6
Udder dry and prep	10.5	8.7
Attach milking machine	12.4	9.5
Re-adjust and re-attach	1.5	0.5
Post-milking spray or dip	4.0	3.5
Cow exit	0.4	0.4
Idle / waiting time	6.4 (16%)[a]	12.3 (32%)[a]
Total routine, sec / cow	40.0	38.5
Parlor performance, cow / hr	180	187
Cows / labor hour	90	93.5

[a]Percent of total time.

at less than 37 inches per cow, typically 30 to 34 inches apart. Herringbone parlors have been converted to parabones successfully, increasing cow capacity without building a new milking parlor. Preliminary throughput data indicates that parabone parlor performance is similar to that of parallel parlors, with performance influenced by stall design (either rapid- or standard-exit) and pre-milking hygiene routine.

Performance of Renovated versus New Parlors

Many early parallel and parabone parlors were built to fit into existing herringbone milking parlors. These conversions expanded parlor capacity and improved efficiency. Table 6 illustrates the performance differences in barns renovated to parallel designs versus newly constructed parallel parlors. Steady state throughput is 10 to 12 percent higher in new versus renovated parlors; the major reason for the lower throughput in renovated barns is inadequate cow exit space, which increases cow exit time.

For rapid-exit parlors, the distance from the stall to the wall should be 8 to 14 feet, depending upon the number of stalls in the parlor.

Comparative Data on Some Factors Affecting Parlor Performance

Milking Frequency

Data has been collected on a large number of dairies milking both two and three times per day. Two examples of how parlor performance is affected by milking frequency are illustrated in Table 7. In this case, steady state throughput is 8 to 10 percent faster when cows are milked three versus two times per day.

Detachers

Automatic detachers are often utilized to reduce labor cost in parlors; however, if the number of operators remains the same, detachers have little effect on steady state throughput (Table 8). Automatic detachers may still be a viable option if the number of operators can be reduced, saving labor costs.

Wash Pens

Although it is not common in colder climates, dairy producers in the southwestern U.S. commonly wash cows in a pen prior to milking. Using a wash pen increases steady state throughput 8 to 21 percent, depending on parlor size and cow cleanliness. Three examples of parlors with and without wash pens are illustrated in Table 9.

Number of Operators

The number of operators for a particular parlor size can vary between dairies due to milking procedure differences or facility limitations. The number of operators can have a drastic influence on average number of cows per labor hour. These differences are exhibited in Table 10. The average number of cows per labor hour is reduced by approximately 30 cows using four operators versus using one operator in parallel milking parlors.

Pre-Milking Hygiene

The use of a pre-dip milking hygiene reduces parlor performance 15 to 20 percent, because the milker has to make two additional passes. The effect of pre-dip milking hygiene is illustrated in Table 11.

Cleanliness

A defecation and urination study was conducted in herringbone and parallel parlors (without grain) in an effort to compare parallel and herringbone parlor cleanliness. Table 12 summarizes data that indicates there usually is less defecation and urination in parallel parlors.

Table 6. Effect of parallel parlor construction on throughput (cows per hour).[a]

Type of construction	Double-12 (cows/hr)	Double-20 (cows/hr)
Renovation	93	161
New construction	104	187

[a]All parlor comparisons are with the same mechanization and number of operators.

Table 7. Effect of daily milking frequency on throughput (cows per hour) in parallel parlors.[a]

	Double-20	Double-30
2×	179	260
3×	195 (8%)b	290 (10%)[b]

[a]All parlor comparisons are with the same mechanization and number of operators.
[b]Percent increase over 2 times milking.

Table 8. Effect of detachers versus no detachers on cows per hour in parallel parlors.[a]

	Detachers (cows/hr)	No. Detachers (cows/hr)
Double-16	146	157
Double-20	180	178

[a]All parlors with the same number of operators.

Table 9. Effect of no wash pen versus wash pen on cows per hour in parallel parlors.[a]

	Double-12 (cows/hr)	Double-16 (cows/hr)	Double-20 (cows/hr)
No wash pen	88.0	149.0	160.0
Wash pen	96.0 (9%)[b]	161.0 (8%)[b]	195.0 (21%)[b]

[a]All parlor comparisons are with the same mechanization and number of operators.
[b]Percent increase over no wash pen.

