

ANIMAL WELFARE IN ABBATOIR – TRANSPORT, ARRIVAL, LAIRAGE AND HANDLING

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ANIMAL TRANSPORT

- Hundreds of thousands of animals are daily transported for slaughter, fattening and breeding.
- Transport conditions during these journeys vary a lot (lorry, train, boat,..)



ANIMAL TRANSPORT – TAHC CHAPTER 7.3.

- Animal welfare during transport includes the conditions for the protection of animals during transport.
- No one may transport animals or allow them to be transported in a way that could cause injury or unnecessary animal suffering.
- WOAHP provides guidelines on transportation by land, sea, and air, ensuring that animals are moved under humane conditions.

KEY PRINCIPLES FOR TRANSPORT

Fitness for transport

Handling during loading/unloading

Space and ventilation

Food, water, and rest

For long journeys, resting periods are required.

Emergency preparedness

ANIMAL TRANSPORT

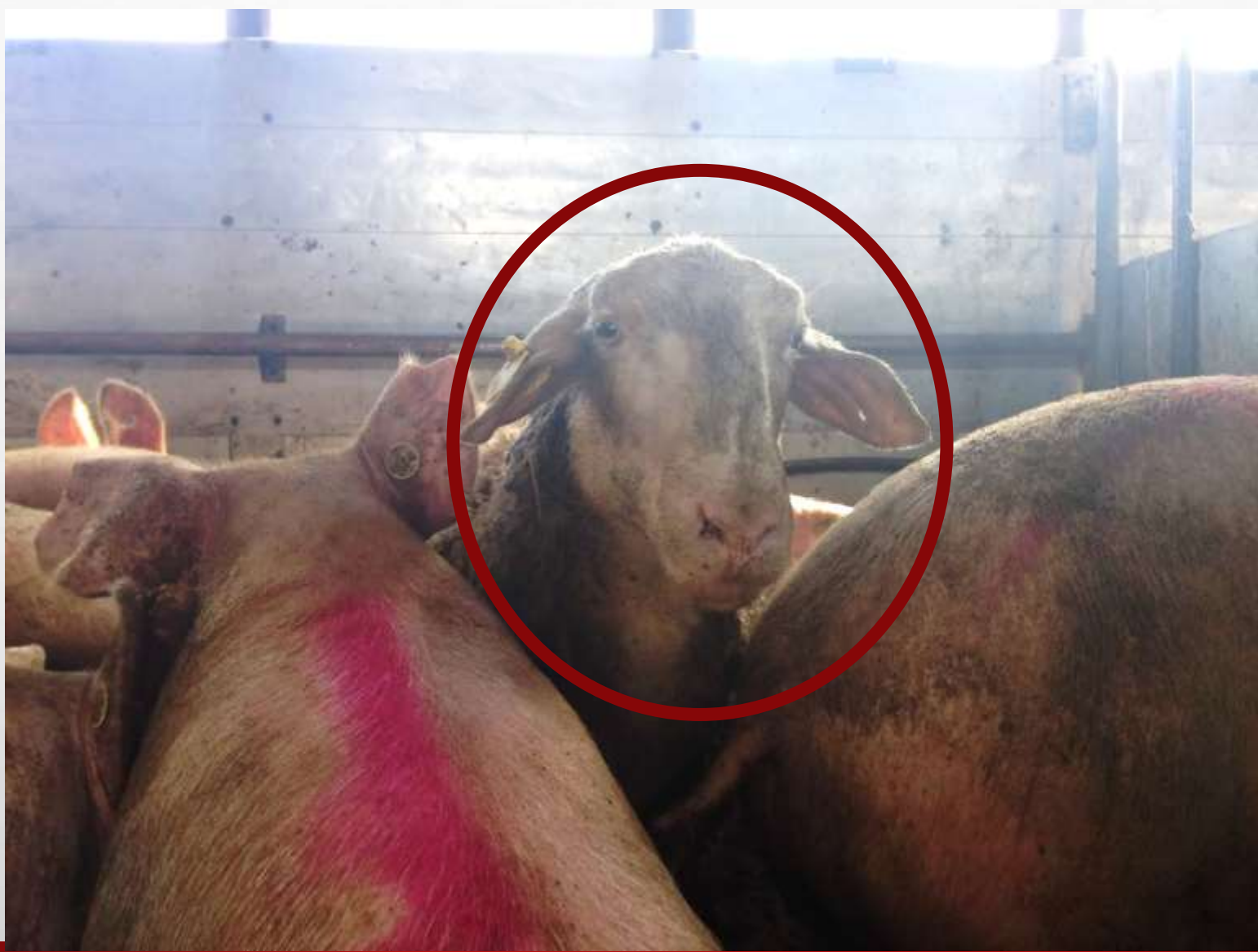
- Animals must be transported in conditions that guarantee that they will not be injured or suffered unnecessarily.



ANIMAL TRANSPORT

- Big food production systems (farm-slaughterhouse-retailer)
- Animal transport is involved a lot in these systems
- Driver training







ANIMAL FITNESS FOR TRANSPORT

- Only fit and healthy animals should be transported.
- Animals that are weak, sick, injured, heavily pregnant, or have just given birth should NOT be transported unless absolutely necessary (and only under veterinary supervision).
- Lameness, or those unable to stand, should not be moved.
- Young animals should be properly weaned before transport.

