

Setting and Stabilizing the Temperature for Vaccine Storage Equipment

Excerpt from the 2012 Centers For Disease Control and Prevention (CDC) Storage and Handling Toolkit.

Available at: <http://www.cdc.gov/vaccines/recs/storage/toolkit/>

Setting and Stabilizing the Temperatures in Storage Units

Thermostats

Refrigerator and freezer thermostats are marked in various ways, depending on the brand. There are a variety of ways to indicate the temperature setting. For example, some have a series of numbers or letters on the control knob. Others may have “MIN,” “MED,” and “MAX” marked on the knob or a dial ranging from “cold” to “coldest.” Consult the owner’s manual for instructions on how to operate the thermostat.

In general, thermostats do not show temperatures, but rather the levels of coldness. The only way to know what the temperature is where the vaccine is stored is to measure it with a calibrated thermometer. Continue monitoring the temperature of the unit using a calibrated thermometer to assure that the vaccines are not exposed to inappropriate temperatures.



Refrigerator unit thermostat



Freezer unit thermostat

Adjusting the Storage Unit Temperatures

Only the primary or alternate vaccine coordinator should adjust the temperature of a vaccine storage unit. A warning sign should be posted on the storage unit that says, “Do not adjust refrigerator (or freezer) temperature controls. Notify (insert name) if adjustments are necessary” (see example warning sign). Limiting access to the thermostat reduces the risk that the temperatures will be adjusted inappropriately. In some situations, the thermostat may need to be reset in summer and winter, depending on the ambient room temperature. If the thermostat requires adjustment, alert the vaccine coordinator or immediate supervisor.



Only the primary or alternate vaccine coordinators should adjust the temperature of a vaccine storage unit

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Use caution in adjusting a thermostat. Normal defrost cycles and busy workdays can lead to slight temperature variations that are not necessarily indicative of inappropriate vaccine temperatures. First, be sure the unit is plugged into a power source. Then check the temperatures inside the refrigerator and/or freezer unit(s). Next, data from continuous data loggers should be checked to verify that a temperature reset is appropriate.



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To adjust the temperature and avoid exceeding the required temperature range, turn the thermostat knob slowly, making small adjustments toward a warmer or colder setting as necessary. Allow the temperature inside the unit to stabilize for 30 minutes; then recheck the temperature. Adjust the thermostat again as necessary.

Aim to stabilize the refrigerator unit temperature around 40°F (5°C). Make sure the temperature remains between 35°F and 46°F (2° C and 8°C). Aim to stabilize the freezer unit temperature between -58°F and +5°F (-50°C and -15°C).

If you are using the refrigerator compartment of a combination unit to store refrigerated vaccine, note that this type of unit has a cooling system that directs cold air from the freezer compartment into the main refrigerator compartment. This type of unit has two thermostat controls: one controls the freezer temperature, and the other controls the volume of freezing air that enters the main refrigerator compartment. Use care when adjusting the freezer temperature because this will affect the temperature of the air venting into the refrigerator compartment. Without careful and frequent temperature monitoring inside the refrigerator compartment, there is a risk of freezing the refrigerated vaccines. It is for this reason that it is recommended to only use the refrigerator compartment of a combination unit for vaccine storage. Vaccine storage in the freezer compartment should be avoided.

Frequent temperature monitoring of both the freezer and refrigerator units throughout the day, at the beginning and end of each workday, and whenever thermostats are adjusted is required. It may take 2 to 7 days to stabilize the temperature between 35°F and 46°F (2°C and 8°C) in a newly installed or repaired refrigerator. Likewise, it may take 2 to 3 days to stabilize the temperature between -58°F and +5°F (-50°C and -15°C) in a newly installed or repaired freezer. Allow one week of twice daily refrigerator and freezer temperature recordings, including minimum/maximum temperatures daily (preferably in the morning) to make sure temperatures are within the appropriate ranges before using the units to store vaccines.

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Vaccine should never be stored in a unit that cannot maintain the required temperature range. Identify an alternate unit to temporarily store the vaccine. It should be able to maintain the appropriate temperature range and have sufficient space to store the vaccines.

