



DIPARTIMENTO DI
MEDICINA VETERINARIA



**BIOSECURITY AND RISK PREVENTION MANUAL
FOR CLINICAL MANAGEMENT OF FARM
ANIMALS**

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The purpose of this manual is to define procedures aimed at ensuring the safety of all structured personnel (faculty and researchers, technical staff) and non-structured personnel (support staff for teaching activities such as fellows, doctoral students and assignees, students, undergraduates, trainees, thesis students, occasional visitors, etc.) of all degree programs, who carry out activities related to livestock animals.

This manual is valid for the Veterinary Teaching Hospital (VTH) as well as at livestock farms where internship activities with the Mobile Clinic and Zootechnics are conducted.

This manual identifies the risks associated with clinical activities with livestock animals and indicates the relevant safety procedures.

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1. RISK ANALYSIS

Activities related to livestock animals, whether clinical or simple housekeeping, can be the cause of the following risks:

- Traumatic events, being the most frequent bite injuries, kicking, crushing, and penetrating wounds. These are injuries related to animal care or movement operations (bites, crushing, kicking, goring...), the environment (flooring, tools, etc.), some activities commonly performed in the barn (moving hay bales or feed sacks or buckets of water...) or activities in which sharp instruments are used (needles, scalpel blades, etc.).

To avoid traumatic events, it is important to know the risks and it is essential, for preventive purposes, to properly train staff in the proper use of procedures and Personal Protective Equipment (PPE).

- Allergens: are represented by allergens of animal (dander, mites, hair, saliva, excrement, urine), plant (found in hay and straw) and insect bites (flies, horseflies, mosquitoes, bees, wasps, hornets etc.) origin. As a result of inhalation, skin contact or by stinging, these substances can cause allergic respiratory diseases such as rhinitis or asthma or even lung diseases, and even anaphylactic shock. To reduce the above risks, the use of protective equipment, staff training and the use of appropriate antidotes are essential to prevent anaphylactic shock.

- Biological agents: animals can be a source or reservoir of pathogens (viruses, bacteria, ecto- and endoparasites, dermatophytes), which can spread through secretions and any scratches or bites or simple contact. Diseases that are transmitted from animals to humans are considered zoonoses. For the prevention of the spread of zoonoses, it is imperative that operators implement the elementary measures of disinfection and personal hygiene. It is, in addition, advisable that staff be regularly vaccinated against tetanus. The operator should properly employ sharp instruments (syringes, needles, scalpels, etc.), use appropriate personal protective equipment, and know how to store and dispose of medical waste.

- Chemical and carcinogenic agents: means drugs, anesthetics, detergents, disinfectants that by various routes (inhalation, dermal, ocular, oropharyngeal or digestive) can penetrate the body and give the following effects: - allergic effects (hand dermatopathy, hives, itching, rhinitis, asthma, edema of the glottis and, in severe cases anaphylactic shock); - teratogenic effects; - mutagenic and carcinogenic effects.

Therefore, operators handling the above substances must consult the safety data sheets of the products on which the correct behaviors to be adopted are indicated, as well as use the necessary PPE for handling them.

-Manual handling of loads: manual handling of loads, if not carried out correctly, can lead to risks of injuries and pathologies to osteo-articular, musculotendinous and neurovascular structures (e.g., upper limb pathologies).

These risks, in addition to being determined by the characteristics of the load (e.g., heavy loads, bulky, difficult to grasp, etc.), can be exacerbated by the unsuitable characteristics of the work environment (floors without anti-stripping or anti-slipping devices, unevenness, inadequate temperatures, poor lighting) and by the characteristics of the operator (age, physical build, previous pathologies can affect the risk of injury).

These pathologies must be prevented by taking appropriate preventive measures such as using the correct loading and unloading techniques and taking advantage of automatic or mechanical handling equipment.



