

FARM STRUCTURES & HOUSING

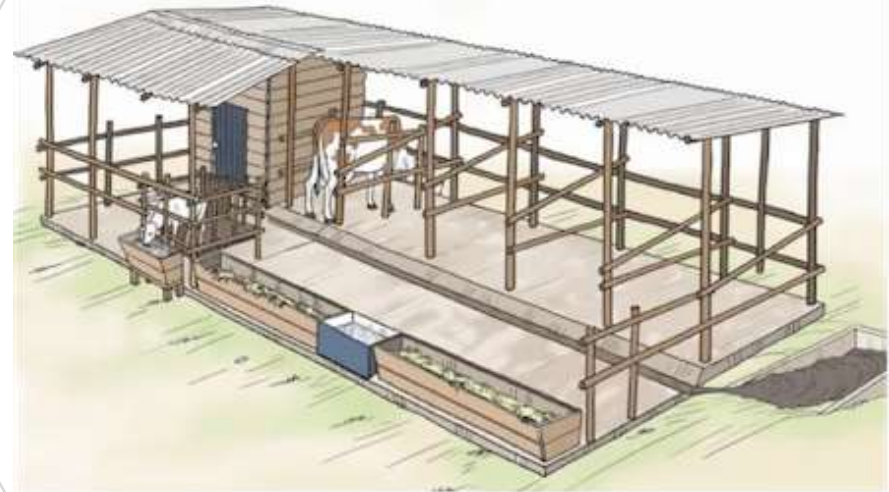
COWS/CALVES/YOUNG STOCK (Level 1)

Topic	Training & information Content
8.1	Farm structures & housing cows/calves/young stock
8.2	Construct small zero grazing unit (SNV handbook)
8.3	Prevention of heat stress in cow barns
8.4	Cow house ground floor plan design (SNV book)
8.5	Best management practice feed fences
8.6	Housing & cow comfort (animal welfare)
8.7	Housing & reduction greenhouse emissions
8.8	Use of sensors (activity meter) in dairy herds



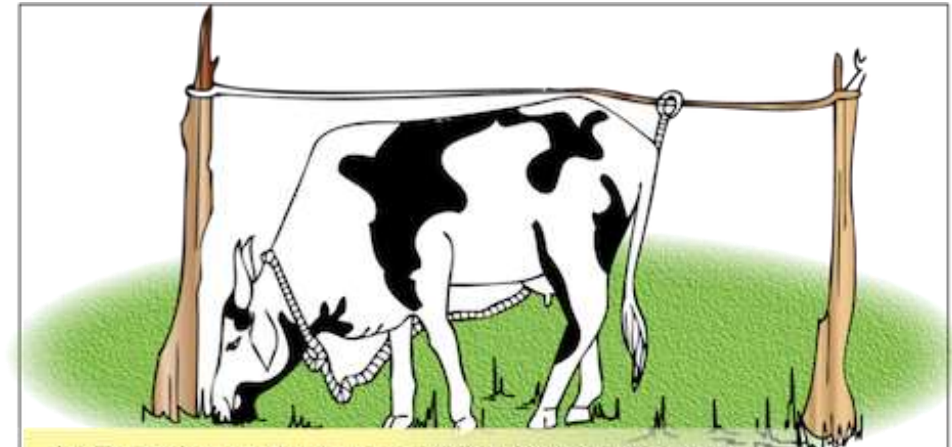
1. You will learn about (learning objectives):

- Types of farm structures in a dairy farm.
- Factors influencing the designs of farm structures.

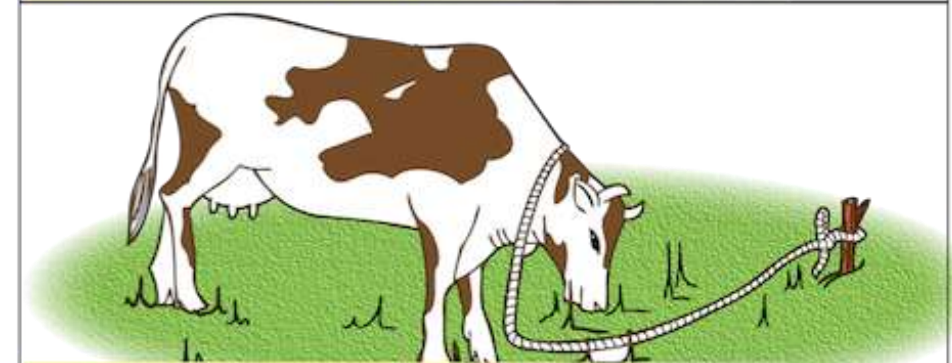


2. Background

- Traditionally, a cow was grazed in the fields and rested under shades of trees.
- Cows could graze freely or tied with ropes and restrained on a selected area.
- Recently for commercial dairy farming systems, cows are restrained in systems known as zero-grazing, semi zero-grazing or in paddocks.



