



# Freeze and Thaw What Are the Rules?

by *Melissa Vaccaro, MS, CHO*

I recall growing up and watching my mother, who was a busy working mom, pull out a package of frozen chicken from the freezer and place it in a container on the counter before she left for work. She would remind my sister and me to start cooking dinner when we got home from high school. When we got home, we'd unwrap the chicken, season it, stick it in a pan, and put it in the oven to bake. Dinner would be ready when mom and dad got home. Looking back at that now, I say thank goodness *Salmonella* is killed by cooking. I am sure there were one

or two times when we made ourselves sick, but we never blamed that chicken that sat on the counter all day thawing.

Most people don't think about thawing as a dangerous food preparation step. The food is still cold, frozen, so what could go wrong? Thawing is, however, a critical point in food preparation when dealing with time and temperature controlled for safety (TCS) foods. If done wrong, you could get sick. TCS foods should never be



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thawed on the counter or in hot water. They must not be left at room temperature more than two hours. Even though the center of the food may still be frozen, as food thaws on the counter or under hot water, the outer layer could be in the danger zone (41°F - 135°F). In the danger zone, bacteria will rapidly grow.

You can't really discuss thawing of foods until you discuss freezing of foods. Freezing is the process in which the temperature of a food is reduced below its freezing point (which varies by food item), and the majority of the water

inside the food undergoes a change in state to form ice crystals. Freezing preserves food for extended periods because it prevents the growth of microorganisms that cause both food spoilage and foodborne illness. It is one of the safest means of preserving foods. Food stored constantly at frozen temperatures is safe and can be kept for a long period of time. Food will not "go bad" if it is maintained frozen. As time goes by food may degrade due to moisture loss (freezer burn). Only quality can continue to deteriorate, but there is no safety issue while in the freezer. It may not look or taste so good, and texture might be off a bit, but it would not make you sick if you thaw and cook it correctly. Food does not become unsafe the longer it sits in the freezer.

Although freezing prevents microbial growth in foods, it will not destroy all microorganisms. Most bacteria present before freezing will be there after thawing. As soon as any part of food begins to thaw, bacteria start to multiply. The number of these bacteria will not reach dangerous levels within short periods of time if the food has been safely thawed, transported, and stored. On the other hand, improper thawing provides an opportunity for bacteria that may have been present before freezing to multiply to harmful numbers.

Can TCS foods be refrozen if they were not cooked? This is always a confusing issue. Yes, food can be frozen, thawed, and re-frozen...but (there is always a 'but')... it had to have been thawed properly. If you begin to thaw chicken in the refrigerator and decide you are not going to use it, you can put it back in the freezer again. The more this happens, quality will continue to deteriorate due to moisture loss, but the food would still be safe. Most experts do not recommend this for other thawing methods, only thawing in the refrigerator.

Do not pack your freezer with a lot of unfrozen food at one time. This will slow the freezing process. Foods that are frozen fast will have the best quality when thawed. Foods frozen quickly will form small ice crystals. These small ice crystals will produce less cell rupture in the food while freezing versus slow freezing that produces large ice crystals and significant cell rupture during freezing. Once thawed, the food will be less watery or soggy and be of better quality if faster freezing occurred.

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Following are several rules and tips to keep food safe at various points of freezing and thawing.

### THE FACILITY

- The design and layout of the food facility should be in compliance with the licensing requirements and conditions mandated by the regulatory agency.
- All frozen and refrigerated spaces should be fitted with equipment for the accurate monitoring of storage temperature.
- Food facilities should develop and implement a program for cleaning and pest control.

### PURCHASING AND RECEIVING

- Food should only be obtained from reputable and approved sources.
- Records showing the dates, quantities, and suppliers of foods should be maintained and held in a manner that permit ready reference.
- Foods received at a 41°F premise should be inspected before acceptance.
- Personnel responsible for inspection should as far as practically possible:
  - > Verify that there are no signs or indications of contamination or damage to the raw food;
  - > Verify that foods have arrived at proper temperature and are free from observable evidence of temperature abuse; and
  - > Move acceptable items quickly into storage.

### STORAGE

- Frozen foods should be stored frozen. The ambient temperatures of the freezer that will allow foods to remain in a frozen state is somewhat dependent on the type of food being frozen. Some foods may hard freeze at 10°F, whereas others may need to be at -10°F to remain hard frozen. Zero degrees Fahrenheit is a good gauge to go by, and adjust your units as necessary.
- The FDA Model Retail Food Code now allows for frozen, commercially processed and packaged raw animal food to be stored or displayed with or above frozen, commercially processed and packaged ready-to-eat foods.

