Chute Losses Aren't Accidents!

Most Injuries Can Be Avoided. Here's How To Rate The Performance Of Your Chute And Crew.

By Temple Grandin

TEMPLE, ARIZ.—Broken necks, legs and other injuries to cattle during processing may never be completely eliminated. Accidents can happen in the best of facilities and with the most careful crew.

But if it seems you are having too many injuries it's time to pinpoint the problems and over come them in your chute and working area. Until now this has been difficult because there have been no standards for comparison.

However, a rating system I have developed can aid you in locating profit sapping trouble spots. With it you can rate your processing performance against over 4,000 head of cattle rated in a study in seven Arizona feedlots. Chute types in the study were stanchion, guillotine and squeeze only hydraulics.

The cattle rated were Brahman crosses, Okies with no Brahman breeding and a few Holsteins.

To rate your hydraulic chute, process exactly 100 head of either re-implant cattle or new arrivals which are being branded, vaccinated, etc. Work all 100 animals in the standard manner without stopping.

As the animals come through the squeeze record every severe choke, mild choke, entry balk, etc. Rate the cattle according to the following criteria. These criteria must be followed exactly for the test to be valid.

Severe choke—Animal collapses unconscious.

Mild choke—Animal staggers drunkenly while exiting from the chute.

Entry balk—Animal refuses to enter the squeeze after being prodded once with an electric prod.

Exit balk—Animal refuses to leave the squeeze after it is released. Record an exit balk if the animal backs up and hits the tailgate or refuses to leave after being prodded once with an electric prod.

Partial escape—Occurs when an animal is caught and held in the chute by his hips.

Total escape—Runs through the chute without being caught.

Falling—Record a fall if the animal's body touches the ground while he is leaving the squeeze.

Headgate leg—Occurs when a front leg is caught in the headgate.

After you have rated the 100 head, add up the number of cattle which had severe chokes, mild chokes, etc. This will give you the percentage of cattle which showed each variable.

Compare these results with either the re-implant table or the brand castrate table, depending on the type of cattle you processed. If your percentage scores are above the percentages in the far right hand column, you have a serious problem which needs to be corrected.

In order to get an accurate rating of your hydraulic squeeze you should rate three or four 100 head bunches of different breeds and weights.

Average the percentage scores for each variable, but do not mix brand castrate percentages with re-implant percentages. To obtain your injury rating add the following percentage scores together according to this formula: mild choke + partial escape + falling + severe choke doubled, for each 100 head bunch.

In case you don't have 100 head to rate, you can still determine the percentage figure to make the comparison by dividing each of the eight items by the number of animals.

Once you locate the problem areas you can systematically solve them.
Thousands of cattle are injured each year when they get their legs caught in the headgate.

One of the most damaging things which can happen in a squeeze chute is choking. It can be caused by either excessive pressure exerted by the headgate on the windpipe and neck arteries or by over-squeezing cattle.

Over-squeezing can choke an animal by compressing its rib cage to the point that breathing is inhibited. Also, over-squeezing can cause scours and throw an animal off feed.

One of the best means of preventing choking is to be certain the space between the squeeze panels at the bottom of the chute is narrow enough to support the animal when pressure is applied. This will keep the animal from slipping down and choking itself in the headgate.

Proper spacing of the bottom panels for 250 to 400 pound cattle is six inches. For cattle over 600 pounds, the width between the bottom panels is eight to twelve inches, depending on the size of the cattle.

Pay close attention to the height of the headgate opening, too, if you want to minimize choke problems. Ideally, the animal should be able to hold its head in a normal position in the headgate opening.

Of course it is almost impossible to design a squeeze chute that can satisfactorily handle all sizes of cattle. If you find you are having serious choking problems in your lot and are using the same hydraulic chute to process light calves and for re-implanting heavier cattle, then you may need to think about a second chute. One could be adjusted for calves and the other for bigger cattle.

The chute operator is your key man in holding down injuries in any kind of squeeze chute. He needs to be skilled and conscientious. In case you have a high choke percentage you should evaluate the operator as well as the equipment. He may have tightened the pressure relief valve so cattle are squeezed too hard or he may be just plain careless.

Such a man should learn how to slow down animals in the squeeze before they reach the headgate to prevent injuries to the neck and shoulders. How many cattle have you lost because they broke their necks by hitting the headgate too hard?

