Caltech
Green Labs Case Study

Proven Energy Results For Chilling-Up Your ULT Freezer

As we prepare for a new school year, Caltech Sustainability has focused on gathering momentum behind an initiative which has the potential for significant impact on the energy consumption and carbon emissions of campus labs. This initiative has been addressed in previous Green Labs Network communications and newsletters, but now we have some labs taking the plunge on moving from a –80 to a –70 ULT set point. Here is what we found for one brand new freezer and another model that was 15 years old. These freezers contained typical biological samples including *E. coli* and plasmids requiring long term storage. No samples were affected by the setpoint change.

Location: Eudora Spalding Room 122		
Purchase Date: 2004		
Setpoint (Celsius)	-80	-70
Actual Temperature	-75	-70 to –68
Daily Energy Consumption (kWh per day)	19.9	18.0
Door Openings (average per day)	0	0
Freezer Utilization (% full)	90%	90%

Location: Braun B115		
Purchase Date: 2019		
Setpoint (Celsius)	-80	-70
Actual Temperature	-80	-70
Daily Energy Consumption (kWh per day)	3.9	2.7
Door Openings (average per day)	0	0
Freezer Utilization (% full)	10%	10%

Dr. Michael Vicic, CCE Lecturer, set up this pilot for an old freezer and a new freezer purchased through Caltech's Freezer Rebate Program. He had the following reflection:

"**With 30% energy savings for a new freezer and with no impact on samples, I'll use a -70 set point for all of my ULT freezers.** Plus, I'll highlight this more sustainable alternative during my lab classes, helping to expand this practice where appropriate. But data for the older freezer was the real eye opener. Clearly, Caltech's Freezer Rebate Program is critical for the Institute to dramatically reduce the carbon footprint of ULT freezers."

Find out more about the Caltech Green Labs Network at sustainability@caltech.edu.

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