

Interventions and Package of Practices needed to Enhance Farmer's Income through Livestock

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Abstract

Livestock plays a vital role in Indian economy. In India, large number of population is dependent on livestock for their livelihood. India has vast store of livestock breeds but milk productivity is still low in the country as compared to many countries. Various livestock species contributes differently to the income of poor and marginal farmers but among different livestock species, cattle and buffalo are largely maintained by farmers to earn their livelihood through sale of milk. There is need to adopt new technologies and package of practices by farmers to enhance the income from rearing of livestock. These include breeding, nutritional, management and health interventions. Dairy technologies such as processing of milk and augmentation of nutritive value of milk are needed to be adopted to increase the income of farmers. Organic farming and Integrated Farming System supplement all other interventions in enhancing the returns to farmers.

Keywords: livestock, farmer's income, package of practices

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INTRODUCTION

Livestock sector of India is one of the largest in the world with about 56.7% of world's buffaloes, 12.5% cattle, 20.4% small ruminant, 2.4% camel, 1.4% equine and 1.5% pigs. In India about 58% human population is engaged in agriculture and rearing of livestock. Livestock sector alone contributes nearly 4.11% to Gross Domestic Product (GDP) and 25.6% of total output in agriculture, fishing and forestry sector. As per the latest All India 19th Livestock Census (2012) [1], country has 512.05 million livestock population which is further comprised of 190.90 million cattle, 108.7 million buffaloes, 65 million sheep, 135.17 million goats, 10.29 million pigs, 0.62 million equines, 0.4 million camel and 0.37 million mithuns and yaks. India has a vast repository of 168 registered breeds of livestock which includes 41 breeds of cattle, 13 of buffalo, 42 of sheep, 28 of goat, 6 of horse and ponies, 9 of camel, 6 of pig, 1 of donkey, 18 chicken, 1 yak, 1 duck and 1 geese [2] The current level of milk production in India is 155 million tonnes. However, the projected demand of milk according to the

Government of India by 2020 is about 191 million tonnes. Milk productivity in the country remains low as compared to many leading countries of the world. In India, average milk productivity of crossbred cows, indigenous cows and buffaloes is about 7.33, 3.41 and 5.76 kg/day, respectively.

Livestock plays an important role in generation of income and thereby livelihood of farmers. Major source of income for farmers is through sale of milk in case of cattle and buffaloes along with milk products and sale of animals itself. There is a lot of advancement in the use of mechanical power in Indian agricultural operations but still bullocks play a very important role especially in rural areas. If we talk about small ruminants then these are referred as mobile banks and assets for economic security of farmers. Goat rearing is the backbone of economy of small and landless farmers in India. Goat, a mini-cow or poor man's cow, is a multipurpose animal to provide meat, hide, fur and manure for soil. It is an insurance against crop failure and provides alternate source of livelihood to

farmers round the year. Sheep is traditionally a poor man's companion. Sheep provides the much needed wool, fibers, manure and to some extent milk also.

Pork as a source of animal protein is gaining popularity in India and demand of pork products is also increasing due to nutritional awareness among people. There is no doubt that swine industry is a profitable enterprise but most of the progressive farmers hesitate to adopt it because of prejudice sentiments in our society against pig farming. Pack animals such as horses, donkeys, ponies, mules, camels etc. are used for transportation purposes especially in hilly regions. One noteworthy example is use of mules for transportation in *Shri Vaishno Devi Shrine* and due to this many people are earning their livelihood. Thus, livestock has been an important source of livelihood for small farmers and contributes about 16% to their income. Cattle and buffaloes are widely maintained among different species of livestock because of social acceptability and potential for generating substantial income from milk. Farmers should adopt new technologies and package of practices in order to get more profit from livestock rearing.

BREEDING TECHNOLOGIES/INTERVENTIONS

Adoption of Artificial Insemination (AI)

Artificial insemination (AI) is not merely a method of impregnation of females but it is a powerful tool for genetic improvement of animals. AI has been considered as an emerging dairy innovation of socioeconomic importance in Indian dairy industry. At present, only about 30% population of cattle and buffalo is under AI coverage which is very less and there is need to enhance this coverage.