**BRAND CASTRATE TABLE**

A total of 2,610 cattle weighing between 250 and 600 pounds received a minimum of two brands, two injections, an ear implant and at least one other treatment such as worming or a pour-on. Of these, 880 head were castrated during processing. None of the cattle were treated with a force feeding machine.

<table>
<thead>
<tr>
<th>Average Percentage</th>
<th>A Serious Problem Exists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe choke</td>
<td>0.8%</td>
</tr>
<tr>
<td>Mild choke</td>
<td>2.0%</td>
</tr>
<tr>
<td>Entry balk</td>
<td>15.0%</td>
</tr>
<tr>
<td>Exit balk</td>
<td>13.0%</td>
</tr>
<tr>
<td>Partial escape</td>
<td>2.5%</td>
</tr>
<tr>
<td>Total escape</td>
<td>0.3%</td>
</tr>
<tr>
<td>Falling</td>
<td>3.5%</td>
</tr>
<tr>
<td>Headgate leg*</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

*The headgate leg percentage was calculated from stanchion and guillotine headgate chute data only.

**RE-IMPLANT CATTLE TABLE**

A total of 2,080 cattle weighing over 600 pounds received an ear implant during processing through a hydraulic chute. None of the cattle were branded or castrated.

<table>
<thead>
<tr>
<th>Average Percentage</th>
<th>A Serious Problem Exists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe choke</td>
<td>0.2%</td>
</tr>
<tr>
<td>Mild choke</td>
<td>0.0%</td>
</tr>
<tr>
<td>Entry balk</td>
<td>10.0%</td>
</tr>
<tr>
<td>Exit balk</td>
<td>18.5%</td>
</tr>
<tr>
<td>Partial escape</td>
<td>4.0%</td>
</tr>
<tr>
<td>Total escape</td>
<td>1.0%</td>
</tr>
<tr>
<td>Falling</td>
<td>6.0%</td>
</tr>
<tr>
<td>Headgate leg</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

**INJURY RATING TABLE**

<table>
<thead>
<tr>
<th>Average Score</th>
<th>A Serious Problem Exists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-implant cattle</td>
<td>11 points</td>
</tr>
<tr>
<td>Brand castrate cattle</td>
<td>9 points</td>
</tr>
<tr>
<td>Brand castrate cattle</td>
<td>9 points</td>
</tr>
</tbody>
</table>

The figure may be higher than you really would like to admit.

Considerably more pressure is required to operate the squeeze than either the headgate or tailgate. If you find you have a problem with the headgate hampering heads or the tailgate breaking legs, an additional pressure relief valve can be installed in the gate circuits which will reduce the amount of pressure on the gates, but not reduce the effectiveness of the squeeze.

Balking, either going into or out of the chute, can waste many valuable hours of a crew's time every day. If you consistently have this problem a look at your entire work area is in order.

Since cattle have 360 degree panoramic vision, any little distraction off to the side can cause balkiness. To cattle, the world is like a black and white TV set and they are quite sensitive to variations in light and dark.

The best type of lighting in a work area is even and diffuse. Dark shadows and bright spots in the alley and crowding pen can, and do, spook cattle. One reason why shadows bother cattle is that they have limited depth perception and sometimes a shadow across the alley gives the appearance of a solid object to them.

On the other side of the coin, a hole in the sunshade can allow a beam of light to form a bright spot in the alley or squeeze chute which may frighten cattle.

As an interesting sidelight, a computer analysis done at Arizona State University on 3,000 head of cattle showed that Brahman type cattle balked less than those with no Brahman blood.

Cattle and loud, abnoxious noises don't mix well. If at all possible, position the hydraulic pump and motor off to one side of the squeeze chute. Don't make the mistake of putting the motor in front of the headgate. One Arizona feeder who did this found it created a serious balking problem.

If the motor must be mounted directly on the chute be sure the motor mounts are secure so there is a minimum of vibrations. A loud, noisy motor can cause balking.
Flapping tarps, plastic sheets and other objects will frighten cattle and should either be removed or firmly tied down.

No objects should be permitted to hang down across the tailgate or any other part of the chute.

