



Animal Health Care Service

Level-IV

**Based on May 2018, Version 3 Occupational
standard**



**Module Title: - Euthanizing Sick, Injured or
Unwanted Animals**

LG Code: AGR AHC2 M17 LO (1-4) LG (68-70)

TTLM Code: AGR AHCS4 TTLM17 0921v1

Adama, Ethiopia

September, 2021





Table of Contents

LO #1- Prepare animal to euthanasia under supervision.....4

Instruction sheet	4
Information Sheet 1- Identifying animal intended for euthanasia	6
Self-check 1	8
Information Sheet 2- Selecting appropriate methods of euthanasia	9
Self-Check – 2.....	23
Information Sheet 3 – keeping and preparing equipment and materials.....	24
Self-Check – 3.....	25
Information Sheet 5 – Identifying hazards and OHS procedures.....	29
Self-Check – 5.....	32
Information Sheet 6 – Requiring licenses and permits to conduct euthanasia.....	33
Self-Check – 6.....	35

LO #2- Carry out euthanasia of an animal.....36

Instruction sheet	36
Information Sheet 1- Using PPE and safety equipment.....	38
Self-Check – 1.....	48
Information Sheet 2- Handle and transport safely equipment of statutory requirements and industry practices	49
Self-Check – 2.....	51
Information Sheet 3: Restraining euthanized animal to minimizes pain and distress	52
Self-Check – 3.....	54
Information Sheet 4 – Applying euthanizing methods.....	55
Self-Check – 4.....	59
Information Sheet 5 – Monitoring euthanasia procedure to ensure animal's death without suffering.....	60
Self-Check – 5.....	61
Information Sheet 6- Follows organizational guidelines, procedures and legislative	62
Self-Check – 6.....	64

LO #3 - Complete euthanasia.....65

Instruction sheet	65
Information Sheet 1 – Confirming death of animal.....	66
Self-Check – 1.....	69
Information Sheet 2 – Handling carcass for research or post-mortem examination	70



Self-Check – 2.....	72
Information Sheet 3 – Dispose animal carcass and biological waste.....	73
Self-Check – 3.....	79
Information Sheet 4 - Handling and moving animal carcass.....	80
Self-Check – 4.....	82
Information Sheet 5 - Decontaminate, clean and store an equipment and materials	83
Self-Check – 5.....	88
Information Sheet 6 – Keep the records and report.....	89
Self-Check – 6.....	92
Operation sheet 1: Sterilization of euthanized equipment and material	93
Operation sheet 2: Confirming euthanizing animals.....	94
Reference Materials	96



LG #68

LO #1- Prepare animal to euthanasia under supervision

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying Animal intended for *euthanasia*
- Selecting the method for animal euthanasia.
- Keeping and preparing equipment and materials required for euthanasia.
- Determining and gathering appropriate human assistance for the procedure.
- Hazards associated with the euthanasia are identified in accordance with *OHS procedures*
- Requiring and viewing licenses and permit to conduct euthanasia.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify hazards and risks associated with the use and handling of chemicals and reagents.
- Follow strict OHS procedures.
- Use and maintain personal PPE.
- Follow defined procedures to ensure personal safety.
- Take up immediate action of first aid on accident from chemical spillage on self, furniture and/or other people in the work area
- Requiring and viewing licenses and permit to conduct euthanasia

Learning Instructions:



1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).



Information Sheet 1- Identifying animal intended for euthanasia

Introduction

This module covers the process of euthanizing sick, injured or unwanted animals in a humane way that complies with safe operating practices and with ethical, welfare and legislative requirements. Animal issues are no longer socially invisible, and increasingly, greater attention is being devoted to understanding the moral significance of experiences of animals and to taking into consideration the welfare of animals. During the past half-century, efforts to ensure the respectful and humane treatment of animals have garnered global attention. Concern for the welfare of animals is reflected in the growth of animal welfare science and ethics. To keep animal welfare and ethics at research, abattoir, zoonotic control programs, aging and loss of production euthanasia was performed. An animal's welfare is ensured when the following five conditions are met. Freedom from hunger or thirst, freedom from discomfort, freedom from pain, injury and disease, freedom from to express normal natural behavior and freedom from fear or distress. Euthanasia is performed when an concurrent pain and distress was occurred.

'Euthanasia' is a Greek term meaning "good death". In this context, its objectives are met when death is induced which causes no pain or distress to an animal. To avoid pain and distress requires that the techniques which are used cause immediate loss of consciousness followed by cardiac and respiratory arrest that ultimately results in loss of brain function. Persons who perform this task must be technically proficient and have a basic understanding of the anatomical landmarks and equipment used for humane euthanasia of animals.

- Euthanasia is defined as a humane death that occurs without pain and distress, while Slaughter is performed properly, it is euthanasia; however, when it is performed improperly, animal suffering may result.

Livestock owners and others who derive all or a portion of their livelihood from animal agriculture share a moral obligation to ensure the welfare of animals. Therefore, when

Page 6 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



disease or injury conditions arise that diminishes quality of life or creates pain and suffering that cannot be effectively relieved by medical means, euthanasia is indicated.

Examples include the following:

- Fractures of the legs, hip or spine that are not repairable and result in immobility or inability to stand
- Emergency medical conditions that result in excruciating pain that cannot be relieved by treatment (e.g. terminal colic in horses, or trauma associated with highway accidents)
- Emaciation and/or debilitation from disease or injury that may result in an animal being too weak to be transported
- Paralysis from traumatic injuries or disease that result in immobility
- Advanced eye disease (e.g. lymphoma or cancer eye in cattle)
- Disease conditions for which cost of treatment is prohibitive
- Disease conditions where no effective treatment is known (Johnes Disease in ruminants), prognosis is poor or time to expected recovery is unusually prolonged.
- *Terminal illness*, e.g. cancer or rabies.
- *Behavioral problems* (usually ones that cannot be corrected) e.g. aggression – Canines that have usually caused grievous bodily harm to either humans or other animals through mauling are usually seized and euthanized ('destroyed' in British legal terms).
- Old age and deterioration leading to loss of major bodily functions, resulting in severe impairment of the quality of life
- Lack of home or caretaker or resources for feeding
- Research and testing: In the course of scientific research or testing, animals may be euthanized in order to be dissected, to prevent suffering after testing, to prevent the spread of disease, or other reasons.

Page 7 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Self-check 1	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer

1. Define 'euthanasia (2pts)?
2. Write the reason for animals euthanizing (4pts)?
3. Write the contents of animals to euthanized (3pts)?

Test II: Choice the best answer in the following

1. Which one not true animal euthanized one (1pts)?
A. Advanced eye disease B. Disease conditions for which cost of treatment are prohibitive C. Disease conditions where effective treatment is known D. Terminal illness, e.g. cancer or rabies.
2. To keep animal welfare and ethics at research, abattoir, zoonotic control programs, aging and loss of production _____ was performed (2pts).
A. Treatments B. Good management C. Prognosis D. Clinics survey

Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

You can ask your teacher for the copy of the correct answers.

Page 8 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021

Information Sheet 2- Selecting appropriate methods of euthanasia

Euthanatizing method of animals

I. Physical Method

1.1. Acceptable Methods of Euthanasia

The acceptable methods of euthanasia in animals include anesthetic overdose and the physical methods of gunshot and penetrating and non-penetrating captive bolt.

1. Captive Bolt (firearm) and Gunshot

Gunshot and penetrating captive bolt are acceptable methods of euthanasia. The captive-bolt gun or firearm must be aimed at the correct location on the animal's forehead. It should not be aimed between the eyes. The hollow behind the poll also should be avoided, because it is less effective than the forehead position. In sheep, the shot must be aimed at the top of the head because the front of the skull is thick. A captive-bolt gun must be placed firmly against the skull and a firearm must be held 5 to 20 cm away from the skull. Penetrating captive-bolt guns that are actuated by a blank cartridge can be obtained. Practical experience has shown that a 22-caliber firearm is sufficient for cattle and horses. A larger caliber should be used on large bulls, boars, or buffalo.



Euthanizing heifer
by captive method

Figure 1: Euthanized gunshot and anatomically site of Euthanasia

Anatomical Sites for Livestock Euthanasia

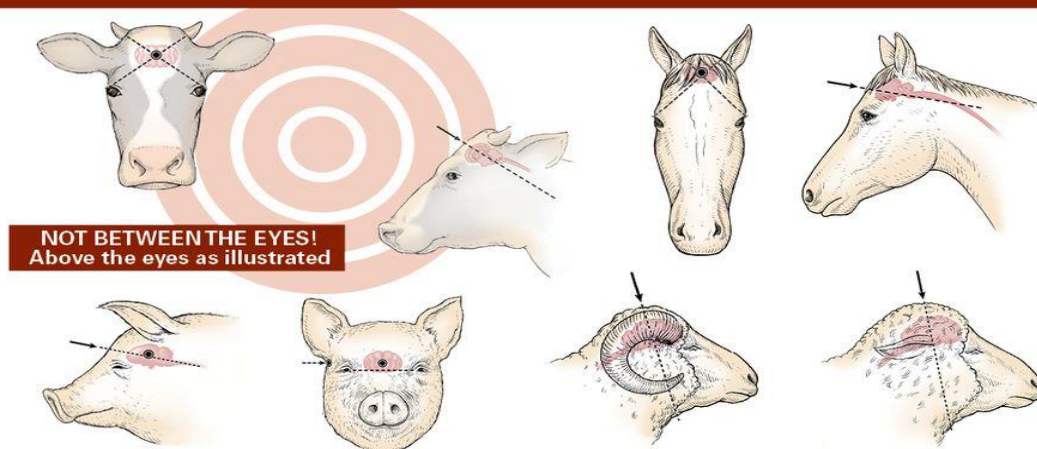


Figure 2: Correct position for euthanasia of livestock by use of a captive-bolt gun or fir

Advantages: When properly positioned a bullet, birdshot from a shot shell or slug will cause massive brain destruction and immediate loss of consciousness. Gunshot is inexpensive and does not require close contact with the animal.

Disadvantages: When using a rifle or handgun, ricochet of the bullet is possible and therefore, the operator and bystanders must use extreme care in positioning of themselves and others when the procedure is performed. Another disadvantage is that in cases involving fractious animals, it may be difficult to get close enough to accurately hit the vital target area.

2. Cervical dislocation

Cervical dislocation is a technique that has been used for many years and, when performed by well-trained individuals, appears to be humane. However, there are few scientific studies to confirm this observation. This technique is used to euthanatize poultry, other small birds, mice, and immature rats and rabbits. For mice and rats, the thumb and index finger are placed on either side of the neck at the base of the skull or, alternatively, a rod is pressed at the base of the skull. With the other hand, the base of the tail or the hind limbs is quickly pulled, causing separation of the cervical vertebrae from the skull. For immature rabbits, the head is held in one hand and the hind limbs in

the other. The animal is stretched and the neck is hyperextended and dorsally twisted to separate the first cervical vertebra from the skull.

Advantages

- Cervical dislocation is a technique that may induce rapid loss of consciousness.
- It does not chemically contaminate tissue.
- It is rapidly accomplished.

Disadvantages

- Cervical dislocation may be aesthetically displeasing to personnel.
- Cervical dislocation requires mastering technical skills to ensure loss of consciousness is rapidly induced.
- Its use is limited to poultry, other small birds, mice, and immature rats and rabbits.

Recommendations: Manual cervical dislocation is a humane technique for euthanasia of poultry, other small birds, mice, rats weighing < 200 g, and rabbits weighing < 1 kg when performed by individuals with a demonstrated high degree of technical proficiency. In lieu of demonstrated technical competency, animals must be sedated or anesthetized prior to cervical dislocation. The need for technical competency is greater in heavy rats and rabbits, in which the large muscle mass in the cervical region makes manual cervical dislocation physically more difficult.

