

SmartNotes

Going green: Where are we on the sustainable microbiology lab journey?

While sustainability has been receiving top billing across sectors in recent years, clinical laboratories have, to date, been slower to develop and adopt more environmentally friendly practices.

“Going green” may appear to be an uphill struggle for a sector, which, by its very nature, uses huge quantities of water, energy, and single-use plastics. However, even small changes can make a big difference in the battle to reduce clinical microbiology’s carbon footprint.

In this SmartNote, we examine the scale of the problem and give some examples of what we are doing to help move the dial.

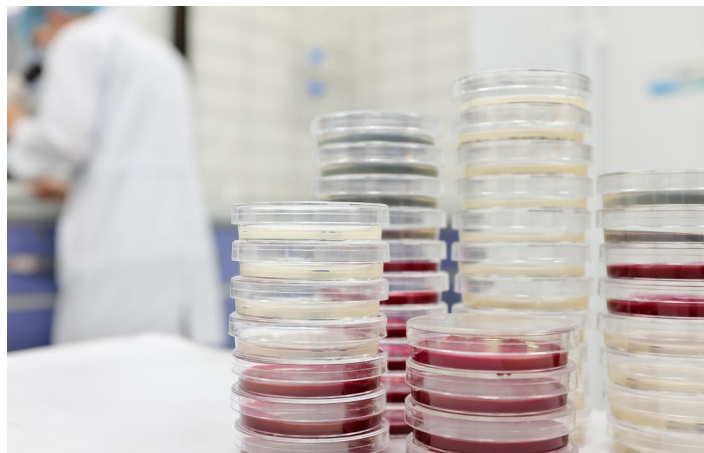
Inherent waste

Clinical laboratories use ten [times more energy and more than four times more water than offices, while generating billions of pounds of waste every year.](#)

It is not hard to see how. Just one -80°C freezer can consume as [much energy as a whole house over the course of a day](#) and a fume hood burns energy equivalent to 1,733 gallons of petrol every year.

At the same time the high throughput of samples, the need for the highest levels of sterility, and the barriers to recycling hazardous wastes drives the use of single-use plastics on an industrial scale.

Thousands of plastic petri dishes, bottles and vials, pipettes and pipette tips pass through a typical facility - from supplier to landfill - every week. According to one study, biomedical and agricultural laboratories are responsible for a [staggering 5.5million metric tons](#) of plastic waste each year. That equates to the weight of 67 cruise liners, or 83% of all the plastic recycled worldwide in 2012.



Green revolution

In recent years, the Green Lab movement has been gaining momentum and in 2018, the Lab Innovations trade show focused on sustainability, demonstrating the appetite for change.

Worldwide, laboratories are focusing their efforts on finding ways to become more sustainable, from switching to more energy-efficient equipment to re-using plastic bottles when possible.

According to [My Green Lab](#), which provides a sustainability certification programme, there are lots of simple things facilities can do to boost their sustainability credentials:

- Use glass pipettes instead of single-use plastic pipettes
- Use glass flasks instead of plastic falcons
- Use bagged falcons instead of polystyrene racked falcons
- Re-use plastic bottles where possible
- Seek out more environmentally friendly products, e.g. no cold chain, less packaging, recyclable or reusable consumables, etc.
- To reduce the impact of cold storage, raise temperatures where possible, choose more energy-efficient equipment when replacing, and maximize freezer space by better inventory management
- Implement energy management strategies, such as turning off equipment when it's not in use
- Take a green chemistry approach by questioning protocols and always using the safest and most sustainable products

Delivering solutions

At Thermo Fisher Scientific, we have been working with our microbiology partners to achieve our shared sustainability goals. Reducing waste, we have found, is consistently a top priority.

Laboratory Mönchengladbach Medical Care Center, in Mönchengladbach, Germany, for example, told us that the steady stream of incoming media and laboratory supplies needed to perform its high volume of clinical-chemical and haematology tests had become a “major issue”.



Thermo Fisher Scientific's Tailored Delivery Solution (TDS), however, takes media deliveries out of cardboard boxes. Instead, we package them on scannable crates or trolleys that are delivered directly to our customers' storerooms.

