



freezer challenge.

2024 Completed Scoresheet Record for:

Christina Jones

Takahashi Lab

Southwestern Hill University

21 December 2023

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Estimated kWh/day saved: 68.1*

*This is based on the seven questions in the Freezer Challenge where energy savings are automatically calculated. They are the three questions in the Preventative Maintenance section, the question in Material Management about the volume of samples discarded, the question about chilling up ULT freezers to -70 C in Temperature Tuning, and the two questions in the section on Retirements and Upgrades.

Lab Information

Your Name: Christina Jones

Your Email Address: christina@mygreenlab.org

PI Name or Lab Name: Takahashi Lab

Your Organization (Institution or Company Name) Southwestern Hill University

Department or Site Name: Chemistry

City/State/Province: Montana

Country: United States of America

Our organization is best characterized as: Academic Institution

Options are: Academic Institution, Biotech/Pharmaceutical Company, Government Organization, and Hospital/Clinical/ Other Organization

Please select the option that best describes the subject area of the lab group(s) represented by this scoresheet: Chemistry

Options are: Biology, biochemistry, genetics, etc. / Chemistry / Ecology, geology, botany, evolutionary biology, conservation, field-based studies / Health sciences, anatomy, clinical research / Pathology, histology / Agriculture, bioengineering, etc. / Other

If you selected "Other" for subject area, this is what you wrote in:

Please select the option the best describes the lab group you are submitting this scoresheet for: A laboratory with 11 - 25 lab members.

Options are:

- A laboratory with fewer than 10 lab members.
- A laboratory with 11 - 25 lab members.
- A laboratory with more than 25 lab members.
- A shared cold storage resource, core facility, or biorepository.
- An entire department, R&D facility, or branch of an organization.
- Other - if you pick this option please provide detail below

How many "lab groups" are represented by this scoresheet? * 1

We ask this question to determine which scoresheets are eligible to be considered for Lab Awards, and so we can estimate the number of labs that are participating in the Freezer Challenge for 2024 . NOTE: If your lab would like to be considered for a Lab Award in the 2024 Freezer Challenge, then only input data for a single lab in this scoresheet. If a scoresheet covers more than one lab, those labs are not eligible for Lab Awards - only Organization Awards. **Definition of a LAB: A team of people that work in the same laboratory space(s) with related research/clinical/diagnostic goals. A lab team can be unified by all working for the same head scientist or supporting the same objective. All people within a "lab" as defined by this scoresheet should know one another and regularly interact.*

Preventative Maintenance

Identify the number of cold storage units in each category that you have done a full defrost on, meaning you have removed all samples, turned the unit off, allowed all ice to melt, and then turned the unit back on again.

Mechanical -96°C or colder freezers that DO NOT use Liquid Nitrogen as primary cooling agent: 0

ULT freezers (between -40°C and -96°C): 1

-30°C and/or -40°C freezers: 2

-20°C freezers: 2

Identify the number of cold storage units in each category from which you have removed dust/debris from the intake, filters, and coils.

Mechanical -96°C or colder freezers that DO NOT use Liquid Nitrogen as primary cooling agent: 3

ULT freezers (between -40°C and -96°C): 0

-30°C and/or -40°C freezers: 0

-20°C freezers: 2

4°C refrigerators: 2

Identify the number of cold storage units in each category where you have done either of the following: a). brushed the frost from inside the freezer door or cabinet/shelves; b). cleared the door gaskets and seals of frost or ice by gently tapping/brushing them (no scraping!). Only count each of your lab's cold storage units ONCE for this question, and only record data here if you actually needed to perform one of these best practices due to frost/ice buildup.

Mechanical -96°C or colder freezers that DO NOT use Liquid Nitrogen as primary cooling agent: 1

ULT freezers (between -40°C and -96°C): 2

-30°C and/or -40°C freezers: 3

-20°C freezers: 4

Materials Management

How many cold storage units in your lab have a functioning remote monitoring system with this feature: a call or text or email notification system that alerts lab members when the unit is out of the desired temperature range, when there is a power failure, or when a door is left open.

Any unit -96°C or colder (mechanical or liquid nitrogen): 3

ULT freezers (between -40°C and -96°C): 4

-30°C and/or -40°C freezers: 1

-20°C freezers: 2

4°C refrigerators: 6

Identify the number of cold storage units for which you have created new sample inventories or updated existing inventories since August 2023.

