

# JOB ROLE – DAIRY FARMER-I

Sector – Agriculture

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Class XI<sup>th</sup>



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# **Unit 3 : Establishing Livestock Within Accommodation**

## **Session 2 : Safety Measures for Farm Workers and Disposal of Manure**

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# Session Objectives

In this session the students will learn about the :

- Safety measures for farm workers and disposal of manure
- Personal protective equipment (PPE) for dairy workers
- Common PPE used by the dairy workers
- Safety measures taken during farm activities
- Common problems and their remedial measures
- Collection of manure and washing
- Farm yard manure
- Composting
- Vermicomposting and its benefits and
- Organic mulch

# Introduction

In this session, we will discuss the personal protective equipment and measures for safety of farm workers and the preferable methods for disposal of manure.

# Safety Measures for Farm Workers and Disposal of Manure

- In well-managed dairy farms, dairy workers are protected from injury or impairment of any bodily function that might occur due to absorption or inhalation of harmful elements, or even by physical contact with diseased animals.

# Personal protective equipment (PPE) for dairy workers

- The dairy workers wear protective clothing and adequate protective equipment while carrying out day-to-day operations.
- Risks during animal handling, feeding or milking or other routine operations can be minimized by using personal protective equipment (PPE) by the farm workers.

## Common PPE used by the dairy workers

**Gloves:** It helps to protect the hands from contact with hazardous substances, hot or cold surfaces, stings, rough textures or sharp tools

**Safety shoes or boots:** These are used in dairy farms for various routine farm activities. Gumboots protect the toes and legs of the farm workers from injuries by being stampeded by animals. Gumboots also provide protection from snake bites, slippery surfaces, sharp item penetration, water penetration, etc.

**Goggles:** They protect the eyes from dust and straw particles and fumes. They are used during weeding, welding, cutting and while working in the workshop

**Earplugs and earmuffs :** They protect the farm workers from high noise levels emitted from machines, such as chainsaws, or animals, such as pigs, when housed.

**Face protection :** It is used while welding, to protect the eyes, nose and mouth from fumes, heat and stray metal. Face protection must also be worn while mixing, spraying or applying chemicals or using solvents, and also while grinding metal or cutting timber.

**Hard hats:** These help prevent injuries from falling objects.

**Breathing apparatus :** This is particularly needed when working in confined spaces such as in silos. Both the dairy owner and the workers must wear all necessary and prescribed protective clothing and equipment while operating machines as per manufacturer specifications.



# Safety measures during farm activities

- (i) Always read instructions on labels of chemicals, pesticides, fumigants or disinfectants before use.
- (ii) Use chemicals as prescribed by the manufacturer.
- (iii) Use protective clothing as specified by the manufacturer while handling chemicals.
- (iv) Dispose off chemical containers and medical waste appropriately to minimize environmental damage.

(v) Take immediate medical help or assistance in case of accidents due to chemicals.

(vi) Keep necessary emergency equipment and first aid accessible as per manufacturer's specifications while handling chemicals.

(vii) Chemicals are always kept away from children and animals.

