

Impact Assessment of dairy based interventions under Farmer FIRST Programme of ICAR-NDRI

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Dairying is a sub-sector in agriculture and a prominent subsidiary enterprise which gives income, gainful employment, food, nutritional and livelihood security to the millions of farm families. Dairy farming forms an essential part of Haryana's rural economy. The present study was conducted in the Farmer FIRST Programme area in 5 villages of Karnal district namely Kamalpur Roran, Garhi Gujran, Nagala Roran, Churni and Samoura. Under dairy based interventions, 7 interventions were selected and 184 respondents were selected in proportion to the intervention. The economic impact assessment of the interventions was undertaken and the benefit-cost ratio obtained are as follows: Balanced feeding (1.86), Bypass fat supplementation (2.99), Mineral mixture supplementation (5.37), Theileriosis vaccination (74.88), Theileriosis treatment (10.19), Mastitis diagnosis (41.20) and treatment of mastitis (85.75).

Key words: Balanced feeding, Bypass fat supplement, Endo-parasite, Mastitis control, Mineral mixture, Theileriosis vaccination

FARMER FIRST Programme (FFP) is a new approach involving innovation and technology development with a strong partnership of the farmers and scientists for developing location specific, demand driven and farmer friendly technological options. Through farmers–scientists interactions, problems of farm were identified and based on that, different interventions were introduced to tackle the problems. Under the FFP of ICAR, National Dairy Research Institute, Karnal undertaken the project entitled “Capacity Building of Resource Poor Farmers in Paddy-Wheat cum Dairy Production System through Farmer FIRST Programme under Irrigated Agro- Eco Region of Haryana” with different dairy based

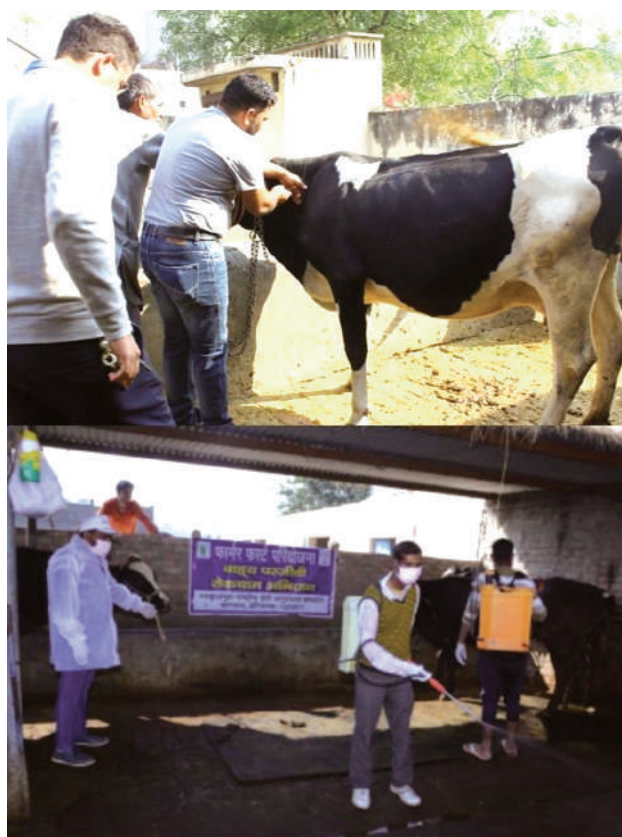


Fig. 1. Activities under interventions

technological interventions. The present study was undertaken with the title “Impact Assessment of selected interventions under Farmer FIRST Programme of NDRI” with the specific objective to assess the economic impact of interventions introduced by the NDRI in the project area (Fig. 1).

Methodology

The present study was conducted in the FFP 5 villages namely: Kamalpur Roran, Garhi Gujran, Nagala Roran, Churni and Samoura from Karnal district on 184 respondents which were selected proportionately. Research design used in this study was an informal experimental design (which includes before and after without control design).

Interview schedule was applied to assess the

economic impact of intervention of the different technological interventions.

Economic impact assessment of interventions

Under economic impact assessment the cost involved under different interventions along with the increase milk production, increase in reproductive efficiency, increase in value of animal and the returns were calculated.

