

Graze

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'by graziers, for graziers'

Formerly 'Pasture Talk'

You, too, can have a parlor



Vance Haugen, shown here with his wife, Bonnie, has built and milked in a lot of low-cost parlors constructed within existing facilities. When he's not working as an extension agent, he helps Bonnie milk 80 cows in their own swing-16, retrofit parlor.

**He's planned them.
He's built them.
He's milked in them.
Vance Haugen
thinks you should
consider a low-cost
milking parlor.**

By Vance Haugen

Whether you manage 20 cows or 200 — and whether you graze your cows or not — New Zealand-style “swing” parlors are certainly worth considering. These parlors offer a lot of milking efficiency at a relatively low cost and with less physical labor than milking in stanchions, which fits well with the grazier mentality. I've seen some brand-new swing parlors that do a wonderful job of milking a lot of cows at far lower costs than conventional American “low-line” facilities.

But what really intrigues me is the idea of putting such a parlor in an existing building — usually a stall barn. There are tremendous savings to be found in using existing walls, current milking equipment and “pre-owned” iron.

And I've seen it done many times. Over the past 10 years, I've assisted in planning, designing and/or constructing about 60 such low-cost parlors — mostly retrofits of existing facilities. I've had a hand in facilities ranging from a swing-six that cost \$4,300, to a \$75,000 swing-16 with automatic take-offs. Both of these systems milk cows efficiently and effectively, and both meet the goals of the owner/operator. On the farm that spent \$4,300, two people needed one-and-a-half hours to milk just over 30 cows through their “modern” 24 tie-stall barn. With the swing-six parlor, one person now milks 45 cows in an hour and 15 minutes. In the other situation, two people needed two hours to milk 80 cows in 65, head-to-head stanchions. They now milk 140 cows in 1.5 hours with their swing-16 with automatic take-offs.

What's more, several years ago my wife,

**First of
two
parts**

Intake more important than quality

**And other thoughts from
20 years of grazing research**

By Joel McNair

Jim Gerrish has learned a thing or two about grazing during some 20 years of poking around pastures.

For many years Gerrish has been the lead researcher at the University of Missouri's Forage Systems Research Center at Linneus, which is generally recognized as the premier grazing research facility in the Midwest, if not the entire U.S. The FSRC has run a large number of trials attempting to measure forage and beef cattle performance — and how they interrelate — within a wide variety of grazing systems. Gerrish and his family also graze beef stockers and run a cow-calf

operation on 260 acres in northern Missouri.

So, it would seem natural that Jim Gerrish has some opinions about grazing. He shared some thoughts about “what really matters” in grazing during a presentation at the 2001 GrassWorks Conference in Wausau, Wisconsin. Presented below are some aspects of what matters to Jim Gerrish based on that presentation, with some additional explanation based on FSRC work.

**“Intake on pasture is 75%
availability, and only 25% quality.”**

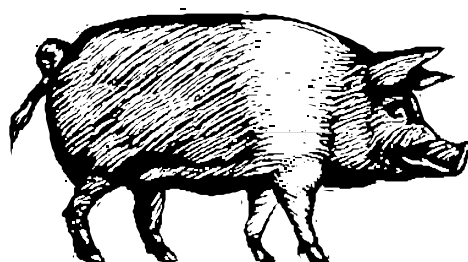
Everyone knows that livestock will not grow or produce milk at optimal levels without adequate nutrient intake. Gerrish contends that in a grazing situation, it is far more important to have adequate

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**David Surprenant is
back to talk about
how he handles the
spring flush**

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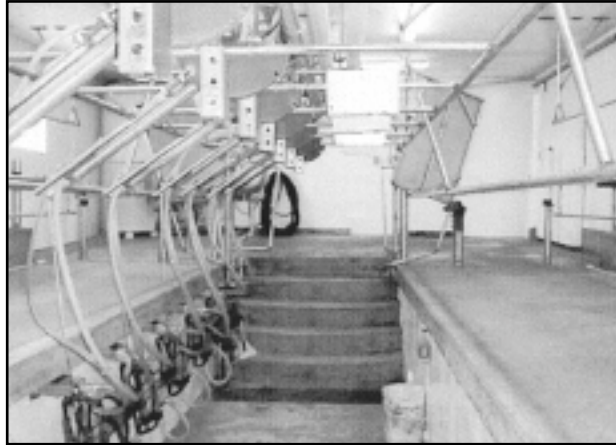
Parlors can be as cheap — or as expensive

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Bonnie, and I retrofitted our own barn in southern Minnesota with a swing-16 parlor. After milking in this parlor for eight years, I am still excited about what these facilities can offer — especially to small to mid-sized grazing operations that want to milk cows efficiently while not spending a lot of money to accomplish that goal.

