

Transport to and unloading at the slaughterhouse

1. Load cattle in groups

Load cattle in groups. Cattle are social animals and experience stress when separated, therefore it's best to keep them in small groups of two or three. Loading small groups is usually the quickest way and induces the least amount of stress with the animals being more calm and easier to round up.



Rounding up cattle in pairs of three

2. Ensure loading ramps and sidewalls are at an adequate height and solid

Ensure loading ramps and sidewalls are at an adequate height and are solid. This prevents cattle from falling of the tailgate, getting distracted by environmental factors (making them balk) or possibly getting stuck.



Ensure the sidewalls of the loading ramp are adequately high and solid

3. Reduce sound

Cattle are very sensitive for sudden sounds, therefore it's best to reduce noise during loading and unloading as this will reduce the amount of stress the cattle experience. Sounds can easily be reduced by using rubber or sound reducing materials. E.g. these materials can be attached to the bottom and sides of the tailgate. This will reduce the sound when opening and closing the tailgate.

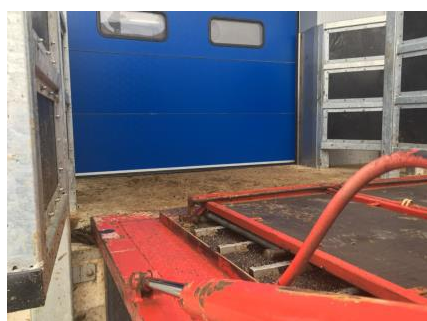


To avoid metal on metal contact during unloading, mount a rubber panel or other sound reducing material on the inside of the tailgate as shown on the pictures. This reduces the amount of noise, which will make the cattle less hesitant and scared to go down the ramp. Attaching a rope to the side walls of the trucks' tailgate so that the truck driver can gently lower it down rather than letting it fall and cause a bang.



4. Avoid steep slopes

Cattle are frightened of steep slopes and have difficulty moving up and down them. Where possible have the tailgate as level as possible. Best practice would be to have the tailgate on the same level as the loading area. This will make it easier for the cattle to walk in and out of the truck and will decrease the risk of cattle falling and decreases congestion.



Tailgate is at the same level as the loading platform- This makes unloading easier.



Loading platform at the livestock market in Leewarden (angle of the tailgate is reduced).

5. Install proper lighting

Cattle tend to gravitate to proper lighted areas but ensure the light does not directly hit their eyes as this will scare them away. Cattle move towards lit areas, and are afraid of moving towards dark areas where they have trouble seeing what is ahead.

6. Anti-slip flooring.

To avoid cattle from slipping and injuring themselves ensure the loading ramp is covered with anti-slip materials. Use steps on slight slopes and use the bedding on hand (e.g. straw) to cover the ramp.



7. Be patient during loading and unloading

- With the use of your body position you can get the cattle in motion. Using tools shouldn't be necessary. Be smart and make use of the of the cattle's natural behavior. By being aware of the flight zone and using it to your advantage, you can make the cattle calmly move away from you.
- Do not chase the cattle. They walk slower than us humans do.
- With cattle the right brain is connected to the left eye with which they make a risk assessment. Always stand behind the cattle on the left-hand side so they can see you with their left eye.
- Patience is a virtue. By being patient, you will be able to load the cattle effectively. Chasing the cattle will induce stress and will make them walk in the opposite direction.
- What doesn't work is: shouting, whistling and clapping your hands, making fast movements (waiving your arms), hitting pushing and pulling or standing in their pathway.

8. Immediately euthanize sick or crippled animals

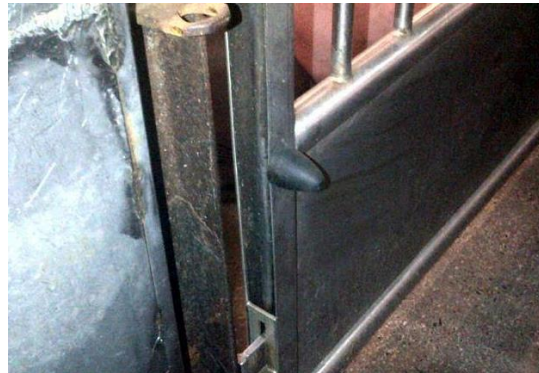
Upon arrival immediately euthanize crippled or sick animals. Do this while they are still in the truck and do not force them to stand or use electric prods.