Table 1: Results of the literature search on the prevalence of pregnant animals slaughtered in the EU and Switzerland divided by species and country (n.a.: data not available)

Species	Country	Percentage/number of animals found pregnant at slaughter	Percentage per term of gestation		Reference
			Of total number slaughtered	Of pregnant animals	
Cattle	United Kingdom	23.5% (out of 6,670 cows; 1 slaughterhouse)	6.3% 3rd term	26.8%	Singleton and Dobson (1995)
Cattle	Luxemburg Germany Belgium Italy	LU: 5.3% (out of 3,619 cows, range DE: 4.9% (out of 1,012 cows; 1 slaughterhouse) BE: 10.1% (out of 965 cows; 1 slaughterhouse) IT: 4.5% (out of 3,071 cows; 1 slaughterhouse)	LU: 1.3% 3rd term DE: 2.3% 3rd term IT: 0.7% 3rd term	LU: 25% 3rd term DE: 46% 3rd term IT: 15% 3rd term	Di Nicolo (2006)
Cattle	Germany	4.4% pregnant (median 2.9%; range 0-10.8%; 10 slaughterhouses)	n.a.	n.a.	Lücker et al. (2003)

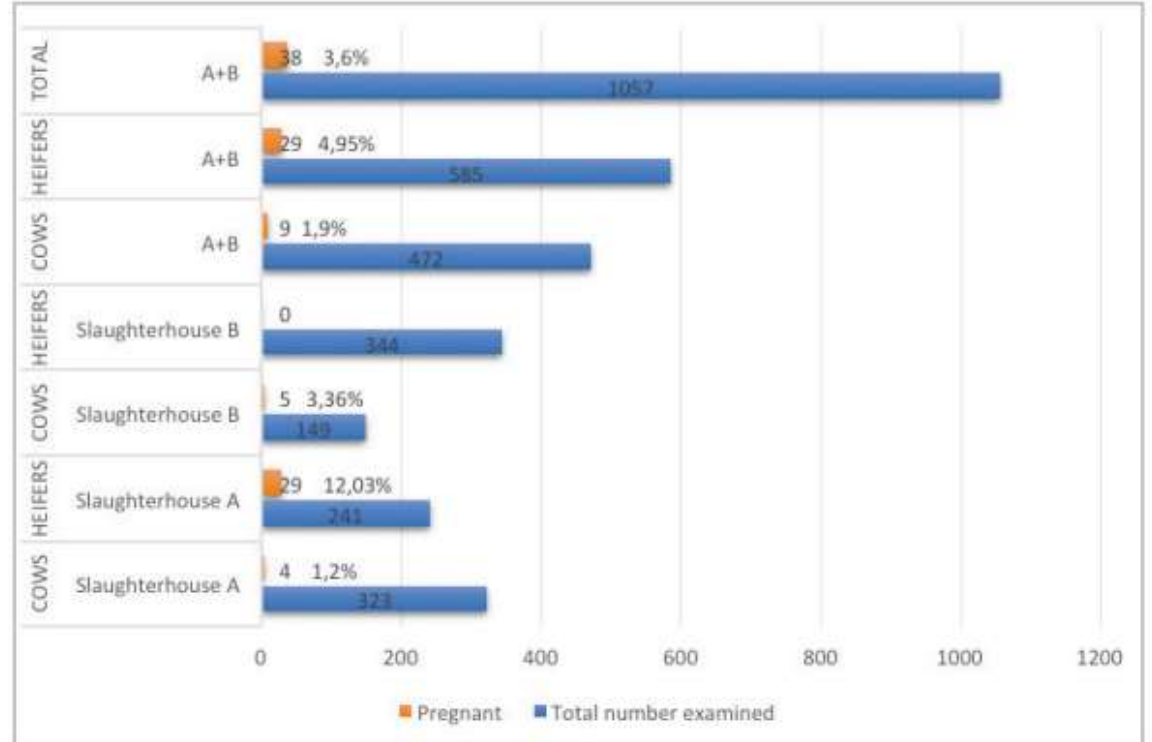


Fig. 2. Number of pregnant animals in the total number examined

HANDLING DURING LOADING & UNLOADING

Must be done calmly to prevent stress and injuries.

Use of force (hitting, dragging, kicking) is prohibited.

Electric prods should only be used when necessary and never on sensitive areas (face, genitals).

Loading ramps should be at an appropriate slope and have non-slip surfaces.

Animals should be grouped appropriately to prevent aggression (e.g., avoid mixing unfamiliar males).

PLANNING AND PREPARATION



Transport must be well-planned, including route, duration, and potential risks.



Coordination between the sender, transporter, and receiver is essential.



Emergency response plans must be in place.



FOOD, WATER, AND REST DURING TRANSPORT

- Short journeys (<8 hours): No mandatory feeding, but water must be provided if necessary.
- Long journeys (>8 hours): Regular access to water, food, and rest.
- Rest stops should be planned for land transport.
- Holding pens should be available at ports/airports for waiting animals.

SPECIFIC TRANSPORT REQUIREMENTS

- A. Transport by Land

- Vehicles should be designed for safe, stress-free transport.
- Adequate ventilation to avoid heat stress or cold stress.
- Non-slip flooring and secure partitions to prevent falls.
- Adequate space allowance per animal to prevent overcrowding.

- B. Transport by Sea

- Ships should meet International Maritime Organization (IMO) standards.
- Animals must be properly secured to prevent injury. Water and feed must be available for long journeys.
- Regular veterinary inspections are required.



C. TRANSPORT BY AIR

- International Air Transport Association (IATA) guidelines must be followed.
- Proper crate design with ventilation, bedding, and temperature control.
- Animals should be handled gently during loading/unloading.

- To support the industry (e.g. farmers, drivers) to improve animal welfare, a consortium consisting of 16 partners has started to develop Guides to Good and Best Practice as a European Commission, DG Sante pilot project (2018).

