Cooling the Milk at Collection Centres and Farms with Bulk Milk Coolers: Rajasthan

A Bulk Milk Cooler of 5000 litre capacity installed at a Dairy Cooperative Society in Rajasthan

Background and Objectives

Milk is a highly perishable commodity. Further, the fact that cattle and buffalo rearing in India is a small holder activity with most farmers and dairy units being very small, sometimes limited to one animal, makes the matter worse. Although India is the highest producer of milk in the world with total milk production of 112.54 million MT per annum which is about 26% of world milk production, average milk production per animal is very low compared to world averages. There were approximately 10.1 million exotic/ cross bred cows and 28.8 million non-descript/indigenous cows in milk in India in 2010 with total estimated milk production of 47.83 million MT with average milk yield of less than 3.4 kg per day. Similarly, 35.48 million buffalos yield only about 59.2 million MT milk at a daily average of 4.5 litres per day. Rest of the milk production is largely accounted for by the goat milk.

The temperature of milk at the time of milking is about 37°C. It is to be quickly chilled to 4°C to check the growth of micro-organisms and to maintain its quality as per international standards. With most farmers owning less than 2/3 animals, it is well nigh impossible for these small dairy owners to have the resources to invest in storing the milk at required 4°C before supplying to consumers or milk collection centres.

Rajasthan is ranked 3rd in the country after Uttar Pradesh and Andhra Pradesh with annual total milk production of 9.55 million MT in 2010 with the state's share of 8.48% in national milk production. The total number of cows and buffalos in the state are 12.12 and 1.11 million respectively. The average milk production for a cow is 3.68 lpd and for a buffalo it is 5.66 lpd, slightly higher than national average. However, dairy is a real small holder activity in Rajasthan and dairy farms with farms larger than 50 animals is almost non-existent. The Rajasthan Cooperative Dairy Federation (RCDF) is the largest organised milk supplier in the state with its network of 16 district level milk processing plants with membership of 6.65 lakh milk farmers. RCDF collects about 16.27 lakh kgs of milk per day.

Small dairy owners bring the milk to the Dairy Cooperative Societies (DCS). The milk is retained in DCS until the milk tanker reaches DCS collection centre. In many cases, the milk is transported in raw form to district level milk processing plants in simple plastic/aluminium milk cans. The time between milking and delivering the same to the RCDF tanker/ milk processing plant constitutes quite a few hours and is long enough to affect the quality of milk and, in many cases, milk gets spoilt. There were regular incidences of milk spoilage either at DCSs or during transportation. RCDF record shows that 1.5 to 2% milk used to get spoilt. The loss of the precious produce was affecting the profitability of all stake holders including milk producers, DCSs and the RCDF.

In this situation, the most sensible investment was to install Bulk Milk Coolers (BMCs) at village level DCSs, which is the first stage of milk collection. A BMC is a two shelled container consisting of an inner and outer stainless steel shells with injected Poly Urethane Foam (PUF) insulation in between the two shells. Each BMC is equipped with an in-built light weight, low rpm (25-32) agitator and a refrigeration system and an additional milk reception unit, a pumping device and a generator set. The refrigeration system consists of a hermetically sealed compressor, controls and safety features that make the BMC extremely reliable and energy efficient. The milk from suppliers is poured into the reception unit and stored in a BMC where it is cooled to 4°C within 2-3 hours after its collection. The milk in BMC is maintained at this temperature till it is pumped into specifically designed milk transportation tankers through which it reaches to district milk processing plants.

Installation of BMCs in DCSs had started before RKVY but received a significant boost after RKVY funds became available in 2007-08.

The situation in Punjab is somewhat different. Punjab was a close competitor to Rajasthan with total annual production of 9.39 million MT of milk production in 2010. But, Punjab has much better stock of milch animals and average animal ownership per farmer is also higher. Punjab has 714 thousand exotic/cross bred cows compared to only 132 thousand such cows in Rajasthan. Non-descript and indigenous cows are almost negligible in Punjab with their number being only 133000 whereas bulk of Rajasthan's cattle are of this type and their number is 1727000. Both the states have large number of buffalo population with Punjab farmers owning 2.1 million and Rajasthan farmers having 2.8 million of them. Punjab farmers have invested in private dairies with individual farmers or group of farmers making investment in BMCs.