**The risks associated with the dairy workers and farmers are as follows :**

(i) Transmission of diseases

(ii) Problems related to the handling of animals

# Common problems at a dairy farm and their remedial measures

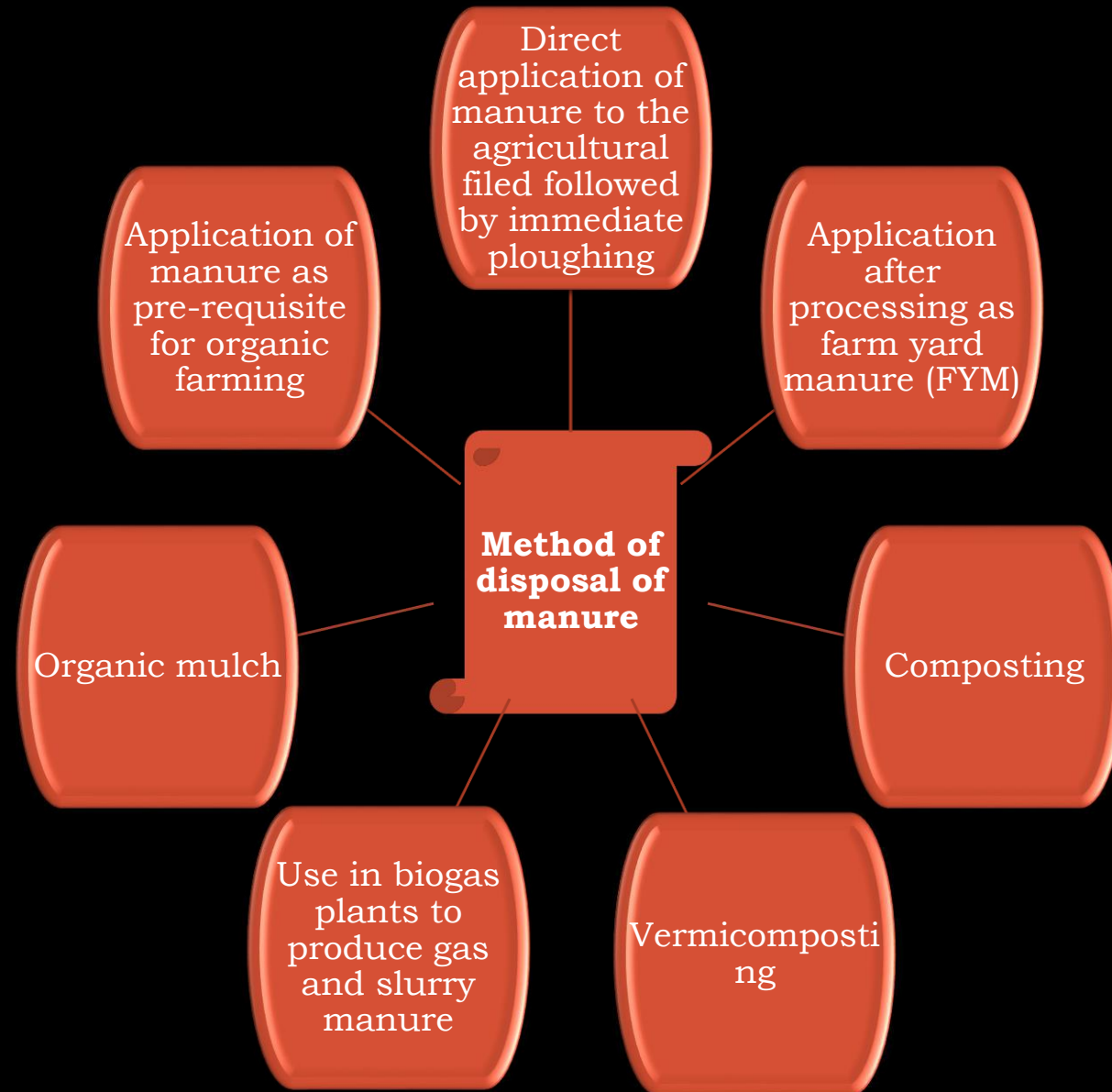
Common problem	Remedial measures
Damage to clothing	Wear comfortable overalls without lengthy projections that can be trapped. Wear industrial shoes or water-proof footwear
Burns and scalds	Wear hair covering. Wear gloves when handling items containing hot items, toxicants, etc.
Dust inhalations	Wear face masks to filter out dust
Cut at fingers, wrists	Wear gloves

# Collection of manure and washing

- Manure is the breeding place for a large number of pathogens. For its management solid manure is usually collected and removed from the animal shed twice daily and flushing of the floor of the animal house.
- In other conditions, manure is removed from the animal house by flushing out both liquid and solid manure with water pressure by the hosepipe.
- Solid waste from livestock farm is dumped in the manure pit.
- These wastes are gradually changed into manure by the bacterial activity after few months.

- The manure pit should be about 100 meters away from the animal shed and other buildings to avoid foul smell originating from the manure pit. Manure pits should be easily accessible from different parts of the farm.
- It should be away from the water source. A roof may be provided over the pit to protect it from rain.
- Liquid manure and washing run out by the shallow drain located longitudinally to the long axis of the shed which is further divided into subdrains.
- Main drain finally connected to the liquid manure storage tank or the same can be treated by effluent treatment plant. The treated water can be reused for agricultural purposes.

