

Profile: SunDanzer

Solar-powered refrigerators allow off-grid farmers to sell more milk



Challenge

Limited electrification in rural areas means that about 85 percent of Kenya's more than 800,000 dairy farms lack access to refrigerated storage. As a result, less than half the milk produced reaches dairy processors, with only milk obtained in the morning sold to processors. Evening milk is used by families or sold to neighbors (at a lower price) or to hawkers who resell it to local markets. Of the milk that does reach processors, up to 30 percent is of low quality because of the lack of cooling systems.



This farmer uses energy from photovoltaic modules to power his new refrigerator.

Innovation

With a USD 1 million grant from the multi-donor Powering Agriculture Initiative, SunDanzer (www.sundanzer.com) developed a small-scale cooling system tailored for medium-size dairy farmers and dairy cooperatives in Kenya. The photovoltaic refrigerator uses solar energy to cool up to 24 liters of evening milk, which can be sold to dairy processors with the fresh morning milk. Instead of using maintenance-intense batteries, SunDanzer's refrigerator freezes saltwater as thermal storage during the day. Its design is adapted to fit the aluminum milk containers Kenyan dairy farmers use. The refrigerator can also be used to store food and charge mobile phones.

SunDanzer itself is not involved in financing. Its partner cooperatives work with saving and credit cooperatives (SACCOs) to provide financing arrangements for the large capital outlay of USD 2,000 per unit. A liter of milk in Kenya sells for about USD 0.37. Assuming that a farmer can sell his evening milk, the payback period for one solar-powered refrigerator is about 225 days, according to the company.

Impact

SunDanzer's clean energy solution increases dairy farm productivity and income by allowing farmers to sell more and better-quality milk to processors. It reduces bacteria counts and improves the quality of the milk. By being able to refrigerate, dairy farmers are also less vulnerable to delays in milk collection, which otherwise would have caused the milk to spoil. The change in productivity is quite significant, with reports of 20 percent increase in farmer's milk production.

Scaling Up

Dairy collection cooperatives and dairy processors have a strong interest in providing dairy farmers with SunDanzer's chilling technology, in order to increase their milk supply and production capacity. Other important enablers for growth are SunDanzer's experienced local partners, which are involved in product design, distribution, and financing. SunDanzer's main partner in Kenya is Winrock International, a nonprofit organization with more than 25 years of experience in renewable energy-based rural electrification. Winrock knows the market and has contacts with dairy farmers and cooperatives. It has established contacts with local dairy cooperatives for product distribution and with SACCOs for financing.