(a) Tethering method using sliding knot on the neck



(b) Cow tethered to a peg to graze

2.1 Background Cont'd...

- A cow barn is a structure that houses all groups of dairy animals and has several sections.
- A dairy farm also has other structures, i.e;
 - Milk storage room,
 - Farm offices and staff housing,
 - Farm stores; feed silos, silage bunkers etc.
 - Manure storage e.g. biogas structure.
 - Crush and chute,
 - Dip and spray race, and
 - Ideally an individual box for hoof trimming.



3. Different units in cow housing: grouping cattle

Different cows are grouped by considering;

- Their gender; females separated males.
- Age of the cows; young stock separated from mature cows.
- The stages of lactations, production levels, and size/weight of the cows.
- Health; Sick cows separated the rest of healthy herd.



3.1 Grouping cattle Cont'd...

Cattle in a farm can be grouped into;

- i. Cows in different lactation stages (early, mid & late lactation stages)
- ii. Dry cows (Far off/Close up)
- iii. Maternity (calving area)
- iv. Newborn and calves (age 0 – 3 months)
- v. Female young stock (weaners, age 4 -7 months)
- vi. Female young stock (age 8 – 11 months)
- vii. Bulling/unmated Heifers (age 12 – 15 months)
- viii. Mated heifers (age 16 – 19 months)
- ix. Pregnant heifers (age 20 months – delivery)
- x. Breeding bull(s)
- xi. Sick cows and new cows (quarantine).



4. Important natural behaviours of cows

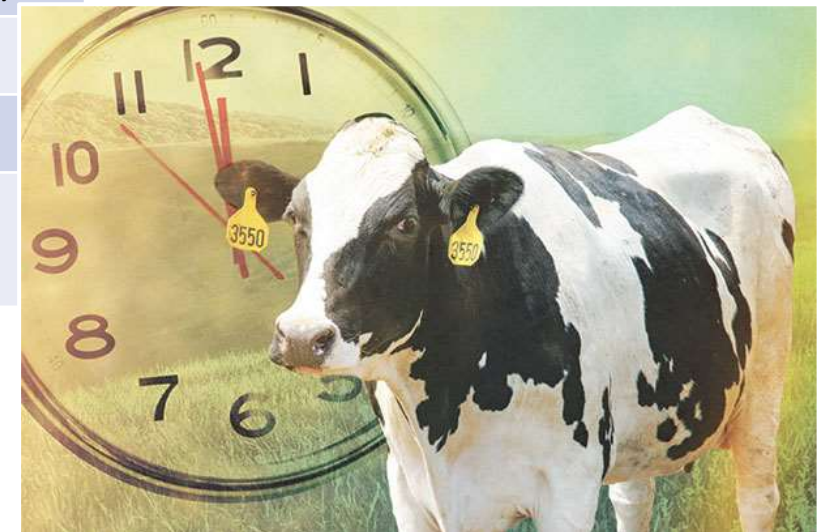
- The natural environment for a cow is grazing in grassland.
- When providing structures and cow housing, ensure the cow is comfortable with enough space to express her natural behaviors, e.g. ;
 - Heat during estrus cycles,
 - Grooming each other,
 - Other social interactions to determine ranking orders.



4.1 Important natural behaviours of cows Cont'd...

Activities of lactating cows in a 24 hours period in a cow barn

No.	Activity	Average time devoted to activity per day
1.	Eating	3-5 hours (9-14 times per day)
2.	Ruminating (chewing cuds)	7-10 hours
3.	Drinking water	30 minutes (6-10 times a day)
4.	Resting/lying down	12-14 hours
5.	Social interaction	2-3 hours
6.	Outside pen (Milking, walking time, etc.)	1.5 hours-3.5hours



5. Basic requirements of a cow house

Considered the following cow basic requirements while housing them;

- Provide adequate space
- Access to and availability of feed and water,
- A cow house/barn with enough fresh air (ventilation) and light,
- The barns should be clean and safe.