Not that you can't screw up such a facility with poor planning and design. Retrofits in particular require lots of planning and, more often than not, creative solutions to problems posed by the existing facility. I've seen a few mistakes that compromised things like cow flow and post-milking clean-up. And this can go beyond the parlor. For instance, one disaster that comes to mind is where the parlor displaced cow housing, and the cows were coming in so dirty that both milking time and mastitis incidence increased. In our own facility, we set it up as a three-season parlor that flushes for clean-up. When we went to year-round milking, the flush system didn't work, because the water had to run through our unheated holding area. I should have put drains at the parlor entrance. While it's no big deal, it is a headache that we could have avoided with a little extra thinking.

I want to address some of the common themes, concerns and potential problems that confront almost anyone considering a parlor retrofit. This article is not meant to be a detailed blueprint for designing such a facility. Every parlor is going to be different — especially those that have to fit into the unique circumstances of each individual existing facility. Instead, I want to offer some random thoughts. Some of these include some fairly hard facts of life. Others have more to do with the thought processes that should be included when planning a retrofit parlor. At the end, I'll offer a couple of resources for finding more details about such facilities.



Putting this swing-10 parlor into a tie-stall barn cost a total of \$32,000, with about half the labor supplied by friends, neighbors, and fellow graziers. It features a three-inch milk line and CIP.

Almost any building can be used as the shell for a retrofit parlor if it is reasonably sound structurally, and if the infrastructure needs (electrical, waste handling, cow traffic, milk truck accessibility) are met. Hog farrowing barns, grain storage buildings, machine sheds — I've seen all of them used. A building with less than 10 years of use left in it, such as a 35-year old pole shed, probably is not a good choice. You'll need an absolute minimum width of 18 feet to fit the parlor pit and cow platforms, and 20 feet is a lot better. You'll need proper holding and exit areas (more on that later). Another option is to build a lean-to onto an existing building — especially if it's the milking barn and you can employ the current milk house. One thing about that, though: Building a parlor often coincides with expanding the herd. I estimate that a larger bulk tank and other milkhouse work happens with about 60% of all retrofits. Even if you need a bigger tank, you can usually still keep your current milk house by figuring out a way to stick your bigger tank out one of its walls.

Consider a 'parabone'

You can choose a "herringbone" parlor design in which the cows stand almost lengthwise to the pit, and units are attached from the side. You can choose a "parallel" design, in which cows stand perpendicular to the pit, and units are attached between the rear legs. Or, you can go for a "parabone," where cows stand at an approximate 70-degree angle to the pit, with units attached from the rear.

I think the parabone design is best for low-cost retrofits. It requires a shorter pit than the herringbone for the same number of cows. And the stall design is cheaper than with a parallel, which usually requires indexing and some sort of costly and complex rapid-exit mechanism. With the parabone, the cow will have a natural tendency to move out to the front of the parlor, where a rather simple, inexpensive gate can be used.

What kind of parlor are we talking about?

Most new parlors installed for big confinement farms are based on systems with low milk lines (below the cow platform) and a milking unit for each cow/stall. In contrast, New Zealand "swing" parlors have the milk line centered over the pit at a "mid-line" height. There is just one milking unit for every two cows, with the unit "swinging" back and forth across the pit to milk cows on each side. Mid-line systems have a bad rap because of reduced vacuum and greater vacuum fluctuation. However, dairy farmers have been producing quality milk in "mid-line" stanchion barns for many years. I feel that the mid-line swings, if designed with proper slope and functional equipment, can do an excellent job in milking cows — especially on grazing farms with moderate herd averages.

The main advantage to a swing parlor is cost. Having half the number of milking units and take-offs can save you a bundle. A low-line requires that the receiving group (milk jar, transfer pump, etc.) be in the pit (requiring a longer pit) or in the basement of a two-story pit (which costs money). With a swing parlor you can save maybe 20-30% on the entire construction cost on milking equipment alone — even more if it's a larger parlor.