In AI, superior quality germplasm can be utilized effectively and efficiently. It is rightly said that "*more the number of good genes in animal, more the money in farmer's jeans*". Farmers should get their animals inseminated with high quality semen with the assistance of veterinarian. The technique of AI allows semen to be transported across countries, can be utilized in large number of females and semen can be stored for long period of time. Natural mating may lead to transmission of venereal diseases. This will cause more

economic loss to the farmers. Additionally, males grow faster and consume more feed as compared to females. In case of AI, there is no need to rear the bull so it results in more gain to the farmers. The Government is providing sexed semen in some states such as Punjab at subsidy. Farmers can utilize sexed semen to get female calf for higher economic returns.

Proper Heat Detection

Heat detection is one of the major problems when we talk about getting one calf per year. Heat detection is very crucial as it contributes towards the ultimate pregnancy rate. A cow wrongly detected in estrus and inseminated incurs heavy loss in terms of wasteful expenditure of quality male germplasm, production loss and has increased risk of introducing genital infections. Every missed heat has economic loss as it is directly related to long service period which in turn leads to long intercalving interval. Farmer should keep in mind 21 days period as it is an essential part of heat detection. Animals should be visited frequently to keep watch over animals for detecting heat. In case of buffaloes, chances of missing heat are high because most noticeable signs are visible during mid-heat. So, buffaloes require extra attention as compared to cattle regarding heat detection.

Optimum Age at First Calving (AFC)

Heifer rearing is most crucial and expensive part for a farmer. Present heifers decide the future herd of the farm. Age at puberty and calving is related to weight of the animals. Heifers can be bred when they have attained 60–65% of their adult weight [3]. Nutrition plays an important role in attaining proper weight at proper time. According to some reports if an indigenous cattle and buffalo can grow at an average rate of 380 g and 500 g per day, respectively from date of birth then they can attain critical weight (225 kg and 330 kg, respectively) required at proper time for breeding. Lifetime milk production is influenced by AFC to a large extent. The optimum AFC in Indian, crossbred cattle and buffaloes is 3 years, 2 years and 3.5 years, respectively. Prolonged AFC leads to less number of calving so results in less lifetime production despite of having more production in first lactation. If AFC is below optimum, then there is difficulty in calving, weak calves

are born and less milk in first lactation. So, it is enviable to obtain an optimum AFC to get more profit.

NUTRITIONAL TECHNOLOGIES/INTERVENTIONS

Balanced Ration

It is important to keep the feeding costs minimum by proper planning of feeding programmes to get profit. Feed costs are about 50–60% of the total cost of producing milk. Cows need to be fed balanced rations to give the most profitable level of production. If we start from the calf hood, calves should be provided with colostrum. The antibodies are transferred from mother to the calf through colostrum. This will protect the calf against diseases in the early stages until their own antibody manufacturing system takes over.

Heifers should be provided with adequate quantity of concentrate and quality fodder as they are future replacements. Care should be taken to feed the advanced pregnant cows and buffaloes as the feeding management at these critical stages will ensure adequate built up of body reserves for use during early stages of lactation when the energy intake of the animal often fails to keep pace with the level of milk production. Concentrates should also be supplemented whenever necessary and depending on the level of production.

Transition Period

It is reported that supplementation of mustard oil during transition period improves health status of animals by reducing reproductive disorders such as retention of placenta and metritis. If an animal calves in February, March and April then it will reach peak almost in May, June and July when animal is already in heat stress. In such cases, 200 g/day/head mustard oil supplementation keeps the animal in positive energy balance which directly affects subsequent production and reproductive status of the animal.

Feeding Bypass Fat and Protein

Feeding bypass fat decreases the incidence of metabolic disorders such as ketosis, acidosis and milk fever; and increases peak milk

production and reproductive efficiency after calving. Similarly feeding of bypass proteins results in more efficient utilization of proteins, improves milk production as well as fat and solid not fat (SNF) percent in milk.

Urea Molasses Mineral Block (UMMB)

It is very useful for milk producers in green fodder deficit regions as it is a readily available source of energy, protein and minerals for dairy animals. Slow ingestion of urea leads to efficient microbial protein production and improved digestibility. It is observed that feeding of UMMB enhances body weight gain, draught power and milk yield in cattle, buffaloes, sheep and goats.