6. Cow barn design

- There are different systems to accommodate dairy cows; of which (i) free stall (cubicles), (ii) loose housing and (iii) tie-stalls are the most common.



Free stalls system (Cubicles)

- Has several sections but well separated.
- Has the following main sections;
 - i. Feeding area
 - ii. Walking area/alley (in the middle of the barn)
 - iii. Cubicles (resting area)



Loose housing system

- Cows are allowed to move freely over the whole barn except for milking and treatment areas.
- Cows have a large resting area with soft bedding.



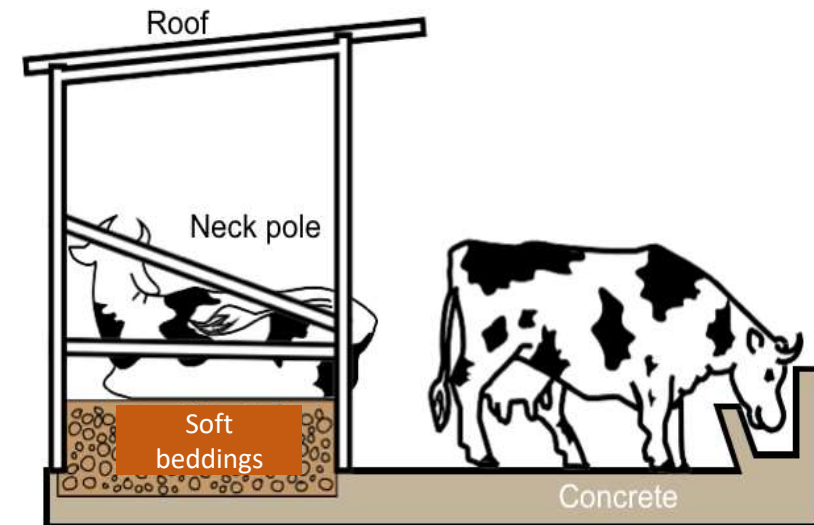
Tie-stall design

- This design restrains cows in one cubicle where they both eat and rest.
- The tie-stall design provides the least cow comfort because animals are restrained.
- Restraining may have the cows develop lameness and chain injuries in the neck.

7. Recommended housing: Free stalls

- In this module, the free stall/cubicles system is recommended as the most appropriate design for the Eastern Africa situation.
 - It gives the highest level of cow comfort.
 - Cows are cleaner, with lower incidence of diseases and injuries.

Side elevation of a cubicle dairy cattle shed



Resting and sleeping

Walking and manuring

8. Young stock housing: Housing heifers

- Heifers are female youngstock that are ready to be served/mated or already mated.
- The mated heifers should be housed in structures that are similar to lactating cows, but smaller.
- This is so that they get used to the housing system prior to joining the lactating cows after first calving.



9. Young stock housing: Housing females between 6-12 months

- This group's stage/age is after the weaning stage and before the breeding stage.
- This category of heifers are mostly housed in a loose housing system or in some cases cubicles systems.



10. Young stock housing: Housing Newborns and Calves

- Newborns and calves are not housed in groups, instead in individual pens under the same roof.
- The calf pens are constructed next to each other such that calves can see the other calves but with enough space in between to avoid physical contact with the other calves.



11. Maternity barn

- Adequate space in group maternity pens allows cows to isolate themselves during calving.
- Best maternity management practices are essential.
- Provide fresh, dry bedding to maintain hygiene.
- Provide at least one stall per cow.