# Method of disposal of manure



# Utilization of Manure

There are various methods for handling and treating animal waste. Methods that are available for applying animal excreta into the soil include there are various methods for handling and treating animal waste. Methods that are available for applying animal excreta into the soil include;

- i. Farm yard manure (FYM)
- ii. Conversion into compost
- iii. Vermicomposting
- iv. As a feed stock in biogas plants to produce gas and slurry manure.
- v. Organic mulch: A layer of organic material designed to protect exposed soil or freshly seeded areas from erosion by eliminating direct impact of precipitation and slowing overland flows.

- i. **Farm Yard Manure (FYM)** : The FYM is the decomposed mixture of dung and urine of farm animals along with litter, left over feed and fodder fed to the animals. A well decomposed FYM contains 0.7-1.3% N, 0.3-0.8%  $P_2O_5$  and 0.4-1.0%  $K_2O$  on dry weight basis. However, composition depends on the type of animals, its ration, age, species, etc.
- ii. **Composting** : Composting is a natural process in which organic matter is decomposed by microorganisms. This process is in practice for centuries by farmers who stock dung into piles or in pits (Photo 5.5). Composting can be either aerobic or anaerobic. The advantages of aerobic decomposing are shorter stabilization time, no foul smell and destruction of weeds and pathogens. During composting, temperatures can reach 150°F. Most pathogens that are harmful to humans can be destroyed at 131°F or higher.



**iii. Vermi-composting :** The term vermi-composting means the use of earthworms for composting organic residues. Vermi-composting is the process by which earthworms are used to convert organic materials (usually wastes) into humus-like material. The goal is to process the farm waste as quickly and efficiently as possible. Earthworms can consume practically all kinds of organic matter and eat their own body weight per day, e.g. 1 kg of worms can consume 1 kg of residues every day. Vermi-compost is nothing but the excreta of earthworms, which is rich in humus and nutrients



