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Cost benefit Analysis in Milk Production by Feeding of Maize Green Fodder (African Tall) to Dairy Cattle of Uttar Pradesh

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Abstract
This study evaluates the cost-benefit analysis of feeding maize green fodder (African Tall) to dairy cattle in 30 districts of Uttar Pradesh during 2022–2023. A sample of 3,220 farmers participated, each cultivating maize fodder with seeds provided by BAIF Development Research Foundation. The total fodder production was 4,044 metric tons, averaging 1,256.77 kg per farmer. Feeding 20 kg of maize fodder daily to milking cattle reduced concentrate feed usage by 2 kg per day without affecting milk yield, saving approximately ₹50 per animal daily. Additionally, milk production increased by 0.5 liters per day, yielding ₹25 extra income per animal. Farmers achieved a net gain of ₹75 per animal daily due to reduced feed costs and increased milk revenue. The study highlights maize fodder's economic viability, improved livestock health, and its potential to enhance farmers' income and sustainability in dairying.

Keywords: Cost-benefit analysis, maize fodder, African tall

1. Introduction
The real India lives in villages and smaller towns and therein lies the future of our country as well as Uttar Pradesh state. The Uttar Pradesh is situated between 23°52'N and 31°28'N latitudes and 77°3' and 84°39'E longitudes. The climate of the state also vary widely - primarily due to it being far from the moderating effect of the sea and the occasional cold air arising due to western disturbances - with temperatures reaching as high as 49 °C in summer, and as low as – 1 °C in winter. The rainfall of the state is heaviest in the plains of east and decreases it volume towards the north-west. A large number of farmers of Uttar Pradesh state depend on animal husbandry for their livelihood. Livestock sector plays an important role in rural economy through supply of milk, meat, eggs, wool, their castings (dung), etc, since time immemorial. Livestock production and agriculture are intrinsically linked to each other, and both are crucial for overall food security. Marginal, small and semi-medium farmers with average operational holdings of area less than 4 ha own more than 80 percent livestock of the state. The milk yield of an animal depends upon its breed and management practices. The poor quality of feed and fodder is also an important reason for the low yield of milk. The fodder available to the animals is of poor quality and lesser quantity. In order to get better yields of milk, the milch cattle must be feeded with balance feed and fodder. Fodder scarcity makes dairying uneconomical and unattractive entrepreneur among poor farmers of the country.
The productivity of livestock is mainly depending on green and dry fodder. Fodder crops are the cheapest source of feed but the area under fodder cultivation (~767 thousand hectares in 2014-15) and permanent pastures, grazing lands (65 thousand ha) is insufficient. The declining area and deteriorating quality of natural grassland has further compounded the problem.
There is always debate on the exact shortage of feed and fodder in the country, but recently it has been reported that the country faces a net deficit of green fodder (35.6%), dry fodder (26%) and concentrates (41%; Anonymous). The area under fodder crops (4.9%) has almost remained static for the last three-four decades. The availability of dry fodder, green fodder and concentrates has been forecasted at 409.4, 135.6 and 61.2 million tonnes, respectively by 2030.

Moreover, 50 -60 percent of total cost of livestock production goes to fodder feeding and remaining to health and other management aspects. Thus, bridging the gap between demand and supply is indeed a matter of great concern. Keeping in view the above, the present study was conducted to assess the cost benefits in milk production by feeding of Maize fodder (African tall) to dairy cattle under existing farming systems in 30 districts of Uttar Pradesh.

Methodology

The methodology adopted is a quantitative approach in which data analysis was done in excel to analyze the fodder production. All data were collected from BAIF Cattle Development Centres in the state.

Sample size and study area

A sample of 3220 farmers of different villages in 30 districts of Uttar Pradesh selected under the project for the year- 2022-23.

Selected farmers are also supported with training on livestock management (feeding, breeding, disease control etc.) and Artificial Insemination services to cow & buffaloes of farmers through the trained youth posted at each centre being operated by BAIF. Purpose of all the activities is to strengthen farmers managerial skill, reduce management cost, enhance production of cattle & ultimate increase the income of farmers. There are 23 farmers were selected from each centre with following criteria- farmers having 0.3-acre land for fodder cultivation, 2 to 5 dairy animals, basically literate & needy to be aware about his development etc. All the information was collected through individual contact at his door step. The estimation of market value of fodder was derived on the basis of seasonal production and requirement of green fodder to animals.

