

Work the Plan

Don't just plan the work. Work the plan by developing a safe, efficient cattle-handling facility.

by *Corinne Patterson*

Have you ever been asked to share your job description as a beef producer? The description may include marketer, health care provider, ration formulator, range/pasture manager, mechanic, maybe even builder.

Beef producers are expected to wear many hats through their daily encounters with cows. Practicing the job requirements of a beef producer requires handling cattle in a safe, efficient manner. As a result, one of the most important elements to an operation is its handling facility.

You've got to have a plan, says Stanley "Jay" Solomon, an engineering technology Extension educator with the University of Illinois (U of I). It's important to know how the facility is expected to be used now, as well as to allow for future expansion if needed.

"Most producers have found that if you set up a really safe handling system, it is also a very efficient moving and handling system," Solomon says.

Raymond Huhnke, professor and Extension agricultural engineer at Oklahoma State University (OSU), says corral design has changed dramatically in the last 40 years. "It goes back to the open range concept, in my opinion, where a lot of work was done simply from the horse using a rope," he says. "When we start confining animals, we are putting the animals and ourselves in potential danger if the facilities aren't designed properly."

There are both financial and physical reasons a cattleman may or may not have an ideal cattle-handling system.

"As engineers, we can design the Cadillac

of handling systems. But if the producer doesn't understand how it operates or it doesn't meet his or her needs, it is not an effective system."

Follow basic steps

A seedstock producer may have several needs for a handling facility, such as the ability to artificially inseminate (AI), work with a veterinarian on an embryo transfer (ET) program, vaccinate calves, freeze-brand, pregnancy-check cows and much more.

"Work through what you are going to try to do with the facility," Solomon recommends. Consider what equipment will be important — maybe a loading chute, working chute, squeeze chute, palpation gate, etc.

It's important to first map out the facilities on paper. "We want to make certain that the producer actually puts something on the piece of paper before he or she starts moving soil and setting posts," Huhnke says. It's easier to move a line on paper than it is to move a fence line once it is set.

Solomon says, if possible, make your sketch to scale. You can prevent a lot of mistakes if you think your way through, not only the facility design, but also other buildings and structures that may not allow for a workable plan.

With the plan in hand, Huhnke recommends the producer go to the building site and flag or stake the outside perimeters of the facility. This will help ensure adequate space for construction and avoid interference with existing facilities.

Setting the heavy hinge post for the crowding tub gate is the first step in the building phase.

"We start with the crowding gate post because that is the center of the working facility," Huhnke says. "You move out from there, constructing the crowding and working areas. The pens are built last."

Concrete is suggested in two areas of a handling facility, Huhnke says. The first is for setting gate and fence posts. By adding "collars" to these pipes in high-pressure areas, you provide additional resistance against the soil to prevent movement. "If you don't use any concrete around the gate posts, the gates would certainly sag because the pipe would move with the soil," Huhnke adds.

He recommends that the heavy crowding gate hinge post have at least a 2-foot (ft.)-diameter collar and be set in 4 ft. of concrete. Concrete collars for smaller gates and fence posts should be at least 12 inches (in.) in diameter and at least 30 in. deep. But, he points out, the diameter of the collar and the depth of the hole depends on the size of gate desired and the type of soil (see Table 1 for more recommendations).

Table 1: Corral and working-facility dimensions

	Animal size		
	Up to 600 lb.	600-1,200 lb.	Over 1,200 lb. and cow-calf operations
Pen Space			
Catch or holding, sq. ft. per head	14	17	20
Crowding, sq. ft. per head	6	10	12
Working chute with vertical sides			
Width, in.	18	20-24	26-30
Length, ft. (minimum)	20	20	20
Working chute with sloping sides			
Width at bottom inside clear, in.	13	15	16
Width at top inside clear, in.	20	24	28
Length, ft. (minimum)	20	20	20
Working chute fence			
Height, in. (minimum)	45	50	60
Depth of posts in ground, in. (minimum)	30	30	30
Corral fence			
Height, in.	60	60	60
Depth of posts in ground, in. (minimum)	30	30	30
Loading chute			
Width, in.	26	26	26-30
Length, ft. (minimum)	12	12	12
Rise, in. per ft.	3½	3½	3½
Ramp height, in., for:			
Stock trailer	15	15	15
Pickup truck	28	28	28
Stock truck	40	40	40
Tractor trailer	48	48	48
Double-decker trailer	100	100	100

Source: *Modern Corral Design*, Oklahoma Cooperative Extension Service and Oklahoma State University.

