New device will find carcinogenic food fungus faster

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One of the food industry's major recurring challenges, detecting highly carcinogenic toxins that occur naturally in our most common crops, could soon be solved by groundbreaking research that exploits aflatoxins' fluorescent properties.

Aflatoxins are present in a wide range of foodstuffs, especially cereals, grains and nuts and are known to be highly carcinogenic. As they are naturally occuring there is no way to eliminate them from the food chain. Instead, suppliers and producers of food stuffs that are particularly vulnerable to aflatoxins focus on detecting them quickly.

Dr Stephen Euston at Heriot-Watt University is leading a project to test the feasibility of a new device, designed by Edinburgh Biosciences, that will detect aflatoxins much more quickly and accurately than current methods. The focus is on making the device easy to use, with simple and instant results that don't require a chemistry degree to be able to understand them. This will remove the need for expensive lab technicians to spend days analysing samples, potentially hundreds of miles away.

Dr Euston said: "Detecting aflatoxins quickly and at each stage of the global supply system is of crucial concern. They occur naturally in some crops, but they can find another way into the food chain through contaminated animal feedstock.

"At the moment, detection relies on a time-consuming method that

involves extracting the toxin from the food and then transported to a lab for testing and identification. Few methods allow testing of the foodstuff to happen then and there, in the field or in the cargo dock. This leads to delays and costs, which are passed onto the consumer.

"Aflatoxins fluoresce strongly, which we're using to our advantage. We're using the latest Light Emitting Diodes (LEDs) with a new generation of interference filters to develop a highly sensitive instrument that will detect the fluoresence and identify aflatoxins rapidly.

"The EU has the most stringent requirements of any regulatory body when it comes to the level of aflatoxins permitted in foodstuffs. Anything above four micrograms per kilogram, which is equivalent to four billionths of a kilogram, is not permitted. Our device will detect aflatoxins at an even lower level.

"This device will have huge benefits to farmers, tranportation agents, port inspectors, buyers , importers, exporters and producers of foodstuffs for human and animal consumption.

"Ultimately, though, the consumer will benefit . Food will be safer and as production costs go down, so too should retail costs."

As well as developing a prototype instrument that will be low cost and easy to use, Dr Euston and his team are working to establish test procedures that will allow the instrument to be used to test bulk material in situ, whether nuts, corn or cereals.

The research partnership between Dr Stephen Euston at Heriot-Watt University and Edinburgh Biosciences, a spinout company based at the university's Edinburgh campus, received funding from the Technology Strategy Board. The team expects to have a prototype instrument by June 2014.

Provided by Heriot-Watt University