Improving animal-welfare in pig slaughterhouses

Tips on how to reduce stress, suffering and ease handling

- Edition 2021 -

Eyes *on* Animals | Watching out for their welfare

Foreword by Dr. Temple Grandin

Improving Animal Welfare in Pig Slaughterhouses is an excellent booklet which provides practical information to improve welfare, transport, handling efficiency, and stunning.

The information in this book will be especially useful to slaughterhouse managers and staff who work directly with the pigs.

Numerous photos show transport vehicles, lairages, flooring, raceways, restrainers and stunners in European facilities. There are extensive guidelines and photos about simple methods to reduce the frequency of pigs balking, backing up or turning around when they are being moved. Modifications of lighting to reduce reflections and illumination of a dark race entrance will often improve pig movement.

Some other topics that are covered in this excellent publication are cooling pigs on transport vehicles, stunning methods, handler training, and the use of video cameras to monitor handling. Video cameras can be used to detect poor handling, but they also can be used to reward employees who handle pigs quietly with careful low stress handling. Lots of easy-to-use practical tips that managers, welfare officers, and employees can immediately start using.

Dr. Temple Grandin

Dr. Temple Grandin is a world-known ethologist and spokesperson for the humane treatment of livestock . Author of more than 60 scientific papers on animal behavior and consultant to the livestock industry on animal-behaviour, welfare and design. Dr. Temple Grandin recently published her new book “The Slaughter of Farmed Animals: Practical Ways of Enhancing Animal Welfare”.

Personal note by Eyes on Animals

This Industry Tips document is a collection of better or brand new and unique practices we have seen during our inspections of slaughterhouses. They represent years of work and international travel.

Our main goal is to get these better practices copied and put in place in slaughterhouses everywhere so animal suffering can be reduced. That is why it is free and public on our website.

Nevertheless Eyes on Animals is a small NGO with a tight budget. **Please consider making a donation for the use of this document: IBAN: NL73TRIO0212364219 | BIC: TRIONL2U**

Thank you!

The Eyes on Animals slaughter inspection team – Lesley, Madelaine, Margreet, Monique (missing on the photo : Asalet and Roy)

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1. Unloading area

- ✓ **Good handling of pigs starts with socializing them at the farm.** Dr. Temple Grandin highly recommends that slaughterhouses ask their supplying farmers to walk through the weaner pens at least once a day. Pigs will then become used to close contact with people and be less frightened when handled during transport and slaughter. [1]

  Also make sure pens on the farm have sufficient enrichment material for rooting, like straw or alfalfa; pigs reared in enriched conditions are easier to move and fight less compared to pigs reared in barren environments.[2]

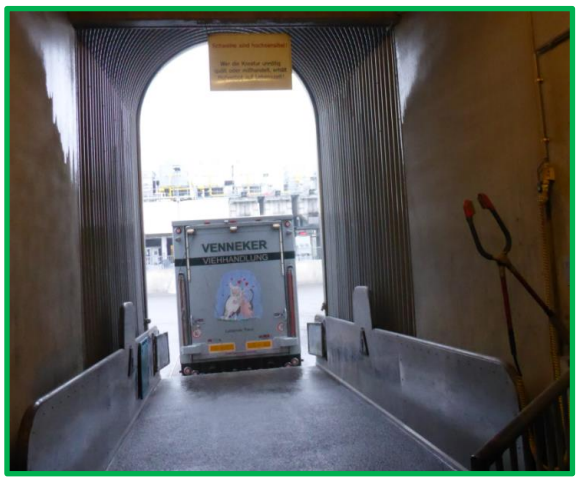
- ✓ **Unload pigs in small groups - one compartment at a time instead of one deck at a time.** Give the first pig sufficient time to explore the new environment and it will then lead the remaining pigs. Pigs are calmer in smaller groups and thus move more easily.[3] When pigs move easily, human handlers will also be more calm with them. It is a win-win solution.

  Unloading too many pigs at a time results in panic, confusion and pigs jumping on top of each other as they have nowhere to go. This costs time!

- ✓ Hang up **big banners** at the unloading docks to remind drivers that rough handling (electric prodding, kicking, hitting, yelling) is not accepted and pigs should be unloaded in small groups to reduce stress. Slaughterhouses should have a clear animal welfare policy and communicate it clearly and regularly throughout the chain (from farm to slaughter).

- ✓ Use camera surveillance and have big screens in the unloading area visible so **drivers are aware they are being filmed**. This will motivate them to treat pigs in a humane way.

- ✓ **Ensure that the sides of the unloading ramp are solid and high**, this prevents pigs from falling off the ramp and blocks the view of negative distractions in the surrounding environment that could make them fearful or hesitant.



Make the sides of the unloading ramp high and solid

- ✓ Make sure there is a power supply in the unloading area for cross-ventilated closed trucks to connect their ventilation system to. This is very important during the summer, because pigs on board such trucks are totally dependent on the mechanical fans for fresh air.


Make sure cross-ventilated trucks can connect to a power supply, so their fans always work.

- ✓ **Place rubber or synthetic panels on the inside of the unloading ramp to prevent metal to metal contact during unloading.** This prevents a lot of noise and enables the pigs to walk more easily off the tailgate. The sound- absorbing panels can be attached with screws to make sure they stay in place. See picture below of Compaxo slaughterhouse for an example:

Rubber panels to reduce noise at Compaxo pig slaughterhouse

- ✓ **The steeper the slope, the more fearful the pigs are.** The slope of the tailgate should never exceed 15°. Best is when there is no gradient at all.[4] A long unloading platform that can be set, via a hydraulic lift-system for example, at the different heights of the truck decks (see photos below) so pigs can walk straight off easily is the most ideal.

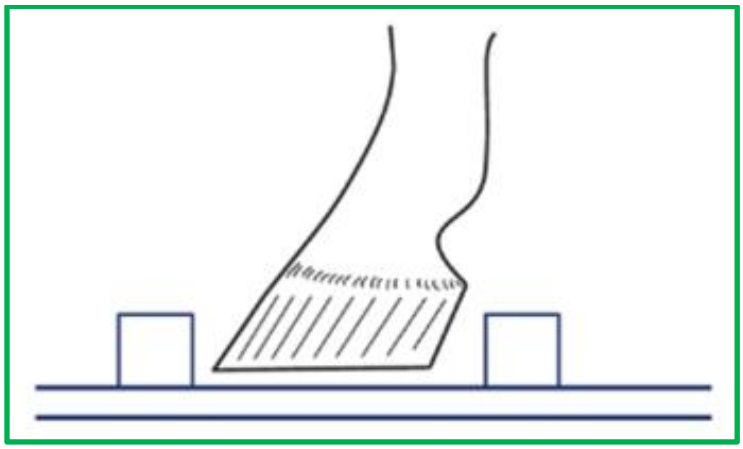

A loading platform that can be set at different heights so the gradient is small or absent

- ✓ **Illuminate the place where the pigs are unloaded.** Pigs tend to walk more easily towards an illuminated area. Ensure that light does not shine directly into the face of the pigs because this inhibits their movement.

✓ **The floor of the (un)loading ramp and platform should be non-slip** to prevent pigs from slipping or injuring themselves.

Create non-slip flooring to prevent the pigs from slipping

✓ Use cleats when there is a slope, even when the ramp is not steep. The cleats should not be too high or wide (2,5cm x 2,5cm max) with not too much space in between each but enough for the pig cloven-hoof to fit in between. Ideal is 15cm. [5]



Correct cleat spacing for all livestock. The cleats should be spaced so that the hooves fit easily between them. For pigs this is 15cm. Source: Temple Grandin, 2018

✓ **Use the same flooring throughout the whole facility to prevent sudden changes in floor structure or colors.** Pigs are sensitive to contrasts in colours and are not very good at seeing depth and distance. Differences in flooring causes stress, hesitation behaviour and thus pile ups.

- ✓ **Remove strips, objects, drains or other distractions on the floor.** Pigs have poor vision – all sudden changes in flooring (colour, texture, reflection) can cause them to pile up or get stressed. Also make sure there are no gloves or other strange objects lying around on the floor.

Remove metal strips, drains or other distractions on the floor. They will cause pigs to balk.

Combat heatstress

Unfortunately Eyes on Animals continues to see long waiting lines in front of slaughterhouses with pigs left on board trucks for hours. The pigs suffer severe heatstress and many break out into fights as a result. From studies it is known pigs, during transport, experience the most stress when left waiting on board stationary trucks.[6]

Long waiting lines are a serious risk to animal-welfare

In a stationary truck the temperatures and humidity can easily build up and cause heatstress and even death.

Waiting lines increase the risk of heat stress and mortality

It is also undesirable to leave pigs on board of a waiting truck as the pigs will become restless. They tend to wake up and, if social groups are mixed, often start fighting. This will also make the pigs more susceptible to heatstress.

Waiting lines are also unacceptable because of risk of fighting

To prevent pigs from fighting and suffering from heat stress waiting queues should always be prevented. Make sure:

- ✓ **The unloading area and lairage are large enough to immediately unload and rest all the pigs. The lairage space should have** a buffer of 10% in order to accommodate animals arriving earlier or later than planned or in case of a breakdown in the slaughterline.

- ✓ Adjust **the delivery times of live animals to the night time or early morning**, when the temperatures are lower. The working hours of the employees should also be adjusted in the summer according to announced heat waves. Slaughterhouses should adopt a “tropical schedule”; the schedule changes to the evening, night-time and early morning only. At Van Rooi slaughterhouse (NL)

they are experimenting with this.

- ✓ Have a second look at the inbound schedule and make sure that there are **not too many trucks arriving at the same time**, especially not during hot and humid periods of the day.

- ✓ On hot days accept and slaughter fewer pigs.

If trucks nevertheless have to wait outside the following steps <u>MUST</u> be taken:

- ✓ **Set up powerful and large industrial fans.** These should be adjustable in height, angle and portable so they can be positioned beside each truck and the airflow can reach each deck.

Large mobile fans to ventilate stationary trucks help reduce heatstress


Left, old situation: fans are too low, the airflow does not reach the top decks .
Right, new situation; two fans are stacked and can be set at different angles so all decks can

be reached.

- ✓ Build a canopy where livestock trucks can park underneath so that animals on board are kept in the shade until they can be unloaded. Make sure the sides of the canopy are open so the wind can blow through the trucks. Place extra mobile fans for extra ventilation of the trucks where necessary. Make sure the fans are big enough and adjustable, so they can be set at different heights and angles.

Canopies for waiting trucks at Vion Boxtel (left) and Westfort (right)

- ✓ Make sure there is enough air-space in between and above the trucks so the wind can pass at all sides to provide as much air crossing as possible to the animals on board and help dissipate their heat. The roof of the canopy should be light coloured in order to reflect the sunlight.

Parking areas with white roof and open sides, providing some shade and ventilation at Van Rooi (left) and Vion (right) where pigs often cannot be unloaded immediately.

✓ Make sure the parking area has a light coloured floor. Whitewash the asphalt to reflect sunlight and reduce heat inside the truck.


Whitewashed floor and white roof to reflect sunlight at VION Boxtel and Remkes in Epe

✓ Instead of a canopy trucks can also be parked on a lane in between high trees to provide shade and ventilation. Make sure however that this area provides enough shade during the *whole* day.


Waiting line in between trees *Trees provide shade at this parking zone*

These trees do not provide enough shade

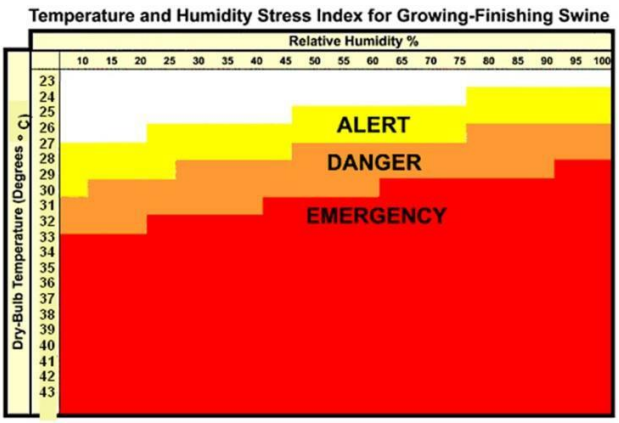
- ✓ A misting system helps to further decrease temperature inside trucks. But make sure it is always used in combination with sufficient powerful fans so the humidity does not rise. The higher the humidity level – the more difficult pigs can cope with heat. Van Rooi slaughterhouse in Helmond (NL) has a misting-system built into their canopy. Watch the video of it here >> At Westfort pig slaughterhouse in IJsselstein (NL) fans and water misters have been installed along the roof to reduce the temperature inside the trucks. The fans switch on automatically when the temperature reaches 22 degrees and the water misters when the temperature reaches 25 degrees.

Fans and water misters at Westfort slaughterhouse (NL)

Studies have shown that heatstress is reduced when misting systems, in combination with fans, are used during waiting times in the lorry. It reduces

drinking behaviour in the lairage, physical fatigue when being moved through the slaughter process and water loss in meat.

- ✓ When wetting the asphalt or trucks, realize that doing this is only beneficial for the pigs if it's being done with the use of an industrial ventilator. Wetting the asphalt or truck alone, will slow down the rising temperature but will also increase the humidity (creating a sauna-like environment). An increase in humidity on a hot day means that the pigs will have trouble cooling down and will suffer more.



Wetting asphalt is only beneficial for pigs if it is done with the use of an industrial ventilator so the humidity does not increase

- ✓ **Appoint one employee to be responsible for checking on the welfare of pigs on board waiting trucks during extreme heat.** This employee should be trained to recognize signs of heat stress. As soon as pigs develop heat stress, or the welfare is impaired for other reasons, the truck should be given immediate priority to unload so the animals do not suffer additionally and can receive proper care.

Recognizing signs of heat stress

When pigs suffer from heat stress they have rapid, shallow breathing and their mouth is wide open, like a dogs'. Sometimes there is foam/saliva around their mouths and their skin turns red. A pig suffering from heat stress will lie on his or her side with the legs stretched in an attempt to cool her body temperature down.