At one feedlot I visited the crew had hung the rope used for holding a bull's legs during castration diagonally across the tailgate. This caused some of the animals to attempt to jump through an open side bar when they entered the squeeze.

Your crew also can be responsible for balking simply by the way they handle cattle. Make certain the man who is implanting and tipping horns steps off to the side of the chute where he can't be seen by the animal entering the chute.

Overcrowding in pens, particularly those using revolving gates, and in alleys is a big contributing factor in chute balks. Also, packing them in too tightly frequently causes rearing and falling and subsequent trampling of the down animal.

A common mistake that leads to balking is the cowboy who leans over the alley in front of an animal's head and prods him on the rear with a hotshot.

Indiscriminate use of electric prods can be a real troublemaker in the work area. Cattle should never be jolted with 110 volts of alternating current. A battery operated prod is far superior and cattle will often respond to the buzz without having to be shocked.

When you are working Brahman or Brahman crosses use prods sparingly. When Brahman type cattle begin switching their tails it is a clear sign they are getting angry and agitated.

Another rule is to not prod an animal unless there is some place for him to go. Wait for the tailgate to open before giving the animal a jolt with the electric prod. Following this simple rule will cut down your problems with angry, balky cattle.

If you want to back up an animal, never use the prod. Usually they can be easily backed up by hitting them gently on the nose with your hand.

A poor operator may be a part of your balking problems. If he fails to catch the animal's head the first time it will often refuse to place its head through the headgate a second time.

It was also observed that when one animal balks the next animal in line is more likely to balk, thus starting a chain reaction of balking.

Construction of the alley leading to the squeeze chute has a big bearing on the ease of getting cattle into the chute without balking.

The best type crowding alley has solid sides which are high enough to prevent cattle from seeing out over the top. A five-foot high alley is recommended for working the large Brahman crosses.

If animals can see over the top, then anti-jump rails over the alley will alleviate many problems. A curved alley with at least a 15 degree bend will help prevent cattle from bunching at the end of the alley.

One-way and anti-backup gates should work easily without banging and clanging. Heavy, noisy gates will increase the amount of balking encountered at the squeeze. Such gates should be counter-balanced to reduce noise. A piece of tire fastened to the gates will also cut the noise factor.

The type of hydraulic squeeze chute also has a significant effect on the amount of balking.

In a squeeze only chute, all processing including branding and castration are done while the animal is held in the squeeze only without a headgate. Survey results indicate the squeeze only chute had the least amount of balking.

This is because the cattle had a clear view through the chute because of the absence of a headgate. Due to the increased choking hazard, a squeeze only chute should be operated by a skilled operator.

A tailgate should be designed so cattle waiting in line in the alley can see through it when it is closed. Some of the hydraulic stanchion chutes with scissors tailgates are designed so there is a gap between the two halves when the gate is closed. This feature helps prevent balking because cattle can see through it.

Cattle have panoramic vision, as shown in this drawing. The area covered by the coarse concentric circles represents the animal's field of vision in which it has no depth perception. The small shaded area in front of the animal's head represents its binocular field. It has depth perception in this 25 to 50 degree area.
A drain running across the work alley will be a constant problem because cattle are afraid to cross it.

If your present squeeze has a solid tailgate which prevents the cattle from seeing through it, modification is called for. One way to do this is to remove the solid metal or wood from the upper portion of the gate and replace it with expanded steel mesh or bars.

In a well designed work area the only view of the outside world the animal should have is through the squeeze chute. This leads him to believe he can escape and he will enter the squeeze more readily.

Cattle do escape from the squeeze chute and the crew hates to waste time chasing them down. However, don’t let your crews succumb to working an animal that is caught at the hips in the headgate. Doing this is an invitation to injury to the animal and to crew members.

Escape is a problem common to hydraulic chutes that are underpowered, enabling cattle to “bull” their way through the headgate. The hydraulic pump should be run by a 220 or three-phase electric motor that is at least three horsepower.

An underpowered chute is almost as dangerous to cattle as one that is overpowered because it can’t control them.

Falling while leaving the chute causes many cattle injuries. My survey shows Brahman type cattle fall down more often than other cattle, probably because they charge out of the chute like a freight train.

In the final analysis, however, the best of equipment and facilities will be only as good as your crew. They shouldn’t be trying for the world speed record for processing cattle and they should realize cattle do feel pain. And any unnecessary injury or pain they are subjected to means money down the drain because weight gains will suffer.

