

ENVETEC GENERATIONS:

HOW DAIRYGOLD TURNED PLASTIC LAB WASTE INTO A CIRCULAR RESOURCE

Treating microbiological waste on site to cut carbon, end waste to landfill and recycle high value polymers at Ireland's largest agricultural co-operative.





OVERVIEW

Dairygold is Ireland's largest agricultural co-operative, processing an annual volume of approximately 1.5 billion litres of milk on behalf of its farmer members in the Golden Vale.

"Golden Valleys, Growing Naturally" is embedded in the company logo, and growing naturally with minimal impact on the environment is a stated priority of the business. Since the abolition of milk quotas there has been a sustained increase in milk production across Ireland, and balancing that growth against sustainability commitments such as zero waste to landfill has been a high priority challenge.

At the centre of quality assurance sits Dairygold's Central QC Microbiology Laboratory, which specialises in dairy product testing and operates as a critical component of the wider food industry. Its primary focus is assessing the quality and safety of dairy products through rigorous microbiological analysis, testing samples drawn from the co-op's four main processing facilities.

1.5bn

Litres of milk processed annually

4

Processing facilities served by the Central QC Lab

#1

Largest agricultural co-operative in Ireland

PS + PP

High-value polymers now recovered, not landfilled

THE FOUR SITES TESTED

Clonmel Road · Castlefarm · Mallow · Mogeely

Rising milk volumes, together with customer and regulatory requirements, drove a significant increase in finished product testing and with it a significant volume of single use plastic waste each year.

THE CHALLENGE

Plastic is unavoidable in dairy microbiology but incineration and landfill doesn't have to be

Plastic products are used extensively in Dairygold's microbiology laboratories for their versatility, convenience and compatibility with laboratory processes. These items play a crucial role in maintaining sterility, facilitating experimentation and ensuring accurate analysis within the dairy microbiology setting, they cannot simply be designed out.

The result was a growing stream of contaminated single-use plastic that required special handling, off site transport and disposal. Addressing it was essential to Dairygold's sustainability goals, and to the co-op's ambition to integrate laboratory operations into a high performing, environmentally sustainable supply chain.

SUSTAINABILITY GOALS

Integrate laboratory operations into Dairygold's vision of a high-performing, environmentally sustainable supply chain, securing the future for Dairygold and its members.

Reduce agricultural industry emissions by at least 25% by 2030, in line with the national greenhouse gas reduction target and the Food Vision Dairy Group's recommendations.

Achieve zero waste to landfill across operations, including laboratory services.

DAIRYGOLD NEEDED A SOLUTION THAT COULD

- 1 Render microbiological waste safe **on site**, removing special handling and transport
- 2 Enable **recycling** of single-use plastics previously destined for landfill
- 3 Cut the **carbon footprint** of waste treatment versus conventional methods
- 4 Integrate into existing laboratory **workflows** without adding manual steps



— THE SOLUTION

Envetec's GENERATIONS[®] technology

GENERATIONS uses a unique combination of simultaneous chemical disinfection and shredding to render biohazardous laboratory waste safe. The biodegradable treatment chemical treats the material while it is reduced to flake, enabling resource recovery from waste that was previously destined for disposal.

This non-thermal, low energy approach greatly reduces reliance on autoclaving. By treating the material on site, the waste no longer requires complex handling or transportation, treated material can be collected and managed by a recycling company as a feedstock rather than a hazard.



01

On-site treatment of biohazardous waste

All microbiological waste from the Central QC Lab is treated where it is generated, removing special handling and off-site transport of hazardous material.

02

Circularity for lab plastics

Petri dishes (polystyrene) and pipettes (polypropylene) carry high recycling value. Post treatment, both re-enter the polymer supply chain instead of landfill.

03

Validated efficacy

The system is validated in alignment with international STAATT guidelines, and Dairygold performs its own verification testing to confirm ongoing efficacy.

RECYCLING PARTNER

Envirogreen

Dairygold partnered with the Irish recycling company Envirogreen to fully enable recycling of the high-value polymer material post-treatment, separation, compounding and resale as recycled pellets.



