

Manual for handling cattle in consideration of animal welfare and guidance on facility improvement (Q&A) required for exporting beef to the U.S., the EU, etc.

March 2025

Japan Meat Technology Institute

Cattle Handling Manual

1. Outline

To expand beef exports, it is essential to continuously enhance and strengthen commercial distribution network in the U.S. and the EU (including the U.K., EU, Switzerland, Liechtenstein, and Norway), where large populations and stable demand create significant opportunities.

A fundamental requirement for this expansion is full compliance with the animal welfare regulations governing the handling of beef cattle, as mandated by these countries and regions. Similar regulatory standards are enforced in Canada, Taiwan, Hong Kong, Australia, New Zealand, Argentina, and Uruguay.

To address these requirements, the Center developed the “*Manual for the Improvement of Beef Cattle Handling for Export in Consideration of Animal Welfare*” in March 2023. However, in July 2023, the Ministry of Agriculture, Forestry, and Fisheries (MAFF) published “*Technical Guidelines on Feed Management for Breed-Specific*”. Accordingly, the Center revised its manual to reflect the latest update in these guidelines and other relevant information.

In this manual, “*beef cattle*” refers to all cattle raised for export, including those fattened spent dairy cows.

2. Handling practices for beef cattle that consider animal welfare required for exports to the U.S., the EU, and other regions.

Basic provisions (Source: Export Meat Handling Guidelines and Inspection Implementation Requirements)

- ☐ Implement appropriate measures to safeguard cattle from extreme high or low temperatures or other adverse weather conditions.
- ☐ Cattle, including those with limited mobility, should receive proper care in accordance with animal welfare standards.
- ☐ Take all necessary measures to minimize pain during slaughter and related procedures as much as possible.
- ☐ The animal handling facility should be maintaining proper ventilation and taking measures to alleviate animal distress and noise.
- ☐ An animal welfare manual is in place, and a designated person has been appointed to oversee compliance, particularly in facilities intended for the

EU and other countries.

Checklist of Items to include in the stunning monitoring manual.

- Assign designate personnel to monitoring
- Establish clear indicators and measurable standards for determining cattle unconsciousness and sensory responses.
- Monitoring frequency, the number of samples required for evaluation during monitoring.
- Establish protocols for identifying unexpected deficiencies when the stunning criteria are not met, and for making necessary adjustments to procedures.
- About stunners and backup equipment

(1) Transport from the farm

Based on the "Technical Guidelines for the Transport of Livestock Animals" presented by the Ministry of Agriculture, Forestry and Fisheries (MAFF) in accordance with the international standards of the "World Organisation for Animal Health (WOAH)", the following recommendations are made.

Basic provisions

- ☐ Everyone involved in cattle transportation understands the importance and necessity of handling cattle with care and ensuring a comfortable environment.
- ☐ Ensure the total duration of cattle transportation remained to a minimum.
- ☐ Communicate with the destination in advance to minimize the cattle' s waiting time in the truck, including the time required for unloading.
- ☐ Prepare a contact list, manual to address emergencies such as delays caused by sudden severe weather or vehicle accidents, etc.

Transport preparation

(For cattle)

- ☐ Cattle are checked for health and injuries before transport to ensure they are fit for transport and do not require feeding and watering, during transit.
- ☐ For long-distance transport, the animal should properly be fed and get water, with sufficient rest provided beforehand.

(vehicles and transportation equipment related)

- ☐ The truck beds and related structures should be appropriately designed for the type, age, and weight of the cattle to be transported, ensuring sufficient ceiling height for normal standing posture and adequate ventilation for the cattle.
- ☐ The loading capacity is assessed to provide adequate space per cattle.
- ☐ Trucks and other transport vehicles should be thoroughly cleaned, washed, and disinfected before use to ensure all cattle-contact surface are sanitary. The trucks should be designed to prevent the leakage of excreta, etc. during transport.
- ☐ The pre-transport waiting area should be appropriately structured for the cattle (including adequate aisle width, height of walls and fences, safe and anti-slip flooring and absence of obstacles or protrusions, etc.).



