

JOB ROLE – DAIRY FARMER-I

Sector – Agriculture

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Class XIth



PSS Central Institute of Vocational Education
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Unit 4 : Providing Feed and Water for Livestock

Session 3 : Equipment used in chaffing of green fodder

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Session Objectives

- In this session the students will learn about the :
 - Equipment used in chaffing of green fodder
 - Basic equipment/machines required for the preparation of concentrate mixture
 - Maintenance of equipment/machinery
 - Preparation of feed at the farm
 - Steps in preparing concentrate mixture at farm level
 - Maintaining feed inventory
 - Benefits of concentrate mixture prepared at the farm
 - Procurement, checking and receiving of animal feed
 - Storage of animal feed
 - Common structure for storage of feedstuff

Introduction

- Preparation of animal feed is a very important step which has to be done with utmost care and scientifically.
- Dry fodder like wheat straw can be fed to the animals as such without any preparation and therefore does not require machines.
- Green fodder requires chaffing before feeding to the animals

Equipment used in chaffing of green fodder

- Chaff cutter is used to chaff the green fodder, which cuts the fodder into very small pieces.
- Chaffed fodder is more palatable and reduces fodder wastage from the manger.
- Two types of chaff cutter are available in the market—manual and electrically operated.



Electrically operated chaff cutter

Basic equipment/machines required for the preparation of concentrate mixture

- Concentrate is the mixture of various feed ingredients, and can be prepared in the farm itself
- Feed ingredients like grains, cake flakes are grounded with the help of a feed grinder to get a uniform mixture of feed items.
- Afterwards, all the feed ingredients and feed supplements are added and mixed as per the feed formula.
- Mixing can be done manually on the mixing floor or through an electrically operated mixer.



Feed Grinder



Feed Mixer

Maintenance of equipment/machinery

- Machines are cleaned regularly and kept in safe and working condition.
- The different devices used in the manufacture of feed and feed ingredients are periodically tested for accuracy.
- Records of all maintenance works carried out on equipment and machinery are kept for future reference.

- **Preparation of feed at the farm**
- **Ingredients used for preparation of concentrate mixture**
- In order to get a balanced feed, different feed ingredients are mixed in suitable proportion
- This type of mixture is known as concentrate mixture or compound cattle feed.
- The composition of cattle feed depends on the type of animals, milk production, season, etc.
- This concentrate mixture is fed to the animals along with roughages (green and/or dry).

Various feed items included in the concentrate mixture

Grains	Maize, sorghum, wheat, oat, barley, millets, etc.
Brans	Rice bran, wheat bran, de-oiled rice bran, rice polish
Oil cakes	Cakes of mustard, cotton seed, groundnut, soybean, rapeseed, sunflower, linseed
Animal protein source	Fish meal, bone meal, meat meal
Chunies	Moong, arhar, gram, guar, tur and other locally available pulses
Agro-industrial byproducts	Molasses, tamarind seed powder, tapioca waste, etc.
Minerals and vitamins	Mineral mixture, di-calcium phosphate, common salt, vitamin A, D ₃ and E

