

## **Online Spring Symposium April 4<sup>th</sup> 2023: Green Toxicology: How big is our footprint?**

### **Welcome & Introduction**

The chair welcomes everyone to this meeting of the risk assessment section of the NVT. Before giving the floor to the speakers, a few questions on the expectations of this meeting and the experience with sustainability in the lab are answered by the audience. There is a general interest in options to improve our footprint, what is going on in this field, what are the quick wins. Most attendants have limited personal experience in this field, but are curious to hear what is going on.

### **LEAF – Addressing the Sustainability of Science by Martin Farley (UCL)**

LEAF (Laboratory Efficiency Assessment Framework) is a standard to improve sustainability of Laboratories. Many institutions and companies have net-zero targets, but what does that mean for our scientific laboratories? Laboratory facilities costs lots of energy, think of ventilation, heating, cooling, fume hoods, freezers, ovens, and autoclaves. It is also a sector that is growing. Companies might reach net zero for scope 1 (direct emissions) or scope 2 (indirect emissions), but in most cases not for scope 3 (e.g. purchased goods). The largest impact on sustainability is in fact related to what we buy, which makes it very complex as new products are often more energy efficient in use, but come out worse in a life-cycle analysis. Also mind that producers try to push us to buy more. On the positive side, there is are also producers that are running net zero on energy use. However, many companies have not done a real life-cycle analysis, which is the golden standard for measuring impact. Always aim for absolute figures on carbon emissions. In general washing and reusing saves carbon over using single-use materials. What is also needed is more scientific research how to achieve net-zero science, as well as standards for sustainable practices, of which LEAF is an example, which includes a calculator of carbon and money saved. LEAF has been online for 2 years and has achieved a large user base in that time. Further information and materials can be found at <https://www.ucl.ac.uk/sustainable/leaf-laboratory-efficiency-assessment-framework>

### **Sustainability at the RIVM by Eline Politiek (RIVM)**

Eline is the sustainability coordinator at RIVM. RIVM has challenges with regard to sustainability due to the spread over multiple, mostly older, buildings. This makes RIVM a relatively high contributor to governmental CO<sub>2</sub> use. The goal is to reach the government goal of climate neutral business operation in 2030. To this end the RIVM has been using the CO<sub>2</sub> prestatieladder with certifications at several levels, since 2022. The first action was to purchase green electricity. Next steps are ventilation, better isolation of buildings, more led-lights. But the biggest impact is in purchase; this will be addressed with MVOI (Maatschappelijk Verantwoord Opdrachtgeven en Inkopen), but it is still a challenge to incorporate sustainability in purchase orders.

For personal transportation, the bicycle is encouraged financially. Waste is an issue as the waste company does not accept the separated streams. Success was achieved with the harmonization of lab supplies between the seven departments. The first project was on the use of pipettes, now everyone uses the same type of pipette tips, with more efficient ordering and discussions with suppliers about the packaging. The second project was on gloves, a reduction from more than 20 type and brands to only 2 types was achieved.

Problem is that the sustainability is important but not urgent, and quality and safety come first. A complication lies in the plans of the RIVM to move to the new building in 2025, which should have taken place in 2018. And the bureaucracy is very time consuming. For the future the prestatieladder helps a lot as it measures progress and raises awareness, as well as being part of LEAF. Lastly, working together between institutes gives us more strength.

### **Coffee break**

## **Balancing best practices, regulatory compliance, and sustainability in a toxicology lab environment by Liesbeth Segers (Charles River Laboratories)**

Liesbeth is Environmental Health, Safety and Sustainability manager at Charles River, an US Contract Research Organization. Sustainability has been on the agenda for the last 25 years. The facility at Den Bosch offers safety assessment for new and existing substances like pharmaceuticals and chemicals. Also there are facilities in Schaijk, Leiden and Groningen. They work according to GLP, have animal welfare accreditation and the Ecovadis label, which is a very broad sustainability certification. As they test new substances, the safety characteristics of these substances are often not known yet. The first priority is and remains safety, followed by quality, efficiency and sustainability. There are two incentives: specific budget for sustainability measures and cost saving due to energy reduction. In addition, sustainability is made a goal in every employee's and teams performance.

Some examples of actual measures to improve the sustainability were given: 1. Change the anesthetic gas from isoflurane to CO<sub>2</sub> to have less emission and replacement of F and Cl but to consider challenges like animal welfare, safety (no smell) and quality. 2. Recycling or replace formalin for the fixation tissues, to increase safety (CMR decrease) and to reduce emission and less energy on waste destruction, but to consider e.g. more handlings in case of recycling and quality issues. 3. Decrease over-ventilation by using smaller fume hoods and also less chemicals so you need less ventilation. Challenges are the requirements for animal housing and worker safety, high investments for air handling, but the win is to have less energy use due decrease in heating and cooling. Goal is to get the building from the 70ties to net zero. In the US and Spain they have their own windmill parks. 4. Packaging is also a challenge. Some jerry-cans can be sent back to the suppliers, but they cannot be reused as long as they are not from the same plastics. An important factor is to involve all relevant teams and colleagues as well as setting up project teams for changes, to share knowledge, talk with suppliers and contractors and focus on chemicals, materials and energy.

### **Discussion & wrap-up**

In general the feedback is very positive. After each presentation the audience and speakers use the opportunity for interaction and discussion. The scope of sustainability appears to be wide and there is a need to balance multiple aspects (e.g. sustainability versus safety). There are many useful opportunities to use in labs and buildings and it was stimulating to discuss them with each other.

In the end we can best focus on the part we can do ourselves. Our own slice of the apple pie as it were.

Hopefully this helps to start more actions and gets people to take action. Even little steps can help a lot and make a difference.