THE GENERATIONS CYCLE

There are five steps involved in converting microbiological material from the Central QC Lab to recycled plastic feedstock, from treatment on site in Mitchelstown to pellets sold into manufacturing.



STEP 1 Treat on site

GENERATIONS shreds and chemically disinfects the laboratory's microbiological material in a single process, rendering it safe within the lab.



STEP 2 Capture flake

Flake material of 5–15mm is produced and captured in bins, ready for collection by Envirogreen as an ordinary recyclable stream.



STEP 3 Separate polymers

Common separation technologies such as float-sink baths, used by Envirogreen, sort the flake by polymer category.



STEP 4 Extrude and compound

Separated polymers go through an extrusion process that compounds the material into recycled plastic pellets.



STEP 5 Back into manufacturing

Pellets are sold as recycled plastic to manufacturing operations and used across a range of applications. Closing the loop on material that was once landfilled.

BEFORE AND AFTER

TRADITIONAL WASTE PROCESS

Lab material	Autoclaved	Segregated
Off-site transport	Landfill / incineration	

GENERATIONS PROCESS

Lab material	Treated on site
Collected by Envirogreen	Recycled

— EFFICACY & MATERIAL

VALIDATION

Aligned to international STAATT guidelines

The GENERATIONS system is validated in alignment with STAATT, the recognised international standard for the treatment of biohazardous waste. Dairygold performs its own verification tests to confirm the ongoing efficacy of the system in daily use.

POLYMER THROUGHPUT

A large number of test kits, every single day

In a single day at Dairygold, GENERATIONS processes a large number of microbiological test kits, each containing multiple single-use plastic items. These consumables are made of high grade polymers that are highly attractive to recycling operations.

PS Polystyrene

The petri dishes that make up the majority of the lab's microbiological consumables, a high recycling value polymer once treated.

PP Polypropylene

Pipettes and tips, also recovered as a clean, separable polymer stream through the Envirogreen process.

5–15mm

Flake size produced by the shredding and disinfection cycle

STAATT

International guidelines the treatment process is validated against

Zero

Waste to landfill, the co-op goal this stream now supports



— OUTCOMES

90%

Average reduction in greenhouse gas emissions versus conventional treatment methods

An independent study by carbon consultancy Carbon Action assessed six life science facilities across Ireland, the UK and the US, and found that GENERATIONS has the ability to reduce GHG emissions by 90% on average compared with conventional treatment methods, a direct contribution to Dairygold's CO₂e reduction commitments.

CARBON

A lower-carbon waste route

Non-thermal treatment on site replaces energy intensive autoclaving and the transport of hazardous waste off site.

CIRCULARITY

Recycling what was unrecyclable

Material previously destined for landfill, at cost to both Dairygold and the environment is now recovered as polymer feedstock.

OPERATIONS

Simpler handling in the lab

Treated material needs no special handling or segregation for disposal, and leaves site as a single recyclable stream.

This case study underscores that the adoption of clean technology such as Envetec's GENERATIONS has the potential to significantly enhance sustainability practices in laboratory settings, deliver tangible CO₂e reductions, and facilitate the recycling of single-use plastics.



— CLIENT FEEDBACK

“Every aspect of the supply chain must do their bit.”

“The single biggest challenge we face as an industry is to deliver quality food products to our customers in a sustainable way. Every aspect of the supply chain must do their bit.

GENERATIONS has facilitated a change in practices, from disposing of valuable resources to allowing them to be recycled in a circular economy.”



JOHN O'CALLAGHAN
Dairygold

TREATED

Microbiological waste rendered safe on site, inside the lab

REDUCED

90% average GHG reduction versus conventional treatment

RECYCLED

PS and PP recovered as pellets instead of going to landfill





Creating clean change by bringing the circular economy to life science

On-site treatment

Non-thermal, low energy disinfection
and shredding in a single cycle.

Circular material

High value polymers recovered and
returned to manufacturing.

Measurable impact

Emissions savings evidenced against
previous treatment baselines.

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FIND OUT MORE

www.envetec.com

Average reduction found by independent carbon consultancy Carbon Action on analysis of GENERATIONS versus traditional treatment methods, across six life-science facilities in Ireland, the UK and the US. GENERATIONS is a registered trademark of Envetec. Patents pending.

