

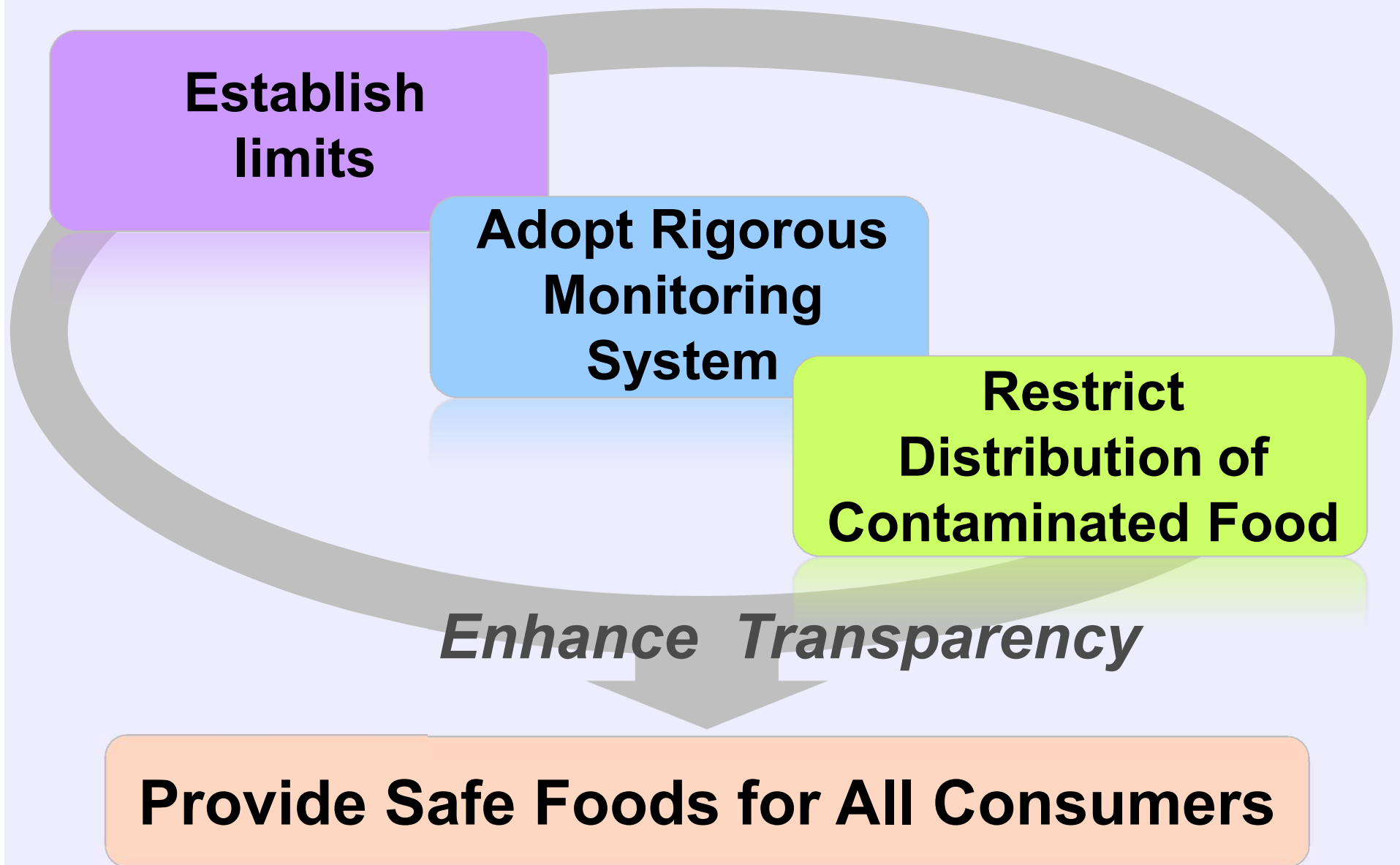
Radioactive materials in foods

-current situation and protective measures-

Department of Environmental Health and Food Safety
Pharmaceutical Safety and Environmental Health Bureau
Ministry of Health, Labour and Welfare



■ MHLW's Four Actions for Safety



■ Control of radioactive materials in foods

■ Establish limits for radioactive materials in foods

- The indicator values given by the Nuclear Safety Commission were set as the provisional regulation values. (March 17, 2011 - March 31, 2012)
- The present limits for radioactive materials in foods took effect. (April 1, 2012 -)



■ Monitor radioactive materials in foods

- The monitoring is conducted by the local governments around the 17 prefectures. (March 18, 2011 -)
- The Nuclear Emergency Response Headquarters established guidelines on the local governments' formulation of monitoring plans for radioactive materials in foods. (April 4, 2011)



■ Recall and dispose of foods containing radioactive materials above the limits

All the articles in a lot in which the levels are exceeded are recalled or disposed of.

■ Restrict the distribution of foods [Nuclear Emergency Response Headquarters]

Distribution is restricted on a prefecture basis (or a smaller area basis in a prefecture), judging from the spreading of places where radioactive materials above the limits are detected as a result of inspections. (March 21, 2011-)



■ Lift restrictions [Nuclear Emergency Response Headquarters]

Every testing result from samples collected within the past one month from at least three different locations in a municipality must be below the corresponding limits.