I just feel that here are few true drawbacks to the basic design of a swing parlor. If you're into this stuff, indexing, computerized individual cow performance data, improved operator comfort features and take-offs can be easily incorporated into a swing parlor. One true drawback on any swing parlor is that a slow cow louses up cow flow efficiency. There are ways to minimize this problem, but it is a larger problem than in a conventional double-up (units on each side) parlor.

Just as an aside, for a number of years I also helped plan flat-barn parlors because they were low-cost, and not a bad system. They still are not a bad system. But, because we can build swing pit parlors for the same cost (or less), I have quit promoting flat barn parlors. With the rare exception, the added safety and generally greater cow flow (cows per hour) have done-in the flat barn. And, given the cost of hip and knee replacements, I can't in good conscience even suggest a system that requires all the deep knee bends or even shallow ones.

Why consider a retrofit?

Retrofitting an existing facility can save you 25-50% of the cost of building from scratch. Sure, there can be unanticipated construction costs, such as for the guy that hit a pretty-good size spring under the floor of his tie-stall barn. But getting water and electrical to a new building almost always involves a good chunk of change. Also, many states and counties allow retrofits to fall under the umbrella of remodeling, which can mean relaxing or grandfathering some building codes.

Sizing it right

Most graziers want to milk their cows in two hours or less. This generally translates into a parlor that is larger than is generally recommended for conventional parlors. I don't believe that there is a herd size too small for a low-cost, swing parlor. On the upper end of the scale, there are many herds with more than 500 cows that employ swing parlors.

A rule of thumb for sizing a parlor is three turns per hour, with a turn defined as the time it takes from the entrance of the first cow on a side, to the next time the first cow enters the same side again. Let's say you have 100 cows that you want to milk in an hour-and-a-half. If you turned three sides per hour, that would equal nine turns. One-hundred divided by nine equals a swing-11 parlor. This is a very conservative estimate. If cow preparation is minimal, much higher throughput is possible: New Zealand swing-overs often make four to five turns per hour.

I believe these parlors should be sized and (correctly) built to be a *completely* one-person operation. This means that, after you load the cows into the holding area, you should never get out of the pit except in rare emergencies. While some swing parlors with 20 or more units function as one-person operations, many operators seem comfortable with a maximum of 12 units per person.

When in doubt, break it out

Some of the worst parlor mistakes have come from farmers' love of existing concrete. I've seen this passion cause a holding area to be shaped wrong, which caused a large manure puddle to continually form at the parlor entrance. In my own parlor, I insisted that the four-foot manger from the tie-stall barn remain in place. Because of the resulting improper slope, I will have to chase water puddles for the rest of this parlor's life. Cow traffic, clean-up time, heating, ventilation, waste management, and other factors can all be profoundly affected by concrete work. Concrete is extremely inexpensive compared to five to 20 years of dealing with a problem such as poor clean-up or slow cow traffic. With a pneumatic jack hammer or a jack hammer mounted on a skid steer, removing concrete becomes one of the simplest jobs of the parlor retrofit construction job. One of your goals is to reduce milking time for a long time. Don't go halfway and save only 30 minutes per milking, where going all the way would have saved you 45.

Beams, posts and pillars

Since we're talking about potential mistakes, let's talk about dealing with all the stuff that has always supported the structure that you intend to retrofit with a parlor. All sorts of problems are caused by not removing or changing posts and beams to accommodate new loading methods. I know one farmer

— as you choose

who elected to keep a post two inches from his new parlor's kick rail. He almost got his hand broken when a cow kicked it into that post. The post was removed, and the structure re-engineered, at a greatly higher cost than if things had been done right in the first place. These posts can also restrict cow-flow in parlors, and exit and holding areas.

Too many people get caught up in saving their second-story storage. No hay in the mow means you don't need the posts and beams. I saw one parlor retrofit where a lot expense went into ensuring strong support for the mow, only to have the farmer soon abandon that mow with a switch to baleage.

