

Radioactivity Testing in Food

Latest Update: April 2012

Occurrence of Radioactivity

Natural sources of radiation – a combination of cosmic and terrestrial radiation - represent the major part of radioactivity in the food chain. The radionuclides potassium-40, uranium-235 and -238 as well as products from these decay series such as radon-222, radium-226 and thorium-232 can be dated back to the beginning of the earth. Radionuclides such as tritium and carbon-14 are continuously formed in the atmosphere. Main sources for **man-made radioactivity** dispersed in the environment have been the nuclear weapon tests performed in the 1960s as well as the Chernobyl reactor accident in 1986.

Relevant Nuclides

Severe damage and containment breaches within nuclear power plants lead to the harmful release of volatile isotopes such as iodine and caesium. Less volatile radionuclides such as strontium, antimony, uranium and plutonium can be part of aerosol or dust particle releases. The extent and severity of their release is highly dependent on the process taking place in failing reactors.

Usually, caesium-134 and -137 are considered good indicator nuclides due to their distribution in the environment and the long half-life of caesium-137 of 30 years. Additionally, in case of Fukushima, iodine-131 (half-life 8 days) has initially been used as a marker nuclide for the assessment of food and feed.



Radionuclides in the Food Chain

Following a radioactive fallout, the presence and bioavailability of caesium-137 depends on properties and characteristics of the soil. Acidic soils and soils rich in humus, such as bog and forest soils, are in a high risk category as caesium-137 maintains a high bioavailability. Up to today, considerable caesium-137 contaminations of mushrooms, forest fruits and venison are detected e.g. in Bavaria, still originating from the Chernobyl reactor accident.

EU Regulations

EU Regulation 733/2008 lays down maximum levels of caesium-134 and -137 for third country imports affected by the **Chernobyl** reactor accident.

Since the beginning of April 2012, the import of food and feed originating from **Japan** is governed by the EU Implementing Regulation 284/2012. Products are only allowed to be imported with safety certificates attesting that they:

Eurofins

Tel.: +49 40 492 94 777

wej-contaminants@eurofins.de
www.eurofins.de

- were processed before 11 March 2011, or
- are not originating in and consigned from one out of 11 named prefectures, or
- are consigned from but not originating in one out of 11 prefectures and have not been exposed to radioactivity during transiting, or
- do not contain levels of **caesium-134 and -137** above the maximum levels provided in Tab. 1.

The provisions also apply to products originating from coastal waters irrespective of where such products are landed.

Contrary to the previous Implementing Regulation (EU) No. 961/2011, maximum levels for further radionuclides such as

iodine, strontium or (trans-) plutonium remain unlisted.

Analysis

Eurofins' analytical expertise in the field of radioactivity is based on more than 20 years of experience. Our offering includes the analysis of **iodine-131**, **caesium-134** and **caesium-137** by means of γ -spectrometry using either germanium- or sodium iodide-detection.

We offer you the **following tests** with a limit of detection of 3 Bq/kg for each radionuclide:

- **A7380:** caesium-134 and caesium-137
- **JCRCL:** caesium-134, caesium-137 and iodine-131

Other radionuclides can be quantified on request.

About Eurofins

- Global provider of analytical services with momentarily 150 laboratories and 10,000 employees in 30 countries
- Competence Centres and laboratories of excellence with state-of-the-art analytical technology
- Local contacts within a global network
- Reliable results on time
- Accreditation according to DIN EN ISO/IEC 17025:2005 or the appropriate standard of the given country
- Continuous participation in proficiency tests to check and confirm our quality
- Authorised experts for double and cross checks according to § 43 of the German Food and Feed Code (LFGB)

Tab. 1: Maximum levels for caesium-134 and -137 according to Regulation (EU) No. 284/2012

	Food or Feed Category	Maximum Level [Bq/kg]
Food ¹	1. Food for infants and young children	50
	2. Milk and dairy products	50
	3. Other food (except for food under 4. and 5.)	100 ²
	4. Mineral water and similar drinks, tea brewed from unfermented leaves	10
	5. Soybeans and soybean products	500
Feed ³	1. Feed intended for cows and horses	100
	2. Feed intended for pigs	80
	3. Feed intended for poultry	160
	4. Feed for fish (except for feed for ornamental fish)	40

¹ For dried products intended to be consumed in a reconstituted state, the maximum level applies to the reconstituted product as consumed (reconstitution factor for dried mushrooms: 5); for tea, the maximum level applies to the infusion (processing factor: 50).

² For rice (products) before 01 October 2012, the maximum level of 500 Bq/kg applies.

³ A maximum level is relative to a feed with a moisture content of 12 %.

Contact:

Eurofins WEJ Contaminants GmbH

Neuländer Kamp 1
D-21079 Hamburg

Customer Service:

Nadja Flüchter
Phone +49-40-49294-763
Fax +49-40-49294-99763
Email: NadjaFluechter@eurofins.de