



## Hydroponics – An Innovative Approach of Green Fodder Cultivation

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### ***Introduction***

Green fodder feeding to livestock ensures optimization of productivity. Though India is the top producer of milk in the world insufficient livestock feed, fodder is one of the constraints affecting growth, health, production and reproduction potential of livestock. Green fodder is essential to feed livestock but the reduced availability of land, lack of water and more labour requirement. It is become difficult to produce required quantity green fodder throughout the year also; the lack of quality fodder hampers the growth production and reproduction of livestock. Novel approach called Hydroponic fodder would be the best solution for the fix. In this technology green fodders produced by growing seeds without soil, and with very little water, within six-seven days the seeds are sprouted the seedlings will be up to 30-35 cm tall and provide a highly nutritious feed.

### ***What is hydroponics?***

The word hydroponics has been derived from the Greek word ‘water working’. Hydro means water’ and ponics means ‘working’ and it is a technology of growing plants without soil, but in water or nutrient rich solution for a short duration in an environmentally controlled houses or machine.

### ***What are the requirements for hydroponic fodder production?***

- 45 square meter area for production of 1000 kg of green fodder daily
- Hydroponic machine
- Uninterrupted power supply
- Clean water
- Seeds with good germination capacity
- Good sanitation
- Two labours

### ***Construction of Hydroponic fodder system***

Temperature and humidity are the two important parameters to produce good quality fodder. The fodder easily grows in semi-controlled environmental conditions with the temperature range of 15-32 °C and relative humidity of 80-85%. However, light also plays an important role in production, therefore light can be control through construction of small shed net or a low-cost greenhouse. Shade netting or gunny bags also used as covering material for the structure.



### ***Construction***

- According to demand, size of hydroponics system can be desired. Mostly 10 ft x 10 ft shade net were used and it is better to choose near to the livestock shade for easy operation.
- Ventilation is to avail for easy maintenance of the temperature and humidity.
- Tray of about 1.5 x 3 ft with perforation is needed, must be made up of good plastic and strong enough to hold the weight of the fodder.
- The shed can be made up of bamboo rack, plastic rack or metal rack to hold the trays and limited to four layers.
- Maintain enough space between the layers with slight slope for easy drain of water

### ***Hydroponic fodder production process***

Good quality seeds should be used for germination. Seeds such as maize, pulses, wheat, and horse gram can be produce through hydroponic fodder system except pearl millet and sorghum seeds because these sprouted leaves harmful for livestock. In cold regions wheat and oats seed are good, while in hot regions maize where suitable for hydroponic fodder production.

### ***Process***

- Add a 5-7 liters warm water in a bucket which has seeds and remove the floated seeds and other impurities.
- After that add 50 -100 gm salt and make it dissolved in water which will helps to minimize chance on fungus production on sprouted seed.
- Remain the seeds in soaked condition for around 12 hours. Then drain the water and wash with clean water.
- Transfer the washed seed in a gunny bag and allow them to sprout. In a cold climate, it will take more than 24 hours to germinate while in a hot climate the seed will take about 24 hours to get sprout.
- Wash the trays properly and check for blockages of holes.
- Evenly spread the transfer sprouted seeds from the gunny bags to trays and place the trays on the rack in the shade net or greenhouse.
- Sprinkle the water to the sprouted seeds every day. In hot weather conditions sprinkling to be done at every two hours, and in cold weather condition for every 4 hours it helps to maintain moisture.

### ***Maintenance***

- Periodically clean the shed and avoid the chance of fungus and moulds development
- Do not disturb the sprouted seeds in the trays until the harvest because it will influence the growth of the fodder.
- Within a week can harvest eight kilograms of fodder from 1 kilogram of seed. Therefore, arrange the tray based on the demand. Because well planning would not disturb the system.



### ***Feeding of Hydroponic Green Fodder***

- Take out fodder slabs from the tray after six to seven days and make into small pieces before feeding it to the livestock, so it will reduce the wastage
- Avoid remain the fodder for more than nine days in the trays because the nutrient value of fodder starts to decrease slowly and fibre start to develop.
- It can also be feed along with the other food.

### ***Advantages of hydroponic fodder***

#### **1) Nutrient Value**

Hydroponics fodder has more nutrient than traditional fodder. It contains high carbohydrate, minerals, and vitamins.

#### **2) Time to grow**

Compared to traditional fodder which often needs up to two months to grow you can grow hydroponic fodder in just one week

#### **3) Less water requirement**

Only 3 to 4 liters of water is necessary to grow one kilogram of hydroponic fodder on other for traditional fodder approximate 15 -20 liter water required.

#### **4) Easy daily production**

Hydroponic fodder can be produced on a regular basis throughout the year even when there is a water crisis.

#### **5) Chemicals or pesticides**

It does not require any Chemicals or pesticides to produce

#### **6) Less workforce and Transport cost**

It needs only less workforce and transport cost.

### ***Conclusion***

For the sustainable dairy farming, quality green fodder should be a fed regularly. Hydroponic fodder is a good option in front of the farmer because it grows fast, it contains a high nutrient value, and the most important thing is animals keen to have.