This excellent steel working area is at the Orita Cattle Company, Brawley, Calif. The work area is kept clean by washing with a high pressure hose. The drain is in the center of the alley circle so cattle can’t see it.

The surface immediately in front of the headgate should be rough and dry so cattle have good footing. A grid built of three-quarter inch steel rods in front of the headgate works well. When work areas are built the concrete floors should be scored by four inch squares with one-inch deep grooves.

Some of the falling can also be eliminated by making certain the bottom panels of the squeeze are adjusted to the size of the cattle.

Sample Rating Sheet

<table>
<thead>
<tr>
<th>Chokes</th>
<th>Balks</th>
<th>Escapes</th>
<th>Falling</th>
<th>Headgate Leg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe</td>
<td>Mild</td>
<td>Entry</td>
<td>Exit</td>
<td>Partial</td>
</tr>
</tbody>
</table>

Breed: Weight: Operations: Performed on Animals

Use a new rating sheet for each 100 head bunch. Make a check or tally mark in the appropriate column for each animal which entry balks, severe chokes, falls, etc.
Rough-Neck Chute Crews May Cost You $5 To $10 A Head

By Temple Grandin

TEMPE, ARIZ.—When did you last check your chute crew? No, not just a cursory quick drive-by look, but an honest, critical appraisal of their performance?

Can you, without any reservations, say they are implanting, applying grubicides, drenching, using balling guns, branding and administering vaccinations properly? If you can't, then you must not mind letting a lot of dollars evaporate right off the close-out sheet.

Let's look at each of the items. Every time a fat steer goes through the chute and the crew fails for some reason to re-implant it, you have just tossed away $10.

On the average, implanted growth promotants increase an animal's weight gains about 10 percent. Nutritionists estimate about one half of the 10 percent increase comes from the re-implant.

Paul Guyer, extension beef specialist at the University of Nebraska, figures that every steer that misses the re-implant will take about 150 pounds of additional feed to reach market weight.

That means if you re-implant 15,000 head a year and your crew lets 5 percent of the cattle escape through the chute without the implant, or botch the job, you are losing up to $7,500 a year in extra feed cost.

Nutritionist Gene Erwin, head of Erwin and Associates at Tolleson, Arizona, notes that a botched implant job can cause you at least a $5 loss in weight gains.

Dirty needles will cause infection and eventually a wall of scar tissue will form around the implant, preventing the pellets from being absorbed.

Crushed pellets, on the other hand, absorb too rapidly so the animal will not get the full benefit of the implant. Also, they can cause burls, steers and other problems.

Erwin suggests a few typical bunches of cattle be put back through the chute to determine if the pellets are being absorbed properly.

Applying grubicide should be a simple enough operation, yet Dr. R. C. Schock, an American Cyanamid veterinarian, says he is dismayed at the amount of material that lands on the ground instead of the animal's back. He estimates this sloppiness on the part of the crew costs seven to 14 pounds of gain. On top of this is the loss taken because of the damage to hides and carcasses from grubs.

Careless injection of vaccines also are costly. As one drug company representative said, "The way crews squirt our products around, it's a wonder they work at all."

Dr. Schock advises it is a good practice to check syringes periodically for worn parts. He has found in checking syringes in many lots that, even though they are set correctly, they do not administer the proper amounts of material due to wear.

Another point is to be certain that the vaccination is administered properly. In case of question, have your veterinarian give the crew a short course in injection techniques.

Improper use of balling guns and drenching equipment also rates high on Dr. Schock's list of ways for your crew to cost you money. He estimates the throat of one out of every five head drenched or pill ed is injured. Such injuries will set cattle back four to five days and you can figure at least a $3 loss due to reduced gains.

Branding an alphabet soup of numbers and symbols on an animal's side also hurts gains. Preliminary research done by Don Addis of the University of California indicates rib branding has a more detrimental effect on weight gains than hip brands. There is some evidence that rib branding can cause lung damage, particularly if the iron is kept on too long.

Under even the best of conditions, just putting cattle through a chute will cause a one or two day loss in gains. If, however, your crew is unnecessarily rough the cattle can be easily set back a week or more. That means at least four days of gain is needlessly lost.

