

The TRANS Iowa Low-Cost Milking Parlor Design

Transitioning Your Iowa Dairy for Future Profit and Quality of Life

The Iowa Dairy Industry is in a state of TRANSition to TRANSform the dairy industry. Making milking easier has long been a theme of ISU Dairy Extension in helping the dairy industry transition to a more labor efficient, profitable and physically healthy method of milking cows relative to stall barns or outdated parlors.

The intent of this paper is to relay to dairy producers and the industry which serves them the background and reasoning of the TRANS Iowa Milking Parlor design. Quite often, this design is labeled as an inferior concept relative to other milking parlors being installed in Iowa and understandably, buyer preferences are important in the purchase of any product. However, much of the inferiority image given to low-cost, remodeled parlors is often due to lack of knowledge with their function when properly designed, installed and operated. The goal is to make the parlor option available to every dairy operator's budget situation.

Improve Dairy Profits and Quality of Life

As Iowa dairy profits are analyzed, three things become very apparent in comparison to the rest of the country and many parts of the world. First, the labor efficiency in many current milking facilities whether measured on a per cow or per hundredweight measurement per person or per hour (or a combination such as cows or hundredweights per person per hour) is very low. Rather than milking in the 25-40 cows per person/hour range, the aim is to be able to milk in the 60-80 cows per person/hour range.

Second, the cost of milking a cow on a per hundredweight basis is often 30%-150% higher than other areas. The annual labor cost alone milking in a stall barn versus a well designed parlor could justify a \$10,000 to \$20,000 low-cost parlor expense with the labor savings realized in less than one year.

Third, physical strain of the operator's knees and back resulting in long term health problems is a critical area for dairy producers, especially those who milk in tie stall barns or outdated parlors. The goal is for producers to milk cows without bending knees, neck, back, etc so physical strain is reduced while using a properly positioned kick rail for milking safety.

So, improving dairy profits and quality of life is an interrelated issue of saving time through labor efficiency; saving health through ergonomic improvement; and saving profit by reducing the cost of milking cows.

Do a Dairy Facility Assessment

An "outside" set of eyes, like ISU Extension Dairy Specialists, can be valuable in helping to assess where you are at with where you want to get to and helping to provide a bridge of understanding for how to get there. Facility assessments are done considering your present buildings on the farm in addition to facilities to consider building to further meet your goals.

The ole' stall barn, the ole' herringbone or 'ole side opening parlor with too few and too small of stalls, shallow pits, gutter grates and is physically painful to milk in has more hope to be a labor efficient, low cost and ergonomically sound option than many could ever believe. However, it is also important to not be penny-wise but pound foolish if the long-term structural design would dictate building a new parlor/holding area from scratch.

Many stall barns can be retrofitted for a swing 10 parlor with holding area for 100-120 cows herds. Many herringbone or other parlors can be remodeled going from a double 6 to a swing 10. One Iowa herd remodeled their parlor in that fashion for \$2,000. Creativity and sweat equity are very valuable for those opportunities so one needs to get out and look what other producers are doing and/or ask ISU Extension to come to assess your facilities and milk remodeling opportunities for all their worth. Consider visiting the NE Iowa Dairy Grazing Center in Calmar, Iowa for a first hand look at this low-cost design. Photos and design basics are included on the next page.

ISU Fact Sheet LT-0601 by Larry Tranel, ISU Extension Dairy Field Specialist, NE Iowa, 2006.