Mineral Mixture

Minerals play a vital role in metabolic functions, growth, milk production, reproduction and health of animals. Mineral accessibility of animals varies from area to area as level of minerals in feed and fodders are different in different regions. To overcome all these problems, nowadays Area Specific Mineral Mixture (ASMM) has been formulated. ASSM should be fed at the rate of 25 g daily for calves, 50 g daily for growing and nonlactating animals and 100–200 g daily for lactating animals depending on the level of milk production [4].

Azolla Feeding

Currently, some farmers are adopting practice of azolla feeding to their livestock. Azolla is very nutritious, economic and efficient organic feed substitute for livestock. Azolla is a rich source of protein, contain essential minerals, all essential amino acids many probiotics, carotene and is easily digestible due to low lignin content. It is reported that azolla feeding does not affect milk production, improves quality of milk, health and longevity of livestock.

MANAGEMENT TECHNOLOGIES/INTERVENTIONS

Housing

A cow's production performance is a measure of her genetic potential which is modified by the environment in which she is kept. Researchers have shown that the economically

important traits such as milk production, growth rate and reproductive efficiency parameters have moderate heritability and the genetics accounts for only about 30–35% of the actual performance of dairy animal; remaining 65–70% being the contribution of the environment. The managerial factors directly influencing dairy animal productivity include housing management, milking procedure and technique, feeds and feeding, disease prevention including vaccination and udder health management. Animals should have proper space for feeding and watering. There should be adequate ventilation and plantation around animal house. During summers, animals should be kept under shady trees and water should be offered frequently to animals.

Clean Milk Production

Farmers need to follow some good hygienic practices in order to obtain superior quality milk. There is need to develop sustainable, scientific, and ecofriendly dairy animal management based on principles of clean, green and ethical practices for clean milk production. There are some standard procedures related to cleaning of animal shed, hygiene of animals as well as milker and milking practices which should be adopted by farmers.

Waste Management

Cow dung is a valuable byproduct and has multifarious uses. It can be used as fuel and manure. Use of cow dung as manure reduces the requirement on chemical fertilizers while, at the same time, contributes to ecofriendly organic agriculture and natural farming. The excreta of dairy animals provide major nutrients such as NPK to the crops and hence used to improve the soil fertility. Vermi composting improves the manure quality and availability of nutrients to plants. Cow dung has specifically been used to prepare amritpani whereby 5 kg indigenous cow dung is sufficient to meet manurial requirements of one hectare. Cow urine has immunomodulatory properties which cures human ailments and has the capacity to enhance body's immunity. It is effective against tuberculosis, cancer and enhances the impact of vaccinations. 'Panchgavya' is a term

used to describe five major substances obtained from cow which include cow's urine, milk, ghee, curd and dung. All the five products possess medicinal properties against many disorders and are used for the medicinal purpose singly or in combination with some other herbs. Several *Gaushalas* are engaged in preparation of *Panchgavya* products and maintain record of their effective use on patients. By preparing *Panchgavya* products, many of these *Gaushalas* are now self-sufficient. All these waste products are not waste in true sense and adds to the economy of farmers to a large extent.

HEALTH TECHNOLOGIES/INTERVENTIONS

Mastitis

Various udder and reproductive disorders are causing huge economic losses in terms of production loss, treatment cost and reduced consumer's preference as people are aware of not consuming milk from diseased animals. Mastitis is one of the most common and costly diseases of dairy cattle. According to some reports in cattle, the cost of udder problems including mastitis and unusable milk together with those of reproductive problems accounted for about 70–80% of the total health costs. A study on the economic losses due to mastitis in India puts the extent of total financial loss to Rs. 1607.20 crores [5]. Adoption of proper hygienic measures is the most important management practice in mastitis control. Animals should be kept in standing position for about half an hour after milking as teat canal is open after milking and animals are most susceptible to catch infections during this period. It is said that almost half of the battle is won if mastitis in milch animals is controlled.

Vaccination and Deworming

It is well said that "*Prevention is better than cure*". Prevention of occurrence of disease saves animal from distress and pain along with saving unnecessary cost on treatment, medicine and management. Animals should be vaccinated regularly as per schedule against major infectious diseases such as Leptospirosis, Brucellosis etc. For some diseases there are disease-specific measures which should be followed by farmer for prevention and control of diseases.