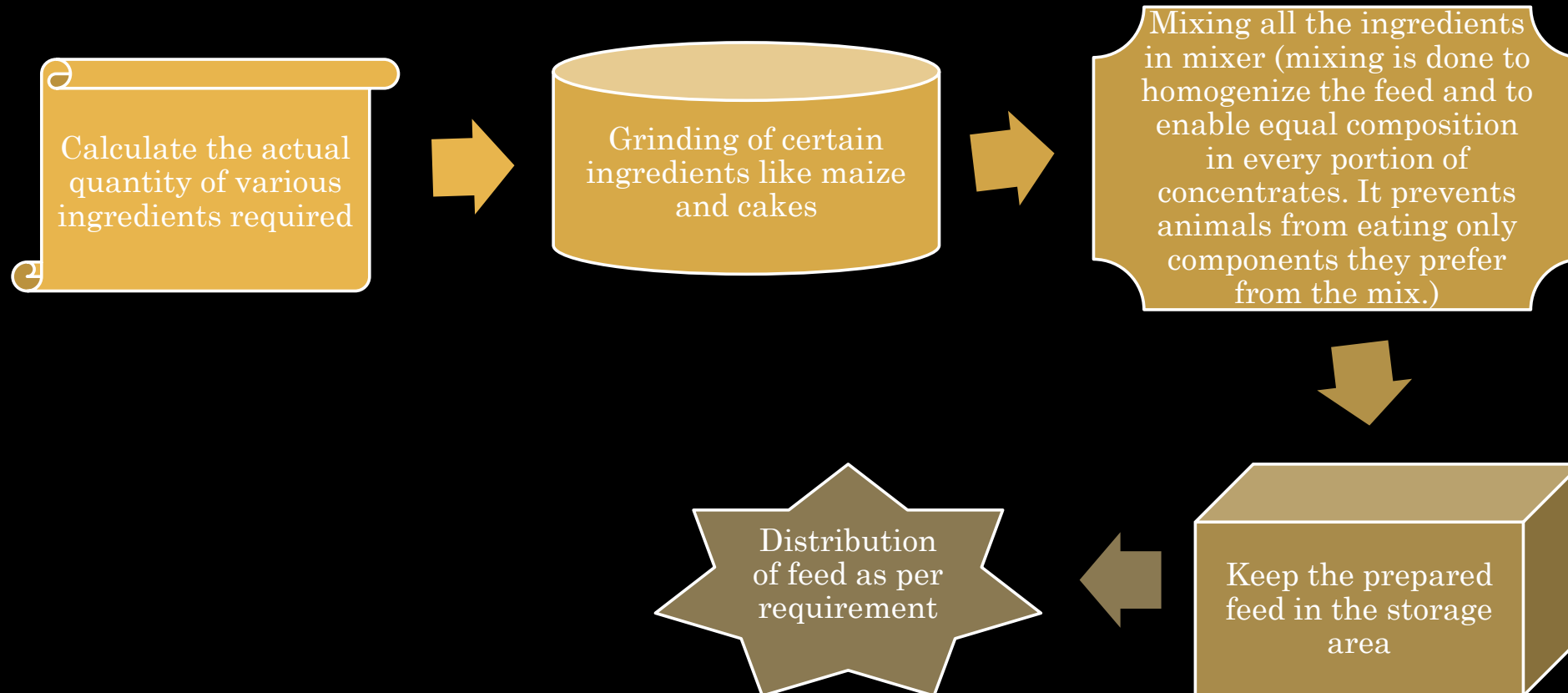
Composition of concentrate mixture

- Animal feed alone accounts for about 70 per cent of the total cost of milk production
- Balanced and economical feeding of dairy animals plays a pivotal role in successful dairy farming.
- Good quality animal ration is balanced in all nutrients and simultaneously economical.
- The proportion of ingredients to be incorporated in the ration are selected on the basis of their prices in particular seasons

Usual proportion of various ingredients in daily concentrate mixtures

Ingredients	Proportion
Grain	35-40
Oil cakes	32-35
Agricultural by-products (brans, chunies, agro-industrial byproducts, etc.)	25-28
Mineral mixture and vitamins	2
Salt	1
Total	100

Steps in preparing concentrate mixture at farm level



Precautions taken during concentrate mixture preparation

- (i) Grind maize and other grains shortly before use.
- (ii) The grinding process releases the oils in the germs of the grains which are grinded for preparation of concentrate mixture. The released oil contains poly-unsaturated fats and some amount of natural antioxidants. Rancidity can occur within days or weeks after grinding, necessitating inclusion of ground grain in the concentrate mixture only at the time of feeding to the animals.
- (iii) Separate storage areas for raw material and finished products are provided to prevent cross contamination.