Stabilizing the Temperatures with Water Bottles and Frozen Coolant Packs

You can help stabilize the temperature in the refrigerator by keeping at least two or three large containers of water inside. Store water bottles labeled “Do NOT drink” against the inside walls and in the door racks. You can help stabilize the temperature in the freezer by keeping frozen coolant packs inside. Store the frozen coolant packs along the walls, back, and bottom of the freezer and inside the racks of the freezer door. Frozen coolant packs in the freezer door and water containers in the refrigerator door should be placed securely so they cannot dislodge and prevent unit doors from closing. In addition, caution must be taken to avoid weighing down a door so much that the seal is compromised when the door is closed. Not only will water bottles and frozen coolant packs help maintain even temperatures in the storage unit with frequent opening and closing of the doors, they will also help to keep the temperatures stable in the event of a power failure.



Stabilize the temperatures in a freezer with frozen coolant packs.



Stabilize the temperatures in a refrigerator with water bottles labeled “DO NOT drink.”

Opening the Door

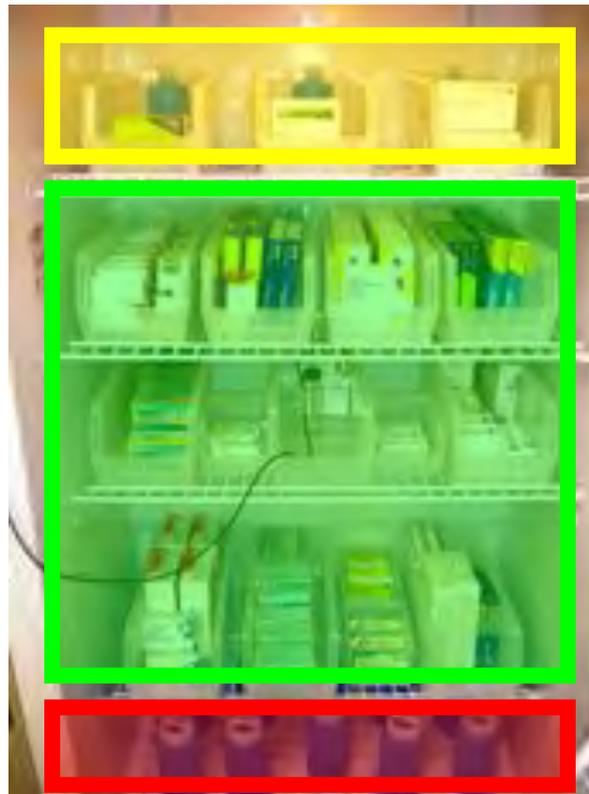
Limit the number of times the vaccine storage unit door is opened and avoid letting the door stand open unnecessarily. Not only does this affect the temperature in the unit, it also exposes the vaccines to light, which can reduce the potency of some vaccines (see CDC’s [Vaccine Storage and Handling Guide](#) for vaccine-specific recommendations). Routinely check the refrigerator and freezer doors throughout the day and at the end of each workday to ensure they are tightly closed.

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Deli, Fruit, and Vegetable Drawers

Remove any deli, fruit, and vegetable drawers from the refrigerator. Removing the drawers not only provides extra space for storing containers of water, but it also removes the temptation to use the drawers for storage of food, beverages, or vaccines. Food and beverages should not be stored in a vaccine storage unit. Vaccines should not be stored near the floor or in the deli, fruit, or vegetable drawers because the temperature in these areas is different from that in the body of the refrigerator. For more information on best storage practices for refrigerated vaccines, see [NIST Guidance on Storage of Refrigerated Vaccine](#) in the Resources section.



Avoid storage on top shelf near cooling vent unless unit is a freezerless unit

Place vaccines in original packaging in storage trays in center fridge space 2 to 3 inches from wall.

Deli drawers removed

Water bottles to help stabilize temperature

Temperature Variations

Temperatures can vary in a vaccine storage unit based on the contents, how often the door is opened, and power interruptions. The only way to be sure the temperature in a storage unit has remained within the appropriate range is to frequently read and document the temperature using a calibrated thermometer.