Contribution ID : **160** Type : **Poster**

Rapid Detection of Processed Uranium in Food

Tuesday, 27 September 2016 12:02 (0:02)

Content

The US FDA maintains an active, robust program for routine monitoring of food for radionuclide contamination and stands ready to respond to emergencies. With on-going interest in increasing analysis capabilities, a focus of recent work has been application of isotope ratio mass spectrometry (IR-MS) to the determination of radionuclides in food. In this current study, a rapid, high-throughput method for detection of processed uranium in food was developed. This technique is particularly useful for uranium isotopes because the isotope ratios for processed uranium, as used for nuclear energy and weaponry, differ significantly from natural uranium. In response to an incident, the Agency may be in need of means to differentiate between natural and processed uranium. Since radioactive tracers and spikes are not used; non-radiochemical laboratories can perform this analysis. The method is intended for fresh fruit, vegetables, and dairy products, and 23 distinct categories of fruits, vegetables, and dairy have been examined to date with excellent results. Food can quickly and easily triaged into contaminated versus non-contaminated. For all non-contaminated products examined to date, the maximum deviation from known ratio is below 4 %. Sub-picogram quantities of U-235 can be detected in contaminated foods. Notable features include elimination of regulated nuclear material; i.e. non-radiochemical laboratories may perform this analysis, elimination of several extremely hazardous reagents e.g. aqua regia and hydrofluoric acid (HF), and the method was developed on a moderately priced, and widely used quadrupole ICP-MS. Traditionally fingerprinting studies are performed on expensive sector field mass spectrometers or thermal ionization mass spectrometer (TIMS). As developed, this method could be quickly implemented at many laboratories to increase emergency response capability

About the Presenter

Dr Shareef is a chemist at the US FDA

Primary author(s) : Dr. SHAREEF, Abdur-Rafay Shareef (US FDA)

Co-author(s) : Dr. LIN, Zhichao (US FDA); Ms. EMANUELE, Kathryn (US FDA); Ms. HEALEY, Stephanie (US FDA); Dr. REGAN, Patrick (US FDA); Mr. BAKER, Brian (US FDA)

Presenter(s) : Dr. SHAREEF, Abdur-Rafay Shareef (US FDA)

Session Classification : Applications

Track Classification : Applications