- (iv) The feed is kept dry (less than 12 per cent) to prevent fungal or bacterial growth.
- (v) Store feed in closed bags in a cool dry place.
- (vi) Prevent rodent and insect infestation.
- (vii) Stock inventory is properly managed to ensure that neither raw material nor finished feeds deteriorate prior to use or during storage.

Maintaining feed inventory

- Periodic actual counting of different feed items in storage area is termed as feed inventory.
- As already explained, the feed cost is one of the largest expenditure in dairy farming.
- Careful monitoring of feed inventory helps the dairy entrepreneur in controlling the feed costs and maximizing profitability
- Feed inventory is a valuable tool for determining available feed supply and estimating future needs of total feedstuff for the herd.
- The inventory is adjusted for losses caused on account of storage and losses during feeding animals

A sample feed inventory

S.N.	Date of receipt of feed	Source/ supplier of feed	Description	Quantity	Storage area	Sampled (yes/no)	Signature of the person handling the feed

Benefits of concentrate mixture prepared at the farm

- Underfeeding of animals can lead to low productivity and poor health condition
- Overfeeding causes loss of nutrients and increased expenditure on feed. Hence, animals are fed as per their exact feed requirement.
- Many dairy entrepreneurs choose to manufacture concentrate mixture at the farm itself to control feed costs.
- In order to produce concentrate mixture of high quality, good quality feed ingredients are purchased from the market and concentrate mixture is prepared as per the feed formulation formula.

- Farmers often have little or no control over the quality of feeds that they purchase from the market
- The use of sub-standard feed ingredients results in low production and poor returns to the farmer.
- In many instances, adulterants are used in the concentrate procured from the market to satisfy the laboratory testing.
- Farm-made concentrate mixture is a cheaper option compared to the concentrate mixtures available in the market.

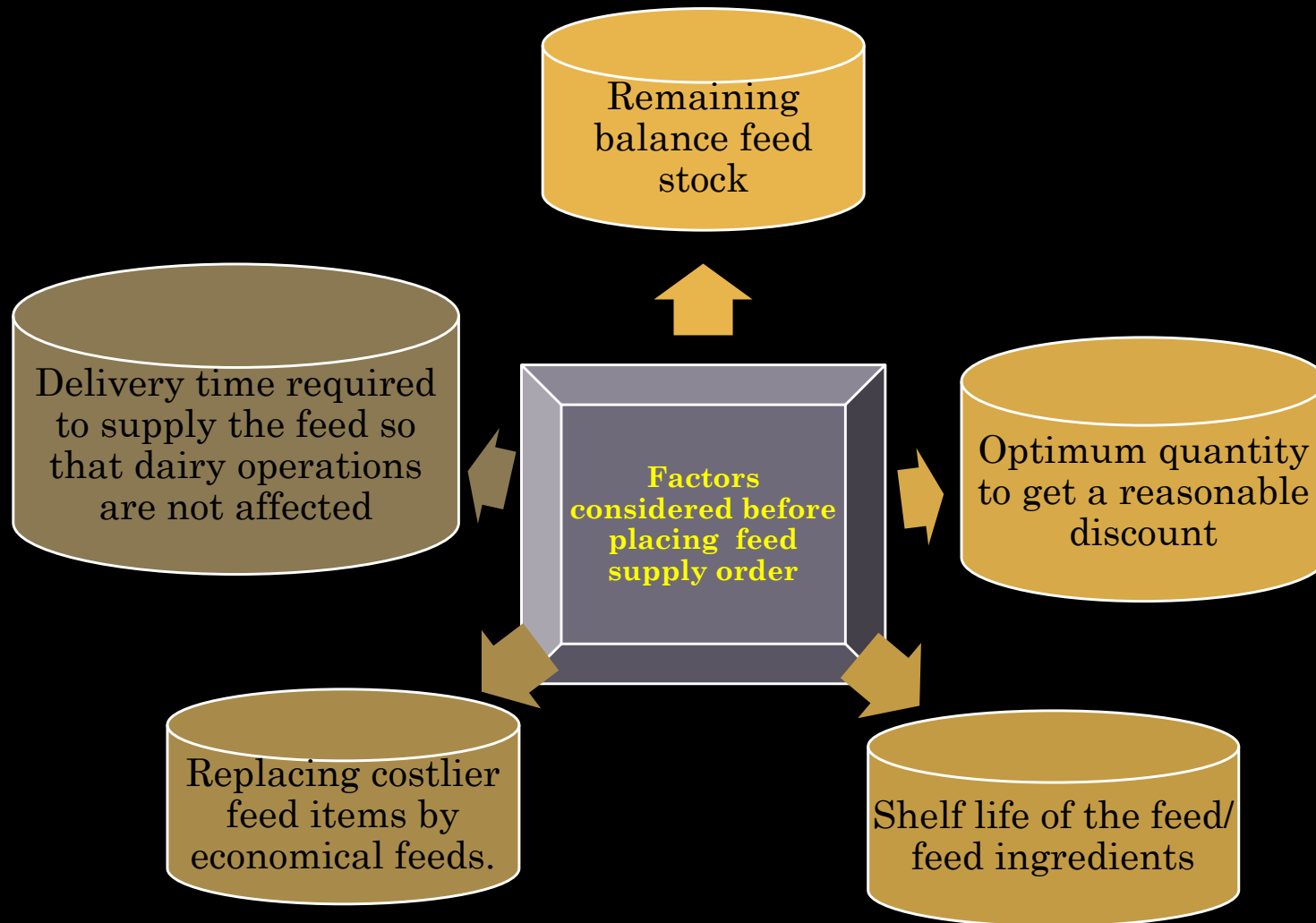
Procurement, checking and receiving of animal feed