■ Concept of the Japanese limits

**1 mSv
/year**

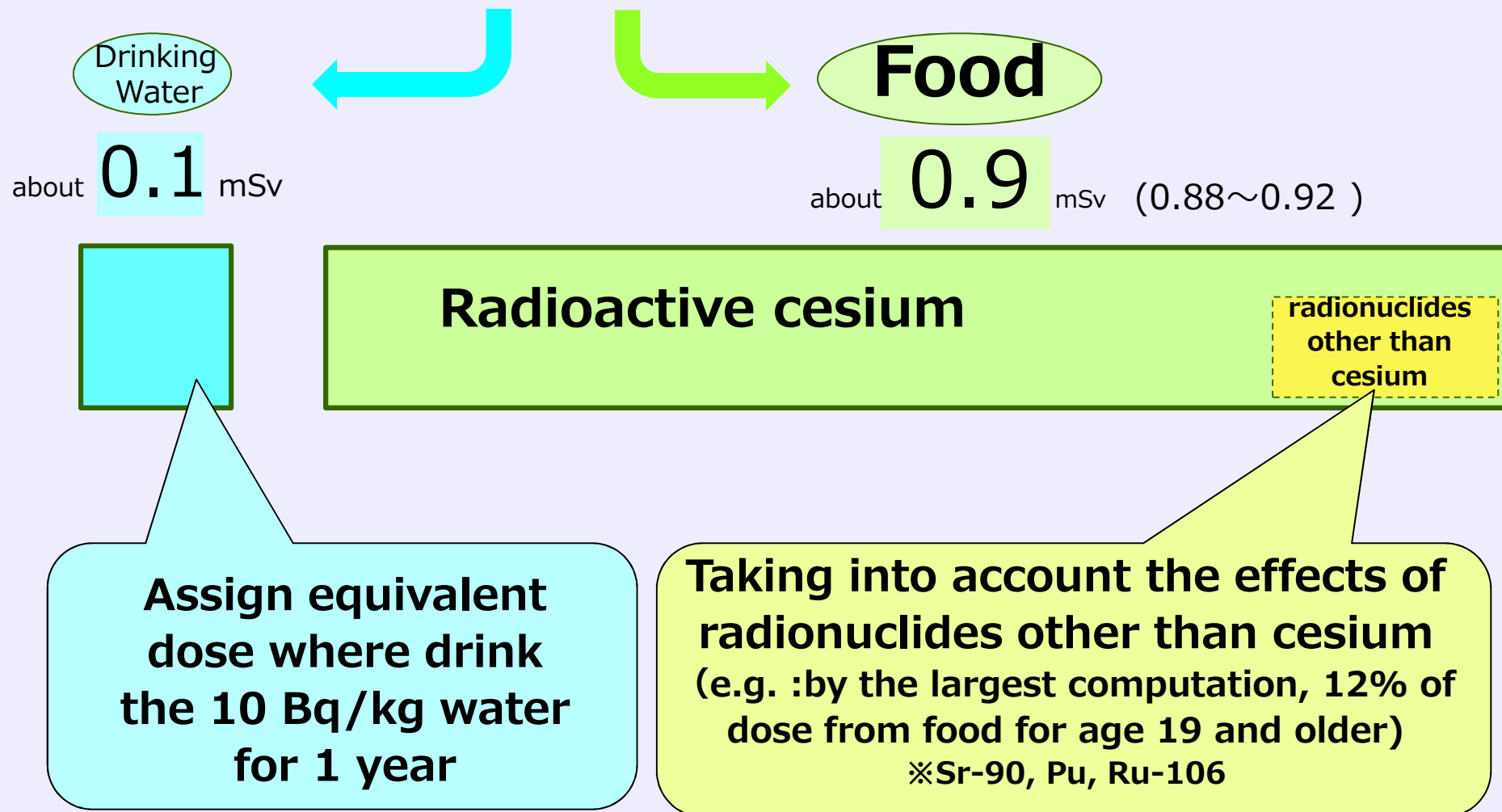
Category	Limit
Drinking water	10
Milk	50
General Foods	100
Infant Foods	50

(Bq/kg)