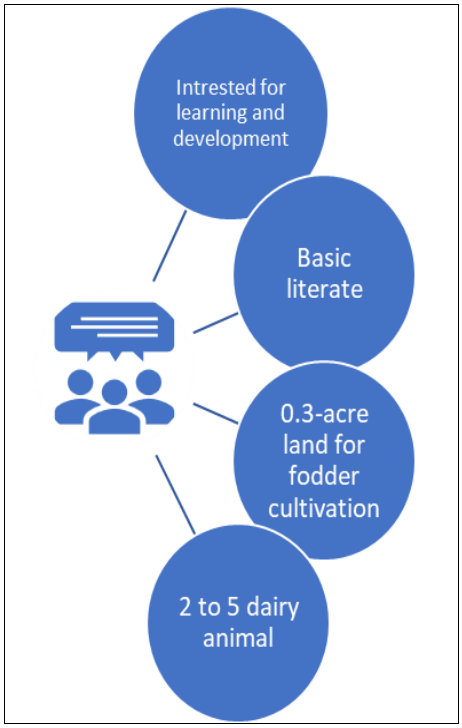

Fig 1: Criteria for selection of farmers

After selection & review, each farmer was supported with 2 kg Maize fodder seed (African Tall) in June -22. Thus total 6440 kg seed was provided among 3220 farmers. The details of distribution, showing & production is also recorded. Zone wise Maize fodder production detail is sowing in below mentioned table-

S.N.	Tech. Zone	No. of District	No. of LDC	No. of farmer	Seed Qtty. (kg.)	Area covered (hect.)	Fodder Production (kg.)	Avr. Prod. Per Farmer (kg.)
1	Etawa	7	27	621	1242	30.85	898530	1446.91
2	Bareilly	6	27	621	1242	24.76	752735	1212.13
3	Lucknow	5	27	621	1242	27.97	799490	1287.42
4	Aayodhya	5	27	621	1242	37.86	792050	1275.44
5	Gorakhpur	5	27	621	1242	34.45	681150	1096.86
6	Prayagraj	2	5	115	230	5.20	122850	1068.26
		30	140	3220	6440	161.09	4046805	1256.77

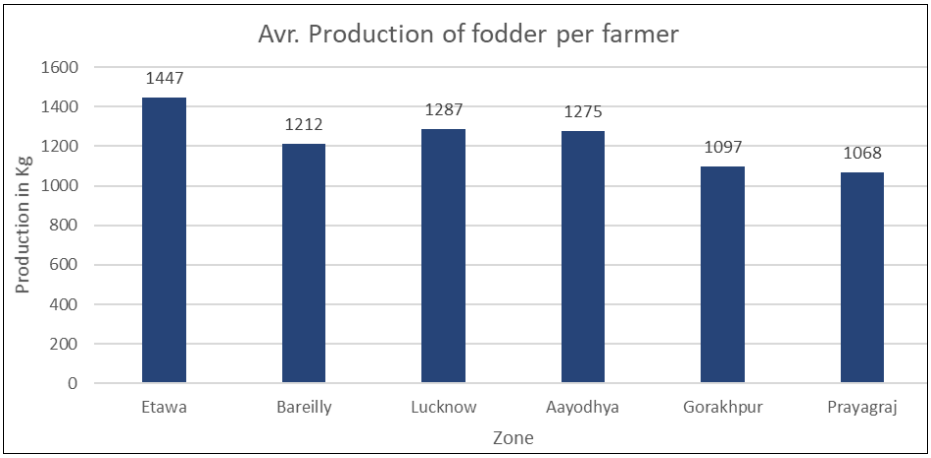

Fig 2: Zone wise analysis of fodder production

Key Findings

The data was analysed in various aspects:

1. How green fodder reduced the quantity of concentrate ration in feeding of dairy cattle without affecting milk production;
2. Comparative effect on milk production before & after feeding of maize fodder and;
3. Average income/savings by using fodder in feeding.

The data shows the total production of 4043655 kg (4044 MT) green fodder by using 6440 kg seed in 161-hectare land. A survey was conducted by field staff under supervision of technical / veterinary officers. On the basis of data analysis, it is found out that daily feeding of 20 kg maize green fodder to one milking cattle is reduced up to 2 kg of concentrate ration without affecting the milk production. So approx. Rs 50/- daily can be saved per animal. The fodder was feeded to animals for 2 months and each farmer save Rs. 3000.00 due to daily saving of 2 kg concentrate feed cost.

Results

Above data shows the total production of maize fodder with 3220 farmers and average production per farmer in zone. A 2nd survey also conducted for feeding data to animals. All farmers have been feeded the fodder to their animals for 2 months@10kg/animal/day. Since fodder is good in digestibility & nutrition due to its palatability in comparison to concentrate, It is found that farmer saved average 2 kg concentrate feed. As per market rate of cattle feed Rs.50 per animal per day saved. It is also seen that milk production of animal has been increased @0.5 litre per day for Rs.25/-. Total Rs.75/- gained by farmer by using fodder. In other hand, health of animals is also looking fine & cost of medicines is minimized.

Conclusion

The fodder activity is for year-round with farmers & season wise fodder cultivation, production is inbuilt in project, outcomes will be increased in term of feed quantity & cost reduction, more milk production, better animal health & overall enhance the income of famers.

Conflict of Interest

Not available

Financial Support

Not available

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