<http://www.animaltransportguides.eu/>



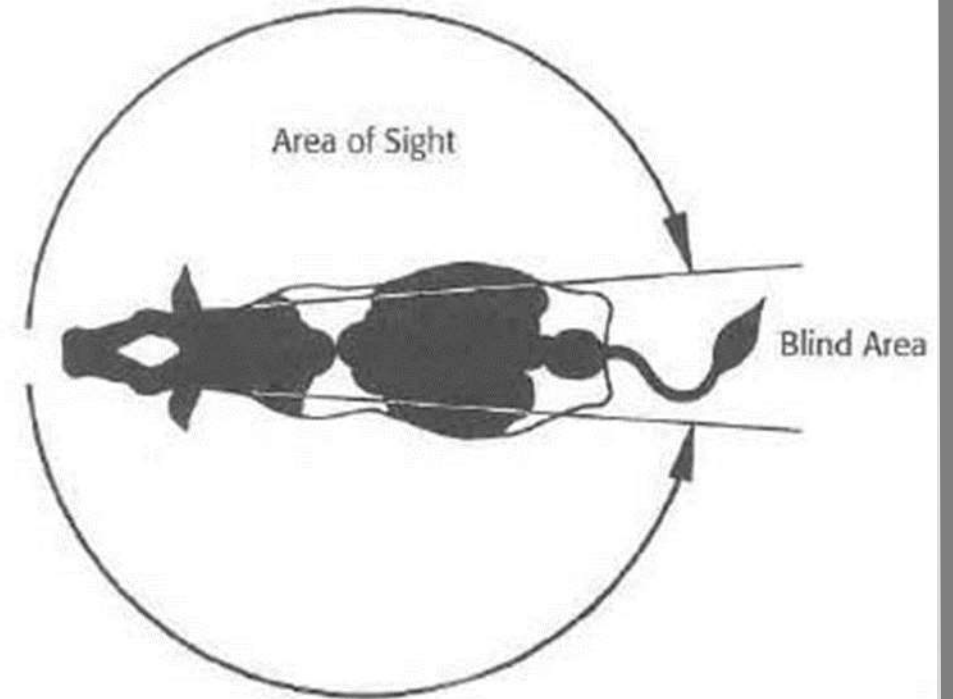
HANDLING OF ANIMALS (WOAH CHAPTER 7.1 - TAHG)

- Proper handling of animals is crucial for reducing stress, preventing injuries, and ensuring humane treatment. The WOAH provides international guidelines on how animals should be managed at farms, markets, transport hubs, and slaughterhouses to safeguard their welfare.

ANIMAL HANDLING

The goal is to handle with animals calmly and under control, as easily as possible for them and for workers with as little stress as possible.

This requires both patience and skill, and a full understanding of the way animals behave in unfamiliar environments.



GENERAL PRINCIPLES OF HUMANE HANDLING

- To minimize fear, distress, and physical harm, handling should adhere to the following core principles:
 - ✓ Animals should be handled calmly—sudden movements, loud noises, and aggressive handling should be avoided.
 - ✓ Use proper equipment—avoid tools that cause pain, such as sticks, whips, and electric prods (only used as a last resort).
 - ✓ Handlers must be trained in low-stress handling techniques.
 - ✓ Handling methods should align with species-specific behavior—for example, sheep follow flock behavior, while pigs are sensitive to bright lights and loud noises.
 - ✓ Injured or unfit animals must be handled with extra care—they should not be forced to move and may require euthanasia if suffering is severe.



HANDLING DURING LOADING & UNLOADING

Use non-slip flooring to prevent slipping and injuries.

Use ramps with proper incline:

Maximum slope: 20° for pigs and cattle, 26° for sheep and goats.

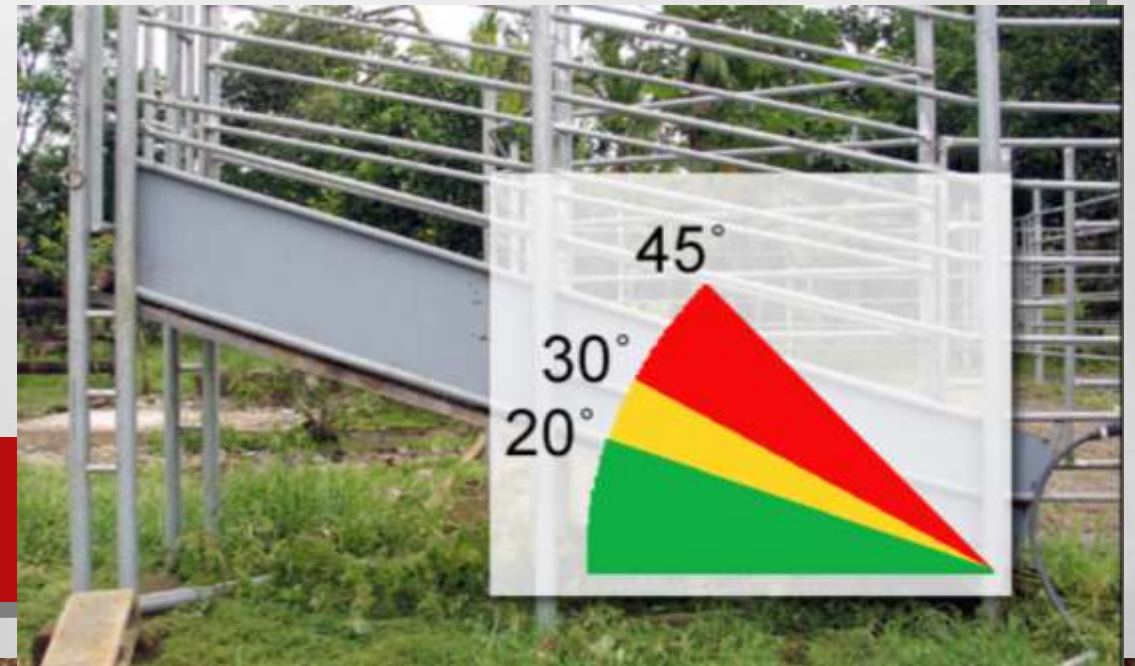
Ramps should have solid sides to prevent animals from getting distracted.

Reduce noise levels: Avoid shouting, banging equipment, or other loud disturbances.

Encourage movement without force: Use natural animal behavior (e.g., sheep follow each other). Pigs can be guided with boards instead of prods. Cattle can be led with gentle pressure and movement-based guidance.

RECEPTION

- Ramps - a certain inclination depending on the type of animal (max. 20 degrees for pigs, calves and horses, max. 26 degrees and 34 minutes for sheep and cattle except calves) - inclination greater than 10 degrees - floor bars that allow animals to climb or descend without dangers or difficulties
- Lifting platforms and upper platforms - safety fences





Animals should be given time to calm down after transport before slaughter.



Water must be available at all times; food must be provided if animals are kept for more than 12 hours.



Animals should be moved in small groups to avoid overcrowding.