Lairage

1. Reduce sound

-In the most idyllic lairage there is hardly any sound. Cattle have sensitive hearing and become stressed from sudden sounds. E.g. metal gates being opened and closed (metal on metal). Eyes On Animals advises moving parts (gates, dividers etc.) to be made of plastics (polypropylene). Rubber/plastic nobs and strips can be mounted as well to avoid metal on metal contact.

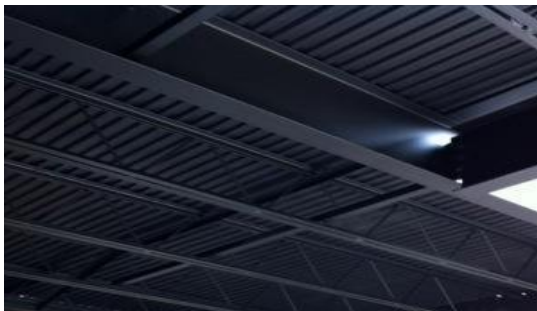


Plastic fencing (left). Rubber nob (right)



Placing of rubber nobs to reduce sound when opening and closing the gate

-Avoid high ceilings. This will reduce echo and noise. Make use of isolation materials that will absorb sounds. With the use of pneumatics (air pressure) ensure that the whistling/sizzling sounds are redirected to another area, away from the animals. Other areas, like washing areas which produce a lot of sound shouldn't be near the pens.



Ceilings with sound-absorbing materials

2. Keep cattle in the same groups.

When groups are mixed they will start to jump up on each other (aka mounting, a form of dominant behavior). Jumping will induce stress and increases the risk of injury. By keeping the cattle in the same social groups this kind of behavior can be avoided. The advantages: calm cattle and fewer injuries. In addition, they will be easier to drive.

Eyes On Animals have encountered trucks where partitions could be placed in different positions and the size of groups could be controlled. The same would be possible for the lairage (please see picture below, pig slaughterhouse Westfort). Keeping cattle in stable social groups will be beneficial for the cattle's wellbeing.



Partitions with sound reducing materials (plastic and rubber).

3. Anti-mounting fencing

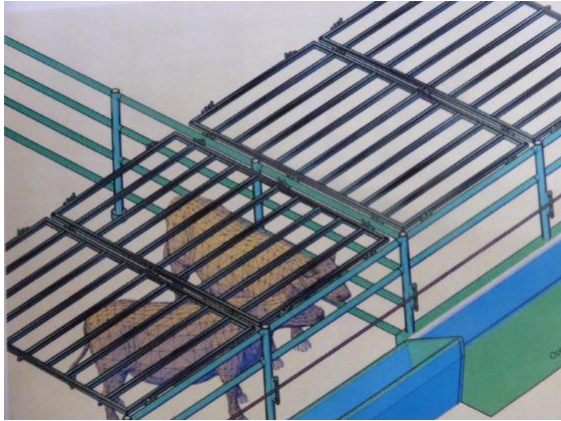
We advise to place anti-mounting fences (half meter above the withers of the cattle) so that the cattle physically won't be able to jump each other. This will reduce stress and will create a calmer atmosphere.



Anti-mounting fence "ceiling" above the lairage pens



Another option would be to place anti-mounting fencing in the corners of each waiting area, this way the cattle who are being jumped on can hide under the fencing.



Anti-jump fencing in the corners of the lairage. Submissive cattle take refuge under the fencing.

4. Proper drinking facilities

Each lairage should have fresh and sufficient drinking water for the cattle to drink as they please and require. Install troughs and spooned bowls. Not all cattle are acquainted with drinking nipples and will have trouble drinking from these, having these alone won't be sufficient. To avoid fights, ensure there are plenty water resources installed throughout the area.



