

Animal health care service

NTQF Level - II

Learning Guide -03

Unit of Competence: - Carry out Sanitation and Waste Management Duties

Module Title: Carry out Sanitation and Waste Management Duties

LG Code: AGRAHC2M04LO3-LG- 03

TTLM Code: AGRAHC2 TTLM 1019v1

LO3: Carry out cleaning, disinfection and sterilization tools and equipment

Instruction Sheet	Learning Guide #-
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Clean, disinfect and sterilize tools and equipment
- Clean, disinfect and sterilize working areas and animal premises
- Foot baths and wheel bathes

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

- Clean, disinfect and sterilize tools and equipment
- Clean, disinfect and sterilize working areas and animal premises
- Foot baths and wheel bathes

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 2 to 36.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1 on page 6”
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #3.
7. Submit your accomplished Self-check. This will form part of your training portfolio

8. Read the information written in the “Information Sheets 2”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
9. Accomplish the “Self-check 2 on page 10”
10. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 2).
11. If you earned a satisfactory evaluation proceed to “Information Sheet 3”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #3.
12. Submit your accomplished Self-check. This will form part of your training portfolio
13. Read the information written in the “Information Sheets 3”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
14. Accomplish the “Self-check 3 on page 13”
15. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 3).
16. Submit your accomplished Self-check. This will form part of your training portfolio

Information sheet-1	Clean, disinfect and sterilize tools and equipments
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1. Clean, disinfect and sterilize equipments

When we consider anaesthetic equipment, we should know what level of disinfection or sterilization is required for a particular item. It is therefore imperative that we learn few definitions related to this subject.

1.1. Disinfection: describes a process that eliminates most disease-producing microorganisms except bacterial spores. In OT environment and for anaesthetic equipment, liquid chemicals or wet pasteurization are commonly used for disinfection.

Sterilization: describes a process that destroys or eliminates all forms of microbial life including bacterial spores ensuring acceptable level of sterility. Steam under pressure, dry heat, ethylene oxide (ETO) gas and hydrogen peroxide gas plasma are some of the methods available for this purpose.

High Level Disinfection (HLD): is a process that destroys fungi, viruses and vegetative bacteria, but not necessarily bacterial spores. Disinfectants like aldehydes, per acetic acid, and chlorine dioxide are used for this purpose and may produce sterilization with longer contact time.

Intermediate level disinfection (ILD): eliminates all pathogenic vegetative bacteria including Mycobacterium Tuberculosis, fungi and most viruses except some small viruses without envelopes and bacterial spores. Alcohol, sodium hypochlorite, phenols, and iodophors are often used for ILD.

Low Level Disinfection (LLD): kills some fungi, some viruses and most vegetative bacteria except M. Tuberculosis and endospores. Disinfectants such as alcohol and quaternary ammonium compounds are commonly used for LLD.

As far as anaesthetic equipment is concerned, only the items used for invasive procedures actually require sterilization whereas for most others decontamination or disinfection may suffice. For efficient disinfection or sterilization, the contaminated anaesthetic equipment and devices must be thoroughly cleaned.

Each cleaned item must be inspected and tested for smooth functioning and disassembled again before sending for sterilization so that all its surfaces can come in contact with the sterility.

1.2. STERILIZATION:

A particular medical device can be made sterile using physical or chemical procedures depending on its degree of contact with the patient. The chemical germicides formulated as sterilants and disinfectants should be used rationally.

Chemical disinfection and sterilization

This fast and technically easy to carry out method is suitable for equipment likely to get damaged by heat sterilization. Chemical sterilization is achieved by completely immersing equipment in disinfectant containing solution for varying period of time depending on the nature of the item to be disinfected or sterilized. The sterilants act on the exposed surfaces of the item. This type of sterilization is commonly used for endoscopes. However, disinfected items should be rinsed well to clear residual chemical which can cause irritation of the tissues. The major disadvantage of this method is inability to monitor the efficacy of the procedure which is done indirectly by surveying the patient outcome after subsequent use. Few of the most commonly used disinfectants are include alcohol, chlorine, hydrogen peroxide form aldehydes and etc.

1.3. Cleaning: The first step in decontamination is thorough cleaning of equipment which primarily is required to lower the bioburden before they are subjected to disinfection or sterilization.

Cleaning of dismantled equipment ensures there is no residue left on any of its parts by washing with cool water with an enzymatic cleaner and detergent. One should avoid water temperature to exceed 45°C to prevent coagulation of proteinaceous material as this forms protective layer for micro-organisms during disinfection or sterilization. Care should be taken in case of articles with lumen to prevent drying of material within it. If an item is not cleaned properly, despite sterilizing the item any residue left behind can hamper the smooth functioning of the device or can cause reaction in the patient with subsequent use.

