# Ultra Low Temperature Freezer Energy Conservation

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CARBON NEUTRALITY

## HOW TO OPTIMIZE THE PERFORMANCE AND EFFICIENCY OF YOUR LAB'S ULT FREEZER

**Ultra Low Temperature (ULT) freezers are common in life sciences, biochemistry and biology laboratories. They store samples like DNA, RNA, antigens, bacteria, viruses, and cell liners.**

### Raise the temperature on your ULT freezer to -70° C

It is only recently that -80° ULT freezers have become the industry norm. Today most ULT freezers operate between -80° and -86° C with a typical factory default setting of -85° C.

Many higher education institutions are now encouraging labs to raise the temperature of ULT freezers by 10° C to save energy without compromising the quality of research. Studies have shown that DNA samples are stable with little or no denaturing when stored at temperatures as high as -20° C over 24 months.

- Raising the temperature by 10° C has been shown to save 10-15% of a freezer's electricity costs—possibly up to 30% for some older models.
- Laboratories performing only DNA research can opt for a residential freezer to save up to 80% of their freezer-related energy costs.

### Keep up on preventive maintenance

ULT freezers often contain irreplaceable samples collected over years of research. Simple preventive maintenance can keep the freezer performing reliably and reduce energy use.

- Clean the condenser filter
- Remove frost or ice build-up
- Clean the door gaskets
- Store materials appropriately
- Do not ignore freezer alarms

A trained technician should always perform advanced servicing and maintenance of laboratory equipment.

### DID YOU KNOW?

Opening the freezer door for 60 seconds causes the temperature to rise 8° C when set at -80° C and 3° C when set at -70° C. Make sure you know where your samples are to

**MINIMIZE DOOR OPEN TIME AND SAVE ENERGY!**

The purchase price of a ULT only accounts for about 28% of the total cost of ownership. Most of the life cycle costs stem from operating a ULT (electrical, HVAC, and maintenance costs).

**U-M has 700 registered ULT freezers on the Ann Arbor campus, and an estimated 400 unregistered ULT freezers, so even small reductions in energy use can add up to big savings and contribute to U-M's carbon neutrality efforts.**

### Is it time to replace that old ULT freezer?

Older model ULT freezers can consume up to 30 Kwh/day—as much as some entire homes! When you purchase a new ULT freezer, consider a high-efficiency model that consumes as little as 9 Kwh/day.

For more information, email **sustainable-labs@umich.edu**