The following factors are given due consideration.

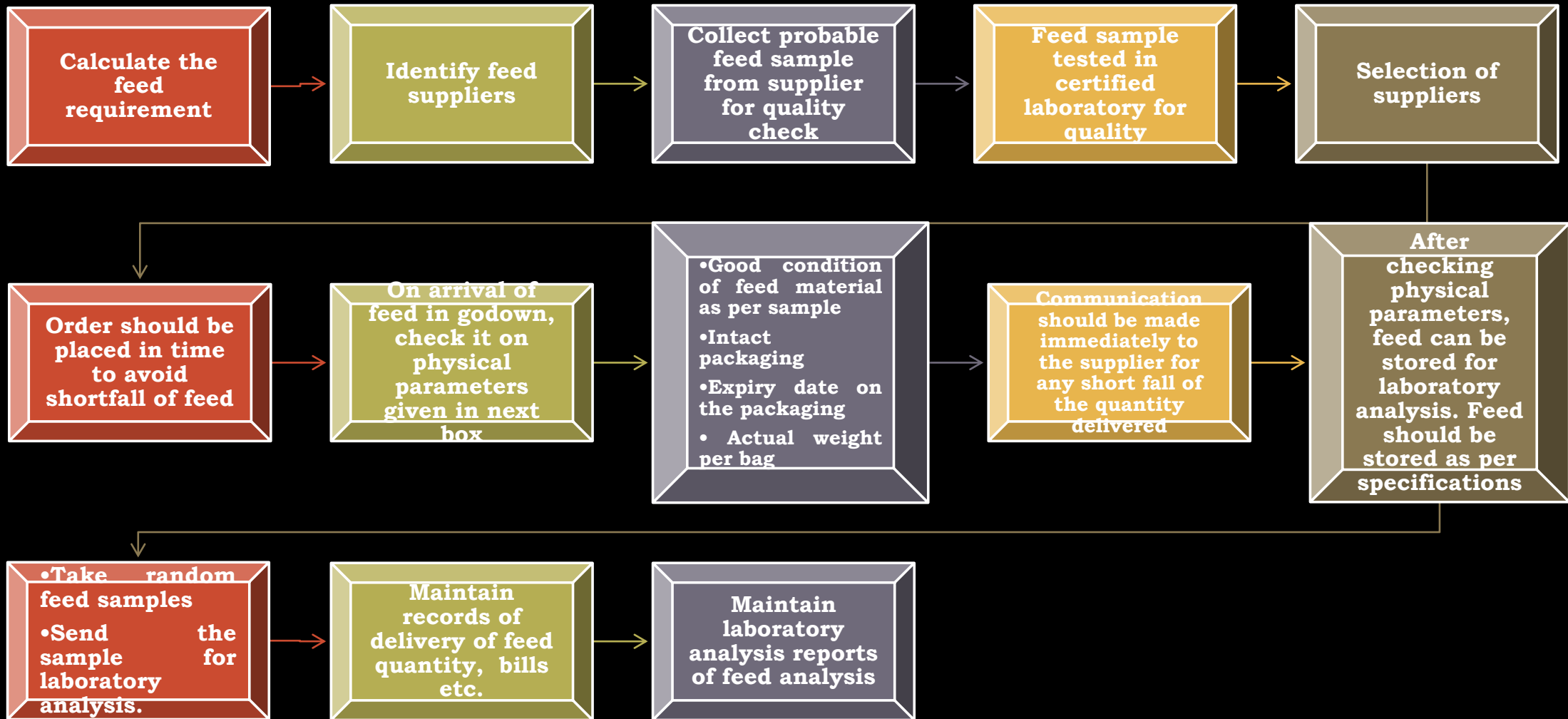
- (i) Protein content and protein quality of feedstuff
- (ii) TDN content of feedstuff
- (iii) Feed requirement of different categories of animals
- (iv) Major feed ingredients required to formulate a given concentrate.