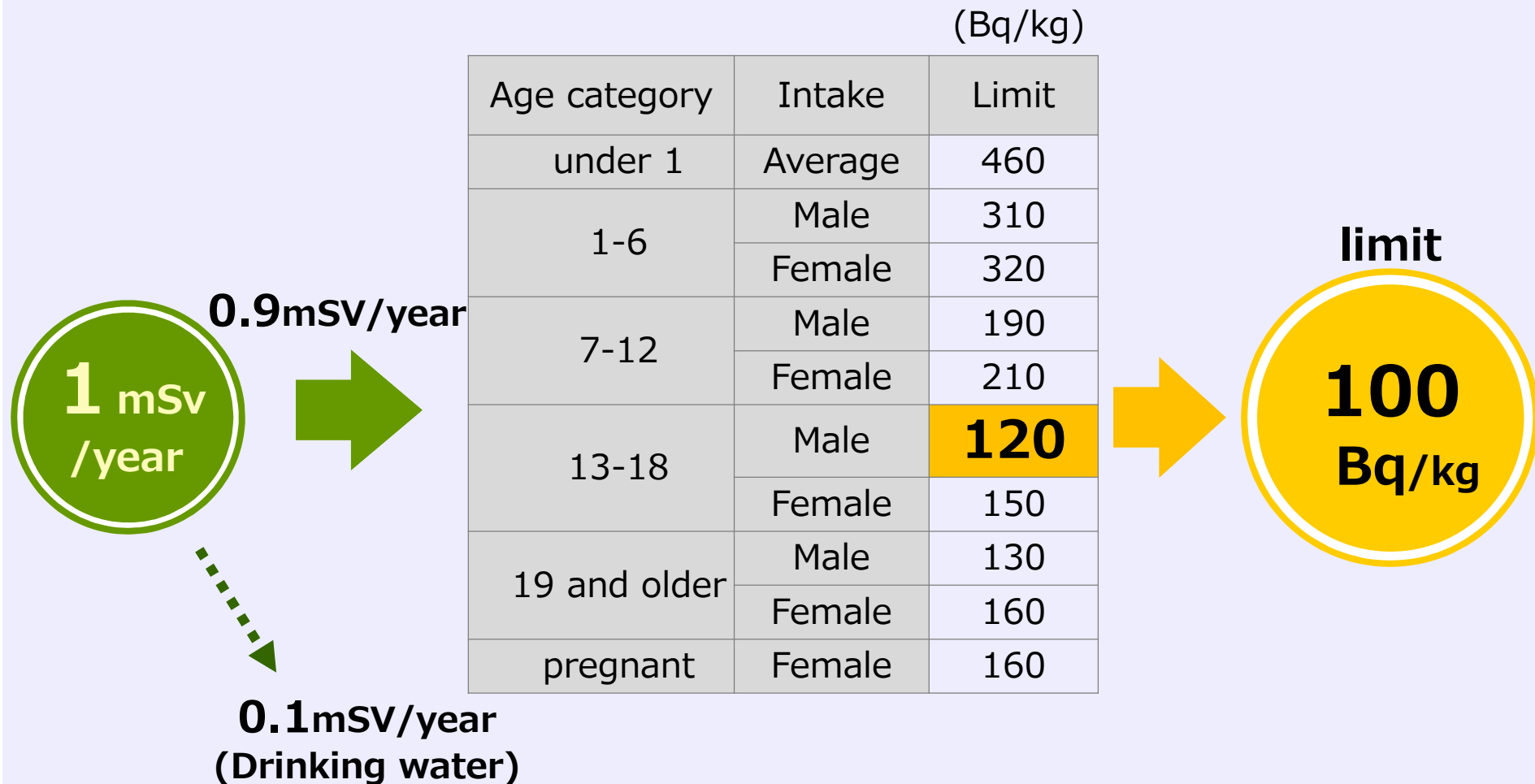
- ◆ **The limits are based on 1 mSv in a year consistent with an intervention exemption level adopted by codex**
- ◆ **The limits are based on more conservative assumption than codex**
 - Even if as much as 50% of the foods are contaminated at the limit value, effective dose of most vulnerable age group is expected to be below 1 mSv/year (the intervention level), including the exposure to strontium, etc.

■ The concept of radionuclides to be regulated

Dose limit of 1 year per person for the standard limits
1 mSv



■ The Concept of the limit for “General Foods”



Calculate limit values, taking into consideration the intake and conversion coefficient according to age category.

■ The range of food categories

Food category	The reason to establish the limits	The range of foods
Drinking water	<ol style="list-style-type: none"> 1 Water is essential for human life and there is no substitution for water, and its consumption is large. 2 WHO's guidance level for radioactive cesium in drinking water is 10Bq/kg. 3 Strict management is possible for the radionuclides in tap water. 	<ul style="list-style-type: none"> ○ Drinking water, water used for cooking and tea drinks, which is substitute for water
Infant Foods	<ul style="list-style-type: none"> ○ The Food Safety Commission pointed out that "the susceptibility to radiation may be higher in childhood than in adulthood." 	<ul style="list-style-type: none"> ○ Foods approved to be labeled as "fit for infants" based on Article 26 Paragraph 1 of the Health Promotion Law ○ Foods and drinks sold as intended for infants
Milk	<ol style="list-style-type: none"> 1 Children consume a lot. 2 Food Safety Commission pointed out that "a susceptibility to radiation may be higher in childhood than in adulthood." 	<ul style="list-style-type: none"> ○ "Milk" and "milk drinks" refers to products specified in Article 2 Paragraph 1 and 40 of the Ministerial Ordinance concerning Compositional Standards Etc. for Milk and Milk Products.
General Foods	<p>For the following reasons, foods other than given above are categorized as "General Foods"</p> <ol style="list-style-type: none"> 1 It is possible to make the influence of individual differences in eating habits (deviation of the foods to be consumed) minimal. 2 Regulation intelligible for people 3 Consistency with international views, such as these of Codex Alimentarius Commission 	<ul style="list-style-type: none"> ○ Foods other than given above

■ The concept of radionuclides to be regulated (1)

Standard limits set the radioactive cesium as an indicator

- Targets to be regulated are all radionuclides based on the evaluation of the Nuclear and Industrial Safety Agency as substances emitted by the Fukushima nuclear power plant accident, and whose half-life is over 1 year.

Regulated Radionuclides	Physical Half-life		
Cs-134	2.1years	Sr-90	29years
Cs-137	30years	Pu	14years or more
		Ru-106	374days

Note: The limits are not established for radioactive Iodine, which has a short half-life (8 days) and has been no longer detected, and for Uranium, whose level is almost the same in the nuclear power plant site as in the natural environment.

- Because radionuclides other than Cs-134 and Cs-137 require a longer time for measurement, the limits for radioactive cesium are established for effective dose of radionuclides (including Sr-90, Ru-106, Pu) not to exceed 1 mSv/year.