HANDLING AT SLAUGHTERHOUSES

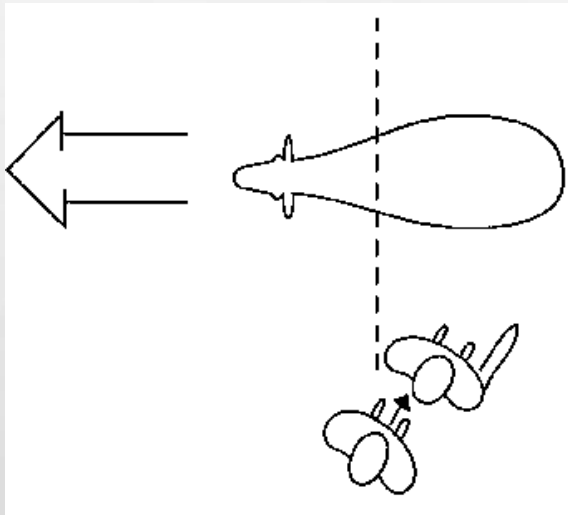
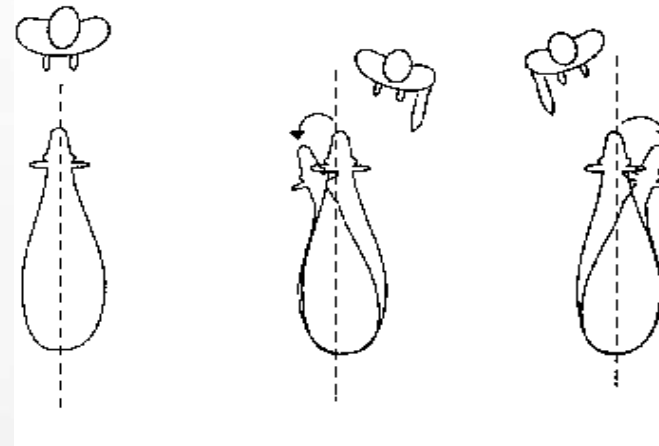
SAFETY BUBBLE / FLIGHT ZONE

- A zone in which an animal feels safe away from another animal or human.
- In stressful situations, the safety zone of animals increases, while in animals accustomed to physical manipulation, it decreases over time.
- It also depends on the species, breed and sex.



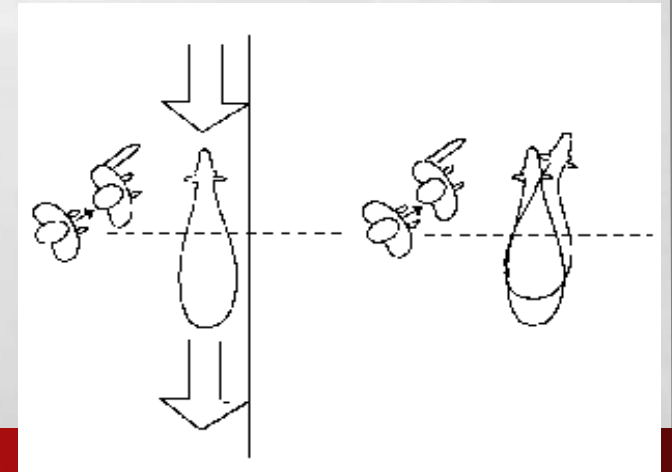
POINT OF BALANCE

“Point of balance” is a factor related to flight zone, and working with the animals’ point of balance will also help you move it more safely. The point of balance is located in the shoulder area.



This point allows us to manage animals without physical contact

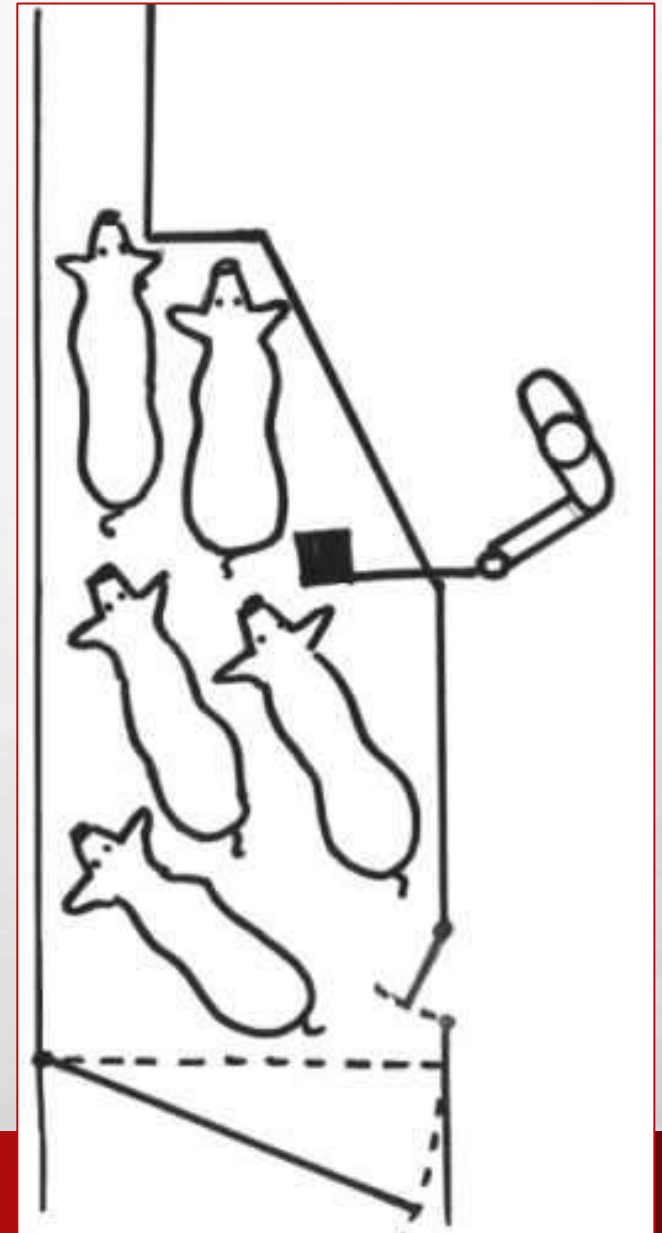
Depending on the obstacles, the animals will move to stay within their own "safety bubble".