2. PREVENTION AND PROTECTION MEASURES

2.1. WORK CLOTHING AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

Any activity related to livestock animals must first be undertaken by adopting appropriate clothing (greens and/or disposable or washable overalls). In addition, it is prohibited to wear items that may be dangerous to the operator and the animal, such as rings, bracelets, earrings, necklaces and watches. Fingernails must be short, groomed, healthy, and no artificial nails are allowed (they may break gloves and can create injuries in animals).

The following Personal Protective Equipment (PPE), i.e., devices whose function is to safeguard the operator from health hazards, must be worn. Some PPE should be worn only at particular times during the activity and as needed, as shown below.

- Safety footwear, with a reinforced toe, useful to avoid possible trampling injuries. They are essential whenever the operator is in the vicinity of animal feet;



- Useful socks on occasional visits to farms or if the animal is contained in labor;



- Plastic gown, useful in examinations of cattle and horses requiring transrectal exploration; must be used when working on animals carrying infectious diseases, or whenever required by the operating procedures of individual Services.



- Disposable coveralls, is most frequently worn in visits to swine and poultry enclosures.

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- Disposable gloves, in all cases when taking biological material, when working on animals carrying infectious diseases, and in general during visits. In addition, the use of gloves is necessary when handling chemical agents.



- Long disposable gloves for rectal exploration



- Dust mask useful to avoid risk from allergens and for those susceptible to breathing difficulties



- Goggles useful for protecting the eyes from accidental contact with certain parts of the animal (e.g., tail) or during any handling of chemicals (disinfectants, etc.).
- Helmets for suspended loads, useful in operating rooms or on farms where winches and hoists are present.

3. RULES OF CONDUCT FOR SAFETY

3.1. STANDARDS OF GENERAL BEHAVIOR

The procedures outlined below cover general standards of behavior to be assumed on the farm and/or in the barn, during a visit or class.

- Behave in a manner that causes as little disturbance to the animals as possible
- Smoking is prohibited inside the barn
- Keep cell phones turned off or muted to avoid disturbing the animals
- Speak in a low tone and do not make a commotion
- Wear appropriate clothing
- Avoid wearing a white coat
- Wear footwear if away from the animals, while in close proximity, reinforced toe shoes are mandatory
- Walk carefully, both to avoid disturbing the animals and to avoid slipping
- Never approach animals alone and maintain a safe distance
- Do not rest your hands and arms on stall dividers, to avoid fractures or injuries
- Do not get in the way of technicians' work and pay attention to any machinery in action, and avoid stopping or passing through areas where work activities are taking place
- Comply with safety signs in the facility
- Always follow the directions given by the teaching and/or technical staff present in the facility.

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3.2 STANDARDS OF BEHAVIOR FOR BOVINE SPECIES

The risks related to activities with cattle are essentially injuries caused by headbutting, horns, kicking or biting; injuries to the eyes from tail flake; injuries from crushing or slipping on manure-covered or wet floors. In addition, biological hazards, from contact with organic fluids and droppings, may be highlighted, which may be accentuated in the case of contact with sick animals, with the consequent risk of zoonoses. Such risks should never be underestimated, even in the case of great familiarity with such species.

Therefore, to minimize such injuries, the following rules should be observed:

- Wear appropriate clothing and PPE
- Before approaching a bovine, one must observe the temperament of the animal, evaluating the position of the muzzle, neck, eyes and ears. An animal with barred eyes, strained neck, and turned ears is on alert and may react violently
- Avoid sudden movements and approach animals in a calm and quiet manner
- Make ourselves heard, speaking in a low, relaxed tone, as we approach the animal, lest the animal, caught by surprise, may react with kicks
- Cattle have a field of vision of up to 330°, with a blind spot, represented by the animal's rear end. Moreover, adult cattle tend to kick laterally, rarely posteriorly; for the young animal it is exactly the opposite, that is, it has the ability to kick posteriorly even with both legs. Therefore, always approach the animal from the side, touching it starting from the tip of the shoulder. Make our presence felt, always in a calm and quiet manner and paying attention to the animal's kicking area.
- It is advisable not to turn your back on animals.
- If the animal is not particularly calm, it is advisable to use restraints to ensure safe operations.
- Never place your hands on top of the fence, in the presence of animals, let alone between the elements of the fence, to avoid getting stuck, with risk of fractures.
- Always be ready for a sudden reaction from the animal. Each animal has a "personal space" which is called a "flight zone" that is an imaginary area around the animal. When you enter inside that zone, the animal will react and move away. The size of this area depends on the breed of the animal and its previous experience.

