

Cattle Behavior and Cattle Handling

Temple Grandin

Grandin Livestock Handling Systems, Inc.
1401 Silver
Urbana, IL 61801

Introduction

Reducing stress during handling is important because excitement and other handling stresses can lower conception rate and suppress immune function (Stoebel and Moberg, 1982; Hixon et al, 1981; Kelley et al, 1981 and Blecha et al, 1984). An animal's previous experiences will affect its response to handling (Grandin, 1984). Animals raised in close contact with people will have less intense physiologic responses to handling than animals raised on pasture (Reid & Mills, 1962). Livestock remember painful and frightening experiences. Sheep will remember a bad experience when they enter the corrals a year later (Huston, 1985) and cattle will remember an aversive event such as electro-immobilization for at least nine months (Pascoe, 1986).

There is an old saying "You can tell what kind of stockman a man is by looking at the behavior of his cattle." Cattle which have had previous experiences with gentle handling will be less excitable when they are handled in the future. Providing a feed reward immediately after handling will facilitate movement through the corrals in the future (Hutson, 1982). Animals with previous experiences with gentle handling and a feed reward can be trained to voluntarily accept restraint (Grandin, 1985). Wythes and Shorthose (1984) found that calves accustomed to regular gentle handling had fewer bruises during marketing. Calves handled quietly in good facilities will have lower heart rates compared to calves handled roughly in poor facilities (Stermer et al, 1981). An understanding of basic cattle behavior principles will help you and your clients to reduce stress on the animals and improve handling safety for both people and animals.

Cattle Perception

Contrary to popular belief, ruminants can see color but have a deficiency in the red end of the spectrum (Sambraus, 1978; Munkenbeck, 1982). They have depth perception but their ability to perceive depth at ground level while they are moving is probably poor (Hutson, 1985). This may explain why they stop and look down at shadows during handling.

Cattle depend heavily on their vision and are easily motivated by fear. Livestock are sensitive to harsh contrasts of light and dark around loading chutes, scales and work areas. Illumination should be even and there should be no sudden discontinuity in the floor level or texture. Cattle are more sensitive to high pitched and loud noises than people

(Kilgour et al, 1983). The sound of banging metal can cause balking during handling. Rubber stops on gates and squeeze chutes will help reduce noise. On hydraulic chutes locate the motor away from the chute.

Solid shades should be used over the working, loading and scale areas. Slatted shades are fine for areas where the animals live and "feel" familiar. The zebra stripe pattern cast by the slatted shades constructed from snow fence or corrugated sheets suspended on cables will cause balking. The pattern of alternating light and dark has the same effect as building a cattle guard in the middle of the facility.

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 or change in floor level (i.e. gutter) can be 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. Handlers themselves should be cautious about causing shadows.

Approach Light

Cattle have a tendency to move toward light (Grandin, 1980). When loading livestock at night, use frosted lamps that do not glare in the animal's faces mounted inside of the truck or spotlights mounted 10 to 20 feet off the ground. 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. Spotlights aimed at the chute entrance will attract the cattle. The lights must not shine into the eyes of approaching cattle.

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. With a roofed working area, make sure that the shadow of the roof does not fall on the junction between the single file chute and the crowding pen.

Prevent Balking

Drain grates in the middle of the floor will make cattle balk because animals will often refuse to walk over them. 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 fence needs no cover and so it is easier to clean.

Cattle 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. Walk through alleys and chutes to view them from a cow's eye level before moving or loading animals. Check for broken side rails, protruding fasteners, and nails which could injure livestock. You will be surprised at the things you may see. When cattle are being worked, the handlers should stand back away from the headgate so that approaching animals cannot see them with their wide angle vision. The installation of shields for people to hide behind can facilitate the movement of livestock.

Problems with balking tend to come in bunches; when one animal balks, the tendency to balk seems to spread to the next animals in line. When an animal is being moved through a single file chute, the animal must never be prodded until it has a place to go. Once it has balked, it will continue balking. The handler should wait until the tail gate on the squeeze chute is open before prodding the next animals. A plastic garbage bag attached to a broom handle is a good tool for moving cattle in pens. The cattle move away from the rustling plastic. When livestock are being moved, well trained dogs are recommended for open areas and large pens. Once the animals are confined in the crowding pen and single file chute, dogs should not be allowed near the fences where they still can bite at the cattle.

