

Azolla-An Ideal Organic Feed Substitute for Livestock

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SUMMARY

Azolla can be used as an animal feed, human food, medicine and water purifier. It may also be used for the production of hydrogen fuel the production of biogas the control of mosquitoes and the reduction of ammonia volatilization which accompanies the application of chemical nitrogen fertilizer. Azolla is very rich in proteins, essential amino acids, vitamins (vitamin A, vitamin B12, Beta Carotene), growth promoter intermediaries and minerals including calcium, phosphorous, potassium, ferrous, copper, magnesium. On a dry weight basis, Azolla has 25-35% protein content, 10-15% mineral content, and 7-10% comprising a combination of amino acids, bio-active substances and biopolymers

INTRODUCTION

Azolla is a floating fern mostly utilized as bio- fertilizer for wetland paddy. It belongs to the family of Azollaceae. The fern Azolla, hosts a symbiotic blue green algae *Anabaena azolla*, which is responsible for the fixation and assimilation of atmospheric nitrogen. Azolla was found to be a very nutritive and cheap organic feed substitute for dairy cattle. Azolla has enormous potential as a livestock feed due to its ability to proliferate without inorganic nitrogen fertilization. Its high rate of growth in water without the need to displace existing crops or natural ecological system.

Nutritive Value

Azolla is rich in protein, almost 20-25% CP on dry weight basis. It is also found to contain essential minerals like Iron, calcium, magnesium, phosphorus, copper, manganese etc. apart from appreciable quantities of vitamin A and vitamin B12. It is also found to contain almost all the essential amino acids, many probiotics, bio-polymers and beta carotene.

Nutritional composition of common Azolla species (*Azolla caroliniana*, *Azolla microphylla*, *Azolla pinnata*)

Name of Content	Per 100gms	Name of Content	Per 100gms
Carotene	4475mcg	Sodium	0.26mg
Vit-B12	1019mg	Manganese	102ppm
Protein	25-30%	Magnesium	4.3mg
Beta-Carotene	1380mcg	Sulfur	2.7mg
Phosphors	0.86mg	Copper	0.9ppm
Calcium	67mg	Cobalt	0.61mg
Iron	7.3mg	Zinc	4.1mg

Azolla Production

1. Clear the land and well level
2. An artificial water body is made, preferably under the shade of a tree, with the help of a silpauline sheet
3. Dug out pit of the size 2M X 2M X 1M
4. 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.
5. About 05-10 kg of sieved fertile soil is uniformly spread over the silpauline sheet.
6. Slurry made of 5-kg cow dung and 50 gm. of Super Phosphate in 10 liters water, is poured onto the sheet
7. Add animal feed supplement mineral mixture powder 50 gm.
8. More water is poured to make the water level reach about 10 cm.
9. About 500 gm. to 1kg of fresh and pure culture of Azolla is inoculated in the pit.

10. Then spread the fresh water on Azolla
11. Azolla will rapidly grow and fill the pit within 10-15 days and about 500 gm. – 600 gm. of Azolla can be harvested daily thereafter.
12. A mixture of 50 gms of Super Phosphate and 50 gm. of mineral powder about 1 kg of cow dung should be added once in every week
13. This is done to keep the Azolla in rapid multiplication phase and to maintain the daily yield of 500 gm. /pit.

Precautions

1. Adjust the humidity level up to 60-80%.
2. A shady place, preferably under a tree, with sufficient sunlight should be chosen for the Azolla production unit.
3. A place of direct sunlight should be avoided. All corners of the pit should be of the same level so that the water level can be maintained uniformly.
4. Azolla biomass @ 300 gm.– 350 gm. /sq. meter should be removed daily to avoid over crowding and for keeping the fern at rapid multiplication phase.
5. Plant protection measures against pests and diseases should be taken as and when required.
6. About 5 kg bed soil should be replaced with fresh soil, once in 30 days, to avoid nitrogen build up and prevent micro-nutrient deficiency.
7. 25 to 30% water also needs to be replaced with fresh water, once in 10 days, to prevent nitrogen build up in the bed.
8. Replacement of water and soil should be followed by fresh inoculation of Azolla, at least once in month.

Harvesting

1. Azolla should be harvested with a plastic tray having holes of 1 sq.cm mesh size to drain the water.
2. The tray along with Azolla should be kept in a bucket, half filled with water.
3. Azolla should be washed to get rid of the cow dung smell.
4. Washing also helps in separating the small plantlets which drain out of the tray.
5. The plantlets along with water in the bucket can be poured back in to the original bed.
6. Fresh Azolla thus collected should be mixed with commercial feed in 1:1 ratio to feed livestock. However, it is advisable to mix Azolla in regular feed in 1:1 ratio at the beginning, for one week. After a fortnight of feeding on Azolla mixed with regular feed, livestock may be directly fed with Azolla, without the addition of regular feed material.

CONCLUSION

The above mentioned bio-chemical constitution along with the rapid multiplication rate makes azolla an ideal organic feed substitute for livestock. Livestock can easily digest azolla due to its high protein content and low lignin content. Fresh azolla can be mixed with commercial feed in the ratio 1:1 or given directly to livestock. Milk production in cattle is increased by 10-12% when they were feed with azolla. It is also improving the quality of milk.

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