

ABSTRACT

Direct drive solar milk chillers have been successfully developed and demonstrated with two and a half years field of operational experience in the Nakuru milk shed of Kenya. These innovative solar farm milk chillers (FMCs) are the first such units ever to be deployed and have been successfully operating with no issues or failures. The FMCs enable dairy farmers to boost incomes by selling chilled evening milk which would otherwise not be sold to dairy processors the next morning due to overnight spoilage. Milk is a highly nutritious, but perishable food, the storage quality of which cannot be improved once it has left the farm; thus, it is imperative to chill milk to below 10°C within 4 hours after milking at the point-of-production (on the farm) to protect quality. The solar FMC technology has been used to chill from about 25 to 40 liters of milk overnight to about 4°C. No overnight solar chilled milk was rejected by milk buyers in the 2-year study (traders and dairy cooperatives) and farmer incomes were significantly increased by over 30 percent.

Keywords: photovoltaics, direct drive solar refrigeration, milk chilling, Kenya