

## **THAWING AT AMBIENT TEMPERATURE ON THE COUNTER**

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Raw meat, fish, and poultry are contaminated with various spoilage and pathogenic bacteria. These bacteria do not multiply when frozen and may actually decrease slightly in population. because of freezing injury.

However, as soon as frozen raw meat, fish, and poultry products begin to thaw, any bacteria that may have been present before freezing can begin to multiply again when the temperature increases to their growth range. Since spoilage bacteria begin to multiply at 23F vs. pathogen multiplication at 29.3F, the problem in thawing raw meat, fish, and poultry should be a little spoilage bacteria multiplication. This is, in fact, the case.

The FDA Model Food Code (1999) recommends that food be thawed in the refrigerator or in flowing water, but provides no research to show that these methods of thawing are required to ensure safety. Thawing food, such as poultry carcasses, in the refrigerator can be inefficient and time consuming, in addition to occupying refrigeration space required for other food items. This procedure can lead to the risk of cross-contamination of ready-to-eat food stored in the refrigerator if this type of food comes in contact with the drip from the raw food. Thawing time is very unpredictable because of refrigeration temperature that may be colder than planned.

On the other hand, the USDA, applying the research of Klose et al. (1968), has never had restrictions on thawing at room temperature in food processing plants and allows food to be thawed in this manner. Klose et al. reported on the growth of spoilage bacteria in thawing turkeys that ranged in weight from 4 to 22 pounds at temperatures of 55, 70, and 84F (12.8, 21.1, and 28.9C). These authors concluded that ambient (room) air temperature thawing, at 70F and below, is a satisfactory thawing procedure. It takes about 15 hours for the middle of a 22-pound turkey to get to 32F, while the surface temperature rises to 53F or less. In this amount of time, there would be about 4 multiplications of spoilage bacteria and non-detectable multiplications of salmonellae.

Recently, Jiménez et al. (1999) reported a study that supports the conclusion that poultry can be thawed safely at ambient temperature, on the counter. Large chicken carcasses weighing over 6.5 pounds were frozen and then thawed by 3 different thawing methods: thawing on the counter at ambient temperature (72F), thawing in flowing water (72F), and thawing in refrigeration ranging from 38 to 45F.

Differences in bacterial population before freezing and after thawing were assessed. The aerobic plate count, Enterobacteriaceae, pseudomonad populations of the skin of uninoculated chickens did not increase when the chickens were thawed on the counter in less than 10 hours to an internal temperature of 40F within the breast. The most notable observation was that there was a small increase (0.5 log<sub>10</sub> CFU/g) in the population of pseudomonad bacteria (spoilage bacteria) when the chicken was thawed under refrigeration, which took about 55 hours.

In another part of this study, chickens were inoculated with Salmonella hadar in order to assess the effect of the different thawing methods on the growth of this microorganism. It was shown that there was a slight decrease in the population of Salmonella hadar-inoculated chickens frozen and thawed at room temperature to an internal temperature of 40F within the breast. This same decrease was noted in chickens frozen and thawed in flowing water and in refrigeration. This latter observation demonstrates the reduction in cell numbers because of freezing injury and the inability of this strain of salmonellae to grow below 45F.

In summary, the research study by Jiménez et al. (1999) supports the previous study by Klose et al. (1968). The USDA is correct to allow raw meat, fish, and poultry to thaw at room temperature. There is no risk in thawing these products at room temperature.

#### References

FDA Food Code. 1999. U.S. Public Health Service, U.S. Dept. of Health and Human Services. Pub. No. PB99-115925. Washington, D.C. Jiménez, S.M., Pirovani, M.E., Salsi, M.S., Tiburzi, M.C., and Snyder, O.P. 1999. The effect of freezing and different thawing methods on the growth of bacteria in chicken. Submitted for publication to the J. Food Protect. Klose, A.A., Lineweaver, H., and Palmer, H.H.. 1968. Thawing turkeys at ambient air temperature. Food Tech. 22:1310-1314.

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