

Corral Design Takes Careful Planning

by Temple Grandin
Colorado State University, Department of Animal Sciences

Vision and Facility Design

Cattle have poor depth perception when they are moving with their heads up. To see depth, they have to stop and put their heads down. This is why they balk at shadows and strange objects on the ground. A single shadow that falls across a scale or loading chute can disrupt handling. The lead animal will often balk and refuse to cross the shadow. If you are having problems with animals balking at one place, a shadow is a likely cause. Balking can also be caused by a small bright spot formed by the sun's rays coming through a hole in a roof. Patching the hole will often solve the problem. Shades constructed from snow fence should not be used over working areas. The zebra stripe shadows can cause balking.

Drain gates in the middle of the floor will make cattle balk. A good drainage design is to slope the concrete floor in the squeeze chute area toward an open drainage ditch located outside the fences. The open drainage ditch outside the fences needs no cover and so it is easier to clean. Animals will also balk if they see a moving or flapping object. A coat flung over a chute fence or the shiny reflection off a car bumper will cause balking.

Cattle have a tendency to move toward the light. If you ever have to load livestock at night, it is strongly recommended that frosted lamps that do not glare in the animal's face be positioned inside of the truck. However, loading

chutes and squeeze chutes should face either north or south; livestock will balk if they have to look directly into the sun. Sometimes it is difficult to persuade cattle to enter a roofed working area. Persuading the animals to enter a dark, single-file chute from an outdoor crowding pen in bright sunlight is often difficult. Cattle are more easily driven into a shaded area from an outdoor pen if they are first lined up in single file.

Many people make the mistake of placing the single-file chute and squeeze chute entirely inside a building and the crowding pen outside. Balking will be reduced if the single-file chute is extended 10 to 15 feet outside the building. The animals will enter more easily if they are lined up single file before they enter the dark building. The wall of the building should NEVER be placed at the junction between the single-file chute and the crowding pen. Either cover up the entire squeeze chute and crowding pen area or extend the single-file chute beyond the building. If you have just a shade over your working area, make sure that the shadow of the shade does not fall on the junction between the single-file chute and the crowding pen.

Solid Chute Sides

The sides of the single-file chute, loading chute, and crowding pen should be solid. Solid sides prevent the animals from seeing people, cars, and other distractions outside the chute. The principle of using solid sides is like putting

blindens on the harness horse. The blinders prevent the horse from seeing distractions with his wide-angle vision. Cattle in a handling facility should be able to see only one pathway of escape—this is extremely important. They should be able to see other animals moving in front of them down the chute.

Do Not Dead End Your Chute

Livestock will balk if a chute appears to be a dead end. Sliding and one-way gates in the single-file chute must be constructed so that your animals can see through them, otherwise the animals will balk. The sides of the single-file chute and the crowding pen should be solid. The crowding pen gate also should be solid so that animals cannot see through and turn back towards herd mates they just left. Palpation gates, however, should be solid so that cattle do not see a person standing in the chute.

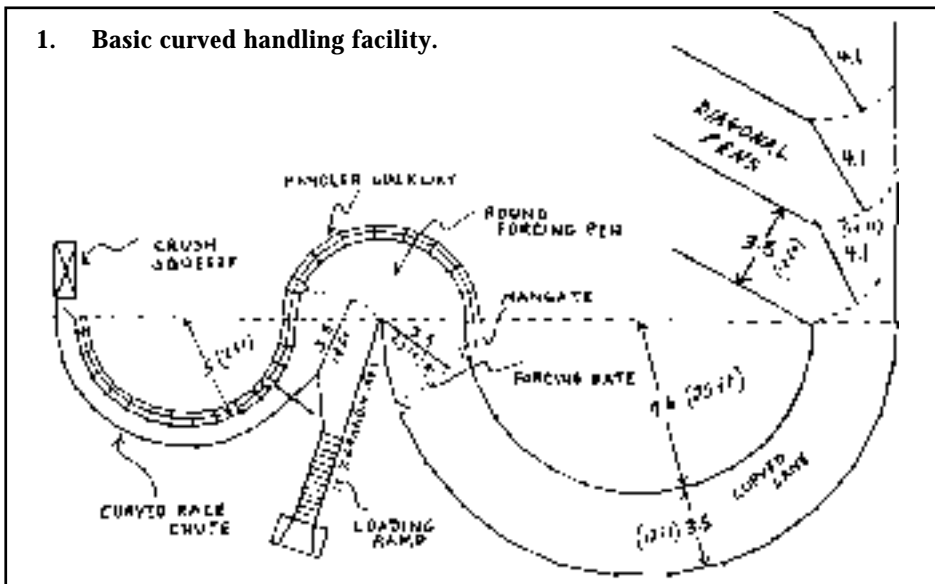
When a curved chute is used, it must be laid out properly so that it does not appear to be a dead end. A cow standing in the crowding pen must be able to see a minimum of two body lengths up the chute. Cows will balk if the chute is bent too sharply at the junction between the crowding pen and the single-file chute. Diagram 1 illustrates an efficient curved facility that is easy to lay out. It consists of three half circles laid out along a layout line. A 16 ft. inside radius for the curved single-file chute is recommended. A 12 ft. radius is the absolute minimum unless a straight section is installed at the junction between the crowding pen and the chute.