Mechanical -96°C or colder freezers that DO NOT use Liquid Nitrogen as primary cooling agent: 2

ULT freezers (between -40°C and -96°C): 5

-30°C and/or -40°C freezers: 3

-20°C freezers: 3

4°C refrigerators: 4

Liquid Nitrogen Storage (-96°C or colder): 1

Identify the number of refrigeration units from which you have cleaned out or removed samples/other items since August 2023.

Mechanical -96°C or colder freezers that DO NOT use Liquid Nitrogen as primary cooling agent: 2

ULT freezers (between -40°C and -96°C): 1

-30°C and/or -40°C freezers: 1

-20°C freezers: 1

4°C refrigerators: 1

Liquid Nitrogen Storage (-96°C or colder): 2

Approximately how many samples have you discarded in total (since August 1, 2023), across all the cold storage units you cleaned out samples from? Provide your best estimate; select a single answer.

Choice Selected: Enough to clear 2 - 3 shelves worth of space (175 - 300 standard freezer boxes)

Options to choose from:

- *Less than a single shelf worth of space (approximately 1 to 150 standard freezer boxes that are 5 x 5 x 2 inches)*
- *About a single shelf worth of space (approximately 150 standard freezer boxes that are 5 x 5 x 2 inches)*
- *Enough to clear 2 - 3 shelves worth of space (175 - 300 standard freezer boxes)*
- *Enough to clear 4 shelves UP TO an entire refrigerator or freezer (approximately 301-600 standard freezer boxes)*
- *Enough to clear 2 entire refrigerators or freezers.*
- *Enough to clear 3 entire refrigerators or freezers.*
- *Enough to clear 4 or more entire refrigerators or freezers.*
- *Not Applicable*

If you know the number of samples you discarded, please describe here. This question will not be scored...the previous question will. But if you have this information and wish to share it with us or your organization's site coordinator, please include it here.

Answer Given: 2,000

Estimate the number of full, standard freezer boxes that your lab has replaced with high density format freezer boxes.

Choice Selected: 31 - 50 full standard freezer boxes have been converted to high density format storage

Options to choose from:

- 1 - 10 full standard freezer boxes have been converted to high density format storage
- 11 - 30 full standard freezer boxes have been converted to high density format storage
- 31 - 50 full standard freezer boxes have been converted to high density format storage
- 51 - 100 full standard freezer boxes have been converted to high density format storage
- More than 100 full standard freezer boxes have been converted to high density format storage

Consider the volume of all the freezers (all varieties) in your lab - estimate the percentage of total freezer volume where your lab has racks in place for holding sample boxes/bags. A rack is defined as a vertical-space storage mechanism on a shelf of an upright freezer, or sitting at the base of a chest freezer.

Choice Selected: 75% to 95% of freezer(s) volume has racks or other on-shelf storage mechanism

Options to choose from:

- Less than 25% of freezer(s) volume has racks or other on-shelf storage mechanism
- 25% to 50% of freezer(s) volume has racks or other on-shelf storage mechanism
- 50% to 75% of freezer(s) volume has racks or other on-shelf storage mechanism
- 75% to 95% of freezer(s) volume has racks or other on-shelf storage mechanism
- 100% of freezer(s) volume has racks or other on-shelf storage mechanism
- Not Applicable

Temperature Tuning

Identify the number of ULT freezers whose set points have been adjusted from -80°C to -70°C or warmer. Please indicate the number of freezers whose set points were adjusted to -70°C prior to the 2024 Freezer Challenge (before August 2023) and during this Freezer Challenge (after August 2023).

Number of ULT freezers set at -70°C or above prior to 1 August 2023: 2

Number of ULT freezers set at -70°C or warmer during this Freezer Challenge (new actions since August 2023): 3

Identify the total quantity of samples or other items that you moved from a colder storage temperature to a warmer storage temperature, across all the cold storage units you did this for. Some examples of how you could do this are, a) moving samples out of a colder unit into a slightly warmer one such as -70 C to -20 C, or b) changing the set point of a cold storage unit to a warmer temperature such as warming a -40 C unit to -20 C. Do not count warming an ultra-low to -70 C for this question though, as this was captured in question 1 on this page.

