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Enzyme Pretreatment for Rapid Detection of Salmonella in Raw Chicken, Egg White, and Spinach

New enzyme formulations and software enhance food extract preparation, leading to 3- to 5-fold faster microbial recovery and rapid pathogen detection in food safety analysis.

To prevent food-borne pathogens from spreading and helping with safety and health of a population, it is essential to have pathogen detection systems. It is difficult to process food samples and there is a need to use different types of enzymes for this process. Current technologies for detection include culture enrichment and microfiltration, which are not as efficient, and none of these technologies supply enzyme solutions for enriching food extracts with respect to background microorganisms.

Purdue University researchers developed a product that won the grand prize in the 2014 FDA Food Safety Challenge - http://www.purdue.edu/newsroom/releases/2015/Q3/purdue-university-innovation-wins-fda-food-safety-challenge.html.

This new product of enzyme formulations and software for defining best conditions, using enzymes to treat food extracts. This product improves recovery of microorganisms and enhances rapid hollow tube microfiltration (in connection with a C3D instrument). It would allow matching enzymes to different food materials, identifying optimum conditions, and obtaining enhanced microbial recovery in order to analyze food microorganisms within four hours. This system would allow rapid concentration, retrieval, and discovery of pathogens that are present in various types of food. Due to the individual components of this technology, it has a 3- to 5-fold faster recovery of microorganisms, while concurrently minimizing the need for enrichment or selective culture that is usually used to obtain adequate cultures for pathogen detection.

To view a video related to this technology, click this link: https://www.youtube.com/watch?v=pdJSDPnmIfs&feature=youtu.be.

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Category

Agriculture, Nutrition, & AgTech/Food Safety & Traceability

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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Advantages:

-Enhanced microfiltration

-Faster process for analyzing microorganisms

-Minimizes need for selective cultures

Potential Applications:

-Food industry

-Food safety

TRL: 5

Intellectual Property:

Provisional-Patent, 2015-07-23, United States | Provisional-Patent, 2016-01-27, United States | PCT-Patent, 2016-07-22, WO | NATL-Patent, 2016-07-22, Canada | NATL-Patent, 2017-12-11, United States | NATL-Patent, 2018-01-19, Mexico | NATL-Patent, N/A, China

Keywords: pathogen detection systems, food safety challenge winner, enzyme formulations, food extracts treatment, rapid hollow tube microfiltration, microbial recovery, food microorganism analysis, rapid concentration, pathogen retrieval, food industry application, Biotechnology, Detection, Food Processing, Food Safety