

Improving livelihood of farmers

through introduction of parasitic control and mineral mixture supplementation in animal

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Animal husbandry is an important source of livelihood in Jharkhand and plays a key role in nutritional security. Backyard animal husbandry contributes substantially and has the potential to transform rural economy by upscaling from backyard to sustainable homestead enterprises and for entrepreneurship development of rural unemployed youth. It may also play a role in social mainstreaming. Although it plays an important role in agriculture-led economy of the state, the per capita availability of milk, meat and egg is less than half of the national average. General backwardness and poor productivity of animal husbandry sector in Jharkhand reflected by the fact that per capita availability of milk in Jharkhand is 165 g/day against national availability of 175 g/day whereas ICMR recommendation is of 400 g/day. The annual per capita recommendation for egg consumption is 180 while availability in Jharkhand is mere 15 eggs/year against national average of 69 eggs/year. Under the Farmers First Project being implemented by ICAR Research Complex for Eastern Region, Research Centre, Ranchi, technology demonstration on area specific chelated mineral mixture and management of endo- and ecto-parasites in livestock and poultry was initiated for improving the productivity of animals. The action began with sensitization of the farmers towards modern management practices of livestock through Animal health camps followed by training of farmers in each village.

Key words: Livelihood, Mineral mixture, Parasitic control

LIVESTOCK rearing is a traditional practice followed by majority of tribal farmers in Jharkhand. Pig, poultry, goat, cattle and buffaloes are important animal component of tribal farming system of the state. Farmers maintain a sizeable livestock herd in their backyard e. g. 5 to 6 pigs or goats or both, 2 to 4 cattle or buffaloes and 5 to 8 poultry birds. There is a high demand for pig, poultry and goat, especially in festival season. Except for seven North Eastern states and Andaman & Nicobar Islands, Jharkhand has the highest number of animal per thousand households with

the figure of 177 against the national average of 47. It reflects the importance of Animal husbandry in Jharkhand. However, most of the farmers follow the traditional system of animal husbandry practices and the returns are limited because of scientific management practices are not followed. A preliminary study on management practices followed by tribal farmers in and around ICAR Research Complex for Eastern Region, Research Centre, Ranchi revealed that >95% of famers till date have not adopted better management practices especially of feeding, breeding and health care.

Introduction of scientific management practices including maintenance of healthy stock of animals can contribute significantly towards increasing the income from livestock sector.

Context of Farmers FIRST Project

The Farmers First Project (FFP) on “Enhancing Food, Nutritional and Livelihood Security of Marginal and Small Farmers in Jharkhand through Need Based Agricultural Technologies” is being implemented by ICAR Research Complex for Eastern Region, Research Centre, Ranchi in four villages, viz. Malti,



Farmer with mineral mixture



Sensitization programme in villages through Animal Health Camps

Tetri, Kutiyatu and Pindarkom situated in southern outskirts of Ranchi. In this project a benchmark survey revealed that 1,565 animals are being reared by a total of 955 household in project villages. The cattle population constitute the major share (51.12%) followed by goats (30.67%), buffaloes (8.95%) and pigs (4.97%). Animal husbandry contributes a considerable proportion of income of marginal (< 1.0 ha), small (1-2 ha) as well as medium (2-5 ha) farm holding sections in adopted villages, which stands at 29.70%, 33.50% and 28.0%, respectively. Baseline survey revealed backwardness of the production system in terms of low availability of superior animal genetic resources, unscientific feeding, poor husbandry and health management practices as major factors responsible for low level of animal production and productivity in the adopted villages.

During the initial survey it was also observed that most of the animals were suffering from endo- as well as ecto-parasites. The main reason for endoparasitic infestation is grazing in open field and drinking of unclean or polluted water. It was observed in surveyed villages that the farmers take their animal for grazing in open area. The animals drink water from polluted pond or water bodies. Consequently the animals face the risk of parasitic infestations. The farmers are not aware of giving deworming drugs periodically to the animals. The animals suffer from various parasitic diseases and most of the animals are in poor health and less productive. On field study it was recorded that the animals mainly suffer from tapeworm, round worm, hook worms and flukes. Ectoparasitic infestations are mainly due to mange mites, lice

and ticks.

Use of mineral mixture as supplement with feed is also not known to the farmers. Most of the farmers do not practice stall feeding. Open grazing contributes nearly 90% of total feed and nutrient requirement of cattle and goats. The poultry depend almost entirely on scavenging whereas in case of pig, it contributes 90% of their food requirement. Studies conducted on nutritional status of animal feed and animals in Jharkhand indicated that the plant materials used as fodder in the region are markedly deficient in copper, zinc, calcium and sulphur. These inadequacies in supply of minerals in the soil-plant-animal continuum contribute towards deficiency of calcium, phosphorus, magnesium, sulphur, copper, zinc and cobalt in animals resulting in poor health and low productivity.

Keeping this in view a programme on mineral mixture supplementation and management of endo- and ecto-parasites in livestock and poultry was initiated under the project.

Details of technological interventions

Health check up of animals was done in a series of animal health camps in collaboration with state animal husbandry department, with focus on improvement in general health of the animals and increase in production in all 4 villages. Farmers from 343 households were educated and trained in use of mineral mixture as a supplement in animal feed. They were also trained to administer anthelmintic drugs like Albendazole, Febendazole etc. for control of endoparasites. Deworming drugs were ground in mortar and pestle and mixed with jiggery to form a lump. One bolus is

given to large animals and a tablet is used for goats and pigs. More than 700 animals benefitted from this. Similarly, for management of ectoparasitic infestations like ticks, mite, lice etc, farmers were trained to use the recommended medicines; these medicines were also supplied to the farmers. After administering anthelmintic doses, liver tonic and mineral mixture were distributed to the farmers with hands-on training at farmers' doorsteps in each village. For addressing the problem of deficiency of minerals, area specific chelated mineral mixture for Jharkhand, formulated by National Dairy Development Board and supplied in large scale by The Jharkhand State Co-operative Milk Producers' Federation Ltd, was provided to the farmers. The formulation is rich in calcium, phosphorus, magnesium, sulphur, copper, zinc cobalt, iodine and chromium. After six months of initiation of the programme, data were recorded every fortnight on body weight of the small livestock and milk production in cattle and buffaloes.