Solid Chute Sides

For cattle the sides of the single file chute, loading chute and crowding pen should be solid (Grandin 1980a, Rider et al, 1974). Solid sides prevent the animals from seeing people, cars and other distractions outside the chute and will reduce agitation. The principle of using solid sides is like putting blinders 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. Vowles et al, 1984, found that cattle moved more quickly through a crowd pen with solid fences. They should be able to see other animals moving in front of them down the 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 the animals can see through them, otherwise the animals will balk. However, palpation gates

should be solid to prevent approaching cattle from seeing a person standing in the chute. The crowding pen gate should also be solid to prevent the cattle from turning back. The only opening they should see is the entrance to the single file chute.

Herd Behavior

All species of livestock will follow the leader and this instinct is strong in cattle. A single file chute to the squeeze can be constructed too short. The chute should be long enough to take advantage of the animal's tendency to follow the leader. The minimum length for the single file chute is 20 feet. In larger facilities, 30 to 50 lineal feet is recommended. Do not make the chute longer. Problems with downed cattle may result if they are held for over 15 minutes.

Cattle are herd animals and, if isolated, can become agitated and stressed. This is especially a problem with some exotics and Brahman-type cattle. An animal left alone in the crowding pen after the other animals have entered the single file chute, may attempt to jump the fence to rejoin its herdmates. A lone steer or cow may become agitated and charge the handler. A large portion of the serious handler injuries occur when a steer or cow, separated from its herdmates, refuses to walk up the single file chute. When a lone animal refuses to move, the handler should release it from the crowding pen and bring it back with another group of cattle.

Effects of Slope

To prevent livestock from piling up against the back gate in the crowding pen, the floor of the pen must be level and deeply grooved to prevent slipping. A 10 degree slope in the crowding pen will cause the animals to pile and fall down against the crowding gate. A small $\frac{1}{4}$ to $\frac{1}{8}$ inch slope per foot for drainage will not cause a handling problem. Livestock handle more easily when moved uphill than downhill, but they move most easily on a flat surface.

Why a Curved Chute Works

Circular crowd pens and curved chute can reduce time spent moving cattle by 50 percent (Vowles and Hollier, 1982). A curved chute works better than a straight chute for two reasons. First, it prevents the animals 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 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.

Cattle can be driven most efficiently if the handler is situated at a 45 degree to 60 degree angle to the animal's

shoulder (Figure 1). The point of balance (Figure 1) is at the shoulder. A handler positioned behind the point of balance will cause the animal to move forward (Kilgour and Dalton, 1984). A well-designed, curved single file chute has a catwalk for the handler to use along the inner radius. The handler should 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.