Proper drinking facilities

5. Stocking densities

Avoid a high stocking density in the lairage as this will increase stress and mounting behavior. Furthermore, cattle will need adequate space to be able to comfortably lay down and keep distance to one and other. The purpose of the lairage is for the cattle to be able to rest. Cattle will be easier to drive and will be calmer in the stun box if the lairage is a comfortable and stress-free environment. It won't meet its purpose if it's packed with cattle.

When bulls are kept separately they should also be provided with sufficient space to be able to lay down.

6. Comfort for "suspect" animals

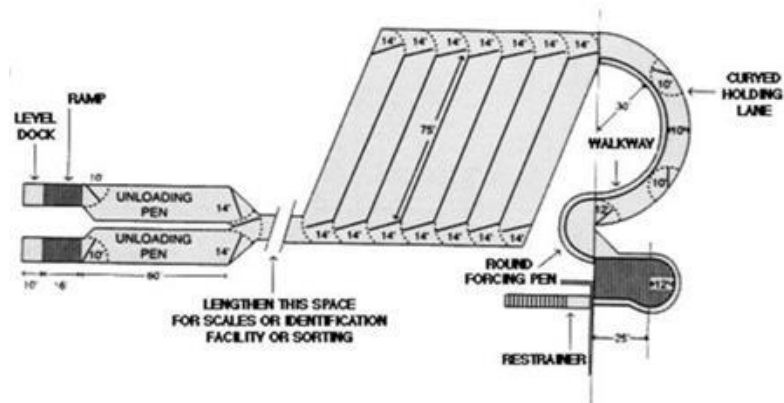
Because these animals are suspected for being sick or wounded, euthanizing or at the very least slaughtering them as soon as possible is the most humane option. If this isn't an option, ensure to provide extra comfort for them while they wait for inspection. Make the suspect pen comfortable with for example rubber mats to stand and lay on. This is softer than bare concrete flooring and isolates them from the cold floor. Other bedding material can be used if your plant allows it, such as straw. It is also very important that the pen for suspect animals be located in a very quiet area of the lairage where there is no activity, so as not to cause additional stress.



Rubber mat in suspect pen

7. Keep the walking route clear and simple

Ideally the lairage has a diagonal design, where the livestock enter one side and exit the other. For reference see picture below. This design by Temple Grandin is clear and simple. Due to the simple design its clear to them where to go and there is no need for them to turn around or manoeuvre sharp angles. Less effort will be needed to drive the animals.



Copyright: Temple Grandin 9

8. Ensure the walls in the lairage are at an adequate height and closed.

To avoid any distractions caused by movements and people, construct walls which are solid almost all the way down to the ground. Also ensure these are at adequate height so that cattle can't look over the walls (construct the walls at the height of the withers) or injure themselves attempting to jump over them.



To avoid these situations, construct walls which are closed and of adequate height.

9. Minimize the waiting time

Unlike with pigs, cattle don't benefit from long waiting hours in the lairage. Ideally, the maximum waiting time is 3 hours. With a waiting time exceeding 12 hours feed and appropriate bedding must be provided to the cattle.

10. Clean the flooring regularly

The flooring on which the cattle walk and lay on should be clean and dry. This is important for the cattle's comfort and to avoid injuries caused by slipping.



11. Separate the bulls from the cows

Bulls should be kept separately unless they are from the same pair. Always separate the bulls from the cows.

12. Play classical or calm music.

Research has proven that harmonic music has a calming effect on cattle. Install speakers in the lairage and play these types of music, avoid rock music and types alike. This also helps blend out abrupt noises that scare cattle.



13. video surveillance

Install intelligent camera surveillance in the slaughterhouse (at each area which contains live animals). This way the staff's behavior with regards to handling of animals can be monitored.

Raceways

1. Driving cattle into the raceway

-Calmly drive the cattle from the lairage to the raceway. Make use of the cattle's natural behavior and stand on the left behind side. This way the cattle can see you with their left eye (the right brain is connected to the left eye with which they make a risk assessment).