A normal respiratory rate for a pig is 25-35 breaths per minute, which can be calculated by the up and down movement of the breast. Watch a video of a pig experiencing heat stress here >>

ABM	Description
Discolouration of the skin	Changes from light to redder colour of the skin (Pilcher et al., 2011)
Panting	Breathing with short, quick breaths with an open mouth (Dalmau et al., 2009c; Welfare Quality®, 2009)

Assessment of heat stress at arrival. Source: EFSA, 2020

Pigs with signs of heatstress: rapit open-mouth breathing with foam around the mouth

Handling of pigs in pain or discomfort

- ✓ **Make sure there is a manual electric stunner present** near the unloading ramp, so that pigs that have become sick, injured or extremely stressed or exhausted during transport can be stunned immediately upon arrival and further suffering is prevented. This is also a legal requirement.

Electric tongs to stun injured or sick pigs immediately after arrival

- ✓ Make sure there is a back-up stunner in case the electric stunner does not work. Clean the electrodes every day. Check if the stunners work properly and replace them when necessary.

- ✓ Backup stunners need to be used in a correct way. We recommend both head and then heart stunning the standard procedure for emergency killing (and not just head stunning), to reduce risks of pigs regaining consciousness as much as possible. Bleed the pig out directly after stunning since electrocution does not guarantee a cardiac arrest in all cases. Please refer to Chapter 4. Electrical stunning. Employees who are allowed to emergency stun a pig need to have had a **training**. Frequently check if employees perform their tasks well.

- ✓ Pigs who are emergency stunned, need to be bled out as soon as possible. Electrocuting the heart does not guarantee cardiac arrest. Besides, shackling the pig and moving it towards the slaughterline can activate the heart again.[7] [8] Therefore a pig, also with head and heart stunning, should be bled out as soon as possible. OIE (World Organisation for Animal Health) recommends within 15 seconds after electric stunning.[9] Also if a captive bolt gun is being used; debleed the pig as soon as possible as it may not cause immediate death.[10] Please refer to Chapter 4. Stunning.

- ✓ Pigs that arrive injured, in pain, exhausted, severely stressed or experience difficulties breathing should **be stunned and bled out immediately on the spot** to prevent any further suffering.

  Signals of exhaustion, extreme stress or shock are: immobilized by fear "freezing" (while sometimes still screaming)**,** lying on the floor unable to stand up, muscle tremors (shaking) and fast, shallow open-mouth breathing.

Pig in shock are often unable to stand up and (after a while) will lie on their sides. They often have rapid, shallow open-mouth breathing. Pigs in shock should be killed immediately on the spot to prevent any further suffering.

Signs of breathing difficulties: sitting like a dog with legs spread, open-mouth breathing, coughing and blue skin discoloration.

Pigs with breathing difficulties should be humanely killed immediately to prevent further suffering

✓ Shock or extreme exhaustion in pigs is often caused by rough handling and/or transport conditions.[11] Important causes are:

- ✕ not enough space in the truck to rest
- ✕ rough and poor treatment during loading and unloading; multiple use of electric prods, loading too many pigs at a time, hitting and yelling, rushing the animals etc
- ✕ heatstress; often due to insufficient ventilation in the truck and long waiting lines
- ✕ water and/or food deprivation for too long

Slaughterhouses should therefore have a **registration system** in which they keep track of the number pigs arriving in shock or extreme exhaustion, the concerned transport companies, transport conditions (if any deviations are detected) and the farm of origin. This way the probable cause (a rough handler, a poorly ventilated trailer…) can be detected and responsible parties can be notified and warned.

2. Lairage

First of all the size of the lairage (and number of unloading docks) should **always be adequate for the supply coming in.** It should have an additional "buffer" of at least 10% (in the case that more trucks than expected arrive at the same time or there is a break-down in the slaughter line) so all pigs can be immediately unloaded after arrival. There should not be any pigs that have to wait on board stationary trucks.

Have enough unloading platforms and a big lairage so all pigs can be immediately unloaded

Having pigs wait on stationary trucks is highly undesirable. It is known from studies that pigs in transit experience the most stress when trucks are stationary. They will become restless, start to fight and, should there be poor ventilation and/or exposure to sun, they will likely start to suffer from heat stress. One study found that there is a 2.2-fold increase of mortality when pigs are in stationary trucks for over 30 minutes.[12] It will also lead to a higher incidence of carcass defects (PSE and DFD meat).


Waiting lines in front of the slaughterhouse are undesirable because of the risk of heat stress and fighting. The lairage therefore should be large enough for the supply coming in.

Reduce fighting

Mixing pigs from different social groups prior to transport and lairaging is standard practice but this often results in hierarchy fights, injuries and fear in pigs. Welfare problems increase with lairaging time (and time of food deprivation).


Because pigs from different social groups are mixed when transported and lairaged, they fight.

To prevent hierarchy fights slaughterhouses should:

- ✓ **Keep pigs in social stable groups at all times: from farm to the lairage in the slaughterhouse.** Never mix or merge pigs from different social groups: not at the farm, not during transport and not in the lairage.

  Motivate farmers and transporters to keep and transport pigs in social stable groups. Drivers should simply load pigs from one fattening-pen in one truck-compartment. They can use trucks with dividers that can be adjusted according to the group size on the farm.

At the slaughterhouse pigs from one truck-compartment should be housed in one waiting-pen with no mixing of new animals.

- ✓ Use **partitions that can be set at different spacings** to keep different small social groups separate from one another in the lairage. The manager of Meijer Export Station in the Netherlands is very content with the plastic partitions they have been using for the past 20 years. These partitions can be set up, placed and taken down as desired. Tönnies slaughterhouse in Germany also uses partitions to keep stable social groups separated from eachother in their lairage.

Lairages at Tönnies and Westfort with many partitions to keep pigs in the same socially stable groups

- ✓ In case transport companies cannot prevent mixing prior to transport, **we recommend keeping pigs from one truck-compartment the same as in one waiting pen of the lairage.** Do not merge pigs from different truck-compartments in one waiting pen as this will further increase stress and hierarchy fights.

- ✓ **If mixing pigs cannot be prevented at all, they should be slaughtered as soon as possible after arrival.** Resting them serves no purpose as it will only increase their stress and have a negative impact on meat-quality.

- ✓ In Belgium there is a co-op called “Porc Qualité Ardenne (PQA)” that **keeps its pigs in socially-stable groups from farm to slaughterhouse** in cooperation with its farmers. The manager of the slaughterhouse says this makes a world of difference for the noise level and animal-welfare in their slaughterhouse. Also in Northern Europe it is common to raise pigs without mixing them from farrowing to slaughter. Please watch a video of PQA here >>

Video from PQA where pigs are kept in socially- stable groups from farm to slaughter

- ✓ Have doors between the pens, so pigs that are aggressive or being attacked can easily be moved to another pen.

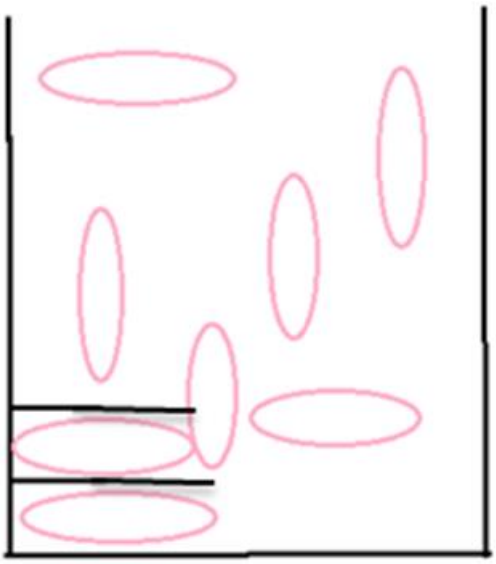
- ✓ Scatter some **corn** kernels in the lairage pens before placing pigs in them can help reduce stress. The newly-arrived pigs will make a positive association with the new place and this will make them calmer. The pigs will start to investigate the corn and focus their attention on the floor. This will prevent both stress in the pigs caused by the novel environment and keep them busy, with less time to fight. A rope, wood shaving or straw will have the same effect.
  Watch a video of the effect sprinkling corn on the pen floor can have on pigs here >>


Scattering corn kernels can create a positive distraction for pigs and will decrease fighting behaviour

- ✓ Different social groups should never be mixed, but when there is no other choice, make sure that the pigs can escape from each other. For example, include a separate narrow passageway within the lairage pen, where a pig that is being

picked on can run into to escape the aggression (see drawing below). Creating ways for submissive pigs to escape reduces aggression and stress in the entire lairage area.

Submissive pig unable to escape



Narrow passageways to make escape-boxes

✓ Use **AllBite blocks** inside the lairage to reduce fights. AllBite is a molasses-based block designed to reduce vice behaviors. Its design and its delivery system attract pigs and encourage them to chew on the block instead of on eachother. For more information and to order one (about 45 euros) click here: https://go.alltech.com/allbite

Use all-bite blocks to reduce fights and improve welfare. © Alltech

- ✓ Spray a masking odor on all boars so they all smell the same. From slaughterhouses we have heard that this reduces fighting inside the pen significantly. This spray from the company Schippers is known to be good: https://www.schippers.nl/ms-non-bite-spray-600-ml-1909970.html

Usage of masking spray at Westfort pig slaughterhouse (NL) to reduce fighting

- ✓ We have heard that fighting in pigs decreases when the pen has an odour of a boar in it or when there is a strong-smelling boar present in the lairage. Spray some boar taint in the lairages for that reason. Artificial boar taint can be bought (as it is used on farms to also brings sows into oestrus). See for example here: https://www.msschippers.com/ms-boar-odor-150-ml-4505625.html

- ✓ A small slaughterhouse located in the Netherlands sprinkles the back of the necks of the pigs with vinegar to reduce aggression. The manager says this also helps reduce fighting as they all smell the same.

- ✓ Use enrichment material inside the lairage pens which the pigs can root in and is chewable. The pigs will than start to investigate the material and fight less as they are positively distracted. Make sure the pigs have enough space to play with the material. In in an overcrowded pen enrichment material is useless.

Enrichment "toys" at Compaxo (NL) to distract pigs from fighting. Even better is enrichment material (straw, woodchips…) where pigs can perform rooting. Rooting is an important inherent behavior that keeps pigs content and focused.

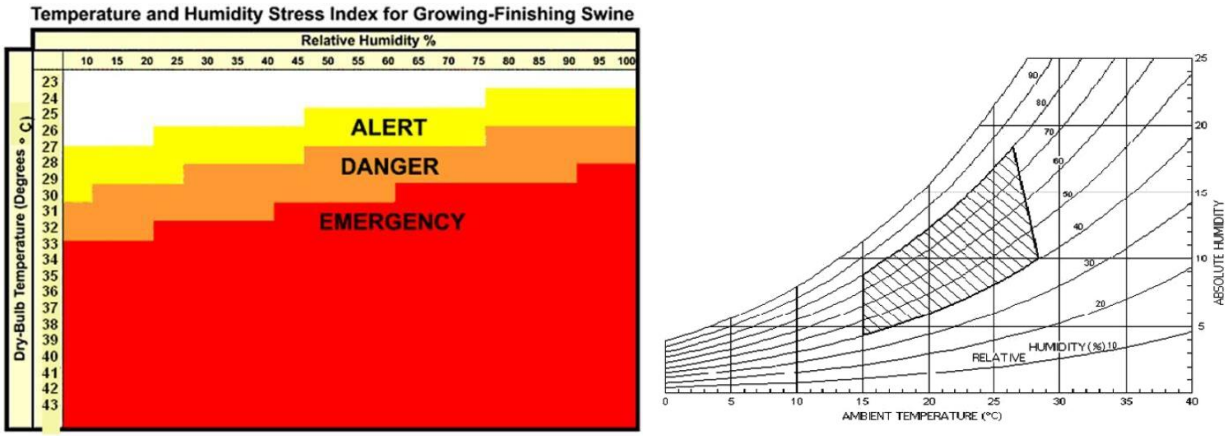
- ✓ Fasting pigs before slaughter, within limits, is beneficial for welfare. It reduces the risk of pigs vomiting during transport and developing heat stress. However, fasting periods longer than 12-16 hours are known to increase fighting and skin damage.[13] Hungry pigs are also more difficult to handle; they go backwards, turn-around and vocalize more. Slaughterhouses should therefore keep feed-withdrawal times limited and take into account the whole fasting-period; from farm to lairage.

Create comfort

The purpose of a lairage is to rest the pigs. Make sure the lairage is indeed comfortable enough to permit rest. This way pigs can recover from transport stress.

Remember: a pig that feels safe and comfortable will lie down after about an hour. If the pigs are still restless after one hour; find the reasons why and improve the lairage! To make the lairage comfortable for the pigs, pay attention to the following:

- ✓ **Make sure the lairage is not too cold or too warm;** keep the lairage in between 15-26°C for slaughter pigs and 15-20°C for sows. Pay attention to the humidity level; in humid areas pigs have more difficulties to cope with heat. Please refer to the graphs below.



Left: Temperature- and humidity index, Right: Comfortzone finishing pigs. Source: Correia-da-Silva / EFSA

Heat- and cold stress signals

When pigs are lying ventrally with their legs curled underneath, huddling (lying on top of each other with half of their bodies) and/or shivering – it is likely too cold in the lairage.

