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## Effect of *Azolla* feeding as a supplement on milk and reproduction performance on zebu cattle under field condition

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### Abstract

*Azolla* has enormous potential as a livestock feed due to its high content of Protein, essential amino acids, vitamins, growth promoter intermediaries and minerals. This technology of cultivation of *Azolla* was transferred through conductance of demonstrations and trainings in the District. Feeding of *Azolla* as livestock feed to milch animals resulted in Increase in milk yield and fat content and considerably improved reproductive traits. The findings revealed that 20% milk yield increased and 32% conception rate of native cattle improved in semi arid condition of western Rajasthan.

**Keywords:** *Azolla*, livestock, milk yield and reproductive traits

### Introduction

Despite being largest producer of milk, in India there acute shortage of feed and fodder for dairy animals. Shortage of dry fodder, green fodder and concentrate has been estimated to be 12 to 14 per cent, 25 to 30 per cent and 30 to 35per cent, respectively. The shortage of fodder is therefore, compensated with the use of readymade commercial feed resulting in increased cost of milk production. The search for alternatives to green fodder and concentrates led to a wonderful plant *Azolla*, which holds the promise of providing a sustainable feed for livestock. *Azolla*, family *Azollaceae*, is a floating fern, it has symbiotic relationship with blue green algae, *Anabaena Azollae*, which is responsible for the fixation and assimilation of atmospheric Nitrogen. *Azolla* is very rich in proteins (25 -30%), essential amino acid (7 -10%), Vitamins, growth promoter intermediaries and minerals (10-15%). The use of *Azolla* as a feed resource fish, Swine, poultry and other domestic animals had been tested with favorable results (Castillo *et al.*, 1981). The present study was undertaken with an objective of finding the effect of feeding *Azolla* plants on milk yield, reproductive traits like fertility, conception rate and successful pregnancy in Kankrej cows under field condition.

### Materials and Methods

The technology was demonstrated in five blocks namely Jalore, Sayala, Ranibada, Sanchore and Ahore by selecting ten farmers from each block. Thus, a total of 50 farmers and one lactating Kankrej cow each from each farmer were taken to study the impact of feeding of *Azolla* were selected for the present study in 2017-18. Approximately 1.5 to 2.0 Kg. fresh *Azolla* was fed to the milch animals per day along with usual ration. The animals' were maintained on chaffed pearl millet fodder at ad lib and 3 to 4 kg of commercial concentrates mixture. These selected animals had already completed a period of three months of lactation period. The observations on milk yield and milk fat percentage was recorded for three months starting from one month after the *Azolla* was included in ration of animals. An artificial water body is made, preferably under the shade of a tree, with help of a silpauline sheet. A pit of the size of 3M x1.5M x0.2 M 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. About 10-15 kg of sieved fertile soil is uniformly spread over the silpauline sheet. Slurry made of 2kg cow dung and 30 g of Super phosphate in 10 liters of water, is poured onto the sheet. More water is poured to make the water reach about 10cm. About 500g to 1 kg 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 1kg of Azolla can be harvested daily thereafter. A mixture of 20g of Super Phosphate and about 1kg of cow dung should be added in 5 days. This is done to keep the Azolla in rapid multiplication phase and to maintain the yield of 1kg /pit. Lush green Azolla was harvested in a plastic tray having holes of 1sq.cm mesh size to drain the water. Then it was thoroughly washed twice get rid of the cow dung smell / ammonia smell. Fresh Azolla, 2kg /day, thus collected was mixed with concentrate mixture in 1:1 ratio and fed to the cows. The criteria used to know improvement in milk yield under the present trial were total milk yield/d, CLR, Fat% and SNF. These parameters were measured on 0<sup>th</sup>, 10<sup>th</sup> and 31<sup>th</sup> day of feeding trial. The reproductive parameters used were post partum estrus and conception rate.

### Results and Discussion

Azolla holds the promise of providing a sustainable feed for livestock. The milk yield showed increasing trend and it increased from 3.5 liter to 4.2 l/d after 31 days of feeding @2kg /day Azolla. About 20% increase in the milk yield is a significant improvement. Also, around 18% (5.67% from 4.8%) increase in the fat yield, which again showed increasing trend, was observed. Further around, 7% improvement (From 27 to 29) was observed in corrected lactometer reading (CLR) and 5% improvement was observed in Solid not fat (SNF) on 30<sup>th</sup> day of feeding of Azolla which accentuates the beneficial effect of Azolla feeding on milk. Various studies revealed that, feeding of Azolla in dairy animals, increases milk production by 15-20 per cent when 1.5kg – 2kg of Azolla was combined with the concentrate feed (Kamalasanana, Pillai *et al.* 2002, Manjunath, Patil *et.al.* 2013 and Mathur, G.N. *et al.* 2013) <sup>[1, 3, 2]</sup>. Further the animals were observed for post partum estrus for 3months. 32 percent animals came to estrous after 2 months of feeding of Azolla. The animals were artificially inseminated and pregnancy diagnosis was done on 90<sup>th</sup> of pregnancy. It was found that all the animals were settled. The findings obtained in the present study confirm the nutritional importance and the beneficial effect of Azolla feeding

### Horizontal spread of technology

Inspired by the easy method of cultivation, good yield and economy of production and being exposed to extension interventions made by KVK, large number of farmers started practicing cultivation of *Azolla* on small scale. After the impact of the technology was established and feedback of farmers was encouraging, the KVK contacted Project Director of ATMA, Department of Agriculture, Govt. of Rajasthan for its faster horizontal spread and was successful in getting approval of subsidy of Rs. 4000/- for construction of *Azolla* in pucca trench.

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