



FOOD SAFETY AND BIOSENSORS | DoD CFD

Biosensors are being pursued by the military as real-time, field-portable instruments for the detection and identification of pathogenic microorganisms and toxins in foods. Biosensors originated from the integration of molecular biology and information technology (i.e. microcircuits, optical fibers, etc.). Biosensors work by using information technology to qualify or quantify biomolecule-analyte interactions, such as antibody-antigen interactions.

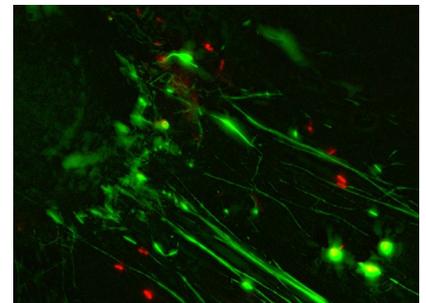
WHY IS IT NEEDED?

Biosensor systems will provide military food inspectors with the ability to rapidly detect pathogens and potential contaminants, including chemical/biological agents. Enhanced screening and surveillance of military food sources will significantly improve food safety, thereby reducing the health risks and medical costs associated with foodborne illness.



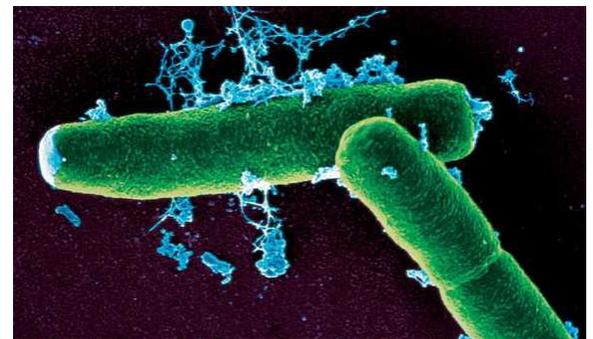
TECHNOLOGY:

Commercial biosensor platforms use the biochemical tools of electrochemiluminescence, electrochemical, fluorescence, and chemiluminescence and are being validated for performance with food matrices. The Surface Micro Channel Resonator and the electrospun nanofiber membrane are two biosensor platform technologies being developed and investigated for military applications. Similar efforts in food sampling strategies are being designed and modified to improve the capture and concentration of a bioagent from the food matrix (i.e. immunomagnetic separation integrated with current commercial biosensor systems). Investments made in evolving array and stand-off based technologies provide for a larger number of food samples screened at a time and will greatly enhance the Warfighters' ability to detect pathogens in food. The food safety and biosensor program will serve as a platform for future technology insertions aimed at improving food safety.



KEY FEATURES / BENEFITS:

Research in biosensor technologies will produce field portable instruments that are validated to provide rapid, real-time analysis of host nation procured food and combat rations in remote locations, fixed field-feeding sites, and military dining facilities. Biosensors will reduce the labor and time required for food safety testing, and their effectiveness will result in decreased lost work time, medical costs, and mission costs associated with protecting the Warfighter from foodborne illness.



Color scanning electron micrograph (SEM) of anthrax bacteria (*Bacillus anthracis*) (top), and anthrax spores, the cause of the disease anthrax in humans and livestock

POINT OF CONTACT:

Combat Feeding

Phone: COMM (508) 233-4670, DSN 256-4670

E-Mail: nati-amsrd-nsc-ad-b@conus.army.mil

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