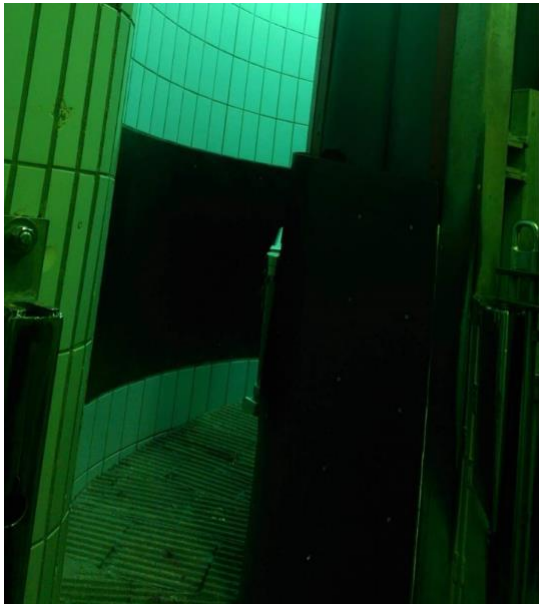
-Cattle walk slower than us humans do. Do not chase them up. This will induce stress and will make them walk the opposite direction.

-If needed use a tool like a flag or a plastic paddle. Don't use these to hit or poke the animals. Usually the use of your body and position should be enough to drive the cattle into the raceway.

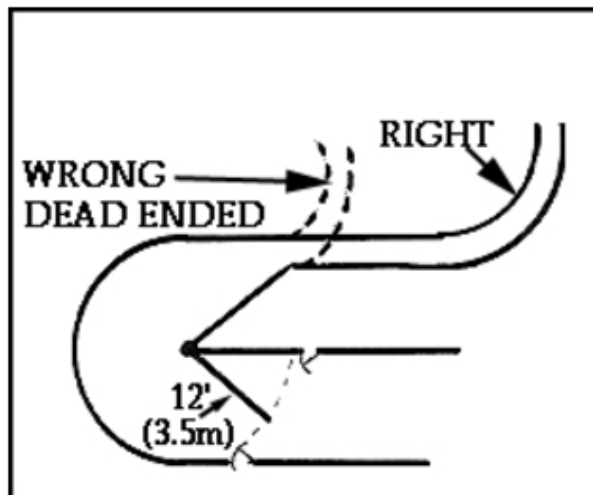
-When animals are hesitant, observe their behavior and assess the raceway. Eliminate any stress factors. Usually animals are hesitant when they are fearful of something ahead.

- Screaming and shouting has the opposite effect. Remaining calm will prevent the animals from balking or turning around and will make the drive into the raceway easier.

- Temple Grandin recommends the use of a circle crowd pen, allowing the cattle to be driven one after the other. Drive them in small groups only and ensure the pen is not too crowded (the pen should only be half full or less). Too many animals will induce congestion and stress. Take note of the design there should never be a bend at the entrance of the raceway as this will block the cattle's view (they should be able to see three cows ahead).



Incorrect positioning of the bend



-Don't force a hesitant animal. This will cause a lot of stress. If possible let the animal be for the moment and have another try later on.

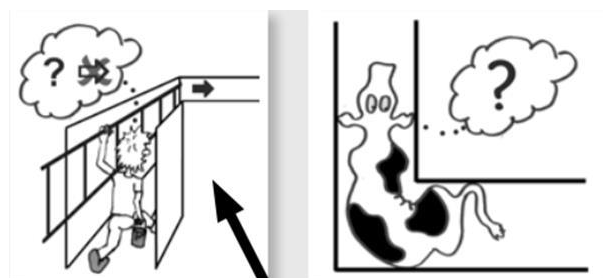
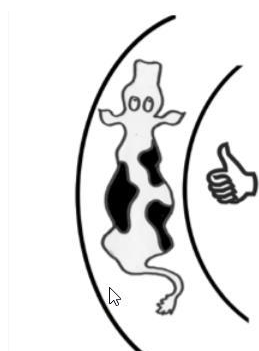
-Ensure that there is a constant flow and that the raceway isn't too short. There should always be enough room for the animals to stand in the raceway before entering the stun box. In the meantime new animals can be gathered. This will reduce workload on the employees and they will experience less stress and frustration. Which in its turn will be beneficial for the animals wellbeing.