Based on an understanding of the above-mentioned factors, requirement of animals' feed is calculated on daily or monthly basis.

Factors considered before placing feed supply order



Procurement, checking and receiving of animal feed in a dairy farm



Storage of animal feed

- Large amounts of stored feed are usually damaged by rodents and insects, which leads to substantial losses of nutrients and their palatability decreases.
- It also leads to mould and other harmful growth and accumulation of harmful toxins in the feedstuff.
- It is essential to store the feed properly for efficient dairy farm management.

Safe and scientific storage of animal feed

- Following factors are considered for safe and scientific storage of animal feed
- 1. *Site selection* : The storage structure is located on a raised and well drained site. Accessibility is also an important factor kept into consideration. The site must be free from dampness, excessive heat, insects, rodents, termites, etc.
- 2. *Selection of proper structure for storage* : The structure for storage of feed depends on the quantity of feed to be stored and the period of storage. In case of godown storage and CAP (cover and plinth) storage, sufficient space is provided between two stacks, between stacks and the walls, to ensure proper aeration.

- *3. Cleaning of bags:* New gunny bags are preferred. Second-hand gunny bags disinfested by boiling them in disinfectant solution and fully dried before filling the feed in them, could also be used.
- *4. Cleaning and fumigation of storage structure :* It is important to clean and fumigate the feed storage structure before storing the feed in it. Storage structure must not have cracks, holes or crevices
- *5. Height of the platform : Height of the platform.* The storage platform is sufficiently high so that the store is free from moisture/water seepage

6. *Proper aeration* : Proper aeration is provided during dry and clean weather and care is taken to avoid the aeration in rainy seasons to protect the stock from infections due to excess moisture.

7. *Height of the stored material* : On concrete floor the feed material may be stored up to a height of 5 meters only.