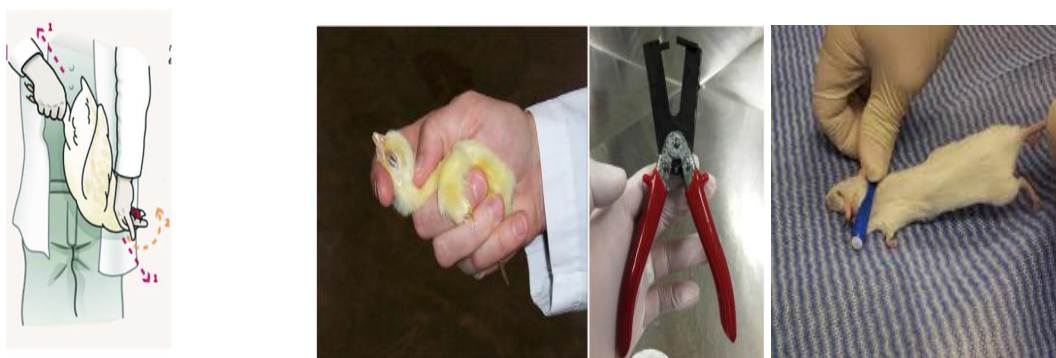


Figure 3: Cervical dislocation site and methods of euthanasia indications



3. Decapitation

Decapitation can be used to euthanatize rodents and small rabbits in research settings. It provides a means to recover tissues and body fluids that are chemically uncontaminated. It also provides a means of obtaining anatomically undamaged brain tissue for study.

Advantages

- Decapitation is a technique that appears to induce rapid loss of consciousness.
- It does not chemically contaminate tissues.
- It is rapidly accomplished.

Disadvantages

- Handling and restraint required to perform this technique may be distressful to animals.
- The interpretation of the presence of electrical activity in the brain following decapitation has created controversy and its importance may still be open to debate.
- Personnel performing this technique should recognize the inherent danger of the guillotine and take adequate precautions to prevent personal injury.
- Decapitation may be aesthetically displeasing to personnel performing or observing the technique.

Recommendations: This technique is conditionally acceptable if performed correctly, and it should be used in research settings when its use is required by the experimental design and approved by the Institutional Animal Care and Use Committee. The equipment used to perform decapitation should be maintained in good working order and serviced on a regular basis to ensure sharpness of blades. The use of plastic cones to restrain animals appears to reduce distress from handling, minimizes the chance of injury to personnel, and improves positioning of the animal in the guillotine.

Page 12 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Decapitation of amphibians, fish, and reptiles is addressed elsewhere in these guidelines.

4. Electrocutation

Electrocutation, using alternating current, has been used as a method of euthanasia for species such as dogs, cattle, sheep, swine, foxes, and mink. Electrocutation induces death by cardiac fibrillation, which causes cerebral hypoxia. However, animals do not lose consciousness for 10 to 30 seconds or more after onset of cardiac fibrillation. It is imperative that animals be unconscious before being electrocuted. This can be accomplished by any acceptable means, including electrical stunning. Although an effective, 1- step stunning and electrocution method has been described for use in sheep and hogs, euthanasia by electrocution in most species remains a 2-step procedure.

Advantages

- Electrocutation is humane if the animal is first rendered unconscious.
- It does not chemically contaminate tissues.
- It is economical.

Disadvantages

- Electrocutation may be hazardous to personnel.
- When conventional single-animal probes are used, it may not be a useful method for mass euthanasia because so much time is required per animal.
- It is not a useful method for dangerous, intractable animals.
- It is aesthetically objectionable because of violent extension and stiffening of the limbs, head, and neck.
- It may not result in death in small animals (< 5 kg) because ventricular fibrillation and circulatory collapse do not always persist after cessation of current flow.

Page 13 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Recommendations: Euthanasia by electrocution requires special skills and equipment that will ensure passage of sufficient current through the brain to induce loss of consciousness and cardiac fibrillation in the 1-step method for sheep and hogs, or cardiac fibrillation in the unconscious animal when the 2-step procedure is used. Although the method is conditionally acceptable if the aforementioned requirements are met, its disadvantages far outweigh its advantages in most applications. Techniques that apply electric current from head to tail, head to foot, or head to moistened metal plates on which the animal is standing are unacceptable.

5. Microwave irradiation

Heating by microwave irradiation is used primarily by neurobiologists to fix brain metabolites in vivo while maintaining the anatomic integrity of the brain. Microwave instruments have been specifically designed for use in euthanasia of laboratory mice and rats. The instruments differ in design from kitchen units and may vary in maximal power output from 1.3 to 10kw. All units direct their microwave energy to the head of the animal. The power required to rapidly halt brain enzyme activity depends on the efficiency of the unit, the ability to tune the resonant cavity and the size of the rodent head. There is considerable variation among instruments in the time required for loss of consciousness and euthanasia. A 10kw, 2,450 MHz instrument operated at a power of 9kw will increase the brain temperature of 18 to 28 g mice to 79 C in 330ms, and the brain temperature of 250 to 420 g rats to 94 C in 800 143ms.

Advantages

- Loss of consciousness is achieved in less than 100ms, and death in less than 1 second.
- This is the most effective method to fix brain tissue in vivo for subsequent assay of enzymatically labile chemicals.

Disadvantages

- Instruments are expensive.

Page 14 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



- Only animals the size of mice and rats can be euthanatized with commercial instruments that are currently available.

Recommendations: Microwave irradiation is a humane method for euthanatizing small laboratory rodents if instruments that induce rapid loss of consciousness are used. Only instruments that are designed for this use and have appropriate power and microwave distribution can be used. Microwave ovens designed for domestic and institutional kitchens are absolutely unacceptable for euthanasia.

6. kill traps

Mechanical kill traps are used for the collection and killing of small, free-ranging mammals for commercial purposes (fur, skin, or meat), scientific purposes, to stop property damage, and to protect human safety. Their use remains controversial, and the panel recognized that kill traps do not always render a rapid or stress-free death consistent with criteria for euthanasia found elsewhere in this document. For this reason, use of live traps followed by other methods of euthanasia is preferred. There are a few situations when that is not possible or when it may actually be more stressful to the animals or dangerous to humans to use live traps.

Advantage: Free-ranging small mammals may be killed with minimal distress associated with handling and human contact.

Disadvantages

- Traps may not afford death within acceptable time periods.
- Selectivity and efficiency is dependent on the skill and proficiency of the operator.

Recommendations: Kill traps do not always meet the panel's criteria for euthanasia. At the same time, it is recognized that they can be practical and effective for scientific animal collection when used in a manner that ensures selectivity, a swift kill, no damage to body parts needed for field research, and minimal potential for injury of no target species. Traps need to be checked at least once daily. In those instances when an animal is wounded or captured but not dead, the animal must be killed quickly and

Page 15 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



humanely. Kill traps should be used only when other acceptable techniques are impossible or have failed.

7. Thoracic compression

Thoracic (cardiopulmonary, cardiac) compression is used to euthanatize small- to medium-sized free ranging birds when alternate techniques described in these guidelines are not practical.

Advantages

- This technique is rapid.
- It is apparently painless.
- It maximizes carcass use for analytical/contaminant studies.

Disadvantages

- It may be considered aesthetically unpleasant by onlookers.
- The degree of distress is unknown.

Recommendations: Thoracic (cardiopulmonary, cardiac) compression is a physical technique for avian euthanasia that has applicability in the field when other methods cannot be used. It is accomplished by bringing the thumb and forefinger of one hand under the bird's wing from the posterior and placing them against the ribs. The forefinger of the other hand is placed against the ventral edge of the sternum, just below the furculum. All fingers are brought together forcefully and held under pressure to stop the heart and lungs. Loss of consciousness and death develop quickly. Proper training is needed in the use of this technique to avoid trauma to the bird. Cardiopulmonary compression is not appropriate for laboratory settings, for large or diving birds, or for other species.

Page 16 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021

8. Exsanguination

Once the animal has been rendered unconscious, procedures to ensure death should be initiated. Exsanguination should be performed using a pointed, very sharp knife with a rigid blade at least 6 inches (15 cm) in length. The knife should be fully inserted through the skin just behind the point of the jaw and below the neck bones. From this position the knife is drawn forward severing the jugular vein, carotid artery, and windpipe. Properly performed, blood should flow freely with death occurring within a few minutes (See diagram at right).

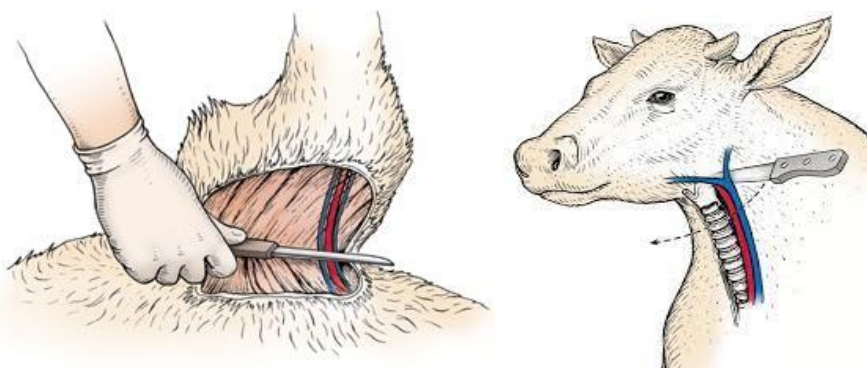


Figure 8: *Exsanguination site of animals*

9. Maceration

Maceration, via use of a specially designed mechanical apparatus having rotating blades or projections, causes immediate fragmentation and death of day-old poultry and embryonated eggs. A review of the use of commercially available macerators for euthanasia of chicks, poults, and pipped eggs indicates that death by maceration in day-old poultry occurs immediately with minimal pain and distress. Maceration is an alternative to the use of carbon dioxide for euthanasia of day-old poultry. Maceration is believed to be equivalent to cervical dislocation and cranial compression as to time element, and is considered to be an acceptable means of euthanasia for newly hatched poultry by the Federation of Animal Science Societies, Agriculture Canada, World Organization for Animal Health (OIE), and European Union.

Advantages

Page 17 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1 September, 2021
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- Death is almost instantaneous.
- The method is safe for workers.
- Large numbers of animals can be killed quickly.

Disadvantages

- Special equipment is required.
- Macerated tissues may present biosecurity risks.

Recommendations: Maceration requires special equipment that must be kept in excellent working order. Chicks must be delivered to the macerator in a way and at a rate that prevents a backlog of chicks at the point of entry into the macerator and without causing injury, suffocation, or avoidable distress to the chicks before maceration.

10. Stunning

Animals may be stunned by a blow to the head, by use of a non-penetrating captive bolt, or by use of electric current. Stunning must be followed immediately by a method that ensures death. With stunning, evaluating loss of consciousness is difficult, but it is usually associated with a loss of the menace or blink response, pupillary dilatation, and a loss of coordinated movements. Specific changes in the electroencephalogram and a loss of visually evoked responses are also thought to indicate loss of consciousness.

Electrical stunning: Alternating electrical current has been used for stunning species such as dogs, cattle, sheep, goats, hogs, fish and chickens.



11. pithing

In general, pithing is used as an adjunctive procedure to ensure death in an animal that has been rendered unconscious by other means. For some species, such as frogs, with anatomic features that facilitate easy access to the central nervous system, pithing may be used as a sole means of euthanasia, but an anesthetic overdose is a more suitable method.



Figure 4: pithing of frog and capture techniques

II. Chemical methods

Premedication drugs (e.g. sedation), as well as drugs for euthanasia, are used when appropriate and may include barbiturate overdose techniques by intravenous, intraperitoneal or intra-cardiac injection.