Remodeling the 'Ole Dairy Barn

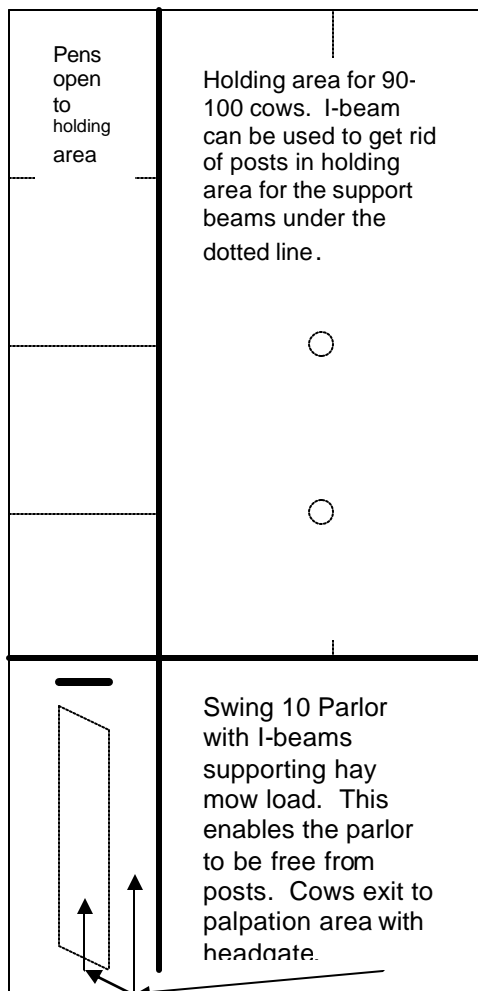
As herds move beyond 50 cows, the thought of a milking parlor should be taken seriously as the 2:1 labor efficiency of a parlor over a stall barn, along with the 3-5:1 improved efficiency of not feeding in a stall barn (TMR, pasture and/or component feeding) is noticeable. In addition, going from daily manure haul to even weekly or bi-weekly is often met with a 2:1 improvement in manure handling efficiency.

Most stall barns that are structurally sound make good candidates for a low-cost pit parlor milking system, holding area, palpation area and possibly even maternity/sick pen area for a 80-120 cow herd. Thus, 32' by 100' stall barns can quite readily fit all four of those needs into it.

Most stall barns have two rows of beams going down it lengthwise to support the hay mow. This would be divided into four areas. The area closest to the milk house normally would house the enclosed parlor, needing an 18'-22' wide area by 27-30' long for a swing 10 parlor. That leaves approximately a 20' by 72' holding area for 90-100 cows depending on cow size (with 20 cows already in the parlor for a 110-120 cow herd). The parlor and holding area is closed off by a garage door or rolling doors.

Thus, the parlor/holding area take 2/3rds of the barn closest to the milk house. The other 1/3rd or approximately 12' is used for an exit lane and palpation rail area but usually for just the length of the parlor. The remainder of the barn down from the palpation rail and across from the holding area can be used for maternity/sick pens and over time, additional holding area if needed.

Below follows an outline plan of the typical barn remodel.



In most cases, the minimum width to be considered for the parlor for smaller breeds would be 17' and for larger breeds, 18'.

The slopes of the parlor floors are very crucial to their operation. The most crucial measurements in the parlor is typically the position of the manure splash guard or pan and the kick rail.

Being off even a couple percentage points on the slope or a couple inches on the positioning of the manure splash guard or kick rail can necessitate having to reach, bending over center to wash cows or put on milking units.

The pits can be dug with a skid steer. Then either homemade forms braced on one side and poured against dirt wall can be used for pit wall or forms for both sides of the walls can be rented, etc.

ISU Extension can assist in walking through the steps of building a low-cost milking parlor.