■ The concept of radionuclides to be regulated (2)

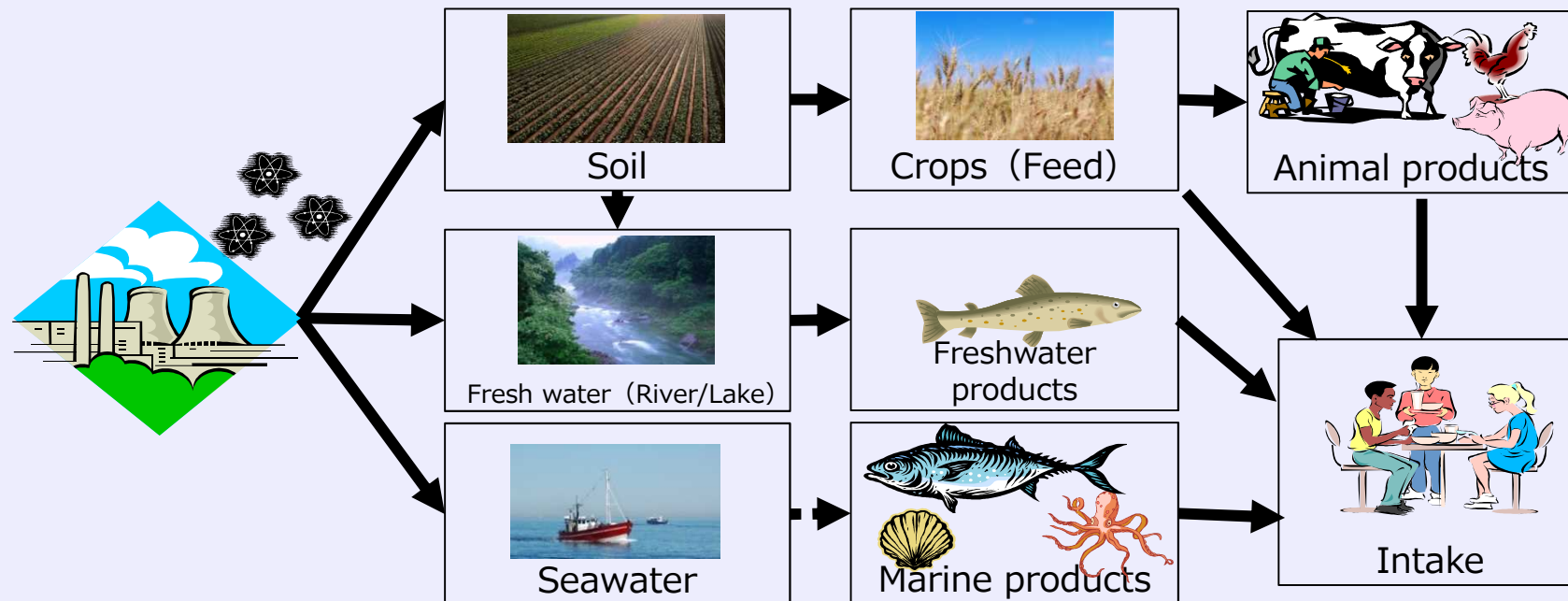
● The concept for establishment of the limits

The limits for radioactive cesium are established for effective dose of radionuclides (including Sr-90, Ru-106, Pu) not to exceed 1mSv/year.

Because radionuclides other than Cs-134 and Cs-137 require a longer time for measurement, following procedure is taken to establish the limits.

- Analyze the migration ratio of each radionuclide according to migration pathway, derive the contribution of radioactive cesium according to product and age categories, and establish the limits for radioactive cesium so that the sum of effective dose does not exceed 1mSv/year.

e.g.)The contribution of radionuclides other than radioactive cesium is about 12% (in case of people aged 19 and older)

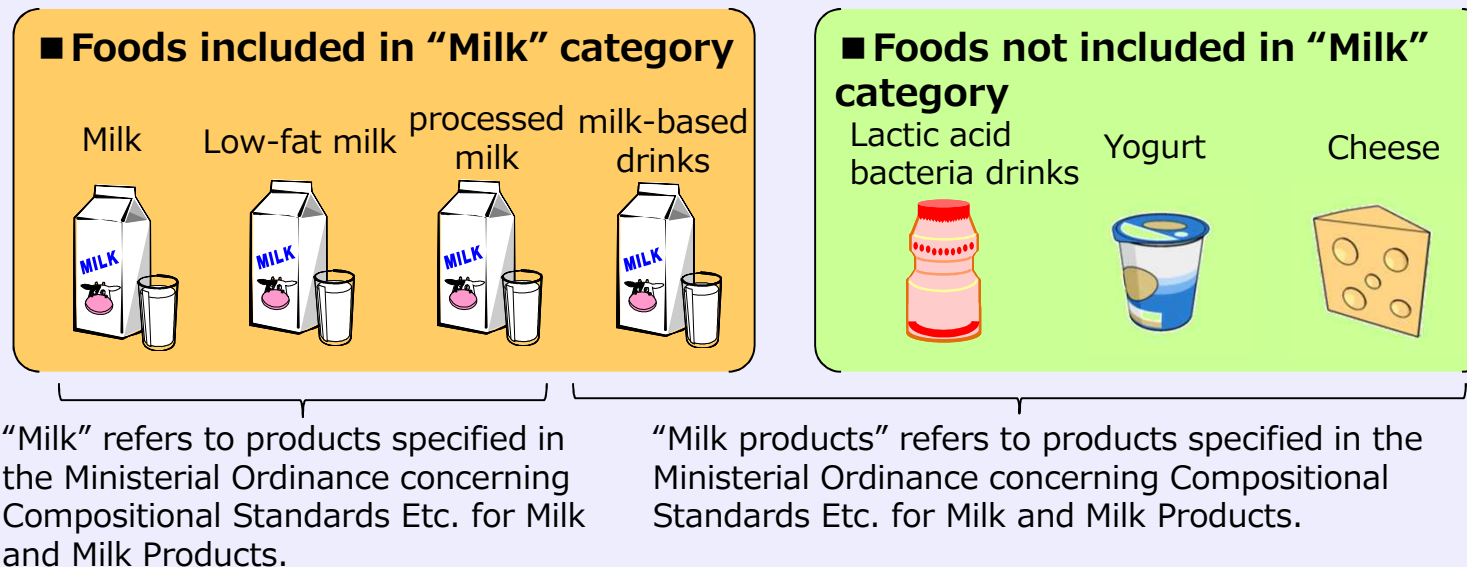


■ The range of “Milk” and limits for “Milk” and “Infant Foods”

<Foods included in “Milk” category>

The “Milk” category covers milk and milk drinks.