Results of technological interventions made

Supplementation of area specific chelated mineral mixture resulted in an average of 37.28% increase in milk yield. By management of endo- and ecto. parasite, the average daily gain in body weight of the treated goats was recorded as 88.12 g as compared to 56.31 g in untreated animals. In case of pigs, the mean daily weight gain was 321 g in treated animals and 246 g in case of untreated pigs. In case of dairy animals, the benefit cost ratio was worked out to be 4.5:1 whereas in case of goats and pigs, it was 1:1.7.

In case of milch animals, data were recorded from 32 farmers having 43 cows and buffaloes of 1st to 6th lactation. On an average 37.28% increase in milk yield with a range of 20% to 50% was recorded. During the period of observation no calf mortality was recorded. Disease incidence among all age groups reduced drastically. Particularly no calcium tetany was reported during this period. Period of lactation extended in case of milch animals on



Demonstration on technique of administering deworming medicine



Smt Pushpa Tirkey with milch cow

an average by 43 days. Faecal sample examination for parasite eggs revealed that there was no endo-parasitic infestation in treated animals and treatment with ecto-parasitic drugs also eradicated ecto-parasitic infestation. In case of goats, data were collected with help of 28 goat farmers from 18 treated and 22 untreated goats. Average daily gain in body weight of the treated animals was recorded as 88.12 g whereas it was 56.31 g in case of untreated goats. Similar to cattle, there was no faecal samples of goats, no case of anaemia and diarrhoea due to parasites were recorded in treated animals. Overall health of the animals improved significantly. However, in untreated animals anaemia and diarrhea were common in all four villages. Data regarding pigs were recorded with help of 12 pig farmers. Body weight increase in pigs were recorded from 18 untreated and 18 pigs treated with mineral mixture. The body weight of the animals enhanced in all treated animals. The mean daily weight gain was 321 g in treated animals and 246 g in case of untreated pigs. At the beginning of the project, 94.85% of pigs were found suffering from endo-parasitic infestation. But after treatment with anthelmintics, the incidence came down to 7.13%. In pigs, mange mite infestation was common in all four villages. The animals treated with ecto-parasitic drugs showed reduction in the incidence (64.53% cases).

Case studies

Smt. Pushpa Tirkey, a small holder farmer in Kutiatu village, rears a herd

of 8 cattle of which 3 are in milk. When interventions started, she used to obtain 12.0 litres of milk per day. At that time endo-parasitic infestation of some of her animals was detected and suitable anthelmintic medicines were administered. Feeding of mineral mixture was started at the rate of 100 g/day. Milk yield was recorded at regular intervals of 15 days. After 3 months of deworming and regular use of mineral mixture, all other factors remaining same, the milk yield gradually increased to 16.5 litres per day. Since January 2019 she has also started purchasing the 'area specific chelated mineral mixture' from the market. By adoption of this technology, she has been able to increase her net income by ₹ 3000 per month approximately. The benefit cost ratio in her case stands at 4.5:1. She has also planted 0.1 acre of hybrid napier as green fodder in her farm to meet the green fodder requirement of her cattle with increased appetite.

Smt. Mariam Kachhap is a marginal farmer in Tetri village, whose main source of income is animal husbandry. Her husband also works as a daily wage labourer in the Ranchi city and earns about ₹ 3000/- to ₹ 4000 per month. She maintains a herd of 15 pigs, 12 goats and a flock of 20 hens. Every month, she used to sell at least one pig (weighing 50-60 kg) @ ₹ 140 per kg live weight, one goat (weighing 15-18 kg) @ ₹ 480 per kg live weight and 150-160 eggs @ ₹ 5 per piece. Her gross income was nearly ₹ 15,000 to ₹ 16,000 per month. As it is typical of this region, her animals and birds were found

infested by ecto- as well as endo-parasites. Her livestock was also improperly fed. The goats depended almost entirely on open grazing, and the pigs and hens depended mostly on scavenging for food. Therefore, interventions in terms of deworming and mineral mixture supplementation were started. After 8 months of deworming treatment and regular supplementation of mineral mixture, the weight of marketable pig and goat were 85 kg and 22 kg, respectively. Apart from this, litter size of pig increased from 6-8 to 10 number per sow and there was no incidence of piglet anemia. She could earn additional net income of ₹ 5700 in three months. The benefit cost ratio was worked out to be 1:1.7. It is also expected that with increased litter size, she will be able to sell at least 15-18 numbers of pig per year. Smt Kachhap has also started purchasing the area specific chelated mineral mixture from market since February, 2019. Her husband hopes that he will not need go to Ranchi city for earning additional income.

Recommendation

The high benefit cost ratio of the technologies observed in all the cases under study amply justifies the potential of these technologies in Jharkhand. In the scenario of low adoption rate of standard feeding practices in the region, the alarming situation of nutritional deficiency in animals can be mitigated by large-scale adoption of practices like deworming and supplementation of area specific chelated mineral mixture. It is imperative that these low cost technologies are incorporated in the prevailing animal husbandry practices in the region through intensive sensitization of policy makers and extension workers.

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