

Dairy Development at Lower Gangetic Region: Constraints and its Management

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Abstract—At lower Gangetic region, non-availability of feeds, high cost of production, poor shelter system, shortage of liquid nitrogen, difficulty in transporting frozen semen straws, inadequate animal health care system, unhygienic milk production under hot-humid conditions etc. discourage the farmers from adopting dairy business in large scale, which has to be overcome, so that, dairy development can take place in right perspective. To combat energy deficiency, additional quantity of green roughages to be fed to dairy animals. Scientific dairy management enables the farmer to utilize his limited resources to maximize returns from his dairy farm. The cost of feed and price of good dairy animal as well as milk prices are generally outside control, but volume of milk production depends largely on the application of sound management practices. Marketing facility is not well developed in most parts of this region and farmers do not get fair price of milk which itself is a major cause for lack of interest among dairy farmers specially the new generation. At this region numbers of dairy plants are few as compared total numbers in India. Very few dairy entrepreneurs are existing in this region. The poor quality animals, small holding size, high animal population density, poor fertility and delayed puberty, scarcity of feeds and fodders, high cost of concentrate ingredients, low price of milk, deterioration of community pastures, inadequate marketing facility are major challenges need to address immediately. There is a wide scope of dairy development by augmenting the productivity of dairy animals through effective involvement of AH and veterinary department of state on health care, feeding, breeding and management and marketing.

Introduction: It is well known that lower Gangetic region belong to the “milk shadow” zone in the country. At this region of the country agriculture and its allied activities (fishery, dairy, goatary, poultry etc) are main sources of income of farmers. Among these activities dairy is the second choice of rural people which meet out their money requirement through sale of milk. About 71 million farm families, one out of every two households, are involved in dairying. Dairy management in this region should be an efficient use of available resources among existing enterprises in such a way so that optimum productivity can be harvested. In this region, dairy development should be organize by small farmers for better animal productivity as well as to improve farm income within small holder centered approach.

This region contributes only 11% of total milk of India with an asset of 34% of cattle and 11% of buffalo population of this country. Recent milk production in West Bengal is 4961 thousand tonnes in the year 2014-15. The present per capita availability of milk in West Bengal is 145 gm/ day in the 2014-15 (Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, GOI, retrieved from web site: www.nddb.org). India continues to be the largest producer of milk in the world. The milk production in India was 165.4 MT in 2016-17 with per capita availability of 355 g/day. Agro-climatic condition of India is always considered to be the triggering factor for diversification in livestock population and its productivity. The per capita availability of milk in this region is much less than the national average. At lower Gangetic region small, marginal and landless dairy farmers rear 1 – 2 milch cows mainly on crop residues, agricultural by products and few on grazing land. As compared to other regions of India, the dairy development at lower Gangetic region is not up to the mark.

Reproductive performance is considered to be important because of its positive association with breeding efficiency, productivity and profitability of the dairy enterprise. The average milk production of dairy cattle in the eastern region (lower Gangetic) is very low as compared to the national average which is due to poor production performance of indigenous cows of this region. The growth of crossbred population in eastern and north eastern states is faster than all India average which is a good sign to augment milk production in the region. The contribution of buffalo is negligible in this region except the state of Bihar and Jharkhand. So, recent constraints and its management are very much required to understand the region specific dairy development for upliftment of rural economy at lower Gangetic region.

Constraints of hygienic milk production and its management:

A major part of milk produced at lower Gangetic area is used to prepare sweets and other dairy products. The quality dairy

products with long duration keeping quality can be made from fresh milk, but never from visibly clean but otherwise unsafe milk. Freshly and aseptically drawn milk from a healthy cow has a very few microorganisms, which may vary from few hundred to thousands. The milk products meant for export must meet world standards in respect of microbial count and pesticide residue. As per European Union Directive on hygiene, Grade 1 milk has a total bacterial count of < 30000 bacteria / ml and a somatic cell count of < 300000 cells / ml. The high animal population density is another big constraint. It is highest as compared to other regions. Higher animal population density reduces the per capita availability of feeds, fodder and straw and subsequently affects the production. At the lower Gangetic region, about 10% of milk collected in summer months by dairies is received either in sour or un-process able state. This causes a huge economic loss. Dairy farmers as well as dairy industry are unable to sustain souring or curdling loss in summer when milk production is the lowest.

There is an immediate need for hygienic milk production in the present day scenario and to achieve this prevention of initial microbial contamination of milk at base level is an essential requirement. So the emphasis is to be given on health status of milch animals, condition of dairy animal housing, status of udder, hygiene of milkers, milking practices, milking containers, feed, fodder and feeding practices, grazing area and storage system for milk. Routine checking of animals for diseases like mastitis, diarrhea, brucellosis and tuberculosis should be carried out. It is not advisable to sell or consume milk from animal suffering from TB and Mastitis, as these diseases can be communicated to humans through milk. Dairy animals to be milked must be healthy and as clean as possible. Cows having regular udder shape i.e., proportional udder with regular teats is beneficial on hygienic milk production point of view as compared to cows having pendulous udder shape with improper cleanliness. Cows with pendulous udders usually have higher somatic cell count and a more frequent mastitis occurrence.