Washing of devices should be undertaken in a special area away from anesthesia room and can be achieved using manual or automated methods. Developing countries still rely on purely manual reprocessing which consists of rinsing, disinfection, final rinsing, and drying. Washer disinfectors, low temperature steam or ultrasonic baths are available and when used will protect the staff from exposure to both chemicals and microorganisms. The floor, walls, and ceiling of work place should be regularly washed and cleaned with germicide. Whenever there are fluid spills contaminated with blood, the area should be treated with tuberculocidal germicide. It

would be ideal to have negative air pressure in this room and air from this area should be exhausted to outside.

Those involved in cleaning equipment should use gloves to protect themselves from injuries and infection.

Self-Check -1	Written Test
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Directions:

Write short answer for the following questions (5pnt each)

1. What is sterilization?
2. Write types of disinfection?

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

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

Name: _____ **IDN0:** _____

Score = _____

Rating: _____

Answer sheet:

Part one: Write short answer for the following questions (2.5pnt each)

1.
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2.
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Information sheet-2	Clean, disinfect and sterilize work areas and animal premises
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2.1 Clean, disinfect and sterilize work areas and animal premises

2.1.1. Instruction

The cleaning and disinfection (C&D) of equipment, materials, and premises is done to prevent or mitigate the spread of foreign animal diseases (FADs) during an outbreak. As part of a wider response, this helps to stabilize animal agriculture, the food supply, the economy, and to protect public health and the environment. This standard operating procedure (SOP) provides State Animal Health Officials, Animal and Plant Health Inspection Service (APHIS) personnel, and Incident Management Teams (IMTs) with guidance on choosing and using optimal C&D. Several key Animal and plant health inspection service (APHIS) documents complement this standard operating procedure (SOP) and provide further detail when necessary. This standard operating procedure (SOP) references

The following Animal and plant health inspection service (APHIS) documents:

•Foreign Animal Disease Preparedness and Response Plan (FAD PReP)/National Animal Health Emergency Management System (NAHEMS) Guidelines:

- Biosecurity
- Cleaning and disinfecting
- Disposal
- Health and Safety
- Personal Protective Equipment (PPE)
- Wildlife Management and Vector Control
- FAD PReP SOPs:
- Biosecurity
- Disposal
- Health and Safety & PPE.

2.1.2. Cleaning and Disinfection of work area

During foreign animal disease (FAD) outbreak, cleaning and disinfection (C&D) activities are conducted as a part of regular Biosecurity operations (e.g., to disinfect vehicles) as well as to cleaning and disinfecting (C&D) previously infected premises to prevent the spread of disease and move towards restocking. The latter of cleaning and disinfecting (C&D) of previously infected premises can also be termed virus elimination. Cleaning and disinfecting (C&D) is an effective means of lessening the threat of animal diseases by reducing the presence of pathogenic microorganisms and preventing the spread of disease agents. Cleaning and disinfecting (C&D) can involve the use of physical, chemical, or biological processes to remove, inactivate, reduce, or destroy pathogenic microorganisms. Selected cleaning and disinfecting (C&D) methods should account for the physical characteristics of the premises and other factors, such as environmental conditions, which may influence the effectiveness of virus elimination.

Virus elimination refers to the activities that are undertaken after depopulation and disposal on the premises, to return the premises to a “free” status. Cleaning and disinfecting (C&D) on the other hand, can refer to both activities conducted as part of Biosecurity operations (including movement controls), as well as the measures that are conducted during virus elimination procedures.

Cleaning: The removal of gross contamination, organic material, and debris from the premises or respective structures, via mechanical means like sweeping (dry cleaning) and/or the use of water and soap or detergent (wet cleaning). The goal is to minimize organic material so disinfection can be effective.

Disinfection: Methods used on surfaces to destroy or eliminate a specific species of infectious microorganism through physical (e.g., heat) or chemical (e.g., disinfectant) means. A combination of methods may be required.

Virus elimination: cleaning and disinfecting (C&D) measures conducted with the primary purpose to destroy or eliminate all viruses on the premises as cost effectively as possible.