(partitions to provide adequate space per head)

Loading

- ☐ Take measures to minimize unnecessary stress on cattle.
- ☐ The number of workers (livestock handlers) should be sufficient for the number of cattle to be managed.
- ☐ Painful implements (e.g., driving sticks) or painful methods (e.g., flogging, twisting) should not be used to move cattle.
- ☐ Conscious cattle must not be dragged or dropped.

※If a head harness is required, preferably it applied at the loading stage.

(2) Cattle Transportation

- ☐ Ensure to observe the cattle regularly during transportation.
- ☐ Appropriate measures should be taken to ensure adequate ventilation during transport as well as when vehicles are parked or stopped.



(Mist fan for heat stress prevention)

☐ Noise and odors should be minimized or prevented whenever possible.

☐ Measures should be implemented to prevent heat (such as preventing direct sunlight, ensuring ventilation, using nighttime transportation, etc.) and minimizing drafts for cold to maintain appropriate temperatures whenever possible.



(prevention of heat (direct sunlight) and cold (drafts))

☐ If a cattle's physical condition deteriorates or it sustains an injury during transportation, it should be separated from other cattle. If necessary, appropriate action should be taken in consultation with a veterinarian or other healthcare professional.

☐ Vehicles used for cattle transportation should properly be disinfected upon entering or leaving the facility.

(3) Delivery to slaughterhouse

Unloading

(For cattle)

☐ Ensure not giving unnecessary stress, etc. to cattle.

☐ Ensure you have an adequate number of workers (livestock handlers) to effectively care for the cattle, etc.

☐ When driving cattle, be sure not to use any implements that may cause pain (such as driving sticks) or painful methods (such as whipping, twisting). For example, the following practices must be strictly avoided such as forceful beatings with limbs or implements, stimulation of sensitive areas, pulling of the head, ears, horns, legs, tail, etc., use of ropes to restrain or pulling of horns, nose rings, or legs, or prodding with sharp instruments?

☐ You should not drag or drop conscious cattle.

☐ While unloading cattle from a vehicle, the operator should use the tools in a way that minimizes unnecessary agitation and stress for the cattle.

☐ Are electric shock devices used? If so, ensure they are used only to adult cattle that are difficult to move, and for a maximum of one second or less, and never used repeatedly.

(Equipment and vehicles)

- ☐ The aisles and ramps in unloading areas are properly designed for cattle (such as appropriate aisle width, adequate wall and fence height, safe and non-slip flooring, absence of obstacles or protrusions, etc.).
- ☐ The overall environment, including vehicles for unloading areas and ramps, should not cause any potential hazards to cattle.
- ☐ The floors, aisles, ramps, and other structural elements should be designed to prevent cattle from falling or tipping over.



(Unloading gate from truck)



(anti-slip ramp)



(Installation of side panels to prevent falls)

(4) Lairage

(For cattle)

- ☐ Water supply facilities should be adequate, ensuring cattle always have access to water.
- ☐ If confined for more than 12 hours (facilities for the EU) or 24 hours (facilities for the U.S.), ensure cattle are properly fed.
- ☐ The environment for the lairage area and the area for ante-mortem inspections does not cause harm to cattle.
- ☐ Cattle should be handled calmly when moved, ensuring the operator uses the tools minimizing unnecessary agitation.
- ☐ Cattle with disabilities such as non-ambulatory, must be handled humanely.
- ☐ If ropes are used to restrain horns, nose rings, or legs, they should be tied in a way that prevents injury and allows cattle to lie down, eat and drink if needed (especially required in facilities for the EU and other countries).
- ☐ Electric shock devices used? If so, they must be applied only to adult cattle



(Water supply facilities that allow free access to drinking water at any time)

that are struggling to move, for one second or less, and never use it repeatedly (especially required in facilities for the EU and other countries).