FIGURE 1. Flight Zone Diagram

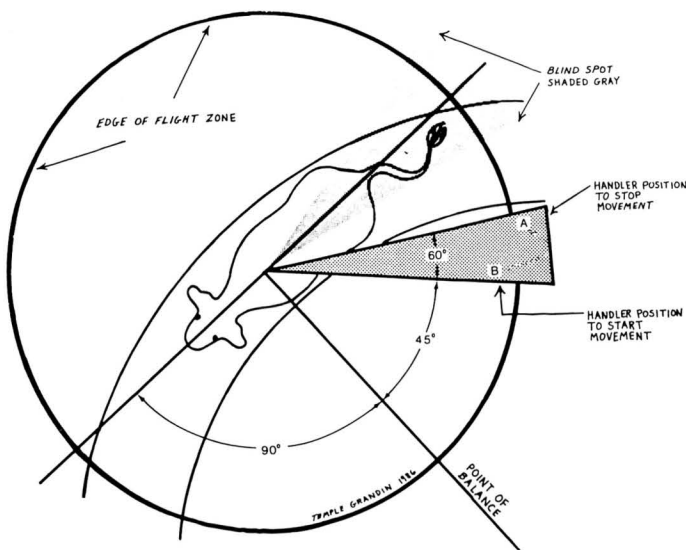
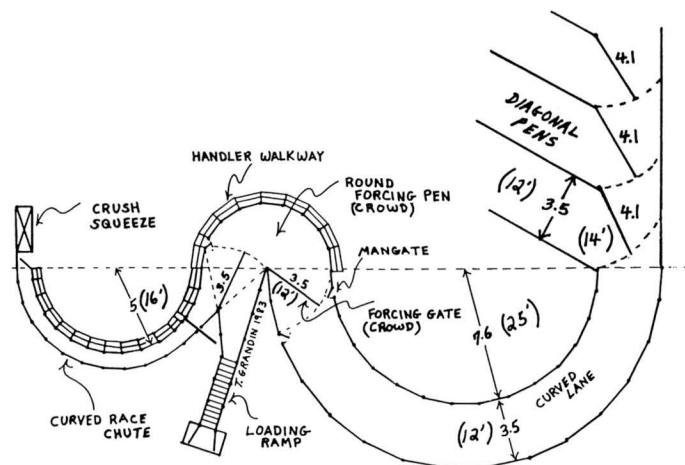


Figure 2 illustrates curved facilities for handling cattle. Curved designs are recommended. A curved chute must be designed so it does not appear to be a dead end. Avoid sharp bends at the junction between the single file chute and the crowd pen. A 12 to 16 foot inside radius is recommended. Tight 5 foot radius turns can be used if space is limited (Grandin, 1984). Chutes with tight 5 foot inside radius bends have a straight section where they join the crowd pen. They also must be constructed in a smooth continuous curve.

Flight Distance

When a person penetrates an animal's flight zone, the animal will move away. If the handler penetrates the flight zone too deeply, the animal will either turn back and run past him or break and run away. Research found that when the flight zone of bulls was invaded by a mechanical trolley, the bulls would move away and keep a constant distance between themselves and the trolley (Kilgour, 1971). When the trolley got too close, the bulls bolted past it. The best place for the handler to work is on the edge of the flight zone.

FIGURE 2. Curved Cattle Handling Facility



This will cause cattle to move away in an orderly manner. The cattle will stop moving when the handler retreats from the flight zone.

The size of the flight zone varies depending on cattle tameness or wildness. The flight zone of range cows may be as much as 300 feet whereas the flight zone of the cattle on feed may be only five to 25 feet. The size of the flight zone is also affected by the size of the enclosure the animals are in. Sheep confined in a narrow alley had smaller flight zones (Hutson, 1982). Extremely tame cattle are often difficult to drive because they no longer have a flight zone.

Getting too close to cattle when they are being driven down an alley or into a crowding pen can cause problems. Getting too close makes cattle feel cornered. If the cattle attempt to turn back, the handler should back up and retreat to remove himself from the animal's flight zone instead of moving closer.

Cattle will often rear up and get excited while waiting in the single file chute. A common cause of this problem is the leaning over the single file chute and deeply penetrating the animal's flight zone (Grandin, 1983). The cattle will usually settle down if the handler backs up.

Breed Differences

The breed of cattle can affect the way they react to handling. Cattle with Brahman blood and some exotics are more excitable and may be harder to handle than the English breeds. When Brahman or Brahman-cross cattle are being handled, it is important to keep them as calm as possible and to limit use of electric prods. Brahman and Brahman-cross cattle can become excited; they are difficult to block at gates, and prone to ram into fences (Tulloh, 1961). With this type of cattle, it is especially important to use substantial fencing. If thin rods are used for fencing, a wide belly rail should be installed to present a visual barrier. Angus cattle tend to be more restless than Herefords (Tulloh, 1961). Holstein cattle tend to move slowly. Brahman cattle tend to stay together in a more cohesive mob than English cattle.

Brahman and Brahman-cross cattle can become so disturbed that they will lie down and become immobile, especially if they have been prodded repeatedly with an electric prod. When a Brahman or Brahman-cross animal lies down, it must be left alone for about five minutes. Prodding a downed Brahman can kill it. This problem rarely occurs in English cattle or European cattle such as Charolais.

