



Finalist's case study



Emily Haggett (University of Southampton) Student Research & Development “The occurrence of microplastics in European culinary sea salts”

UNIVERSITY OF Southampton

- Profile**
Example:
- Higher Education
 - 23,500 students (25% of which are international)
 - 5000 staff
 - Urban campus
 - Annual turnover £400M

About the project

Summary

Novel undergraduate research was undertaken to investigate the microplastic content of European culinary sea salts. Microplastic levels found were much higher than results from other continents, providing important new evidence to further highlight the current marine plastic pollution issue.

Project partners

University of Southampton

The results

The problem

Each year approximately eight million tonnes of plastic waste enters our oceans. These plastics are now beginning to break down and the resulting microplastics are being discovered in various marine biota and food products. This research looked into the production of European culinary sea salts as a potential pathway for microplastics into the human food chain.

The approach

Sea salt samples from various destinations in Europe were dissolved and filtered to capture any microplastic content. Microplastic particles per sample were counted and identified using Raman Laser Spectroscopy. Different salt production methods and locations were also researched to gain an insight into potential plastic sources.

Our goals

To quantify microplastic contamination levels of European sea salts. To establish plastic types present in sea salts. To establish if culinary sea salts are a direct pathway for microplastics into the human food chain.

Obstacles and solutions

Airbourne plastic contamination	create a plastic free laboratory environment (changing apparatus used, filtering all ducts, limiting personnel allowed into the lab space, caution over clothes worn in
Time limits for project	Strict organization of project and many extra hours put into it.
Project budget	Friends going on European holidays and bringing back sea salt packets for me!



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Difficulty to find out about production methods of each salt company – no information shared or used

Undertook a lengthy investigation using published data and google Earth to derive proximity to potential microplastic contamination sources

Performance and results

It has been found that sea salts from Europe contain much higher levels of microplastics compared to results published from Chinese sea salts. From extensive research and analysis of the locations of microplastic contamination, it is thought the levels of contamination are determined largely by oceanic currents such as the Gulf Stream. Analysis of microplastics found in the salts show high contamination levels due to plastics used in aquaculture activities. Results provide first hand evidence that microplastics have a direct pathway into the human food chain

The future

Lessons learned

From this research a clear lesson to share with everyone is that microplastics are extremely prevalent in the marine environment. More needs to be done to tackle this issue and this needs to happen both at the individual level (reducing our own individual reliance on single-use plastic items) and at the governmental level (legislation to further protect our waters and increase recycling rates to keep plastics out of the marine environment and our food chain!).

Top 3 learnings from implementing your project

1. The existence of today's 'single use' culture. Throughout researching microplastics I have realised how much society relies on plastic as an everyday, single use material – it's everywhere!
2. To always keep reading. New information is constantly being published and staying up to date with relevant research will always benefit your own, regardless of how much you already understand the topic.
3. You should always challenge yourself at every opportunity – especially when picking a dissertation topic. You will work harder and be more satisfied with the outcome.

Sharing your project

The project has been shared through presenting results at an international symposium, undertaking talks with members of the public at various events, live radio interviews discussing the results, applying for this award, and the work is also being sent to an international scientific journal with the intention of a publication, after which Surfers Against Sewage (environmental charity) intends to publicise the findings.

What has it meant to your institution to be a Green Gown Award finalist?

I am absolutely delighted that Emily has won the Green Gown Award for Student Research and Development. Her research project is a substantial and important piece of sustainability work that speaks highly of her skills, and also recognises the support of her excellent Environmental Science academic supervisory team. (Professor Sir Christopher Snowden, President and Vice-Chancellor of the University of Southampton)

Further information

Emily Haggett
(eah1n12@soton.ac.uk)