Factors Affecting Parlor Performance

Cow Entrance

Feeding grain in the milking parlor can reduce entrance time. However, it only takes one or two cows that consistently stop during entrance or exit to eat from a feed bowl in the middle of the parlor to destroy this advantage. Feed bowl covers can encourage cows to move forward before stopping, but the trend is still away from grain feeding in the parlor. The advantage to grain feeding upon entry time decreases as cows are trained that grain is not available.

Opening and closing gates consumes part of entry and exit time. Power gates with controls at either end of the parlor can speed the milker's job by eliminating the need for milkers to walk to each end to open or close gates manually.

Size and layout of the holding area affects cow entry time. Holding pens should be sized with 12 to 15 square feet per cow for the largest group. Holding times of more than two hours must be avoided in today's higher producing herds. Holding cows a maximum one hour per milking will benefit herds milked three times daily. Cows should enter the parlor straight ahead. Turning should occur only during exiting. The holding pen should be as open to the parlor as regulations allow, with good lighting between the pen and the parlor. Crowd gates improve cow entry about 10 percent and improve overall throughput by about 5 percent. The gates also improve employee satisfaction and will speed up entrance of first-lactation strings. Cows should learn to enter the parlor without coaxing. Finally, holding-pen washing reduces cow cleaning in the parlor. An ideal holding pen would include a separate wash pen and drip pen with crowd gate, with each sized for the group.

Table 10. Number of operators and cows per labor hour in parallel parlors.

No. of operators	Avg. No. of cows/labor hour	Range (cows/labor hour)
1	102.6	64-128
2	82.0	45-123
3	83.9	63-110
4	73.1	63-90

Table 11. Parallel parlor performance with and without pre-dip milking hygiene.

Parlor size	No. of operators	Pre-dip (cows/hr)	No Pre-dip (cows/hr)
Double-20	3	207	243
Double-24	2	203	235

Table 12. Defecation and urination rates for herringbone and parallel parlors with no grain.

Parlor type	Incidence of defecation and urination
Herringbone	1.5-3.5%
Parallel	0.5-1.7%

Cow Washing and Preparation

Dirty cows increase prep time an average of 16 seconds per cow, which can lead to a 20 percent difference in parlor throughput. Stall and lot management is critical to parlor performance. Holding pen washing helps when management cannot, but cows must be dry when the milking machine goes on for long-term udder health. A full-sized drip pen allows to air dry and reduces further drying in the parlor. Most herds with pen washing and adequate drip facilities allow for immediate pre-dipping or stripping of cows on entry.

Clipping hair on udders on each fresh cow makes drying udders easier and reduces the opportunity for mud and manure to build up on the udder. Burning off hair with a broad flame from a small propane burner works well with minimal discomfort to the cow. Tail docking or switch trimming is beneficial in free-stall barns with flush manure systems and in parallel milking systems.

When the first cow enters a parlor, the milker should follow the cow to the front and begin prepping her. Other cows will follow. Waiting for all cows on a side to be in before prepping adds to entry time and increases the time to attach all units on a side.

Milking Time

Employees tend to milk as fast as necessary. In a two-hour milking, milkers do not feel as much pressure to milk quickly as when you have an eight-hour shift followed by another milking crew. You may want cows milked and cared for completely in the parlor, rather than going for maximum throughput. However, switching to 3 times milking or adding cows may increase "parlor pressure."

Unit Adjustment or Re-attach Time

Unit adjustment and re-attach times are mainly a function of milking unit support, performance of teat cup inflations, vacuum supply, and so on. The position of the milking unit and hoses appears to have some effect, too. Parallel parlors, where the milk hose and pulsator tube pass between the rear legs, require less adjustment and re-attach time compared

to herringbone parlors (0.5 seconds per cow compared to 1.5 seconds per cow). While machine positioning is not as easy in parallels, the improvement comes from reduced cow movement and their inability to step on the side of the unit or the milk hose.

Teat cup extenders can prevent slippage and fall-off on wide-uddered cows. But, the milker trades unit set-up time for adjustment time. Teat cup extenders are advisable for udder health and proper milking of pendulous udders.

Machine stripping cows can add 20 percent to milking time if done on every cow. Cows can be trained to be machine stripped. Machine-stripping adds little to milk in the tank, so it should be a "hands off" procedure except for a problem cow or two.

Idle Time

"Idle time" is the time spent on activities, such as washing boots or hands, restocking towels, and trimming a milk hose. Some milkers "make" idle time—they wash their hands when there are units to attach, teats to dip, and so on. Speeding up parlor performance for these employees is a matter of employee management. In other cases, there are periods when there is nothing to do in the milking routine. To reduce this idle time, simply add milking units.