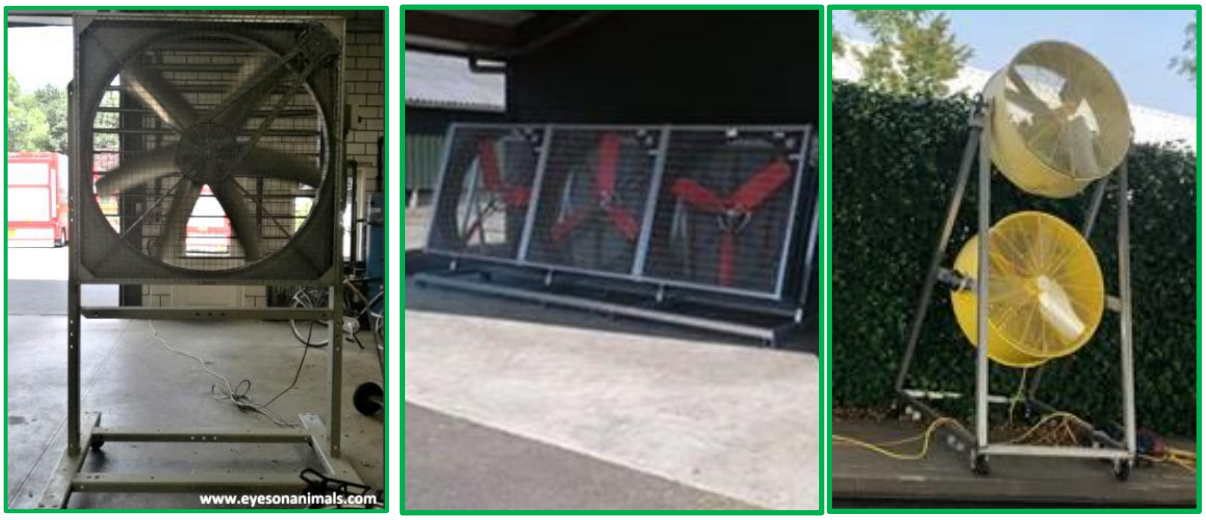
When pigs are experiencing heat stress they have shallow, rapid open- mouth breathing. Sometimes their skin turns red. Pigs are very susceptible for heatstress as they have a limited amount of sweat glands. Heat stress is one of the most common causes of death among pigs.

A normal respiratory rate for a slaughter pig is 25-35 breaths per minute, which can be calculated by the up and down movement of the chest. Watch a video of a pig experiencing heatstress here >>

- ✓ The lairage should be equipped with a **good misting and ventilation system** in order to keep the temperature low in the summer. In winter misting systems can cause cold stress. Don't use them constantly if temperatures are 5°C or lower. Adjust usage of fans and misting systems according to temperature and pig-signals. Make sure the fans do not produce a lot of noise, in order to keep the lairage as quiet as possible.

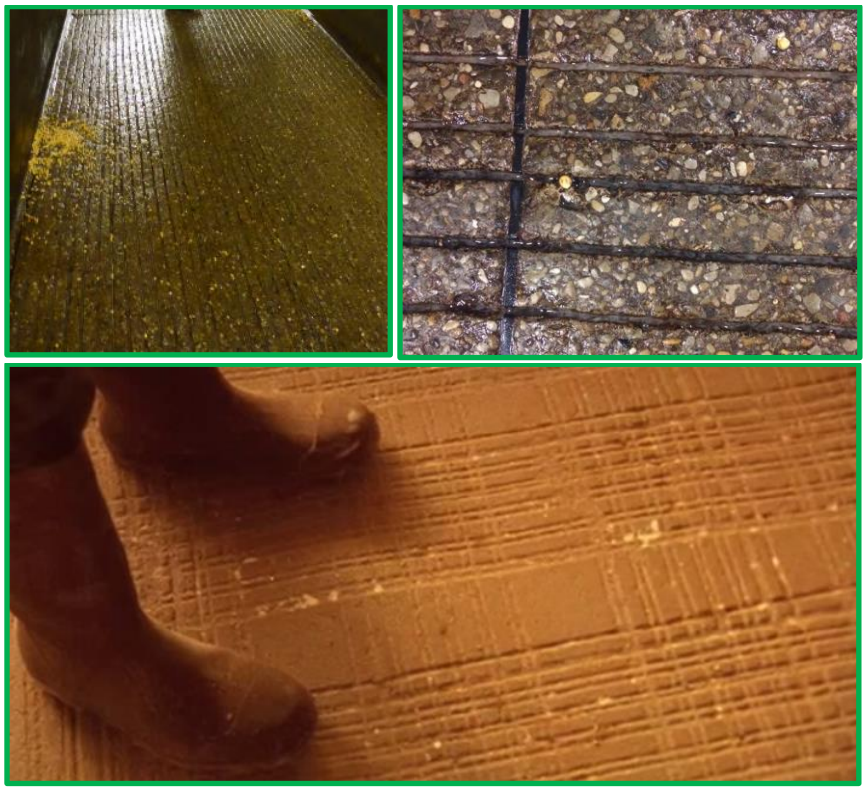
Misting system in combination with fans can help reduce heat stress but should not be used at 5°C or lower to prevent cold-stress

- ✓ **Make sure there are powerful mobile fans available** that can be used inside the lairage when necessary, for example during a heat wave. These fans should be very powerful to be able to reach all pig inside the lairage.



Make sure there are powerful mobile fans available that can be used inside the lairage when en where necessary

- ✓ **Have a comfortable anti-slip floor.** Slippery floors cause injuries. Use floor heating in winter and floor cooling in the summer.



Examples of good non-slip flooring

- ✓ **Prevent drafts in the lairage.** The presence of a draft will prevent pigs from resting and increases fighting. Make fencing solid down to the floor or use anti-draft curtains.

Good anti-draft rubber curtains at Westfort pig slaughterhouse in the Netherlands to stop drafts (left photo) and open gaps causing unwanted drafts (right photo).

Loading density

- ✓ **Make sure there is space for <u>all</u> pigs to comfortably lie down and rest**. In order to properly rest, pigs need to be able to lie down comfortably (without having to touch other pigs), stand up and turn around. For this an average slaughter pig (110 kg) needs 0,629m2 minimum. [14]

  Pigs fight considerably less in pens that are kept 1/3 empty. [15] Even better is when the pen is half empty. Also check if pigs have enough space to easily walk towards the water nipples.

Overcrowded lairage; pigs are unable to rest as they cannot lie down comfortably without lying on top of eachother and should one want to walk or drink, s/he disturbs others.

Good loading density; pigs have enough space to comfortably lie down without disturbing eachother. (Ideally the sides of the pen should be solid too).

- ✓ In summer make sure every pig can lie down on its side with legs stretched out, without having to touch other pigs. In this position a pig can reduce its body

temperature.

- ✓ Make sure there are enough water nipples so all pigs (also the submissive ones) are able to drink at all times. Also check if the nipples are easy to access and work efficiently. Be aware pigs are often deprived from water during transport – they are thirsty, especially on hot days, and need to have access to water as soon as possible. There should be at least one drinking nipple minimum per 10 pigs, but to avoid the risk of submissive pigs not having access, much better is to have several spread out throughout the pen.

Left photo: Nipple too close to pipe rendering it inaccessible. Right photo: Correct nipple.

Reduce noises

- ✓ **Get rid of all hard and abrupt noises in the plant,** such as yelling people, gates that bang when closed, chains hitting metal or loud machines. Pigs are very sensitive to new or sudden noises. Pigs cannot localize the direction of sound as well as people. Pigs are able to hear sounds that humans cannot (ultrasound). **Pigs experience less stress in a quiet area – this will also ease handling and improve meat quality.**

  Make sure the noise level does not exceed 80dB. Noise levels above 80-85dB, especially when they are abrupt, are known to cause stress in pigs (increased heartrate and agitation) and negatively affect meat quality (PSE meat). [16]

✓ Hang up a **large decibel monitor** linked with a green smiley face/light or red unhappy face/light, to make employees aware of the noise level and motivate them to aim for lower decibels.

A decibel monitor helps to motivate workers to aim for low decibels in the slaughterhouse

Set the ideal noise limit at the beginning for 80 decibels. This is most realistic and won't de-motivate employees. Then with time and experience, one can set the maximum noise level lower and lower.

The aim is 60 decibels and lower, without any abrupt sudden noises which are the most stressful of all. Handy mnemonic: at 60 decibels a normal conversation without shouting is possible.

✓ Using plastic instead of metal gates and fencing is a way to reduce noise because **plastic gates** hardly make any sound when opening or closing.

Plastic gates at export center Harsen and slaughterhouse Westfort reduce noise in the lairage.

✓ Prevent metal on metal contact when gates are closed by mounting rubber material or other sound reducing material strips or padding.


Mounting rubber helps in reducing loud bangs when gates are closed

✓ Make sure that areas where a lot of noise is produced (for example where the trucks are cleaned with high-pressure water hoses or where animals are being unloaded) are located far away from the animals, or are separated by insulated walls. Inside the lairage you want it to be as quiet as possible so animals can rest and not be distracted or anxious.

✓ Search for **materials to install in the ceiling that are sound-absorbing**. Make sure that, when using hydraulic systems, hissing sounds are transported to a different room via a pipe.

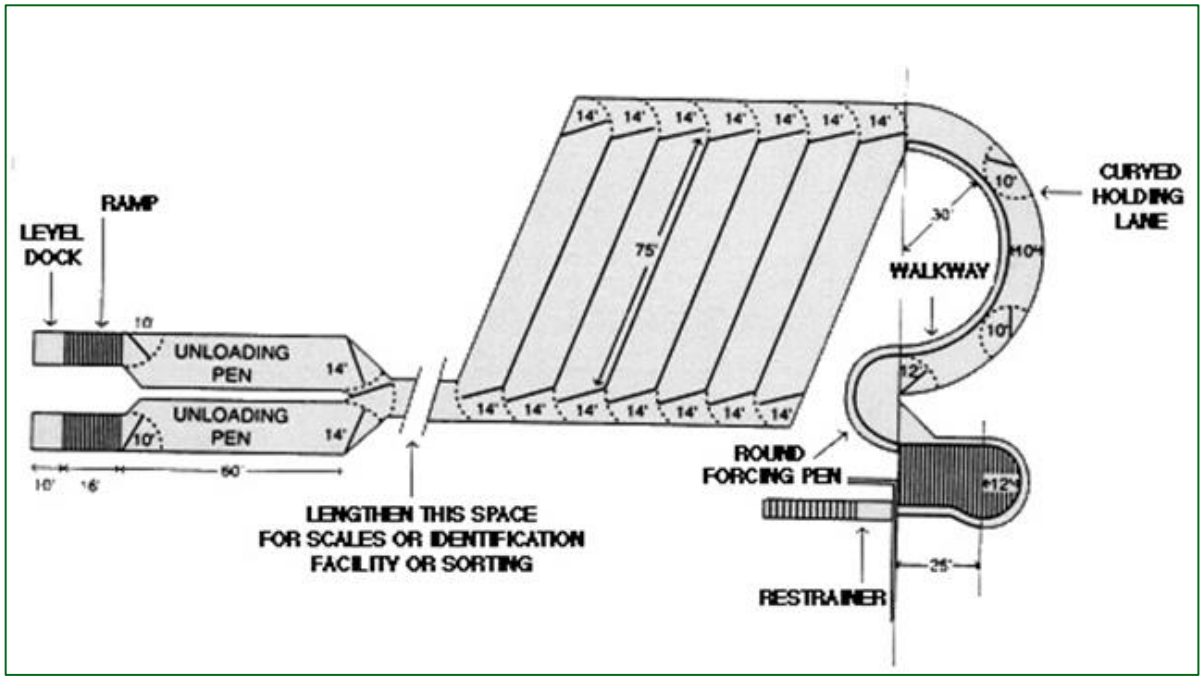

Sound absorbing design and material of ceilings

- ✓ Research shows that melodious music lowers the heart rate, which indicates a lower stress level, in animals (just like in humans). When music is played, pigs startle less easily from sudden noises. A slaughterhouse in Belgium has installed speakers in the lairage and is very pleased with the result.

  In a German slaughterhouse, where they also play music, they have composed a Pig Pop CD with classical music and soft rock. The pigs in the lairages are calmer and the employees enjoy the music as well. Studies have shown that a content and relaxed employee is calmer when handling animals than a frustrated or bored employee.

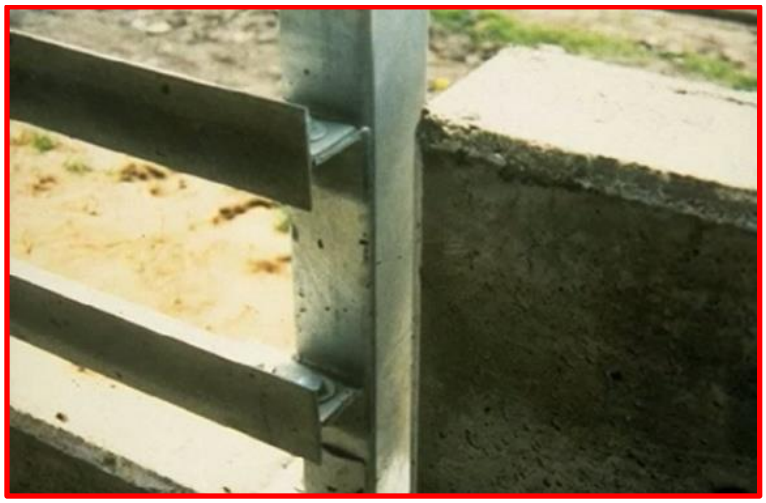
Design

- ✓ Long and narrow pens where pigs can enter on one end and can exit on the other end (see drawing below) are ideal. Pigs like this design of pen because there are two long solid walls to lie against. Pigs prefer to lie against a solid-wall rather than in an open area.



Temple Grandin's design showing oblong pens. This design was made for a cattle slaughterhouse but the left part (unloading and lairage pens) can also be applied to pig slaughterhouses. © T.Grandin

- ✓ **Make sure that there are no sharp edges or pointy objects in the lairage** or any of the areas where live animals will be passing through. These will cause injuries.



Sharp protruding objects will cause injuries. Photo: T. Grandin

Sick pen

- ✓ Pigs that arrive in poor condition, are injured, sick, in shock or showing any signs of discomfort and suffering **should be stunned and killed immediately** (using emergency slaughter) on the spot. This is required by law. Please refer to Chapter 1. Handling of pigs in pain or discomfort.

  But also mildly sick or injured pigs or pigs with a (small) abnormality (“suspect animals” or “category 3 animals”) like a large umbilical hernia, a joint infection, a bitten tail or abscess should **be stunned and killed immediately** to relieve their discomfort right away. Never let them wait until the end of the day – this prolongs their stress. Waiting in a slaughterhouse is not restful for any animal and certainly not for one that already feels compromised.

Stun and kill suspect animals immediately on the spot to relieve their discomfort

- ✓ To prevent “suspect animals” contaminating the slaughterline they can be marked or tagged after killing. This way the veterinarian sees easily that the carcass needs special attention. Some slaughterhouses have an extra slaughterline for carcasses that need extra inspection.

