Sterile laboratory plastic recycling ecosystem

CSTE Stories FROM THE Field

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CATEGORY: **Epidemiology and Laboratory Capacity (ELC)**

The Missouri Department of Health and Senior Services (DHSS) State Public Health Laboratory (SPHL) purchased equipment to break down and recapture plastic testing supplies. The broken-down material is now used with a 3D printer to make new testing materials in-house rather than purchasing them through traditional channels.

The "What"

As with many public health facilities during the COVID-19 pandemic, the SPHL encountered severe difficulties acquiring essential plastic testing supplies. These shortages and logistical disruptions spurred the SPHL to explore alternative means of acquisition for some of the supplies that are so essential to the testing we conduct.

While seeking a solution to the plastic supply shortage, the SPHL stumbled across another directly related issue. As a byproduct of annual testing, roughly 1500 lbs of sterile polypropylene is required to be discarded. This happens for several reasons, but the principal problem was the absence of a robust recycling workflow for sterile #5 plastic.

Using Epidemiology and Laboratory Capacity for the Prevention and Control of Emerging Infectious Diseases (ELC) funding, the SPHL acquired three (3) pieces of recycling equipment: a shredder, granulator, and extruder. These pieces of equipment enabled the SPHL to break down and process the recaptured materials into a 2.85mm polypropylene filament which is directly compatible with the 3D printers already in place at the laboratory.

This has resulted in providing the SPHL with the ability to convert annual plastic waste (what was functionally trash) into potentially 1500 lbs of 3D printable filaments. If these were purchased through traditional channels, costs would be more than $75,000.

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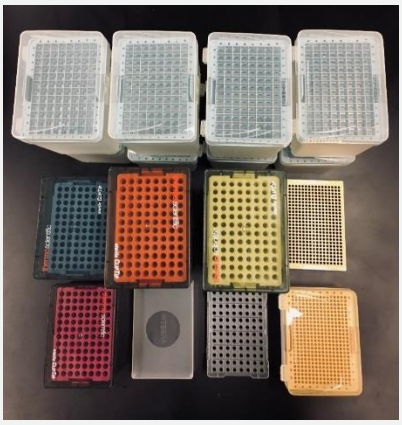
The "So What"

The immediate advantage of this initiative was a notable reduction in downstream plastic waste (over 75% recapture rate). In addition, the SPHL implemented in-house fabrication of over 300 different laboratory supplies using reclaimed materials. This has reduced fiscal demands, saving more than $5,000 within the past fiscal year.



The "Now What"

Moving forward, Missouri SPHL intends to refine the process and broaden the portfolio of plastic consumables that are capable of being produced using recaptured/reclaimed materials. All of these processes take place in-house and thereby increase the SPHL's self-sufficiency and redundancy in the face of future public health crises.

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