12. The milking parlour

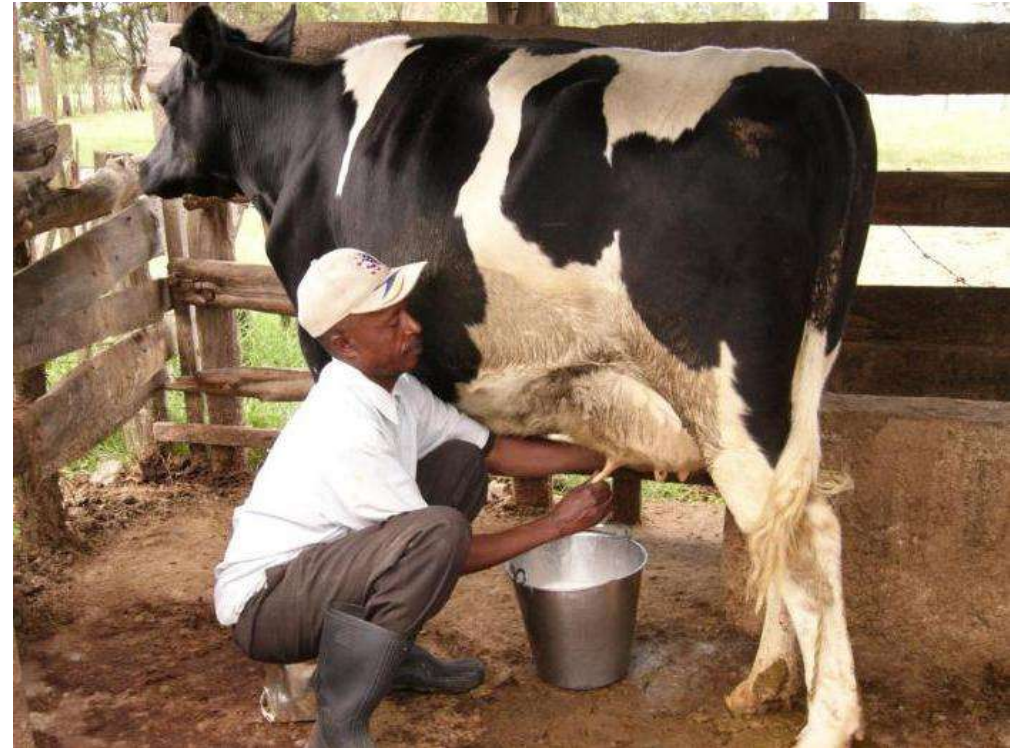
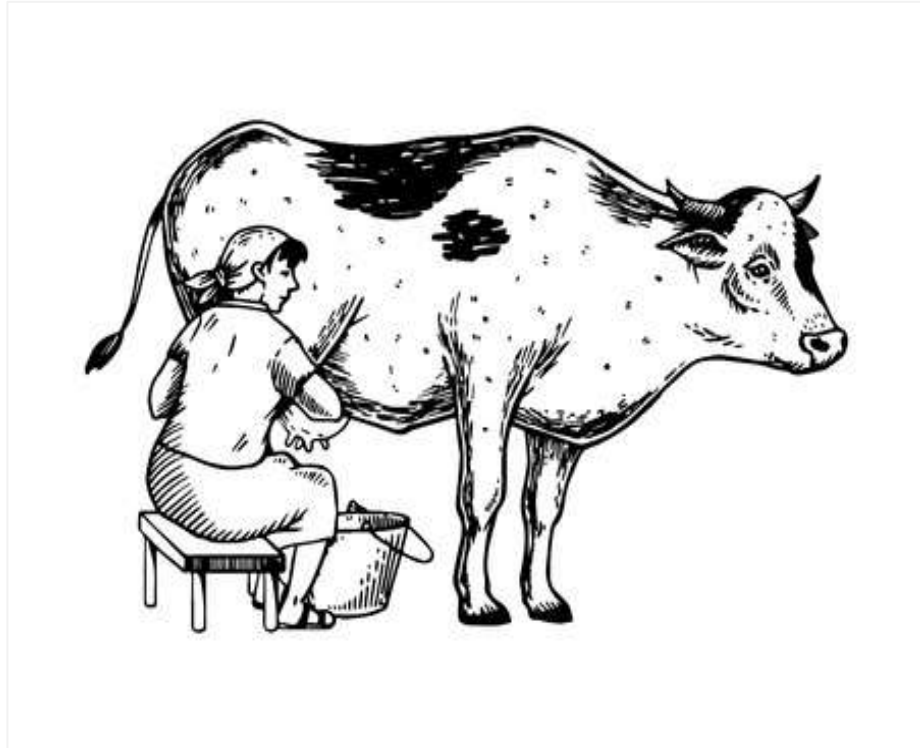
- A milking parlor is where cows are milked on a dairy farm.
- It should be located near the lactating cows.
- The flow of cows to and from the milking parlour should be managed and well designed to ensure a smooth flow of cows.