Milk drinks are drink products which are made mainly of milk as the main ingredient, and they include those which are recognized by consumers as similar kinds of drinks to milk and processed milk.



- Since “Milk” and “Infant foods” are categories provided in consideration for children, the limit for them is established as a level that is not affected even if all of the marketed foods are contaminated.

→ “50 Bq/kg” which is half of the limit for “General foods”(100Bq/kg) applies to “Milk” and “Infant foods”.

Application of the limits to foods manufactured/processed

● Basic Concept

In principle, processed foods are subject to the limit for “General foods”. The limit applies to the various stages of products on a case by case basis, for example, to the finished products or raw materials. For the foods given in 1 and 2 below, the limit applies to products in a ready-to-eat state based on the view of Codex Commission.

1 Dry foods that are intended to be consumed in a reconstituted state, such as dried products of mushrooms, seaweeds, fish & shellfish and vegetables etc.

→ The limit for “General foods” applies to raw materials (in a natural state) and reconstituted products.

Notes: For foods that are intended to be consumed in a dried state, such as *nori*(dried laver), *niboshi*(dried sardines), dried cuttlefish, raisin, etc., the limit for “General foods” applies to ingredients (in a natural state) and finished products (in a dry state).

2 Foods that are consumed after brewing process, such as tea leaves, and foods that are produced through extraction process, such as vegetable oils, like rice oil.

→ There is a big difference in form between raw materials and finished products before consumption. The limit applies not to raw materials but to finished products. For tea leaves, the limit for “Drinking water” applies to a liquid extract obtained after brewing process. For edible oils, which are obtained through extraction from rice bran or oil seeds, the limit for “General foods” applies to oil as finished product.

■ Concepts of Inspection Plan for Radioactive Materials in Foods (1)

Formulation by The Nuclear Emergency Response Headquarters (Latest Revision: 2015/3/20)

Government sets the guideline of monitoring plan, including items subject to inspection and frequency of inspections. The inspections are implemented by local governments and focused on items especially in which higher level of radioactive cesium might be detected.

Instructed based on the detected levels of radionuclides previous fiscal year

- Local governments subject to inspections
- Items subjected to inspections as follows;
 - Food items from which radioactive cesium above the limits has been detected (e.g.: mushrooms, wild plants, birds and animals)
 - Items that are greatly influenced by the management of feeding (e.g.: milk, beef)
 - Fishery products
 - Food items that the restriction of distribution was cancelled since management system are settled
 - Foods distributed in the market
- The designation of municipalities subject to inspection
- The frequency of inspections
 - ⇒ *Inspection Plan of each local government is designed according to actual situation such as level of detections, amounts of production, and seasons of shipment.*

http://www.mhlw.go.jp/english/topics/2011eq/dl/food_revision_20_March_2015.pdf

■ Rigorous Monitoring System of Radionuclides in Foods

- ① Nuclides analysis by using germanium semiconductor detectors.
- ② Screening analysis by using NaI scintillation spectrometers and other instruments

Shredding

Weighing

Measurement

Analysis



■ Restriction of Distribution and/or Consumption of Foods

Order by Act on Special Measures Concerning Nuclear Emergency Preparedness

“Restriction of Distribution”

When areas producing the items exceeding the limits have been spread out, relevant areas and items become subject to restriction.

“Restriction of Consumption”

When significantly high level of concentration is detected in items, the restriction of consumption is immediately established.

■ The requirements for establishing items and areas of restriction

- When it is considered that areas producing the items exceeding the limits have been spread out, relevant areas and items become to restriction.
- Unit of Restriction is prefecture basis. Prefectures can be divided into multiple number of areas if they can be administered by prefectures and municipalities.

■ The requirements for cancellation of restriction

- Based on the application of the relevant prefecture.
- Prefectures can be divided into a multiple zones, in the light of the actual situations of the shipments of the items.
- As a general rule, the results of radioactive cesium inspections conducted at 3 or more locations per municipality within the last month must all fall below the limits.



※ Monitoring of radioactive materials in food are mainly carried out before shipment. Most of the food items exceeding the limits are derived from areas where restrictions of distribution have been instructed.

■ Monitoring of radioactive materials in foods

The monitoring of radioactive materials in foods is conducted by the local governments around the 17 prefectures on the basis of the inspection plan.

March 18, 2011 – March 31, 2012

137,037 of which 1,204 were detected as above the provisional regulation values.

(violation rate:0.88%)

April 1, 2012 – March 31, 2013

278,275 of which 2,372 were detected as above the present limits.

(violation rate:0.85%)

April 1, 2013 – March 31, 2014

335,860 of which 1,025 were detected as above the present limits.

(violation rate:0.31%)

April 1, 2014 – March 31, 2015

314,216 of which 565 were detected as above the present limits.

(violation rate:0.18%)

April 1, 2015 – March 31, 2016

340,311 of which 291 were detected as above the present limits.

(violation rate:0.09%)

April 1, 2016 – March 31, 2017

322,563 of which 461 were detected as above the present limits.