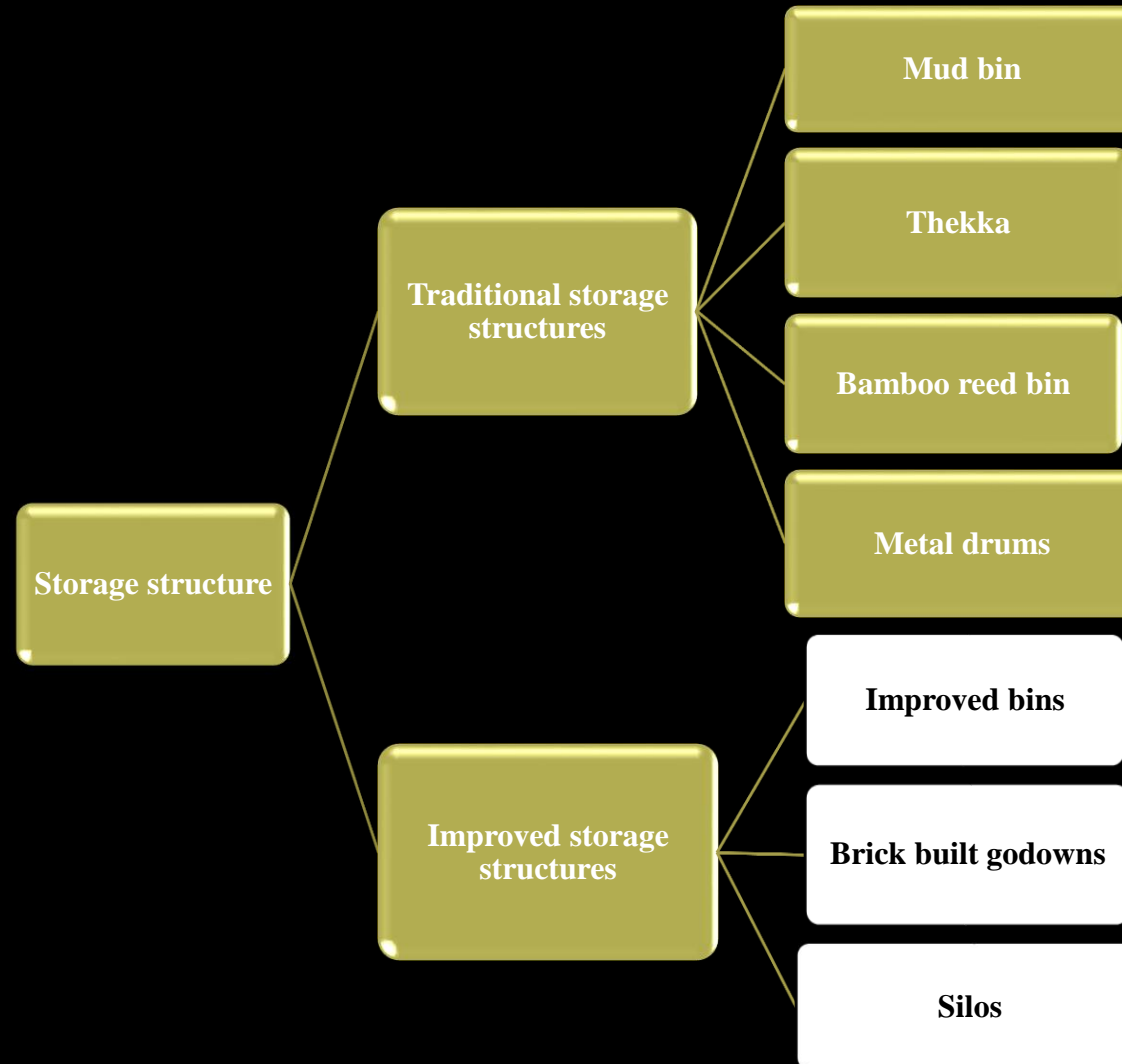
8. *Separate storage for new and old stock* : To prevent contamination in new stock from the old stock, it is advised to store them separately

9. Regular inspection : To maintain proper health and hygiene of stock, regular inspection of stored feed ingredients is necessary. Periodic fumigation is carried out in case of storage for long duration.

Common structure for storage of feedstuff

- Storage structure is selected based on the available structural material and type of feedstuff to be stored.
- Traditionally, feed ingredients are stored in country made storage structures prepared from the locally available material
- Nowadays, improved storage structures are available with more storage capacity and with proper protection to prevent storage losses.

Common structure for storage of feedstuffs



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