Why a Curved Chute Works

A curved chute works better than a straight chute for two reasons. First, it prevents the animal from seeing the truck, the squeeze chute, or people until it is almost in the truck or squeeze chute. A curved chute also takes advantage of the animal's natural tendency to circle around the handler. When you enter a pen of cattle or sheep, you have probably noticed that the animals will turn and face you, but maintain a safe distance. As you move through the pen, the animals will keep looking at you and circle around you as you move. A curved chute takes advantage of this natural circling behavior.

A well-designed, curved single-file

1. Basic curved handling facility.



chute has a catwalk for the handler to use along the inner radius. The handler should always work along the inner radius. The curved chute forces the handler to stand at the best angle and lets the animals circle around him. The solid sides block out visual distractions except for the handler on the catwalk. The catwalk should run alongside of the chute and NEVER be placed overhead. The distance from the catwalk platform to the top of the chute fence should be 42 inches. This brings the top of the fence to belt-buckle height on the average person.

Dark Box AI Chute

For improved conception rates, cows should be handled gently for AI and not allowed to become agitated or overheated. The chute used for AI should not be the same chute used for branding, dehorning, or injections. The cow should not associate the AI chute with pain. Cows can be easily restrained for AI or pregnancy testing in a dark box chute that has no headgate or squeeze. Even the wildest cow can be restrained with a minimum of excitement. The dark box chute can be easily constructed from plywood or steel. It has solid sides, top and front. When the cow is inside the box, she is inside a quiet, snug, dark enclosure. A chain is latched behind her rump to keep her in. After insemination, the cow is released through a gate in either the front or the side of the dark box. If wild cows are being handled, an extra long, dark box can be constructed. A tame cow that is not in heat is used as a pacifier and is placed in the chute in front of the cow to be bred. Even a wild cow will stand quietly and place

her head on the pacifier cow's rump. After breeding, the cow is allowed to exit through a side gate, while the pacifier cow remains in the chute.

Loading Chute Design

Loading chutes should be equipped with telescoping side panels and a self-aligning dock bumper. These devices will help prevent foot and leg injuries caused by an animal stepping down between the truck and the chute. The side panels will prevent animals from jumping out the gap between the chute and the truck.

A well designed, loading ramp has a level landing at the top. This provides the animals with a level surface to walk on when they first get off the truck. The landing should be at least 5 ft. wide for cattle. Many animals are injured on ramps that are too steep. The slope of a permanently installed cattle ramp should not exceed 20 degrees. The slope of a portable or adjustable chute should not exceed 25 degrees.

Chutes for both loading and unloading cattle should have solid sides and a gradual curve. If the curve is too sharp, the chute will look like a dead end when the animals are being unloaded. A curved single-file chute is most efficient for forcing cattle to enter a truck or a squeeze chute. A chute used for loading and unloading cattle should have an inside radius of 12 ft. to 17 ft., the bigger radius is the best. A loading chute for Longhorns should be 48" - 60" wide while 30" wide is the maximum width for other cattle breeds.

Corrals

A corral constructed with round holding pens, diagonal sorting pens, and curved drive lanes will enable you to

handle cattle more efficiently because there is a minimum of square corners for the cattle to bunch up in. The principle of the corral layout in Diagram 2 is that the animals are gathered into the big round pen and then directed to the curved sorting reservoir lane for sorting and handling. The curved sorting lane serves two functions: it holds cattle which will be sorted back into diagonal pens and it holds cattle waiting to go to the squeeze chute, AI chute, or calf table. When cows and calves are being separated, the calves are held in the diagonal pens and the central drive lane, and the cows are allowed to pass through one of the diagonal pens into the large post-working pen.