ANIMAL HANDLING – RACEWAY



The animals like to walk in semicircular corridors, presumably because they feel they are returning to where they started from.



PROHIBITED PRACTICES

- Beating, kicking, or excessive force
- Dragging animals by tails, legs, ears, or horns
- Throwing or dropping animals
- Using electric prods on sensitive areas (face, genitals, anus)
- Transporting or handling sick/injured animals improperly

- Any mistreatment of animals should be reported and corrected immediately.

ANTE.-MORTEM INSPECTION

- The term ante-mortem means “before death.”
- All livestock presented for slaughter must receive ante-mortem inspection.
- Ante-mortem inspection identifies animals not fit for human consumption.
- Here animals that are down, disabled, diseased, or dead (known as 4D animals) are removed from the food chain and labeled “condemned.”

***ANTE MORTEM* INSPECTION**

(CHAPTER 7.5 - SLAUGHTER OF ANIMALS)

- **THE OFFICIAL VETERINARIAN MUST CARRY OUT AN *ANTE-MORTEM* EXAMINATION OF ALL ANIMALS BEFORE SLAUGHTER;**
- **THIS INSPECTION MUST BE DONE WITHIN 24 HOURS OF ARRIVAL AT THE SLAUGHTERHOUSE AND LESS THAN 24 HOURS BEFORE SLAUGHTER;**
- **IN ADDITION, THE OFFICIAL VETERINARIAN MAY REQUEST AN INSPECTION AT ANY OTHER TIME.**



- The ante-mortem examination must in particular determine whether the animal in question has signs that:
 - indicate that welfare is at risk;
 - or indicate any condition that could have a harmful effect on human or animal health, whereby special attention should be directed to the detection of zoonoses and animal diseases for which animal health rules are established in Union legislation.

In addition to the routine *ante-mortem* examination, the official veterinarian must perform a clinical examination of all animals that the FBO or official assistant may have set aside.



ANTE MORTEM INSPECTION

- Other animals showing signs of being sick are labeled “suspect” and are segregated from healthy animals for more thorough inspection during processing procedures.
- Ante-mortem inspection of poultry is performed on a lot basis.
- Implementing regulation (EU) 2019/627 is laying down the criteria and conditions for derogations from certain requirements of that Regulation, so that ante-mortem and post-mortem inspections can be performed under the responsibility of the official veterinarian, instead of being performed or supervised by the official veterinarian.
- These delegated acts should also lay down the criteria and conditions under which official controls may be performed by other staff designated by the competent authorities in cutting plants.

LAIRAGE

- Animals that will not be slaughtered immediately upon arrival must be housed in a depot.

Animal accommodation (lairage) has:

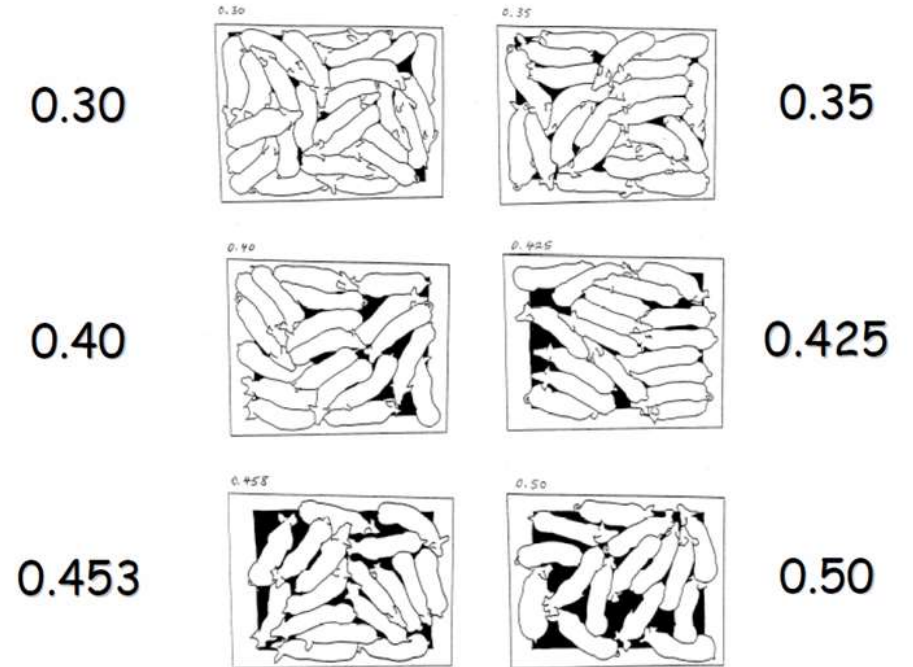
- - non-slip floors on which animals cannot be injured in any way,
- adequate ventilation that can function optimally even in conditions of unfavorable temperature values and humidity, (auxiliary devices)
- artificial lighting strong enough that it is possible to inspect animals at any time, (additional if necessary)
- if necessary, equipment for tying animals,
- if necessary, suitable litter for animals that stay overnight.