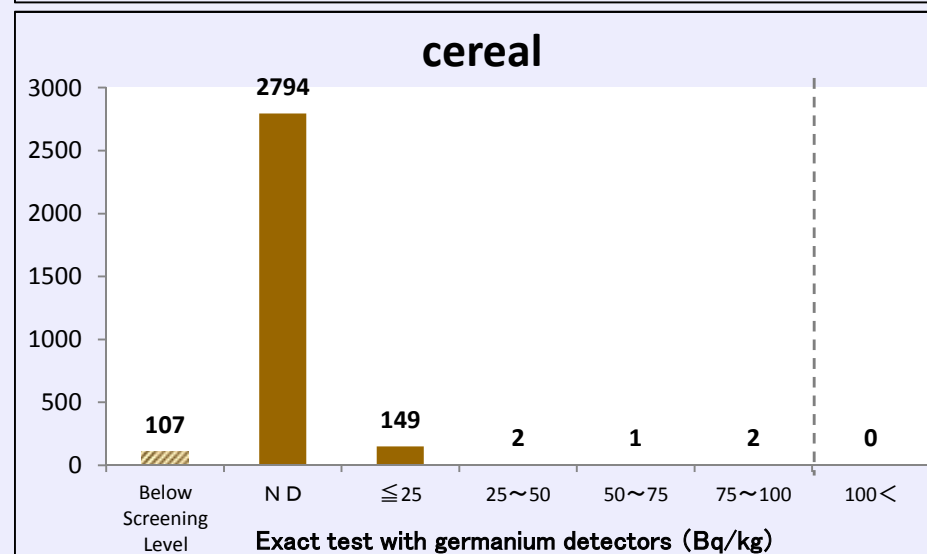
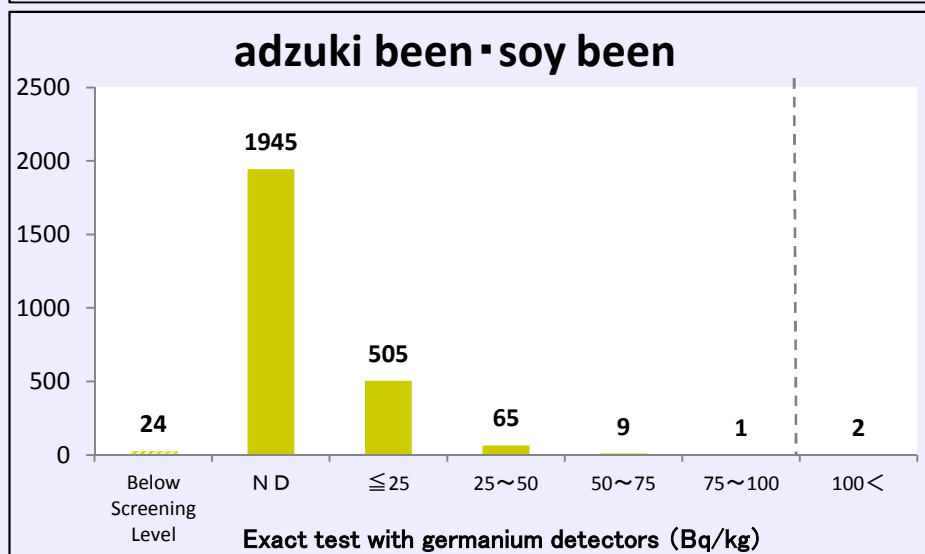
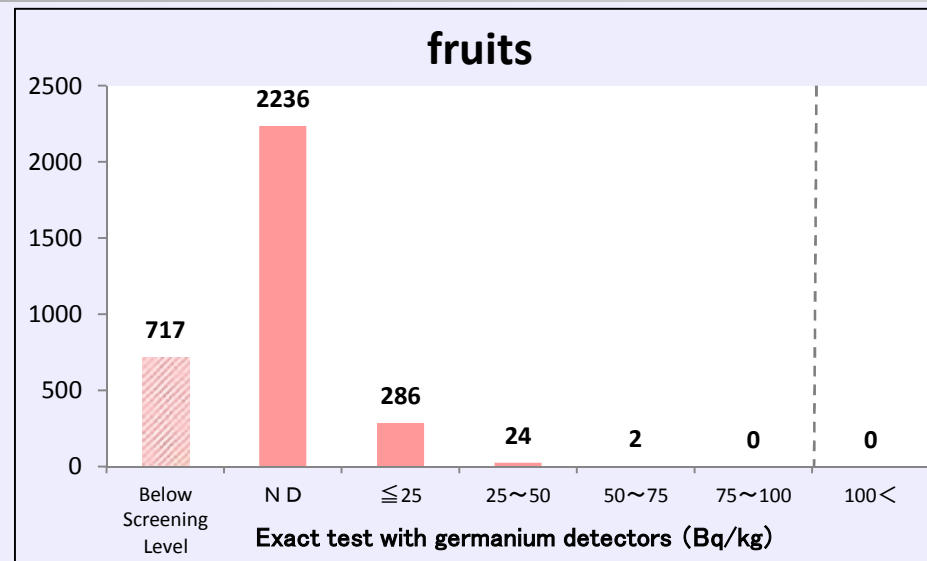
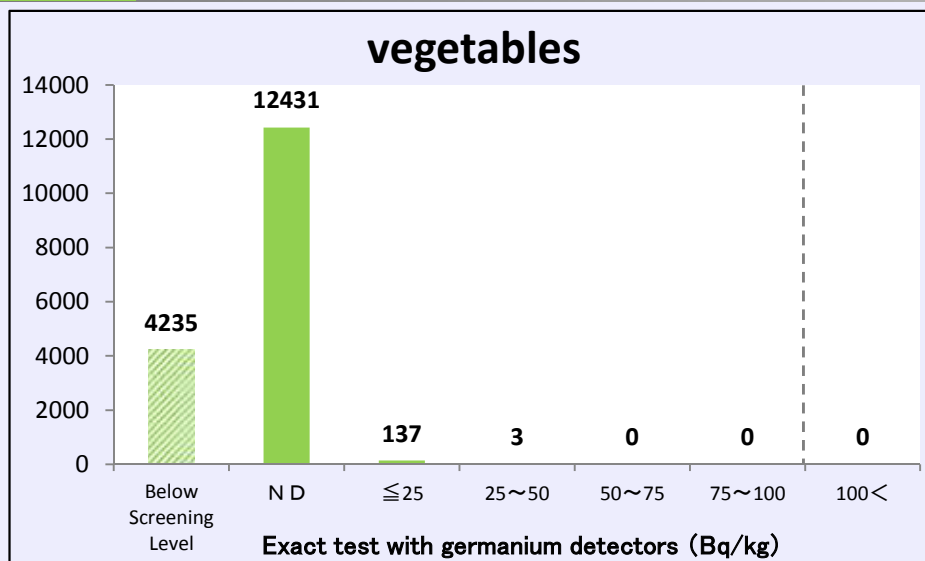
(violation rate:0.14%)

