

Strategies for Sustainable Dairy Production in India

“The industry’s major contribution in providing newer avenues for employment, both direct and indirect, and its role in improving the nutritional standards of our people also add to the importance that needs to be attached to this sector during the 21st century.”

The contribution of dairy animal is widely recognised. Our country is blessed with vast dairy resource. Dairy farming involves a group of interaction of many factors that influence production & reproduction, environment and management. Dairy cooperatives cover about 60,000 villages all over India and only 12-14 per cent of total milk production is canalized through organised sector. Concerted efforts should, therefore be directed towards unorganised dairy farmers by providing necessary inputs and make them to adopt newer milk production technologies. India has become the world’s largest milk producer but its share in the world milk trade is very minimum. An attempt to identify problems of the farmers and to resolve the same for improving the export earning and higher returns to dairy farmers is discussed in this paper. Various tips have also been given for efficient identification and formulation of dairy husbandry.

Introduction

Ever since the creation of mankind, the major thrust has been on the search for food for existence. Thus, for human population, the nature provided a continuous supply of food. Plants and animals were utilised by man as foods during the prehistoric period. Subsequent domestication of animals and evolution of crop raising activities made animals farming as a subsidiary to agriculture. In western countries, animal husbandry is even now referred to as ‘Animal Agriculture’. However, of late, dairy industry has shown the ability to sustain itself as a profitable industry in many sphere over-powering the traditional dominance exercised by agriculture. This trend is witnessed all over the world. Fortunately, our country is blessed with vast dairy resources. Cattle and buffaloes population are the highest in India (Annual report, 2000).

Dairying in India is by large in the hands of small/marginal landholders and agriculture laborers. The national average land holding is 1.68 hectares per farm family and cattle and/or buffalo is a part of family. Eighty per cent of 97.7 million farm families in India posses cattle and/or buffalo. Even agriculture labourers (11.5% of 97.7 million) posses one or two dairy cattle / buffalo. Owing to the infrastructure developed by NDDB and state federations for procurement of milk, processing and marketing, the member producers are paid on the basis of fat and SNF content of milk. The farm family for all inputs on crop production, education, health etc. uses this earning as the seed money. Thus, cooperative dairying has changed the life-style of farm family. Livestock keeping in general and dairying in particular, once a subsidiary enterprise, (Supplementary / complementary) to agriculture, has now become the major enterprise economically and the crop production are becoming dependent on dairying. Milk producer’s cooperative societies (institution) at village level are more powerful entities than panchayatraj institutions at any level.

Dairy Economics In India

The contribution of dairy animals to our economy is now being widely recognised. The value of milk and milk products produced in our country is estimated at Rs. 83,300 crore, (Anon 1998). In many developing countries in which a human population growth rate is 2.5 per cent per annum compared to one per cent in developed countries, the amount of protein and energy consumed by the people is below the recommended levels and also the proportion of protein that comes from animal sources is very low. Milk is considered as the most important livestock product, followed by eggs, meat and fish. Further, when indirect income from animal draught power, manure, leather etc. is considered, the contribution from livestock sector adds up to an annual revenue of Rs. 1,83,000 crores (Rs. 502 crores / day approximately), (Annual Report NABARD, 1999).

Dairying generates plenty of jobs for rural women. The economic activity alone can reverse the trend of migration of rural masses to cities in search for employment, despite deplorable living condition in cities and towns.

The investment by the Indian government in animal husbandry and dairying has remained almost constant at around six per cent of investment in agriculture. It has even shown a decreasing trend from 6.0 to 4.6 and 5.0 per cent during the last two plan periods. However, a browse at (Table 1) will clearly prove the growing importance of dairy sector in the nation’s economy in spite of constant

decreasing support through plan investment. Between 1981 and 1992, while the percent share of agriculture output in GDP has decreased but in the same period the share of livestock has increased. Annual growth rate registered in agriculture output during the last five years also averaged around 1.40 to 1.70 per cent as compared to 4.5 to 7.0 per cent and growth rate shown by dairy industry during the same period.