“We do pretty much all microbiological examinations that can be offered, including an S3 laboratory. Currently we have about 2,500 to 3,000 samples per day in microbiology.

Individually wrapped and delivered carton boxes of 100x10 media plates, for instance, would last maybe half a day – so it was quite obvious that we had a huge waste issue.”

Cornelia Quandt, the laboratory's Quality Manager

“Each cage has the barcodes from all batches within it taped to the outside. We can scan the stock directly into our logistics system and check the incoming goods very easily. I can see from one look how much I have of what kind of products.

Not only has TDS slashed the laboratory's cardboard waste, but it also saved around 30 man-hours per week².

To unpack the quantities that are currently coming in with the cages, we would need to have at least two people – incoming goods checking, unpacking, storing in fridges, then distribution to the floor.

TDS is easier and faster. Not only with the unpacking, but also booking into our merchandise management system, as well as processing the waste.”

Cornelia Quandt



Reducing the sector's reliance on single-use plastic is another challenge, and we are constantly working on innovative ways to reduce waste without compromising on quality or safety.

The Thermo Scientific™ Oxoid™ Columbia CNA Agar/*Brilliance*™ GBS Agar Biplate is but one such example.

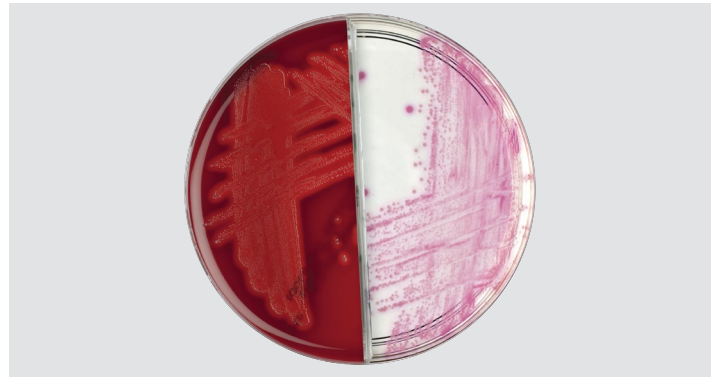
Optimized to support the growth of Group B Streptococci (GBS), *Brilliance* GBS Agar is highly selective with superior, reliable performance. By combining it with Columbia CNA Agar, laboratories can also identify Gram-positive organisms, achieving a more complete clinical picture from a single sample on a single plate.

The South West London Pathology (SWLP) partnership's state-of-the-art microbiology laboratory switched to the biplate as part of a wider programme of automation designed to drive efficiencies.

“We went with the biplate because it's a more selective media for Group Bs and other Gram-positive organisms. It's definitely sensitive and beneficial to the scientists reading the digital images.

In addition, instead of having two plates, a CNA plate and a Group B strep plate, we now have one. We are producing half of the waste, and only need half the storage.”

Shelley Bray, automation lead at SWLP



Our automation friendly SmartPlate design for Thermo Scientific™ Remel™ and Oxoid™ prepared culture media, has a lightweight design that lowers the overall amount of plastic required. In fact, they contain between nine and 20% less plastic than previous plates, and around 8% less than the leading competitor.

Future goals

When it comes to sustainability, we cannot afford to rest on our laurels. And here at Thermo Fisher Scientific we do not intend to.

Under our corporate sustainability targets, we pledge to reduce greenhouse gases by 30% on 2018 levels by 2030.

We will also continue to reduce how much water we use and how much waste we generate. In 2019, we diverted more than 4,300 tonnes from landfill, and, as of June 2021, 26 of our sites are working towards zero waste accreditation¹.

Because we believe that, as a sector, we must continue to work together to reduce our impact on the environment while continuing to guide the right first-time diagnosis decisions that enable outstanding patient care.

References

1. Corporate Social Responsibility 2019 Executive Summary. http://static.fishersci.eu/content/dam/fishersci/en_EU/environment/14654_Sustainability/2019_Corporate_Social_Responsibility_Report_V2.pdf
2. Based on customer's internal assessment.

Find out more at thermofisher.com/microbiology