Once the crowding gate post is set, hang the gate. You can begin to establish a more accurate sorting alley width by determining the placement of vertical posts in the curved portion of the crowding pen by using the gate for a guide.

Using your crowding gate, set the posts on the quarter curve, allowing 3 in. of space between the leading edge of the gate and the inside edge of the posts, Huhnke says.

Set the posts for the remaining side of the crowding area, as well as the opening for the working chute and the loading chute.

The other area where concrete is recommended is under the crowding area and squeeze chute to provide a cleaner and safer area for animals to be worked, Huhnke says. The slab should slope about 1/4 in. per ft. toward the outside of the curve for proper drainage. It needs to have a rough finish. Coarse broom finishes are generally not adequate. It may take a pattern, such as a diamond, to create grooves for sure footing.

After the slab is cured, begin constructing the crowding chute. When construction and placement are satisfactory, use anchor bolts to tie the crowding chute and squeeze chute to the slab.

The next key step is to set the sorting gate and hinge post so that it latches to the inside

wall of the sorting alley and opens to the bump post with its leading edge.

A bump post will need to be put in place approximately 3 ft. from the right-hand corner of the head gate or from the front of the squeeze chute. The sorting gate from the catch pen will help establish proper placement.

Adjust and set the sorting gate from the holding pen so it will latch against the catch lot fence line, and, when opened toward the chute, will reach and latch to your bump post.

Once the two primary sorting gates have been properly fitted to your working unit, the remaining alley walls, scale, lot fences and gates can be built.

The book, *Modern Corral Design*, co-authored by Huhnke, and other OSU faculty, including Ken Apple, emeritus professional and area livestock specialist, and Sam Harp, emeritus Extension agricultural engineer, highlights this step-by-step process for construction of a handling facility.

Not every beef producer runs his or her operation the same as the next. There are many philosophies and ideas about the ideal cattle-handling facility, but the important thing is that beef producers evaluate the job at hand and determine how the facility will be used. (See the

sidebar on page 90 for tips to improve specific elements of a handling facility.)

“There are a number of people out here with a number of ideas,” Solomon says. “The biggest thing is, don’t get in a hurry. If you are going to put in a facility and it’s expected to last 20 or 30 years, don’t make the decisions in two days. Take a little time to absorb and think through the process.”



Editor’s Note: *Modern Corral Design* can be purchased by sending a check or money order of \$5, plus \$1 postage and handling, to the Plans and Building Information Service, Biosystems and Agricultural Engineering Department, 214 Agricultural Hall, Oklahoma State University, Stillwater, OK 74078-0469.

