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Technology for Production and Feeding of Hydroponics Green Fodder

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Green fodders are staple feed for dairy animals. Dairy animals producing up to 5-7 liters milk per day can be maintained exclusively by feeding green fodders. Inclusion of green fodders in ration of dairy animals decreases amount of concentrate feeding and thus increases profit. Therefore, for economical and sustainable dairy farming, fodder production round the year is highly essential.

Advantages of Feeding Green Fodder

- Fulfills bulk of animal easily and quickly.
- Major source of vegetable protein.
- Good source of carbohydrate (soluble and fibrous).
- Good source of minerals.
- Rich source of vitamins.
- Good source of water (approx. 15-25% water).

Limitations of Green Fodder Production Under Conventional Practices

- More land requirement.
- Scarcity of water or saline water.
- More labour requirement for cultivation (sowing, earthing up, weeding, harvesting etc.).
- More growth time (approx. 45-60 days).
- Non-availability of same quality green fodder round the year.
- Requirement of manure and fertlizer.
- Affected by natural calamities.

Hydroponics Green Fodder

- Green fodders produced by growing seeds without soil but in water or nutrients rich solutions are known as hydroponics green fodder.
- Hydroponics green fodders are mostly produced in green houses under controlled environment

Advantages of Hydroponics Green Fodder

Table 1: Production (600 kg/ day) of conventional green fodder Vs. hydroponics green fodder

Attributes	Conventional Green Fodder	Hydroponics Green Fodder
Area	10, 000 sq. mts	50 sq. mts
Land fertility	Essential	Not Essential
Fertilizers	Required	Not required
Water and electricity	Very high	Very low
Labour requirement	More	Less
Growth period	45-60 days	7 days
Fodder yield dependency	Based on climate	Not based on climate but under controlled environment
Fencing and protection	Required	Not required

Production of Hydroponics Green Fodder

- Under RKVY Scheme, Govt. of India, a Hydroponics Green Fodder Production Unit is installed at ICAR Research complex for Goa, Old Goa in collaboration with Goa State Co-operative Milk Producrers' Union Limited, Curti, Ponda, Goa.

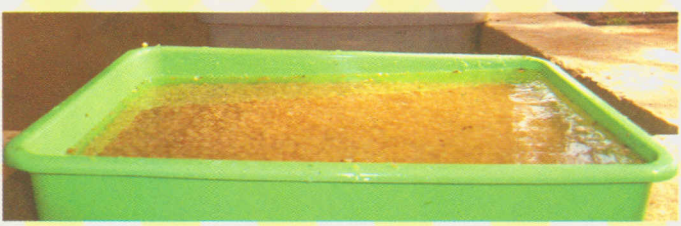
- Hydroponics Green Fodder Production Unit is inbuilt with a greenhouse (for growth of fodder) and a control unit, (for regulation of light, temperature, humidity and water) for optimum growth of fodder.

Greenhouse

- Green house is of 25ft.x10 ft.x10ft. (approx.).
- Fodders are grown in trays in 7 days cycle excluding the day for seed soaking.
- For each day, there is provision to accomodate 72 trays in two rows of racks.

Procedure for green fodder production

- Maize seed is the best choice.
- Procure good quality maize seeds with at least 85% germination rate.



- Seeds should be pesticide free.
- Separate impurities from seeds by impurities-separator.
- Weigh 1.5 kg seeds and allow to soak in water for 24 hours in soaking tray.

- Transfer soaked seeds to green house tray and spread uniformly throughout it.
- Load trays on '1st two rows' of racks.
- Next day, shift '1st day trays' in '3rd and 4th rows' of racks.
- Then, every following day, shift these 'two rows of trays' to their respective below 'two rows' of racks till they reach 'bottom two rows', which coincides on 7th day.
- On 8th day, 'bottom two rows of trays' containing optimum grown green fodder is removed for feeding dairy animals.

Yield and chemical composition of hydroponics green fodder

- One tray containing 1.5 kg maize seeds produces 7-9 kg green fodder with fodder height of 20-25 cm.

Table 2: Chemical compositions (on % DM basis) of conventional green fodder Vs. hydroponics green fodder

Nutrient	Conventional Green Fodder (Maize)	Hydroponics Green Fodder (Maize)
Protein	10.67	13.57
Ether Extract	2.27	3.49
Crude Fiber	25.92	14.07
Nitrogen Free Extract	51.78	66.72
Total Ash	9.36	3.84
Acid Insoluble Ash	1.40	0.33

- It looks like a mat consisting of roots, seeds and plants.
- In comparison to conventional green fodders, hydroponics green fodders contain more protein, fat (ether extract) and soluble carbohydrates (nitrogen free extract); but less fiber, total ash and acid insoluble ash.

Feeding of hydroponics green fodder

- Separate fodder matting into small pieces prior feeding to milch animals.
- It is highly succulent and relished by dairy animals.
- Based on protein content, it is advised to feed 7-8 kg hydroponics maize green fodder to replace one kg cocncentrate mixture.
- As it is highly sacculent, it is recommended to offer maximum 20 kg hydrponics green fodder per day per animal.
- Feeding mixture of hydroponics green fodder with other dry and green fodders to dairy animals is beneficial.

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