Table I: Trends in Growth of Animal Husbandry and Agriculture Output (At Current Price) (Styasai and Vishwanahen, 19997)

	1981	1992
% Share of agriculture output in GDP	37.80	27.60
% Share of livestock output in GDP	8.66	9.20
% Share of livestock output in agriculture	24.95	31.27
Plan investment in agriculture as % of total quality	12.50	13.10
Plan investment in animal husbandry and dairying as % of agriculture	5.80	4.99

Sustainable Dairy Farming

Sustainable dairy farming can be explained as continuity of viability of the foundation stock with continuous improvement in production traits namely the birth weight at weaning, age at puberty, size at puberty, age and size at first breeding, age and size at first calving, milk yield, milk quality, persistence of lactation, lactation length, matured body size, productive life span, number of calving per life span, endurance, disease resistance and tolerance to tropical temperature.

Sustainable dairy farming is an interaction of many factors that influence production and reproduction environment, longevity of live and input management. In other words, sustainable dairy farming depends on the efficiency of management of inputs, manpower and livestock to optimise the production viz. – milk yield, inter calving period replacement stock, sale of surplus young stock, production of fodder, summer stress management and sale price of principal commodity (milk).

Dairying is acknowledged as the major instrument in bringing about socio-economic transformation of rural poor in our country. Milk is the second largest agricultural commodity produced in our country next only to rice. India's bovine population is about 19.2 per cent of world's and 51.0 per cent of Asia's population. With annual production of about 84.83 million tonnes of milk. Considering the biological value of milk protein, our traditional habit of including milk in daily dietary have been one of the most important factors that had saved millions of children of our country from developing malnutrition syndromes.

Since, ever growing human population is making scarcely available land still more scarce, our aim to improve milk output should be by way of improving productivity of the animals rather than increasing the heads of bovine population. Concerted efforts should henceforth be directed towards the dairy farmers contributing major proportion of our country's milk production to provide necessary input and make them adopt newer technologies in breeding, housing, feeding, rearing and health care to ensure substantial growth in milk output.

It is heartening to note that per capita milk availability in India is near to the recommended level of 240 g/d (Table 2). However, there exists a vast difference between urban and rural milk consumption. Hence, the scope for increased domestic demand is still very high.

Further, even though India has become the world's largest major milk producer with the cost of milk production being very low next only to New Zealand, its share in world's milk trade is very minimal. Exports earnings through ghee, skim and whole milk powders are increasing, while import of special cheeses and butter oil is also showing an increasing trend. Under the most favorable environment, created by WTO agreement, to improve our export earning through this sector and ensure better returns to dairy farmers, research efforts should be directed towards new product development through biotechnology (genetically modified cultures and convenient packaging, ensuring, higher shelf life). Further, improved compliance to milk food legislation and conforming to international standards will also aid in improving export avenues for dairy products.

Indian dairy industry is so well developed on modern lines. It has acquired the technologies and engineering capabilities so well that now it is in a position to even export such technologies to other nations.

Table 2: Population, Per Capita Availability and Production of Milk in India

Year ¹	Population (million) ¹	Year ²	Per Capita Availability of Milk (g/day) ²	Production (Million)
1960	439	1985-86	160	44.0
1970	548	1990-91	176	53.9
1980	685	1995-96	197	66.2
1990	813	2001-2002	222	80.9
1995	923	2002-2003	234	85.7
2002-2003	921	2003-2004	237	89.4
		2004-2005	240	92.2
¹ (Source: Census 2003 www.fao.com)				
² (Source: Indian Dairyman 56(10) 52, 2004)				

Problems Confronting Sustainable Dairy Production

There is wide variation in (a) agro-climatic condition, (b) biodiversity and ecology (c) socio economic and cultural background of people, (d) types/breeds of dairy cattle reared.

It is therefore necessary to plan for dairy development specific to each micro level, viz., a block, a village, a taluk and a district. This planning not only would result in optimum utilisation of local resources, but will also ensure better viability of the programmes and higher cost benefits ratio.

Before embarking on planning and formulation of dairy development programmes, it is necessary to consider environmental impact (water bodies pollution, over grazing of grasslands, degradation of watersheds, deforestation).

Nowadays, environmental aspect is very much stressed by the private parties and multinational agencies while funding the animal husbandry projects.

