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SOLAR MILK COOLING

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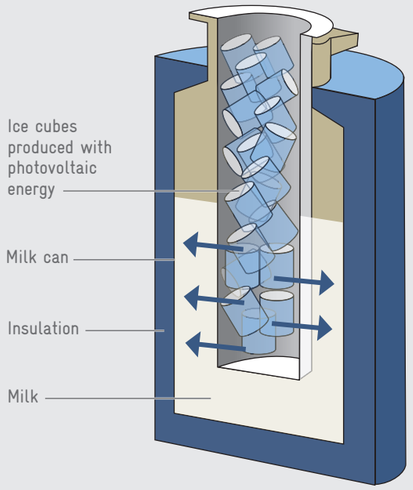
Why?

In 2013 around 760 billion litres of fresh milk were produced worldwide. The resulting dairy products are consumed by some six billion people. Milk production provides many farmers in developing countries with a vital source of food and income.

Raw milk is a very perishable foodstuff; its quality deteriorates considerably without further treatment by chilling or heating. Heavy losses therefore occur in rural areas for want of cooling facilities. At an ambient temperature of 30 °C unchilled milk exceeds the limit of 1 million bacteria per millilitre after only two hours. Exceeding this value the milk is still drinkable but not suitable anymore for the production of some dairy products such as cheese.

A cooling system enables the milk to be transported to markets, where better quality gives access to price premiums. Even milk not processed until late in the evening is still usable the following day if it has been chilled over night.



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What?

Commercially available chest freezers driven by photovoltaic energy enable an efficient production of ice. The 2 kg cylindrical ice blocks are put into a compartment inside the milk can to cool down the freshly produced milk.

The can tested in Tunisia holds maximum 30 litres and 8 kg of ice. Milk can be cooled down to 17 °C with only 6 kg ice with the full load of 30 litres. Less than 10 °C can be reached when using 8 kg of ice and a filling of the can with 20 litres. This allows a safe storage of milk up to 8 and 16 hours respectively under local climatic conditions.

In Kenya, the system has been adapted to fit the local Mazzi Can, covering 10 litres (7.5 litres milk plus 2 kg ice). The system inhibits the growth of bacteria and extends the shelf life of the milk by cooling it down to below 15 °C within 1 hour. With an outside temperature of around 35 °C the milk temperature stays then below 20 °C for about 5 hours.

A stainless steel milk can with insert and insulation costs around € 400, while the cheaper plastic version (like the Mazzi Can) is available for around € 200.

Where?

There is great potential for the use of this technology in a large number of developing countries. The milk cooling solution is currently being trialled in Tunisia, Kenya and Colombia.

More?

Energypedia: Solar Milk Cooling with Insulated Milk Cans
https://energypedia.info/wiki/Solar_Milk_Cooling_with_Insulated_Milk_Cans

With Whom?

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ICARDA Science for Better Livelihoods in Dry Areas

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