Choice Selected: Moved 1 - 500 samples or items, OR up to 5 standard freezer boxes

Options to choose from:

- *Moved 1 - 500 samples or items, OR up to 5 standard freezer boxes*
- *Moved 600 - 2000 samples or items, OR 6 to 20 standard freezer boxes*
- *Moved 2100 - 5000 samples or items, OR 21 to 50 standard freezer boxes*
- *Moved 5,100 - 20,000 samples or items, OR 51 to 200 standard freezer boxes*
- *Moved more than 20,000 samples or items, OR more than 200 standard freezer boxes to a warmer temperature*
- *Not Applicable*

Retirements and Upgrades

RETIREMENT WITHOUT REPLACEMENT - Identify the number of cold storage units that you retired as a result of them being empty or no longer needed. (In other words, retirement without replacement. Your answer to this question SHOULD NOT be identical to the answers you give for the next question on energy efficient upgrades).

Mechanical -96°C or colder freezers that DO NOT use Liquid Nitrogen as primary cooling agent: 0

ULT freezers (between -40°C and -96°C): 0

-30°C and/or -40°C freezers: 0

-20°C freezers: 2

4°C refrigerators: 0

RETIREMENT WITH ENERGY EFFICIENT REPLACEMENT - Identify the number of cold storage units that you upgraded to a more energy-efficient model.

Mechanical -96°C or colder freezers that DO NOT use Liquid Nitrogen as primary cooling agent: 0

ULT freezers (between -40°C and -96°C): 1

-30°C and/or -40°C freezers: 0

-20°C freezers: 0

4°C refrigerators: 0

Sharing and Room Temperature Sample Storage

Identify the number of research groups that share cold storage space with your lab in each of the categories below.

UULT freezers (anything colder than -96°C) - either mechanical or LN2: 0

ULT freezers (between -40°C and -96°C): 1

-30°C and/or -40°C freezers: 0

-20°C freezers: 0

4°C refrigerators: 3

Identify the number of refrigeration units that contain barcoded inventory.

UULT freezers (anything colder than -96°C): 0

ULT freezers (between -40°C and -96°C): 0

-30°C and/or -40°C freezers: 0

-20°C freezers: 2

4°C refrigerators: 0

Please indicate the number of times you have tried room temperature sample storage (RTSS) for well plates and/or sets of 25 tubes.

Well Plate: 0

Set of 25 Tubes: 0

Please indicate the number of reagents or kits THAT USED TO BE STORED AT 4 C OR COLDER that are now stored at room temperature.

Reagents: 0

Kits: 0

If you have adopted room temperature sample storage, please select the total number of well plates, sets of 25 tubes or vials, round bottom flasks, and/or 2" boxes that are currently being stored at room temperature that had previously been stored in refrigerators or freezers. Select a single answer.

Option Selected: Not Applicable

Options to choose from:

- 1 - 10 items (well plates, sets of 25 tubes, flasks, or 2" tall boxes)
- 11 - 30 items
- 31 - 50 items
- 51-100 items
- More than 100 items
- Not Applicable
-

Community Engagement

Part of sustainability is being willing to share what actions you are taking with others, such as friends, family, neighbors, or peers. This is called Social Diffusion, and highly effective in the realm of sustainability. Earn up to three points for this question for successfully motivating one, two, or three other lab groups to join the 2024 Freezer Challenge. These labs can be from your institution, but don't have to be. List the lab name, institution, and your lab contact in the text box below for up to three labs you've discussed the 2024 competition with. If they register before July 1, 2024, you will earn a point for each lab for this action.

Lab 1: Smith Lab, Southwestern Hill University, John Smith

Lab 2: Tree Lab, Southwestern Hill University, Tammy Schwartz

Lab 3: Bernstein Lab, Southwestern Hill University, Kathy Jones

Additional Information

Please describe any additional actions your lab has taken to improve sample management or reduce the environmental impact of cold storage. Do not restate other answers you provided in the scoresheet. Only include different actions that the scoresheet did not cover.

Nothing else to add here!

You must answer this question if you want to be considered to win an award for this Freezer Challenge. Indicate the total number of cold storage units in your lab for each category.

Mechanical -96°C or colder freezers that DO NOT use Liquid Nitrogen as primary cooling agent: 2

ULT freezers (between -40°C and -96°C): 4

-30°C and/or -40°C freezers: 5

-20°C freezers: 6

4°C refrigerators: 4

Liquid Nitrogen Storage (-96°C or colder): 1

Total number of cold storage units in your lab: 22

Total raw points earned for scoresheet (not normalized) excluding the Community Engagement section:

Estimated kWh per day saved for this scoresheet: 68.1

Certification: By submitting this scoresheet for the 2024 Freezer Challenge, I attest to the information captured in this scoresheet to be both accurate and truthful to the actions implemented within the laboratory / laboratories which undertook the 2024 Freezer Challenge.