Marking (a cut in the dead pig' feet) of suspect animal in Austrian slaughterhouse

If slaughterhouses however make use of a pen to accommodate suspect animals for a (short) period of time, they have to make sure the conditions inside these pens are optimal:

- ✓ The pen should be **near the unloading area** so pigs can be rested immediately after unloading. This area is usually noisy however, so **insulated walls** or other options must be used to keep the environment inside the suspect pen quiet and non-threatening. Suspect pigs are often not in an optimal condition. Even more than other pigs they need to recover from stress in a quiet area.

- ✓ Provide a **soft and warm lying area** for the suspect animals. Offer the animals sawdust, straw, or rubber matting to lie on. Compaxo and Westfort have installed floor heating in the sick pen. This is also a good idea to keep the pigs warm and comfortable. Cooperl offers straw, this is the best solution.

Rubber mats at Tönnies (DE) *Sawdust at VION* (NL

Sawdust at Van Rooi (NL) *Straw at Cooperl (photo shot in 2008)*

- ✓ Make sure that there are **enough drinking nipples**, easily accessible for all pigs (including the submissive ones).
- ✓ Make sure there is **enough space and no draft**.
- ✓ Make sure the **floor is dry, especially in the winter**. Wet floors easily extract heat from a pigs body. It can cause hypothermia.
- ✓ Give the pigs some **corn kernels or bedding** to keep them occupied.
- ✓ Place **dividers into the sick pen** so submissive pigs can be easily separated or protected from dominant pigs. Creating ways for submissive pigs to escape, reduces aggression and stress in the entire lairage area.
- ✓ Make sure that the **temperature is comfortable**; in between 15-26°C for slaughter pigs and 15-20°C for sows depending on the humidity level. The higher the humidity, the more difficult pigs can cope with stress.

3. Moving pigs

General

If pigs are scared to enter a raceway or reverse half way – there is a problem with the raceway, not with the pigs. Find out why the pigs are scared to move forward and remove the causes. Below is a list of design and handling problems that often cause pigs to panic and balk. Remember: a stressed pig is very difficult to handle – it is crucial to keep them calm and remove all potential stress factors!

- ✓ **Ban all stress producing tools.** The use of electric prods, sound producing paddles or clappers or yelling is not necessary in a well-constructed raceway. Clappers or sound producing paddles cause a lot of stress because they are very noisy. They may not cause physical pain to the animals, but psychological fear caused by loud noise is just as bad. Hands, boards or a flag are often enough to calmly move the pigs forward.




Your hands, a board or flag are often enough to move pigs forward. Do not produce constant sound.

Electric prods or continuous loud noises cause a lot of stress and pain which will negatively impact meat quality (improving pH level). **If pigs refuse to move without the use of electric prods or loud noises – there is a big problem with the design of your raceway. Find the causes!**

Caution! Even if your electric voltage is set very low, the psychological stress of being electric prodded is always high, especially because most pigs will have had earlier horrible experiences with electric prods on the farm or during loading.

✓ Pigs can be frightened of people or strange objects in their environment. This can cause pigs to turn around, pile up and become even more nervous**. Place high solid panels at strategic spots to prevent their view of distractions** (such as people and strange objects) so that pigs will walk forward calmly and undisturbed.

Panel in the raceway at Westfort so employee can hide behind it when the pigs are walking through

- ✓ **The sides of the raceways should always be high and solid (block the view) so pigs are not distracted or stressed by people or objects around them**. Make sure that there are no strange objects (on the floor or side-walls) or people in front of them. Even a simple hose on the ground will cause pigs to hesitate as their curiosity kicks in and they want to explore the unfamiliar object first.

High, solid sides prevent pigs from seeing people alongside the raceway and the green lights decreases shadows and has a calming effect on pigs.

- ✓ Make sure that the floors in the lairage and raceways are made from the **same material and colour.** Pigs are sensitive to contrasts in colours and are not very good at seeing depth and distance. Differences in flooring causes stress and pile ups.

Changes in floor colour or material will make pigs balk

Strange objects on the floor or something as simple as a drain or a strip of metal or plastic can cause pigs to stop. Pigs want to investigate the floor before they dare to walk further. The entire floor should be of the same colour, texture and not have any protruding contrasts. That is why floor-drains should always be installed outside of the raceway and not in it.

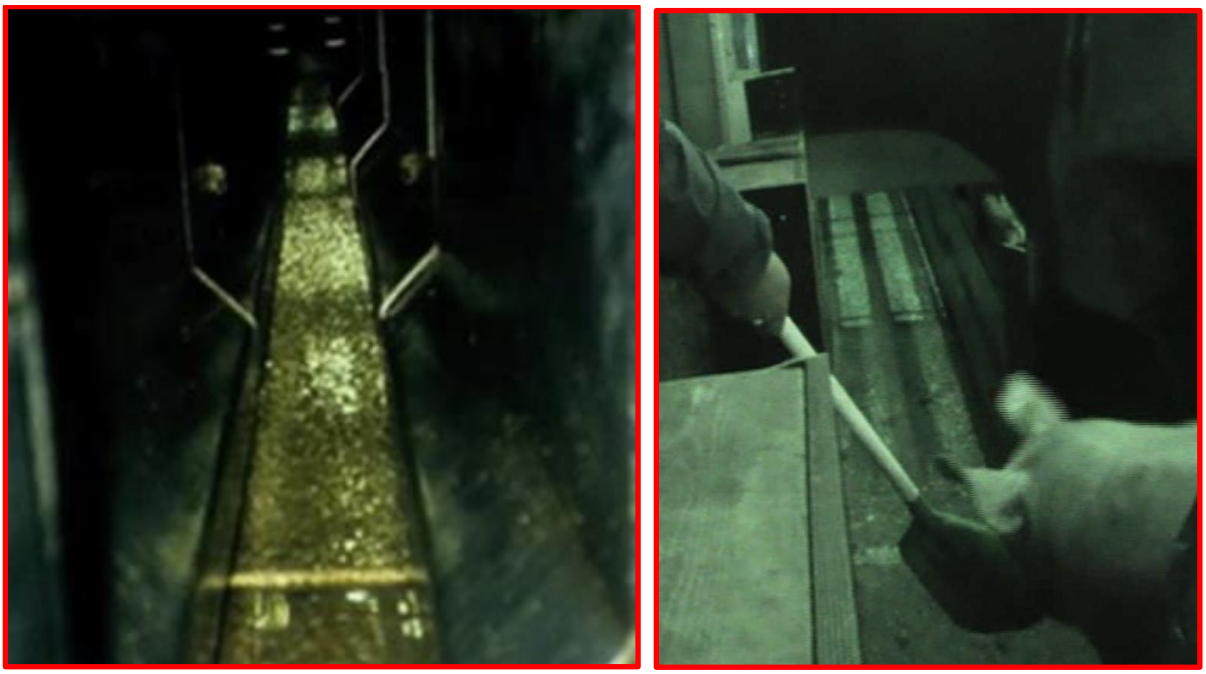
The sudden change on the ground, such as a plastic strip or drain cover is enough to cause pile ups. © photos: T. Grandin

Left: metal strip distracts the pig, right: drains are painted green to reduce contrasts, which is good. However the pigs were still distracted by the metal grey strips.

Take into consideration that pigs have a range of vision of 310° enabling them to (partly) see even what is happening behind them.

✓ Make the flooring of the passageways **non-slip.** If pigs are scared to slip they will slow down or even stop walking, resulting in pile ups and stress.

✓ Prevent **shadows or reflections of light on the floor**. Pigs do not know what shadow is and want to investigate it before they dare to walk further. Shadows and reflections on the floor cause pile ups, delays, and stress in the pigs. Shadows can be prevented by using indirect and diffuse light. Try placing the lamps on the side instead of on the ceiling or placing way more lamps throughout the plant, further high up.



Shadows and reflections on the floor like these will make pigs balk. Left: © T. Grandin

✓ Installing green lighting will help reduce shadows on the floor. It will however not totally prevent it. The colour green is also calming for pigs. Green is the colour of trees and bushes – where pigs feel safe in. They can also see well in it.

Green lighting was installed at Tönnies to reduce the creations of shadows

- ✓ An important reason pigs refuse to enter a raceway is when air blows into their face. Pigs really become stressed in windy and drafty environments. If air is blowing in the raceway, the pigs will walk in the opposite direction, away from it. The airflow can be checked by using a smoke producing device.

- ✓ Make sure that all the floors in the slaughterhouse are flat and level. Especially the raceway towards the stunner.[17] Pigs are afraid of slopes, causing pile ups.

A raceway with a slope going upwards makes it difficult to move the pigs

- ✓ Use the principle that pigs like to walk towards the **light.** Lighting the end of a passageway (see pictures below) will facilitate pig movement. Prevent light shining directly into the face of the pigs because this inhibits their movement. Fiddle with the angle of the light so that the least amount of shadows are created.

Compaxo placed extra lighting above the single-file raceway to help encourage pigs to walk forward

- ✓ Make sure that curves in raceways are **wide enough and well lit** – to prevent the illusion of a dead-end. A curved raceway is ideal because it gives pigs the impression that they are walking back to where they came from. A curve in a raceway limits the pigs' front and back view which reduces visual distractions.

  The exact sharpness of the passageway is very important. A pig needs to be able to **view an area in front of him that has a length of at least 3-4 pigs**. If not, the pig will think that there is a dead-end and turn around or walk backwards. Place a panel in sharp corners to block the sharp corner and make it more diagonal, this will improve the flow and reduce stress.

A panel in a sharp corner will improve the flow and reduce stress

Read more about curved raceways in chapter 'Electrical stunning'.

- ✓ **Move pigs in small groups** (6-8 pigs) from lairage to stunner. Moving pigs in smaller groups is easier and prevents stress. [18] This is also emphasized by Temple Grandin. [19] The risk of mortality during handling is lowest when pigs are kept in small groups. Research shows that moving pigs in large groups does not save time, but people often think that. It is a myth.

- ✓ It is very **important that the people moving the pigs are calm**. Pigs perceive fast sudden movements as a threat. Pigs will try to escape or will freeze when confronted with a perceived threat. When the employee stays calm, the pigs will also stay calm, making them easier to handle. Yelling, hitting or rushing the pigs makes them more difficult to handle and makes everything take longer. Go by the principle of "When you have an hour, it will take you 20 minutes, When you have 20 minutes, it will take you an hour".

- ✓ **Make as little noise as possible.** Rattles, clappers or sound making paddles (stress-stimuli) should be used as little as possible as it will make pigs stressed. Remember: stressed pigs are more difficult to handle and have a negative influence on meat-quality. If pigs are not willing to enter a raceway, or stop

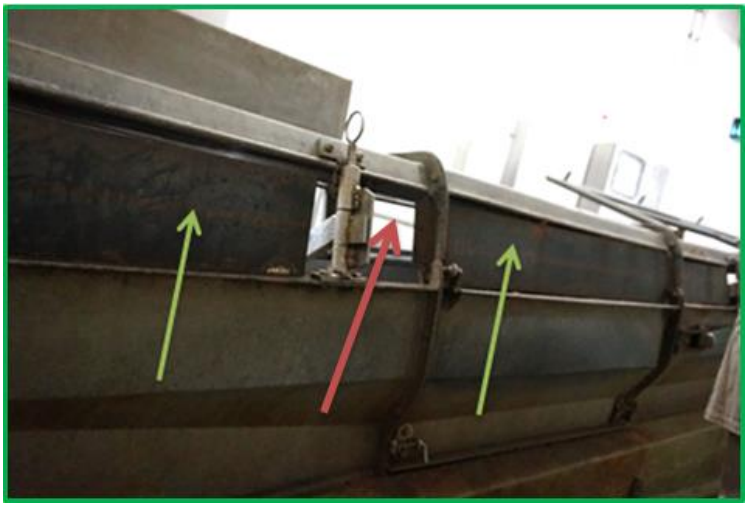
halfway → there is something distracting or scaring them. Try to find the causes instead of using sound or other stress-stimuli to force pigs forward.

Never produce sound by hitting the raceway - it will cause the pigs to panic and is morally unacceptable. Panicked pigs are often more difficult to handle and their meat quality is reduced.

- ✓ **If pigs see people ahead – they will refuse to walk forwards. Especially if these people wear bright clothing, move or make sound.** Make sure your workers are invisible for the pigs – this can be accomplished by closing the sides of the raceway and make them of sufficient height or install high panels for workers to hide behind. Close all gaps on the side of raceway. Remember: pigs have their eyes on the sides of their heads – they are very aware of what happens next to them.

Left: the worker at the end of the raceway can frighten and demotivate pigs from moving forward. The blue anti-reverse door will also cause pigs to balk – it is a clear obstruction and

colour contrast. Right: a high panel to hide behind can help to ease the flow.



If a raceway is open on the sides – attach some side panels. This will block the pigs' view of workers or other distractions at the side. In this photo you can see side-panels (+) but there is still a gap that needs to be closed (-).

- ✓ Make sure you place your workers in the RIGHT position. It does not make sense to have a worker rushing the pigs at a point in the chute where they cannot move any faster and the worker just creates panic and stress, leading to a bottle neck effect. Place a person only at points where an animal may hesitate to move forward, to keep the flow going. Best is if pigs cannot see the workers.

- ✓ **Install smart camera surveillance** in the slaughterhouse. Research shows that employees handle the animals calmer when they know that there is video surveillance. To make them aware of the video surveillance place big screens at several places in the slaughterhouse where they too can see themselves in action.

  Gentler handling also positively influences meat quality (less PSE meat). Video surveillance is also useful for discovering "stress markers" in the lairage, during handling and moving, and prior to stunning that can help you re-think that area and come up with solutions. Sometimes you see new things when looking at footage that you did not notice in "real life". Video surveillance is now compulsory in Dutch slaughterhouses.

  Should you not yet have Smart Camera Surveillance, make sure there is a protocol to make efficient use of the documented footage. Important questions to

answer within this protocol are:

- ✓ How often the images are viewed; for example, 2-3 times a day at varying times for 20 minutes.
- ✓ By whom the images are viewed; preferably by animal welfare officers who alternate.
- ✓ To whom any misconduct / violations must be reported.
- ✓ A plan of action in the event of misconduct / violations being detected. After how many warnings, for example, will an employee be dismissed.
- ✓ Use video material also to teach employees. Very good animal handling caught on videotape should be rewarded.

