

# Regulation Values for Radioactive Materials in Food in Japan



October 17, 2011  
Department of Food Safety  
Ministry of Health, Labour and Welfare

## Progress of Setting Provisional Regulation Values for Radioactive Materials in Food

### 【Progress】

○ On March 11, the Great East Japan Earthquake occurred. (Tohoku District – Off the Pacific Ocean Earthquake)



○ On March 17, handling of provisional regulation values for radioactive materials in food was notified to prefectures, etc.



○ On March 20, the Food Safety Commission was requested to assess the impact of radioactive materials in food on health and food products.



○ On March 29, the Food Safety Commission presented the “Urgent Summary of Radioactive Materials” to the Ministry of Health, Labour and Welfare.

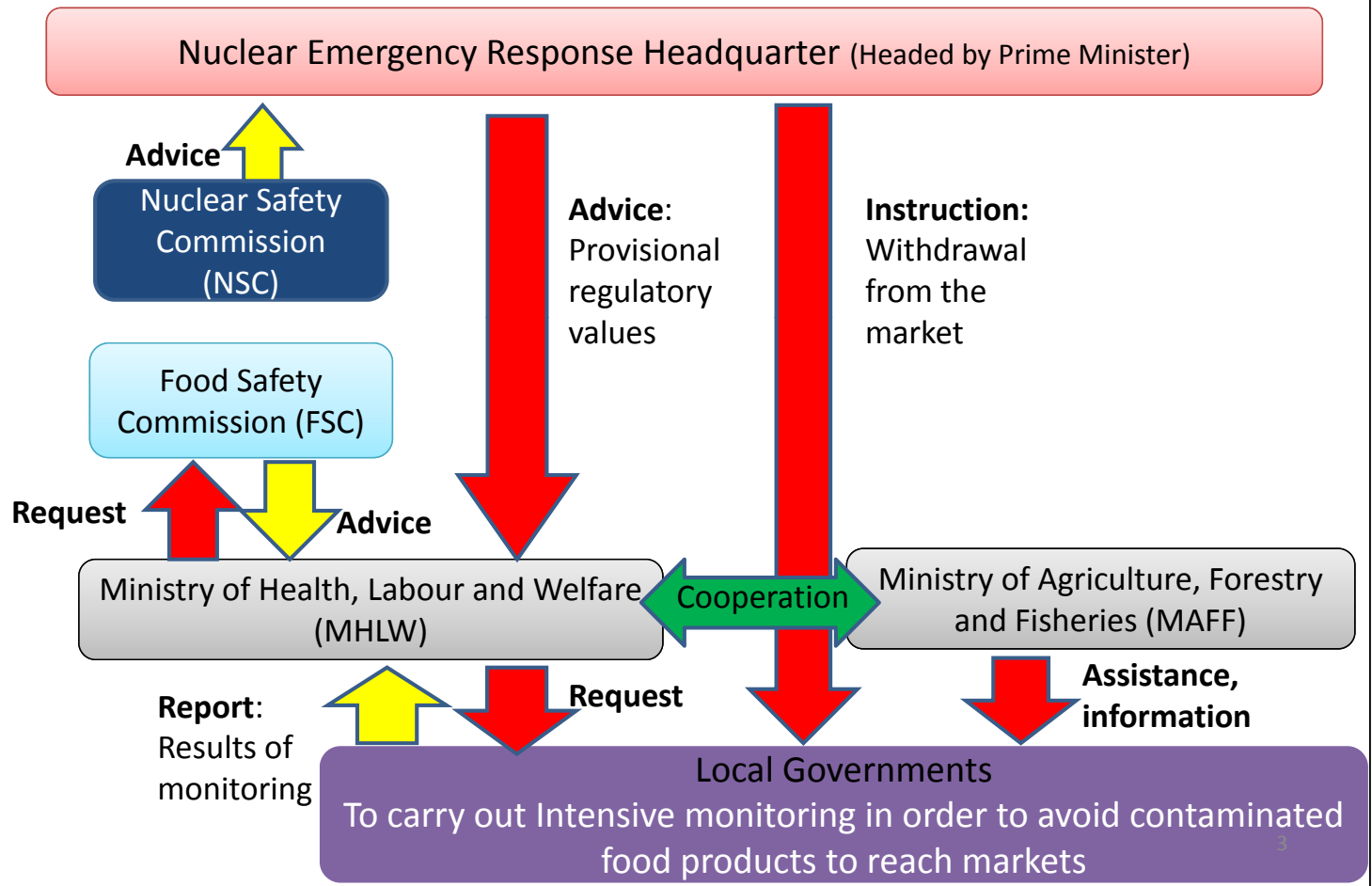


○ On April 4, the Radioactive Material Response Working Group was established in the Food Sanitation Subcommittee of the Pharmaceutical Affairs and Food Sanitation Council.



○ On April 5, responding to instructions by the Nuclear Emergency Response Headquarters, handling of provisional regulation values for radioactive iodine in seafood was notified to prefectures, etc.

# Administrative System for Food Safety in the Situation of Nuclear Emergency



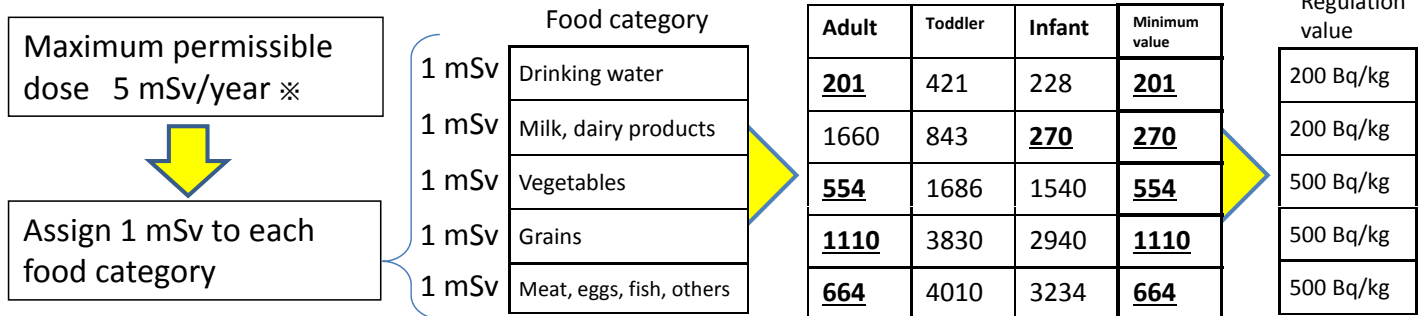
## Concept of Regulation Values

# Concept of Setting Regulation Values for Food

- Current provisional regulation values for radioactive materials based on the Food Hygiene Law are established in line with the following.
