

## Refrigerator/Freezer Purchasing Guide

<p><b>1. The ability to maintain temperature</b></p>	<p>Vaccine storage refrigerator or freezer units should be able to maintain the required temperatures throughout the year. CDC recommends the use of stand-alone units (units that only refrigerate or freeze), as they maintain the required temperatures effectively. CDC does not recommend the use of the freezer portion of combination units as they are not capable of maintaining the required temperatures. Most pharmacy-grade units are excellent at maintaining temperatures.</p> <p><b>Dormitory style refrigerators must not be used for vaccine storage.</b></p>
<p><b>2. Size of the unit</b></p>	<p>Vaccine storage units should be large enough to hold the year's largest inventory (such as the inventory during influenza season) without crowding vaccines.</p> <p>Vaccine storage units should have enough space to hold water bottles for refrigerators and frozen packs for freezers. Water bottles and coolant packs help to stabilize temperatures in emergency situations like a power outage.</p>
<p><b>3. Refrigerators or freezers with built-in thermometers</b></p>	<p>Some refrigerator/freezer units have built-in thermometers. Some manufacturers place the built-in thermometer close to the wall of the unit, which contradicts the current recommendation that says thermometers should be placed at the center, close to the vaccines. If providers wish to buy a unit with a built-in thermometer, they should check for the placement of the glycol vial and whether the thermometer is calibrated or not. Providers should check the cost of recalibration with the manufacturers and they should recalibrate the built-in thermometers regularly according to the manufacturer's recommendation. Providers must keep the certificates of calibration.</p>
<p><b>4. Defrost cycle of the unit</b></p>	<p>CDC recommends the use of refrigerators/freezers with an automatic defrost cycle or that are frost-free for vaccine storage. Units with manual defrost cycle may need a backup refrigerator/freezer when they are defrosted and accumulation of ice in a unit with manual defrost cycle may affect the performance of the unit. Therefore, units with manual defrost cycle are not preferred for vaccine storage.</p>
<p><b>5. The door of the unit</b></p>	<p>There is no specific recommendation on the type of refrigerator/freezer door. However, there are some qualities to look for. Some units have doors that close automatically with an alarm to detect if the door is ajar. Some units have locks and backup generator. A National Institute of Standards and Technology's (NIST) study showed that refrigerators with a glass door have an increased risk of temperature excursion during power failure.</p>

After buying a new refrigerator or freezer unit, allow one week of twice daily temperature recordings, including minimum and maximum temperatures, to make sure the unit maintains the required temperature before storing vaccines in the unit.

## Easy Steps to Purchase a Refrigerator or Freezer

Step 1. Estimate the maximum number of doses that will be stored in the unit

Step 2. Match the maximum doses with the minimum cubic feet needed

Step 3. Search for product name and model number for prices or use the provided table

<b>Refrigerators</b>	<b>Freezers</b>
Add the number of doses on hand _____	Add the number of doses on hand _____
VFC vaccine _____	VFC MMR, MMRV and Varicella _____
VFC flu vaccine + _____	Private MMR, MMRV and Varicella + _____
Private vaccine + _____	Total doses _____
Private flu vaccine + _____	Multiply by <span style="float: right;">x1.25</span>
Total doses _____	<b>Maximum doses</b> = _____
Multiply by <span style="float: right;">x1.25</span>	
<b>Maximum doses</b> = _____	