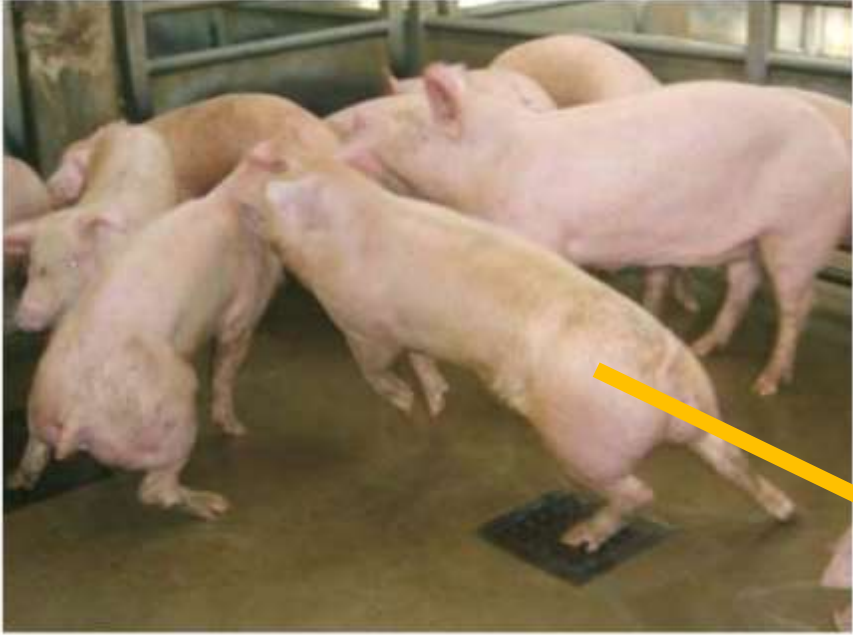
LAIRAGE

- If the facility has areas for housing animals outdoors without natural shade or shelter, adequate protection from adverse weather conditions must be provided.
- For animals that will not be slaughtered immediately upon arrival at the slaughterhouse, water is constantly available.
- Animals that will not be slaughtered within 12 hours of arrival at the slaughterhouse have sufficient food at their disposal at appropriate intervals.
- Animals that are tethered, when staying in the slaughterhouse for more than 12 hours, are tethered in such a way that they can lie down, lie down, get up and eat without difficulty.
- Non-tethered animals must have access to food so that they can eat unhindered at all times.

Population density - scheme



CONSEQUENCES



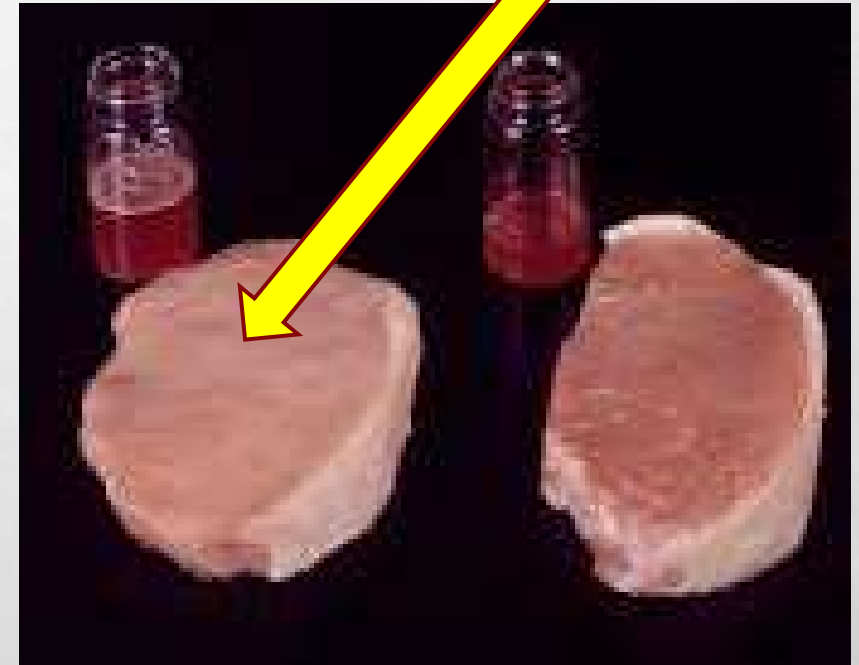
CONCENQUENCES – LOW MEAT QUALITY



- Stress applied to livestock before and during slaughter procedures can lead to undesirable effects on the meat produced from these animals, including both PSE and DFD.

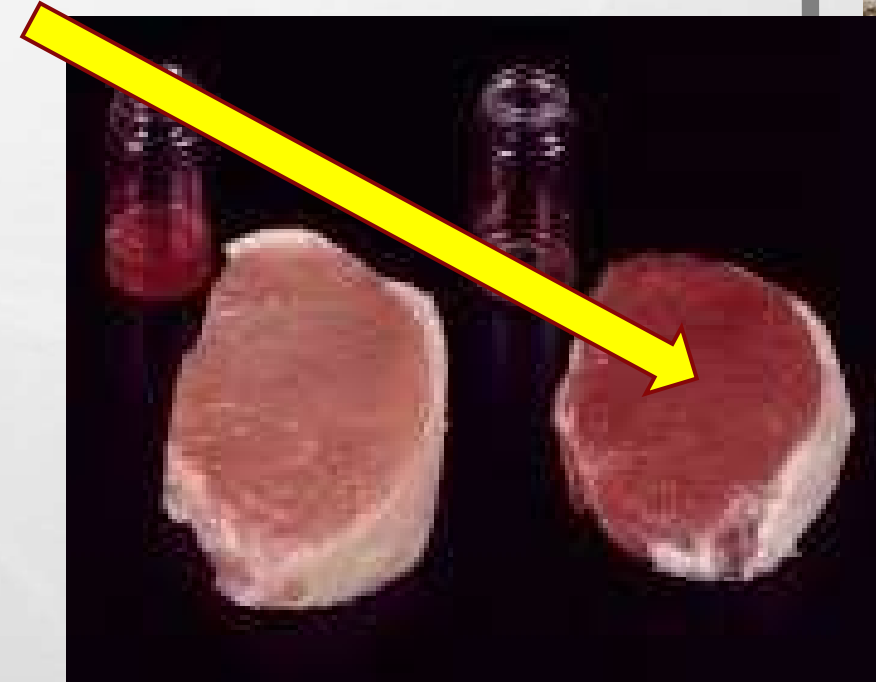
PSE MEAT

- Pale, soft, and exudative (PSE) meat is the result of a rapid postmortem pH decline while the muscle temperature is too high.
- This combination of low pH and high temperature adversely affects muscle proteins, reducing their ability to hold water (the meat drips and is soft and mushy) and causing them to reflect light from the surface of the meat (the meat appears pale).
- PSE meat is especially problematic in the pork industry.
- It is known to be stress-related and inheritable.



DFD MEAT

- Dark, firm, and dry (DFD) meat is the result of an ultimate pH that is higher than normal.
- Carcasses that produce DFD meat are usually referred to as dark cutters.
- DFD meat is often the result of animals experiencing extreme stress or exercise of the muscles before slaughter. Stress and exercise use up the animal's glycogen reserves, and, therefore, postmortem lactic acid production through anaerobic glycolysis is diminished.
- The resulting postmortem pH of DFD meat is 6.2 to 6.5, compared with an ultimate pH value of 5.5 for normal meat.
- The dry appearance of this meat is thought to be a result of an unusually high water-holding capacity, causing the muscle fibres to swell with tightly held water.