Single-file raceway

In electrical stunning systems, pigs are often moved towards the electric stunner via a narrow, single-file raceway of approximately 5-20 metres long. In this raceway pigs have to walk behind eachother in a single file. As pigs are herd animal this stresses them out - they prefer to walk in small groups to feel safe. Common design flaws inside the raceway also make the pigs scared to enter it. Electric prods or noise-making clappers/paddles are often used to force pigs to enter the single file raceway, causing much stress.

When a slaughterhouse choses the electrical stunning system, it is important that this “stress-point” be dealt with, not only because causing suffering is unacceptable, but also because the last 5 minutes before a pig is slaughtered has a huge impact on meat quality. The more a pig is stressed just before slaughter, the more PSE in the meat. If moving pigs towards the electric stunner could be rendered smooth and calm, then electrical stunning is much more humane than CO2 stunning. Good electric stunning is immediate, whereas CO2 is adversive and takes 15-20 seconds..

Moving pigs into the single file raceway

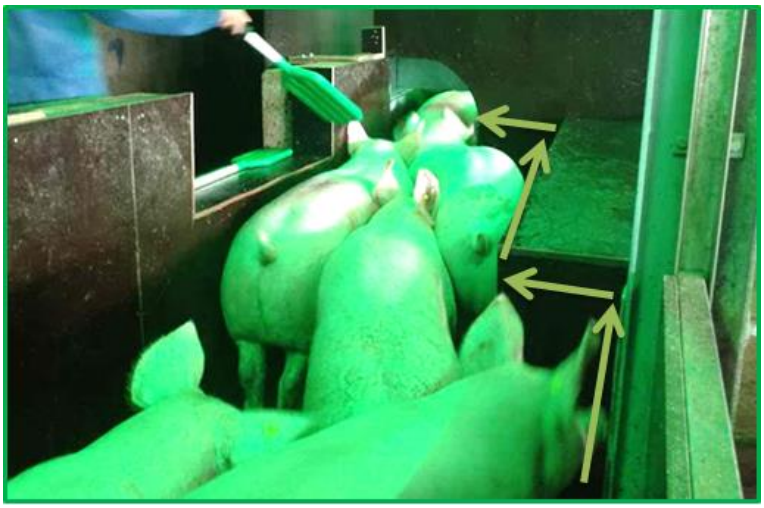
- ✓ Slaughterhouses that use electricity to stun pigs often use **a funnel-shaped entrance to the single file raceway.** A funnel-shaped entrance however will just lead to bottle-necking and pigs jumping onto eachother.


Funnel-shaped entrance to a single-file raceway will lead to bottle-necking and pigs trying to escape. Use of electric prods at this point is very common.

Temple Grandin recommends an **offset-step design** so that one pig can step aside to allow another one to pass. The offset step should be at least the width of one pigs. See the illustration of the design below.

Left: offset step design by Temple Grandin, right: offset step in Dutch slaughterhouse

At slaughterhouse Compaxo a double-offset step was made to reduce bottle-necking.



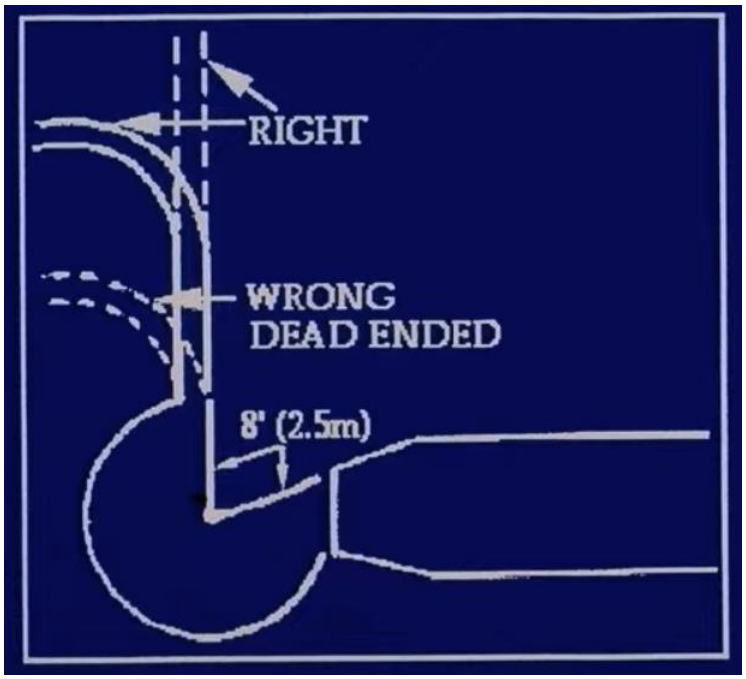
Double-offset step entrance to reduce bottle-necking

- ✓ To move pigs into the single file raceway Eyes on Animals advises pig slaughterhouses to use a curved crowdpen, like the corral designs by Temple Grandin. A corral design or curved crowdpen brings the pigs in a curve towards the single-file raceway. This eases movement and reduces fright and stress in the pigs because the round curve gives the impression that the pigs will eventually be returning into the group. They are therefore less hesitant to enter the single file chute. It is however important that the crowd-pen never be crowded, only made half-full. Pigs need room to turn around. The recommended radius is 2,5m.[20] In North-America several slaughterhouses and farms work with the corral system of Temple Grandin.

Round crowdpens that move pigs towards the stunner work very well. Crowdpens however should only be half-full. The crowdpen in the left photo is too full according to Temple Grandin. Pigs need room to turn around.

- ✓ Make sure that curves in raceways are wide enough and well-lit to prevent the illusion of a dead end. A pig needs to be able to view an area in front of her or

him that has a length of at least 3-4 pigs, if not the pig will think that there is a dead-end. See measurements in the picture below.



Make curves wide enough and not too sharp © T. Grandin

- We recommend slaughterhouses to build two single file raceways next to eachother instead of one. By using two single-file raceways, with a see-through wall in between, pigs will experience less stress as they are still walking side by side and there is less time pressure to get all the pigs through one single entrance. A slaughterhouse that wishes to slaughter 600 pigs per hour only needs to put 300 per hour through each single entrance if they have two raceways, instead of all 600 through the same single entrance. This drastically reduces time pressure and stress, for both the pigs and the workers.

Round crowdpen leading to two single file raceways (with a see-through divider in-between) will reduce stress as pigs can still walk side by side, which feels safer for them. © T. Grandin

- The German slaughterhouse Thönes Natur and Austrian slaughterhouse Grossfurtner also use a corral-shaped crowdpen to herd pigs into the single-file raceway to be electrically stunned. It was designed as a corral to reduce stress and panic often caused when pigs are forced to move from a group pen into single-file.


Corral shaped double entrance raceway for pigs at Thönes Natur and Grossfurtner

We visited both Thönes Natur and Grossfurtner and were very impressed with this corral-shaped crowdpen because indeed the pigs moved in a much calmer manner than seen in other slaughterhouses using straight-files.

>>Watch a video of the corral-shaped crowdpen at Thönes Natur here <<

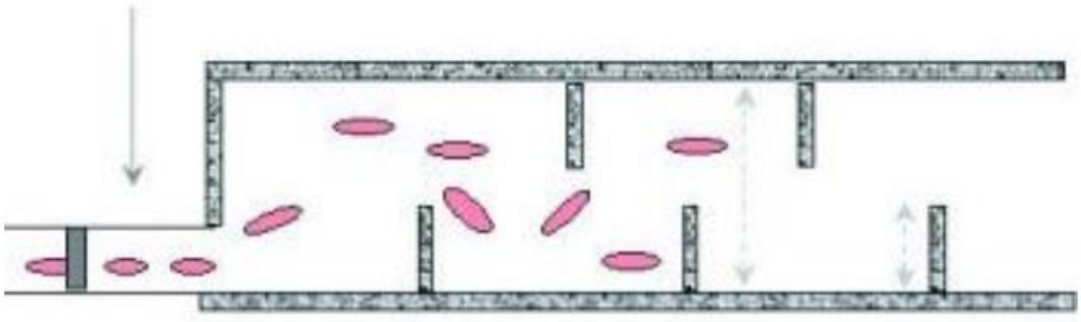
- By using a **double entrance to the raceway** pigs do not have to be forced into one single entry and thus experience less stress. The pig can chose which entrance to take, or feel like he is escaping the handler. This concept is used by both Thönes Natur (DE) and at two slaughterhouses from Grossfurtner (AT).

>> Watch a video of the double entrance at Thönes Natur here <<

Double-entrance to raceway to reduce stress at Thönes Natur and Grossfurtner

Double-entrance to the raceway to reduce stress at Grossfurtner (AT)

- ✓ Another way of easing the movement of groups of pigs into a single raceway is by using a labyrinth race. This is considered one of the most effective designs to keep stress levels low. A labyrinth race is split into sections by partitions on both sides that reach half the race. There should be 160cm in between each partition on opposite sides of the wall. Please see the design below. In each section the group of pigs will become smaller in a natural way – as some pigs will move forward and some will be stopped by the partition. At the end pigs will walk behind eachother in the single raceway without having been forced and without panic.



Source: ***Humane Slaughter Association***

- ✓ The stress that is caused by moving the pigs into the single file raceway can also be reduced by building a **stepped raceway**. In a stepped raceway groups of pigs will slowly be made more narrow – step by step. A stepped raceway will make the movement of the pigs towards the single file less abrupt and more natural.

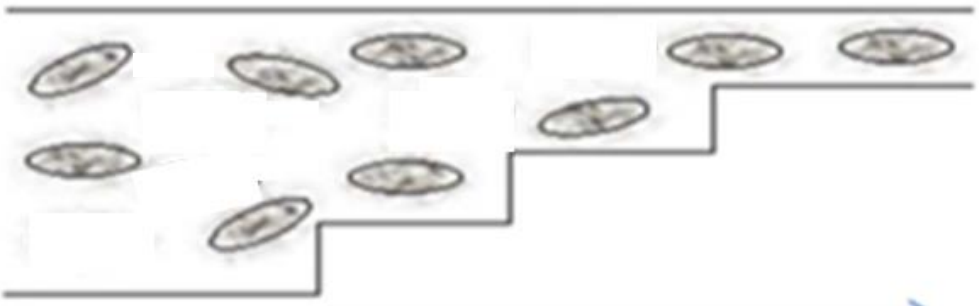


Figure 8 Diagram of a stepped race for moving pigs

Source: ***Humane Slaughter Association***

Common distractions and design flaws

- ✓ **Make sure there is enough light at the entrance of the single file.** Often the entrance of single files are not well lit. Pigs (just like humans) do not like to walk

into a dark area. Point the lamps in the same direction as the pigs are walking – so it does not shine in their eyes. Indirect and diffuse light is best so creation of shadows in minimalized.

The entrances to these single files raceways are not well lit – pigs will be scared to enter. Add lamps.

- ✓ Pigs are very sensitive to drafts. They will **refuse to enter a raceway where air is blowing into their faces.** Remove all airflows blowing into the direction of the pigs. Airflows can be checked with a smoke generator.
- ✓ **There are sharp contrasts, shadows, metal strips, drains or other distractions visible at the entrance or inside the raceway.** Pigs have limited view. Something as simple as a drain, shadow or metal strip can cause pigs to stop. The pigs refuse to pass it as to them it can look like a hole in the floor or obstruction. Floors need to be in one color and material. There should be 0% distractions.

Left: pig stops to explore a metal strip. Right: raceway full of shadows and white patches on

the floor which will distract the pigs.

- ✓ **Anti-reverse doors form an obstruction.** To prevent pigs from walking backwards or piling up, slaughterhouses often install anti-reverse doors inside the single raceway. These anti-reverse doors however often increase stress, because they form a clear obstruction, especially when they have a bright colour.

  For pigs it is not clear that anti-reverse doors are flexible. Sometimes pigs will even try to crawl underneath them – which can cause entrapment. Instead of installing anti-reverse doors find out what is causing the pigs to balk or pile up in the first place. In a well-designed raceway pigs will not balk nor will they need anti-reverse doors.

Anti-reverse doors form a visual obstruction to the pigs. Remove them and rather solve the cause of pigs balking or trying to walk backwards.

Reasons for pigs to balk are: air blowing into their faces, an employee in front of them, noise or jerky movements further up ahead, shadows or reflections on the floor, strange objects in the single-file raceway, dark and dead-ends, a clearly visible conveyer belt, a drop in the floor and not enough light. As long as the causes are not detected or solved and anti-reverse doors are used, we advise to at least make them the same colour as the floor and single-file raceway so they do not visually stick-out so much.

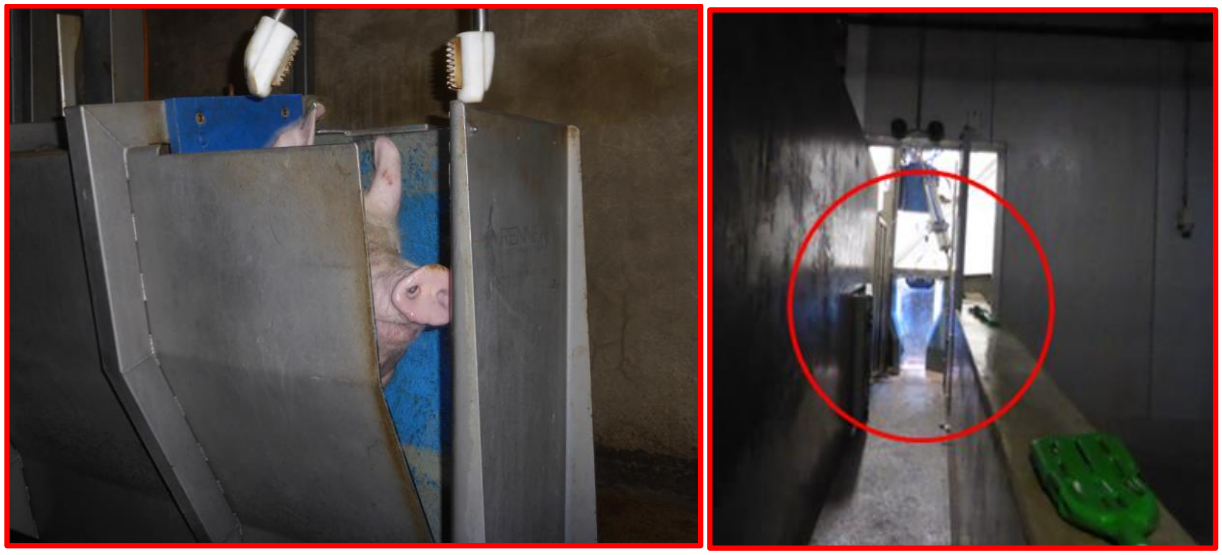
- ✓ **Raceways with a cage construction work less well. Being surrounded by a metal construction gives pigs the impression that they are trapped.** Additionally, the metal bars often create unwanted shadows. A raceway with an open top and fully closed sides is much better.