1. Injectable agents

1.1. Barbiturates

One of the most humane methods of euthanasia is the administration of a barbiturate overdose either by the intravenous, intraperitoneal or intracardiac routes. Injections by the intraperitoneal route work much more slowly than the intravenous route, but are easier for an operator working alone. The intraperitoneal route is used when an intravenous injection would result in stressful handling or be dangerous to the animal or the operator and when there are no easily accessible veins. When using the intraperitoneal route, a non-irritant barbiturate solution should be used i.e. a normal



anaesthetic solution of barbiturate e.g. Nembutal[®] (sodium pentobarbitone). Commercially prepared 'euthanasia solutions' (e.g. Euthatal[®] or Lethabarb[®]) are very alkaline and are thought to cause irritation of the peritoneum and pain prior to unconsciousness. Large volumes of anaesthetic solution would have to be used in anything other than a very small animal (euthanasia solutions are approximately 4 times more concentrated than barbiturates designed for anaesthesia).

Because of the difficulty and unpredictability in performing the injection accurately, intracardiac injection should only be used if the animal is heavily sedated, unconscious or anaesthetised. In some situations, if the operator is skilled and experienced in the technique intracardiac injection may be used on neonates or small animals without causing distress. Animals need to be well restrained. If animals cannot be handled they may need to be immobilised in a restraint cage or sack or sedative drugs/ anaesthetic gases administered prior to injection of barbiturate.

Barbiturates are restricted substances, listed as Schedule 4 under the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). This listing requires that they be restricted to medical, dental or veterinary prescription or supply. Refer to the relevant State and Territory legislation for specific details on the supply, possession, use and storage of these drugs.

1.2. Pentobarbital

Pentobarbital is a short-acting barbiturate typically used as a sedative, a preanesthetic, and to control convulsions in emergencies. It can also be used for short-term treatment of insomnia but has been largely replaced by the benzodiazepine family of drugs. In high doses, pentobarbital causes death by respiratory arrest. It is used for veterinary euthanasia and is used by states and federal government for executions of convicted criminals. In some countries and states, it is also used for physician-assisted suicide. Pentobarbital was widely abused and known on the streets as "yellow jackets" due to the yellow capsule of the Nembutal brand. Pentobarbital in oral (pill) form is no longer commercially available.

Page 20 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



1.3. Anesthetic overdose

Administered by intravenous injection, barbiturates induce a smooth transition from consciousness to unconsciousness and death by causing depression of the central nervous system and respiratory centers in the brain leading to cardiac arrest. Despite their effectiveness as euthanasia agents, there are several drawbacks to their use including cost, the need for intravenous administration of the drug, the necessity to maintain a careful accounting of amounts used, regulatory requirements specifying that only a veterinarian administer these agents and residues that limit carcass disposal options. Nonetheless, depending upon circumstances, the use of a barbiturate overdose may be most the appropriate, particularly in sensitive situations.

1.4. Drug interactions

Administration of ethanol, benzodiazepines, opioids, antihistamines, other sedative-hypnotics, and other central nervous system depressants will cause possible additive effects. Selection of the most appropriate method of euthanasia in any given situation depends on the:

- Species of animal involved
- Available means of animal restraint
- Skill of personnel
- Number of animals, and other considerations. Available information focuses primarily on domestic animals, but the same general considerations should be applied to all species.

General Considerations

A number of issues must be considered when selecting the method of euthanasia includes:

- Species and size of the animals
- Environment where animal is maintained (e.g., pasture, feedlot, dairy barn, swamp)
- Need for specialized equipment (e.g., firearm, gas chamber, chemicals)

Page 21 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021

- Public acceptance of euthanasia method
- Risk of spreading the disease agent
- Hazard to the environment
- Degree of animal restraint required.

The method selected should require minimum restraint;

- Sample contamination as a result of the euthanasia method
- Possible use of the animal carcass



Figure 6: The steps of euthanasia indication in animals



Self-Check – 2	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. Write the method of euthanasia (4pts)?
2. How we can apply euthanasia (4pts)
3. Write an anatomical site of euthanized different animals clearly (1pts)?

Test II: Choice the best answer

1. Which one not an advantage of gunshot (1pts)?
 - A. When properly positioned a bullet, birdshot from a shot shell or slug will cause massive brain destruction and immediate loss of consciousness
 - B. Gunshot is inexpensive and does not require close contact with the animal
 - C. None
2. Which method is a not allowable euthanasia method (2pts)?
 - A. Lost on road B. Decapitation C. Stunning D. None

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points

You can ask your teacher for the copy of the correct answers.

Page 23 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



Information Sheet 3 – keeping and preparing equipment and materials

Humane Euthanasia by equipment and material with Exsanguination

Properly applied, euthanasia by either gunshot or penetrating captive bolt (combined with procedures to ensure death), causes less fear and anxiety and induces a more rapid, painless, and humane death than can be achieved by most other methods. However, both methods may involve human risk, and therefore, require skill and experience. Neither method should be attempted by untrained or inexperienced persons.

Notes: Exsanguination: is death caused by loss of blood (severe loss of blood).

The euthanasia area shall have the following equipment and materials:-

- A table or other work area where animals can be handled safely; the surface of which shall have a non-skid texture that provides comfortable footing for the animal
- A separate table or workbench where captive bolt, the drugs, needles, syringes, and hair clippers can be placed
- A sink and faucet
- An eye wash station
- A well-stocked first-aid kit
- One or more tourniquets
- Usable animal restraint devices
- A pair of electric hair clippers in good working order
- A control stick (catch pole) for fractious dogs
- A net for feral cats
- A stethoscope and
- Towels, sponges, and disinfectant



Self-Check – 3	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. List at least the 5 euthanizing (4pts)?
2. How we can keep euthanasia material (2pts)?
3. Define the term 'Exsanguination' (3 pts)?

Test II: Choice the best answer

1. Which one is not euthanized equipment (3 pts)?
 - A. A sink and faucet
 - B. An eye wash station
 - C. A well-stocked first-aid kit
 - D. One or more tourniquets
 - E. No answer

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points

You can ask your teacher for the copy of the correct answers.

Page 25 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



Information Sheet 4 – Determine and gather human assistance for euthanasia

The objective of humane euthanasia is to induce death without causing pain or distress to the animal. In evaluating methods of euthanasia, the panel used the following criteria:

- ability to induce loss of consciousness and death without causing pain, distress, anxiety, or apprehension
- time required to induce loss of consciousness
- reliability
- safety of personnel
- irreversibility
- compatibility with requirement and purpose
- emotional effect on observers or operators
- compatibility with subsequent evaluation, examination, or use of tissue
- drug availability and human abuse potential
- compatibility with species, age, and health status
- ability to maintain equipment in proper working order; and
- Safety for predators/scavengers should the carcass is consumed.

Considerations in planning the humane killing of animals

Many activities will need to be conducted on affected premises, including the humane killing of animals. The team leader should develop a plan for humanely killing animals on the premises which should include consideration of:

1. minimizing handling and movement of animals
2. killing the animals on the affected premises; however, there may be circumstances where the animals may need to be moved to another location for killing; when the killing is conducted at a slaughterhouse/abattoir
3. the species, number, age and size of animals to be killed, and the order of killing them
4. methods of killing the animals, and their cost
5. housing, husbandry, location of the animals as well as accessibility of the farm

Page 26 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



6. the availability and effectiveness of equipment needed for killing of the animals, as well as the time necessary to kill the required number of animals using such methods
7. the facilities available on the premises that will assist with the killing including any additional facilities that may need to be brought on and then removed from the premises
8. biosecurity and environmental issues
9. the health and safety of personnel conducting the killing
10. any legal issues that may be involved, for example where restricted veterinary drugs or poisons may be used, or where the process may impact on the environment
11. the presence of other nearby premises holding animals
12. Possibilities for removal, disposal and destruction of carcasses.

Page 27 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Self-Check – 4	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. Write the concepts of assisting animals during euthanizing (2pts)?
2. What is humane euthanasia means (4pts)?

Test II: Choice the best answer

1. In evaluating methods of euthanasia, the panel used the following criteria except (3pts)
 - A. time required to induce loss of consciousness
 - B. reliability
 - C. safety of personnel
 - D. reversibility
2. Euthanasia is performed by (1pts)
 - A. Animals' B. wild animals C. Vet. Technician D. All

Note: Satisfactory rating - 5 points Unsatisfactory - below 5 points

You can ask you teacher for the copy of the correct answers.

Page 28 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



Information Sheet 5 – Identifying hazards and OHS procedures

Hazards and risks

Hazard: is the inherent danger involved in working with a particular animal, material, equipment, process, procedure or system. There are many hazards involved in working with animals. These hazards range from minor to very serious, and can include things like allergies, bites, zoonotic diseases, working with hazardous chemicals or radiation, and handling contaminated waste. Information follows in this document that describes many of the potential hazards individually.

Risk: is a measure of the likelihood of a consequence from working with a certain hazard. E.g. immunocompetent, wound, scratch, microbial flora exposure, allergy development and etc.

What are the risks involved in working with animals?

- The risks involved range from a low to high potential of injury or illness from the identified hazards.

What can be done to avoid hazards and reduce risk?

- The primary way to avoid problems in work with animals is to know what the hazards are and what precautions to take in order to avoid them.

Example 1: *Types of Hazards that May be Present during Work on Animal Protocols.*

Types	Examples
Physical Hazards	Bites, sprains, scratches, sharps, lasers, machinery, slips, falls
Chemical Hazards	Burns, skin irritations, inhalation, ingestion
Zoonosis	Human diseases acquired from animals
Allergens	Allergies to rodents, cats, dogs (urine, contaminated litter, dander, hair)
Ergonomics	Heavy lifting, repetitive motion, body mechanics, posture
Infectious Agents	Bacteria, fungi, parasites, protozoa, rickettsia, viruses, blood borne pathogens



Euthanasia OHS procedure

1. Prior to any euthanasia, the euthanasia room should be checked to be sure the room is clean and tidy, the shades are drawn, the “Occupied” sign has been flipped over, and all needed supplies are available. Supplies needed include towels/blankets, alcohol bottle, syringes and needles, gloves, keys to open drug lock box, enough sedative and euthanasia solution as needed for the size of the animal, clippers, stethoscope, muzzles, pens, and anything else you feel you need to adequately perform this task.
2. Check that all paperwork has been provided, a tag has been provided for cremation if needed, and that the tag is the correct color for the cremation desired.
3. All animals will be sedated prior to euthanasia unless the veterinarian/technician feels there is a specific reason not to sedate the animal. Either KAT or Telazol may be used for sedation, according to the drug dose charts.
4. Use all necessary precautions to ensure that staff will not be harmed (bitten or scratched) during the procedure. Whenever possible, staff should hold the animal while injections are given.
5. Once the animal is well sedated, an IV injection of euthanasia solution should be given, according to the euthanasia dose chart.
6. Use stethoscope to confirm that the heart is stopped. A heart stick may be used instead.
6. Place the animal in one of the plastic bags provided in the euthanasia room, tie the bag tightly, and affix the cremation card to the bag if appropriate. Animals should be placed in the freezer. Always use TWO people to lift a dog up or down onto the cart and into the freezer. A large towel or blanket should be placed underneath a heavy animal (like a stretcher) to assist with lifting.
7. Complete the euthanasia paperwork as follows:
 - Fill out the controlled substance log book for euthanasia solution used.
 - If sedation was used, fill out the controlled substance log book with the appropriate information.
 - Fill out the disposal log book.
 - Stamp the kennel card paperwork and fill out the appropriate info for the euthanasia stamp.

Page 30 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



8. Clean the room (including table, clippers, and mop floor if needed), put away any supplies used, and check if any items need to be restocked. Make sure that lock box is closed and staff's keys are not left in the room. Turn out the lights and flip the "Occupied" sign back over to the blank side.



Self-Check – 5	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. What is hazard (4pts)?
2. What is the source of hazard (2pts)?
3. Write an OHS procedure (4pts)?

Test II: Choice the best answer

1. _____ is the inherent danger involved in working with a particular animal, material, equipment, process, procedure or system (2pts).
A. Risk assessment B. Risk C. Hazard
2. _____ is a measure of the likelihood of a consequence from working with a certain danger (3pts).
A. Risk assessment B. Risk C. Hazard

Note: Satisfactory rating – 7.5 points Unsatisfactory - below 7.5 points

You can ask your teacher for the copy of the correct answers.