SEE ALSO SIDEBAR ON PAGE 90

Fig. 1: Example 50-cow handling facility, isometric view

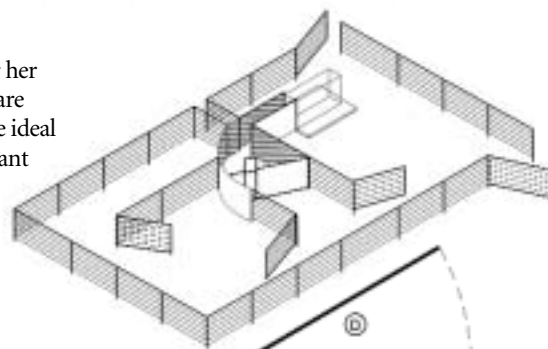
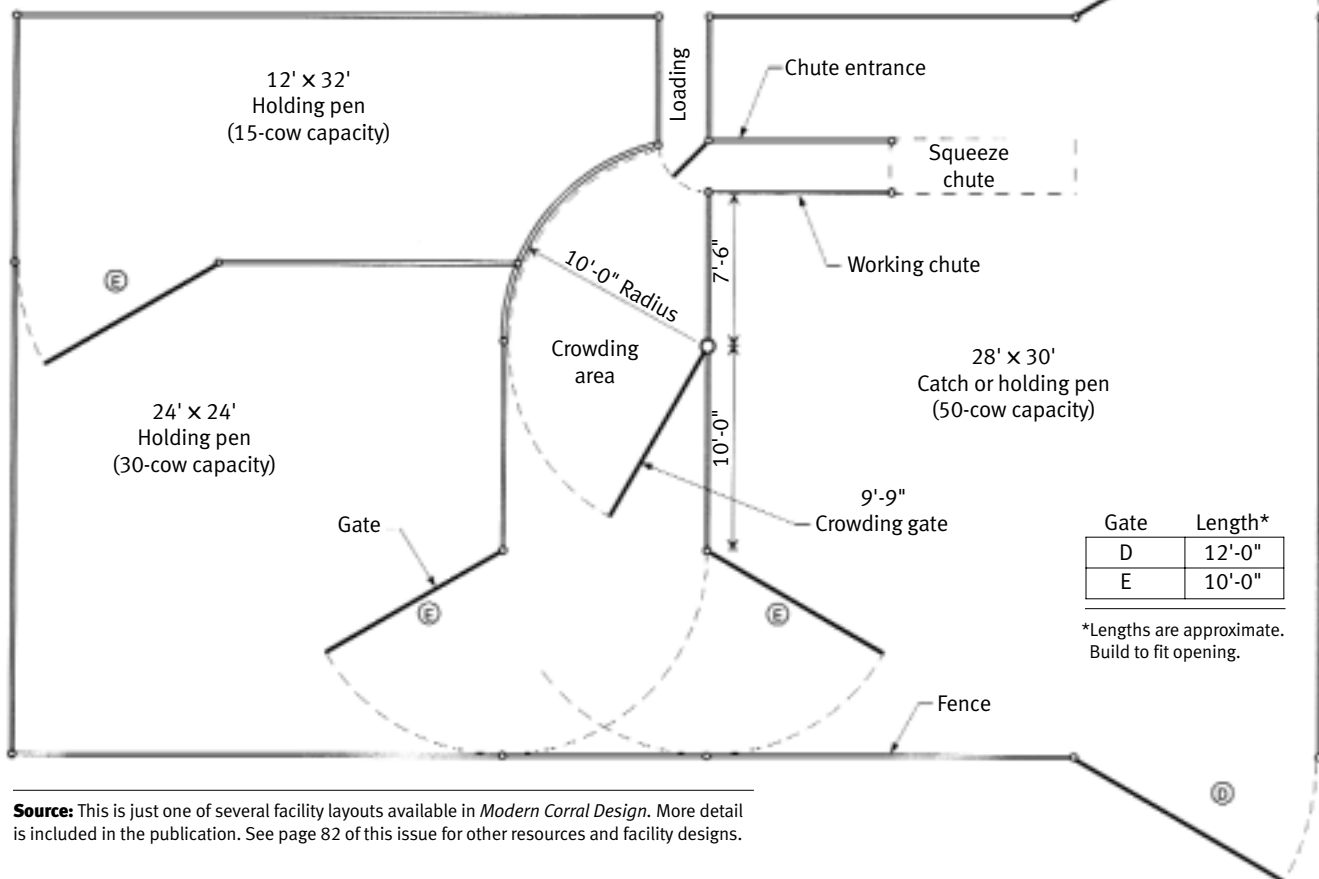


Fig. 2: Example 50-cow handling facility, plan view



Source: This is just one of several facility layouts available in *Modern Corral Design*. More detail is included in the publication. See page 82 of this issue for other resources and facility designs.