Dark Box AI Chute

For improved conception rates, cows should be handled gently for AI and not allowed to become agitated or overheated (Stott, 1975). The chute used for AI should not be the same chute used for branding, dehorning, or injections or having her head jerked around with nose tongs. The cow should not associate 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 (Parsons and Helphinstein, 1969; Swan, 1975). 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. 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 displaying estrus 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.

A dark enclosure may reduce physiological arousal. Recent research with cattle indicates that restricting vision lowers heartrate and respiration rate (Kinsman, 1986). New Zealanders have been using the dark box principle for handling deer. Deer are handled in a dark room to keep them calm. When the deer move outside they will often attempt to jump high fences when people approach. Inside the dark room, people can walk up and touch the deer.

If a large number of cows have to be pregnancy checked or inseminated, two to six AI chutes can be laid out in a herringbone pattern. The chutes are set on a 60 degree angle (McFarlane, 1976; Canada Plan Service, No Date). They are built like regular dark box AI chutes except that the partitions in between the cows are constructed from open bars so the cows can see each other. The cows will stand more quietly if they have company (Ewbank, 1968). The two outer fences should be solid. If the cows are reluctant to enter the dark box, a small 6 by 12 inch window can be cut in the solid front gate in front of each cow.

Chute Design

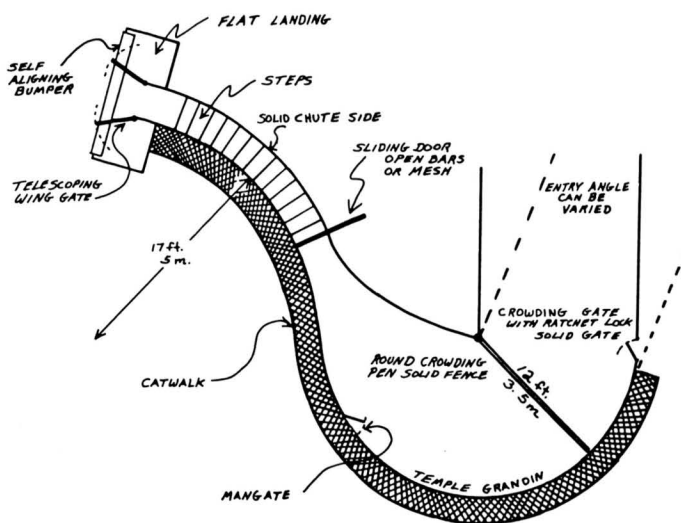
Different types of headgates are suitable for different uses. A straight bar stanchion is recommended for veterinary

clinics and for AI because choking is highly unlikely (Grandin, 1980b). A curved bar stanchion is a good general purpose headgate for feedlots and general ranch work. It provides a good compromise between head control and safety from choking. A positive type headgate which locks tightly around the neck provides good head control but an increased choking hazard. Proper adjustment of the squeeze chute will reduce choking. The space between the squeeze sides at the floor must be narrow enough so the V shape of the squeeze supports the animal. Careful adjustment of squeeze chutes will reduce injuries to both people and cattle.

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. 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. If you build your ramp out of concrete, stairsteps are strongly recommended. For cattle, the steps should have a 3.5 to 4 inch rise and a 12 inch tread width. The surface of the steps should be grooved to provide good footing. On adjustable or wooden ramps, the cleats should be spaced eight inches from the edge of one cleat to the edge of the next cleat (Mayes, 1978). The cleats should be 1½ to 2 inches high for cattle.

Chutes for both loading and unloading cattle should have solid sides and a gradual curve (Grandin, 1979) (Figure 3). 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 for loading and unloading cattle should have an inside radius of 12 to 17 feet, the bigger radius is best. A loading chute for cattle should be 30 inches wide and no wider. The largest bulls will fit through a 30 inch wide chute. If the chute is going to be used exclusively for calves, it should be 20 to 24 inches wide.

