

RESEARCH PAPER

Optimization of milk procurement routes of FPO owned dairy unit

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ABSTRACT

Raw milk quality and quantity is the corner stone of excellent dairy products. Milk procurement guards this with an eagle eye and ensures that company's production needs are met. Milk procurement is the starting point of FPO's dairy supply chain. The FPO owned dairy unit has adopted a system of milk collection through village level milk pooling points (MPP's). MPP is a common place in villages where the farmers pool their milk. The person who collects the milk from the farmers is called as "Pala Mitra" / "MPP operator". The present study was carried out at the selected BMC centre of a FPO owned dairy unit in Chittoor district of Andhra Pradesh. The principal objective of the study was to optimize the milk procurement routes using travelling salesman model. The findings of the study show that in route-1 the optimized distance is 48.2 kilometers, time travelled to cover all the milk pooling points is 83.5 minutes and the total cost per trip is around 345 Rs. In route-2 optimized distance is 26.7 kilometers, time travelled to cover all the milk pooling points is 76 minutes and the total cost per trip is around 191 Rs. In route-3 optimized distance is 18.4 kilometers, time travelled to cover all the milk pooling points is 71 minutes and the total cost per trip is around 132 Rs. There was a significance reduction of total distance, time and cost in raw milk transportation for the identified bulk milk cooling unit with the optimization of routes was observed. The total distance for travelling to procure the milk to BMC unit has been reduced to 186.8 kilometers per day from 194.6 kilometers per day. The total time of travelling to procure milk to BMC unit was reduced from 501 minutes per day to 461 minutes per day. The total cost incurred for transportation of raw milk to BMC unit has been reduced from 1391.4 Rs. to 1335.6 Rs. With route optimization in all routes of identified bulk milk cooling unit a total reduction in cost of transportation of 55.77 Rs. per day could be achieved. As these transportation operations are routine and need to be done throughout the year an annual cost saving of 20,356 Rs. per annum for the identified BMC unit could be achieved.

KEY WORDS : MPP (Milk pooling point), BMC (Bulk milk cooling) unit, Travelling salesman problem model (TSP), FPO, Milk procurement

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