Exit Time

In barns with stationary front stalls, feed bowl covers are helpful so cows cannot continue eating or only eat small amounts from several bowls as they walk out. Shortening the walking distance also helps, as in polygon or "pregnant" herringbone and parallel parlors.

Lighting in the exit alley should be bright and uniform. Cows do not like the contrast of crossing from a well-lit parlor platform to a dark exit alley. A rapid-exit lane of 8 feet is adequate for cows to move forward and turn toward the holding area. An alley that is too narrow won't allow cows' rumps to clear from under the elevated front of the stalls; alleys that are too wide allow cows to stand too comfortably without turning to leave the parlor.

There is always some socializing between cows in the holding pen and exit alleys. A solid fence near the front of the holding area will help cows start down the exit lane before stopping. The goal is to get cows started to the point that gates can be closed and milking can resume.

Considerations for Larger Parlors

Entry Time

Shortening the walking distance and loading fewer cows at one time can reduce entry time. The polygon herringbone loads at the end and midway on the side, which cuts the walking distance and the number of cows entering the parlor in half. However, the amount of time opening and closing gates doubles. Parallel parlors, in contrast, reduce walking distance over standard herringbones by nearly half with the same number of cows entering. Parallels also have a wider platform than herringbones and smaller or absent grates, both of which reduce entry time.

Grouping Cows

Grouping cows can improve parlor flow; segregating cows that take longer than 12 minutes to milk in a separate group can improve throughput on the remaining groups by 25 percent. As parlors get bigger, as in the case of a double-50 parallel, grouping by milking speed will become more important. Groups should also be sized for the parlor. If you have a double 20, cow groups should be in increments of 20 cows (80, 100, 120, and so on) to fill the side as the holding pen empties.

Milking Procedures

Batch or Territorial Milking. Batch milking is the "all in, all out" concept of milking. All cows enter, are prepped, and milked as a group or "turn." The entire turn of cows can only be milked as fast as the slowest milking cow in the group. Entrance time and idle time increase as employees load the parlor and then wait for the last cow to finish.

Territorial milking, where one employee milks the cows in the front of the parlor and seldom helps out the employee in the back "territory," can occur in multiple milker parlors. Entrance time for the milker nearest the holding pen will be high, as he or she waits for the entire side to load. Idle time occurs for the milker in the front of the parlor, as he or she must wait for the back cows to finish milking. Both batch and territorial milking techniques will slow parlor throughput by 20 to 30 percent. Avoid these practices.

Shift Milking. Employees in a milking parlor are the same as employees in any job; they take an hour to reach peak efficiency. Their efficiency slowly declines until about one hour before the end of the shift, when efficiency increases as job completion nears. There is good data that parlor performance will improve during an 8-hour shift, if employees break for 15 minutes in the middle of the shift. In parlors where more than one person is

working, one might take a break while others continue working. However, simultaneous milking breaks for all employees also improves cow care and parlor throughput over 8-hour shifts.

Number of People in the Parlor. Economics of milking say you need to milk the cows as fast as possible with the fewest number of milkers. If you mechanize the parlor, it should result in fewer milkers or faster cow flow. Producers are often faced with this decision: "Can I milk with one less person, or should I add stalls to keep everyone busy?" Many farmers cut one milker, leaving the remaining employee(s) overloaded—machines get dirty; teat dipping may be haphazard; cows are treated less gently. More farmers are learning that cutting an employee is a false economy. Instead, producers are hiring a roving employee who gets groups of cows into the holding pen, washes units between exit and entry, keeps the towel racks full, milks during breaks, and runs errands throughout milking. Rovers can be part-time workers paid minimum wage, so they can improve parlor performance and cow care at a low cost.

Some people work best alone; others work better together. Multiple people in the parlor can make training a new milker easier and can increase safety for employees, because there is always help available. However, problems can arise if responsibility for the milking is not clearly defined or personalities clash. The number of people in the parlor should be a decision based on the people working and the capabilities of your equipment. Larger parlors nearly always require multiple employees working as a team.

Safety. Worker safety will continue to be an important issue. Some states already charge sizable premiums for worker compensation insurance, so safety should be designed into milking facilities and trained into workers' routines. Parallel parlors offer some advantages in reducing injuries from cows. A higher platform (about 40 inches) can reduce stress on backs and shoulders. Think safety when making changes to a high performance parlor.

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