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# Microplastics analysis in food: assessing human exposure through Raman micro-spectroscopy

Microplastics are small particles of synthetic polymers, insoluble in water, ranging in size from 1  $\mu\text{m}$  to 5 mm. They have been detected in various environmental matrices, in drinking water and food [1], and are now recognized as emerging particulate anthropogenic pollutants. Due to their persistent nature and potential harmful effects on both human health and the environment, microplastics have become a growing concern. Current efforts by the scientific community and standardization bodies are focused on assessing the risks associated with microplastics exposure. These initiatives aim to gather comprehensive data on real-world exposure levels and to evaluate the impacts of microplastics on living organisms.

Raman micro-spectroscopy is recognized as a reference method for monitoring microplastics, allowing for chemical identification, particle size measurement, and particle quantification [2].

In this work, a standardized analytical protocol for microplastics detection was applied to a sugar sample. Rapid, automated analysis of thousands of particles down to 5  $\mu\text{m}$  in size was carried out using Particle Finder™ and ID Finder™ software. The results revealed an alarming number of microplastic particles smaller than 20  $\mu\text{m}$  in diameter.

## References

- [1] Borriello, Lucrezia, Marcello Scivico, Nunzio Antonio Cacciola, Francesco Esposito, Lorella Severino, Teresa Cirillo. *Foods* 12 (2023) 3396
- [2] Natalia P. Ivleva, *Chemical Reviews* 121 (2021) 11886