※The number of food samples tested includes test results of foods distributed in the market and test results implemented by the local governments other than the 17 prefectures designated by the guideline.



■ Number of samples in monitoring of radioactive Cesium in foods

(2014.4~2015.3) (1)

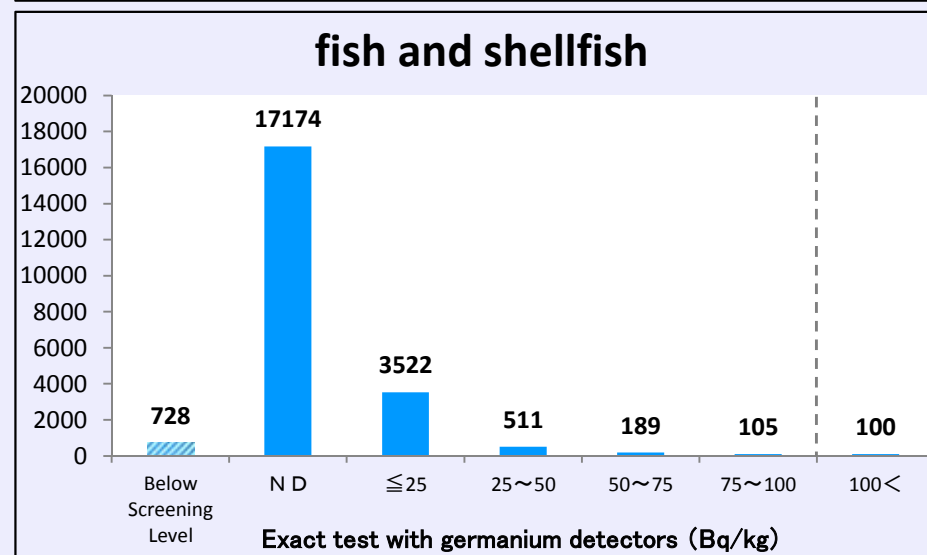
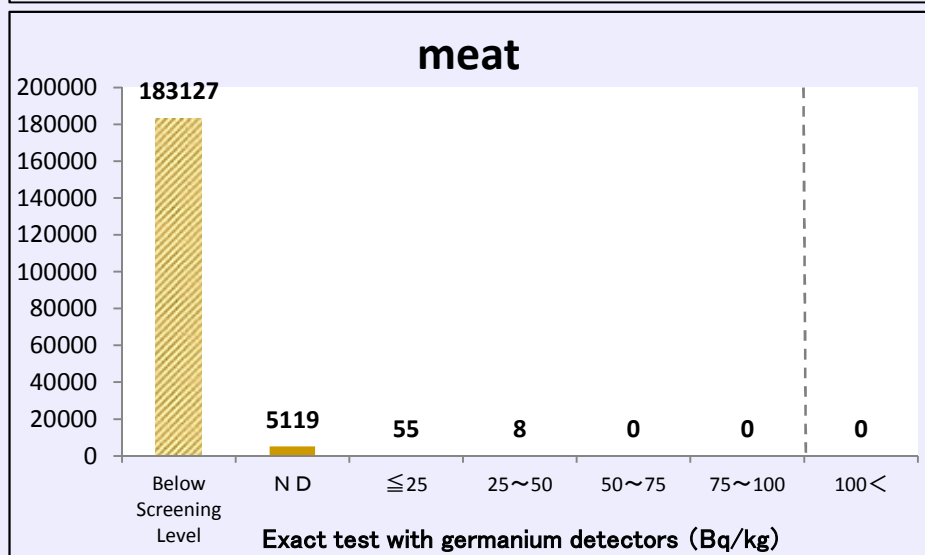
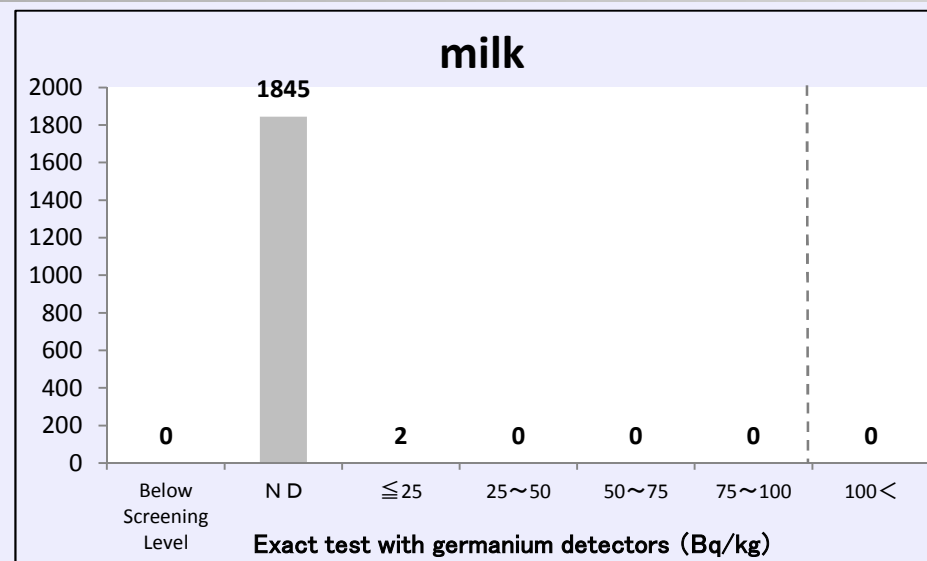
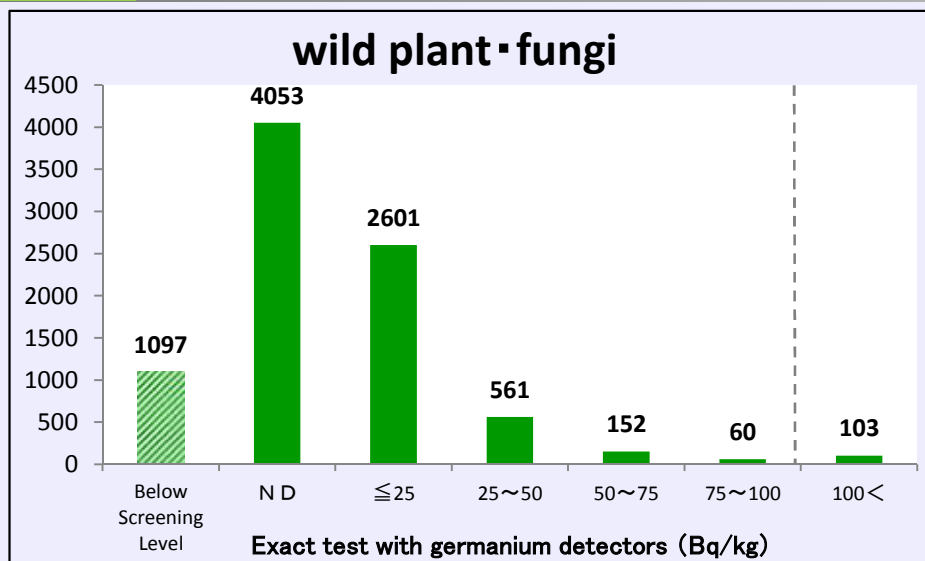