<b>Refrigerators</b>		
Maximum Doses	Minimum Cubic Ft	Examples of Refrigerator-only units
2,000+ doses	May need more than one refrigerator	See below
1000 – 2000	40 cu. ft.	Revco REL-4504A; REL-4504D*
900 – 1000	36 cu. ft.	Nor-Lake NSPR331WWG/O*; Panasonic MPR-1014R*
801 - 900	21 - 23 cu. ft.	Aegis Scientific 1-R-25*; Nor-Lake NSPR24WWG/5*
701 - 800	17 - 20 cu. ft.	Aegis Scientific 3-CR-17*; Marvel Scientific 17CAR001; Frigidaire FCRS201RFB
400 – 700	16.7 cu. ft.	Nor-Lake LR161WWW/O*; Kenmore 70722; Frigidaire FRU17B2J
100 - 399	4.9 - 6.1 cu. ft. (must be pharmacy grade)	Nor-Lake LRO61WWW/OX; LRO61WWW/OXD*; LR051WWW/O* Revco REL-404A*
<b>Freezers</b>		
Maximum Doses	Minimum Cubic Ft	Examples of Freezer-only units
501 – 6,000	7 - 14.8 cu. ft.	Revco ULT1230A*; Frigidaire FFFC07M1QW; FFFC09M1QW; Arctic Air CF07
201 - 500	5 - 5.6 cu. ft.	Revco ULT-430A* ; Frigidaire FFFC05M1QW; Kenmore 12502; Helmer Scientific HLF105*
0 - 200	3.5 - 4.9 cu. ft.	Nor-Lake LF041WWW/OM*; Revco ULT-430A*; Thermo Scientific JLF430*

## Refrigerator

Model	Manufacturer	Temperature range**	Size in cubic feet	Price*	Defrost Cycle	Door	Website
11-670-301	Fisher Scientific	1°C to 12°C	12	\$5,274	Automatic	Glass door	<a href="https://www.fishersci.com/shop/products/general-purpose-gp-series-lab-refrigerators/11670301">https://www.fishersci.com/shop/products/general-purpose-gp-series-lab-refrigerators/11670301</a>
13-986-050	Fisher Scientific	2°C to 10°C	5.4	\$2,839	Automatic	Solid door	<a href="http://www.fishersci.com/shop/products/fisher-scientific-isotemp-general-purpose-undercounter-refrigerator/13986050">http://www.fishersci.com/shop/products/fisher-scientific-isotemp-general-purpose-undercounter-refrigerator/13986050</a>
REF20-PH	Follett	1.5°C to 5°C	19.7	\$9,805	Automatic	Glass door/ self-closing	<a href="https://www.follettice.com/products/medical-grade-refrigeration/upright/medical-grade-upright-refrigerator/models~default.aspx">https://www.follettice.com/products/medical-grade-refrigeration/upright/medical-grade-upright-refrigerator/models~default.aspx</a>
REF5P-00-00	Follett	2°C to 10°C	4.5	\$4,165	Automatic	Solid door	<a href="https://www.follettice.com/products/medical-grade-refrigeration/upright/medical-grade-upright-refrigerator/models~default.aspx">https://www.follettice.com/products/medical-grade-refrigeration/upright/medical-grade-upright-refrigerator/models~default.aspx</a>
REF5P-00-GD	Follett	2°C to 10°C	4.5	\$4,640	Automatic	Glass door	<a href="http://www.follettice.com/products/medical-grade-refrigeration/performance-plus-undercounter-medical-grade-refrigerator/performance-plus-undercounter-medical-grade-refrigerators/models~default.aspx">http://www.follettice.com/products/medical-grade-refrigeration/performance-plus-undercounter-medical-grade-refrigerator/performance-plus-undercounter-medical-grade-refrigerators/models~default.aspx</a>
iPR125	Helmer Scientific	2°C to 10°C	25.2	\$6,846	Automatic	Solid Door	<a href="http://www.helmerinc.com/ipr125-pharmacy-refrigerator-us-canada.aspx">www.helmerinc.com/ipr125-pharmacy-refrigerator-us-canada.aspx</a>
HPR125	Helmer Scientific	2°C to 10°C	25.5	\$4,931	Automatic	Glass door	<a href="http://www.helmerinc.com/products/hpr125-pharmacy-refrigerator.html">http://www.helmerinc.com/products/hpr125-pharmacy-refrigerator.html</a>
iPR111	Helmer Scientific	2°C to 10°C	11.5	\$5,173	Automatic	Solid Door	<a href="http://www.helmerinc.com/ipr111-pharmacy-refrigerator-us-canada.aspx">www.helmerinc.com/ipr111-pharmacy-refrigerator-us-canada.aspx</a>
HPR111	Helmer Scientific	2°C to 10°C	11.5	\$3,839	Automatic	Solid door	<a href="http://www.helmerinc.com/products/hpr111-pharmacy-refrigerator.html">http://www.helmerinc.com/products/hpr111-pharmacy-refrigerator.html</a>

