

Researcher Develops Sensor to Detect E.coli

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As the Food and Drug Administration takes days to track down the source of the E. coli outbreak, Dr. Raj Mutharasan is optimizing a sensor that can enable growers to do the job themselves in a few minutes.

Mutharasan, a professor of chemical engineering at Drexel University, has developed an “intelligent” sensor technology that is precise, accurate and cheap. Costing just a few dollars, the sensor can provide a result within 10 minutes and can detect pathogens or bacteria, like E. coli, with a sensitivity of four cells per milliliter.

The standard detection process of E. coli bacteria in food processing takes about 24 hours. A sample is taken to a lab and placed on a nutrient agar. If E. coli is present, they will multiply on the agar and researchers can visibly identify them.

Mutharasan’s sensor can be placed into a palm-sized device that can be placed in the hands of food inspectors and growers, and is even cheap enough to one day enter the home.

The sensor uses E. coli antibodies to detect the bacteria in much the way that our bodies work. These antibodies are affixed to a narrow sliver of glass. Attached to the other end of the glass is a ceramic layer that generates voltage in response to applied mechanical stress.

A voltage is applied to the ceramic layer, making it expand and contract, causing the glass sliver to vibrate. The sensor detects changes in the glass sliver’s resonate frequency (the point where vibration is the greatest) and

uses this to determine both the presence and concentration of E. coli bacteria.

Mutharasan is working with a company to commercialize the device and expects it to be in the hands of food safety experts soon. Other applications for the sensor technology include detecting prostate cancer without a biopsy and detecting Alzheimer's disease.

Source: Drexel University

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