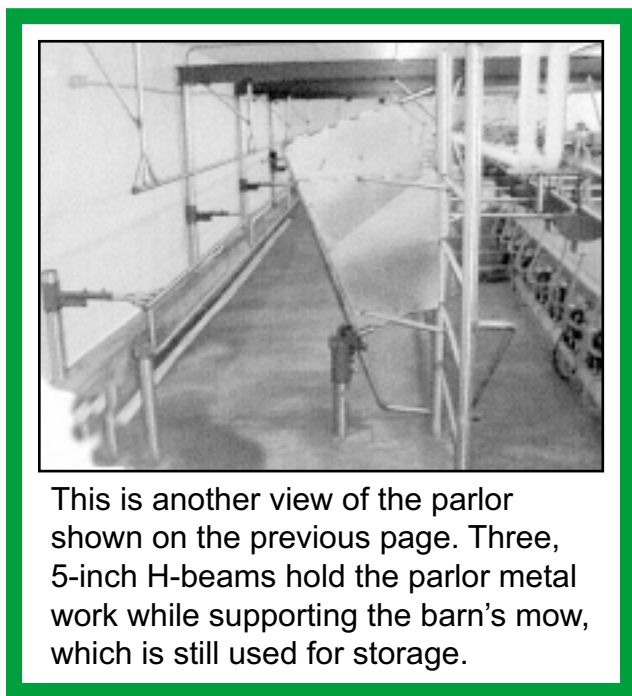
It's extremely easy to replace wooden posts and beams with steel, but be sure to get some engineering help before you do it. Engineers are very cheap to hire compared to compressing and compromising your design because you didn't want to move posts and beams. Anyone can build something so heavy that it won't fall down, but an engineer will design the structure so it *just barely* won't fall down. So, you get both safety, and economy. One other thing: When removing support posts, be sure to have adequate temporary support in place. Once we had a support post kick out while digging a parlor pit, and had half the older, two-story barn sagging before we got the support beam stabilized. Now we stabilize first, and dig second.

The pit should fit

A good milking parlor pit is deep enough (a good compromise is 38-40 inches). Make the pit deep enough, because you can always add mats or something to make the pit shallower, but you will almost never knock out concrete to make the pit deeper once it is poured. A good pit has a 1- to 1.5-inch crown in the floor. The cow platform edge has a lip or a kick space at the bottom of the pit wall for your toes. The pit shouldn't be narrower than 4.5 feet. Be sure to have a way to get animals out of your pit. I know that the design is such that it is almost impossible for an animal to get into the pit, but cattle stay awake at night figuring ways to prove us wrong. One farmer had to cut out part of his parlor superstructure to get an errant cow out of the pit.

Make it sturdy

Square tubing, pipe, solid shafts — all can be used, but make sure it is sturdy enough to withstand a moderately angry cow. By using A-frame construction and tying the entire superstructure together, you add a huge amount of strength, and can generally reduce the bulk and "massiveness" of the metal work. This can contribute to making a prettier parlor. Highway guard rail and other flat stock generally doesn't work as well for parlor superstructure, and it creates too much surface area to clean up. The kick rail should be at 24 to 27 inches from the cow platform. Splash guards are used by some farmers, and they should be light-colored to reflect light



This is another view of the parlor shown on the previous page. Three, 5-inch H-beams hold the parlor metal work while supporting the barn's mow, which is still used for storage.

