Foodborne Staph Toxin Pinpointed by New Assay

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A new test that ARS researchers have developed to trace a Staphylococcus aureus toxin is one billion times more sensitive than the current "gold standard" assay.

(PhysOrg.com) -- Most people need about two days to recover from being sickened by foods contaminated with what's known as staphylococcal enterotoxin A, or "SEA." Produced by Staphylococcus aureus bacteria, this toxin is a leading cause of foodborne illness in the United States and worldwide, according to Agricultural Research Service (ARS) research chemist Reuven Rasooly.

To help public health officials trace the source of food poisoning outbreaks in which staph A is a suspect, and to give food makers another way to ensure the safety of their products, Rasooly has developed a superior new test for finding this toxin in foods. He and technician Paula

M. Do developed the test at the ARS Western Regional Research Center in Albany, Calif.

The ARS test can detect the toxin at levels that are a remarkable one billion times lower than the current "gold standard" assay for SEA. The researchers' experiments with chicken, beef and milk indicate that the assay reliably distinguishes active from inactive toxin and yields reproducible results.

The test takes advantage of the fact that the toxin has a double life. Besides causing nausea, vomiting, diarrhea, and other gastroenteritis symptoms, SEA also acts as a superantigen—a molecule that activates large numbers of immune-system cells. The assay neatly exploits this trait by measuring proliferation of splenocytes, which are immune system cells produced in the spleen. For the assay, the cells are kept alive in laboratory petri dishes.

The SEA assay is practical, comparatively fast, and relatively inexpensive. Experienced technicians can quickly learn how to perform the test using equipment that's standard in laboratories across the nation.

Rasooly and Do describe their test in an article published earlier this year in FEMS Immunology and Medical Microbiology .

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