Raceways with a "cage-like tunnel construction" (see photos) do not work as well as raceways with an open top. They cause shadows on the floor and gives pigs the feeling of being trapped.

- ✓ **If however a raceway with a cage-construction is used and it is not yet possible to replace it or make major changes to it – at least make always sure that the "ceiling" bars are high enough, so that the pigs do not touch them with their backs when walking. If pigs touch the ceiling with their backs – they will be hesitant to walk further.** If pigs of different sizes are slaughtered, the ceiling must be high enough for the tallest ones.

These raceways are too low: the pigs' backs are rubbing against the top of the raceway. There is a big chance these pigs feel trapped, refuse to move forward and will try to walk backwards to get out.

✓ Make sure the restraint box at the end of the raceway is well-lit and open at the front. If a restraint box or raceway is totally closed and dark at the end, the pigs will know they will be trapped (don't underestimate their intelligence!) and refuse to enter. Give the pigs the illusion that there is an escape route or exit ahead.



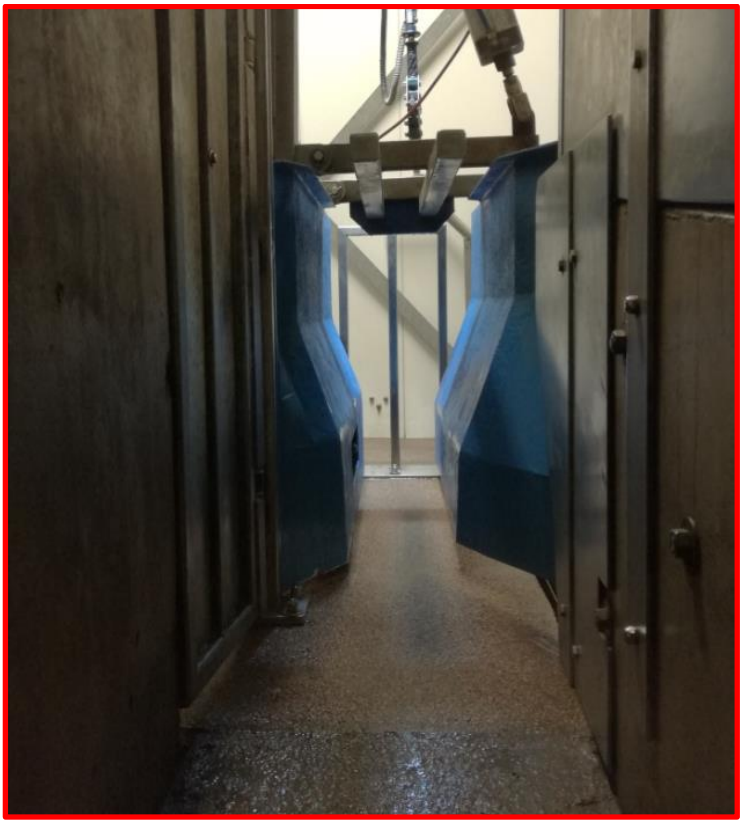
Restraint box in the old situation: closed front. Pigs will be scared to enter this raceway as it appears dead-ended.

Restraint box in the new situation: box opened at the front. The pigs will have less fear to enter this raceway as the end appears open, as if they can walk out of it.

- ✓ **Positive images hung at end of raceway/restraint box** could help pigs be less scared to enter the restraint box (see photos below). In scientific studies of cattle, this idea has been proven to work. When animals have less fear entering the raceway and restraint box, handling tools that cause stress or pain (like prods, canes…) will be less frequently used by the workers because animals will move forward more easily on their own will.

Photos of positive images (such as a field, blue sky and other pigs) on the front wall of the restraint box can reduce fear in the animals entering it.

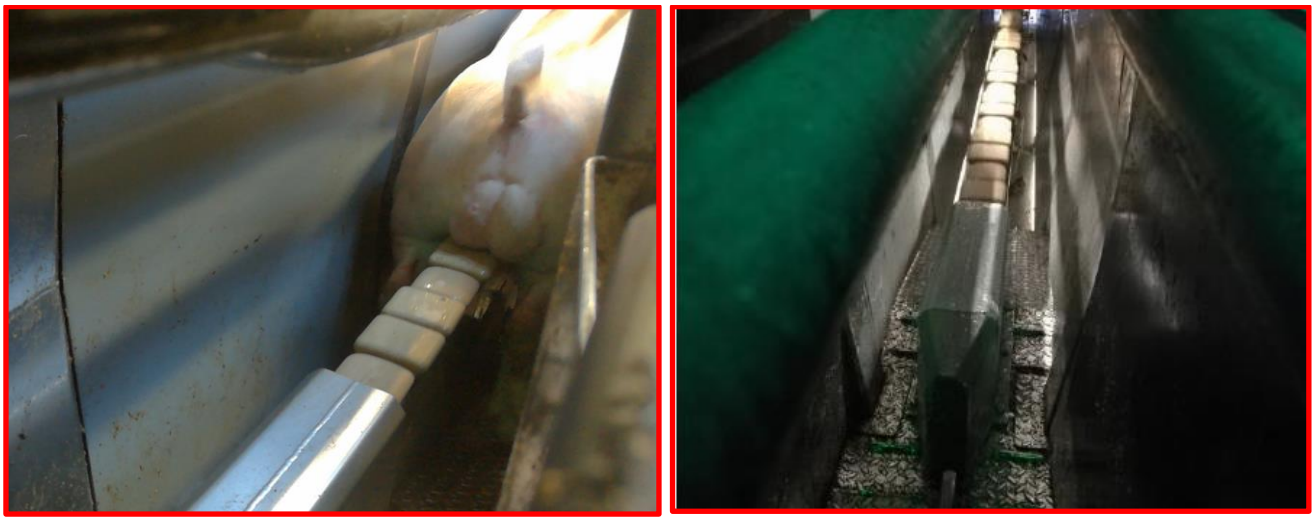
- ✓ Make sure the restraint box at the end of the raceway does not differ in colour from the rest of the raceway. If a box is really bright – pigs will be distracted or even frightened to enter it. Pigs are very sensitive to sudden changes of colour.



The restraint box in this photo is much more narrow than the raceway and has a bright blue colour (strong contrast to grey raceway and white back wall). This will frighten the pigs and make them less willing to advance forward.

Reduce stress in the conveyer restrainer

At the end of a single-file raceway slaughterhouses often have a belly-**restrainer belt** installed (often from Midas – designed by Marel). This belt "carries" the pigs towards the electric stunner. For the pigs, the belt is a strange moving obstacle. It often stands out as it also has a different colour and structure than the rest of the raceway.

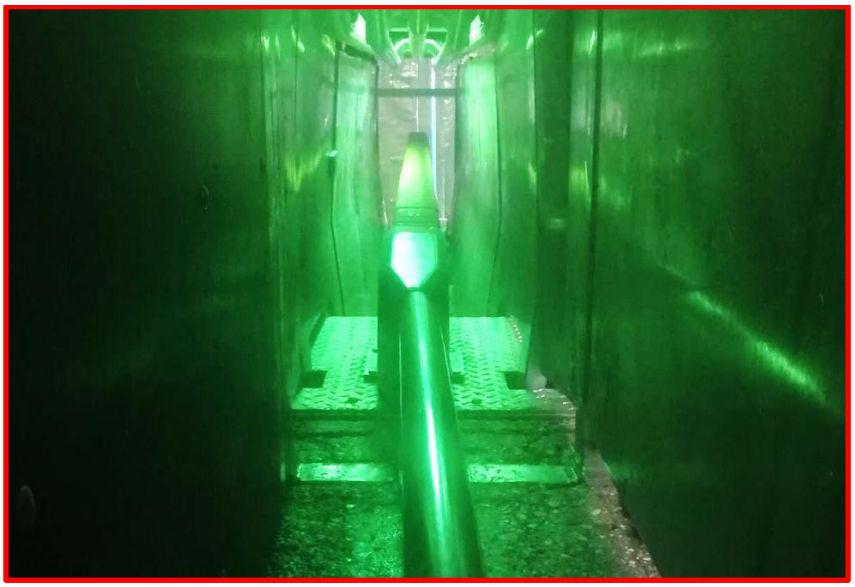


The belt is moving and made of a different color and texture than the rest of the raceway. This will make pigs balk when they approach it.

A common reason for why pigs do not want to walk onto the restrainer belt is because of the reflections on the metal parts. Reflections make pigs balk.[21] For any metal that is used for handling live pigs order brushed metal instead of shiny metal.

In this raceway there are far too many reflections. Pigs will be scared to enter it. Use brushed metal instead of shiny metal.

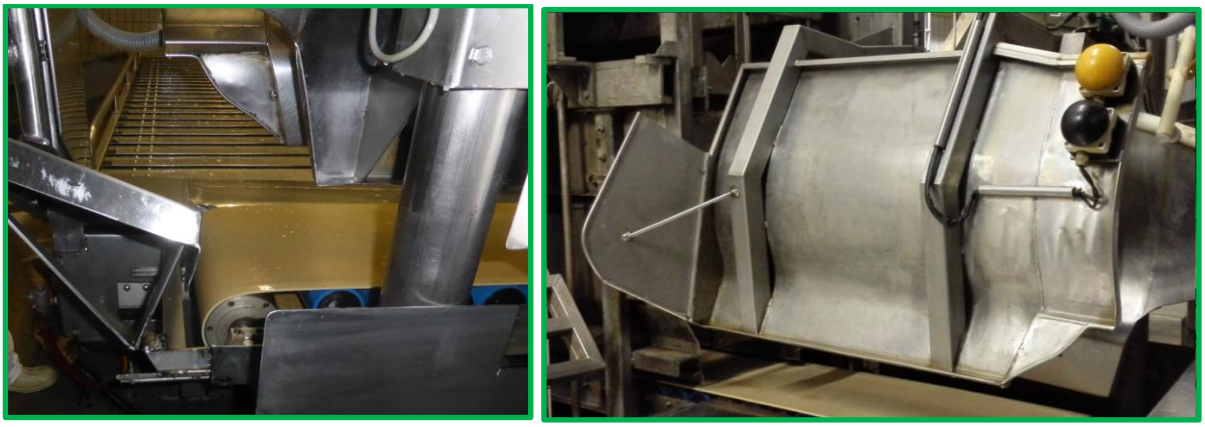
Secondly the belt has no floor underneath (the belt carries them). The floor, at the starting point of the belt, drops down or stops. This creates a cliff-effect (pigs get the impression they fall down). To force pigs to move forward onto the belt, they are often again electrically prodded by employees wishing to keep the speed up.



Visual cliff effect at the entrance of a belt restrainer from Marel (Midas system)

- ✓ To reduce stress at the entrance of the conveyer restrainer Temple Grandin **recommends installing a solid dark false floor underneath the belt restrainer,** made out of rubber. This false floor will give the pigs the impression that they can continue walking on a floor. It is however important that the pigs cannot actually walk on it; the false floor should be a few inches below the pig's feet.

- ✓ Even better than a false floor around the chest conveyor restrainer is a an entire conveyer-*floor. The pigs remain upright on a solid floor but the entire floor moves the pigs automatically towards the stunning.* A conveyer floor is used by Thones Natur (DE) and Grossfurtner (AT). Make sure the conveyer floor is anti-slip. If the pigs are moving well, the floor can remain still.



At Thones Natur and Grossfurtner a conveyer floor is used if pigs do not walk themselves.

Raceway towards the CO2 stunner

If pigs are stunned with CO_2 they are often moved in groups toward the stunner. Very often automatic doors are used to move the pigs forward.

- ✓ **Remove the automatic doors.** Moving pigs by well-trained, calm and professional employees is better than using automatic doors.[22]

  Automatic doors force pigs forward – even when pigs are facing the "wrong" direction or scared to move. This causes pigs to fall, panic or injure themselves. Moving pigs in groups rather than in a single file improves their welfare, however this advantage disappears totally if pigs experience stress by the automatic doors.

  At Westfort pig slaughterhouse in The Netherlands all automatic doors (based on Eyes on Animals' recommendation) were taken out and replaced by calm, well-trained professional employees. Noisy handling tools, such as rattlers and pebble-paddles, were replaced by noiseless tools such as flags, boards and workers' hands. This reduced the stress among the pigs significantly and also improved meat quality (pH level improved by 0.2).

At Westfort all automatic doors were removed. Pigs are now moved by hand, a flag and boards; noisy tools, such as rattles and plastic pebble-paddles, are phased out.

- ✓ In case automatic doors are used and cannot yet be replaced by well-trained and calm employees, try to use as few doors as possible. Make sure that the doors do not slide back directly above the pigs when they are moving back to their starting position. The sound and movement of these doors directly above the

heads of the pigs causes a lot of stress and fear.

It's better to let the doors slide back parallel to the passageway of the pigs, out of sight to the pigs. Another option would be to let the door slide back very high (at least 3 meters above the pigs) so that the pigs barely notice the doors.

Automatic doors sliding backwards directly above the pigs cause stress. Let doors slide back parallel to the raceway or high above, at least 3 meters above the pigs.

- Make doors that slide downwards of **flexible rubber**. It the door slides down while a pig is underneath the flexible rubber will not bruise or scare the pig as much as a door made out of heavy solid material.[23]

- Make sure the doors can be **operated manually by a worker**. A worker can best estimate when doors can be moved forward and take correct action when a pig gets trapped underneath a door or is pushed when facing the wrong direction. When moving pigs fully automatically there is too much risk of pigs getting trapped underneath doors, or are run over or injured while being pushed forcefully.

If automatic doors push pigs forward while some of them are facing the wrong direction pigs will be pushed onto each other or run over. A worker has to operate the doors manually to prevent this.