  - ① Set the annual maximum permissible radiation dose (mSv) originating in food, and assign the dose to each food category.
  - ② Based on certain premises, e.g., continuing to consume contaminated food, calculate the regulation values (Bq/kg) considering the intake volume, etc., of each food category in order not to exceed the set doses.
- ※ For example, the strictest of the limitation values obtained based on generation are applied to all ages by taking the intake volume and sensitivity of adults, toddlers, and infants into consideration.
- After setting the regulation values, inspections are conducted by prefectures, etc., based on the relevant regulation values. If food items exceeding the regulation values are found, measures are taken to prevent the distribution of these food items based on the Food Hygiene Law.
  - ※ The Nuclear Emergency Response Headquarters will determine measures, e.g., restrictions on shipment, based on the Act on Special Measures Concerning Nuclear Emergency Preparedness.

E.g.) Method to set the regulation values for radioactive cesium in the current provisional regulation values

Calculate the limit values (Bq/kg) considering intake volume and sensitivity by age



※ The International Commission on Radiological Protection (ICRP) sets 5 mSv~50 mSv/year as the effective dose for which the ICRP examines intervention for food and drink intake after an accident. Based on this level, the maximum permissible dose of 5 mSv/year was set by the Nuclear Power Safety Commission in the "Index on Restrictions on Food and Drink Intake."