The goals for cleaning and disinfecting (C&D) of work area and animal premises are:

- Remove, inactivate, reduce, or destroy viruses on Infected Premises.
- Conduct C&D/virus elimination activities in the most cost effective manner possible.
- Choose appropriate C&D/virus elimination methods, based on the characteristics of the premises/houses, temperature, and other relevant factors.
- Conduct timely and effective initial C&D on all areas of the premises that do not have contaminated material (this includes vehicles and equipment), prior to final virus elimination activities on the entire premises.
- Conduct final virus elimination procedures in a timely manner

The response goals for C&D are as follows:•

- Ensure that cleaning and disinfecting (C&D) is conducted on any premises where a disease agent is presumed or confirmed to exist within 48 hours of disposal of depopulated animals.
- Remove, inactivate, reduce, or destroy pathogens at infected premises

Self-Check -2	Written Test
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Directions:

Write short answer for the following questions (5pnt each)

1. List some of National Animal Health Emergency Management System (NAHEMS) Guidelines?
2. Define cleaning?

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

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

Name: _____ **IDN0:** _____

Score = _____ Rating: _____
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Answer sheet:

Part one: Write short answer for the following questions (2.5pnt each)

1.

2.

Information sheet-3	Foot baths and wheel baths
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3.1. Foot baths and wheel baths

Let us be very clear. Footbaths are used for prevention not treatment of active painful lesions. Lamé cows with heel warts must be identified through locomotion scoring and be individually examined. Topical antibiotic therapy with a light wrap is the mainstay of treatment.

Think of foot bathing feet for the control of heel warts similar to the use of teat dip for the control of contagious mastitis. It does not treat active infections, but it helps control the spread of infection from cow to cow. For that reason, in most free stall barns, footbaths must be used frequently – but there is farm to farm variation depending on hygiene.

The more manure contamination of the lower leg, the more frequently we must footbath. While some farms with excellent leg hygiene may use a footbath only once a week, others must footbath 5-7 days per week.

In herds with fewer than 25% of cows scoring a 3 or 4 score, foot bathing can be done as needed. Heel warts are rarely a problem. Conversely, where herds are >75% 3 and 4 scores, then foot bathing is probably a necessity 7 days per week.

Typically footbaths can be run twice a day, even in 3 times a day milked herds, BUT if the footbath is not in use, cows MUST be able to bypass it and not walk through a pit of manure. If there is no way around the bath – put something in it!

Cows appear to be more susceptible to heel wart infection in early lactation, so the final footbath frequency for groups within a herd can be manipulated.

For example, the close up group can be foot bathed once a week if we push cows through a bath at least twice. Early lactation cows should be foot bathed at the maximum recommended frequency determined by leg hygiene. Late lactation cows may be foot bathed at 50-75% of the target frequency in order to save on chemical costs.

Footbath Location and Design

Footbaths are frequently poorly designed and located. The best places for them appear to be in transfer lanes between the holding area and the pens and in the return lanes either side of the holding area. In return lanes, make sure that the bath is located two thirds of the way down away from the parlor so that cows do not create a jam leaving the milking area.

Twin baths are optional. If a wash bath is used it should be located 4-6 feet in front of the treatment bath. Wash baths immediately adjacent to treatment baths allow for carryover of wash solution into the treatment bath as the cows splash through – diluting the active concentration of chemical. The treatment bath should allow for at least a 5 inch depth of solution and be at least 8 feet long, preferably 10 feet. Width is determined by the width of the alley. The floor of the bath should not be excessively rough, but it should be non-slip.

Chemicals – Cleaning Agents vs. Disinfectants

Footbath solutions may help clean the foot of manure and disinfect the interdigital space. Do not confuse the two actions. Solutions of hand soap or rock salt are probably primarily cleaning agents – they loosen manure on the foot and allow oxygen to get to the interdigital space. They can be used in the footbath program, but should probably not be the only chemicals used.

Other chemicals are disinfectants. These are the traditional copper and zinc sulfates, formalin, quaternary ammonium compounds and a range of commercial products. Footbath programs should always contain one or more disinfectants.

In designing a footbath program, cleaning agents can be used for one third to half of the time, and then disinfectants can be used for the remainder.

Most chemicals are active for around 200 cow passes – formalin may last 300 cow passes, some chemicals last only 150 cow passes. Activity will also depend on the amount of manure contamination.

Self-Check -3	Written Test
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Directions:

Write short answer for the following questions (5pnt each)

1. Define foot bath?
2. Write importance of foot bath?

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

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

Name: _____ **IDN0:** _____

Score = _____

Rating: _____

Answer sheet:

Part one: Write short answer for the following questions (2.5pnt each)

1.

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2.

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Reference Materials

1. Best practice for cleaning, disinfection and sterilization in all health care setting, provisional infectious disease advisory committee (PIDAC), ministry of health and long term care, Ontario may 2013
2. Community Health Nursing Standards, Policies and Guidelines 2011
10-008