Figure1 The collection bins with the mouse cages to be recycled

From Mouse Cage to Eco-Friendly Sweater

“It was never a lack of will, it was just difficult”

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"Your sweater won't end up smelling like mice," Hafid Kharmich assures with a laugh, as he talks about the unusual destination of new clothing made from recycled laboratory animal cages. As Facility Coordinator of the Netherlands Cancer Institute (NKI), he has every reason to smile. The institute has achieved a European first: it is the first to successfully fully recycle all its laboratory animal cages. An achievement that not only benefits the environment but also demonstrates that perseverance and teamwork can lead to groundbreaking results.

Since Autumn 2024, the NKI's Animal Facility Recycles Plastic Cages in a Sustainable Manner. The facility expects to recycle approximately 37,500 kilograms of waste per year, equivalent to one million 1.5-liter soda bottles. An outdoor clothing company will utilize the material as a raw resource. This achievement, which took 14 years to materialize from its initial conception, is proof of the power of perseverance and teamwork.

Hafid Kharmich, who has been with the NKI for 21 years, was involved in the project from its start, alongside the former head of the animal facility. He witnessed the project's evolution from its small beginnings to its ultimate success. Kharmich's drive for sustainability, combined with the dedication of a few key individuals, played a crucial role in the project's success.

"The idea dates back to 2010, when we were still in the old building," Kharmich recalls. The new animal facility has now been in operation for over a decade.

Complex Challenges

As with many groundbreaking initiatives, the path to success was paved with obstacles. "It was extremely difficult to get all the puzzle pieces in place," says Loes van der Velden, Sustainability Coordinator at the NKI. Several recycling partners dropped out due to the complex challenges. The material from the animal facility is not ordinary waste; some of it is contaminated, potentially containing pathogens.

The turning point came with the arrival of Els Hermans as the new head of the animal facility. Together with Van der Velden and Kharmich, she formed a persistent team that refused to give up until a solution was found. This solution ultimately came in the form of a partnership with Milieu Service Nederland (MSN, Diemen). Van der Velden emphasizes that earlier partners' failures were not due to a lack of will, but rather the inherent difficulties.

One of the most significant obstacles proved to be surprisingly practical in nature. "It may seem trivial," Van der Velden explains, "but our institute's rear area was inaccessible to the recycling company's trucks, and the front area, near the goods reception, had no space for another container." However, MSN was willing to tackle this challenge. The solution came in the form of using smaller roll containers instead of a single large one.

The situation was further complicated by the presence of hospital waste and waste that had been into contact with genetically modified organisms, both of which require special treatment. Consequently, the biological safety officer closely monitored the entire process but found no significant risks in the new approach.

Marieke van de Ven, who has been the facility's head since 2024, explains: "One of the animal departments works with viruses and genetically modified organisms. All this material must go through the autoclave before it's disposed of. Autoclaving turns the waste into a large clump, making it difficult to separate."

Training

"We now have two main streams: dirty polyethylene terephthalate (PET), which includes cages with bedding material, and clean PET, such as plastic tunnels, houses, and bottles," Kharmich explains. Staff members have received intensive training in correctly separating these materials. "We've already taught the staff on the animal departments to separate over the past few years, even though we were still compacting everything together at the back end," Kharmich admits.

This Early Training Proved Crucial to the Project's Success. Marieke van de Ven is impressed by how all employees have adapted to the changes: "From disposing of animal feed in the sterile flow cabinet to separating the different PET streams, these are indeed adjusted actions."

The project has now spread to other areas of the facility. "In the canteen, we've also received new waste bins for PMD (Plastic, Metal, and Drink Cartons), food waste, and residual waste," Kharmich says proudly. "Our ambitions go even further: For the future, we also want to recycle the tissues and paper hand towels that currently go into residual waste."

Figure 2. The waste bins for the various waste streams. (PMD = plastic packaging, metal packaging (cans) and drink cartons)

Grandchildren

This change in mentality is perhaps the biggest gain. "Thanks to this project, we separate six percent of the total waste stream of the entire institute. So it really makes a significant difference and that's inspiring," says Van der Velden.

For other institutes that want to follow their example, Kharmich has clear advice: "Perseverence, perseverence, perseverence. You'll always face setbacks, but you need to get people moving in the same direction." He uses an argument that often works convincingly: "When people ask: why this and why that? I always say: you're doing this for your children and grandchildren."

Animal Research Featured in NRC Podcast (Dutch)
The role of laboratory animals in scientific research is the central focus in a recent episode of the NRC podcast 'Onbehaarde Apen'. For this episode, which was released on January 22, 2025, entitled: 'Why science cannot do without laboratory animals for a long time to come', the creators visited the Netherlands Cancer Institute and the Netherlands Institute for Neuroscience among others.
The podcast follows an extensive special report about animal research in NRC's science section from December 7, 2024, and was released shortly before the expected political debate on this topic on January 29. The episode can be listened to via all common podcast platforms.

Van der Velden adds some practical advice: "Find a waste collector who considers your problem as their problem." Van de Ven looks with pride at what has been achieved: "It's so wonderful to see that this has really gotten off the ground now. I want to emphasize that this wouldn't have happened without Els's persistence. Of course, the institute will continue to monitor progress because there will certainly be startup problems."

Good examples are being followed: the AMC is alreadytalking to a recycler, and if it's up to the NKI, more institutes will follow. The project has had a lasting impact on everyone involved. "You keep thinking about it," says Kharmich. "You pay attention to it, look at waste bins with different eyes. And not just at work, but also in private life."

And for those who are still concerned about those sweaters made from recycled material, Kharmich remains level-headed: "People are already used to recycling. It's nothing new, only the story behind it is special."

Quote Russel & Burch

"In relative replacement, animals are still required, though in actual experiment they are exposed, probably or certainly, to no distress at all. In absolute replacement, animals are not required at all at any stage. It follows from what has been said earlier that absolute replacement may be regarded as the absolute ideal. But where relative replacement is combined with great reduction -as in the use of tissue culture in virology- it may be very welcome indeed, and such developments are among the most important in the whole progress of humane technique."

Russell & Burch, 1959
The Principles of Humane Experimental Technique