## Intake Volume, etc. for Adults, Toddlers, and Infants Used in Setting Provisional Regulation Values

Chart: Intake Volume of Food and Drink (Intake Volume Per Day by Age Layer [kg or liter])

Types of food and drink	Adult	Toddler	Infant
Drinking water	1.65	1.0	0.71
Milk, dairy products	0.2	0.5	0.6
Vegetables	0.6	0.25	0.105
Grains	0.3	0.11	0.055
Meat, eggs, fish, others	0.5	0.105	0.05
All foods (excluding drinking water)	1.6	0.965	0.81

Chart: Dose Per Unit Oral Ingestion Volume (mSv/Bq)

Types of food and drink	Adult	Toddler	Infant
<sup>134</sup> Cs (Committed effective dose)	$1.9 \times 10^{-5}$	$1.3 \times 10^{-5}$	$2.6 \times 10^{-5}$
<sup>137</sup> Cs ( ditto )	$1.4 \times 10^{-5}$	$9.7 \times 10^{-6}$	$2.1 \times 10^{-5}$

## Indices on Radioactive Materials Originating in Food in Different Countries

Nuclides	CODEX/STAN 193-1995	EU Regulation (Euratom) No 3954/87	USA Compliance Policy Guide Sec. 560.750	Japan Regulation values in the Food Hygienic Law
Strontium ( <sup>90</sup> Sr)		Food for infants and toddlers 75 Dairy products 125 General foods 750 Drinking water 125	All foods 160	Express the indices that include the contribution level of strontium as cesium
Radioactive iodine ( <sup>131</sup> I)	Food for infants, toddlers 100 General foods 100 (As the sum of strontium and radioactive iodine, etc.)	Food for infants and toddlers 150 Dairy products 500 General foods 2,000 Drinking water 500	All foods 170	Drinking water 300 Milk, dairy products 300 Vegetables 2,000 (excluding root vegetables and tubers) Seafood 2,000
Radioactive cesium ( <sup>134</sup> Cs, <sup>137</sup> Cs)	Food for infants and toddlers 1,000 General foods 1,000	Food for infants and toddlers 400 Dairy products 1,000 General foods 1,250 Drinking water 1,000	All foods 1,200	Drinking water 200 Milk, dairy products 200 Vegetables 500 Grains 500 Meat, eggs, fish, others 500
Plutonium, americium, etc. ( <sup>239</sup> Pu, <sup>241</sup> Am)	Food for infants and toddlers 1 General foods 10	Food for infants and toddlers 1 Dairy products 20 General foods 80 Drinking water 20	All foods 2	Food for infants and toddlers 1 Drinking water 1 Milk, dairy products 1 Vegetables 10 Grains 10 Meat, eggs, fish, others 10

※CODEX adopts the intervention level of 1 mSv and hypothesizes that up to 10% of all food is contamination.

※EU sets the indices so that additional exposure doses do not exceed 1 mSv annually and hypothesizes that up to 10% of food is contamination.

※USA adopts 5 mSv as the committed effective dose and hypothesizes that 30% of food is contamination.



## Estimation of Exposure Doses from Food

# Estimation of Provisional Doses of Radioactive Materials Originating in Food

~ Examination by the Radioactive Material Response Working Group (dose calculation, etc.) of the Food Sanitation Subcommittee of the Pharmaceutical Affairs and Food Sanitation Council ~

○ Using actual measurement data (median concentration by food category) and average food intake volume data up to June 20, 2011, obtained through the monitoring of radioactive materials in food, exposure doses in food since the nuclear power plant accident were estimated on a test basis.

※ This estimation includes the following variation factors for the estimated values for handling data.

