



-70°C is the new -80°C

Chilling up your ULT freezer

ULT = ultra-low temperature freezer, a.k.a -80°C



▶ ULTs are energy-intensive^[1,2]



▶ Energy use can be reduced!



▶ Best practices

1. Only store samples with ULT requirements and regularly remove old ones.
2. Know sample locations to reduce opening times.
3. Fill empty space with boxes to stabilize temperature.
4. Defrost ULT regularly and clean filters.
5. Remove ice around gaskets to maintain insulation.

▶ Will my samples be fine?

Tested at -70°C storage:

- DNA^[4]/RNA
- Human/Animal/Plant tissue samples
- Cell lines/strains (Yeast, Bacteria, Mammalian, *C. elegans*...)
- Fungal isolates^[5]
- Blood serum^[6,7]
- Proteins^[8] (Antibodies^[7], Enzymes, Peptides)
- Reagents (Primers, Extraction kits, Drugs...)

Check out this worldwide database listing your colleagues' experiences & contribute your own findings!



▶ Join the Freezer Challenge

You can find companionship in the **International Freezer Challenge** [freezerchallenge.org].

In 2023, over 2'000 labs within academia and industry participated. This saved 20.7 million kWh of electricity and 15'000 tons CO₂eq^[9]!

Your ULT freezer can make a difference too!



References:

- [1] Factsheet 08/2021, Bundesamt fuer Energie; <https://pubdb.bfe.admin.ch/de/publication/download/10559>
 [2] <https://www.energy.gov/femp/purchasing-energy-efficient-laboratory-grade-refrigerators-and-freezers>
 [3] Measured by Corinna Biermeier, Peri Lab, UZH on Innova U101 freezer.
 [4] Schwartz, A. et al. Am J Trop Med Hyg 92, 922-925, doi:10.4269/ajtmh.14-0602 (2015).
 [5] Espinel-Ingroff, A., et al.; J Clin Microbiol 42, 1257-1259, doi:10.1128/jcm.42.3.1257-1259.2004 (2004).
 [6] Jansen, E. H. et al.; Free Radic Res 47, 535-540, doi:10.3109/10715762.2013.797969 (2013).
 [7] Garrett, P. E., et al.; 24th Clinical Virology Symposium, April 27-30, 2008, Daytona Beach, FL (US) (2008).
 [8] Agarwal, S. K. et al.; Clin Chem 57, 891-897, doi:10.1373/clinchem.2010.159350 (2011).
 [9] <https://www.freezerchallenge.org/award-winners-2023.html>

Questions? Get in touch!

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