Balanced feeding

Balanced feeding interventions was introduced for higher milk production in dairy animals. Under this intervention animals having milk yield >8 liter/day were selected. The total expenditure involved in balanced feeding was ₹ 3, 375 per animal per month. The average milk yield before the intervention and after the interventions were 12.15 liters per day and 13.34 liters per day; respectively with an average increase in milk yield of 1.25 liters per day and the net returns were ₹ 2,922.5 per animal per month. The average increase in reproductive efficiency was found to be ₹ 568.33 per animal per month and increase in value of animal was seen as of ₹ 4, 416.67 per animal. The B: C ratio was 1.86 (Table 1). Animals were provided with balanced feed (Fig. 2) containing all the essential nutrients and better feeding management under the interventions which leads to increase in milk production along with increase in the reproductive efficiency and the value of the animals. The intervention has made beneficial impact among the respondents.

Bypass fat supplementation

Animals having milk yield of 12-13 liters per day were selected and were supplemented with rumen protected bypass fat to reduce the impact of negative energy balance on animals during transition period. The total expenditure involved in bypass fat (Fig. 3) supplementation was found to be ₹ 1,845 per animal for 3month.The average milk production



Fig. 2. Distribution of inputs to the farmers

before intervention and after the intervention were 13 liters per day and 14.15 liters per day; respectively with an average increase in milk yield of 1.15 Liters per day and the net returns were found to be ₹ 3672.83

per animal for 3 months. The average increase in reproductive efficiency was found to be ₹ 310 per animal for 3 months with an average increase in value of animal was seen ₹ 3100.33 per animal after 3 months. The B: C ratio was 2.99 (Table 2). Bypass fat was an ideal energy dense supplement for early lactating and advanced pregnant animals to overcome negative energy balance and decreases the metabolic disorders in the animals. The intervention found to be beneficial to the farmers. It leads to increase in the milk yield, increase in the reproductive efficiency and increase in the value of animal.

Mineral mixture supplements

Mineral mixture supplement was provided in dairy animals for one month .The total expenditure involved in the mineral mixture supplement was ₹ 525 per animal per month .The average milk yield before the intervention and after the intervention were 13.06 liters per day and 13.91 liters/day; respectively

Table 1. Economic Impact Assessment of Balanced Feeding

Particular	n=6
Cost of balanced feed (for 1 month) (₹)	3,000
Average milk yield before interventions	12.15 liters
Average milk yield after interventions	13.34 liters
Change in milk yield due to interventions	1.25 liters/day
Returns from milk yield (for 1 month) (₹)	1,312.5
Increase in reproductive efficiency (₹)	568.33
Increase in value of animal (₹)	4,416.67
Total Expenditure (₹)	3,375.00
Net Returns (₹)	2,922.50
B:C ratio (Gross returns/Total expenditure)	1.86

Table 2. Economic Impact Assessment of Bypass Fat Supplementation

Particular	n=6
Cost of bypass fat supplement (for 3 months) (₹)	720.00
Average milk yield before interventions	13.00 liters
Average milk yield after interventions	14.15 liters
Change in milk yield due to interventions	1.15 liters/day
Returns from milk yield (for 3 months) (₹)	2107.5
Increase in reproductive efficiency (₹)	310.00
Increase in value of animal (₹)	3100.33
Cost on man power involved (₹)	1125.00
Total Expenditure (₹)	1845
Gross Returns (₹)	5517.83
Net Returns (₹)	3672.83
B:C ratio (Gross returns/Total Expenditure)	2.99

with an average increase in milk yield of 0.85 liters per day. The net returns were found to be ₹ 2,295.97 per animal for three months with B: C ratio of 5.37. The average increase in reproductive efficiency was found to be ₹ 340.00 per animal for three months and improvement in health of animal was found to be ₹ 315.97 per animal for 3 months (Table 3). It helps in increasing the milk yields, increases the reproductive efficiency and improvement in animal health. The higher B: C ratio was found due to supplementing of mineral mixture for one month and we were recorded three months returns/effects. We can say that increased milk yield may be due to mineral mixture supplementation and better management of animals under the intervention.

Ecto-parasite control

Mitraaz (0.5%) and Ectomin (0.05%) solution were used to prevent the infection of ecto-parasite among the dairy animals. The cost and returns involved in ecto-parasite control were calculated for three months and the results were as follows: the total expenditure involved was ₹ 325.97 per animal for three months. The average milk yield before the intervention and after the intervention were 10.95 liters per day and 12.10 liters/day; respectively with an average increase in the milk yield of 1.15 liters per day. The average net returns were found to be ₹ 1,715.76 per animal for three months. The increase in reproductive efficiency was ₹ 381.64 per animal for three months with improvement in health of ₹ 325.97 per animal for 3 months period (Table 4). The parasites control programmes under the interventions helped the farmers to increase their knowledge regarding control and preventive measures against ecto-parasite infections. There was effective control of these parasites along with improved milk yields and improvement in animal health.