Notwithstanding above consideration, it is essential to adopt the following tips for efficient identification and formulation of animal husbandry and veterinary projects.

- Need for identifying such technologies, which demand less capital, less time and minimum operations.
- Exploring the possibilities of providing loans at the lowest interest rates with subsidies for dairy development activities.
- Gradual improvement of existing indigenous breeds of animals.
- Gradual removal of useless stock and replacement with high yielding superior quality animals.
- Gradual manipulation in husbandry practice for improving animal productivity and adoption of biotechnological interventions in feed and fodder, reproduction and growth aspects.
- Need for Government role in improving the supply of inputs and service to dairy farmers / beneficiaries at their doorsteps with minimum cost.
- Contribution from various nongovernmental agencies/organisation to ease the problems of farmers in association with the governmental agencies.
- Need for developing viable farmer's cooperatives societies / federations like, milk producers cooperative societies at village and district levels, federations, boards and corporations.
- Need for simultaneous development of cold chain storage and marketing facilities especially for milk and milk products.
- Need for extensions services from the Government, Agriculture Universities, R&D institutions, federations and corporation, besides mobilization of various input services from various agencies.

Planning a Sustainable Dairy Project

It may be useful to consider the following information for planning and development of new dairy husbandry and veterinary projects which would be sustainable throughout.

Dairy Cattle Population

First step is to know the existing number position of dairy animals in the different dairy sub zones of the country through available records.

- Census report of both human and dairy cattle populations.
- Reports of survey conducted.
- Actually conducting a sample survey.

With these records, we can obtain the appropriate information for identification and development of suitable dairy development projects and schemes at grassroots level.

The information can be classified as follows:

- Number of cattle, buffalo, total males and females, females in milk, dry and pregnancy, males as breeding bulls, young males and females, etc.
- Work animals: regional requirement and availability of drought animals.

Productivity-high yielder, low yielder, etc. in respect of milk Breed-Nondescript, indigenous, exotic upgraded or crossbred etc.

Feed Resources Available

- Pasture grazing land
- Green fodder available and short falls in supply
- Availability of dry fodder
- Concentrate, type and cost, quality, brand
- Mineral mixer

Categories of Holdings

- Land less agricultural workers, marginal, small, medium and large farmers.
- Extent of Usage of Natural Resources Like Land, Human (labour), Capital and entrepreneurship.

Existing Infrastructure facilities

- Veterinary hospitals, dispensaries, and rural veterinary dispensaries (veterinary primary health centers)
- AI centers- AI breeding facilities with liquid or frozen semen.
- Semen banks – semen collection, evaluation and freezing, facilities with adequate facilities for storing, of frozen semen.
- Cooperatives – primary / secondary societies for meeting the farmers demands and provision of inputs inclusive of soft term, short term and medium term loans.
- Extension services – Animal husbandry and dairying.
- Chilling centers – milk collection and chilling units and transportation to processing units.
- Feed plants – manufacturing of compounded feed.
- Manpower availability.

Production of Milk Products and their Demands and Supply

- Production of milk per year per animal and per one thousand human being.
- Actual domestic demand (consumption)

- Surplus available for export.

Contribution of Cattle to Domestic Income

At household, village level, taluk / district level i.e., only for domestic consumption. Contribution of income from dairy sector to domestic needs are classified as - <5% of total income > 5 to 10% income, >10 to 20% income or more than 20% of total income.

Drought Power

World wide, animals are stills very important source of power for agriculture operations and for transportation of goods and people. It is widely used in developing countries like our. Bullocks, buffaloes, horses, mules and camel are very widely use in our country for drought purpose and their role in saving of energy and there by the most precious foreign exchange. It is estimated to be Rs. 45,000 crores per year. It should be emphasised that depleting levels of fossils fuels may slow down or even reverse the mechanization trends witnessed even in developed countries.

Conclusion

Dairy industry is poised to play a major role in our nation's economy in the years to come. The value of milk is set to achieve a new boom. The industry's major contribution in providing newer avenues for employment, both direct and indirect, and its role in improving the nutritional standards of our people also add to the importance that needs to be attached to this sector during the 21st century.

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