Page 32 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



Information Sheet 6 – Requiring licenses and permits to conduct euthanasia

Animal welfare and rights in Ethiopia is about the treatment of and laws concerning non-human animals in Ethiopia. Ethiopia has highly limited animal welfare regulations by international standards and appears to have little animal activism.

Legislation

An article in ***Ethiopia's 2004 Criminal Code Proclamation*** prohibits only public cruelty towards animals. There is no legislation specifically addressing animal welfare. Ethiopia received an F out of possible grades A, B, C, D, E, F, and G on World Animal Protection's Animal Protection Index.

Federal democratic republic of Ethiopia

Ethiopia's Criminal Code No. 414/2004 bans cruel treatments being inflicted on animals in public places. It is also an offence to organize shows or entertainment events during which animals are treated with cruelty - the Criminal Code explicitly mentions animal fights and the captive shooting of animals.

Though it is positive that animal cruelty is prohibited in the Criminal Code, there is a lack of overarching animal welfare legislation in Ethiopia. The country's legislation does not recognize animal sentience, and there is a lack of basic protection for animals. Notably, there is no duty of care onto animal owners. There is also a lack of legislation regarding the conditions of rearing, transport and slaughter of farm animals, as well as the humane treatment of stray animals. Furthermore, the country allows for the use of animals for fur farming and entertainment purposes, such as circuses.

The Ministry of Agriculture in Ethiopia is responsible for implementing farm animal legislation; however, legislation is focused on animal health rather than animal welfare. In 2018, the Lower House of Ethiopia's Parliament approved the merging of the Ministry of Agriculture and Natural Resources with the Ministry of Livestock and Fisheries. The

Page 33 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



Forest and Wildlife Conservation and Development Authority have the responsibility to implement legislation with regards to natural resource management, including issues affecting wildlife and unlawful hunting. There is no Ministry with direct responsibility for animal welfare, nor any committee or government body dedicated to improving animal welfare.

The Government of Ethiopia is urged to enact a comprehensive animal welfare legislative act that would enshrine animal sentience, define animal welfare in line with the OIE standards, and prohibit animal cruelty in private places. Further animal welfare provisions will stem from this recognition of animal sentience. In particular, the Government of Ethiopia is urged to ban the worst forms of confinement for animals reared in farming, and to mandate humane slaughter for all livestock animal species. In addition, the Government of Ethiopia is strongly encouraged to fully ban fur farming, which is inherently cruel and causes pain, distress and suffering to animals.

The Government is also urged to outlaw the culling of stray animal populations, and to implement spay-and-neuter campaigns as a tool to control stray animal populations. The Government is furthermore strongly encouraged to ban the use of all animals for entertainment, in circuses for instance. Overall, the Government of Ethiopia is strongly encouraged to align its current legislation with OIE standards. Responsibility for animal welfare should be allocated to a Ministry, and a specific government body should enact and assess the implementation of animal protection legislation. Such a government body should include representatives from animal welfare organizations’.

Further legal and policy recommendations are associated with each Animal Protection Index (API) indicator and contained in the relevant sections of this report until September, 2021 G.C.

Page 34 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Self-Check – 6	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. Write the codes of animals' welfare in Ethiopia (4pts)?
2. Write the codes of animal's acceptance of animal's welfare in Ethiopia (3pts)?
3. Is Ethiopian having animal's health legislation values (2pts)?

Note: Satisfactory rating – 4.5 points Unsatisfactory - below 4.5 points

You can ask you teacher for the copy of the correct answers.

Page 35 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



LG #69

LO #2- Carry out euthanasia of an animal

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Using PPE and safety equipment
- Handling and transporting equipment safely statutory and industries
- Restraining animal physical to minimizes a pain and distress
- Applying euthanasia methods
- Monitoring euthanasia to animals death without suffering
- Following organizational guidelines, procedures and relevant legislative requirements.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, **you will be able to:**

- Use PPE and safety equipment
- Handle and transport equipment safely statutory and industries
- Restrain animal physical to minimizes a pain and distress
- Apply euthanasia methods
- Monitor euthanasia to animals death without suffering
- Follow organizational guidelines, procedures and relevant legislative requirements

Learning Instructions:



1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).



Information Sheet 1- Using PPE and safety equipment

Selecting and using PPE in veterinary practice

If you use personal protective equipment (PPE) to minimize a risk to health and safety, you must provide appropriate PPE to workers and other people at the workplace unless the PPE has been provided by another person, such as the owner of a horse business. Workers and other persons at the workplace must wear PPE in accordance with any information, training or reasonable instruction that you provide.

When selected and used properly, PPE forms part of a veterinarian's risk management approach to managing infection risks from exposure to Hendra virus and other zoonoses. PPE when used on its own tends to be the least effective way to manage risks. It should be used to supplement higher level control measures.

How to use PPE

You should use disposable (single-use) PPE where possible. Do not reuse items that are intended for single use only. Make sure that reusable PPE (e.g. eye/face protection, rubber boots) is maintained, repaired and replaced so that it continues to minimise risk.

You should establish an entry and exit procedure to provide a clear process for applying infection prevention and control procedures. Select an entry/exit point and identify a 'clean area' (the cold zone), a 'dirty area' (the hot zone where Hendra virus contamination may be present) and a transition area in-between. The transition area should be clearly identified (e.g. by using a ground sheet or tarpaulin). To minimise cross-contamination, separate the transition area into clean and dirty sides. Put on PPE, prepare sampling equipment and prepare disinfectant solutions on the clean side, before entering the hot zone.

Take care when removing PPE to avoid contamination. For example, do not touch potentially contaminated surfaces of PPE and perform hand hygiene before removing

Page 38 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



PPE from the face. Should contamination occur, wash or rinse the affected area thoroughly. Perform hand hygiene again once all PPE has been removed.

Disposable PPE that is worn for clinical situations involving suspected or confirmed Hendra virus infection should be disposed of as clinical waste. PPE designed for reuse should be decontaminated with suitable detergents and disinfectants after it has been used. Wear disposable gloves when decontaminating items of PPE and wash your hands thoroughly after removing gloves.

PPE has the potential to create health and safety risks for the user, especially when multiple items of PPE are worn together as an ensemble. Risks include thermal discomfort, heat stress, fatigue, reduced manual dexterity, restricted vision, and physical injury inflicted by a fractious horse. Be aware of these risks and take reasonably practicable steps to ensure health and safety. For example:

- To minimize thermal discomfort and heat stress, ensure adequate hydration, wear lightweight and breathable underclothing, work in the shade or under a portable shade structure, use cooling fans or other ventilation devices, where possible schedule outdoor work to avoid the hottest part of the day, schedule regular rest breaks, and consider using a powered-air purifying respirator (PAPR). Cooling workwear worn under protective clothing, such as cooling vests and shirts, can provide a cooling effect.
- To minimize fogging of eye and face protection, select equipment with anti-fogging properties, use vented safety eyewear (provided this does not increase the infection risk) and make sure that respiratory protective equipment is properly fitted to minimize leakage of exhaled air.
- To minimize the risk of injury, be alert to the horse's behaviour and use methods of restraint as necessary. You could also consider providing advice to clients on ways in which they can de-sensitize their horses to PPE so that the horse is less anxious when you attend.

Page 39 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Types of PPE

1. Gloves

Purpose Gloves are used to prevent hand contamination and the spread of infection between animals and off the property

Type Gloves include:

- reusable heavy duty gloves
- disposable latex, nitrile or vinyl gloves
- Cut resistant gloves.

When to use You should wear gloves:

- For any contact with an animal's blood, body fluids, mucous membranes and non-intact skin.
- When handling contaminated equipment, instruments, linen and waste.
- When administering an injection or performing venipuncture if contact with blood is likely or if you have non-intact skin on your hands.
- If Hendra virus is a primary or differential diagnosis or if infection is confirmed.
- To protect against other identified health and safety or biosecurity risks.

Level of protection Gloves provide varying levels of protection, such as:

- Single gloving provides a basic level of protection.
- Double gloving may provide a higher level of protection.
- Reusable heavy duty rubber gloves and disposable nitrile gloves may protect against concurrent exposure to hazardous chemicals (e.g. disinfectants).
- Cut-resistant gloves worn over disposable gloves provide additional protection for high risk tasks such as necropsy.

Selection Consider the following when selecting gloves:

- the level of contact with blood and body fluids
- glove properties (e.g. puncture resistance)
- the required level of manual dexterity



- the extent of the area to be protected (e.g. hand, wrist, forearms)
- concurrent exposure to other hazards (e.g. hazardous chemicals)
- compatibility with other PPE (e.g. wrist coverage when worn with overalls)
- the worker (e.g. size, latex allergy).

Use Practical considerations when using gloves include:

- If using duct tape to seal gloves to overalls, make sure this does not tear the gloves or overalls during removal as this may cause contamination.
- Consider using extended cuff gloves to protect the wrist.
- Change gloves if they become torn or damaged during use.
- Always perform hand hygiene immediately after removing gloves.
- If using latex gloves, select a low protein, powder-free make to minimise the risk of latex allergy.

2. Eye and face protection

Purpose Eye and face protection is used to prevent contamination of the face and mucous membranes

Type Eye and face protection includes:

- safety glasses
- safety goggles
- face shield
- Surgical/medical mask or respirator.

When to use You should wear eye and face protection:

- When contamination of the eyes, nose, mouth and face is likely.
- If Hendra virus is a primary or differential diagnosis or if infection is confirmed.
- To protect against other identified health and safety or biosecurity risks.

Level of protection Eye and face protection provides varying levels of protection.

- Safety glasses provide the eyes with a minimum level of protection.
- Safety goggles and face shields provide the eyes with a higher level of



protection but face shields do not provide a tight seal.

- Surgical/medical masks and respirators provide varying levels of protection to the eyes, nose, mouth and face, depending on the level of fluid resistance and face cover.

Fluid resistant surgical/medical masks and respirators provide a higher level of protection against splashes

Selection Consider the following when selecting eye and face protection:

- the level of contact with blood and body fluids
- the potential for sprays and splashes
- PPE properties (e.g. anti-fogging, anti-glare, UV protection, scratch/puncture resistance, ease of decontamination)
- the visual requirements of the task
- environmental conditions (e.g. heat, humidity)
- concurrent exposure to other hazards (e.g. hazardous chemicals)
- The worker (e.g. use of prescription eyewear).

Use Practical considerations when using eye and face protection:

- spectacles, sunglasses and contact lenses do not provide eye protection
- some makes and models of eye and face protection can be worn over spectacles or fitted with prescription lenses
- vented goggles help prevent fogging but may provide a lower level of splash protection
- Non-vented and indirectly vented goggles provide a higher level of splash protection but non-vented goggles may increase the risk of fogging.

3. Protective clothing

Purpose Protective clothing is used to prevent contamination of the skin and personal clothing and the spread of infection between animals and off the property

Type Protective clothing includes:

Page 42 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



- reusable cloth overalls (coveralls)
- disposable gowns
- Disposable overalls.

When to You should wear protective clothing:

use

- When contamination of the skin and clothing with blood and body fluids is likely.
- If Hendra virus is a primary or differential diagnosis or if infection is confirmed.
- To protect against other identified health and safety or biosecurity risks.

Level of Protective clothing provides varying levels of protection. Reusable cloth protection overalls:

- provide a low level of protection and are not fluid resistant
- may not be suitable for high risk situations
- require additional handling during laundering
- do not protect the head and neck.
- Disposable fluid-resistant overalls and gowns:
 - ✓ provide a higher level of protection
 - ✓ are generally lighter and better suited to hot and humid conditions than impermeable overalls
 - ✓ may allow fluid penetration if there is a high level of contact with blood and body fluids or if pressure is applied.
 - ✓ Impermeable (impervious) overalls provide the highest level of protection but increase the risk of thermal discomfort and heat stress.
 - ✓ Protective clothing that includes head and neck protection should be worn in high risk situations and where a high level of contact with blood and body fluids is likely.