It is particularly important that heavy cattle that are to be re-implanted be handled carefully. They, like out of shape people, will be stiff and sore the next day if they are handled roughly in the chute. When this happens you can figure you lost at least a $5 bill in weight gains.

Regardless of the animal's size, once it is set back it is unlikely it will catch up with its pen mates. Studies at the University of California's Imperial Valley Field Station indicate such setbacks are costly.
"It appears," says Glenn Lofgreen of the station, "if calves are given a weight advantage during the first month after arrival they will probably retain that advantage throughout the feeding period."

One way to insure that calves retain that advantage is to make certain your chute crew work quietly and do not attempt to set a new world record for the number of cattle handled in an hour.

One of the key men in your crew is the chute operator because he is the person responsible for proper restraint of the animals. He should be instructed to operate the hydraulic equipment without jerking the controls. Nor should he "play" with the controls once the animal has been restrained. I have been in many feedlots and observed operators who kept jerking the controls just to hear the chute equipment without jerking the controls. Nor should he "play" with the controls once the animal has been restrained. I have been in many feedlots and observed operators who kept jerking the controls just to hear the pressure relief valve open.

Should an animal be improperly restrained or in the wrong position in the chute the pressure should be released gradually. Sudden release of pressure will cause the animal to fight the headgate until he is again restrained. Slow release of pressure tends to keep animals calmer.

An important point to remember is that hydraulic chutes are not hydraulic presses, although some people tend to use them that way.

This calf can't breathe. Over-squeezing is most likely to be a problem in hydraulic chutes powered by a 5 HP or larger motor.

Research I have conducted in Arizona reveals that chutes can exert tremendous amounts of pressure on an animal. In fact, load cell readings taken 27 inches above the floor of the chute and just below the top of the solid portion, showed alarming pressure in some chutes.

The load cell I used had a maximum capacity of 2,000 pounds and four of the chutes tested pegged the end of the meter almost instantly and the pressure relief valve remained closed. Fourteen other chutes I checked exerted pressures ranging from 700 to 1,750 pounds before the relief valve opened.

The sides of a squeeze chute act like levers and the nearer you come to the floor the greater the pressure. For example, if a chute exerts 1,000 pounds of pressure 30 inches above the floor, the pressure will be 2,000 pounds 15 inches from the floor.

Most commercial stanchion non-tilt type hydraulic chutes are equipped with three horsepower 220 volt electric motors. None of these chutes I tested recorded the 2,000 pound plus pressures. Over-squeezing will rarely be a problem with heavy cattle worked through a three horsepower chute.

The four chutes recording over 2,000 pounds pressure were all tilting chutes with five horsepower motors. If you are encountering a problem of over-squeezing with this type of chute it can readily be corrected by loosening the pressure relief valve.

In some cases, if all the circuits are controlled by a single relief valve, the tilt will not operate. This can be overcome by installing a separate pressure relief valve in the squeeze and gate circuits.

The recommended pressure at 27 inches above the chute floor for cattle weighing 600 pounds and over is 1,000 to 1,500 pounds. The pressure range for cattle weighing under 600 pounds is 600 to 800. Remember, these are pressure readings exerted by the chute sides, not hydraulic system pressures.

Over-squeezing and rough handling not only reduce weight gains, they can be a significant factor in death losses. If your cattle grunt and groan or choke it means they are being over-squeezed.

As California feedlot veterinarian Joe Clark observes, "How would you feel if you were kicked in the chest when you had pneumonia?" But that is exactly the way some crews handle sick cattle in the chute.

Over-squeezing heavy cattle when they are being re-implemented can kill them. Arizona feedlot veterinarians Jim Sh...
Fear and excitement can set an animal back a week in gains. A single incident like this can cost you $5 in gains.

This load cell is being used to determine the amount of pressure the hydraulic chute will exert against an animal’s body.

don and Robert Fulton report that autopsies they have performed on over-squeezed cattle revealed ruptured diaphragms. A day or two after re-implanting cattle that have been over-squeezed may appear to have pneumonia and then quickly die. That’s the kind of loss that is unnecessary and no one can afford.

Good handling during processing and re-implanting could mean the difference between a going operation and financial disaster. But it’s up to you to make certain your crew understands and follows proper chute practices. When they do it will mean more money in your pocket.