FARM PRACTICES THAT LEAD TO RISKS IN THE SLAUGHTERHOUSE

- Monitoring animals when they arrive at the slaughterhouse makes it easier for us to inspect because we can assess a larger number of animals at once, and therefore a larger number of farms.
- There are two basic categories that we can assess in the slaughterhouse:

Acute trauma - caused during transport (loading, transport, unloading)

Chronic changes - occurred on the farm (before loading)

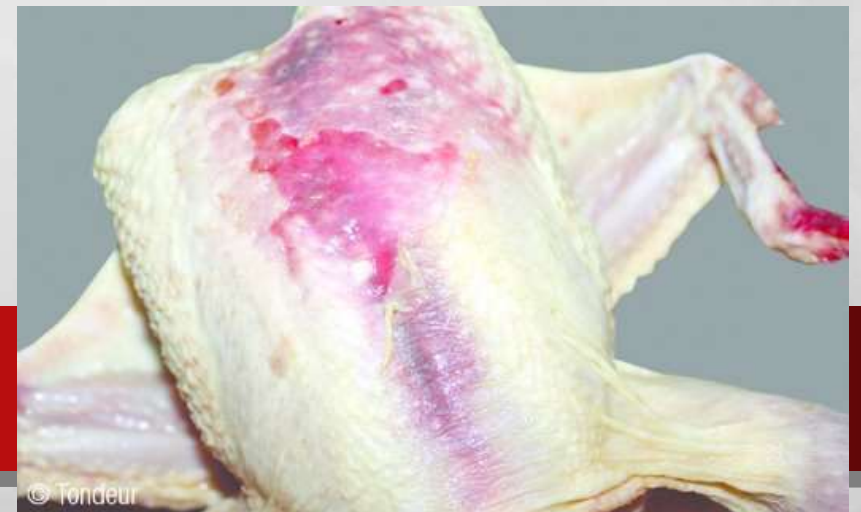
Blood splashes



Injuries caused by human actions



DoA and downer animals





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Cattle

Locomotor system injuries



Pigs

Tail biting, shoulder ulcers



Poultry

Breast ulcers, pododermatitis

CATTLE

**Vanbaale MJ, Galland JC, Hyatt DR, and Milliken GA. 2003. A survey of dairy producer practices and attitudes pertaining to dairy market beef food safety. Food Protection Trends 23:466-73.*

- Cattle with leg injuries, lameness and animals that cannot stand up are more often carriers of pathogenic microorganisms such as *Salmonella* spp., *E. coli* O:157:H7*
- Cows that cannot stand up are 3.3 times more likely to detect *E. coli* O:175:H7 than cows that walk normally#

#Byrne CM, Erol I, Call JE, et al. 2003. Characterization of Escherichia coli O157:H7 from downer and healthy dairy cattle in the upper Midwest region of the United States. Applied and Environment Microbiology 69(8):4683-8.

- *Salmonella*

Spika et al. found that stressed cattle are much more likely to be a source of *Salmonella*.

Spika JS, Waterman SH, Hoo GW, et al. 1987. Chloramphenicol-resistant Salmonella newport traced through hamburger to dairy farms: a major persisting source of human salmonellosis in California. New England Journal of Medicine 316(10):565-70.

PIGS

- Both traumas can lead to infection of deeper tissues, and even septicemia, given that they are open wounds.
- As a result, the formation of an abscess throughout the trunk is possible - not only locally!
- Further bacteriological research revealed *Streptococcus* spp. and *Arcanobacterium* spp. from the contents of the abscess.*

HUEY 1996., MARTINEZ et al. 2007., MARQUES et al., 2012

POULTRY

Breast ulcers

- The causes are bad bedding and weakness of the legs, which indirectly increases the resting time on the sternum.



Pododermatitis

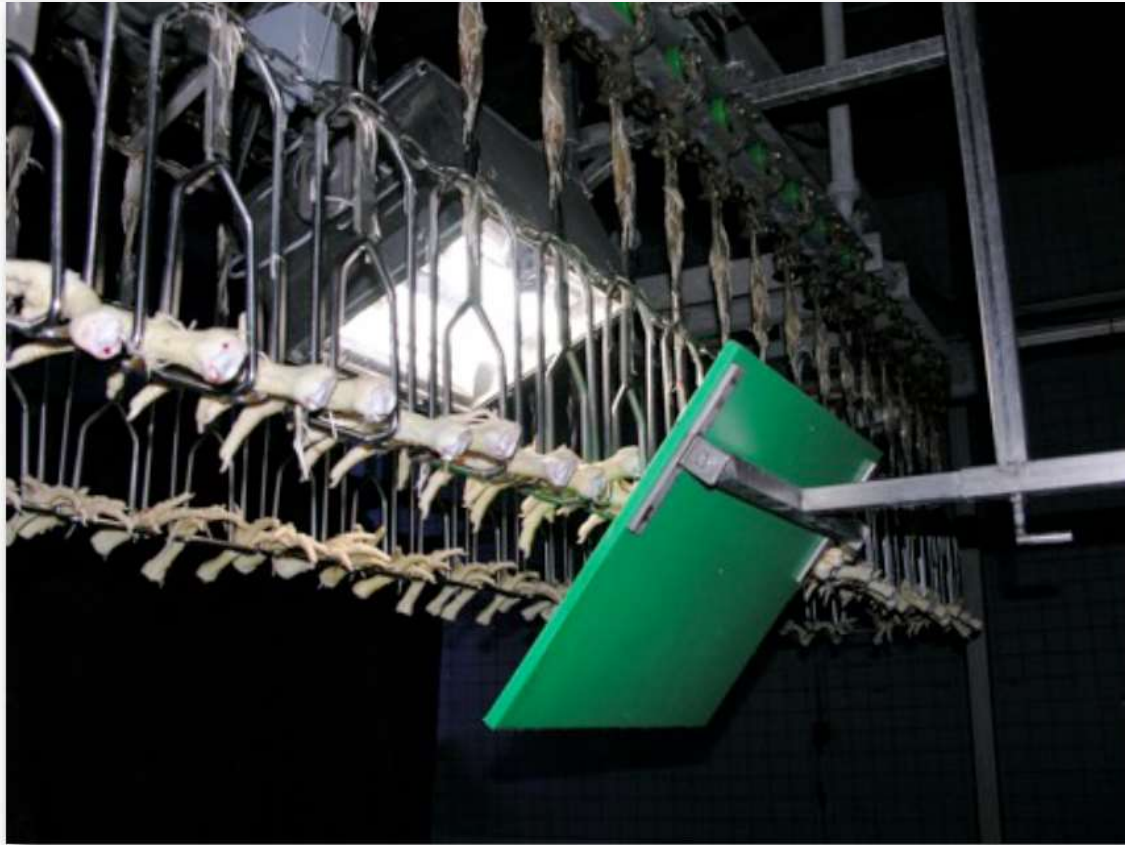
- According to the latest research, wet bedding is one of the main causes of pododermatitis.