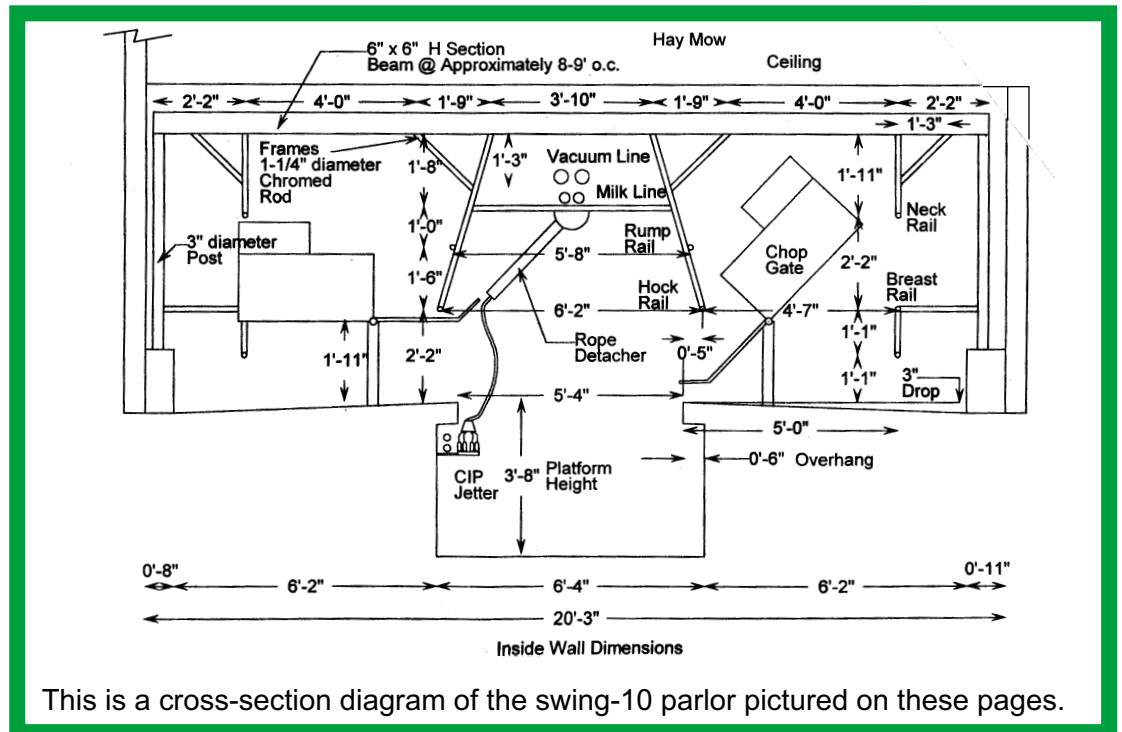
and give the parlor a brighter look. Since cows generally defecate at loading or as they are leaving, a manure pan on the splash guard is usually not helpful.

Indexing probably not needed

On small parlors (10 or less to a side), indexing through curved neck, rump or kick rails is not necessary, and will slow down cow throughput. A straight metal brisket rail, rump rail and kick rail is the best on all swing parlors with 16 units or less, although there may be some benefit to indexing in a few special cases for parlors with 10 to 16 units.

Consider feeding in the parlor

Feeding in the parlor almost always slows down cow flow. It adds dust, and then makes cleanup take longer. Given that, almost all graziers feed grain in the parlor if they do not feed a TMR. The time they lose in the parlor is more than made up in not having to have a separate feeding time and the added expense of a separate feeding area. If you have automatic feeders in the parlor, don't have drop tubes. Cows tend to bang-up drop tubes, feed doesn't go where it is supposed to, and they just cause problems. Be sure your feeding bunk can be easily washed, or old feed can be removed. The occasional first-



This is a cross-section diagram of the swing-10 parlor pictured on these pages.

calf heifer will find her way into the bunk — generally upside down. Have an easy way to get her out unless you really want to have a barbecue during milking. This means having no rails above the bunk, or at least being sure that they are removable.

Heat a good idea in the North

You'll have to be concerned with this if you live in the northern U.S. Heat in the parlor floor is the Mercedes, and forced air heating is the Yugo. Heating the cow platform to prevent icing is good, with the best bet being liquid in specialized plastic tubes buried in the concrete. The heat source could be hot water from the milk house water heater. Or, what about another source, such as an outside, wood-fired boiler? In general, if you can keep things above freezing (for the equipment), keep the drafts out, and the humidity down, you will have a fine system. Forced air is almost always the cheapest, but it is the toughest system for getting uniform, consistent heat throughout the parlor. You can put some ducts in the pit walls while you are forming the pit. This gets warm air evenly distributed in the pit with very little cost.

If you don't have a great parlor heating system, 10 milkings a year can be tough in my part of the world. However, how much are you willing to spend on a heating system to take care of these 10 milkings, rather than just toughing it out? I know a Wisconsin farmer who milks in a three-season swing parlor (open on three sides, and a holding area with no walls or roof). Most years he successfully milks in sub-freezing weather well into December. He dresses well, and scoffs at needing walls and heat. While he's the exception, this does illustrate that the envelope can be stretched. It's also an example of the creative thinking process: How much do we want to spend fixing problems that bother us only a few days out of the year?

Vance Haugen in the extension agriculture agent in Crawford County, Wisconsin. With his wife, Bonnie, he also milks 80 cows near Canton, Minnesota. Next month, Vance will address holding areas, manure management, and overall planning.