4. Stunning

Pig slaughterhouses in Europe use either electrical stunning or CO2 stunning. Eyes on Animals has made a film comparing both stunning methods: CO2 stunning vs. electrical stunning.

The advantage of stunning pigs with electricity is that, if performed correctly, they immediately lose consciousness. The disadvantage in larger slaughterhouses using electric stunning is that the pigs need to be separated from the group and walk into a single file raceway (behind each other) that leads them to the automatic electric prongs. This often causes severe stress. Pigs are herd animals and want to stay in the group no matter what. Natural pig flight- and herd behaviour should be taken into account when designing the single file raceway towards the electrical stunning system. This would prevent a lot of fear and suffering. See also the chapter Single raceway to the electric stunner.

During CO_2 stunning, pigs are stunned in groups but the inhalation of CO_2 causes approximately 20-30 seconds of severe fear, breathlessness, and a painful burning sensation in the air passageway. Video recordings have shown that pigs panic so much that they jump up and attempt to escape from the CO2 “cage/pen” before they become unconscious. Because CO2 is aversive to pigs, nothing can be done to alleviate this suffering. CO2 has inherent welfare problems and thus has no potential to be a humane method for stunning pigs in slaughterhouses. For these reasons, CO_2 stunning has been criticized by many large animal-welfare organizations and scientists.

In 2015 the Dutch House of Representatives for this reason accepted a motion by the Dutch Political Party for Animals to phase out the use of CO_2 for stunning pigs prior to slaughter. The European Food Safety Association and the Eurogroup for Animals have both stated publically that the stunning method applied to animals at slaughter must be quick and non-aversive. Recently the European Parliament has approved 2 million euros funding to research a more humane alternative to CO2 so that CO2 can be phased out in pig slaughterhouses in the near future.

Eyes on Animals has initiated a willingness in the sector to look for better methods to stun pigs humanely before slaughter. Eyes on Animals hopes that a brand new system will be available in the near future and once it is ready, will encourage plants to make the switch immediately. We see the options as either a non-aversive gas that can somehow be administered in a newly designed and engineered group-stunning

system, or a drastic improvement to the design of the current electric stunning system, so that pigs no longer experience stress as seen in the single-file raceway, which remains a huge welfare problem).

Electrical stunning

In bigger slaughterhouses electrical stunning is often fully automatic. In smaller slaughterhouses they often use manual electric prongs. Both systems have their advantages and disadvantages.

- ✓ **It is important the pig does not experience a lot of stress.** Not only for her/his well-being but also for meat quality reasons. A stressed pig will tighten its muscles, causing bleedings when an electrical current is applied.

- ✓ **Dehydration is a common cause of stunning failures**, as the current conductivity will be lower.[24] Make sure pigs are well hydrated by offering them water up until the final moments before slaughter. If a pig arrives dehydrated to the slaughter, a few hours of lairaging is not always sufficient for recovery.[25] It is important pigs get enough water on the farm and during transport if the journey is long.

- ✓ **If pigs are stunned head-only (for 1-3 seconds), which is quiet common in small slaughterhouses, there is a high chance they will regain consciousness quite quickly afterwards (< 30 seconds). After the clonic phase (pedaling/kicking) pigs usually recover.** [26] We therefore recommend to always apply the electrodes to the head first (to stun them) and then also to the chest (to cause cardiac arrest). This is called ”sequential head-to-body cardiac arrest stunning”. By applying the electrodes to the heart (after you applied them to the head first) you reduce the chance of pigs regaining consciousness.

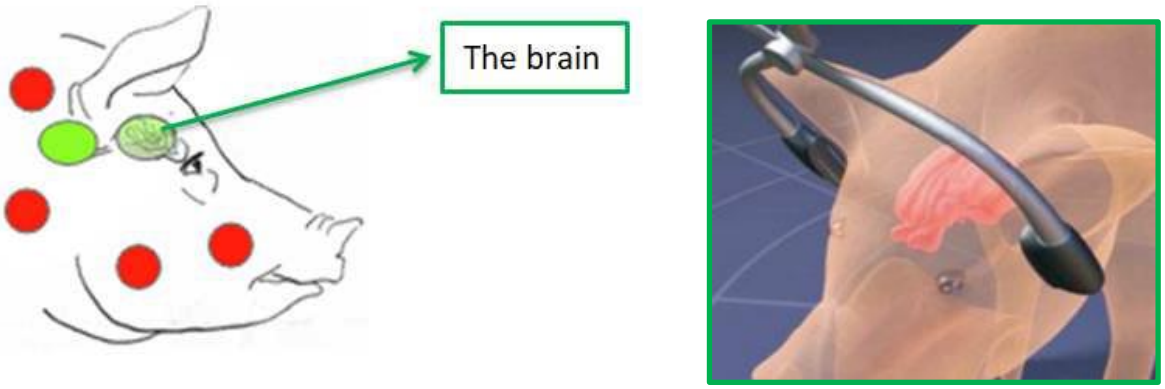
  The chance of pigs regaining consciousness can also be reduced by applying the electrodes to the head for a longer period of time (5-10 seconds), so the current also has time to run through the heart and cause a cardiac arrest.

  But be aware: the chance of pigs regaining conscious is still possible because a cardiac arrest, especially in smaller pigs, is not 100% guaranteed. As well, a heart can be re-activated when the pig is hoisted: therefore debleeding is vital right after stunning. Debleed the pigs within a maximum of 15 seconds after

head-to-body cardiac arrest stunning, to be absolutely sure that pigs do not regain consciousness (during debleeding).

First stun the head (left photo) and then apply the electrodes to the heart (right photo) to cause a cardiac arrest stun.

- ✓ To assure an effective stun **electrodes should be placed on both sides of the head in between the ears and the eyes so the electricity spans the brain.** Placing the electrodes on the base of the ears is also acceptable. If the electrodes are incorrectly placed, the electricity will not span the brain and the animal will not be adequately stunned. Please see the illustration below for correct placement of the electrodes (green dots) and incorrect placement of electrodes (red dots).



Left: Drawing by H. Anil: good (green dots) and bad (red dots) positions of electrodes. Right: Illustration by OIE showing the correct position of the electrodes.

If the electricity does not span the brain directly, for example when the electrodes are placed at the back of the ears (we regularly see this problem in

slaughterhouses still) the pigs will receive a painful shock before they are stunned or will not be stunned adequately. A squeal when electrodes are placed on the head can be a sign of pain.

If electrodes are placed for example only on the neck or heart region pigs will not be stunned at all and experience severe pain.


Left: position of electrode is not ideal. They should be placed more to the front. Right: electrodes are positioned too low.

✓ In smaller slaughterhouses pigs are regularly stunned in the group with manual electric tongs. This method does not require restraint or separation from the group; which will prevent much suffering. **It does however require a very skilled and calm worker as the placement of the electrodes is a bigger challenge when pigs are moving about in a pen.**

Stunning pigs in groups has the advantage that pigs are not separated from the rest and restrained. A skilled employee however is crucial for placing the electrodes correctly (in

between the eyes and the ears). On this photo the electrodes are applied a bit too far behind the ears.

- ✓ **To efficiently stun slaughter pigs of 100kg - a minimum current of 1.3A per pig needs to be used. If pigs however are slaughtered at a higher weight** (which is becoming more common now in several countries and can also be attributed to COVID-19 as many pigs are kept in the pens longer than normal as slaughterhouses have been closed and total national slaughter capacity is down), **make sure to also use a higher current (!).**[27] If sows or boars are slaughtered, the current has to be increased to 3A minimum.

  Use low frequencies (50-60Hz). Low frequencies have a greater ability to penetrate tissues. If higher frequencies are used, the ampèrage has to be increased significantly.[28]

  The current needs to be applied to both sides of the head for 3 seconds minimum (to induce stunning) and after on the heart for 3 seconds. To induce cardiac arrest always use low frequencies (50 of 60hZ) otherwise you will <u>not</u> (!) cause a cardiac arrest. [29]

- ✓ Make sure the electrodes are cleaned every day, so the current flows well. Also check the settings and stunning efficiency every day. Checking the settings only is not sufficient. You should also check if the electrodes cause an grand mal epileptic seizure. Therefore apply the electrodes for 1-3 seconds to the head (in between the eyes and the ears) – directly after you should see a tonic (rigid) and clonic (paddling/kicking) reaction. Do not apply the electrodes any longer as this will mask the seizure. It the body shows no reaction (it stays still without a tonic or clonic phase) the stunning does <u>not</u> work. It is important to test this regularly.

- ✓ Always make sure that <u>each</u> pig is stunned correctly. **A pig that is correctly stunned with electricity will undergo two phases. The tonic phase in which the pig immediately collapses and contracts his/her muscles (looks stiff with legs stretched out) and the clonic phase in which the pig will kick involuntary with his/her legs.** Slowly the body will then relax. A tonic and clonic phase is a sign of an epileptic seizure – the pig is unconscious.

Signs indicating (regaining) consciousness

- ✕ If a pig **does not show a tonic (rigid) and clonic phase (paddling of the legs)**, stunning likely failed. Especially the tonic phase should be clearly visible. The clonic phase (paddling of the legs) is a little less visible in pigs that are stunned head first and then heart.
- ✕ When a **pig blinks spontaneously, in a natural way, or follows movements with the eyes,** it is definitely still conscious. Vibrating eyes, directly after stunning, for a short period of time is normal. Cornea-reflex right after stunning can occur, but it should be definitely absent during debleeding.
- ✕ If the pig **responds to a pain stimulus (for example on the nose)**, the pig is definitely conscious.
- ✕ If the pig **shows an upright reflex (raising of the head or upper body),** the pig is definitely still conscious.
- ✕ When a pig shows **rhythmic breathing** the pig is definitely conscious. An incidental gasp however can sometimes occur.
- ✕ If a pig screams or makes other sounds the pig is still conscious. If the scream or sounds are being made with clear intentions, the animals is still conscious and action must be taken immediately.
- ✕ If a pigs **reacts to the cut, or other slaughtering processes,** it definitely feels pain and is therefore conscious.
- ✕ The bodies and heads on the slaughterline have to be floppy. If **some pigs differ in body posture from the others, be aware,** it is possible they are not correctly stunned or will regain consciousness. Check for other signs of consciousness.

The bodies on the slaughterline have to be floppy (not rigid or up righting). If some pigs differ in body posture from the rest be aware and check for signs of consciousness.

CO2 stunning

- ✓ In group-stunning the stun-to-stick interval is critical as there is a large time interval in between the sticking of the first and last animal of the group coming out of the CO2. Best is to **irreversibly stun the pigs** so the risk of them regaining consciousness before or during debleeding is eliminated. To stun pigs irreversibly they have to be exposed to at a minimum of 90% for a duration of at least 3-5 minutes.[30]

Irreversibly stunning is advantageous to reversible stunning. To irreversibly stun pigs, they

have to be exposed to 90% CO2 minimum for 3-5 minutes.

- ✓ The behavior of pigs in CO2 stunning systems should be monitored with camera surveillance.[31]

- ✓ Make sure only very responsible employees operate the CO2 stunning system that are well trained in its functions.

- ✓ Do NOT overcrowd the pigs in the CO2 chamber/cage. All pigs should have more than enough space to lie down at the same time during stunning (without lying on top of each other!). They also have to be able to spread their legs in order to maintain body balance and not fall when the chamber/cage moves into the pit. Overcrowding will result in **more bruising, inadequate stunning and very serious animal-welfare problems**.

  If chambers are overcrowded, pigs will be squeezed against each other during stunning and jump or crawl on top of each other. As a consequence pigs at the bottom of the pile will have their chest compressed by the weight of the others. Those pigs will suffer tremendously and will not inhale enough CO2 to be adequately stunned, leading to further serious welfare problems when they exit the CO2 chamber to be debled.[32] The inhalation can also be hindered if the pigs are squeezed against each other inside the CO2 chamber.

  Overcrowding is unfortunately a common problem in slaughterhouses where they slaughter above their capacity. To cope with the faster slaughter speed, more pigs are pushed inside the chamber and/or the exposure time is decreased.[33]

- ✓ Another common problem is that CO2 gas is not evenly distributed in the chamber. This can be a design fault or caused by 'stack pressure' due to (new) fans or doors being opened or closed elsewhere in the slaughterhouse. When pigs exiting the CO2 chamber appear conscious (when previously the stunning was efficient) this is likely to be caused by a change in ventilation/stack pressure.[34]

- ✓ In slaughterhouses that use more than one CO2-chamber the stun-to-stick interval is often too long. The more pigs being stunned at one time, the bigger

the time interval between the first and last pig that is debleeded.

The maximum allowed stun-to-stick interval depends on the CO2 exposure time. Please refer to the table below. The longer pigs are exposed to CO2, the more time there is to debleed the pigs before they can regain consciousness. The European Commission recommends to expose pigs to CO2 levels of 90% and higher for a minimum of 180 seconds.

Time of exposure (sec)	Sticking within (sec)
120	30
130	45
140	60
150	75
160	90

Stun-to-stick interval guidelines for CO2 system that use 70% CO2 for 10 seconds and then 90% CO2. Bron: OIE[35]

- ✓ **Be cautious with pigs that have lung problems**. It is likely they have to be exposed to CO2 for a longer period of time to render them unconscious. Dr. Temple Grandin is of the opinion that this issue needs to be researched, as many pigs from factory farms have lung lesions.[36]

  If pigs show clear signs of long problems (difficulties breathing, coughing, sitting like a dog), do not let them be stunned with CO2; emergency kill them with the emergency back-up electric prong (or captive bolt if electric stunner is not available) as soon as possible.

- ✓ Always make sure that <u>each</u> pig is stunned correctly. Pigs who are not properly stunned should be re-stunned immediately. Also when in doubt, stun the animal again.

Signs indicating (regaining) consciousness

- ✕ After CO2 stunning the bodies of the pigs should be floppy. There should be **no regular kicking visible**. An occasional kick can happen. [37]

When the pigs are dropped from the CO2 stunner their bodies should be floppy. Regular movement indicates in ineffective stun.

