

Impact of Technology in Dairy Industry

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I INTRODUCTION

Since ancient time, Agriculture and Animal Husbandry have been integral part of human life & civilization. This has satisfied personal needs of human directly and at the same time has been advantageous for whole ecology indirectly. Indian climate has characteristics to provide suitable conditions for animal husbandry in India. In India dairy industry has been considered a source for social and economic development. In our country supply of milk is ensured mostly by lacs of small and marginal farmers who prominently live in rural areas. The income generated from agricultural activity is seasonal but dairy Industry provides stable and regular income which act as important economic motivational force for small & marginal farmers.

Dairy industry is an important alternate for whole of the world facing challenges of food safety. In a country like India where climate & conditions are suitable for agriculture and animal husbandry, dairy industry can be upgraded at global level. India is well known as the "Oyster" of the global dairy industry. In India, dairy industry is witnessing rapid growth with liberalization. Indian dairy industry aims mainly management of national resources in order to enhance milk production and up gradation of dairy processing by usage of innovative technology.

In India, dairy business has been practiced as rural and cottage industry over the years. Format of semi-commercial dairy started with the establishment of military dairy farms and co-operative milk unions throughout the country towards the end of the 19th century. Since independence this industry has made rapid progress. A number of modern milk and milk produce factories have since been established. The organized dairies in India have successfully been engaged in the routine commercial production of pasteurized packaged milk and dairy products. For example, Amul Dairy established in 1946 & there after Mother Dairy, Prabhat Dairy and many more dairies established in organized sector have augmented production of milk and milk products such as curd, butter milk, ghee, mava, ice-cream etc. as separate industry.

II WHAT IS DAIRY TECHNOLOGY

Dairy technology is the area of engineering which is related with processing and storage of milk and milk products. Dairy technology may be termed as part of food technology which provides with academic knowledge especially by inclusion of biochemistry, bacterium, milk-chemistry, engineering science of processing, storage, packaging and distribution of

milk and production of milk products viz-milk, ice-cream, curd etc. along with proper transportation thereof and storage for longer period in case of need. The aim of technology is to increase milk production, to prevent perversity in milk and milk products, to improve quality of milk and to increase durability of milk and milk products for keeping them safe for longer period for human uses.

(a) Importance of Expansion of Dairy Technology

As of today, we are almost self dependent in the field of milk production (165.4 million tons) and it may increase to the level of approx. 180 million tons by 2022. As a result, we have ample opportunity to produce milk products of good quality due to availability of surplus milk. In view of above possibility, Indian government has targeted to establish 1250 dairy plants by 2022, which is higher than present number of 850 plants approx. It is a matter of surprise that India's share is only 1.67% of total world's export of milk and milk products despite India are largest producer of milk in the world. As such there is ample opportunity to increase export of dairy products with the help of dairy technology.

The first revolutionary attempt commenced in 1970 to increase the production of milk in organized manner which is known as "white Revolution", it has been termed as "Operation flood 1st" also. Ten states of the country were associated with above mission. The object of "Operation Flood" was the development of activities helpful in increasing farmers' income. Operation Flood was first well planned attempt which was supported by technology to some extent to rescue Indian dairy from shabby condition to well-founded condition. Viewing this "Intensive Dairy Development Program" was started in March 1993-94 in non-Operation Flood hilly and backward areas, which was backed by assistance of 100% subsidy. In March, 2005 above scheme was amended and renamed as "Saghan Dairy Development Program". Later on this scheme was revived as "National Bovine Reproduction and Dairy Development Program" in Feb., 2014 after inclusion of other three schemes.

(b) Effect of Introduction of technology in Dairy Industry

In the increasing modernity, changes in dairy Industry have also commenced. Now uses of machines have replaced manual labours in dairy Industry. Mr. Ashish Pandey, MD of 'M/s Dairy Farm Solution', a company engaged in manufacturing of equipments related to dairy and farming, has commented that machines are being used extensively in private sector of dairy Industry

since 2011. The persons having herd size of more than 10 milching animals are using machines. Earlier labours were deployed on basis of daily wages for milching and other related works but now scenario has been changed. Uses of high-tech machines have brought not only substantial saving of wages but have ensured supply of hygienic milk also.

There has been continuous growth in production of milk in India for the past 40 years. The growth of Indian dairy industry during the last three decades has been impressive. Growth during 2013-14 to 2016-17, milk production has been increased more than 5% per annum which is from 147.7 million ton to 165.4 million ton. India has become the world's largest milk producing country with gross output of 165.4 million ton in 2017. Also, per capita availability of milk has risen by 15.8% i.e. 307 gms. per day to 355 gms. per day per man between 2013-14 & 2016-17. Now a National Milk Grid has come into existence which is supplying fresh milk in about 800 cities & towns.

Considering the requirement, the National Dairy Development Board launched the National Dairy Plan (NDP) in 2012 to focus on means to increase production and provide producers with greater access to the organized milk processing sector. Processing the milk through the organized channel will facilitate standardization of product quality and strengthening the direct supply channel both of which will eliminate the intermediaries and ensure better compensation to small and marginal milk producers.

Nearly 80 percent of India's milk production is contributed by small and marginal farmers with an average herd size of one to two milching animals. Indian yield is still much lower than that of US, New Zealand and Germany. These countries certainly have an advantage on the cattle breed, and also benefit from extensive mechanization and larger herd size. In India there is high dependency on family labour and limitations to deploying mechanized milching system given the small herd size holdings. Dairy farming and newer concept on herd aggregation, both of which support collective animal management and mechanization, are at a very nascent stage in India. Few companies like "Parag Milk Foods" are testing models with dairy farms but this requires heavy investment in animal management to satisfy the requirement of raw milk for large processing capacities.