Intervention

Rajasthan took up a project with an outlay of Rs. 20 crores under RKVY in the very first year to invest in BMCs. This was followed up with another project with an outlay of Rs. 31.76 crores in year 2010-11. The RCDF installed a total of 760 BMCs with a total chilling capacity of 12.63 lakhs litres of milk at 760 village DCS's with this investment. The scheme covered 18 districts of the state - Ajmer, Alwar, Bhilwara, Bhartpur, Bikaner, Chittorgarh, Churu, Jaipur, Jalore, Jodhpur, Kota, Nagaur, Pali, Sikar, Shri Ganganagar, Sawai-Madhopur, Tonk & Udaipur. These BMCs are now very useful to the farmers at the DCS as they are able to keep the collected milk chilled till the tanker arrives from the Milk Union.

Punjab's model is more individual farmer oriented. Government provides a financial incentive of 50% for installing Farm Milk Coolers (Farm BMCs) having capacity of 500 liters, 1000 liters and 2000 liters with a suitable D.G set. So far, 23 Farm Milk Coolers

have been subsidized and Rs. 90 lakhs have been disbursed as financial incentive to dairy units under RKVY.

Sh. Kanwaljit Singh, Dairy Farmer of Garanga Village Along With His Farm Milk Cooler

Outcome

An impact assessment study conducted at District Milk Cooperatives of Ajmer, Alwar, Jaipur, Jalore, Pali and Sikar during pre and post BMC phase indicated that the installation of BMC's has significantly improved the quality of milk and income of beneficiaries at all levels. The major outcomes of the BMC intervention are:

- Transportation cost of milk from DCS to processing plants has been reduced by 20% as milk is transported only once a day. The distance of milk route has been increased and the requirement of number of vehicles has also reduced.
- Expenditure on purchase, maintenance and washing of milk cans has been fully avoided.
- Milk collection time has increased at DCS.

- Average milk procurement has increased by 30% at most of the DCS's where BMC's are installed.
- Incidences of sour curd are now rare from 1-2% earlier.
- Average sale price of milk at DCS has increased by 15%.
- Overall profitability of DCS has increased by 2%.

Installation of BMCs has substantially boosted the process of dairy development in the state of Rajasthan. It is definitely not through increase in milk production but mainly through improvement in quality and minimizing the operational cost on procurement, transportation and processing of milk. The average daily milk procurement which was 13.59 lakh kg per day during 2007-08 (pre-BMC phase) has increased by 21.5% to 16.51 lakh kg per day during 2010-11. The milk farmers of the state are thrilled to reap the benefits of chilled milk.

In Punjab also, Dairy farmers, who have invested in farm milk coolers at their dairy farms, have reaped rich dividends after installation of Bulk Milk Coolers. This facility has helped farmers to maintain the quality of their milk and increase its shelf life.

Sardar Kanwaljit Singh of Village Garanga, Distt. Mohali has been running a dairy farm. He was maintaining about 150 cows and producing 800 liters of milk daily. Initially he was having no facility of cooling the milk at farm level, and so he had no capacity to keep milk with him for even a short duration because the bacteria in the milk multiplied very quickly. He had to sell his produce immediately which sometimes led to panic sale and he suffered losses. The investment on the creation of this facility was quite high and hence he could not make arrangements to install a farm milk cooler and had to remain at the mercy of milk purchasers.

He availed assistance under RKVY to install Farm Milk Cooler. He arranged a bank loan and with the assistance from Dairy

Development Department, he purchased a farm milk cooler of 2000 liters capacity along with a D.G Set. A very happy Sh. Kanwaljit Singh claims that with the help of Farm Milk Cooler, he is able to maintain the quality of milk. He says he can now keep milk with him for sometime, which has provided him the advantage of selling it at the optimum rate. Because of Farm Milk Cooler, he asserts, he is able to sell milk at an increased rate of Rs. 1.00 per liter. The buyer happily pays this premium because the quality of milk in farm milk cooler remains up to the mark and the processor has to incur a much smaller cost on its transportation and processing. According to Sh. Kanwaljit Singh yearly benefits due to saving on transportation and higher cost of milk is nearly Rs 3.00 lakh. This is an extra income, which accrues to him due to the investment in Farm Milk Cooler.