Selection Consider the following when selecting protective clothing:

- the level of contact with blood and body fluids
- the level of contamination of the work environment
- PPE properties (e.g. barrier protection, fluid resistance, fabric and seam

Page 43 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



strength, comfort, breathability, zipper protection, ease of use)

- body coverage (e.g. partial/full body, head/neck protection)
- environmental conditions (e.g. heat, humidity)
- the physical demands of the task
- duration of wear
- the worker (e.g. size, heat acclimatisation).

Use

Practical considerations when using protective clothing:

- Launder reusable overalls after each use and carefully manage infection risks from handling contaminated laundry.
- Wear lightweight and breathable clothing underneath overalls.
- When working in hot and humid conditions or wearing protective clothing for extended periods, consider wearing a cooling device such as a cooling vest worn under protective clothing.
- A disposable apron or plastic sleeves worn over protective clothing may provide more protection however additional layers may restrict movement and increase the risk of thermal discomfort and heat stress.
- If using a gown or overalls that do not include an integrated hood, a disposable surgical cap or hood, or a PAPR with an integrated hood or helmet, may be used to protect the head/neck.
- Impermeable overalls should be used with great care to avoid thermal discomfort and heat stress.

4. Respiratory protective equipment (RPE)

Purpose Particulate RPE is used to prevent inhaling infectious aerosols and other particles and contamination of the nose and mouth.

RPE includes:

- disposable P2 respirator
- reusable half-face piece respirator with a particulate filter
- reusable full face piece respirator with a with a particulate filter
- Powered air purifying respirator (PAPR) with a particulate filter.

Page 44 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



When to You should wear RPE:

- use
- When exposed to potentially infectious aerosols, especially those involving the respiratory tract.
 - If Hendra virus is a primary or differential diagnosis or if infection is confirmed.
 - To protect against other identified health and safety or biosecurity risks.

Level of RPE provides varying levels of protection.

- protection
- A disposable P2 respirator provides the minimum level of protection against infectious aerosols.
 - Refer to *AS 1715 Selection, Use and Maintenance of Respiratory Protective Equipment* for guidance on the level of protection provided by half face, full face and PAPR respirators when used with P1, P2 and P3 filters.

Selection Consider the following when selecting RPE:

- level of exposure to aerosols
- concurrent exposure to other hazards (e.g. hazardous chemicals)
- environmental conditions (e.g. heat, humidity)
- the physical demands of the task
- the duration of wear
- the worker (e.g. size, facial hair, health conditions that impact on respirator use)

Use Practical considerations when using RPE.

- Surgical/medical masks and nuisance dust masks do not protect against infectious aerosols.
- If using a disposable P2 respirator:
 - ✓ makes/models that feature an exhalation valve may increase user comfort
 - ✓ makes/models that are fluid resistant (a 'surgical P2 respirator') provide increased protection against fluid strikethrough
 - ✓ replace the respirator if it becomes moist or if respiratory effort increases, taking care to avoid contamination



- ✓ Do not reapply or reuse the respirator.
- If using a reusable respirator:
 - ✓ decontaminate the respirator after use and store in a sealed container
 - ✓ Replace the filter in accordance with the manufacturer's instructions.
- Facial hair, including beards, moustaches, sideburns and stubble, will stop a respirator from sealing properly. Workers, who wear tight-fitting respirators, must be clean shaven to allow a good seal between the respirator and the face.
- A PAPR may provide increased user comfort during physically demanding work, long wear durations and in hot and humid environments.
- If using a tight fitting respirator, provide workers with a respirator fit-test (PDF, 0.86 MB) and make sure they pass a fit-test for the respirator they wear.
- Provide workers with instruction on how to correctly fit a respirator and perform a fit check.
- Additional types of filters may be required if there is concurrent exposure to other hazards (e.g. hazardous chemicals)

5. protective footwear

Purpose Protective footwear is used to prevent contamination of everyday footwear and the spread of infection between animals and off the property

Type Protective footwear includes shoe/boot covers and rubber boots.

When to use You should wear protective footwear:

- When contamination of footwear with blood and body fluids is likely.
- If Hendra virus is a primary or differential diagnosis or if infection is confirmed.
- To protect against other identified health and safety or biosecurity risks.

Type You should wear protective footwear:

- When contamination of footwear with blood and body fluids is likely.
- If Hendra virus is a primary or differential diagnosis or if infection is

Page 46 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



confirmed.

- To protect against other identified health and safety or biosecurity risks.

Level of Protective footwear provides varying levels of protection:

- protection
- Shoe covers provide a minimum level of protection.
 - Water resistant boot covers and rubber boots provide a higher level of protection.

Consider the following when selecting protective footwear:

- Selection
- the level of contact with blood and body fluids
 - the level of contamination of the work environment
 - environmental conditions (e.g. rain, uneven terrain)
 - biosecurity requirements
 - Worker (e.g. size).

Practical considerations when using protective footwear.

- Use
- Shoe/boot covers may be suitable for indoor environments but can easily tear in outdoor environments.
 - Steel capped rubber boots protect against physical injury.
 - Decontaminate footwear after use and remove all visible soil.



Self-Check – 1	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choice the best answer

1. Which PPE types used for protect hazard from eye mucous membrane (3pts)?
A. Boat B. Gloves C. Google D. All
2. Which PPE types used for protect hazard from hand skin (3pts)?
A. Boat B. Gloves C. Google D. All
3. Which PPE types used for protect hazard from foot root (3pts)?
B. Boat B. Gloves C. Google D. All

Test II: Short Answer Questions

1. Write at least 4 the necessary euthanasia equipment (4pts)?
2. How we can save our health at research (3 pts)?

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

You can ask your teacher for the copy of the correct answers

Page 48 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



Information Sheet 2- Handle and transport safely equipment of statutory requirements and industry practices

Introduction

A **statute** is a formal written enactment of a legislative authority that governs the legal entities of a tools, equipment and machinery in country by way of consent. Typically, statutes command or prohibit something, or declare policy.

The code is not intended to replace national laws, regulations or accepted standards. Its object is to provide guidance to those who may be engaged in the framing of provisions relating to the use of machinery at work, such as competent authorities and the management of companies where machinery is supplied or used. The code also offers guidelines to designers, manufacturers, suppliers and employers' and workers' organizations.

Local circumstances and the availability of financial and technical resources will determine the speed and extent of implementation. The provisions of this code should also be read in the context of the conditions in the country proposing to use the information. With this in mind, the needs of developing countries have been taken into consideration.

Transport equipment and tools

Transport vehicles will be needed to relocate items (carcasses, other materials) to the disposal site, whether it is on or off the premises. If the waste must travel on public roads, it should be transported in closed, leak-resistant trucks, containers or dumpsters. Secondary containment may be needed, depending on the type of waste being transported. Some other transport planning considerations are listed below:

- Are transport vehicles designed to handle the materials to be transported?
- Are transport vehicles properly marked for the transport of these materials?
- Are the drivers adequately trained in biosecurity and do they have PPE?
- Do shipments require law enforcement escorts?

Page 49 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



- What travel routes will be used from the premises to the disposal site? (All of the transport route should be approved in advance by the competent authority. Care must be taken to avoid road construction, neighborhoods and densely populated areas.)
- Has an alternate travel route been identified?
- What procedures will be followed if the vehicle is damaged during transit?
- How will vehicles be cleaned and disinfected before leaving the affected premises and after materials have been offloaded at the disposal site?
- How will vehicle-loading be performed in order to avoid releasing biological agent(s) into the environment?
- How will transport vehicle traffic be minimized into the infected area?



Self-Check – 2	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. How we can handle euthanizing materials (4pts)?
2. List at least the 5 tools for animal's euthanasia (2pts)?

Note: Satisfactory rating - 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 3: Restraining euthanized animal to minimizes pain and distress

Animal handling and restraining humane

Animal Handling Skills-Professionalism and Safety

- Good animal handling increase the production, keep animal welfare and ethics.
- The public watches us to learn how to properly handle animals.
- Being professional means being SAFE and HUMANE.
- Good animal handling skills prevent staff from being injured.
- Good animal handling skills reduce stress for the animal.

Examples of Safe Animal Handling to *minimizing stress and pain*:

- Be aware of the special stressors for animals in the clinic setting. The clinic is extremely chaotic for any animal-there are an incredible number of smells and other stimuli and animals are likely to be confused and distressed. Many of our patients have lived entirely outdoors and have not been handled or examined before. They may not have any experience on a leash and may panic in response. Even the most social animal may exhibit aggression toward other animals, particularly in a strange environment and may redirect to nearby people when over-stimulated.
- Never put your face directly into the face of a dog or cat.
- Do not move in behind or crowd around a dog.
- Concentrate on the animal you are handling without being distracted by other activities.
- NEVER sit on the floor while handling/examining a dog. If the animal becomes aggressive or aroused you will be unable to move away or protect yourself and risk serious facial bites.
- Always be prepared to protect yourself or move away quickly in the event an animal becomes aggressive unexpectedly.

Page 52 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Safe and effective animal handling requires a thorough understanding of the normal behavior and responses of each species. Below is some general information on animal behavior and handling techniques. There is no substitute, however, for careful observation and experience.

Notes: If there is any doubt about the temperament of an animal-ASK FOR ASSISTANCE. There are no extra points for being a 'hero'. The safety of our staff and patients is most important!

Page 53 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Self-Check – 3	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. List the method of euthanizing animals humanely (4pts)?

Note: Satisfactory rating - 4 points Unsatisfactory - below 4 points

.You can ask your teacher for the copy of the correct answers.



Information Sheet 4 – Applying euthanizing methods

Introduction

Euthanasia is an unpleasant task, but knowing how to perform it competently not only prevents needless suffering, but avoids those even more unpleasant conditions were improper technique may increase pain and distress in animals requiring euthanasia. There are two types of methods to euthanize those sick, injured and unwanted animals.

I. Allowable Methods of Euthanasia

Purpose: the purpose of these sections is to set standards for allowable methods of euthanasia for animals in the custody of an animal shelter, in accordance with the Texas Health and Safety Code.

Definition: the following term, when used in these rules, shall have the following meaning, unless the context clearly indicates otherwise:

- Animal shelter - A facility that collects, impounds, or keeps stray, homeless, abandoned, or unwanted animals.

Allowable Methods of Euthanasia are:

- a. Only sodium pentobarbital or commercially compressed carbon monoxide gas may be used to euthanize a dog or cat in the custody of an animal shelter.
- b. When sodium pentobarbital is used to euthanize an animal, the following requirements apply.
 1. Persons administering sodium pentobarbital must be thoroughly trained in the proper methods and techniques for euthanizing animals. A person has until the 120th day following the date of initial employment to complete this training.
 2. The routes of injections of sodium pentobarbital, listed in the order of preference, shall be:
 - i. Intravenous injection by hypodermic needle
 - ii. Intraperitoneal injection by hypodermic needle

Page 55 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



iii. intracardiac injection by hypodermic needle.