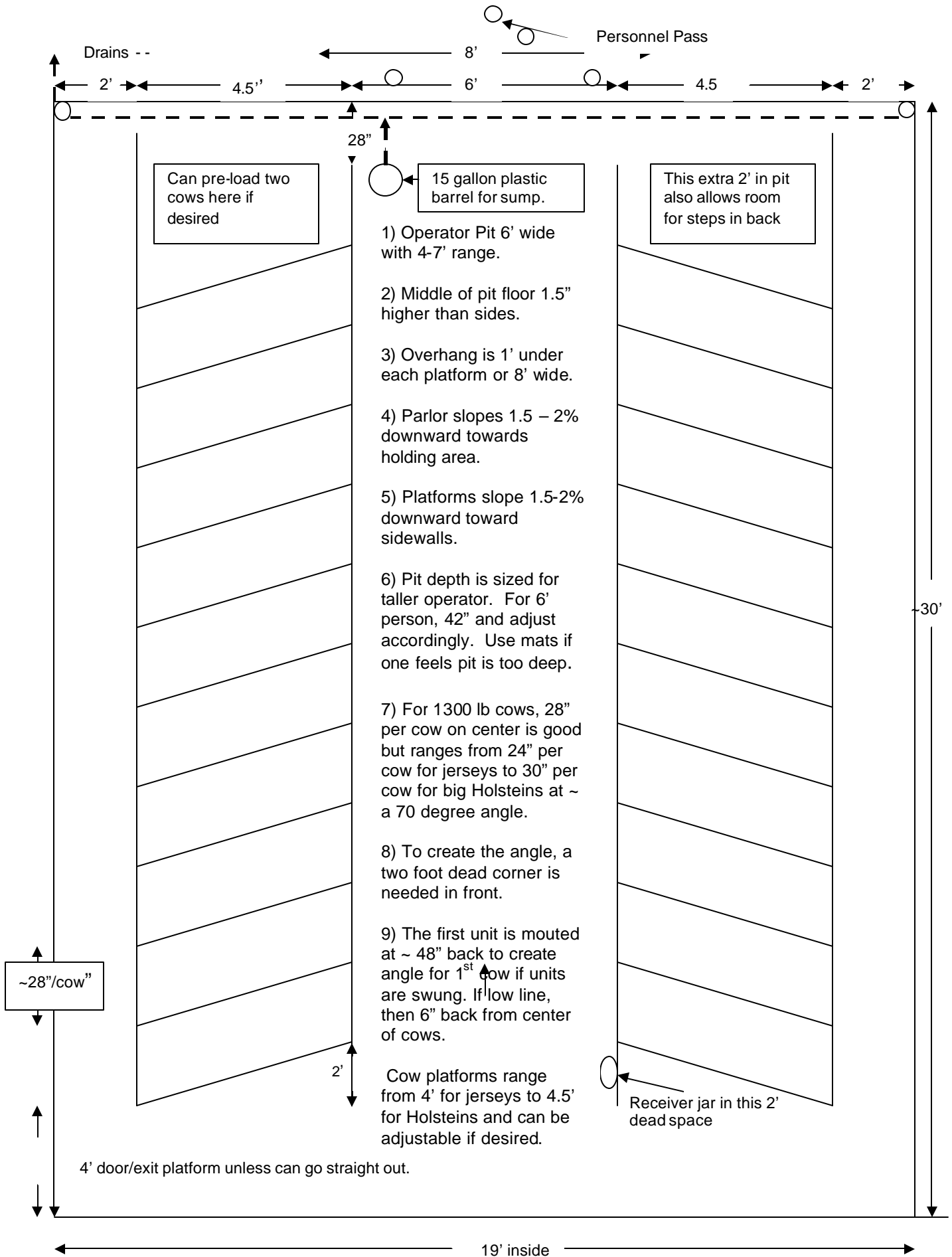


Figure 1. Sample Plan of Swing 10 Milking Parlor—TRANS Iowa Stall Design

- 1) Need an I – Beam with A frame to support strength in middle. One I-beam suffices if no hay mow above; if mow above, 3-4 I beams per 10-12 stalls are needed depending on load above and strength of I beam.
- 2) Left side of diagram has a 24" splash guard; right side has manure pan. Platform side of either should only be 2" inches in towards cows from bird's eye view on top of platform. Else, reaching and bending back forward is necessary during milking.
- 3) Posts are mounted 3" in from back of platform. Bottom of splash guard (on left) is mounted to pit side of post; kick rail mounted 2" back towards pit; top of splash guard slats back 3"; Bottom of manure pan is centered directly above edge of platform from bird's eye view; kick rail is centered below manure pan; top of manure pan slants back into pit 3".

Splash guard bottom is 33" above platform and 2" in. Kickrail top is 24" (22" for jerseys) above cow platform. Chop gate is diagramed on this side for simultaneous loading and unloading cows. Splash guard is 24" wide.

Manure pan bottom is 32" from cow platform centered over edge of platform. Kickrails (top) are 24" above cow platform.

Neckrail is 30-33" from cow platform

Chop gate

Nib rails are not necessary but if used and angled slightly, only 2-3" is useful. Longer ones tend to keep operators further from cows meaning kick rails and splash guards/pans need to move further toward pit.

Pit can be dug with a skid steer but may need to be pulled out.

Cow platforms, pit and pit walls contain ready rod on 2-3' centers with copper wire overlapping, welded to posts and continued into holding area to create equipotential plane to reduce stray voltage.

Figure 2. Side view of TRANS Iowa Stall