ECONOMICS OF FEEDING OF HYDROPONICS MAIZE FODDER IN RATHI CALVES

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ABSTRACT

The experiment was conducted on Rathi calves to assess the effect of hydroponics maize fodder on growth parameter. Twenty male Rathi calves of similar age group (6-12 months) and average body weight (96 kg) were divided into equal five groups. 1.5 kg concentrate mixture (CP 20%) was given to the animals in group T_1 (control). In group T_2, 75% CP requirement was met through concentrate mixture (1.125 kg) and rest through hydroponic maize fodder (2.63 kg). Whereas, in group T_3, 50% of CP was met through 0.75 kg concentrate mixture and rest through 5.27 kg hydroponic maize fodder, while in group T_4, 25% of CP was met through concentrate mixture (0.375 kg) and remaining by hydroponic maize fodder (7.9 kg). In T_5 group CP requirement was met solely through 10.54 kg hydroponic maize fodder. In addition, all the animals were offered 2.5 kg groundnut straw along with *ad lib*. wheat straw. The average daily gain (g/day) was found to be significantly ($P<0.05$) increased in groups fed with hydroponics maize fodder. The cost of feed per weight gain was significantly ($P<0.01$) lower in hydroponics maize fodder fed animals indicating its economic superiority. The results revealed that feeding of hydroponics maize fodder improved the growth rate and also proved to be economical beneficial.

Key words: Rathi calves,hydroponics maize fodder, average daily gain

Introduction

Green fodder is the quint essential need for production and reproductive performance in livestock. Increased industrial activities, poor soil fertility, scarce rainfall, improper irrigation facilities, need of fertilizers, excess of growth time, labour requirement have made the possibilities for growing green fodder more challenging. In order to substitute the cumbersome conventional practices for green fodder cultivation, hydroponics technology is emerging as the effective technique. It has been reported that hydroponics fodder require less amount of water and could be harvested on 7-10 days and then fed to animals. It is nutritionally far more superior than conventional fodder.

Materials and Methods

The hydroponics maize fodder was grown in Ayurvet Progreen machine having the production potential of 480 kg. The maize seeds were soaked for overnight prior to their transfer in the trays of machine. On the first day, the trays were placed at the top most row and then were shifted to the respective lower rows at successive days. On the eight day, the trays were taken out of the machine and the fodder was given to the animals. The gross appearance of fodder resembles like mat.

Twenty male Rathi calves of age group 6-12 month and average body weight 96 kg were divided into five equal groups on the basis of their body weight (mean body weight 95.00, 95.24, 96.41, 96.54 and 96.98 kg in T_1, T_2, T_3, T_4 and T_5, respectively). The animals in group T_1 (control) were fed concentrate mixture (CP 20%), 1.5 kg; In group T_2, 25% of CP was met through hydroponic maize fodder (2.63 kg) and rest through concentrate mixture (1.125 kg). Whereas, in group T_3, 50% of CP was met through hydroponic maize fodder (5.27 kg) and rest through concentrate mixture (0.75 kg). In group T_4, 75% of CP was met through hydroponic maize fodder (7.9 kg) and remaining by concentrate mixture (0.375 kg). In T_5 group CP requirement was met solely through 10.54 kg hydroponic maize fodder. Daily allowance of concentrate and roughage were offered to meet their nutrient requirements (ICAR, 1985). A feeding trial of 30 days was conducted. The body weight of all the experimental animals were recorded with the help of Avery platform digital balance at weekly intervals before feeding and watering.

The data obtained in the experiment were analyzed using statistical procedures as suggested by Snedecor and Cochran (1994). Significance of mean differences was tested by Duncan's New Multiple Range Test (DNMRT) as modified by Kramer (1957).

Results and Discussion

The average daily gain (g/d) in different treatment groups subjected to hydroponics maize fodder were significantly ($P<0.01$) different and indicated that hydroponics maize fodder ensured higher average daily gain in Rathi calves than control group (Tble 1). The highest value was observed in T_4 where 75% of crude protein requirement of concentrate mixture was met through hydroponics maize fodder and the lowest was observed in T_1, control group. Improvement in efficiency of nutrient utilization in animals receiving hydroponics maize fodder may be the reason for significant difference in weight gain as compared to the control group.

Tudor *et al.* (2003), reported that 1.01 kg/head/day weight gain was recorded in steers which were fed with 1.9 kg DM/head/day of sprouts and 3.1 kg DM/head/day of poor quality hay. Verma *et al.* (2015) observed that the average daily gain was higher in groups that received hydroponics barley fodder at 50% level;T_2 (501.67 g) and at 100% level; T_3 (490.33 g) in order to replace crude protein

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Table 1: Effect of hydroponics maize fodder on average daily gain (g/d) in Rathi calves

	Treatment groups					
	T_1	T_2	T_3	T_4	T_5	SEM
Average daily gain	295.88^a	329.66^b	362.36^c	415.42^d	381.62^c	103.4106

Note: Means with different superscripts in a row differ significantly from each other

Table 2: Economics of hydroponics maize fodder

Attribute	Treatment groups					
	T_1	T_2	T_3	T_4	T_5	SEM
Cost of feed (Rs./day/calf)	42.54^a	43.56^b	47.67^c	49.43^d	52.55^e	0.183
Cost per weight gain (Rs.)	143.94^c	132.43^b	132.02^b	119.10^a	137.87^{bc}	15.243

Note: Means with different superscripts in a row differ significantly from each other

and energy requirements of concentrate mixture, compared to group T_1 (375.00 g).

Similarly, Paterson (1937) reported increase in average daily live weight 2.82 lb. for sprouted maize and 2.14 lb. for swedes, when fed to groups of 7 bullocks each, where 8 lb. sprouted maize replaced 20 lb swedes. McCandlish and Struthers (1938) recorded 20% increase in live weight gain (2.6 to 3.1 lb. per day) in cattle when one third of the root allowance (60 lb. swedes) by sprouted maize on dry matter basis.

The cost of hydroponics maize fodder per kg was recorded to be 4.5 Rs. which included the cost of maize seed, cost of nutrient solution, labour cost, electricity charges and miscellaneous expenses (Table 2). The result revealed highly significant ($P<0.01$) effect on cost of feeding hydroponics maize fodder. The cost of feed was significantly higher in T_5, followed by T_4, T_3, T_2 and T_1. However, cost per kg weight gain was lowest in T_4, followed by T_3 and T_2 which were comparable, then by T_5 which value was comparable with T_3, T_2 and T_1. The highest value was observed in T_1 group.

Verma *et al*. (2015) reported that there was a reduction of 33 % in feeding cost per kg weight gain/calf /day in group fed on hydroponics barley fodder in order to replace 50% of crude protein and energy requirements of concentrate mixture (T_2) in comparison to control (T_1). Similarly, Naik *et al*. (2014) found higher profit of Rs. 12.67/cow/day on feeding hydroponics fodder.

It can be thus, inferred that hydroponics maize fodder improved the growth rate besides being cost effective.

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