-If it's not possible for the animal to enter the raceway or proceed through the raceway (e.g. injury) immediately stun the animal on the spot and make a deep and transverse cut across the animal's throat, severing the blood vessels, trachea and esophagus. Never force an injured or downer animal to walk through a raceway.

2. Wide bended raceways

Motion can be encouraged by ensuring the raceway has one or more wide bends. Cattle like to walk towards the way they came from and wide bends will create this illusion.

Sharp corners/bends will create the illusion that the passageway is a dead-end which will discourage the cattle from staying in motion and cause confusion and fear. Besides, cattle aren't physically built to be able to turn around sharp corners.



3. Width of the raceway

If the raceway is too wide, cattle will try to pass each other. This will cause congestion and stress as they will get stuck. In Poland Eyes On Animals encountered a horse slaughterhouse that constructed a passageway which could be adjusted in width by placement of a metal bar. The metal bar could be folded up when needed. Please refer to the photo's below:



4. Drive cattle in small groups.

Drive cattle in small groups through the raceway. They will have more room which will reduce collisions and congestion. Stuffing the raceway with cattle will lead to some slipping and others jumping, and spread fear and chaos throughout the group.

5. Anti-mounting fencing

By placing metal bars above the raceways one can prevent the cattle from jumping on each other.



Raceway with closed walls and anti-jumping fencing

6. Proper lighting

Ensure proper lighting is installed above the raceway. Areas shouldn't be too dark. Cattle prefer to walk from dark areas to light areas. Avoid any light hitting the cattle directly in their eyes as this will blind them and make them balk.

7. Distractions in raceways.

- Ensure there is little to no distractions in the raceways. Strange objects and moving people can cause stress and congestion. Same goes for blood on the floor and floor drains. New smells and contrast in colours and textures make them balk.



Contrast of the floor drain can induce stress

-To minimize distractions, ensure that the outer wall of the raceway is solid and of an adequate height, so the cattle won't be able to look over the wall. The inner wall should be lower than the outer wall so that staff will still be able to control the drive.

-Unity is key. Make the walls of the raceways from the same materials and apply the same colors. Avoid all contrasts in colour, texture, noise, smell etc..

8. Anti-slip

The flooring of the raceways should be made of anti-slip materials, so animals won't slip and fall.

Restraint box

Handling cattle

1. *Being patient has the fastest results*

-If cattle are hesitant/refusing to walk into the restraint box, assess the restraint box and the area. Is there something preventing the cattle from entering (blood on the floor, slippery flooring etc.)? Deal with the situation and try again.

- Don't force hesitant animals. This will induce stress. If possible let the animal be for the moment and have another try later on.

2. *Staffing*

Eliminate the necessity for employees to walk back and forth by placing at least one employee at the raceway beside the entrance to the restraint box and one employee responsible for working the restraint box. This will reduce the stress the cattle experiences and will reduce the waiting time at the restraint box. This will also have a positive effect on the workload of the employee and better results can be achieved.

3. *Effective stunning with minimal stress*

- Only guide the animal into the restraint box if he or she can be stunned immediately. If the stunman is not ready, or if there is a technical problem or delay in the slaughter chain, never leave an animal in the restraint box waiting..

- Once the animal has been guided into the restraint box, immediately close the back gate so that the animal is unable to walk backwards.

- If the restraint box isn't equipped with a head holder, only stun the animal when his or her head is positioned correctly. If the animal is anxious wait a moment until she or he holds the head still.

- if the restraint box is equipped with a head holder, immediately stun the animal once the head has been restrained. Leaving the animal restrained while conscious will induce severe stress and can cause pain.

Stress reducing design

1. Customization of the restraint box.

Assess if the restraint box is still adequate for its purpose. Animals nowadays are bred to be large of size and may be too big for your current restraint box. Construct the restraint box in such way it can be customized to the animal's size (in length and width). (e.g. partitions that can be placed in different positions enabling you to adjust the length and width). Never force a large animal to squeeze into a small restraint box.



2. Restraint box with an open front side

Having a restraint box with an open front creates the impression that the cattle will be able to walk through the box. This will make them less hesitant to enter the restraint box compared to one with a solid front, which gives the uncomfortable feeling to the animal that it is a dead-end. However, it is important that the cattle won't be able to see any movements up ahead.