Constraints of animal feeding and its management:

Recently inadequate supply of feeds and fodder adversely influence milk production and reproduction. The balanced feeding of dairy cattle is of utmost importance for survivability and productivity. Therefore, formulation of feeding schedule incorporating locally available feeds for growth, maintenance and production is very essential to rear the dairy animal economically. The prime constraint for milk production in India is scarcity of feeds and fodders. Crop residues and crop by-products are the major feed resources for livestock. Most crop residues and crop by-products are nutritionally very poor and availability of such poor quality feeds is limited. Day by day increase in the cost of quality concentrate ingredients are another big constraints for the resource poor dairy farmers. Grazing is an important source of

nutrients for a huge number of dairy animal in this region. However, during last few decades these community pastures have been decreased both in quality and quantity in plains as well as in hilly regions of Eastern Himalayas. The main reason for the deterioration in quality is high stocking density, leaching loss, lack of maintenance *etc.*

At this region cows and buffaloes are offered concentrate mixture moistened with water and chaffed paddy straw which improve palatability and intake. The small dairy farmers generally follow traditional way of rearing and feeding of animals. They do not practice balanced ration feeding due to less resources, knowledge and rational decision making ability. However, average annual return per milch cow was highest in landless labourer households followed by marginal farmers and small farmers due to better care and longer lactation length of cows. Economically well off farmers engage themselves in some other economic activities also and did not give much attention to their cows leading to less milk production. Further, seasonal fluctuations in quality and quantity of green fodder, high ambient temperature and humidity adversely affect milk yield.

The grassland and forests (available in few places) are main feeding resources of livestock, besides by products of cereals. Grazing has advantage of exercise and animal gets some green roughages but this is limited to few selected areas due to scarcity and degradation of quality pasture lands. The small dairy farmers prefer grazing due to scarcity of green fodder. The grazing was more in cooperative villages than non-cooperative villages in all category of farming systems. However, opportunity for development of dairy production system based on integrated approach is enormous in this region.

Since there is no specific good quality milch breed of cattle and buffalo in West Bengal, dairy farmers import high producing cows and buffaloes from Bihar, Punjab, Haryana, Uttar Pradesh to meet the demand of quality milk but these animals are rendered infertile due to poor nutritional management. Ignorance of dairy farmers for balanced feeding, plays a key role for such incidence. Supplementation of mineral mixture correct reproductive disorder like repeat breeding, anoestrus and conception rate improve in dairy animals.

For higher milk production at lower Gangetic region, a dairy cow must be fed nutritionally balanced feed consisting of locally available feed resources. This will help to exploit full genetic potential of dairy animals reared under various dairy farming systems. In case of mineral deficiency, area specific mineral mixture needs to be supplemented for better growth, production and reproduction. To overcome the problem of energy, protein and mineral deficiency, balanced concentrate mixture (using local available ingredients like mustard/ til/ linseed cake, rice bran, maize bran, rice grit, wheat bran, dal

chuni etc.), area specific mineral mixture, Urea Mineral Molasses Block(UMMB), urea treated straw, green fodder should be used to cope up these constraints economically.

Constraints of animal reproduction and it's management:

In rural areas of lower Gangetic region, reproductive performance of dairy cattle are being affected due to late maturity, low weight at calving, infertility, reproductive disorders caused by microorganisms, heat detection and conception rate. Reproductive disorders directly affect production, reproduction and economic efficiency traits thus lead to serious losses in dairy sector at this region. The anestrus and repeat breeding in buffaloes and bovines are two of the most serious reproductive problems affecting 30-40% of total cattle and buffalo population. At a micro level, each missed heat is a missed opportunity incurring a loss of milk production for 21 days, with additional cost of feeding and maintenance. In organized farms of defined breeds of buffaloes the first signs of estrus occur at 24– 36 months of age and nearly 280 kg body weight. In non-descript buffaloes first estrus appears at a comparatively higher age. Once estrus cycles are initiated, subsequent estrus appears with normal regularity. The first calving of buffaloes occurs at a body weight of around 480 kg generally between 33 to 45 months of age although many do not calve until much later. Zebu heifers attain puberty earlier around two years of age at about 250 kg body weight. Puberty occurs much earlier in crossbred cows at around 15 – 18 months of age. As such, age of puberty/ sexual maturity within the breed is more a function of growth than of age. Hence; breeding, feeding and management should be directed towards attaining faster growth. Many of dairy farmers of this region do not know about types of semen used for their cows. Distance of AI centers and infrastructure availability for breeding are major constraints faced by farmers. Cost of insemination varies from village to village and household to household at this area.

To cope up these constraints some economic measures should be taken. The success of dairying in rural areas is mainly dependant on normal reproductive process. The trend of higher milk production with poor body condition and low feeding level are associated with a decrease in herd reproductive performance. Many dairy farmers consider low fertility to be their most important herd management problem. Insemination is an important criteria in effective reproductive management. The mode of breeding and correct time of insemination with proper technique are teaching aspects by which animal keepers may encounter their loss by reducing the dry period of their animals.