3. All injections must be administered using an undamaged sterilized hypodermic needle of a size suitable for the size and species of the animal.
 4. Injection shall be conducted in an area out of public view.
 5. The area used for injection shall have sufficient lighting to allow for visual accuracy during the injection process.
 6. Each animal shall be weighed to determine the correct dose of sodium pentobarbital.
 7. Animals given sodium pentobarbital by intraperitoneal injection must be given 3 to 4 times the intravenous dose.
 8. Animals given sodium pentobarbital by intraperitoneal injection shall be placed in a quiet area, separated from physical contact with other animals during the dying process.
 9. Intracardiac injection may not be used unless the animal is heavily sedated, unconscious, or anesthetized.
 10. Carcasses of animals euthanized by sodium pentobarbital must be stored and disposed of in a manner that minimizes the potential for scavenging by animals or humans.
- c. When commercially compressed carbon monoxide gas is used to euthanize an animal, the following requirements apply
1. It must be performed in a commercially manufactured carbon monoxide chamber or one designed and constructed, at a minimum, to equal the effectiveness of a commercially manufactured chamber.
 2. The chamber must be located outdoors or in a well ventilated room.
 3. The chamber must be airtight and equipped with the following:
 - i. an exhaust fan for indoor chambers which is capable of evacuating all gas from the chamber prior to the chamber being opened and is connected by a gas-type duct to the outdoors
 - ii. a gas flow regulator and flow meter for the canister
 - iii. a gas concentration gauge
 - iv. an accurate temperature gauge for monitoring the interior of the chamber

Page 56 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



- v. if located indoors, a carbon monoxide monitor on the exterior of the chamber that is connected to an audible alarm system, which will sound in the room containing the chamber
- vi. explosion-proof electrical equipment if equipment is exposed to carbon monoxide
- vii. a view-port with either internal lighting or external lighting sufficient to allow visual surveillance of all animals within the chamber; and
- viii. If designed to euthanize more than one animal at a time, independent sections or cages to separate individual animals.
- ix. The gas concentration process must achieve at least a 6.0% carbon monoxide gas concentration not to exceed 10% due to flammability and explosiveness throughout the chamber within 5 minutes after the introduction of carbon monoxide into the chamber is initiated.
- x. The ambient temperature inside the chamber should not exceed 85 degrees Fahrenheit (29.4 degrees Celsius) when it contains live animals.
- xi. All equipment, as specified in paragraph of this subsection, must be in proper working order and used at all times during the operation of the chamber.
- xii. Animals must not be removed from the chamber until at least 5 minutes after cessation of respiratory movement.
- xiii. The chamber must be thoroughly vented prior to removing any carcasses.
- xiv. The chamber must be thoroughly cleaned after the completion of each cycle. Chamber surfaces must be constructed and maintained so they are impervious to moisture and can be readily sanitized.
- xv. Persons operating the chamber must be thoroughly trained in the proper methods and techniques for euthanizing animals. A person has until the 120th day following the date of initial employment to complete this training.
- xvi. Operation, maintenance, and safety instructions and guidelines must be displayed prominently in the area containing the chamber.
- xvii. Carbon monoxide should not be used to euthanize animals reasonably presumed to be less than 16 weeks of age or suffering from decreased respiratory function. Very young animals are resistant to the effects of

Page 57 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



carbon monoxide and the time required to achieve death in these animals may be significantly increased. In animals with decreased respiratory function, carbon monoxide levels rise slowly, making it more likely that these animals will experience elevated levels of stress. The use of no inhalant methods of euthanasia should be considered for such animals.

xviii. Only compatible animals of the same species may be placed in the chamber simultaneously.

xix. No live animal may be placed in the chamber with a dead animal.

II. Unacceptable Methods of Euthanasia

The following is a partial list of methods considered as ‘unacceptable’ for euthanasia of livestock:

- Manually applied blunt trauma to the head such as a large hammer
- Injection of any chemical substance not labeled for use as a euthanasia agent
- Injection of air into a vein
- Electrocution as with a 120 or 220 volt electrical cord

Laws regarding acceptable methods of euthanasia vary from state to state. Persons are advised to contact local and/or state legal authorities for further information. In some states, a person convicted of violating these laws may be charged with a felony

Page 58 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Self-Check – 4	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. Define acceptable and unacceptable euthanasia methods (5pts)?

Note: Satisfactory rating - 3 points Unsatisfactory - below 3 points

You can ask your teacher for the copy of the correct answers.



Information Sheet 5 – Monitoring euthanasia procedure to ensure animal's death without suffering

Procedures for Euthanasia

- A. A warm-blooded animal may be euthanized only by administering sodium pentobarbital, a sodium pentobarbital derivative, or a substance or procedure, which acts on the central nervous system and is clinically proven to be humane. When euthanasia is accomplished by adding a lethal solution to water or food, adequate installations shall be provided for feeding and watering which are sufficiently enclosed in order to provide for protection from contamination by feces, uric acid, feathers, and any other debris.
- B. A lethal solution must be administered in the following order of preference:
- By intravenous injection by hypodermic needle
 - By intraperitoneal injection by hypodermic needle
 - By intracardial injection by hypodermic needle (only if the animal is already unconscious or insensitive to pain)
 - By solution or powder added to food
- C. The animal shall be tranquilized with an approved, humane substance before euthanasia is performed.
- D. Euthanasia must be performed by a licensed veterinarian or a licensed or registered veterinary technician under the supervision of a licensed veterinarian.
- E. At least two people must be present for administration of an injection, one to hold the animal and one to perform the procedure.
- F. An animal may not be left unattended between the time euthanasia procedures are commenced and the time death occurs, nor may its body be disposed of until death is confirmed by a qualified person.
- G. This section does not apply to an animal held as live food for another animal.



Self-Check – 5	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. How we can perform euthanasia (2pts)?

Note: Satisfactory rating - 2 points Unsatisfactory - below 2 points

You can ask your teacher for the copy of the correct answers.



Information Sheet 6- Follows organizational guidelines, procedures and legislative

Organization guidelines, procedures and legislative

A policy is a course of action or guidelines to be followed whereas a procedure is the 'nitty gritty' of the policy, outlining what has to be done to implement the policy. All organizations should have written policy and procedures, and staff training in the following areas:

- a confidentiality policy
- a clearly defined process for identifying and regularly updating a Community Resource Index so that all workers are aware of what other services are available to refer to (the index contains basic contact details and information about what each service provides)
- processes for networking with other agencies, including attending relevant interagency (meetings of local service providers)
- guidelines for case conferencing (this will be discussed in more detail a bit later)
- referral protocols, including how referrals should be made, the kind of information that can be shared with other services and any ongoing roles and responsibilities of each service with regard to the client
- A policy for how long client information is kept after clients are no longer involved with the service. For example, different government departments produce documents that outline legal requirements for their staff in relation to storing and maintaining information.

Policies and procedures are an essential part of any organization. Together, policies and procedures provide a roadmap for day-to-day operations. They ensure compliance with laws and regulations, give guidance for decision-making, and streamline internal processes. Following policies and procedures is good for employees and your organization as a whole.

Page 62 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



The Importance of Following Policies and Procedures:

As your organization's leaders create and enforce policies, it's important to make sure your staff understands why following policies and procedures is critical.

Here are just a few of the positive outcomes of following policies and procedures:

A. Consistent processes and structures

Policies and procedures keep operations from devolving into complete chaos. When everyone is following policies and procedures, your organization can run smoothly. Management structures and teams operate as they're meant to. And mistakes and hiccups in processes can be quickly identified and addressed. When your staff is following policies and procedures, your organization will use time and resources more efficiently. You'll be able to grow and achieve your goals as an organization.

Consistency in practices is also right for employees individually. They know what they're responsible for, what's expected of them, and what they can expect from their supervisors and co-workers. This frees them up to do their jobs with confidence and excellence.

B. Better quality service

When employees follow procedures, they perform tasks correctly and provide consistent customer service.

C. A safer workplace

When your staff is following policies and procedures, workplace accidents and incidents are less likely to occur.

Page 63 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Self-Check – 6	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. What are The Importance of Following Policies and Procedures? (5points)

Note: Satisfactory rating - 5 points Unsatisfactory - below 5 points

You can ask your teacher for the copy of the correct answers.



LG #70

LO #3 - Complete euthanasia

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Confirming death of animal
- Handling carcass for research or post-mortem examination
- Disposing carcass and biological waste
- Handling and moving animals carcass
- Decontaminating, cleaning and storing euthanizing equipment
- Keeping record of euthanized animals

This guide will also assist you to attain the learning outcomes stated in the cover page.

Specifically, **upon completion of this learning guide, you will be able to:**

- Confirm death of animal
- Handle carcass for research or post-mortem examination
- Dispose carcass and biological waste
- Handle and move animals carcass
- Decontaminate, clean and store euthanizing equipment
- Keep record of euthanized animals

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).



Information Sheet 1 – Confirming death of animal

3.1 Confirmation of Death

Regardless of the method of euthanasia used, death must be confirmed before disposal of the animal. After the application of a euthanasia procedure and before disposal of the animal it is essential that the death of the animal be confirmed. An animal in deep narcosis following administration of an injectable or inhalant agent may appear dead, but might eventually recover. The following should be used to evaluate consciousness or confirm death.

- Lack of a heartbeat
- Lack of respiration
- Lack of a corneal reflex

The following signs can be used to confirm death:

A. Absence of chest movement/no sign of respiration

The animal's chest has stopped moving up and down indicating that it has stopped breathing. Do not rely on this sign alone as the animal's heart may continue to beat for some time after it has stopped breathing.

B. Absence of heart beat

Determined by using a stethoscope or by palpation of the chest. Optimum auscultation sites are the fourth and fifth intercostal spaces and, because of the heavy shoulder muscles that cover the anterior border of the heart, the use of a flat phonendoscope chest piece pushed under the triceps muscles is necessary. Extension of the forelimb may facilitate auscultation if the animal is quiet. Areas where the various sounds are heard with maximum intensity are not directly over the anatomical sites of the cardiac orifices, because conduction of the sound through the fluid in the chamber gives optimum auscultation at the point where the fluid is closest to the chest wall.

Page 66 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



C. Absence of pulse

This can be palpated in the medial aspect of the hind limb in the live animal, and is lost after death. This technique is of most use in larger species, as it can be impossible to discern in small species. The pulse should be taken at the middle coccygeal or facial arteries in cattle, the facial artery in the horse and the femoral artery in sheep and goats.

D. Loss of color in mucous membranes

Mucous membranes become pale and mottled, there is no capillary refill after pressure is applied and with time they become dry and sticky. More useful in larger species where the mucous membranes in the mouth are easily accessible. Capillary refill is frequently still evident for prolonged periods after an animal has died.

E. Corneal and palpebral reflexes are lost

The corneal reflex (blink reflex) is normally elicited when the eyeball is touched and the palpebral reflex is elicited when the eyelids are stroked. After death the animal's eyes should remain open and the lids should not move when touched. Lack of response to a hard pinch delivered to the comb, wattles, or snood

F. Glazing of eyes: this will occur rapidly after death. The cornea loses its clear moist appearance and becomes opaque, dry and somewhat wrinkled.

Rigor mortis: If death cannot be confirmed by a veterinary surgeon, or there is any doubt, operators should wait until rigor mortis has set in before disposing of the animal's carcass.

- Always check for these signs and do not assume an animal is dead just because it is not moving or apparently not breathing. If death cannot be confirmed, the operator should repeat the same or an alternative procedure.
- If the animal is unconscious, the major blood vessels in the neck can be cut with a sharp knife so that the animal dies of blood loss (i.e. exsanguination)

Page 67 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021

- A lack of a heartbeat and respiration for more than five minutes should be used to confirm death.



Figure 2: Method of euthanasia confirmation



Self-Check – 1	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. What are the major signs used to confirm death in animals following euthanasia? (5 points).
2. Explain the difference between corneal reflex and palpebral reflex? (2 points).

Note: Satisfactory rating - 7 points Unsatisfactory - below 7 points

You can ask your teacher for the copy of the correct answers.



Information Sheet 2 – Handling carcass for research or post-mortem examination

Handling Animal Carcasses

Research is "creative and systematic work undertaken to increase the stock of knowledge". It involves the collection, organization, and analysis of information to increase understanding of a topic or issue. Carcasses of animals that are euthanized by the appropriate authorities (research) should be handled following the procedures below and utilizing the specified Personal Protective Equipment.