Poorly lit (too dark)



Properly lit and open, this encourages cattle to stick their head through the opening

Modern-day restraint boxes are usually equipped with a head restrainer, our experience with head restrainers is that it doesn't always improve the animal's wellbeing. Stunning will be easier with the use of the head restraint but is very stressful for the animal. Once the head has been fixed into position he or she must be stunned immediately.

3. Flapje boven box om zicht op schutter te beperken

Ideally cattle won't be able to see the stunner or the operator for that matter. When the operator is hanging above the cattle in its flight zone its perceived as threatening. The cattle's vision can be blocked by placing a piece of tarpaulin above the restrainer. See below example of T. Grandin.



4. Reducing sound around and in the restraint box

Cattle are easily startled by sudden noises, especially when it's a hissing sound. Usually doors and parts of the restraint box are powered by a pneumatic (air) system. Hydraulic (liquid) powered systems make less noise and should be considered. In some instances, a pneumatic powered system is preferred, usually in the case when the restraint box is designed to be adjustable to the animal's size. With the use of a pneumatic-powered system it is easier to adjust the exact amount of pressure applied to the animal. If pneumatics must be chosen, reduce noise by redirecting the hissing sound to another room via hoses.

5. Solid side walls

The restraint box should have 4 solid side walls. Side walls which don't reach down to the floor create a distraction as cattle will try to look underneath, through the open gap. This in its turn will make the restraint and stunning process more difficult and even risky, as the animal will not have his or her head in the upright position. There is more risk of misfiring and long delays if the animal is distracted in the restraint box.



Restraint box – open spaces on the sides and shadows create distractions

6. Anti-slip flooring

It's very stressful for cattle when they lose their balance and slip or fall. Ensure the flooring is made from anti-slip materials such as rubber or asphalt. Manure and blood will make the flooring slippery and make cattle hesitant to enter. Keep the flooring clean and maintain it regularly to make sure it remains anti-slip. If there is lots of manure in the restraint box, this is also an indication that the process is very stressful for the animals. Animals defecate when fearful.

Stunning and slaughter

A captive bolt pistol can be used to stun cattle. This can either be pneumatic or cartridge activated.



1. Ensure that the stunning equipment is working properly and serviced daily.

- If a captive bolt pistol is used which is powder-activated ensure the cartridges are right beside the pistol and both things kept clean and dry. A humid environment will have a negative impact on the working of the powder-actuated bolt pistol. Spare ammunition and back-up equipment should be within hand reach at all times. - If a pneumatic bolt pistol is used, ensure the pressure gauge is working correctly. Always use the pneumatic bolt pistol using the correct amount of air pressure. This can be read on the pressure gauge.
- All equipment used to stun or kill should be checked on correct functioning prior to usage.
- If the equipment isn't working properly replace it with a properly working one before further usage.
- Perform regular maintenance on the stunning equipment as prescribed in the instruction guide.

2. Positioning of the stun device

The crossing point of two imaginary lines, in the middle of the forehead between the eyes and horns is the correct position to apply the stun.

- Ensure the captive bolt is pressed securely/firmly against the skull/forehead.



3. Assessing Unconsciousness

Please refer to the table below and follow the signs to assess if an animal is properly rendered unconscious. A minimum of three signs should be checked to verify if an animal has been properly stunned with a captive bolt pistol. Educate all employees, so that aside from the operator, all employees can verify if an animal has been properly stunned. An animal should only be hoisted and bled out when he or she has been properly stunned and is 100% unconscious.

Table 1 Stun Quality Protocol describing symptoms with ratings from 3 (highest) to 1 (lowest) risk for recovery and inferior animal welfare.