Endo-parasite control

To prevent endo-parasitic infection among dairy animals deworming was done. The cost and returns involved

in endo-parasite control were calculated and the results were as follows : the total expenditure involved was found to be ₹ 515 per animal for three months. The average milk yield before the intervention and after the intervention were 11.07 liters per day and 11.82 liters per day; respectively with an average increase in the milk yield of 0.75 liters per day.

The average net return were found to be ₹ 2,143.14 per animal for three months. The increase in reproductive efficiency was found to be ₹ 359.34 per animal for three months with an improvement in health of ₹ 305 per animal for 3 months period (Table 5). Like ecto-parasite control the farmers had good knowledge about effective control and preventive measures

against endo-parasite infections which helps in better management of diseases along with increased milk yields, reproductive efficiency and improvement in health.

Theileriosis Vaccination

The expenditures and returns involved in vaccination of animals against theileriosis disease were calculated and the results were as follows: The total expenditure involved in theileriosis vaccination of 16 animals were ₹ 4,266.72 (₹ 264.17/animal) during the vaccination period, which includes expenditures on vaccine, man power and in nitrogen gas filling and transportation. The total avoided losses due to vaccination that is the total benefits the farmers were getting ₹ 3,19,500 (₹ 19968.75/

Table 3. Economic Impact Assessments of Mineral Mixture Supplements

Particular	n=36
Cost of mineral mixture supplement (for 1 month) (₹)	150
Average milk yield before interventions	13.06 Liters
Average milk yield after interventions	13.91 Liters
Change in milk yield due to interventions	0.85 Liters/day
Returns from milk yield (for 3 months) (₹)	2165
Increase in reproductive efficiency (₹)	340.00
Improvement in health of animal (For 3 months) (₹)	315.97
Total Expenditure (₹)	525.00
Net Returns (₹)	2295.97
B:C ratio (Gross Returns/Total Expenditure)	5.37

Table 4. Economic Impact Assessment of Ecto-Parasite Control

Particular	n=67
Cost of medicine (for 3 months) (₹)	680
Average milk yield before interventions	10.95 Liters
Average milk yield after interventions	12.1 Liters
Change in milk yield due to interventions	1.15 Liters/day
Returns from milk yield (for 3 months) (₹)	2063.14
Increase in reproductive efficiency (for 3 months) (₹)	381.64
Improvement in health (for 3 months) (₹)	325.97
Total Expenditure (₹)	325.97
Net Returns (₹)	1715.76
B:C ratio (Gross Returns/ Total Expenditure) (₹)	5.26

Table 5. Economic Impact Assessment of Endo-Parasite Control

Particular	n=46
Cost of dewormer + medicine (for 3 months) (₹)	140
Average milk yield before interventions	11.07 Liters
Average milk yield after interventions	11.82 Liters
Change in milk yield due to interventions	0.75 Liters/day
Returns from milk yield (for 3 months) (₹)	1993.79
Increase in reproductive efficiency (for 3 months) (₹)	359.34
Improvement in health (for 3 months) (₹)	305
Total Expenditure (₹)	515
Net Returns (₹)	2143.14
B:C ratio (Gross Returns/ Total Expenditure)	4.16

animal) after the vaccination and the benefit-cost ratio was found to be 74.88 (Table 6). Initial diagnosis of Theileriosis infection and vaccination against the disease helps the farmers for better management of disease. So by opting the vaccination for Theileriosis in animal, farmers can avoid the expected losses from the infections.

Theileriosis Treatment

Initially we find out the number of animals which undergone the theileriosis treatment and then we calculated the expenditures and returns from it. The expenditure and returns involved in theileriosis treatment were calculated and the results were as follows: the total expenditure involved was ₹ 31,400 (₹ 3140/animal) during treatment period of 10 animals which includes the expenditures on medicines, manpower and transportation and the avoided losses or the benefits out of treatment were ₹ 3,20,000 (₹ 32,000/animal) and the benefit -cost ratio was found to be 10.19 (Table 7). After Initial diagnosis the animals were monitored for the further treatment of Theileriosis and were given timely treatment under the intervention. The higher knowledge about Theileriosis treatment among the respondents also helps the better management of disease and helps the farmers to avoid the expected losses from the infections.