(Equipment related)

- ☐ Ensure floors, aisles, ramps, and other facilities environment is designed to prevent cattle from falling or tipping.
- ☐ Ensure an isolated quarantine space available for injured cattle (especially in facilities for the EU and other countries).

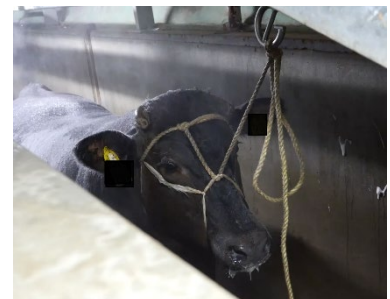


(non-slip floor surface)

(5) Guidance to the Stunning Box

(Cattle related)

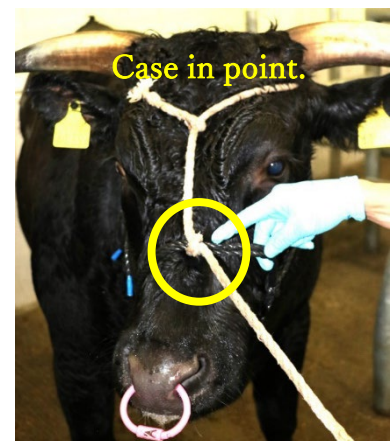
- ☐ Ensure that the level of stimulation and pain, etc. experienced by cattle when entering the stunning pen is minimized.
- ☐ Ensure the ropes used to restrain horns, nose rings, or legs are secured in a way that prevents injury (especially required in facilities for the EU and other countries).
- ☐ If electric shock devices are used, they should be applied only to adult cattle struggling move, for one second or less, and never used repeatedly (especially required in the EU and other countries).



(Leads to stunning box)

(Equipment and facility related)

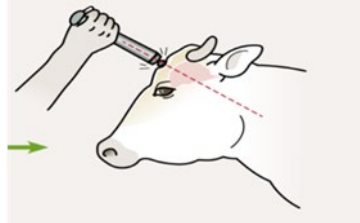
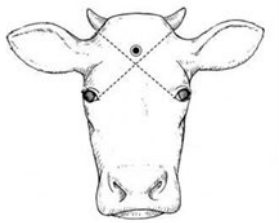
- ☐ Floors, aisles, ramps, and other facility elements should be designed to prevent cattle from falling or tipping.
- ☐ Ensure there are no sharp bends.
- ☐ Floor materials and colors should be consistent.
- ☐ The lighting in the lairage area should be lower than that of the stunning box.
- ☐ A blue tarp or two sheets of lawn cloth should be readily available as a substitute for blindfold on the driveway.



(Induction by head entanglement without using a nose ring)

