

AZOLLA AS FEED SUPPLEMENT FOR FARM ANIMAL IN OSMANABAD DISTRICT OF MAHARASHTRA

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Abstract: Krishi Vigyan Kendra, Tuljapur in Maharashtra has been working on azolla from last three years, studying on azolla as feed supplement to farm animal in Osmanabad district of Maharashtra. Azolla as food supplements and exploring cost effective methods for the mass multiplication of Azollaceae. Azolla hosts a symbiotic blue green alga, *Anabaena azolla*, which is responsible for the fixation & assimilation of atmospheric nitrogen. Azolla, in turn, provides the carbon source & provides a favourable environment for the growth and development of the alga. It is this unique symbiotic relationship that makes azolla a wonderful plant with high protein content. Azolla is easy to cultivate and can be used as an ideal food supplement for cattle. Dairy farmers in Osmanabad district of Maharashtra have started to take up the low cost production technology & we hope that the azolla technology will be taken up more widely by dairy farmers, particularly those who have less area of land for fodder production.

Introduction: The demand for milk and milk product in profitability of dairy farming as an occupation. At the same time, there is a substantial decline in fodder availability. The area under forest and grasslands is decreasing, largely due to the introduction of high yielding dwarf varieties of cereals. 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. Azolla is a feed substitute and a sustainable feed for livestock. It is a potential source of nitrogen and thereby a potential feed ingredient for livestock. **Importance of Azolla:** *Azolla pinnata* is a small aquatic floating fern that lives in symbiosis with the nitrogen fixing blue-green alga; it has high nitrogen fixing ability. It grows naturally in stagnant water of drains, canals, ponds, rivers, marshy lands. Azolla is very rich in proteins, essential amino acids, vitamins (vitamin A, vitamin B₁₂, Beta Carotene) growth promoter intermediaries and minerals like calcium, phosphorus, potassium, iron, copper, magnesium etc. Azolla, on a dry weight basis, is constituted of 25 - 35% protein content, 10-15% mineral content and 7-10% a combination of amino acids, bio-active substances and biopolymers. Carbohydrate and oil content in Azolla is very low. Thus the biochemical composition of Azolla, makes it one of the most economic and efficient feed substitutes for livestock. Moreover, Azolla can be easily digested by livestock, owing to its high protein and low lignin content.

Methodology: Krishi Vigyan Kendra, Tuljapur promoted azolla cultivation among 100 selected dairy farmers spread in eight villages of Osmanabad district in Maharashtra by imparting training on azolla cultivation and also by awarding incentives in

terms of supply of azolla seeds, cash for construction of azolla tank, silpauline sheet, 50 % green shade net, etc. For purposes of this study, the necessary data were collected from a randomly selected sample of 40 dairy farmers spread in four of these adopted villages. All these respondents underwent training on azolla cultivation given by the KVK, Tuljapur. With the help of the project co-ordinator, rapport was built up by the investigator with sample dairy farmers. An assessment was conducted in Osmanabad District of Maharashtra on effect of azolla feeding on milk production of cross breed cows. The technology is assessed by KVK, Tuljapur with treatment viz. T₁- farmers practice i.e 5-8 kg roughages + 2-3 kg concentrates per day per cross breed cows, T₂- T₁(less 500 gm concentrates) + 2 kg Azolla per cross breed per day.

Methods of Azolla cultivation:

1. In Azolla cultivation methods, an artificial water body is made, preferably under the shade net with help of a silpauline sheet.
2. A pit of the size of 10MLX6MW is dug as a first step. This pit is covered with plastic gunnies to prevent the roots of the nearby trees piercing the silpauline sheet, which is spread over the plastic gunnies.
3. About 10-15 kgs of sieved fertile soil is uniformly spread over the silpauline sheet. Slurry made of 2 kg cow dung and 40 gms of super Phosphate in 150 litres water, is poured onto the sheet.
4. More water is poured to make the water level reach about 9 inches. About 500 gms to 1 kg of fresh and pure culture of Azolla is inoculated in the pit. Azolla will rapidly grow and fill the pit within 10-15 days and about 500gms - 600 gms of Azolla can be harvested daily thereafter.
5. A mixture of 20 gms of Super Phosphate and about 1 kg of cow dung should be added once in 5 days. This is done to keep the Azolla in rapid

multiplication phase and to maintain the daily yield of 500gm/pit.

Result and Discussion: The study of was conducted in scarcity zone of Osmanabad district.

Table No. 1

| Sr No. | Treatment | Average milk production |
|--------|---|-------------------------|
| 1 | T ₁ – Farmers practise i.e. 5-8 kg roughages + 2-3 kg concentrates per day (cross breed cows) | 7.00 |
| 2 | T ₂ –T ₁ (less 500 gm concentrates) + 2 kg Azoll per farm animal (cross breed cows). | 7.380 |

Table No. 2

| Sr No. | Year | Average milk production T ₁ (Lit./day) | Average milk production of assessment T ₂ (Lit./day) | Average milk production |
|--------|---------|---|---|-------------------------|
| 1 | 2013-14 | 6.9 | 7.25 | 350 ml |
| 2 | 2014-15 | 7.1 | 7.40 | 300 ml |
| 3 | 2015-16 | 7.0 | 7.50 | 500 ml |

The observations due to T₁ and T₂ treatments on milk production was under taken for three years. It was observed from the data of 120 farmers that milk production was increased from 250 ml to 500 ml per day with average value of 380 ml per day per cross breed due to treatment T₂ over T₁. It is found that the increase in the quantity of the milk produced on the base f nutrient was higher than the quantity of Azollas fed. Hence, it is assumed that more than the carbohydrate, protein content and other components, like carotenoids, like carotenoids, biopolymers,

probiotics etc., may be contribution to the overall increase in the production of milk similar finding were observed by Pillai & etals (2015) Further it was observed that the farmer can be benefited by azolla feeding with C: B ratio 1:1.5.

Conclusions: Feeding of Azolla reduces cost of production, increase milk production and good health of animals. A study on adoption of azolla cultivation was conducted scarcity zone in Osmanabad district of Maharashtra.

References:

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