3.2.1 CATTLE SPECIES CONTAINMENT METHODS

Containment methods have several purposes:

- Avoiding operator injury (responsibility to self)
- Avoiding injury to the animal (liability to client)
- Protection and prevention of work-related injuries (liability to third parties)
- Enabling the performance of diagnostic and therapeutic maneuvers.

Therefore, they should not be considered methods of torture and should be used according to the situation and need.

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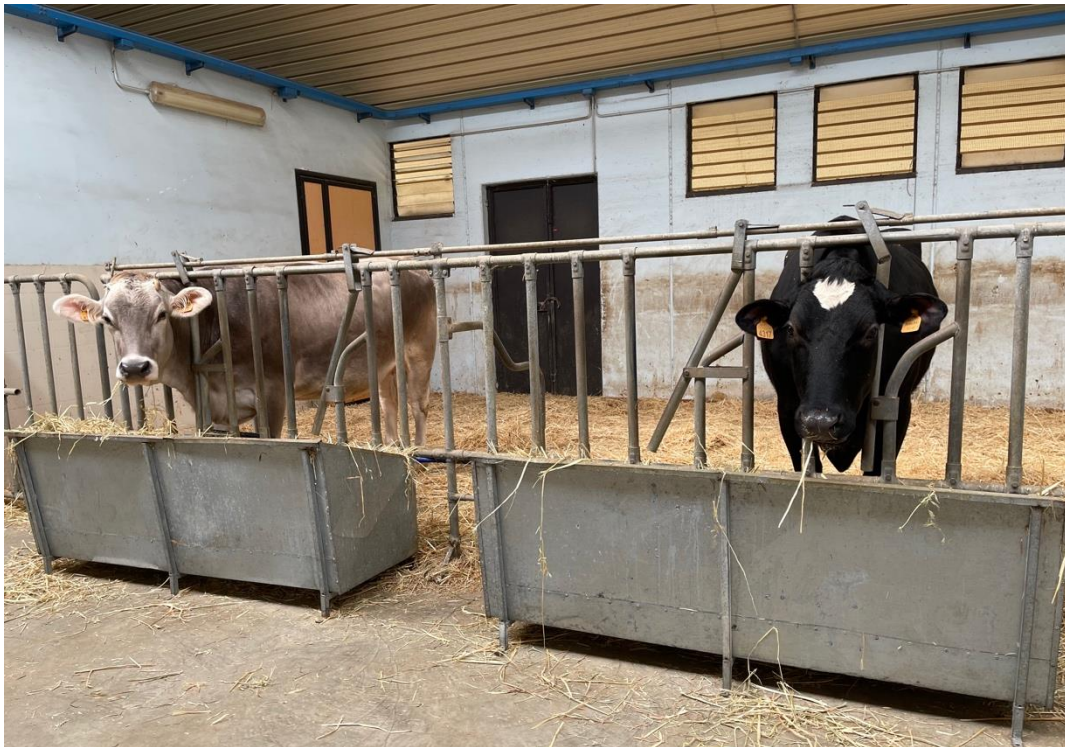
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The main methods of restraint in cattle are:

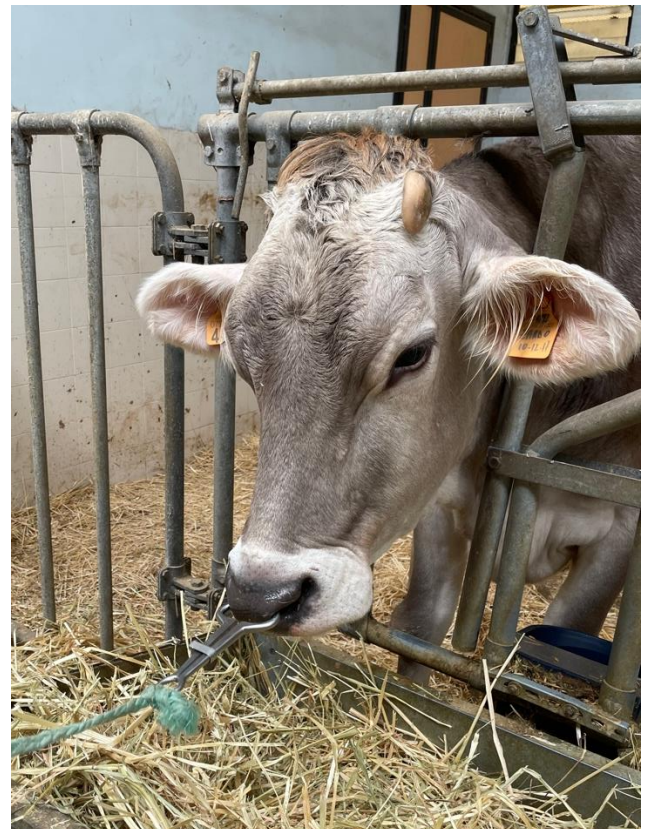
- Self-capture, a non-coercive method to which animals are accustomed.



- halter. Use caution during application because of the risk of possible headbutting



- nose tongs, pincer terminating with two buttoned ends, the closure of which on the nasal septum, a sensitive area for cattle, induces good restraint. Possibly, one can mimic the nose tongs using thumb and middle finger, tightening at the nasal septum.



- ring, for bulls, to take advantage of the same principle as the nose tongs.
- catching the stifle, lifting it with the animal's own hands or tail.

The operator approaches the animal sideways and stroking the back, slowly, with his hand he reaches down the stifle and lifts it up.



- Kick stopper: allows to prevent kicking. It works by the same principle as the previous system, but it is a metal tool that is inserted between the fold of the stifle and the rump.
- Tail brake. Can be implemented by hyperextending the tail, curving it as far anteriorly as possible, toward the rump or by twisting the tail itself.



- Trave, a restraining structure, which allows animals to be immobilized to perform particular operations on them (e.g., farriery operations).

3.3 STANDARDS OF BEHAVIOR FOR THE EQUINE SPECIES

Risks related to activities with horses are essentially injuries caused by kicking, biting, grappling, and headbutting; injuries to the eyes from the tail; and injuries from crushing or slipping on droppings-covered or wet floors. To avoid such risks, it is necessary to know the horse, its temperament and reactions.

The horse, a monogastric herbivorous species, is prey. This situation causes it to have certain characteristics:

- Locomotion adapted to high speed.
- Sensory abilities that enable it to explore the environment very quickly and detect possible predators.
- Physiological mechanisms to achieve immediate adaptation of blood circulation to acute exertion (prevalence of the orthosympathetic system).
- Early motor autonomy after birth.
- Rapid realization of the attachment process after birth.
- Sociality (cooperation, mutual aid and fight against predators, protection of offspring).

Thus, knowing the horse's sensory capabilities is important for understanding reactions:

- The horse's field of vision is about 350°, with monocular vision of about 175°. Monocular vision provides two-dimensional vision i.e., flat, without depth and thus does not allow for accurate perception of distances. The frontal binocular field of view is about 60-70°, provides information related to the depth of the environment and makes the horse able to assess the distance to a visual stimulus. Finally, there is blind field, which includes the entire dorsal part of the body and a triangle with the base located between the two eyes and the tip 1.2-2 meters in front, depending on the horse's head position and morphology.