- Personal Protective Equipment: Heavy rubber or nitrile gloves, safety glasses or goggles and safety shoes should be worn when handling animal carcasses. Tyvek suits should be worn if blood or other fluids are present and likely to get on clothing or skin.
- Use the designated shovel to pick up a road-killed animal. The shovel is spray painted orange, labeled as "Carcass Scoop" and stored in the LaPan Tool crib. Use this shovel only for road kills.
- Confirm the animal is dead by prodding with a long-handled tool. Startling an injured animal can increase the potential for injury or contamination.
- When animal carcasses are transported for disposal, care shall be taken to avoid contact and contain body fluids during transport as follows:
 - ✓ Small animal carcasses should be collected in plastic trash bags for disposal. The bag should be strong (greater than 4mil) to avoid puncture by the teeth, claws or broken bones of the carcass. By dropping the bag over the carcass, and grabbing the carcass through the bag, any possibility of personal contamination can be completely avoided. A shovel or other tool may be used to lift and push the carcass into the bags.
 - ✓ Seal the bag with a knot or twist tie to avoid contaminating the vehicle. Avoid throwing animals into the truck bed to minimize splashing.
 - ✓ Deer and other large carcasses should be wrapped in plastic sheets or tarps.



- The bag containing the carcass should be disposed of immediately in a campus trash dumpster.
- Gloves, tarps and any other materials should be bagged and disposed of
- The shovel, truck bed and any other contaminated non-disposable equipment should be disinfected using a 10% bleach solution. The shovel can be immersed in a bucket containing the solution and the solution can be sprayed or poured over the truck bed and any other surfaces. Contact the Custodial Supervisor to mix a fresh solution of 10% bleach. Nitrile/latex gloves and safety goggles should be worn while using the bleach solution.
- Hands should be washed well with soap and water after handling the carcass and after disinfecting equipment.

Page 71 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Self-Check – 2	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. Write the methods of handling animal waste and carcass (3pts)?
2. Define carcass (5 pts)?

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

You can ask your teacher for the copy of the correct answers.



Information Sheet 3 – Dispose animal carcass and biological waste

Introduction

A euthanized animals and biological waste disposal of hazardous waste can result in serious threats not only to environment which come across it but to farm stock and wildlife as well. It can even pose substantial environmental risks if it is not destroyed responsibly and safely. Proper disposal can help prevent or mitigate the further spread of pathogens. If any materials are potentially contaminated with an animal disease virus or other pathogen, they must undergo treatment or disposal to inactivate or contain the virus or other pathogen. Wastes requiring disposal following an animal disease outbreak include: carcasses; milk and meat products; eggs and wool; contaminated manure or slurry; litter and bedding; contaminated feed and feeding stuff; contaminated personal protective equipment (PPE); contaminated materials and equipment that cannot be cleaned and disinfected; and antimicrobials from cleaning and disinfecting.

Goals of disposal

The overall goal of disposal is to protect the agricultural and national economy through the control and containment of animal disease by conducting operations in a timely, safe, biosecurity, aesthetically acceptable, and environmentally responsible manner. The goals of disposal preparedness are to:

- Establish disposal protocols or procedures that meet regulatory, legislative and environmental requirements before an outbreak
- Identify suitable disposal personnel, supplies, materials and equipment prior to an outbreak
- Prevent the spread of the disease agent with little or no effect on the environment, considering community preferences, and conserving meat or animal protein if logistically supportable from a biosecurity viewpoint.

Page 73 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Carcass and biological waste management options

1. Burning

Burning is a process which involves constructing a bed of combustible materials such as wooden timbers, placing the carcasses on the bed, adding more combustible material over the carcasses, and igniting the pile. There is no containment of materials in this process. Historically, open or uncontrolled burning has been used to thermally destroy animal carcasses and associated materials during animal health crises. Based on Exposure Assessment of Livestock Carcass Management Options during Natural Disasters (2017), the most significant burning exposure pathways are:

- Chemical air inhalation, deposition on crops and deposition on surface water to fish consumed by humans
- Chemical leaching from ash burial to groundwater ingested by humans/livestock; and
- Pathogen pathways not found to be significant.

Table 5: Advantage and disadvantage of burning

Advantage	Disadvantage	Time/cost	Considerations
• On-farm • Inactivates pathogens • Reduces volume	• Biosecurity risk • Not sustainable • Public opposition • Inefficient • Difficult to operate • Regulatory limitations	• Slow • Expensive	• Open burning poses risk of creating wildfires • Air quality • Smell



The method of swine burning which dead by swine flu from research conduct.

Figure 1: Burning an animal after euthanized humane for research

2. Deep burial

Deep burial involves removing soil from the ground to a depth of three to five meters, piling the soil nearby for later use, depositing the carcasses into the excavated area, and then covering the carcasses with the soil that had been previously removed. Once buried, carcasses undergo anaerobic decomposition and break down into minerals and organic material. This is a slow process and may take decades. The anaerobic decomposition process generates body fluids (leachate) which will slowly penetrate the native soil beneath the burial site and may reach groundwater.

Based on Exposure Assessment of Livestock Carcass and biological waste Management Options During Natural Disasters, the most significant deep-burial exposure pathways are chemicals leaching to groundwater and surface water to fish ingested by humans/livestock and pathogens leaching to groundwater ingested by livestock. Data from Avian Influenza Virus RNA in Groundwater Wells Supplying Poultry Farms Affected by the 2015 Influenza Outbreak suggest that it is possible for (viruses) to be transported to groundwater, and therefore that during an outbreak, the potential for farm wells to become contaminated with (virus) should be considered.



3. Above-ground burial

Above-ground burial is a hybrid of deep burial and composting, which includes a shallow trench excavated into native soil to a depth of 60 centimeters (cm) (see Figures 3A and 3B). Thirty cm of carbonaceous material is placed at the bottom of the trench, followed by a single layer of animal carcasses. Excavated soils are subsequently placed back in the trench, forming a mound on which the vegetative cap is established. For the vegetative cap, a plant species should be selected that is readily available and both regionally and seasonally appropriate. Finally, the perimeter of the mound is trenched to prevent the intrusion of surface water into the system. Once the carcasses have decomposed, the disposal site can be leveled and returned to its previous use. In most environments, this will take between 9 and 12 months.

Although no exposure assessments have been performed for above-ground burial, it is expected to have less risk than deep burial due to the increased separation of the carcasses from the groundwater table. Preliminary studies suggest that pathogens are inactivated during above-ground burial, as they are during composting.

4. Composting

Carcass composting is a process that involves constructing a porous base layer of carbon material such as wood chips, mixing or layering carcasses with carbon material for the core of the windrow, and capping the mixture with a blanket of carbon material to promote decomposition of carcasses at elevated temperatures.

Based on Soil Contamination Caused by Emergency Bio-Reduction of Catastrophic Livestock Mortalities, chemicals from composting only migrated about 120 cm below the ground surface over the one-year composting period; therefore, composting is less likely to affect groundwater or surface water than deep burial. The above-referenced exposure assessment recommended the following mitigations when land-applying finished compost:

- Do not land-apply pesticide-contaminated compost

Page 76 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



- Till compost into soil
- Prevent runoff to surface water
- Revegetate immediately
- Test amended soil for heavy metals before allowing grazing

5. Ancillary activities (Incineration)

Storage in order to address situations where mortalities are generated more quickly than the carcasses can be managed, some means of temporary carcass storage must be provided. The carcass management SOP must address where carcasses can be collected and stored until disposal can commence. Similar to food waste, carcasses should be stored in such a manner that they do not constitute a fire, health or safety hazard or provide food or harborage for vectors; they must also be contained or bundled so as not to result in spillage.

All carcass waste material should be securely stored in a manner to prevent liquid leaching and access by scavengers. For example, mortalities can be placed on absorbent material or otherwise contained and covered with a secure tarp or additional absorbent material such as wood chips or shavings. Some planning considerations are listed below:

- Can the storage area be secured to prevent unauthorized access, scavengers, odors, rapid decomposition, and potential animal disease spread to susceptible species?
- Will the carcasses be stored using refrigeration or some other stabilization method such as grinding and preserving them in containers? If so, are the equipment, supplies and materials available to perform the selected method(s)?
- Will the storage capacity be sufficient to accommodate the difference between the maximum expected euthanasia (culling) rate and the maximum disposal rate? If not, avoid euthanizing (culled) animals at a rate that exceeds disposal and storage capacity. When maximum disposal and storage capacities are reached, curtail euthanasia (culling) until adequate capacity is available. Vaccination (for animal diseases where vaccination is possible) such as barrier vaccination or ring

Page 77 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



vaccination can be considered as a tool to slow or eliminate the need for euthanasia (culling).

- Can wastewater and storm water runoff be controlled from the storage site?
- Has a record-keeping system been outlined to identify and track all carcasses and other materials entering and exiting the storage site?
- Can the storage site be adequately cleaned and disinfected during and/or after the response?
- Can storage containers be made leak-resistant?
- Is there sufficient space for heavy equipment which may be needed to move large loads?
- What safeguards will be used to protect soil and groundwater from a release of leachate? Do the safeguards meet all applicable regulations?
- Will the storage method contain leachate, address pressure build-up, and avoid uncontrolled release of gases and pathogens?

Page 78 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Self-Check – 3	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. Define the Methods of carcass disposal? (5 points)
2. List the types of disposing site of euthanatized animals? (4pts)

Note: Satisfactory rating - 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 4 - Handling and moving animal carcass

Handling and disposing of animal carcass

Carcasses of animals that are euthanized by the appropriate authorities should be handled following the procedures below and utilizing the specified Personal Protective Equipment. Disposal should take into account regulations, disease control and drug residues. Once death has been confirmed the animal should be disposed of in accordance with the local and/or national regulations. These rules should be obtained from the local municipality or relevant animal health/ environment departments in advance and all operators should comply with the necessary procedures.

The steps of handling and disposing animal's carcass in safely:

1. Personal Protective Equipment - Heavy rubber or nitrile gloves, safety glasses or goggles and safety shoes should be worn when handling animal carcasses. Tyvek suits should be worn if blood or other fluids are present and likely to get on clothing or skin.
2. Use the designated shovel to pick up a road-killed animal. The shovel is spray painted orange, labeled as "Carcass Scoop" and stored in the LaPan Tool crib. Use this shovel only for road kills.
3. Confirm the animal is dead by prodding with a long-handled tool. Startling an injured animal can increase the potential for injury or contamination.
4. When animal carcasses are transported for disposal, care shall be taken to avoid contact and contain body fluids during transport as follows:
 - Small animal carcasses should be collected in plastic trash bags for disposal. The bag should be strong (greater than 4mil) to avoid puncture by the teeth, claws or broken bones of the carcass. By dropping the bag over the carcass, and grabbing the carcass through the bag, any possibility of personal contamination can be completely avoided. A shovel or other tool may be used to lift and push the carcass into the bags.
 - Seal the bag with a knot or twist tie to avoid contaminating the vehicle. Avoid throwing animals into the truck bed to minimize splashing.

Page 80 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



- Deer and other large carcasses should be wrapped in plastic sheets or tarps
5. The bag containing the carcass should be disposed of immediately in a campus trash dumpster.
 6. Gloves, tarps and any other materials should be bagged and disposed of
 7. The shovel, truck bed and any other contaminated non-disposable equipment should be disinfected using a 10% bleach solution. The shovel can be immersed in a bucket containing the solution and the solution can be sprayed or poured over the truck bed and any other surfaces. Contact the Custodial Supervisor to mix a fresh solution of 10% bleach. Nitrile/latex gloves and safety goggles should be worn while using the bleach solution.
 8. Hands should be washed well with soap and water after handling the carcass and after disinfecting equipment.

If you were bitten by an animal or had contact with the saliva or other fluids from an animal, DO NOT dispose of the carcass. Bag and save the carcass and refer to the Post Exposure Procedures, below.

The carcass should be sealed in a plastic bag, as the rabies virus can remain active for some time after death. The external surfaces of the carcass can remain infective for several hours after death, and the internal organs can remain infective for several weeks depending upon environmental temperature, so burial is not recommended. National or local regulations may require that the carcass, head or a sample of brain tissue are sent to a public health authority laboratory for testing and surveillance.

Page 81 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Self-Check – 4	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. What is the necessary material and vehicles available for euthanizing (7pts)?