SLR104	Helmer Scientific	2°C to 10°C	4	\$1,873	Automatic	Solid door	<a href="http://www.helmerinc.com/products/slr104-ada-lab-pharmacy-undercounter-refrigerator.html">http://www.helmerinc.com/products/slr104-ada-lab-pharmacy-undercounter-refrigerator.html</a>
G-1MRG	Migali Scientific	2°C to 8°C	12	\$3,475	Automatic	Glass door	<a href="http://www.migaliscientific.com/product/glass-door-upright-refrigerator-12-cuft/?cat=vaccine-storage">http://www.migaliscientific.com/product/glass-door-upright-refrigerator-12-cuft/?cat=vaccine-storage</a>
G-1R	Migali Scientific	2°C to 8°C	23	\$3,780	Automatic	Solid door	<a href="http://www.migaliscientific.com/product/23-cuft-glass-door-pharmacy-refrigerator/?cat=vaccine-storage">http://www.migaliscientific.com/product/23-cuft-glass-door-pharmacy-refrigerator/?cat=vaccine-storage</a>
G-1RG	Migali Scientific	2°C to 8°C	23	\$4,035	Automatic	Glass door	<a href="http://www.migaliscientific.com/product/23-cuft-glass-door-pharmacy-refrigerator/?cat=vaccine-storage">http://www.migaliscientific.com/product/23-cuft-glass-door-pharmacy-refrigerator/?cat=vaccine-storage</a>
LR161WWW/0	Nor-Lake Scientific	4°C	16.7	\$2,800	Automatic	Solid door/ self-closing	<a href="http://www.norlake.com/docs/default-source/specification-sheets/general-purpose-laboratory-refrigerator-upright-auto-defrost-specification-sheet-%28139512%29.pdf">www.norlake.com/docs/default-source/specification-sheets/general-purpose-laboratory-refrigerator-upright-auto-defrost-specification-sheet-%28139512%29.pdf</a>
SR-L6111W-PA	Panasonic	1°C to 14°C	5.7	\$2,444	Automatic	Solid door	<a href="http://www.panasonic-healthcare.com/us/medical/under-counter/sr-l6111w">http://www.panasonic-healthcare.com/us/medical/under-counter/sr-l6111w</a>
PS27SD	Powers Scientific Inc.	2°C to 8°C	6.5	\$3,822	Automatic	Glass door	<a href="http://powersscientific.com/pharmacy-refrigerators/">http://powersscientific.com/pharmacy-refrigerators/</a>
PS26SD	Powers Scientific Inc.	2°C to 8°C	10	\$2,980	Automatic	Glass door	<a href="http://powersscientific.com/pharmacy-refrigerators/">http://powersscientific.com/pharmacy-refrigerators/</a>
PS28SSD	Powers Scientific Inc.	2°C to 8°C	18	\$3,454	Automatic	Glass door	<a href="http://powersscientific.com/pharmacy-refrigerators/">http://powersscientific.com/pharmacy-refrigerators/</a>
PS33SD	Powers Scientific Inc.	2°C to 8°C	25	\$4,105	Automatic	Glass door	<a href="http://powersscientific.com/pharmacy-refrigerators/">http://powersscientific.com/pharmacy-refrigerators/</a>
PS52SD	Powers Scientific Inc.	2°C to 8°C	52	\$4,685	Automatic	Glass door	<a href="http://powersscientific.com/pharmacy-refrigerators/">http://powersscientific.com/pharmacy-refrigerators/</a>
DH4-23SD	So-Low	2°C to 8°C	23	\$3,580	Automatic	Solid door	<a href="http://www.so-low.com/lab-pharmacy-refrigerators/Solid Door Laboratory and Pharmacy Refrigerators/DH4-23SD-Solid-Door-Pharmacy-Refrigerator">http://www.so-low.com/lab-pharmacy-refrigerators/Solid Door Laboratory and Pharmacy Refrigerators/DH4-23SD-Solid-Door-Pharmacy-Refrigerator</a>