The horse has a marked sensitivity to movement with about 20-25 images per second, which is why the horse reacts faster to a sudden movement.

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Because of these visual characteristics it is necessary to approach the animal always from the front, avoiding sudden movements, and if the horse has not seen us, it is necessary to call it, making sure it notices our presence; never approach the horse from behind.

- The horse has a well-developed sense of hearing and, in addition, can turn its ears, even independently of each other, 180°. Therefore, it is necessary to always talk to the horse in a low voice before approaching or touching it. The position of the ears will let us know what focuses a horse's attention.

• The horse has a specific sensitivity at the mouth, flanks, withers, and elbow region. Do not touch the animal on the muzzle, or at least avoid sudden movements, so as not to risk a bite or headbutt. Stimulation of the base of the neck and withers by scratching, as is done in mutual grooming between horses, appears to be able to bring about a lowering of the heart rate and thus a relaxing action.

- The most important and clearest horse communication signals are those of the ears, which are the first symptom of responsiveness.

- Ears pointed forward: horse is alert, interested and curious, or may be worried about something

- Ears relaxed and in a neutral position: horse is quiet

- Ears spread apart at the corners of the head: he is sleeping.

- Ears slightly backward: anger and is in a warning phase,

- Ears right down well adhered to the head: horse is very aggressive and may become dangerous

Therefore, observe the horse well before approaching to assess its responsiveness.

3.3.1 METHODS CONTAINMENT OF THE EQUINE SPECIES.

Whenever you need to perform handlings on a horse, you must assess the temperament of the animal and act calmly and firmly. It is customary to handle horses on the left side.

The main methods of restraint in equines are:

- Halter with lunge: to apply the halter to the animal, it will be necessary to approach the animal and follow the following procedure: stand on the left side of the horse, at the neck, first introduce the horse's nose inside the ring and pass the halter post over the head; finally, close the halter with the appropriate snap hook. Attach the halter lunge to the appropriate ring of the halter, always approaching the horse from the front and stroking it on the neck to calm it. The lunge should be held with the left hand, forming "figure-eight" coils. It should never be wrapped around the hand, wrist or body, for the safety of the operator. If the horse becomes frightened, loosen the grip on the lunge so as not to be lifted or dragged by any sudden movement of the animal.



- Chain: if necessary, in the case of particularly restless animals, the lunge, with a part consisting of a chain, can be passed over the back of the nose or under the upper lip to have more control over the animal.
- Lifting a leg: a method generally used to prevent the horse from kicking, as the animal's stability decreases. The most practical method is to lift a forelimb, flexing it until the hoof is brought to elbow level. One approaches the horse on the left side, keeping the body leaning against that of the animal; one then strokes the limb until the pastern is grasped and lifts it, bringing it caudally.





- Twitch on the nose: consisting of a ring of soft rope attached to the end of a wooden handle. To insert this device, you must insert your hand into the ring and with the same hand grasp the animal's upper lip and slide the ring over the lip. Rotate the handle to tighten the string on the lip and hold the stick taut. This method should be maintained for as short a time as possible to avoid injury or skin ischemia.



- Lifting and pulling in skin plica: simple method indicated in restraint for short operations (e.g., injections). A skin plica in the neck is lifted starting at the shoulder, twisting the skin vigorously.



- Tighten the ear in the hand. One approaches the horse, starting from the neck, grasps the base of the ear and tightens. This can be especially useful when manuals must be performed on the animal's head.



- Fetters: to prevent the horse from kicking, fetters can be used to lock the front and hind legs.



- Stocks: safest method of containment especially when rectal exploration needs to be performed. The horse must be led into trave with extreme calmness.