Mastitis Diagnosis

The expenditure and returns involved in mastitis diagnosis were

Table 6. Economic Impact Assessment of Theileriosis Vaccination

Particular	Costs/Return (₹)
<i>Expenditure</i>	
Expenditure on vaccine (@ ₹150/animal)	2,400.00
Expenditure on manpower (@ ₹ 50/animal)	800.00
Expenditure on nitrogen gas filling and transportation (@66.67/animal)	1066.72
Total Expenditure	4266.72
<i>Avoided Losses</i>	
Remaining affected animals (3-1)	2 animals
Loss on mortality (1 animal)	60,000.00
Loss on affected animals but survived: 2 animals (on one animal1800 lit milk @ ₹ 25 = ₹ 45000)	90,000.00
Loss on reproduction cum health (for one year) @ ₹ 150/day: 365 days * 2 animals * 150	109,500.00
Animal is disposed off (₹ 30,000/animal)*2 animals	60,000.00
Total Avoided Losses = Total Return = Benefits	3,19,500
B:C ratio = Total Avoided Losses/Total Expenditure	74.88

Table 7. Economic Impact Assessment of Theileriosis Treatment

Particular	Costs/Returns (₹)
<i>Expenditure:</i>	
Cost on medicines (@ ₹ 2640/animal)	26,400.00
Cost of Manpower and transportation involved	5,000.00
Total expenditure	31,400.00
<i>Avoided losses</i>	
Cost of affected animal (all categories) (@₹40000/animal)	3,20,000.00
B:C ratio (Avoided losses /Total expenditure)	10.19

Table 8. Economic Impact Assessment of Mastitis Diagnosis n=14

Particular	Costs/Returns (in ₹)
<i>Expenditure</i>	
on 20 animals in CMT including manpower involved	1544.00
<i>Losses avoided= Benefits</i>	
Cost of lost milk : 1350 lits * ₹ 25	33,750.00
Loss of price of animal on sale after 1.5 lactation	30,000.00
Total avoided losses	63,750.00
B:C ratio :Total avoided losses / Total expenditure	41.20

calculated and the results were as follows: the total expenditure involved in diagnosis of mastitis

using CMT method for 20 animals were ₹ 1544.00 (₹ 77.2/animal) during diagnosis period and the total



Fig. 3. By Pass Fat Supplementation



Fig. 4. Mastitis treatment

Table 9. Economic Impact Assessment of Treatment of Mastitis

Particular	Costs/Returns (₹)
Expenditure	
Expenditure on medicines (@ ₹ 452.83/animal)	5433.96
Expenditure on man power transport (@ ₹ 166.67/animal)	2000.04
Total Expenditure	7434.00
Losses avoided	
Losses on milk production (1350 lits * 10 animals*₹25)	3,37,500.00
Loss on price of animal (@₹ 30,000/animal)*10 animals)	3,00,000.00
Total losses avoided	6,37,500.00
B: C ratio = Total losses avoided /Total Expenditure	85.75

avoided losses were ₹ 63,750 (₹ 3187.5/animal) after effective diagnosis and treatment. The benefit-cost ratio was 41.20 (Table 8). Demonstration of CMT diagnosis kit, Kissan Sanghoities and awareness programme organized for mastitis control under the intervention helps better management of infections and helps the farmers to avoid the expected losses from the mastitis infection.

Treatment of Mastitis

Initially we find out the animals

undergone the treatment of mastitis and then we have calculated the expenditures and returns involved in mastitis treatment. The expenditure and returns involved in mastitis treatment were calculated and the results were as follows: the expenditure involved in treatment of mastitis in 12 animals was ₹ 7434.00 (₹ 619.5/animal) during mastitis treatment and the total losses avoided (benefits) from mastitis treatment were ₹ 6, 37,500 (₹ 53125/animal) by undertaking the mastitis treatment and the benefit -cost ratio was found

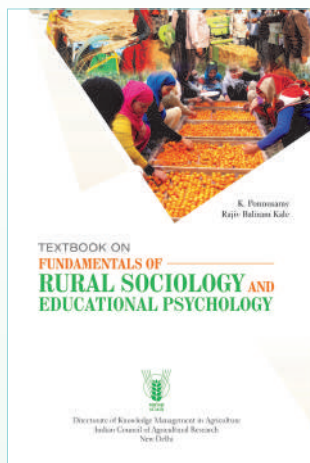
to be 85.75 (Table 9). After diagnosis with infection animals were monitored and provided with on time treatment (Fig. 4) which helps the farmers in better management of disease and helps the farmers to avoid the expected losses.

Conclusion

We can say that the FFP project has made good impact in the project area. Due to the interventions, there was increase in milk yield, improvement in animal health, increase in reproductive efficiency, increase in value of animal and better control and management of mastitis and Theileriosis disease under the interventions. The returns from the milk yield were also increased. These interventions helped the farmers in increasing their incomes.

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TECHNICAL SPECIFICATIONS

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