New innovation in food safety testing

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Foodborne diseases are a major cause of illness and death worldwide, so the need for reliable and rapid means for detecting deadly bacteria in food samples is important for the food industry.

Researchers at Swinburne University of Technology, in partnership with bioMérieux Australia, have developed a new technique for detecting Listeria contamination in food.

Listeria can cause serious and sometimes fatal infections in young children, the elderly and others with weakened immune systems. In pregnant women, it can lead to miscarriage, stillbirth and premature deliveries.

A wide range of foods have been implicated in outbreaks of listeriosis, including milk, soft cheeses, smoked fish, processed meat products – such as pate – and even fresh produce such as coleslaw and cantaloupe.

"Current standard methods to detect Listeria in food rely on biochemical testing that takes four to five days to confirm a positive result," lead researcher Professor Enzo Palombo said. "This process is time-consuming and costly for the food industry."

The detection of foodborne pathogens can be challenging due to the likely presence of multiple bacteria in a single sample.

"We have developed a technique that provides a more rapid and simple detection scheme, compared to conventional methods with minimal

sample processing," Professor Palombo said.

The researchers used mass spectrometry technology MALDI-TOF MS as a tool to detect Listeria monocytogenes and found very low levels of the pathogen could be identified from different food samples.

An experiment was carried out using ultra-high-temperature (UHT) milk as a model food, following which the bacteria was detected from three different foods: chicken pate, cantaloupe and camembert cheese.

"The use of MALDI-TOF MS for bacterial identification from selective enrichment broth could reduce the overall costs involved in food testing as the same strategy could be used for other foodborne bacteria.

"Although the initial infrastructure investment for MALDI-TOF MS is high, the running costs are minimal."

The study was published in the *Journal of Proteomics*.

Provided by Swinburne University of Technology