FRGL404D	Thermo Scientific	1°C to 8°C	4.7	\$4,873	Automatic	Solid door/ Self-closing	<a href="http://www.thermoscientific.com/en/product/forma-high-performance-lab-refrigerators-solid-doors.html">http://www.thermoscientific.com/en/product/forma-high-performance-lab-refrigerators-solid-doors.html</a>
<b>Freezer</b>							
FZR4P-00-00	Follet	-18°C to -37°C	3.9	\$6,375	Automatic	Self-closing	<a href="http://www.follettice.com/products/medical-grade-freezers/performance-plus-undercounter-medical-grade-freezer/performance-plus-undercounter-medical-grade-freezer-features/page.aspx?id=4499">http://www.follettice.com/products/medical-grade-freezers/performance-plus-undercounter-medical-grade-freezer/performance-plus-undercounter-medical-grade-freezer-features/page.aspx?id=4499</a>
FFFC07M1QW	Frigidaire	-10°F to 10°F	7	\$299	Manual	Solid door	<a href="http://www.frigidaire.com/Commercial/Freezers/FFFC07M1QW/">http://www.frigidaire.com/Commercial/Freezers/FFFC07M1QW/</a>
FFFC05M1QW	Frigidaire	-10°F to 10°F	5	\$269	Manual	Solid door	<a href="http://www.frigidaire.com/Commercial/Freezers/FFFC05M1QW/">http://www.frigidaire.com/Commercial/Freezers/FFFC05M1QW/</a>
FFFC09M1RW	Frigidaire	-10°F to 10°F	8.7	\$349	Manual	Solid door	<a href="http://www.frigidaire.com/Commercial/Freezers/FFFC09M1RW/">http://www.frigidaire.com/Commercial/Freezers/FFFC09M1RW/</a>
HLF120	Helmer Scientific	-15°C to -30°C	20	\$4,931	Automatic	Self-closing	<a href="http://www.helmerinc.com/products/hlf120-laboratory-freezer.html">http://www.helmerinc.com/products/hlf120-laboratory-freezer.html</a>
ilF104	Helmer Scientific	-15°C to -30°C	4	\$4,531	Automatic	Self-closing	<a href="http://www.helmerinc.com/ilf104-ada-laboratory-freezer-us-canada.aspx">www.helmerinc.com/ilf104-ada-laboratory-freezer-us-canada.aspx</a>
HLF104	Helmer Scientific	-15°C to -30°C	4	\$3,371	Automatic	Solid door	<a href="http://www.helmerinc.com/products/hlf104-ada-undercounter-laboratory-freezer.html">http://www.helmerinc.com/products/hlf104-ada-undercounter-laboratory-freezer.html</a>
EVOx-U1F	Migali Scientific	-30°	4.3	\$3,188	Automatic	Solid door	<a href="http://www.migaliscientific.com/product/solid-door-under-counter-freezer/?cat=vaccine-storage">http://www.migaliscientific.com/product/solid-door-under-counter-freezer/?cat=vaccine-storage</a>

\*Prices are subject to change and may differ based on manufacturer contracts or quantities ordered.

\*\*The temperature ranges refers to the preset operating temperature of the specified unit.

You store expensive vaccines worth thousands of dollars in the refrigerator or freezer unit you buy. Therefore, you have to be strict when you choose your storage unit. For instance, 10 doses of MMRV and 10 doses of HPV vaccines cost \$2,790 more than the price of some refrigerator units.

Notice: This table provides a list of refrigerators/freezers which can be considered as options when providers plan to purchase a refrigerator and/or freezer for vaccine storage. The information in this document may change over time and does not include all products or manufacturers. Therefore, providers should conduct a detailed search when they plan to purchase a refrigerator/freezer. The North Dakota Department of Health does not recommend or endorse products or manufacturers. This list is a courtesy. Providers may purchase refrigerators and freezers not manufactured by companies on this list. This guide does not differentiate between pharmaceutical and commercial grades.