Large Corral

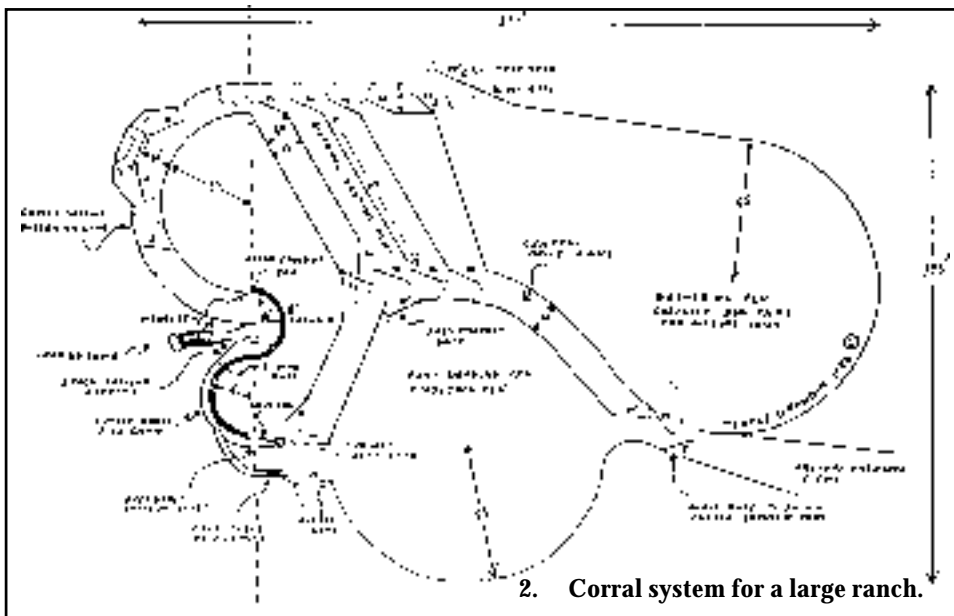
The corral shown in Diagram 2 is a general purpose system for shipping calves, working calves, sorting, pregnancy checking, and AI. It can handle 300 cow-calf pairs or 400 mature cows. For smaller ranches, the large gathering and holding pens can be reduced in size. It is equipped with a two-way sorting gate in front of the squeeze chute for separating the cows that are pregnant from cows that are open. Depending upon your needs, you can position either the squeeze chute, AI chute, or calf table at the sorting gate. If the cattle are watered in the large gathering pen, they will become accustomed to coming and going in and out of the trap gate. When you need to catch an animal, you merely shut the trap gate and direct her up the curved reservoir lane to the chutes. This is an especially handy feature for AI

The curved sorting reservoir terminates in a round crowding pen and curved single-file chute. The crowding gate has a ratchet latch that locks automatically as the gate is advanced behind the cattle. To load low stock trailers, open an 8 ft. gate that is alongside the regular loading chute. This provides you with the advantage of the round crowding pen for stock trailers.

This design can also be modified for pasture rotation. The large gathering pens are eliminated and the main working parts of the corral such as the curved lane, curved chutes, and diagonal pens are retained.

Corral Construction Tips

Five-foot high fences are usually sufficient or cattle such as Hereford and Angus. For Longhorns, Brahman cross and exotics a 5-1/2 ft. to 6 ft. fence is recommended. Solid fencing should be used in the crowding pen, single-file chute, and



loading chute. If your budget permits, solid fencing should be used in the curved reservoir lane. If solid fencing is too expensive, then a wide belly rail should be installed. This is especially important if the corral is constructed from sucker rod.

If a V-shaped chute is built, it should be 16 to 18 in. wide at the bottom and 32 to 36 in. wide at the top. The top measurement is taken at the 4 ft. level for Longhorns and 5 ft. for other breeds. (Note: Some Longhorn breeders use pipe bars at the top. From a cattle psychology standpoint this is not good because the animal can see out, but it allows the Longhorns to move throughout the chute easily. Other breeders utilize a T-shaped chute used in the 1890's, according to Grandin) If the single-file chute has

straight sides, it should be 26 in. wide for the cows and 18 to 20 in. wide for calves. When a funnel-type crowding pen is built, make one side straight and the other side on a 30 degree angle. This design will prevent bunching and jamming. The crowding pen should be 10 to 12 ft. wide.

To prevent animals from slipping in areas paved with concrete, the concrete should be scored with deep grooves. The grooves should be 1 in. to 1-1/2 in. deep in an 8 in. diamond pattern. A diamond pattern should be used because it is easier to wash.

In areas with solid fence, small man-gates must be installed so that people can get away from charging cattle. The best type of man-gate is an 18 in. wide, spring-loaded steel flap. The gate opens inward

toward the cattle and is held shut by a spring. A person can quickly escape because there is no latch to fool with. The man-gates can be constructed from 10 gauge steel with a rim of 1/2 in. rod. ❖

—Some of the information in this paper was obtained from: Ron Kilgour, Ruakura, New Zealand and Bud Williams, Ranch Management Consultants, Albuquerque, NM.

Temple Grandin has designed cattle handling and restraining equipment used in major meat packing plants. She also designed the facilities for Texas Longhorns and Buffalo at the Wichita Mountains Wildlife Refuge. She has published a book of corral designs which you may order by writing her at the Department of Animal Science, Colorado State University, Fort Collins, CO 80523.