



Preparation of concentrate feed, Hydroponic fodder production, Silage making

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Let us see the process involved in feed manufacturing

- ▶ The quality of feed ingredients determines the quality of compounded feeds or finished products. Hence, you should procure quality feed ingredients from various sources.
- ▶ While purchasing the raw materials, sampling should be done in 10 to 15 % of gunny bags from every consignment to assess physical and chemical quality





- ▶ **Maize and other energy sources are checked for aflatoxin and multi mycotoxin.**
- ▶ **Each ingredient supplied will be subjected to rejection if it is not matching the quality standards prescribed**
- ▶ **Feed ingredients are weighed as per feed formula and a batch of appropriate size is made depending upon the capacity of mixer.**





- ▶ **Then, the ingredients are put into elevator one by one for grinding. The material that are in higher quantity should be sent through elevator to the hammer mill and the material in less quantity should follow next.**
- ▶ **If dry fish is included in the formula, it should be mixed in a layer of maize and soyabean meal for effective grinding and sieving.**





- ▶ **While adding oil in the feed, it should be initially mixed with few quantity of ground feed and then added again in the mixer. This process will help in preventing clumpiness.**





Grinding of feed ingredients

▶ Grinding is nothing but reduction in particle size

Advantages of grinding are

- ▶ It Reduces moisture
- ▶ It increases surface area of feed ingredient
- ▶ It Improves digestion
- ▶ Enables homogenized mixing



Mixing of feed ingredients

- ▶ **Two types of mixers are available**
 - ▶ **Horizontal type mixer**
 - ▶ **Vertical type mixer**
- ▶ **Horizontal mixer is the most preferred one**
- ▶ **Mixing blades are of Paddle type, Ribbon type and Double shaft paddle type**
- ▶ **Mixing time in**
 - ▶ **Paddle type takes 8 to 9 min**
 - ▶ **Ribbon type takes 3 to 5 min**
 - ▶ **Double shaft paddle takes 1 to 2 min**



Auto Packing and labelling of finished feed

- ▶ After homogenized mixing, the feeds can either be manually or automatically packed in bags and labelled for further use.





Hydroponic fodder production

- ▶ Let us go into a new type of fodder production called **Hydroponic fodder** production.
- ▶ Rapid urbanization, climate change, water scarcity etc. have led to a search of an





Hydroponic fodder production

- ▶ Let us go into a new type of fodder production called **Hydroponic fodder** production.
- ▶ Rapid urbanization, climate change, water scarcity etc. have led to a search of an alternate system for green fodder production
- ▶ **Hydroponic technology** is an alternative to grow fodder for farm animals which involves production of fodder without soil and harvested in a short period of time