Constraints of animal keeping place and it's management:

At lower Gangetic region, the effect of hot and humid climate is more pronounced than the hot and winter season. Dairy farmers do not pay much attention to animal keeping place / shelter /housing. This may be due to less resources, rational

decision making ability and knowledge. The macro and micro-climate has profound effect on metabolic reactions, growth, milk production and reproduction of dairy animals. Therefore necessary modification of animal shelter for suitable management of macro and micro climate is required during different season round the year. The average holding size in eastern region is very small due to very high population density in the major states. Therefore, land availability for green fodder production is very little and restricted to a few large land holders only. The situation with regard to the green fodder cultivation during last decade has not improved to any significant level in eastern region and the entire land available is utilized mainly for human food production. The shelter design and materials used in construction play a critical role in determination of microenvironment of a shed. The thermal comfort improves to a greater extent in sheds whose roof is covered with bedding of paddy straw, in comparison to provision of shower or fan during summer. Thus modification of the animal keeping place / shelter /housing can alleviate summer stress to a great extent even by using cheaper material like paddy straw as a result feed and water intake and milk production of animals can be maintained. In hot-dry climate of summer, use of shower or fan alone significantly reduces the physiological responses like respiration rate, pulse rate and rectal temperature leading to improved milk production.

To cope up these constraints during Summer, Rainy and Winter some economic measures should be taken. During winter shed without having any wall is being covered by polythene sheet to protect the animal from cold stress. However materials like gunny bags, plastic sheet, bamboo mat, straw panels etc are also used. This type of shed having no wall are airy, allows air to pass through the shed and keeps floor dry as a result animal gets better comfort during summer. Selection of higher heat resistance materials for the roof and increased height of cowshed reduces the shed temperature and minimizes effect of summer on milk yield. Brick floor helps better cleaning and also safe for animal movement.

During morning and evening, when THI exceeded the critical value 72 indicating that the animals were in stress micro-environment in the animal keeping place / shelter /housing. The higher values of THI had a negative influence on milk production in summer season. This can be minimized by providing thermally comfortable shelter with adequate ventilation, using mist blowers to wet the skin, providing buffalo with adequate drinking water supplies and changes in feed formulations thus maintain milk production. It is recommended to sprinkle 1-2% solution of phenyl or other disinfectants on the floor every day. This will prevent multiplication of flies, which are a serious source of infection. Moreover, the disinfection measures have a great role as a most significant form of medical sanitation which doubtlessly influences the hygienic quality of milk. Dung heaps, rubbish and filth should not be allowed to accumulate near the dairy animal housing / milking place.

Constraints of animal breeding and its management:

At this region the animal husbandry activity is a subject of state authorities which primarily focus on animal treatment, with little attention for livestock improvement through sound breeding. However, during the last one decade crossbreeding through artificial insemination in place of natural service, with exotic germ plasm have been in progress. Most local breeds in this region are low yielders. These animals are bred traditionally by local bulls. Crossbreeding has been started for last several years and has significantly improved the genetic ability of the animals for milk production in many areas of this region, though facility for crossbreeding through artificial insemination is not available adequately everywhere. The demand for milk and milk products have been gradually increasing throughout the lower Gangetic region. The people have started realizing that scientific crossbreeding provides the most promising approach for improving productivity of local non-descript cattle which contribute the majority of population. The state of West Bengal has taken up the "National Project on Cattle and Buffalo Breeding". Under the project, an organization "Paschim Banga Go-Sampad Bikash Sanstha" has been formed with objective to provide AI facilities at the doorstep of cattle owner. The sanstha will provide one Pranibandhu (a trained educated unemployed youth) to each Gram Panchayat for assisting in AI and providing primary veterinary care. Due to this, number of AI and calves born has increased over the years.

It is also utmost necessary to educate the rural dairy farmers in various aspects of dairy animal management practices for augmenting dairy productivity. The Animal Resources Development Department, Govt. of West Bengal has launched "Bishes Go Sampad Bikash Abhijan" with the target of achieving 'Zero Deficit' status in milk production in the state. Accordingly, the state has decided for grading up of native non descriptive cattle population through induction of cattle having high genetic merit like Gir and Sahiwal breeds and crossbreds (Jersey and Holstein) suitable for agro-climatic condition of this state which will leads to increase the number of high producing dairy animals. Major emphasis will be on grading up of the existing cattle through extensive artificial insemination, proper preventive / curative health care (like vaccination / deworming, etc.) followed by heifer rearing, essential nutritional support, insurance coverage, etc. The marketing network for milk is also equally important and requires tie-ups with milk unions / societies with extensions up to value added products.

In milk cooperative system, if milk poured by the producer is chilled at the society and transported in insulated milk tankers, then the quality of milk can be retained. At this region milk marketing system should be strengthen and more emphasis should be given on milk procurement through dairy co-operative societies and by converting the milk into value added products with the aim to earn more revenue for dairy farmers.