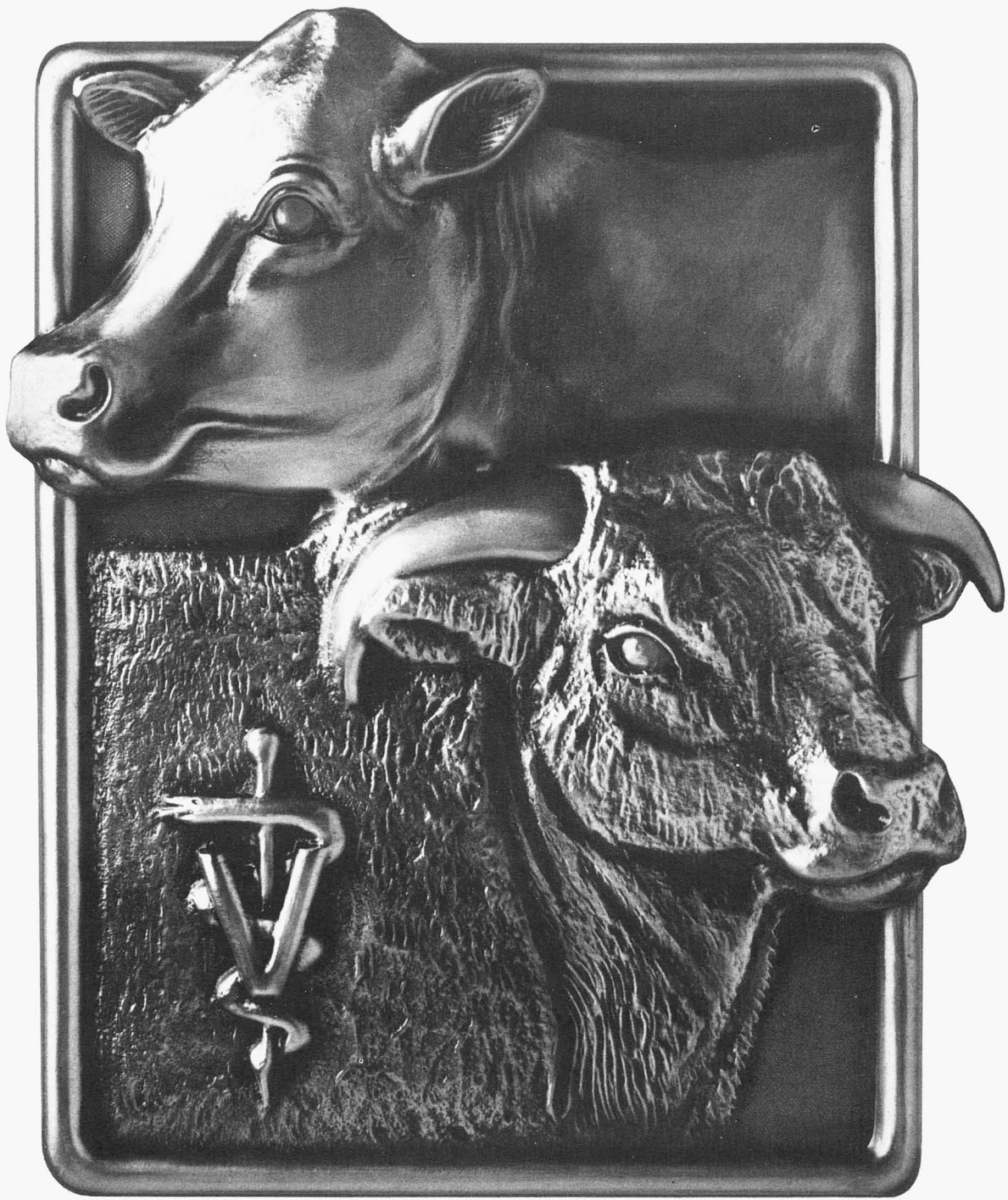
FIGURE 3. Curved Loading Ramp



In auctions and meat packing plants where a chute is used to **unload only**, a wide, straight chute should be used. This provides the animals with a clear path to freedom. These chutes can be six to 10 feet wide. A wide, straight chute should not be used for loading cattle.

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