An old-fashioned butter cooler

QUESTION: Before fridges were common in people's homes, didn't they use some sort of clay pot to keep butter cool? Did such pots exist and how did they work?

Anna A

ANSWER: In the old days, people had iceboxes to keep food cool in their kitchens but that required access to an icehouse where the ice was stored during the summer months. [Ref 1]. At the beginning of the 20th century, larger urban centres also had a well-functioning system of "icemen" who delivered ice to shops and homes. In the country it was possible to have your own icehouse but most people in Sweden kept their food in a walk-in earth cellar that was usually built into a hillside. The temperature and air humidity in such cellars was well suited to storing food in general, especially green vegetables and root crops. The temperature in a well-designed earth cellar stays about 5 – 8 °C year round.

The evaporation of water requires heat, and it was possible to exploit this thermodynamic phenomenon to have chilled food indoors during the summer months. For example, to keep butter cool, people used a non-glazed clay vessel filled with water. The clay pot had a lid and as well as the water it also contained a porcelain jar for the butter. The water gradually oozed out through the walls of the clay pot and evaporated on the outside. The heat required for the evaporation was drawn partly from the air and partly from the clay pot. This cooled down the clay pot and its contents, thereby keeping the butter at an acceptable temperature.

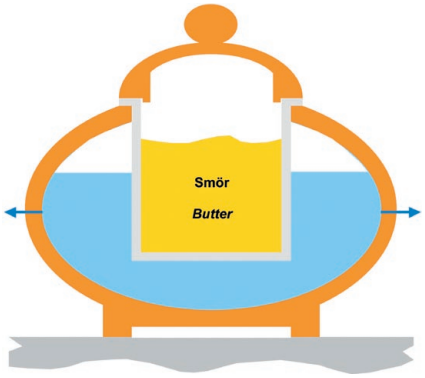
This refrigeration technique is of course very environmentally friendly and we can still use it today in places like summer cottages and boats that have no fridges. We can also use the technique to keep drinks cool on a beach by using a damp towel.

MEASURES AIR HUMIDITY

If we continuously direct an air flow past a thermometer that is equipped with a wet sock we will measure what is known as the wet-bulb temperature. The wet temperature, which is due to the air humidity, is lower than the air temperature that we measure with a dry thermometer. By using a Mollier diagram for humid air we can determine the air humidity with the help of the dry and wet temperatures. We can state the air humidity as relative humidity (RH) in per cent or as the ratio between the mass of the water vapour and the mass of the dry air (the vapour ratio). By "dry air" we mean all the gases in the air except the water vapour. [Ref 2]

Questions should be of general interest and be about temperature measurement techniques and/or heat transfer.

QUESTIONS ANSWERS



The water oozes slowly through the walls of the clay pot and evaporates on the outside, thereby cooling the pot and its contents.

References see: www.pentronic.se >>Pentronic News >> Pentronic News archive
[Ref 1] Pentronic News 2009-3 p. 3
[Ref 2] Pentronic News 2009-2 p. 3

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