

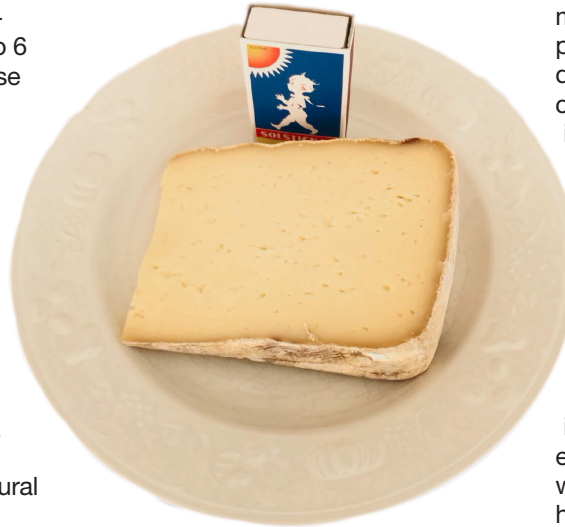
SERVE CHRISTMAS CHEESE LIKE THE EXPERTS

Christmas is one of the major food holidays in Sweden, and involves a number of interesting thermal problems in connection with food and food preparation. As a result, people need to measure or calculate the food's temperature as a function of time.

Cheese stored in the refrigerator acquires a temperature of 4 to 6 °C, which is too low for the cheese to have its optimal flavour. Many cheese lovers say that cheese tastes best when it is a few degrees below room temperature. There are probably as many recommended temperatures as there are cheese lovers.

When we warm cheese at room temperature, the question is how long it takes in terms of time before the cheese reaches the desired temperature. The dessert cheese in the photo acquires heat from the air via natural convection, and from the room's walls, ceiling and furnishings via radiation. Heat is also added from the dish via heat conduction. The dish starts out at room temperature. Inside the cheese, the heat transfer oc-

curs via heat conduction. At a room temperature of 22 °C and a fridge temperature of 6 °C, the cheese should be warmed by about 12 °C to reach a suitable temperature. The heat flow to the cheese is greatest at the beginning, when the temperature



difference between the room and the cheese is the biggest, about 16 °C. As the cheese warms up, this difference becomes smaller. As a result,

both the heat flow and rate of heating become less. The time required for the warming-up process also depends on the type of cheese and the geometry of the cheese.

The warming-up process takes a surprisingly long time. For the cheese shown here, it takes approximately 2½ hours before the thicker part of the cheese reaches the desired temperature. We must accept that some parts of the cheese – including the tip – will become a degree or two warmer. The simplest procedure is for the cheese lover to measure the temperature progression of some favourite cheeses of an appropriate size and decide on the warming-up time required. Another option is to calculate the temperature progression. In this case, however, it is difficult to estimate the parameters required for the calculation, which makes the calculation result highly uncertain.

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