

IMPORTANCE AND ROLE HYDROPONICS FEEDING IN LIVESTOCK AS SOURCE OF GREEN FODDER

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India is an agriculture-based country and having highest livestock population in the world. Total livestock population is 535.82 million in the country showing an increase of 4.64 % over (20th Livestock census 2019). There was decreasing 6 % in the total Indigenous cattle population. Productive performance of Indigenous cattle (2.93 kg/day) is very less compared to Exotic / crossbred cow (7.71 kg /day). The demand for milk and milk products in India is creating new potential in the profitability of dairy farming as an occupation. At the same time, there is a substantial decline in fodder availability. In addition, the area under food crops is also declining owing to urbanization and industrialization. The shortage of fodder due to ever decreasing area under cereals and fodder crops is getting compensated with increased use of commercial cattle feed, resulting in increased costs of milk production. Several attempts have been made to find alternate sources of cattle feed. Hydroponics is considered as the most economic and efficient feed substitute and a sustainable feed for livestock. Green fodder is an important feed component of the dairy animals ration; otherwise the productive and reproductive performance of the dairy animals is adversely affected. Hydroponics is a method of growing plants without soil. Only moisture and nutrients are provided to the growing plants. Hydroponic growing systems produce a greater yield of fodder over a shorter period of time in a less area than others traditionally grown fodder crops. Although the methods of hydroponic fodder production date back to the 1930's, there is renewed interest in hydroponic fodder as a feed-stuff for Cattle, sheep, goats, and other livestock. Hydroponically grown fodder is an extremely economical feed supplement for cattle. With hay, grain, corn and soybean prices reaching record highs, dairymen need a better feed option. This leads to total control over meat or milk production and operational costs. There is also reduction of pesticides and herbicides because the plants are growing fully protected environment. Hydroponics is a year-round growing system that produces a consistent quality and quantity of fodder for animals, regardless of outside

weather. With sprouting, there is a reduction in total energy. The increase in protein percentage is due to the dry matter loss. In fact, the downside to hydroponic fodder is its high water content. According to various forage analysis reports, the dry matter content of hydroponic fodder is only 12 to 15 per cent, compared to almost 90 percent in (unspotted) grains and hays. Even corn silage and haylage have considerably more dry matter than sprouts. Sprouting changes the nutritive characteristics of the grain. There is an increase in fibre and some vitamins and a decrease in toxic and an anti-nutritional factor. This method is fully utilized for fulfil demand of feeds and fodder in the country.

Chemical composition of maize hydroponics

S./No.	Parameters	One % DM Basis
1.	DM (Dry matter)	18.54
2.	CP (Crude Protein)	14.01
3.	EE (Ether extract)	3.56
4.	CF (Crude Fibre)	6.59
5.	NFE (Nitrogen free extract)	75.23
6.	Ash	1.58
7.	AIA (Acid insoluble ash)	0.65

Source of feed for meat animals

Hydroponic fodder may be must suited to meat animals (horses, rabbits, pigs, and poultry) who would benefit more from the changes in the feed due to sprouting (e.g. less starch, more sugars) as compared to ruminants (sheep, goats, and cows) that are less efficient at digesting high quality feed. It is good source of feeds to rabbits and mature chickens; to feed them on the form of mash and pellets makes from maize germ, whole maize, soya beans, canola, sunflower and coccodiosat, among others, in the morning and evening. Chicks, on the other hand, are fed on commercial mash for seven weeks before they are weaned on the homemade feeds.