Note: Satisfactory rating - 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 5 - Decontaminate, clean and store an equipment and materials

Introduction

After using equipment and material for animals euthanizing, equipment may be replaced and stored their first place. But before replace in the store part decontaminated and cleaning are an important.

A. Decontamination (Biosafety)

Decontamination is a term used to describe a process or treatment that renders a medical device, instrument, or environmental surface safe to handle. Sterilization, disinfection, and antisepsis are all forms of decontamination. All infectious materials and all contaminated equipment or apparatus should be decontaminated before being washed, stored, or discarded. Autoclaving is the preferred method. Each individual working with biohazardous material should be responsible for its proper handling.

Decontaminate level of equipment and material

The effectiveness of decontamination ranges from high-level sterilization to simple cleaning with soap and water. Levels of decontamination include:

- 1. Sterilization:** uses a physical or chemical procedure to destroy all microbial life, including highly resistant bacterial endospores.
- 2. Disinfection:** uses a liquid chemical to eliminate virtually all pathogenic microorganisms, with the exception of bacterial spores, on work surfaces and equipment. Effectiveness is influenced by the kinds and numbers of organisms, the amount of organic matter, and the object to be disinfected and chemical exposure time, temperature, and concentration.
- 3. Antisepsis:** is the application of a liquid antimicrobial chemical to skin or living tissue to inhibit or destroy microorganisms. It includes swabbing an injection site on a person or animal and hand washing with germicidal solutions. Manufacturer recommendations for appropriate use of germicides should always be followed.

Page 83 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



- 4. Cleaning:** uses water, detergent, and some mechanical action such as scrubbing with a gloved hand or brush. Cleaning is often a required step before sterilization or disinfection of inanimate objects because it removes all material such as soil or organic material and reduces the number of microorganisms on an object.

Methods of decontaminated

There are 4 main categories of physical and chemical means of decontamination:

A. Heat (Wet and dry)

i. Wet heat

Wet heat is the most dependable method of sterilization. Autoclaving, sometimes called steam sterilization, is the most convenient method of rapidly achieving destruction of all forms of microbial life. Autoclaves use saturated steam under pressure of approximately 15 pounds per square inch to achieve a chamber temperature of at least 250°F (121°C) for a prescribed time usually 30 – 60 minutes.

Typical uses: Autoclaving is a dependable method of sterilizing laboratory equipment and decontaminating biohazard wastes.

ii. Dry heat

Dry heat is less efficient than wet heat and requires longer times and/or higher temperatures to achieve sterilization. It is suitable for the destruction of viable organisms on impermeable non-organic surfaces such as glass, but it is not reliable in the presence of shallow layers of organic or inorganic materials which may act as insulation.

Typical uses: Sterilization of glassware by dry heat can usually be accomplished at 160°–170°C for periods of 2 to 4 hours.

Precautions: Monitor wet and dry heat sterilizers on a regular basis using appropriate biological indicators.

Page 84 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



B. Liquid disinfection

Liquid disinfectants can be generally classified as halogens, acids, alkalis, heavy metal salts, quaternary ammonium compounds, phenolic compounds, aldehydes, ketones, alcohols, and amines.

Liquid disinfectant effectiveness varies with the organism, concentration, contact time, and other conditions of use. Select only liquid disinfectants that are confirmed to be effective against the organism(s) present. No liquid disinfectant is equally useful or effective under all conditions and for all viable agents.

Typical uses: Liquid disinfectants are used for surface decontamination and, when used in sufficient concentration, as a decontaminate for liquid wastes prior to final disposal. Always use chemical disinfectants in accordance with labeled instructions. Do not use chemical disinfectants past the expiration date.

Precautions: The more chemically reactive a compound is, the more likely it is to be toxic and corrosive.

C. Vapors and gases

Vapors and gases, when used in closed systems and under controlled conditions of temperature and humidity, provide excellent disinfection. Agents in this category include the aerosol, vapor, or gas phase of chlorine dioxide, glutaraldehyde, paraformaldehyde, ethylene oxide, per acetic acid, and hydrogen peroxide.

Typical uses: Vapors and gases are primarily used to decontaminate biosafety cabinets, animal rooms, and their associated systems, bulky or stationary equipment not suited to liquid disinfectants, instruments or optics that might be damaged by other decontamination methods, and rooms, buildings, and associated air-handling systems.

D. Radiation

Ionizing: is the methods of destroy microorganisms but is not a practical tool for contaminated material use.

Page 85 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



Non-ionizing: the UV-C band of ultraviolet (UV) radiation contains wavelengths (250-270 nm, 265 is optimum) that effectively destroy most microorganisms in air and water and on surfaces. Organisms must be directly exposed to the UV light; dirt, dust, and shadows can shield organisms, limiting UV lamp effectiveness.

Typical uses: Ultraviolet radiation is typically used to reduce levels of airborne microorganisms and maintain good air hygiene in air locks, animal holding areas, ventilated cabinets, and laboratory rooms. UV is also used in biological safety cabinets (BSC) and in some laboratory rooms to reduce surface contamination.

Precautions: UV can cause burns to the eyes (photokeratitis) and skin of people exposed for even a short period of time.

Use these precautions:

- Activate UV lights only when the area is unoccupied.
- Use proper shielding when UV lamps are in use.
- Interlock UV lamps used for space decontamination with the general room or cabinet illumination, so turning on the lights turns off the UV.
- Warn new and visiting personnel about the hazardous effects of UV radiation and the appropriate precautions to take.

Maintenance

Because UV lamp intensity (its destructive power) decreases with time, proper maintenance is critical for decontamination purposes. Perform this regular maintenance:

- Check lamp efficiency monthly with a UV meter or monitoring strip.
- Clean UV lamps every few weeks to prevent dust and dirt from accumulating that drastically reduces UV lamp effectiveness.

B. Clean

Cleaning is the process of removing unwanted substances, such as dirt, infectious agents, and other impurities, from an object or environment. Cleaning occurs in many

Page 86 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



different contexts, and uses many different methods. Several occupations are devoted to cleaning.

C. Store

A place where goods are stay.

Pointers to follow in storing tools and equipment:

1. Have a designated place for each kind of tools.
2. Label the storage cabinet or place correctly for immediate finding.
3. Store them near the point of use.
4. Wash and dry properly before storing
5. Store knives properly when not in use with sharp edge down
6. Store all material and equipment's according to 'Kaizen' method.



Self-Check – 5	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. Define the term decontamination, cleaning and storing (4pts)?
2. List the types of decontamination techniques (3)?

Note: Satisfactory rating - 7 points Unsatisfactory - below 7 points

You can ask your teacher for the copy of the correct answers.

Page 88 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



Information Sheet 6 – Keep the records and report

Recording and reporting euthanized animals

I. Logging the event and dosage

Immediately after performing the euthanasia of each animal, the Euth-Tech shall ensure that the Euthanasia Log is noted with the event information. Date, time, operator; animal description (e.g. age, breed/type, sex, color, coat, size, weight, unique features); and animal history including the interval held, source location. The record that keeping including but not limited to:

- The date of the euthanasia
- The type of event
- A description of the animal euthanized
- The animal's identification number
- The reason the animal was selected for euthanasia
- The types of drug(s) administered
- The dosage administered
- The type of injection
- The dosage of drug waste (spillage) and
- The Euth-Tech responsible for performing the euthanasia.

II. Disposition of paper work

The Impoundment worksheet of each animal euthanized shall be marked with the following information:

- Species of the animal euthanized
- The weight of the animal
- The dosage of euthanasia drugs used
- The dosage of pre-euthanasia drugs (if used)
- The route of injection (IV, IP, or IC)
- The reason the animal was selected for euthanasia; and
- The Euth-Tech's signature or initials.

Page 89 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



The Impoundment worksheet and all other paperwork associated with the animal shall then be turned into the Receiving Office to be entered into the Center's animal database.

III. Physical Exam Checklist

Table 2: Physical Examination checklist

No	Organs examined	N	A	NE
1	Oral cavity/ teeth			
2	Mucous membranes			
3	Eyes			
4	Ears			
5	Cardiovascular			
6	Respiratory			
7	Gastrointestinal			
8	Musculoskeletal			
9	Lymph nodes			
10	Urogenital			
11	Integumentary			
12	Nervous system			
14	Pain			
15	Appearance/ Attitude			
		N= Normal	A= Abnormal	NA= Not Examined

Diet _____ Indoor _____ Outdoor _____
Pain _____ Body score _____

IV. Euthanasia Request

Page 90 of 98	Holeta Poly Technic College Author/Copyright	Animal health care service Level - IV	Version -1
			September, 2021



Animal Name: _____ Intake Date: _____
 Receiving # _____ Species: _____

☐ FELV+ ☐ FIV+ ☐ Unmanageable medical ☐ Unmanageable behavior

Reason for euthanasia:

Check all that apply:

Examined by:

☐ Shelter DVM _____ ☐ Other DVM _____
☐ Shelter CVT _____ ☐ Shelter staff _____

Consulted with:

☐ Shelter DVM _____ ☐ Other DVM _____
☐ Behavior specialist/trainer _____ ☐ other (specify) _____

Reviewed by Executive staff: ☐ yes ☐ no ☐ N/A
 Owner call requested: ☐ yes ☐ no ☐ N/A

If yes: Date: _____ Time: _____ Results: _____ Initials _____
 Date: _____ Time: _____ Results: _____ Initials _____
 Date: _____ Time: _____ Results: _____ Initials _____

Owner comments:

Euthanasia: Date: _____ **By:** _____



Self-Check – 6	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. Write the main contents that recorded during euthanized after conducting research (4pts).
2. Why record is necessary in euthanasia (2pts).

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points

You can ask your teacher for the copy of the correct answers.



Operation sheet 1: Sterilization of euthanized equipment and material

Objective: Sterilizing an euthanatized equipment and material

Materials: Autoclave, knife, needle, blade, euthanized syringe, plastic sheet, universal bottle and other.

To carry out an euthanized equipment and materials at all, **4 hours**

The step sterilizing euthanizing is indicated as follow:

1. Check the autoclave's drain screen.
2. Prepare research materials for sterilization.
3. Use secondary containment for all items being autoclaved.
4. Close the autoclave door securely.
5. Choose the correct cycle.
6. Set the appropriate time for sterilization and drying.
7. Start the autoclave.
8. Fill out the autoclave log.
9. Follow these precautions when the autoclave cycle is finished.



Operation sheet 2: Confirming euthanizing animals

Objective: confirming an euthanatized

Materials: thermometer, stethoscope,

To carry out an euthanized confirm at all, **3 hours**

Technique

1. Stand to the near side (left hand side of the horse), close to the horse to avoid being kicked. Make sure the horse knows you are there.
2. Lubricate the end of the thermometer with soapy water.
3. If using a mercury thermometer gently shake the mercury down to the bottom of the tube.
4. Lift the tail and gently insert the thermometer into the horse's rectum. Make sure the tip of the thermometer rests against the rectal wall (i.e. make sure it is not inserted into dung).
5. Hold the end of the thermometer to stop it disappearing up the rectum.
6. If you are using a mercury thermometer wait at least 60 seconds before removing the thermometer and reading it.
7. Electronic thermometers will 'beep' when an accurate reading is obtained.



LAP TEST	Performance Test
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Name..... ID..... Date.....

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **7** hour. The project is expected from each student to do it.

Time started: _____ Time finished: _____

Tasks-1: Sterilization of euthanized equipment and material

Tasks- 2: Confirming animals for euthanizing



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AKNOWLEDGEMENT

We wish to extend thanks and appreciation to the many representatives of TVET instructors and respective industry experts who donated their time and expertise to the development of this Teaching, Training and Learning Materials (TTLM).

We would like also to express our appreciation to the TVET instructors and respective industry experts of Oromia Regional State TVET Bureau, Holeta polytechnic College and the World Bank who made the development of this Teaching, Training and Learning Materials (TTLM) with required standards and quality possible.

Page 97 of 98	Holeta Poly Technic College	Animal health care service	Version -1
	Author/Copyright	Level - IV	September, 2021



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