(6) Stunning

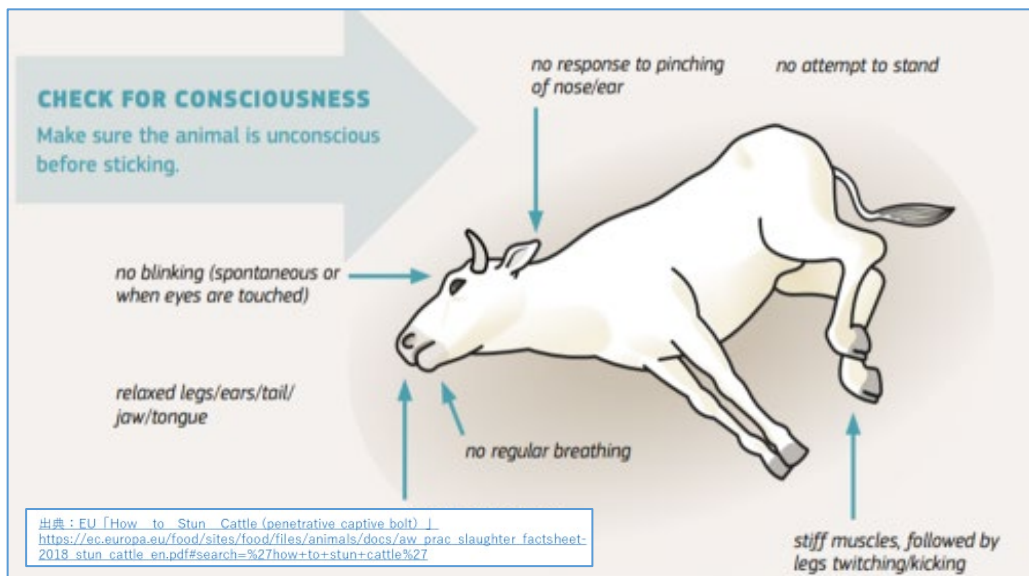
- ☐ Cattle are properly retained to ensure effective stunning.
- ☐ A single blow reliably renders the cattle unconscious.
- ☐ The process from stunning to bleeding must be carried out continuously for each cattle (especially required in facilities for the EU and other countries).



(Image of appropriate forehead location)

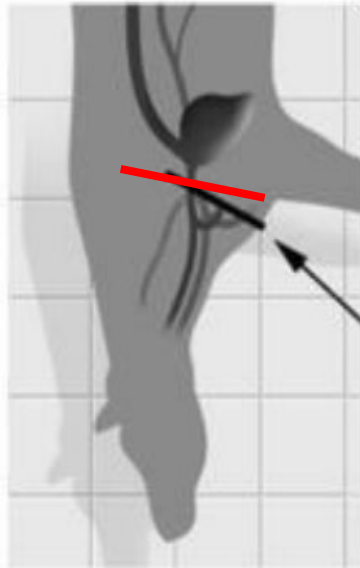
(7) Bleeding

- ☐ Ensure cattle remain fully unconscious before and throughout the bleeding process.



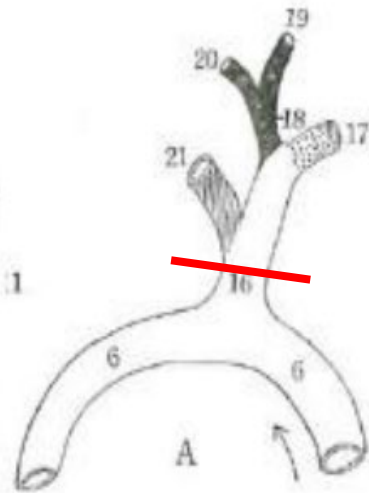
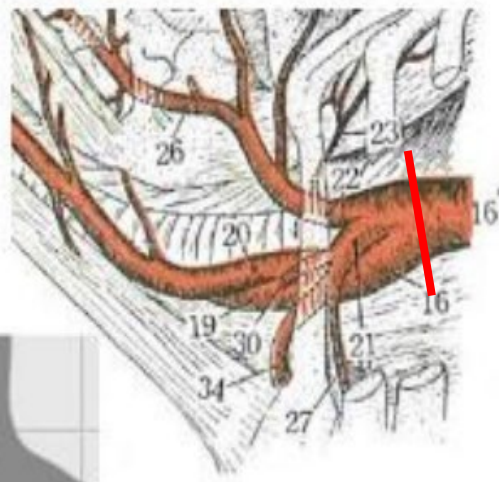
(Check points for loss of consciousness)

- ☐ The brachiocephalic artery has been severed.