Photo courtesy: Magana Dairy Farm

13. Hand milking versus machine milking

- For few milking cows, hand milking is the most economical milking technique.
- When the number of cows increase, the farmer may use a movable or a permanent bucket machine milking.
- A milking parlour for hand and bucket milking requires that both the milker and cow are comfortable during the milking process.



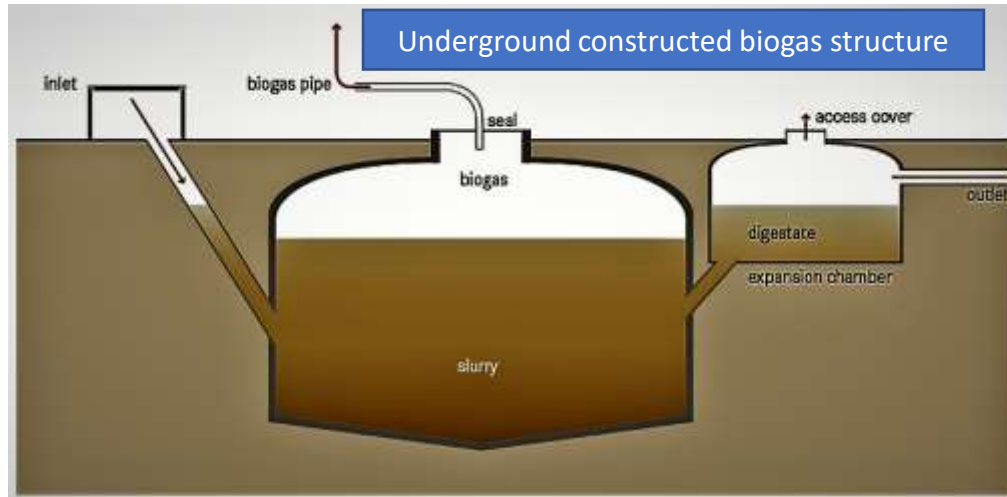
14. Manure storing structures

- Manure storage options include stockpiling, dry stack, composting, liquid storage or hauling away.
- The type of storage structure used depends on the physical consistency of the manure to be stored and whether manure treatment is a part of the manure management system.



15. Biogas structures

- Biogas can be used on the farm to save on other energy sources. It is a by-product of manure.
- The biogas structures are constructed just near the cow barn.
- Types of biogas structures; an underground structure and on the ground structure.



16. Biosecurity structures: Foot bath

- Biosecurity structures are focused on reduction or prevention of introducing new diseases from outside sources, including infectious diseases onto the farm.
- Types of structures; footbaths and sick-bay/isolation barns.
- Install footbaths in areas where the cows and people pass through them such as the entrances and exits of every section in a dairy farm.
- Footbaths have solutions that disinfect the animals and people passing through them.



17. Biosecurity structures: Sick-bay and quarantine barns

- The best solution to prevent newly acquired animals introducing diseases into the farm is through hosting them in a quarantine facility.
- Quarantine consists separation of specific groups of animals to prevent transmission of infectious diseases.
- Sick cows should be separated from the rest of the herd to prevent spread of diseases and monitor them closely.



18. Cattle crush

- Cows have to be constrained during routine operations such as recording, vaccination, ear tagging, weighing and animal health/veterinary procedures.
- A cow's crush holds the animal immobilised to minimise the risk of injury to both the animal and the handler.



19. Farm store facilities

- An efficient and effective feed storage and handling system is vital to any modern dairy farm.

Types of farm stores

- i. The fodder chopping and feed mixing area,
- ii. Dry feed material stores such as haylage, supplements and concentrate,
- iii. Silage bunkers/silos,
- iv. Drug and insemination materials stores,
- v. Other farm equipment storage such as farm machinery.



20. Silage storage structures

- Silage are stored in structures called bunker silos.
- The floor should be concrete or have some impervious material to keep the silage clean.
- The chopped plant materials are spread in even layers on the floor. As the pile gets taller, heavy tractors or payloaders are driven across the top to tightly pack the material.
- When the bunker is full, a large sheet of plastic is used to cover the exposed top surface.



21. Dairy farm fence structures

- The most effective and long lasting fences have correct layout and built with appropriate material and construction. The cost of a properly built fence often returns its value in a short time.
- Physical fencing is typically for long term use.
- Some fencing can be more expensive than other types.



22. Farm offices

- A commercial dairy farm has a farm office to oversee and report all the daily activities on the farm.