- When estimating the annual exposure based on the data results up to June, the data for June is applied to July and onwards. June data on the actual doses, which are expected to decline unless the 1st Fukushima Nuclear Power Plant of TEPCO releases an large additional amount of radioactive material in the future, are provisionally used. (Factor for overestimation)
- In terms of food for which measurement has not been not taken (prior to harvest season), the estimated value is 0 Bq/kg. (This excludes “rice” for which a certain estimated value is set prior to the harvest period based on the belief that the impact should be estimated as much as possible for this estimate because the intake volume of rice is comparatively higher than for other foods.) (Factor for underestimation)
- Data on non-detection is uniformly handled as 10 Bq/kg (factor for overestimation), etc.

○ In this estimation

- (1) The annual effective dose (Japan average) from naturally occurring radioactive materials, e.g., radioactive potassium, is roughly 0.4 mSv and
- (2) The exposure dose originating in food is estimated at roughly 0.1 mSv annually  
(In the case of food intake of median concentration)

※ However, further examination on how to set the representative groups, calculation method of the representative values, and handling of detection threshold data is essential. Currently, a more detailed examination is being conducted using the latest data.

## Excerpts of the Estimation Results

### 1. Estimation of the committed effective dose based on actual measurements

(1) Estimation of doses (mSv) based on the median concentration of actual measurements over four months between March and June 2011

Intake period	All ages	Characteristics of groups			
		Pregnant woman	Child	Fetus	Infant (breast feeding only)
March	0.011	0.010	0.034	0.022	0.019
April	0.007	0.006	0.014	0.007	0.005
May	0.007	0.006	0.008	0.004	0.002
June	0.009	0.008	0.009	0.005	0.002
Total	0.034	0.030	0.065	0.038	0.029

\* Child: 1 to 6 years old

\* Food intake volume (representative value) for pregnant woman is lower compared with other age groups, thus doses are smaller.

(2) Estimated doses (mSv) up to February 2012 based on the median concentration when hypothesizing that the situation in June will be the same from July and onward

	All ages	Pregnant woman *	Child	Fetus *	Infant (breast feeding only)
Annual total	0.106	0.07	0.137	0.063	0.044

(3) Estimation (mSv) when consuming food with the median concentration between March and June 20, 2011, for one year or during the period of pregnancy

	All ages	Pregnant woman *	Child	Fetus *	Infant (breast feeding only)
Annual total	0.096	0.064	0.106	0.036	0.022

### 2. Estimation of doses using the estimated value (rice) in addition to actual measurements

(1) Estimation (mSv) when consuming food (estimated value for rice) with the median concentration between March and June 20, 2011, for one year or during the period of pregnancy

	All ages	Pregnant woman	Child	Fetus	Infant (breast feeding only)
Annual total	<u>0.111</u>	0.072	0.118	0.039	0.024

\* The median for rice is estimated as 7.7 Bq/kg based on the assumption that white rice is consumed.

\* Estimated value for the period of pregnancy (9 months) for fetus and pregnant woman



# Recent Developments in the Revision of Regulation Values

Ministry of Health, Labour and Welfare

## Assessment Report by the Food Safety Commission

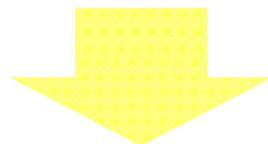
The draft report was released July 26, 2011.

A thorough review has been done by the Working Group about the health effects of radiation exposure.

The Working Group concludes that health effects are likely to appear after lifetime accumulated exposure to radiation exceeding 100 mSv, excluding natural exposure occurring in everyday life.

Children are likely to be more vulnerable to exposure (e.g., thyroid cancer, leukemia).

\* There have been reports on epidemiological studies on the health effects of radiation exposure. However, most data on radiation exposure below 100 mSv cannot be considered reliable. The possibility that there may be a lack of verification cannot be denied, making it difficult to refer to the health effects of added radiation exposure lower than 100 mSv with the current evidence.



After finalization of the report, revision of the provisional regulation values is underway.



**Thank you very much for your  
attention**

**Ministry of Health, Labour and Welfare**