↑ Cutting positions when
bleeding cattle

Humane Slaughter Association



↑ chart of blood vessel

- 6. Aortic arch
 - 16. Brachiocephalic artery
 - 17. Right subclavian artery
 - 18. Bilateral carotid arteries
 - 19. Right common carotid artery
 - 20. Left common carotid artery
 - 21. Left subclavian artery
 - 22. Common trunk of vertebral, deep cervical, supreme intercostal, and dorsal scapular arteries
 - 30. superficial carotid artery
- Kato, "Illustrated comparative Anatomy of Livestock, Volume 2"

(Reference) Prohibited acts

The following cattle handling practices are prohibited under WOAH's International Standard ("Article 7.5 Animal Welfare at Land Slaughter"), as amended in May 2024

- ☐ Crushing, twisting, or breaking the tail of cattle
- ☐ Use of instruments, pressure, or application of irritants that cause injury to any part of the animal.
- ☐ Beating cattle with large sticks, pointed sticks, pipes, stones, wires, leather belts, or other instruments.
- ☐ Kicking, throwing, or dropping a cattle.
- ☐ Grasping only parts of a cattle's body (tail, head, horns, ears, limbs, wool, or hair, etc.) or lifting or dragging by these parts
- ☐ Dragging cattle by any means (chains, ropes, or human hands, etc.) and with any part of the cattle
- ☐ Allowing cattle to walk on other cattle.
- ☐ Touching sensitive areas (eyes, mouth, ears, anogenital area, breast or abdomen, etc.)
- ☐ The following practices for handling conscious cattle are strictly unacceptable and must never be used under any circumstances.
 - Using mechanically restraint that excessively tightens the legs or feet (including tying the limbs together or lifting one or more limbs off the ground)
 - Breaking a cattle's leg, severing a leg tendon or causing blindness.
 - Severing the spinal cord using a dagger, etc.
 - Applying electric currents that do not effectively reach the brain.
 - Suspending or lifting cattle by their legs or feet.
 - Severing the brain stems through the orbit or skull.
 - More than one handler jumping on or lying on the back of cattle to force it to sit or lie down,
 - Use a trip-floor box designed to topple cattle.
- ☐ Breaking the neck of conscious cattle during bleeding is strictly unacceptable.

3. Reference materials

- ① Outline for handling meat exports to the United Kingdom, the European Union, Switzerland, Liechtenstein and Norway
https://www.maff.go.jp/j/shokusan/hq/i-4/yusyutu_shinsei_ousyu.html#eu
- ② Meat Handling Guidelines for Exports to the United States of America
https://www.maff.go.jp/j/shokusan/hq/i-4/yusyutu_shinsei_hokubei.html#usa
- ③ Inspection Procedures at Certified Export Meat Facilities
<https://www.jamti.jp/pdf/tech08-10.pdf>
- ④ Technical guidelines for the transportation of livestock
<https://www.maff.go.jp/j/chikusan/sinko/230726.html#guidelines>
- ⑤ Animal Welfare at Slaughter” regulations of the World Organisation for Animal Health (WOAH)
https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/?id=169&L=1&htmlfile=chapitre_aw_slaughter.htm
- ⑥ Manual for Improved Handling of Beef Cattle for Export in Consideration of Animal Welfare
<https://www.jamti.jp/pdf/tech06-17.pdf>
- ⑦ Q&A about nose rings
<https://www.jamti.jp/pdf/tech06-17.pdf#page=82>

Guidelines for Facility Improvements

1 Unloading

(Q1-1) What should be the design and slope of the facility ramp for unloading cattle from the truck?

(Answer)

Ensure that there are no sharp objects or protrusions that could cause pain.

A nearly horizontal or a slightly uphill slope is preferred, as cattle tend to resist moving downhill.

Danish standards allow slopes up to 10 degrees (20 degrees if there is a cleat used)

North American Meat Institute guidelines recommend that slopes not exceed 20 degrees.



*Photograph: Example of Facility A

(Q1-2) What measures are implemented to prevent slipping?

(Answer)

Slopes should be constructed using anti-slip materials or enhanced traction.

Anti-slip cleats, striped steel or rubber flooring can be incorporated.



*Photograph: Example of Facility A

(Q1-3) What measures are implemented to prevent falls?

