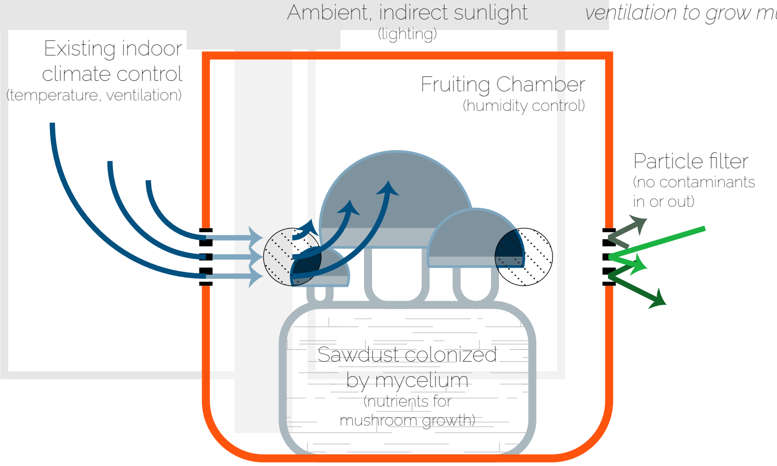
A Fungus Among Us:
Sustainable Food Security via Guerilla Mushroom Farming

As rural becomes urban and the environment becomes more unpredictable, we must grow more food indoors. Mushrooms upcyle waste into nutrient dense food and thrive in the same environments we like: not too hot, not too cold, not too dry, a little sunlight and fresh air. Rather than warehouse farms half-way across the globe, why not co-locate mushroom farms in the same climate controlled spaces we live, work and play? We're already spending the energy, why not grow a few tasty fungi?

Guerilla mushroom farming: *Small, modified plastic storage bins maintain the ideal conditions for mushroom cultivation in our homes and workplaces. They don't require additional power or a lot of space, and take advantage of existing lighting, heating, cooling and ventilation to grow mushrooms.*



36 lb mushrooms per year
per fruiting chamber

Equivalent GHG emissions avoided:

One fruiting chamber reduces the energy to grow and deliver mushrooms from large commercial farms in Asia.

1.36 new urban trees planted per year
per fruiting chamber

Farm utilities:
Heating: 0.34 trees
Cooling: 0.16 trees
Ventilation: 0.15 trees
Lighting: 0.15 trees

Refrigerated shipping:
Asia-to-CA (ocean freight): 0.06 trees
CA-to-MA (truck): 0.35 trees

Supply chain losses:
0.23 trees

Meeting the mushroom demand of an entire city (Cambridge, MA) with guerilla mushroom farming:
117,822 people @ 3 lb mushrooms/person/year = 1 fruiting chamber for every 12 people

353,466 lb of food each year

13,385 city trees planted each year

Annual mushroom yields were estimated based on the USDA 2017 Census of Agriculture (https://www.nass.usda.gov/AgCensus/index.php) for oyster and other specialty mushrooms.
Conversion of CO_2 equivalents to urban trees planted was based on the US EPA Greenhouse Gas Equivalencies Calculator (https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator)
Calculation of commercial mushroom utility demand was derived from the mean average for a continuously operating commercial buidling as reported in the EIA Commercial Building Energy Consumption Survey (CBECS) (https://www.eia.gov/consumption/)
Calculation of shipping related energy costs was estimated based on conversions provided by: Weber, C.L., et al "Food-Miles and the Relative Climate Impacts of Food Choices in the United States", *Environ. Sci. Technol.* 2008, 42(10), 3508-3513.
An additional energy cost for refrigerated shipping and supply chain loses was estimated based on: http://www.foodcoldchain.org/wp-content/uploads/2016/07/Reducing-GHG-Emissions-with-the-Food-Cold-Chain-NOV2015.pdf
Population estimates for Cambridge, MA was taken from US Census Data (https://data.census.gov/cedsci/) and average US mushroom demand was estimated based on https://www.ers.usda.gov/webdocs/outlooks/39489/30836_vgs29501_002.pdf?v=5962

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