

RAPID DETECTION OF THORIUM-232 IN FDA REGULATED PRODUCTS

Kelly Garnick, US Food & Drug Administration

Kelly.Garnick@fda.hhs.gov

Philip Stafford, Kelly Garnick, Elon Malkin, Thomas Scott, and Cong Wei

US Food & Drug Administration, Winchester Engineering and Analytical Center, U.S. Food and Drug Administration, Winchester, MA 01890

Th-232 is a naturally occurring, alpha-emitting element found at low levels in soils and water. Th-232 decay chain includes radionuclides that are gamma, beta and alpha-emitters. Due to the prevalence of gamma radiation monitoring systems, imported products flagged at Customs locations due to elevated gamma-ray activity are increasing. Often, this activity is shown to be concentrated levels of naturally occurring radionuclides. One example is seen in sports tape, mineral patches and products touting positive health effects of “negative ion technology”. Because the route of internal exposure caused by these products is uncertain, it is difficult to intercede. However, health issues are associated with highly concentrated levels of Th-232, even when external radiation is assumed to be the only source of exposure. The Nuclear Regulatory Commission has guidance for basing intervention action on the requirement for licensing to transfer and possess goods containing radioactive material such as Th-232 and its progenies. To address the FDA’s need to develop and evaluate high throughput, sensitive, specific, cost-effective methods to detect threat agents, WEAC validated a high throughput and rapid turnaround analytical method for quantifying Th-232 in matrices associated with certain FDA regulated products. The procedure allows Th-232 results to be obtained within 48 hours and achieved detection levels appropriate for product risk assessment. Activity results for Th-232 in various types of food and pet food matrices are presented.