(Answer)

Horizontal boards (gates) can be used as a fall prevention measure,
Horizontal plates should be securely attached to the platform structure to ensure stability.

(Q1-4) What consideration should the truck side keep in mind when unloading?

(Answer)

Unload promptly upon arrival.
Avoid using electric rods whenever possible.
If necessary, use them only on cattle that refuse to move.

(Q1-5) How can an unloading area be designed to adjust to different truck height?

(Answer)

Installing an elevating platform on the unloading area is one of the possible solutions.



*Photo: Example of Facility C

2 Structure of the lairage

(Q2-1) How should the pen size, wall structure, partition design and height be configured?

(Answer)

<Pen structure, height>

The pen should have a solid and durable wall structure, and it should be designed to minimize disturbances caused by human presence, helping the animals calm down.

<Partition structure, height>

There are no specific recommendations regarding the structure or height of the walls between cattle.

<Pen size>

When cattle are handled in groups,

Cattle should have sufficient space to stand, lie down, and turn comfortably.

Danish standards:

400~ 500 kg: 4.4 m²/head

Over 500 kg: 5.0 m²/head

The North American Meat Institute guidelines:

680 kg: 2.13 m²/head

720 kg: 2.22 m²/head.

For tie-stall system

Danish standards:

1.3m wide x 2.80m long per unit

Ensure each animal has access to a water cup and use ropes to prevent neck engagement.

(The tie-stall system is gradually being phased out in Denmark.)

(Q2-2) What are the specifications for anti -slip measures, flooring materials, and slope angles?

(Answer)

Flooring material with anti-slip properties are essential. A broom finished surface may be used, but it tends to wear down over time, requiring regular maintenance and resurfacing.

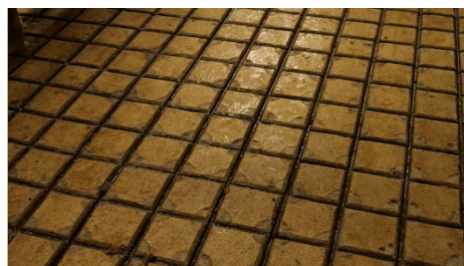
Diamond-cut surface or grooved finishes can be considered.

For worker' s pathways, a floor finished with a steel trowel may be used to facilitate easier cleaning.

The slope should be designed with a near-horizontal slope that allows for adequate drainage.



(Broom finish)



(Diamond cut)

(Q2-3) How should a water supply system be planned?

(Answer)

Animals should always have access to fresh drinking water.

According to Danish standards, one drinking cup should be provided for every eight animals in a herd.

(Q2-4) How should feeding be managed?

(Answer)

Under the regulations of the Beef Export Certification Program to the EU, cattle that are not slaughtered within 12 hours must be fed.

Under the provisions of the Beef Export Certification Program to the U.S., cattle that are not slaughtered within 24 hours must be fed.

For frequent feeding, installing a feed tank in the pen is recommended, but for infrequent feeding, using, a bucket or other container is sufficient.

(Q2-5) What are the optimal wall color and structural design?

(Answer)

The walls and floors of the lairage should be made of consistent material and maintain uniform color.

For color selection, shades of green or blue, which are known for their calming effect on cattle, should be used for wall paint to help reduce stress.

(Q2-6) What is the recommended illuminance level (lux) for lighting?

(Answer)

In the lairage, lights should be turned off after the ante-mortem inspection is completed, as reduced lighting helps keep the cattle calm.