Vermicompost

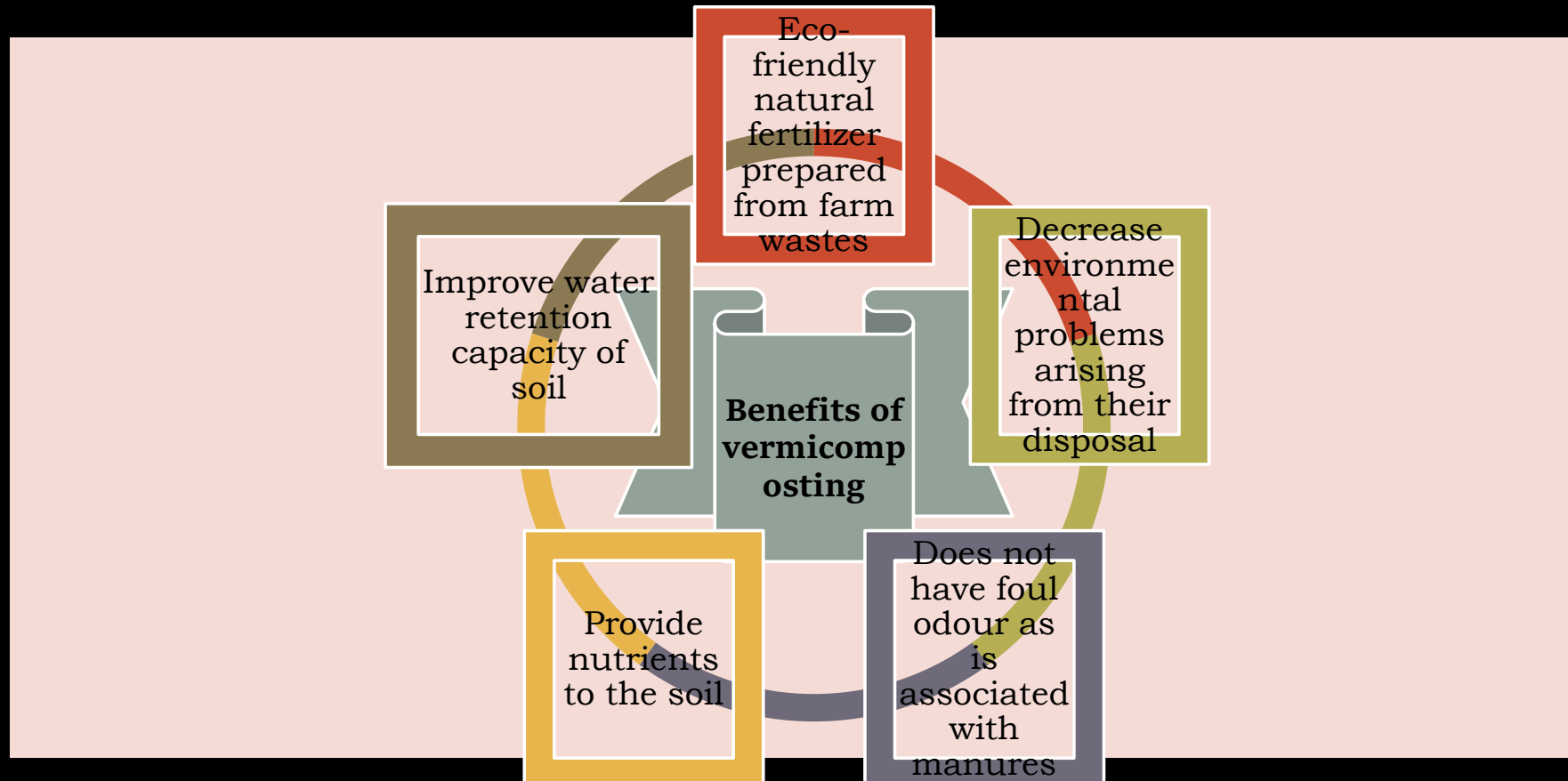


Earthworms used for  
vermicomposting



Manure

- The excreta (castings) are rich in various soil nutrients like nitrogen, potassium, phosphorus, calcium and magnesium. Castings contain: 5 times the available nitrogen, 7 times the available potassium and 1½ times more calcium than found in good topsoil. *Eisenia foetida* and *Lumbricus rubellus* (red worm) species of earthworms are commonly used for vermi-composting. Earthworms not only convert garbage into valuable manure but keep the environment healthy.



#### **iv. As a feed stock in biogas plants to produce gas and slurry manure**

- 1 kg of cattle dung produces about  $.073\text{m}^3$  ( $1.3\text{ ft}^3$ ) of biogas at atmospheric pressure. The availability of dung from a medium size cow is approximately 10 kg per day. the smallest plant producing  $1.7\text{ m}^3$  ( $60\text{ ft}^3$ ) of biogas, waste from at least 5 head of cattle is necessary.
- Biogas ( $1.7\text{ m}^3$ ) produced from this small plant is considered sufficient to meet the cooking and lighting needs of a family of four. Two products are obtained from the plant, biogas and fermented slurry.

- Biogas is non-poisonous, with a characteristic odour, which disappears on burning. When mixed with air, it burns with a non-luminous blue flame without producing any smoke. It has a very low level of inflammability.
- Biogas is used for household cooking, lighting and power. Special lamps are available for lighting where biogas can be used. For a 100 candle power mantle lamp, approximately  $0.13 \text{ m}^3$  ( $4.5 \text{ ft}^3$ ) fuel gas is required per hour

**v. Organic mulch :** Mulch is a layer of material applied to the soil surface. It reduces water loss by reducing evaporation from the soil. Mulch also keeps the soil cooler, reduces weed growth, reduces run-off and reduces erosion

- Manure can be used as mulch but are best mixed with other mulches, especially if the manure is fresh. Like compost, manure decomposes rapidly, so it needs frequent replenishment.

# Summary

- In this session the students have learnt about :

Safety measures for farm workers and disposal of manure

- Personal protective equipment (PPE) for dairy workers
- Common PPE used by the dairy workers
- Safety measures taken during farm activities
- Common problems and their remedial measures
- Collection of manure and washing
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