DAIRY TECHNOLOGIES/INTERVENTIONS Milk Quality and Composition

Farmers should focus on production of quality milk along with increase in the quantity of milk. Farmers should be aware of the recent trends and nutritional composition of the milk. Milk fat plays an important role in the nutritive value and physical properties of milk. Besides serving as a rich source of energy, fat contains a significant amount of essential fatty acids such as linolenic and arachidonic acid. Nowadays milk pricing system is based on the percentage of fat in milk; consequently, higher fat yield fetches better economic returns. Of late, indigenous cattle are gaining importance due to presence of A2 variant of beta casein in their milk which has many health benefits [6]. It is reported that incidences of type-1 diabetes and cardiovascular diseases is low in populations with high consumption of A2 milk. Farmers are getting relatively higher prices for production of A2 milk. So, farmers should try to procure good indigenous animals so that they can produce more quantity of healthy A2 milk. Goat milk is also sold very expensively which is a source of income for many small farmers. It is easy to digest, has fewer allergic proteins, high in calcium and fatty acids, low in cholesterol and absorbs nutrients and minerals better than cow's milk.

Processed Milk Products

If the daily amount of fresh milk is limited, it is more economical to process the milk into less perishable products, store them and sale later in larger quantities. Generally the price of processed milk products is high as compared to raw milk. If a farmer is reluctant to sale the milk because of getting lower price then he can take initiative to sale processed dairy products such as *ghee*, *paneer*, *dahi*, butter etc. Sometimes, there may not be availability of market nearby so in such cases sale of preserved products may bring greater financial gain.

ADOPTION OF SUSTAINABLE FARMING SYSTEMS

Organic Farming

Sustainable agriculture is necessary for sustainable development and organic farming is one of several approaches to meet the

objective of sustainable agriculture. Organic farming is based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony. The primary goal of organic agriculture is to optimize the health and productivity of independent communities of soil life, plants, animals and people. Wastes obtained from livestock can be utilized instead of chemical fertilizers with some indigenous traditional knowledge to get more profit. As per the United Nations report, there seems to be a strong indication that the proliferation of organic agriculture could be a viable strategy to improve livelihoods in Asia's rural areas.

Integrated Farming System (IFS)

The Indian economy is largely agricultural and rural. The declining trends in size of land due to increase in human population poses a serious challenge to the sustainability and profitability of farmers. No single farm enterprise is likely to able to sustain the small and marginal farmers without resorting to IFS. It is one of the best options towards strengthening of small holder farm income to guarantee sustainable livelihood. Integration of resources is made through a combination of land, water and animal resources of a farm through skillful planning including recycling of bioresources. The farm wastes are better recycled for productive purposes in the IFS. It is focussed round a few selected, interdependent, interrelated and often interlinking production systems based on a few crops, animals and related ancillary professions. Farmers of North Eastern region are already having IFS that is the best examples of IFS.

SUPPORTIVE DAIRY AGENCIES

Milk Cooperatives

Milk production activity takes place on individual farms of different sizes in India. This characteristic of milk production system along with perishable nature of milk is a matter of great concern. The role of dairy cooperatives in procurement of milk and providing services to the farmers is remarkable as evident from the Gujarat Cooperative Milk Marketing Federation. The dairy farmers selling the milk to dairy cooperatives get fair price of their product. The cooperatives also

provide financial security and give the money to farmers at certain intervals. In Maharashtra also, dairy activity is developed on cooperative basis and main reason for this development is keen interest of state Government and support of farmers. Hence, in order to increase the income of farmers there is a need to develop more such cooperatives for welfare of farmers so that exploitation of farmers by middle man can be put to an end.

CONCLUSION

There is an immense role of livestock in providing sustainable livelihood to the farmers. Livestock are important part and parcel of farmer's life. Livestock are source of earning, employment and nutrition to the poor and marginal farmers. In order to increase the income, farmers should be aware of recent technologies, interventions and package of practices such as adopting AI, feeding advancements, management practices etc. Farmers should focus on keeping healthy animals for producing good quality and quantity of milk. Switching over to organic farming and IFS is very good alternative for obtaining additional gains from livestock rearing.

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