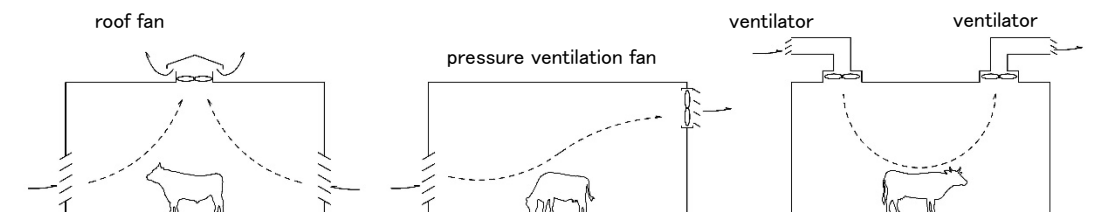
The Enforcement Regulations of the Slaughterhouse Law mandate that adequate illumination must be provided, while the *"Guidelines for Facilities and Equipment of Slaughterhouses"* specify that the area for ante-mortem inspection must maintain a brightness level at least 110 lux.

During unloading, significant differences in brightness between indoor and outdoor areas may cause cattle to hesitate or resist movement, for that reason, making the building side brighter could also be considered.

(Q2-7) Where and how should ventilation equipment (intake and exhaust vents) be installed?

(Answer)

To optimize airflow throughout the building, intake and exhaust vents should be as far apart as possible, depending on the building's shape. Efficient ventilation can be achieved by installing the air intake vent at a lower level and the exhaust vent higher up. If airflow becomes stagnant, incorporating a conveyor fan can help improve circulation.



Conveying fan (Example)



Induction Fan



Pressure ventilation fan for agricultural use



Cattle barn ventilation fan

(Q2-8) What measures do you use to prevent noise?

(Answer)

Cattle have excellent hearing but struggle to pinpoint the source of sounds and making loud noises are particularly distressing, especially if they cannot identify where the sound is coming from.

It is important to reduce the sound of motors, hydraulic machines, blows, and reverberations.

3 Driveways

(Q3-1) How should the walls of the driveway be constructed?

(Answer)

Avoiding sharp bends is recommended.

Additionally, it is desirable to have a certain level of visibility up to the stunning box.

The walls of the driveway should be as sturdy as those of the pens to minimize disturbances caused by the presence of people.

(Q3-2) What kind of structure and method should be used to design the width and height of driveway to ensure smooth movement while preventing visibility of the surrounding area?

(Answer)

The driveway should ideally have a width of 0.9m to 1.0m.

To prevent animals from noticing people, a height of approximately 1.8 m is recommended. However, for animals accustomed to people, such as Wagyu cattle, a slightly lower height of around 1.6 m may be sufficient.

In Denmark, it is recommended to construct walls using concrete up to 1.5 m with steel pipes extending to 1.8 m above that for additional coverage.

As an alternative, a simple blindfold can also be substituted using a blue sheet or two sheets of shade cloth.

(Q3-3) What type of structure should be used to prevent slipping on driveways?

(Answer)

To ensure safety, slip-resistant flooring materials – similar to those in pens – should be used.

The slope should be slightly uphill or near horizontal.

(Q3-4) What color should the floor, exterior walls, and partition walls of driveways be?

(Answer)

Colors such as red and yellow are known to provoke strong reactions in cattle and should be avoided. (The floor, exterior walls, and partition walls leading from the raceway to the stunning pen should maintain a uniform color.)

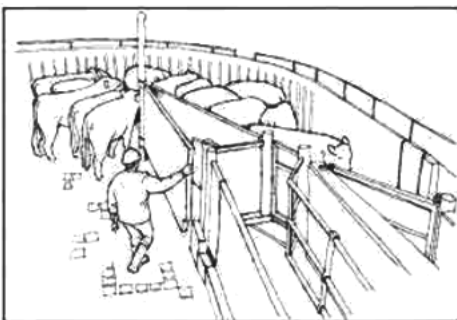
Additionally, using the same material as the pens is advisable, as different flooring materials may cause hesitation in movement.

(Q3-5) Please describe the design of driveways and guiding devices to ensure the smooth movement of cattle.

