

# Developing new products from shellfish waste

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## Rationale

Shellfish processing plants in Wales produce a large amount of shell waste, the disposal of which in local waters has become a contentious environmental management issue, with some coastal residents considering it detrimental to the local environment and property value.

Quay Fresh & Frozen Foods (QFFF), a company based in New Quay, is an SME specialising in processing whelks from local catch. It generates approximately 800 tons of crushed shell waste yearly. Crushed shells have been successfully used in other countries to make water filtration devices, as soil conditioners, construction materials and sludge aggregating agents. SEACAMS 2 is testing alternative uses and products created from the shell waste.

## Microshells

A novel potential application that has not been studied is the use of shells as a substitute for plastic microbeads. Microbeads are ubiquitous in many household products, and their eventual discharge has led to widespread plastic pollution in the environment. The UK and many other industrial nations have committed to phase out microbead usage. Shells, when refined to the appropriate shape and size (microshells), could potentially be an environmentally sustainable alternative that provide the same exfoliating function as microbeads.

SEACAMS2 will test the suitability of whelk 'microshells' as a substitute for microbeads. Microbeads as an artificial material, can be engineered to specific properties. Whelk shells on the other hand are natural material but with limited scope for modification. This project aims to mechanically refine whelk shells to microscopic size and examine their physical and chemical properties. If 'microshells' can replace microbeads in household products, the outcome could lead to a new patent and a new commercial product.

### Water Filtration

This project will design and test the use of crushed whelk shells, alone as well as mixed with other materials, for water filtration. Experimental water will be assessed for quality (e.g. particulate load, nutrient concentrations, viable microorganisms) before and after passing through the tested device.

### Soil Conditioners

Whelk shells contain calcium carbonate and other minerals, which can be added to soil as a natural conditioner to improve soil quality and mitigate acidity. SEACAMS2 is using pilot studies on experimental plots using different soil/shell mix, to examine the resultant plant growth.



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