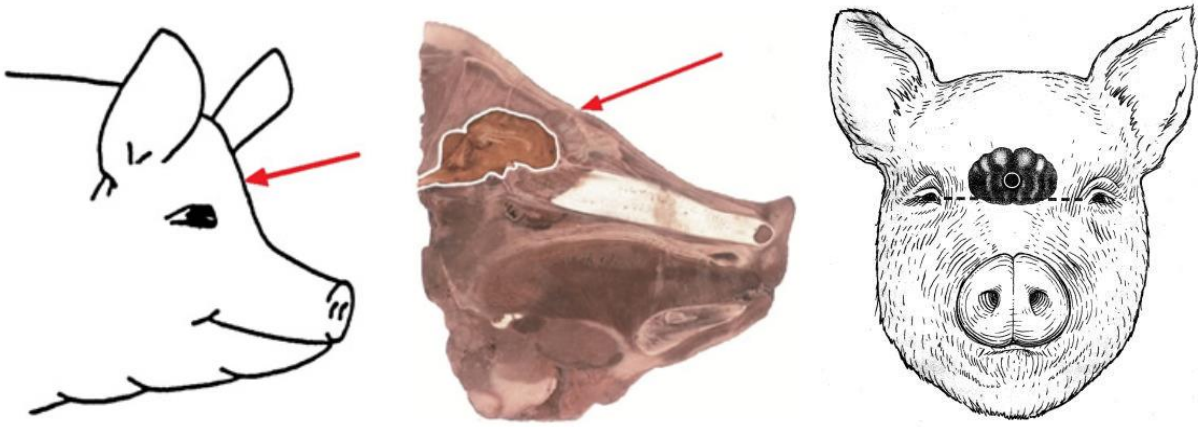
- ✕ When a pig blinks spontaneously, in a natural way, or follows movements with the eyes, the pig is definitely conscious. Eyes should be fixed, with a dilated pupil. [38]
- ✕ When the pig responds to the cornea reflex test (the pig blinks when you gently touch his eye) he may be regaining consciousness, especially when this is observed during debleeding. [39]
- ✕ If the pig responds to a pain stimulus (for example on the nose) the pig is definitely conscious.
- ✕ If the pig shows an upright reflex (the head or upper body is lifted) the pig is definitely conscious. [40]
- ✕ When a pig shows rhythmic breathing the pig is definitely conscious. Also regular gasping (> 3 times in 10 seconds) is a sign the pig is possibly regaining consciousness.
- ✕ If a pig screams or makes other sounds the pig is likely still conscious. If the scream or sounds are being made with clear intentions, the animals is still conscious and action must be taken immediately.
- ✕ If a pig reacts to the cut, or other slaughtering processes, he or she definitely feels pain and is therefore still conscious.

✕ The bodies on the slaughterline have to be floppy. If some pigs differ in body posture from the others, be aware, it is possible they are not correctly stunned or regain consciousness. Check for other signs of consciousness.

Captive bolt stunning

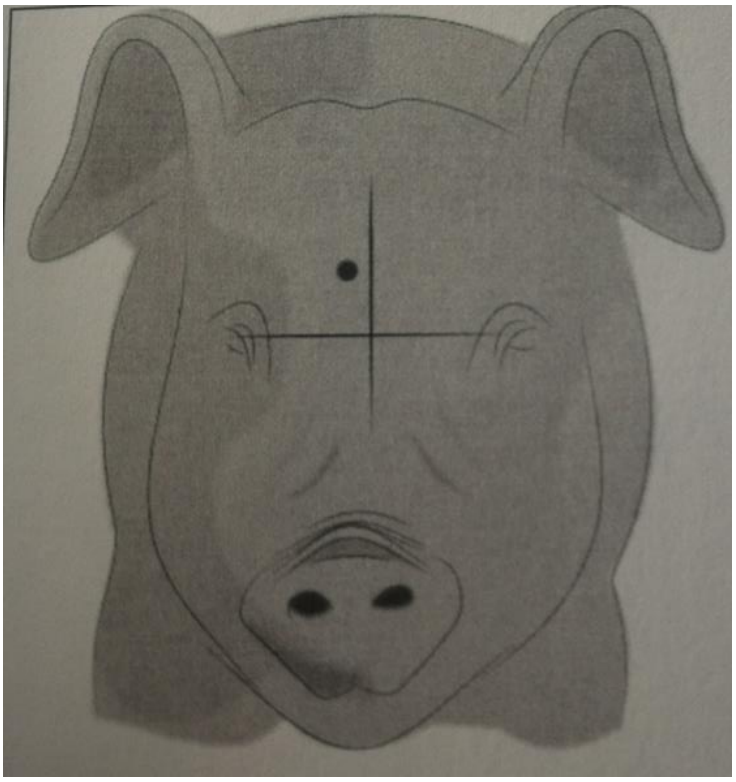
- **Electric prongs are better than captive bolt guns.** Stunning with a captive bolt gun requires more precision (the target area is very small) which is a challenge, especially when the pig may move his or her head. Also the brain lies relatively deep in the head. Another challenge is that captive bolt stunning is characterized by heavily involuntary kicking – which will making immediate bleeding difficult to perform.

- The captive bolt gun should be positioned at an angle of 90° (towards the tail), 2 cm above the imaginary line in between the eyes.



Stunning a pig with a captive bolt gun requires a very exact position of the gun (90°, 2cm above an imaginary line connecting pig's eyes). Electric tongs are easier and safer to use. Source left drawings: HSA[41] Source right drawing: T. Grandin

- Do not use a captive bolt gun on sows and boars as they have bony structure in the middle of their skull causing stunning failures. In the middle the skull is too thick to be adequately penetrated. In case an animal needs to be put out of its misery and there is only a captive bolt gun available, position it 3-4cm above the imaginary line in between the eyes, a bit to the left or the right where the skull is less thick.



In larger pigs the bolt should be positioned 3-4cm above the imaginary line in between the eyes, a little bit to the left or right where the skull is less think. Source: OIE

- Refer to the manufacturers' instructions so that the correct cartridges are used for each model.[42]

- **It is important to debleed the pig immediately after the sh**ot – as the pig may not die immediately (depends on the level and area of brain damage).[43]

- **When stunning is effective the pig will collapse immediately, stretch his/her legs (tonic phase) and stop breathing**. It will than often have intense involuntary kicking/pedaling (clonic phase). His/her eyes will have a glaze expression. Corneal reflex should be absent. If the pig does not collapse immediately, screams, breathes or the tonic phase (rigid) is absent – the stunning failed. Re-stun the pig immediately.

- **Clean the captive bolt gun daily** according to the company's instructions (dust it and replace the rubbers or other parts when necessary). Store the gun and its cartridges in a clean and dry place. **If they become wet, it will result in stunning failures.**

Regularly test the effectiveness of the captive bolt stunner. Therefore you can buy a special testing station. Have repair kits and new rubber rings on hand to quickly repair ones that become worn out or damaged. Ask the company where you bought the captive bolt gun for repair kits, a testing station and help for any other issues.[44] When the captive bolt is showing signs of irreversible wear and tear, replace it with a new one on time.

- Pigs that are showing signs that they are (possibly) regaining consciousness should be re-stunned immediately. When in any doubt, stun the animal again. It is always better to re-stun than to wait.

- Make sure there is a backup stunner (mobile electric prongs) placed at three key positions: right after stunning, before debleeding and in front of the water boiler.

- Make sure there are employees continuously checking if pigs are unconscious and appoint them in charge of this task. One person should be positioned directly after stunning, one person at the point of debleeding and one right before the scalding tank.

Signs indicating (regaining) consciousness

- ✕ If the pig does not collapse immediately after stunning and **does not show a tonic (rigid) and clonic phase (paddling of the legs)**, stunning likely failed. Especially the tonic phase should be clearly visible. The clonic phase (paddling of the legs) can sometimes be absent in pigs stunned with a captive bolt gun.
- ✕ When a **pig blinks spontaneously, in a natural way, or follows movements with the eyes,** it is definitely still conscious.
- ✕ If the pig **responds to a pain stimulus (for example on the nose)**, the pig is definitely conscious.
- ✕ If the pig **shows an upright reflex (raising of the head or upper body),** the pig is definitely still conscious.
- ✕ When a pig shows **rhythmic breathing** the pig is definitely conscious.

- ✕ If a pig screams or makes other sounds the pig is still conscious. If the scream or sounds are being made with clear intentions, the animals is still conscious and action must be taken immediately.
- ✕ If a pigs **reacts to the cut, or other slaughtering processes,** it definitely feels pain and is therefore conscious.

The bodies and heads on the slaughterline have to be floppy. If **some pigs differ in body posture from the others, be aware,** it is possible they are not correctly stunned or will regain consciousness. Check for other signs of consciousness.

5. Debleeding

- Only perform bleeding when there are no signs of consciousness. See chapter on Stunning.

- An electrically-stunned pig should be debled as soon as possible and at least within a maximum of 15 seconds.

- Make sure only one pig is stunned and debled at a time. Only proceed to the next pig when you are finished with the previous one and the previous one is clearly dead and insensitive to pain.

- A pig stunned with CO2 should be also debled as soon as possible. Maximum stun-to-stick intervals depends on the level of CO2 and exposure time. Please refer to chapter CO2 stunning.

- The cut should be made just below the sternum. The knife blade should be at least 15cm long and have a cutting edge on both sides.

- The cut should be made in one fluent movement (not back and forth) in which both the carotid arteries and jugular veins are cut. Make sure the cut is not too small, the blood flow should be rapid and voluminous.

- Make sure pigs are debled for a sufficient amount of time (3 minutes minimum), so they are dead before they enter the water boiler/scalding tank.[45] If pigs are not dead yet, there is a risk that they regain consciousness during the scalding process. This is totally unacceptable.

- At Tönnies pig slaughterhouse in Germany the pigs are weighed after sticking to measure if they have lost enough blood to ensure that the pigs do not regain consciousness.

At Tönnies there is a monitor showing the amount of blood that a pig has lost in kilograms

- Make sure both carotid arteries and jugular veins are cut – so the pigs lose a lot of blood in a short amount of time. If the cut (stick) is correct, there should be a rapid blood flow. If the blood-flow goes slowly – make sure you make a new proper cut.

6. Overall animal welfare recommendations

Training workers

In an intensive research on pig welfare during slaughter EFSA concluded that **almost all hazards (29 out of 30) were caused by staff** (lack of appropriate skills or fatigue).[46] This makes proper training of staff the most important factor in a slaughterhouse to assure animals are being treated as humanely as possible and protected from unnecessary stress and pain.

A good training:

- uses both theory (e-learning or a PP-presentation) and practical. To illustrate hazards and good practices, use video's, photos and drawings. Practical component should never be underestimated – most people learn and retain information best when learning by doing.
- **is focused on the individual task and position of the worker**. The training should inform the worker in detail how to perform his or her task and what to do in different (emergency) situations.
- Appoint a calm and professional worker in your slaughterhouse as a **"buddy"** to train new workers.
- after the training the worker needs to **pass an exam**. To see if he/she has the skills to perform his/her tasks well and to examine if he/she has the right attitude towards animals (calm, kind and respectful with sufficient knowledge about animal behavior). Also make use of camera-surveillance to see if workers also perform their tasks well if they are not (clearly) being watched.
- is **given in a language that is well understood** by the worker.
- communicates clearly about the high animal-welfare standards in your company.
- is clear about who should be contacted when there are questions or concerns.

Warning banners

Hang up **big banners** at several places inside the slaughterhouse (the unloading docks, lairages, raceways, canteen) with clear instructions to remind drivers what kind of behaviour or tools are not accepted and what the consequences are when they are being violated. Make sure they are translated into different languages so all workers and visiting livestock truck drivers understand them well.

Slaughterhouses should have a clear animal-welfare policy and communicate it clearly and regularly to all people involved: drivers, employees, veterinarians, inspectors, visitors and also the farmers and collecting centres that deliver the pigs.

Examples of instructions on the banners:

- Electric prods are forbidden in this slaughterhouse
- Unload and move pigs in small groups, one compartment at a time (max 13 pigs), to ease the flow and reduce stress
- Be quiet! Noise causes stress in pigs and makes them more difficult to handle.
- Kicking, hitting and yelling is not allowed in this slaughterhouse. Anyone seen abusing animals is not welcome in this plant and legal follow-up action will be taken.
- Only use your hands, a board or a flag to guide animals silently. Guiding tools are never to be used to create noise or fear.
- Stun and kill all pigs that show signs of discomfort. We do not want to prolong their suffering. Inform the lairage manager immediately. *Add photos of pigs showing signs of discomfort.*

Banner at unloading dock at Tönnies pig slaughterhouse in Germany(DE): "Pigs are sentient beings. Mistreatment results in a lifelong ban".

Camera surveillance

- **Install smart camera surveillance at several places** in your slaughterhouse. Make sure workers and drivers know there is active camera surveillance. To make them aware of this you can hang banners that warn them they are being filmed, or even better: big video screens showing them in action !

Signs at Tönnies slaughterhouse in Germany informing workers that they are being filmed for their own safety and that of the animals.

- The best is **intelligent camera surveillance so violations and animal-welfare risks are identified automatically and effectively. For example: pigs that do not walk properly, the use of electric prods or pigs that show signs of consciousness.** Instead of watching hours of footage you can focus just on the "abnormal" scenes that are detected by the camera. Make sure the camera surveillance also makes use of sound; without recording the sound, stress in pigs is more difficult to identify.

- We recommend the use of infrared cameras so pigs arriving with a fever or in heat-stress can be detected by their temperature. There is an app available that can detect pigs with a fever, infection or heat-stress. More info: Degree2act-app.

Noises and distractions

- Make all moving parts inside the slaughterhouse out of hard plastic material (instead of metal) to reduce sounds – think of lairage gates, dividers, doors…. **Too much noise causes stress in pigs and has a negative impact on meat quality, especially abrupt loud noises like the slamming of a metal gate.**

- Make sure you use only brushed metal in unloading docks, raceways and the stunning area – to avoid reflections that make pigs balk and scared.

- ✓ Hang up a **large decibel monitors in several key areas in the slaughterplant** to make employees aware of the noise level they produce and to motivate them to aim for lower decibels. Link it with a green smiley face/light or red unhappy face/light.

A decibel monitor helps to motivate workers to keep noise-levels low in the slaughterhouse

For more info, please check chapter "Reduce noises".

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