Indigenous chicken can be fed on hydroponic fodder as three quarters of their daily feed requirement while layers and broilers (exotic) can be fed on hydroponic fodder as a third of their meal. The farmer also uses hydroponics to plant strawberries, tomatoes and lettuce. It needs less labour to cultivate hydroponics fodder for animals. If farmer can fed chicken on hydroponic fodder exclusively. First of all, 2kg of seed produces 10kg of fodder in just 7 to 8 days. If each chicken eats 150g of fodder, that would mean we could feed up to 66 chickens. 7 day old fodder is just a bit too tough to be digested by poultry. This is because the fibre content is so high and poultry have a real problem digesting this fodder. Thus it is best to feed

your chicken with 4 day old fodder. If fodder fed after 7 days, the farmer fed to chicken with any dry commercial feed in flour form is good. Usually mix it up at a ratio of 100g of hydroponic fodder to 30g of commercial feed. The chicken has responded well to this, with a faster weight gain, larger eggs and certainly no constipation. All this with the added advantage of reducing the feeding cost.



As feed for livestock

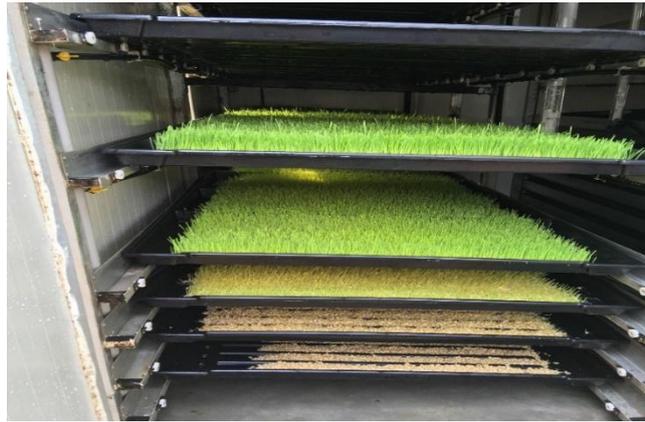
Fodder sprouts are tender and young, the equivalent of fresh green grass. As such, they are more palatable and nutritious to all types and classes of livestock. On a dry matter basis, hydroponic fodder compares favourably with other nutritious feed-stuffs.

Advantages of hydroponic fodder

There is less waste water, as animals consume the recirculation water along with the feed. Since production is hydroponic, there is no leaching of nutrients into the environment. Hydroponic fodder production requires considerably less land and labour to produce feed for livestock. While hydroponic fodder is not likely to become a major source of feed for commercial livestock, it could be feasible under certain circumstances.

Dry and drought-prone regions

Hydroponic fodder production is probably best-suited to semi-arid, arid, and drought-prone areas of the country. By growing fodder indoors, crop failures would no longer be a risk. Good quality forage could be produced year-round. Feed supplies would be insured. Lack of water resources could be allocated more efficiently.



Limited land

In places where less land for agriculture are extremely high or land is simply not readily available, hydroponic fodder has obvious advantages, as it can be produced in a small footprint. Because the fodder is produced continuously, there is no need for long-term feed storage and no nutrient losses that can be associated with feed storage.



High alternative feed costs

Hydroponic fodder is considerably more expensive than conventional feedstuffs, it assumes that conventional feedstuffs are available and priced competitively. There are many locations in which this is not the case and hydroponic fodder could be more competitively priced.

Small-scale producers

Requiring smaller amounts of fodder, small-scale producers may be able to build their own fodder systems for a few thousands. When the investment is low and labour is



unpaid, the cost of hydroponic fodder is considerably less.

Organic

Hydroponic fodder production seems particularly well-suited to organic producers, who already pay high prices for feed or have difficulty to grow organic feedstuffs. Cereal grains can easily be sprouted in accordance with Certified Organic Programs.

In the future

Due to scarce of land and water increases and feed prices continue to rise, hydroponic fodder could become a better option for more livestock producers.

Conclusion

Hydroponics can be used as an ideal green fodder substitute for livestock, fish and poultry, this technology will be taken up in a big way by the dairy and poultry farmers, especially, by those who have less land as well as scarce conditions for fodder production. It can be concluded that hydroponics is a promising source of feed for chicken and other meat animals effective in improving, Growth performance, Digestibility, Milk production, Reduces the feeding cost.

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