Co-operatives sector is continuously playing a vital role, but over the last 15 years, private sector companies have made an impressive growth in building capacities for processing milk and milk derivatives. In last 4-5 years the dairy sector has received private equity investment close to Rs. 2,500 crores, backed by strong consumption in India. Private sector companies can capitalize on the investment interest and focus on establishing vertically integrated dairy companies (village level supply chain + high end processing capacities).

Private sector companies like Hatsun Agro Heritage Foods, Dodala Dairy, Paras Milk Foods, Prabhat Dairy and VRS Foods, are investing in building village level collection capacities, which is similar to the co-operative model. Increasing focus from the private sector on establishing last-mile linkages will complement the dairy development initiatives of the co-operatives and there by lead to a larger share of the organized sector in milk processing.

The centre has led the "Jan Dhan Yojana" to deepen the access of the unbanked and under banked segment to the financial systems. Technology-based newer payment platforms have enabled immediate funds transfer to remote users. The next big move is the launch of Payment Banks that will further deepen last-mile coverage. Penetration of technology and banking systems will ensure that dairy farmers get compensation on the same day, unlike the delays in physical settlement systems.

The central Government has introduced "e-Pashu Hat" scheme, an online portal for sale and purchase of milch animals, frozen semen and embryos at concessional rates at home, in order to involve farmers and entrepreneurs in dairy industry. Viewing above scheme 'Uttar Pradesh Pashu Dhan Vikas Parishad' is also exercising to start similar portal.

Dr. B.B.S. Yadav, the CEO of 'Uttar Pradesh Pashu Dhan Vikas Parishad' has told that farmers may procure cows, buffaloes and their embryos of different breeds through the said portal. For above purpose tagging of milch animals of good breed has been started at state level. The portal will provide the farmers with complete knowledge of the embryos which they want to purchase. The 'e-Pashu Dhan Hat' portal has been established first time in the country under 'National Bovine Productivity Mission'. This portal will play important role in associating breeders and farmers for native breeds. The farmers may get knowledge of native breeds through this portal. The farmers and breeders may sale and purchase cows and buffaloes of native breeds through this portal. Above advantage may also be derived through similar portal to be started at State level. Such portal will lead to new dimension for preservation and promotion of native breeds.

(c) Dairy Industry in India VS European Countries

There are approx eighteen thousand dairies in Netherland, there are 85 cows on an average per dairy and 14.5 billion liters of milk is produced in these dairies. There is milk production of 9 thousand liters in 305 days in a year per cow approximately.

Mr. Laxmandas Sukharmani, a resident of Panna in Distt. Satna of Madhya Pradesh has been on study tour of Asia & Europe for 5 last month to learn newer technology of agriculture and animal husbandry. During above period he inspected five dairies of Netherland and learnt newer technology being used

in dairies for the purpose to get them introduced in our country.

He shared his experience and told, "During this tour I inspected five dairies. The peculiar observation was that there are one man to monitor 100 animals almost in all dairies. Most of the work is done by machines in foreign dairies because the interest rate on loans granted for purchase of machines in foreign countries is cheaper i.e. around 1% than that of India which is around 13%." About designing and architecture of dairies he added "There is long tank in the dairy building covered with thick wooden planks. The dung and urine excreted by animals are dropped down in the tank through Robot sensors, to ensure dairy neat and clean. The planks used to cover tanks do not deteriorate easily." He added "Most of cattlemen in India do not provide cattle with balanced diet but in foreign countries, cattle are provided with balanced diet three times a day to keep milk production unaffected. In foreign countries, 80% of land of dairy establishment is used to grow green fodder. There is similar proper management of feeding cattle in almost all dairies. The cow comes and stands by the machine itself time to time and machines extract the milk using laser sensors."

He further added "Solar panels are installed on roof of dairy building for electrification and operation of machines. There is a room in each dairy equipped with computer to store data related to feeding, movement, walk, health etc. of cattle with the usage of machines and software which are observed and analyzed by a family member."

The cattlemen are adopting infrastructure of foreign dairies in many states of our country also. Mr. Dalvir Singh resident of village Syahdwa in distt. Hisar of Haryana is holding 400 Holstein Frisian cows in his dairy, which produce 3700 liters of milk per day. The whole work of this dairy which is spread in six acres of land is done by machines. The dairy manager Mr. Satish Singh told, "The machines installed in our dairy are based on German Technology. The position of each cow is updated through microchip implant in lag of the cow. An engineer is employed to keep data related to all cows updated through computer. The treatment is given to the cattle then & there if falls sick requiring less manual assistance.

III CONCLUSION

As I have narrated earlier, India has become self-sufficient in production of milk but there is still need to increase per capita availability of milk for per capita consumption of milk and milk products. On the basis of past growth rate of milk production with introduction of technology in dairy industry we may not only able to fulfill above need but to generate significant surplus to export milk and milk products. With introduction of Technology the dairy business in India is transforming into an emerging industry. There by educated youngsters having rural or

agricultural background and having studied in dairy technology are adopting dairy business as start-up instead of doing job in similar or other fields. There are examples of youngsters who have left the present jobs and established dairy business/industry as start-up. Our Govt. is also providing all sort of assistance from financial to technological to augment dairy industry and invite entrepreneurs to adopt dairy industry. I comprehend no room of disappointment of India becoming one of largest world's exporting countries of milk and milk products to rationalize its present status of world's largest producer of milk.

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