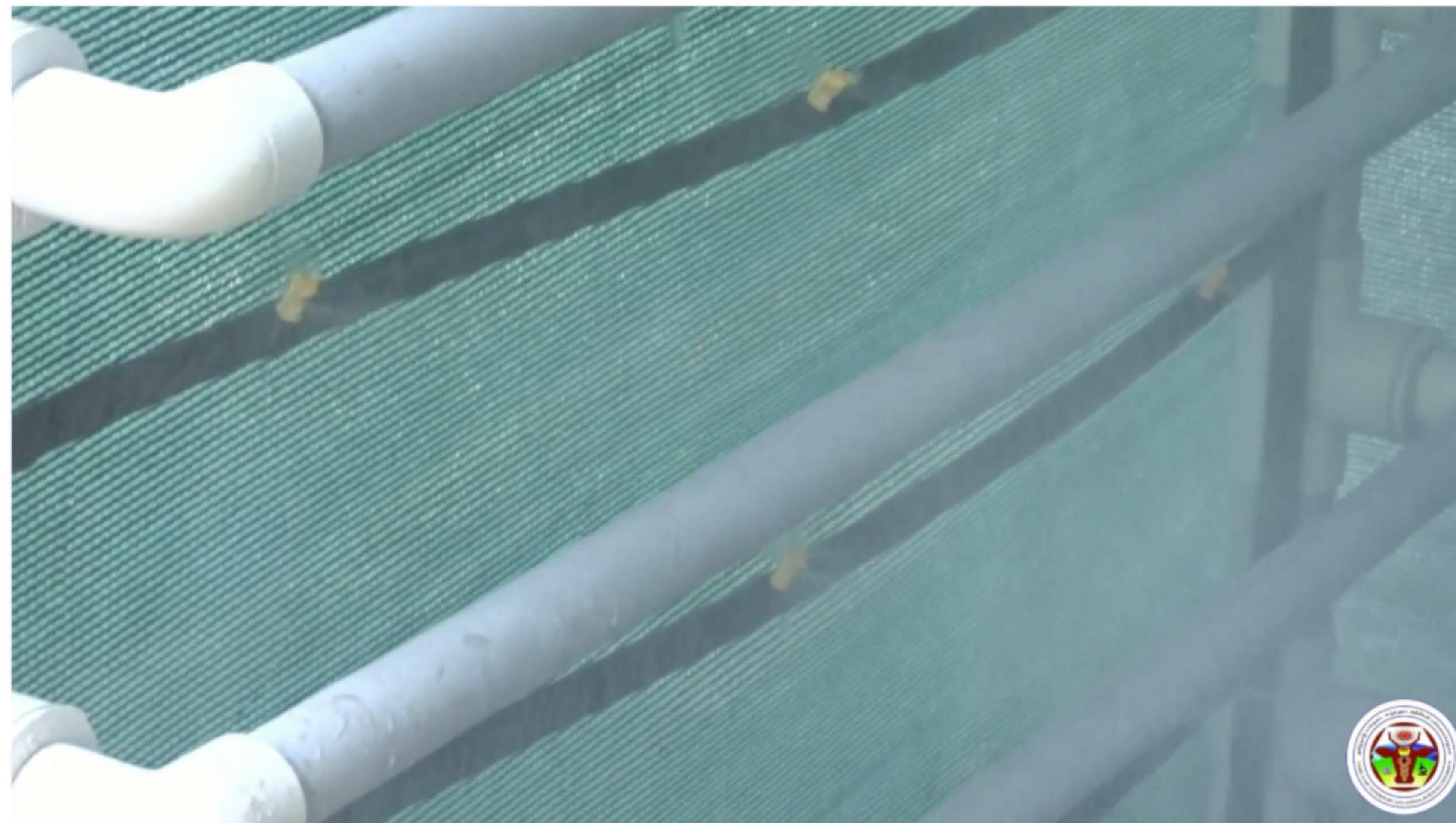




Let us see the equipment required for producing hydroponic fodder

TANUVAS Low cost hydroponic device

- ▶ It is a device with a height of 7 Feet with eight racks inbetween
- ▶ The device is made up of PVC pipes
- ▶ Production capacity of this device is 10 Kg / day





What are the fodder seeds required for producing hydroponic fodder

- ▶ Maize, bajra, oat, wheat, barley and finger millets are some of the cereal seeds used for producing hydroponic fodder
- ▶ Cow pea, sunhemp, horse gram are some of the leguminous seeds which can be used for producing hydroponic fodder



Seeds should be tested for its germination

- ▶ The germination potential of seeds should be around 80 - 85 %.
- ▶ Good quality seeds need to be purchased. seeds used should be clean, sound and undamaged
- ▶ Seeds should be sterilized by soaking the seeds in 2 per cent sodium hypochlorite solution (household bleach) for 30 minutes to control the formation of mould
- ▶ Maize Seed rate for producing hydroponic fodder is 250 g / sq ft





What are the steps involved in hydroponic fodder cultivation

- ▶ After disinfection, maize seeds should be tied in gunny bag, separately soaked in tap water and kept in plastic bucket for 12 hours.
- ▶ The seeds soaked in gunny bag are removed from bucket and placed in air tight drum for 24 hours
- ▶ Then, the seeds are loaded in hydroponic trays for fodder cultivation



What are the steps involved in hydroponic fodder cultivation

- ▶ **Sprinkler system** need to be switched on for irrigating the fodder.
- ▶ Each fodder **tray need to be moved** from **lower rack to higher rack**. The racks are shifted in sequential days.
- ▶ **Harvesting of fodder** is done
 - ▶ on 8th day for hydroponic fodder maize, jowar, moth bean
 - ▶ on 6th day for horse gram
 - ▶ on 4th day for sun hemp, cowpea, bajra, ragi, foxtail millet





Feeding of hydroponic fodder

- ▶ Hydroponic fodder is nutritious, palatable, succulent and highly digestible
- ▶ Cattle consume **15 Kg of maize hydroponic** fodder per day
- ▶ **Adult Goat** consume **2 Kg of maize hydroponic fodder** per day
- ▶ **Adult sheep** consume **1 Kg of maize hydroponic fodder** per day





Silage making

- ▶ **Silage** – It is a fermented feed resulting from the storage of high moisture crops under anaerobic conditions in a silo
Silage making will be very useful during lean periods when there is fodder shortage.





Let us see the process involved in Silage making

- ▶ 1. Silo pit is an air tight structure designed for the storage and preservation of high moisture forages as silage
- ▶ The size of the silo pit is decided based on the number of animals to be fed daily
- ▶ Side wall should be smooth and straight in order to prevent formation of air pockets which will affect normal microbial fermentation.
- ▶ The side wall should also be strong and rigid in order to withstand pressure





Process involved in Silage making

- ▶ 2. The bottom layer of the silo pit should be covered with waste grasses
- ▶ 3. Then the fodder should be filled layer by layer
 - ▶ Maize and sorghum are the best crops for silage making.
 - ▶ Leguminous crop are not suitable for silage making.
 - ▶ In grasses, cereal fodders like hybrid napier are commonly used.
 - ▶ Forage containing 60 -65 % moisture are the best crops for ensiling
 - ▶ Crops should be harvested at the flowering stage
 - ▶ Wilted and dry forages and forages with hollow structure should be chopped more finely than forage of high moisture content





Silage

The forage will be converted into silage in a duration of 3 weeks

Characteristic of good silage

- ▶ The silage will have acidic pH 3.5- 4.2
- ▶ The silage will be green or brownish in colour
- ▶ The silage should be palatable with no foul smell
- ▶ Ammoniacal nitrogen should be less than 10 %





Feed / Fodder resources and their utilization

- 1. Feed and fodder**
- 2. Roughage sources – Green and Dry roughage**
- 3. Energy sources – Conventional and unconventional feed sources**
- 4. Protein sources – Conventional and unconventional feed sources**
- 5. Preparation of concentrate feed, Hydroponic fodder production, Silage making**



Thank you