SAFEGUARDS
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RADIATION CONTAMINATION FOUND IN IMPORTED FOOD FROM JAPAN

On March 19, 2011 Japanese government found radiation contamination in milk and spinach resulting from the disaster at Fukushima Daiichi nuclear power plant[1]. Because of the concern for human consumption of food products with radionuclides, the U.S and several countries in Asia such as South Korea, Indonesia, Thailand, Malaysia, India, Singapore and Philippines have begun strictly monitoring iodine-131 (I-131) and cesium-137 (Cs-137) contamination from imported Japanese food products.

Many people in the world have been worried the effect of radioactive contamination to the environment and food chain after the nuclear accident in Japan. I-131 and Cs-137 are the main fission byproducts which are released and can cause the cancer in human. I-131 moves through the atmosphere more easily than Cs-137, but it has a half-life of only eight days whereas Cs-137 attaches itself directly to the particle and deposits into soil for long period of time. The half-life of Cs-137 is about 30 years[2]. Both radionuclides can accumulate in plants, fruits, vegetables, and crops, when they are ingested by animal or human which leads to an unsafe food supply chain.

To assure that such foods are safe, the Ministry of Health, Labor and Welfare (MHLW) of Japan provided Notice No. 0317 Article 3 on March 17, 2011 which informs the inspectors that they shall conduct radionuclide investigation using the "Manual for Measuring Radioactivity of Foods in Case of Emergency" dated May 9, 2002. Guideline level for each radionuclide in food and drinking water are shown in Table 1. The U.S. Food and Drug Administration (FDA) additionally monitors Japanese food for radiation based on Compliance Policy Guide (CPG) 7119.14. The guidance levels for radionuclide activity concentration, called derived intervention levels (DILs), as indicated in Table 2. Besides Asia countries and U.S, European Union (EU) urges its members to check on food from Japan based on Council Regulation (EEC) No. 737/90. They are to check the accumulated maximum radioactive levels in term of Cs-134 and Cs-137 as shown in Table 3.

1. Food Contamination Observed up to 90 miles from Fukushima, March 19, 2011
2. Iodine-131 and Cesium-137

TABLE 1 Indices relating to limits on food and drink ingestion[3]

NUCLIDE	INDEX VALUES RELATING TO INGESTION LIMITS IN GUIDELINES FOR COPING WITH DISASTERS AT NUCLEAR FACILITIES ETC. (Bq/kg)	
Radioactive Iodine (Representative radio-nuclides among mixed radio-nuclides: ^{131}I)	Drinking water	300
	Milk dairy products[4]	
	Vegetables (Except root vegetables and tubers)	2000
Radioactive cesium	Drinking water	200
	Milk, dairy products	
	Vegetables	500
	Grain	
	Meat, eggs, fish etc.	
Uranium	Infant foods	20
	Drinking water	
	Milk, dairy products	
	Vegetables	100
	Grains	
	Meat, eggs, fish, etc.	
Alpha-emitting nuclides of plutonium and transuranic elements (Total radioactive concentration of ^{238}Pu, ^{239}Pu, ^{240}PU, ^{241}Am, ^{242}Cm, ^{243}Cm, ^{244}Cm)	Infant foods	1
	Drinking water	
	Milk, dairy products	
	Vegetables	10
	Grains	
	Meat, eggs, fish etc.	

[3] Handling of food contaminated by radioactivity, Director-General, Department of Food Safety, Pharmaceutical and Food Safety Bureau, Ministry of Health, Labour and Welfare

[4] Provide guidance so that materials exceeding 100 Bq/kg are not used in milk supplied for use in powdered baby formula or for direct drinking to baby.

TABLE 2 Derived Intervention Levels (DILs) for Each Radionuclide Group for Food in Domestic Commerce and Food Offered for Import[5]

RADIONUCLIDE GROUP	DIL (Bq/kg)
Strontium-90	160
Iodine-131	170
Cesium-134 + Cesium-137	1200
Plutonium-238 + Plutonium-239 + Americium-241	2
Ruthenium-103 + Ruthenium-106[c]	(C3 / 6800) + (C6 / 450) < 1

TABLE 3 The accumulated maximum radioactive level in food according to Council Regulation (EEC) No. 737/90.

RADIONUCLIDE GROUP	FOOD	THE ACCUMULATED MAXIMUM RADIOACTIVE LEVEL (Bq/kg)
Cesium-134 + Cesium-137	Milk	370
	Milk products	370
	Foodstuffs intended for special feeding of infants during the first four to six month of life	370
	Other food products	600

Throughout SGS global network, we can help you to check radioactive contamination in your food products by carrying out measurements on a wide range of radionuclides. To guarantee food safety, our laboratories utilize state-of-the-art high resolution instrument for radionuclide determination. If you need more information, please don't hesitate to contact us.

[5] FDA/ORA CPG 7119.14

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