Stun Quality Rating (SQR)	Action	Symptom	Definition
SQR3*	Re-stun immediately	Failed to collapse	Animal does not immediately fall to the ground after shot with all legs collapsed
		Attempt to regain posture	Animal attempts to stand up or lift the head before hoisting
		Vocalisation	Repeat vocalisations or groans can be heard not associated with a one-time exhalation
		Pain response	Animal reacts to a painful stimulus such as a prick to the inner skin of the nostril with a sharp instrument while on the stun crate or shackle
		Blinking	Animal opens/closes eyelid on own (fast or slow) without stimulation
		Corneal reflex	Animal blinks (fast or slow) in response to stimulus of the cornea
		Rhythmic breathing	Continuous rhythmic inhalation and exhalation in the form of expansion/contraction of the trunk area can be seen or exhalations can be felt with the hand
SQR2*	Re-stun immediately	Full eyeball rotation	The eyeball rolls so mostly pink sclera can be seen and little or no iris
		Nystagmus	Rapid side-to-side (twitching) movements of the eyeballs
SQR1	Monitor closely and re-stun if ≥ 2 symptoms are observed	Absence of tonic/clonic phase	Absence of tonus in whole body and muscle spasms for over 20 s after stunning
		Partial eye rotation	The eyeball rolls so that only half of the iris is still visible
		Groaning	A groaning sound can be heard upon exhalation and not repeated
		Head raising	The head is flexed upwards while animal hangs on the shackle line
		Gasping	Repetitive contraction and retraction of the lips and slight opening/closing of the mouth
		Reactions to sticking	Severe kicking and body or head movements during skinning or sticking procedures
		Ears not pointing downwards	When the ears face backwards towards body at sticking and do not hang downwards
		Tongue up	When tongue is retained in mouth (not hanging down and relaxed out of mouth) at sticking

* If an animal shows any one symptom of SQR2 or 3 it is considered inadequately stunned.

Instruments can be purchased to measure the effectiveness of the captive bolt

https://meatinfo.co.uk/news/fullstory.php/aid/21965/New_stun_gun_measurement_device_available_to_UK_customers_.html

4. Measurement is key

- Keep a maintenance log and a test log (legal requirement).
- Keep a log of failed (first) stun attempts. Perform a trend analysis to pin point the underlying cause and come up with a solution to tackle the problem.

5. Loaded and properly working back-up equipment should be within hand reach of the stun box.

Always have back up equipment ready for use and within hand reach, so a second stun can be administered immediately in case the first attempt failed (legal obligation).



Second captive bolt pistol as back up equipment

6. Stunning bulls and heavy cows.

Research has concluded bulls and large/heavy cows are at risk for not being properly stunned. This risk is mainly due to the lack of proper maintenance and cleaning of the captive bolt. Another contributing factor is the amount of hair on the forehead and the thickness of the skin. All the more reason to ensure the captive bolt is cleaned and maintained daily after usage, preferably several times throughout the day.

If bulls and cows aren't being stunned properly and this is a recurring issue you need to purchase a different captive bolt with more power or a heavier shot load. When in doubt always perform a second or third stun.

7. Re-stun animals directly when the first attempt failed.

- If an animal is not properly stunned it must be re-stunned immediately.
- Don't place the captive bolt on the same place as the initial stun, this will not result in a stun. Use a different position.
- If an animal needs to be re-stunned use a heavier shot load (switch to more powerful cartridge for heavier shots).

Bleeding

1. Immediately bleed the cattle after the bovine has been properly stunned.

Animals must be bled out as soon as possible after stunning and should be done within 60 seconds after the stun.

2. Effective bleeding

A cattle's brain is provided with oxygen by the jugular veins and vertebral arteries. Therefore, all of these blood vessels should be severed. Death will occur faster and chance of regaining conscious remains slim. Eyes on Animals advises to always sever the vertebral arteries (in the chest area).

General

1. Level out the flooring

Ensure that the flooring in the entire slaughterhouse is one color and made of anti-slip materials. Prevent shadows, bumps, holes and puddles as this will startle the cattle and cause stress and congestion.



2. Green light

Cattle have poor depth perception, so anything that creates a contrast (like shadows on the floor) will startle them and stress them out. To minimize shadows and contrasts we advise installing green lights throughout the slaughterhouse (in the areas which contain live animals). Below is an example of green light installed at the lairage. This can be created by covering the tube lights with green covers. Example: <https://www.firstlight.nl/tl-hoezen/gekleurde-tl-hoezen-voor-tl5-16mm-buizen/>