3.4 STANDARDS OF BEHAVIOR FOR THE SWINE SPECIES

The pig is a social species, in nature living in stable compound groups (2-3 sows with offspring). Groups of up to 80 individuals are possible. In contrast, boars, except for the mating period, tend to live solitarily. Each individual, however, possesses an individual space which, if invaded by another animal even from the same group, may give rise to aggressive reactions.

- The main sense developed in pigs is the sense of smell, which they use to eat, distinguish individuals and to communicate danger, through pheromones. Pigs are very sensitive to odors, and some are very undesirable, such as cigarette smoke and the smell of gasoline.

- As far as vision is concerned, pigs do not have accommodative abilities, that is, they cannot focus, but they are very sensitive to light contrasts. The vision of shadows is different from that of humans because they are perceived as obstacles.

Pigs also have a "flight zone," which is a personal area around the individual, the size of which depends on the breed and especially on previous experience. Knowledge of the flight zone can be used for animal handling.

- Body language is also important in pigs to understand the animal's reactivity:

- Calm pigs: present relaxed head and ears, move at a walk or trot, but do not run away and vocalizations are low

- Pigs showing extreme fear: all attention is on the handler, trying to get as far away as possible, in a haphazard manner

- Pigs showing extreme fear: they are panicked, with out-of-control movements, sharp vocalizations and possible severe stress to the point of death.

3.4.1 CONTAINMENT METHODS FOR THE SWINE SPECIES

Swine are dangerous to contain and cannot be led with a rope, as is the case with cattle and horses. The main risk when containing pigs is biting, as they have very sharp and sharp tusks. Other risks associated with activities with pigs are trauma from contact with the animals when handling or entering housing stalls. This risk is commensurate with the size of the animals encountered, as well as their possible aggressiveness, related to their emotional state.

Methods of restraint vary with the size of the animal:

- Piglets are grabbed by the hind leg, just above the hock and holding the other hand under the chest.

- Adult pigs with snare, a metal tool equipped with a noose also made of metal. The noose is inserted inside the mouth and tightened around the maxilla. This operation is very dangerous because of the risk of biting.

- Electric goad: According to Regulation (EC) No. 1/2005 of the European Council dealing with modes of transport of live animals, the use of electric goads or instruments with sharp ends is prohibited. Also, in the regulation it states that "Such instruments shall be used only on adult pigs that refuse to move, and only if they have room in front of them to move. Discharges shall not last longer than one second and should be delivered at appropriate intervals, and applied only to the muscles of the hindquarters. Discharges should not be applied repeatedly if the animal does not respond."

- Paddle or bulkhead: for handling pigs, a paddle or bulkhead is used, which is visualized as a solid impassable wall.



3.5 BEHAVIOR NORMS FOR THE SHEEP-GOAT SPECIES

Sheep and goats have a different reaction to external stimuli.

Sheep under threat have a strong grouping instinct, the same attitude they would have in the wild when faced with a predator. Farmers take advantage of this trait to group sheep together in the pasture with the help of sheepdogs.

Goats exhibit a flight response and move away from the group upon threat from predators, making the task of grouping them not exactly easy.

Sheep have a more timid and reluctant disposition, while goats are more aggressive and exploratory.

Communication between individuals in the same group occurs through attitudes that vary by species:

- In sheep, the alert attitude is characterized by a raised head turned toward the possible source of threat.
- In goats, on the other hand, the alert state is communicated through the production of a sneeze-like noise (snort) accompanied by quick movements of a forelimb against the ground. Also noticeable is the raising of hairs along the spine.

3.5.1 CONTAINMENT METHODS OF THE SHEEP AND GOAT SPECIES

The main hazards associated with activities with sheep-goats are traumatic injuries due to horns, kicking, crushing, and slipping.

The main methods of containment are:

- Shepherd's crook: to be used only on the hind legs, from the hock upward.
- Holding the animal upright: one arm is passed under the animal's neck and the other over the hind train. Or one straddles the animal's back and squeezes the chest between the legs. Then grasp the head (sheep) or horns (goats) with your hands.