

# Dairy farmers to benefit from solar-powered coolers

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Small dairy farms, which form the bulk of milk producers, are suffering from low production as a result of lack of cooling systems and animal feeds. Now, researchers at Germany's University of Hohenheim have developed solar-powered milk cooling refrigerators for small dairy farmers.



[Image Source: The East Africa](#) - Photo: Rachel Kibui

The university is carrying out trials of the new cooling system with optimised animal feeding at Sam Malanga Cooperative Society in Siaya County in western Kenya and the Sidi Bouzid region in central Tunisia, to adapt it to local conditions. The University of Hohenheim said the goal is to support an integrated value chain as raw milk under warm climatic conditions can exceed maximum bacterial count after two to five hours, leading to poor quality and rejection.

"In Tunisia, 85 percent of farmers have fewer than ten cows and access to the market is frequently restricted," said Prof Joachim Müller of the university's Agricultural Engineering in Tropics and Subtropics Department.

Cooling retains milk quality and ensures premium prices. It enables higher production as farmers can milk cows twice a day. Processors charge a premium for better tasting dairy products chilled from farm to factory.

## Addressing farm milk storage with ice-based cooling system

The ice-based cooling solution is an initiative of the German Federal Ministry for Economic Cooperation and Development to address farm milk storage as well as transport to collection centres and urban markets.

"Ice is first prepared with solar power. We fill ice into an extra vessel in the middle of special insulated 30 litre churns. This enables milk to be cooled up to 12 hours, preventing the formation of germs," said a doctoral student, Victor Torres Toledo.

The University of Hohenheim cooling system comprises solar panels linked to a control panel and batteries for a freezer with an ice maker. Storage of ice blocks enables the system to run in low solar radiation and high ambient temperatures.

## **Reduce losses**

Phaesum GmbH is expected to commercialise the solar-powered milk coolers to meet the refrigeration needs of small and medium-sized dairy farmers and thus reduce losses along the entire value chain in Africa.

Prof Uta Dickhöfer of the Animal Nutrition and Rangeland Management in Tropics and Subtropics Department of University of Hohenheim said optimised animal feeding is vital to support dairy farmers. "Feeding determines milk performance, quality, the composition of milk and its price. In the tropics and subtropics, we face special challenges. There are seasonal discrepancies in quality and quantity of feed," she said.

Evaluation of solar-powered milk coolers at the Sam Malanga Dairy Cooperative Society Kenya covering installation, monitoring, and milk handling is being done by Jaramogi Oginga Odinga University of Science and Technology.

Field assessment in Tunisia is being done by the Ministry of Agriculture along with the International Centre for Agricultural Research in Dry Areas. Sidi Bouzid produces about one-sixth of national milk output. Small and medium-sized farms with 10 to 20 cows have a daily output of below 200 litres.

"Strategic feeding adapted to the day-to-day requirements of the animals aimed at enhancing the productivity of individual animals as well as the herd makes more sense," added Prof Dickhöfer.

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