### SAFE THAWING METHODS

There are four safe and approved ways to thaw:

1. In the refrigerator
2. Under cold water
3. Direct to any cooking equipment, without pre-thawing
4. In the microwave, followed by cooking

All thawing foods should be monitored using a calibrated thermometer throughout the thawing process.



**Thawing in the refrigerator** is by far the best and safest way to thaw foods. This method, however, requires you to plan ahead. It may take 24 hours to thaw a food item that weighs 5 pounds. When thawing in the refrigerator, keep in mind that some locations within the unit may be cooler than others. Additionally, foods will take longer to thaw in a 35°F cooler versus a 41°F cooler. As long as the food is in ambient air of 41°F or cooler, your food will thaw safely.

- Refrigerator thawing allows for good air circulation and easy handling.
- Thawing procedures should be well planned to minimize the time thawed food is in the temperature danger zone (i.e. between 41°F and 135°F) and to prevent cross-contamination.
- Raw animal foods should be kept away from other foods in a refrigerator or placed on the bottom shelf of the fridge to prevent cross contamination during the thaw.
- Thawing food should be placed in clean and covered containers to prevent dripping and spilling onto other food contact surfaces.

- The cooler should be fitted with equipment for the accurate monitoring of thawing temperature.
- Thawed food should not be allowed to stand at room temperature other than for the short period of time necessary for preparation.

**Thawing using cold water** is another safe option. This method is faster, but requires more monitoring.

- The cool water should be 70°F or below.
- The food should be completely submerged under running water. Water should be of sufficient velocity to agitate and float off loose particles into overflow.
- Thawed portions should not rise above 41°F.
- This method should take four hours or less, including thawing, preparation, cooking, or cooling cumulatively.

**Thawing as part of the cooking process** is another allowable option. This would include the use of any cooking units, including a microwave. Food can be taken right from the freezer and placed into a cooking unit. Keep in mind, cooking time will take longer if you are starting with a frozen product, so plan ahead and always verify you have reached a final cook temperature.

- Final internal cook temperature of the food, taken in the thickest part of the food, should meet the safe cooking temperatures as required.

**Thawing using a microwave** is the final allowable method of thawing food.

- If using a microwave to thaw, food should be immediately placed in cooking equipment to begin the cooking process. There should be no interruption in the process.
- It is recommended that foods thawed in the microwave be cooked before re-freezing.



**Microwave thawing** is the final allowable method to thaw food. Food should immediately be cooked after microwave thawing.

If you are thawing reduced oxygen packaged (vacuum packaged) fish that bears a label to 'keep frozen until time of use,' it should be removed from its packaging prior to thawing under refrigeration or prior to (or immediately upon completion of) the thawing process using running water thawing methods.

There are times when you think you have seen it all, but people come up with very interesting ways to thaw foods. Never thaw foods in a garage, basement, car, dishwasher, plastic garbage bag, outdoors, or on the porch. These methods can leave your foods unsafe to eat. Thawing takes planning ahead. If you are not the type that likes to think ahead, then be sure to use the approved rapid thawing methods.

## TRANSPORTATION OF FROZEN FOODS

- At all stages of distribution, frozen foods should be transported as quickly as possible and maintained at frozen temperatures. Transportation of frozen food should not allow foods to thaw.
- Frozen food should always be transported carefully to avoid contamination. Care should be taken to ensure cross-contamination cannot occur.
- Vehicles should be soundly constructed, well maintained, and kept clean. They should be designed in such a way as to ensure that the temperature remains constant.

## TRAINING

- All staff involved in handling frozen/thawed food at any stage in the thawing, packaging, transporting, and displaying process should be instructed and trained in issues relating to their work activities.

CDMs and their team should use safe thawing and freezing methods to protect their clients from foodborne illness. **E**



**Melissa Vaccaro, MS, CHO** is a Food Program Specialist for the PA Department of Agriculture and an Executive Board Member for the Central Atlantic States Association of Food and Drug Officials (CASA). She is co-author of the SURE™ Complete HACCP Food Safety Series.

 [mvaccaro86@gmail.com](mailto:mvaccaro86@gmail.com)