POULTRY

- Both traumas, as in the case of pigs, represent a danger to the safety of consumers, considering that they represent an entrance for microorganisms.
- In the case of pododermatitis, the literature most often mentions *Staphilococcus aureus* as well as the highly specific *Mycoplasma synoviae*, but in poultry, the connection between well-being in breeding and the occurrence of the most important pathogens - *Salmonella* spp and *Campylobacter* spp. has been undoubtedly proven in poultry (Iannetti et al., 2020).

'IN LINE' CAMERA SYSTEM



Footpads

Total	15
Not Scored	0
Total Scored	15

Score 0	3	3000
Score 1	3	3000
Score 2	9	6000

Flock Score (1.0 - 2.0) **140**

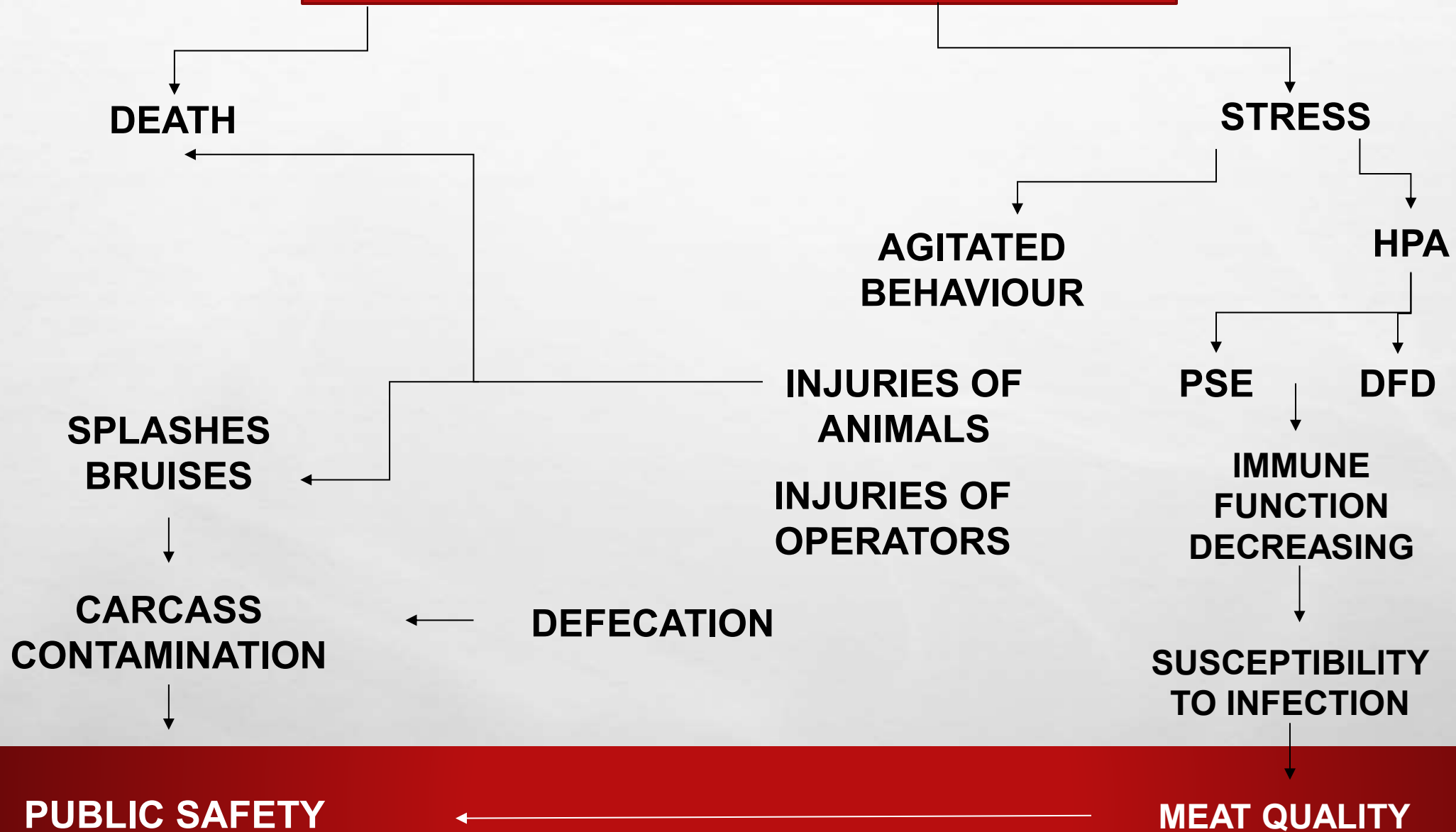
Foot

The software interface displays a camera feed of chicken feet. Two feet are highlighted with green boxes, labeled 'Score 2 (140)'. Two other feet are highlighted with red boxes, labeled 'Severe Lesion - Score 2 (190)'. The interface also shows a 'Foot Score = 2' label.

meyn
Poultry Processing Solutions

Windows taskbar: Flandria, Meyn, 11:43:25

INADEQUATE HANDLING OF ANIMALS



★ **The end**