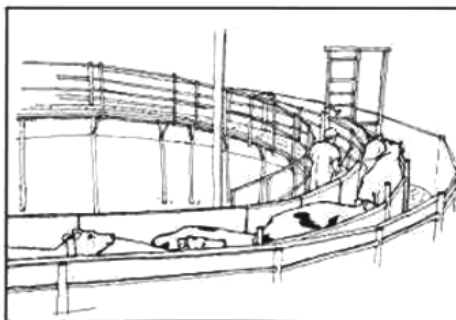
(Answer)

Ideally, cattle should be guided as naturally as possible, however, a rail is installed overhead to pull the headcollar, and there is a towing-type guiding device.

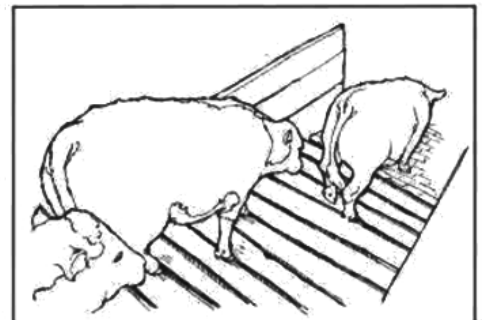
In addition, the North American Meat Institute's *"Recommended Guidelines for Animal Handling,"* include a following standardized design layout to optimize cattle movement.



Group pen



Curved passage



Ramps for unloading

(Q3-6) How bright should the lighting of driveways be?

(Answer)

Because of the animal's habit of moving from dark to light areas, the illumination should be lower than that of the stunning box.

(Q3-7) What is the best structure for drainage channels to prevent water from pooling? Also, is there a way to avoid placing drainage outlets in the driveway?

(Answer)

Drainage channels should be installed in passage designated for people rather than driveways used by cattle.

4. Stunning pen

(Q4-1) What kind of structural modifications should be made to improve the structure of a stunning device so that cattle can smoothly move into the stunning pen?

(Answer)

To facilitate the smooth entry of cattle into the stunning box, it is beneficial to ensure that the worker ahead remains out of sight during their approach. Additionally, bright lighting on the front wall of the stunning pen encourages cattle to move forward and makes it easier to get them to lift their heads toward the illuminated area.

To maintain consistency and reduce hesitation, the structure and color of the floor and walls should remain as unchanged as possible from the driveway.

Introducing black rubber resin as a buffer on the floor may create the cliff effect, making cattle reluctant to proceed.

(Q4-2) What improvements can be made to prevent cattle from seeing outside while waiting for stunning?

(Answer)

One method is to install a gate in front of the stunning box. Additionally, for a simple visual barrier, a blue sheet or two sheets of shade cloth can be used as a substitute.

(Q4-3) What improvements can be made to stabilize and securely retain the head during stunning?

(Answer)

To determine the precise stunning position, it is desirable to develop a device to restrain the head at an early stage and integrate it into the stunning box for effective use.

5 Bleeding area, bleeding rail

(Q5-1) What structural improvements can be made to shorten the duration between stunning and bleeding?

(Answer)

- Increasing the speed of the door lifting and opening, ideally raising it 30 cm from the floor.
- The receiving platform should be designed so that the ejected cattle can smoothly assume the proper position by sliding conditions, angles, etc.
- Examples of Movable and Body-Receiving Platforms
(Incline method (inclined displacement method) can enhance efficiency)
- Reduce lifting time for landing machines.
- Stunning to sticking (brachiocephalic artery) should be completed within 15 seconds for the hoisting method should be completed within 45 seconds and each operator should work in coordinated and synchronized movement for maximum efficiency.
- Ensure a state of complete unconsciousness and complete exsanguination during that period.

The above considerations are possible.

6 Other

(Q6-1) Where and in what position should video surveillance devices be installed?

(Answer)

It is desirable to install the devices at a height where cattle are not bothered by them.

Additionally, the number and placement of cameras should be arranged to ensure there are no blind spots in the pens.