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Azolla: An Evergreen Fodder for Livestock

Hitesh Kumar Yadav[1], Jyoti[2] and Harish Kumar[3]
[1]Department of Seed Science and Technology, Acharya Narendra dev University of Agriculture & Technology, Kumarganj, Ayodhya, 224229 (UP).
[2]Assistant Professor, School of Agricultural Sciences IIMT University, Meerut.
[3]Assistant Professor, School of Agricultural Sciences IIMT University, Meerut.

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Introduction

Increasing demand for milk is creating new possibilities to make animal husbandry business profitable. However, at the same time there is a continuous decrease in the availability of green fodder. The area of forests and pastures is decreasing as well as crop products are also decreasing, which are otherwise being used as animal feed. This shortage of green fodder is being met by commercial animal feed, due to which the cost of milk production is increasing.

Azolla has the potential to provide evergreen nutritious food for animals. It is a fern, floating on the surface of water. Blue-green algae exist as symbionts on the surface of Azolla. These blue-green algae are known as *Anabaena ajoli*, which is responsible for the fixation of nitrogen from the atmosphere and provide Carbon source and environment required for the growth of Azolla. Thus this unique mutualistic symbiotic relationship develops Azolla as a beneficial plant. High amount of protein is available in it.

Nutrients found in Azolla and effect on physical growth

Proteins, essential amino acids and vitamins (Vitamin-A, Vitamin B_{12} and beta-carotene), growth mediating components and minerals such as calcium, phosphorus, potash, iron, copper, magnesium etc. are found in abundance in Azolla. It contains 40-60 percent protein, 10-15 percent minerals and 7-10 percent amino acids, bio-active substances and bio-polymers etc. on the basis of dry quantity. The amount of carbohydrate and fat in Azolla is very less. Its composition makes it a very nutritious and effective animal feed. It can be easily digested by animals because it is high in protein and low in lignin. Animals get used to eating

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it very quickly. Apart from this, the process of Azolla production is simple and economical. Daily feed requirement formilch animal is about 1.5 to 2.0 kg. If given daily to milch animals, milk production can be increased up to 15 percent.

Using Azolla as poultry feed, increases average weight of broiler birds and eggs. It can be used as feed for sheep, goats, pigs and rabbits. A 20 percent increase in paddy production and 30 percent increase in fish production have been found when Azolla is grown with paddy co-fish production.

Comparison of Azolla with other fodder crops-

Crop	Annual Production(q/ha)	Dry weight	Protein %
Hybrid napier grass	2500	50	4
Lucern	800	16	3.2
Cow pea	350	7	1.4
Sorghum	400	32	0.6
Azolla	**7300**	**56**	**40-60**

Azolla production method-

1. Dig a pit 2 m long, 2 m wide and 0.2 m deep in a shady place.
2. It should be covered with a plastic sheet. It can also be grown in a cement tank. In such a situation, it is not necessary to lay plastic sheet. As far as possible, use anti-ultraviolet ray plastic seat. Plastic sheet silpolyen is a polythene tarpaulin that has the ability to resist ultraviolet rays of light.
3. Spread about 10-15 kg soil in the pit.
4. Mix 2 kg cow dung and 30 grams single super phosphate in 10 litres of water and fill the pit.
5. The water level should be up to 10 cm.
6. Put 500 grams to 1.0 kg Azolla culturein the pit.
7. Azolla develops very fast and within 10-15 days it spreads in the entire pit. After this 800-1200 grams of Azolla can be taken out.
8. Azolla grows rapidly by adding 20 grams of single super phosphate and about 1 kg of cow dung to the pit once every 5 days.
9. Feed 1.5-2.0 kg Azolla daily to the animal along with regular diet.

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Precautions to be taken during Azolla production-

1. To maintain the fast growth and minimum doubling time of Azolla, it is necessary to take out Azolla daily for use.
2. Cow dung and superphosphate should be added from time to time so that Azolla continues to grow rapidly.
3. 30 degree temperature is suitable for preparing Azolla. It should be prepared in shade.
4. The pH of the pit being used to prepare Azolla should be tested from time to time. Proper pH should be between 5.5-7.0.
5. In every 30 days the soil of Azolla pit should be changed so that NitrogenExcessand deficiency of other minor minerals can be avoided.
6. Replace about 20-30% of water in every 10 days from the pit and add fresh water so that production of excess Nitrogen can be avoided.
7. Completely cleaned the azolla pit in every 6 month and add Fresh water, cow dung and Azolla culture.
8. Azolla should be thoroughly washed with clean water before use so that the smell of cow dung should go away.

Method of feeding Azolla-

1. Before feeding Azolla to animals collect it in a perforated tray having hole of size 1 cm such that all the water drain out from it.
2. The tray should be kept over a bucket and washed thoroughly with water so that the cow dung smell should go away.
3. The water collected in the bucket should be put back in the pit.
4. The obtained Azolla should be mixed with animal feed and fed to the animal.