

Novel techniques to ensure safe, spicy and delicious food

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EU researchers have developed tools and guidelines to help protect Europe's spice and herb commodity chains from deliberate, accidental and natural biological and chemical contamination.

From aniseed, basil and cinnamon to curry, paprika and pepper, [spices](#)

play a big part in some of Europe's favourite dishes. But because these spices are usually added to our meals without any direct heating, they are particularly vulnerable to contamination. Furthermore, the entire production and supply chain – from planting to harvesting, production to packaging and shipping to selling – is ripe for contamination by microbiological and chemical agents. Add in the fact that most spices are imported from outside of Europe and what you could have is a recipe for risk.

The EU-funded SPICED project aims to mitigate these vulnerabilities by implementing best practices specifically geared to ensuring the safety of our spices and herbs. This is a novel approach to food safety, as traditionally experts have focused on major food ingredients, thus failing to properly identify contaminated spices and herbs as the cause of many food-borne infections and intoxications.

New tools, processes and techniques

To accomplish this, project researchers focused on the spices most susceptible to contamination, such as pepper, paprika, nutmeg, vanilla, parsley, oregano and basil. First, they developed tailored tools for both detecting and preventing deliberate, accidental and natural contaminations, such as salmonella and e-coli. This included characterising the heterogeneous matrices of spices and herbs, implementing on-site and high throughput diagnostic methods for detecting contamination, studying their intra- and inter-plant production and supply chains within the context of biological and [chemical hazards](#), and improving the overall knowledgebase of relevant biological hazards.

Based on this initial work, the project team created innovative processes for reducing chemical alterations and ensuring the authenticity of spices and herbs. For example, the project demonstrated how sampling strategies that use non-targeted fingerprinting methods provide better

hazard detection. Likewise, an exemplary spice and herb production and processing chain was developed, thus closing the door to key vulnerabilities. For spices like paprika and pepper, whose production and trade has been stagnant for decades, the project evaluated the entire value chain and made recommendations for updated best practices.

Another innovative strategy coming out of the project are techniques for de-spiking dry spices and herbs that are contaminated with microorganisms. To better protect against chemical hazards and reduce the threat of food terrorism, the project issued standard operating procedures for a more robust verification of the authenticity of spices and herbs. The procedures aim to facilitate the exchange of analytical methods amongst and between laboratories, producers and consumers.

Guidelines for ongoing safety

To further ensure that the project's work is utilised across the EU and becomes standard practice, SPICED has produced various guidelines to help differentiate between natural and intentional incidents.

Additionally, data on currently available decontamination methods for spices and herbs, along with production facilities, have been collected.

Even though the project ended in June 2016, the work undertaken by the SPICED consortium will continue through the tight network built up by the project during its three year lifetime.

More information: Project website: www.spiced.eu/

Provided by CORDIS

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