* Monitoring of radioactive materials in food are mainly carried out before shipment.
 Most of the food items exceeding the limits are derived from areas where restrictions of distribution have been instructed.
 The lot of testing item, which exceeds the limits, is treated as violation of Food Sanitation Act.



■ Number of samples in monitoring of radioactive Cesium in foods

(2014.4~2015.3) (2)

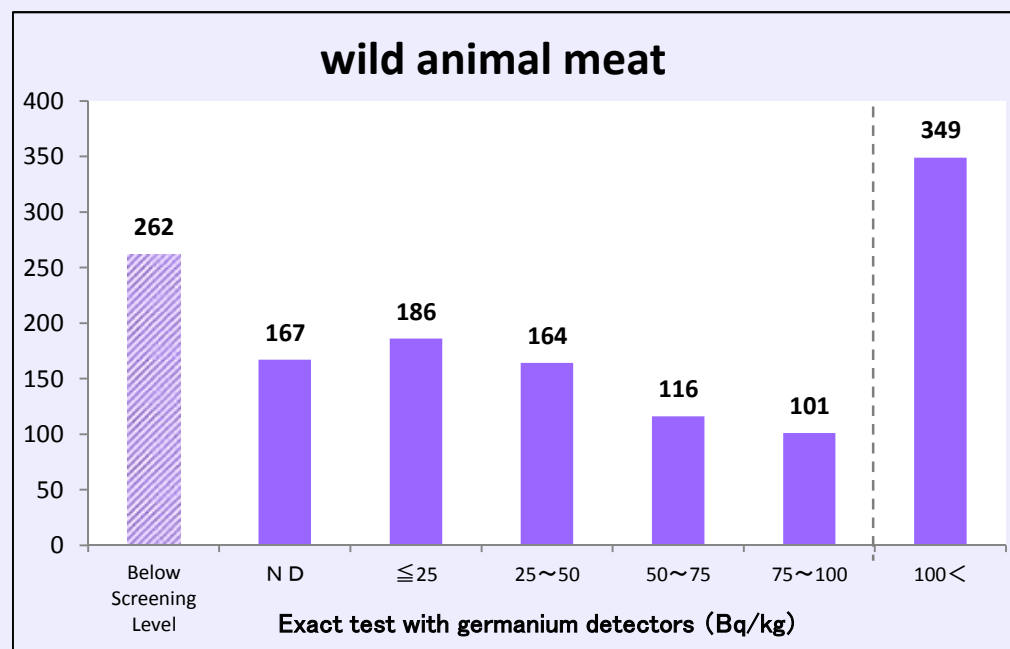


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■ Number of samples in monitoring of radioactive Cesium in foods

(2014.4~2015.3) (3)

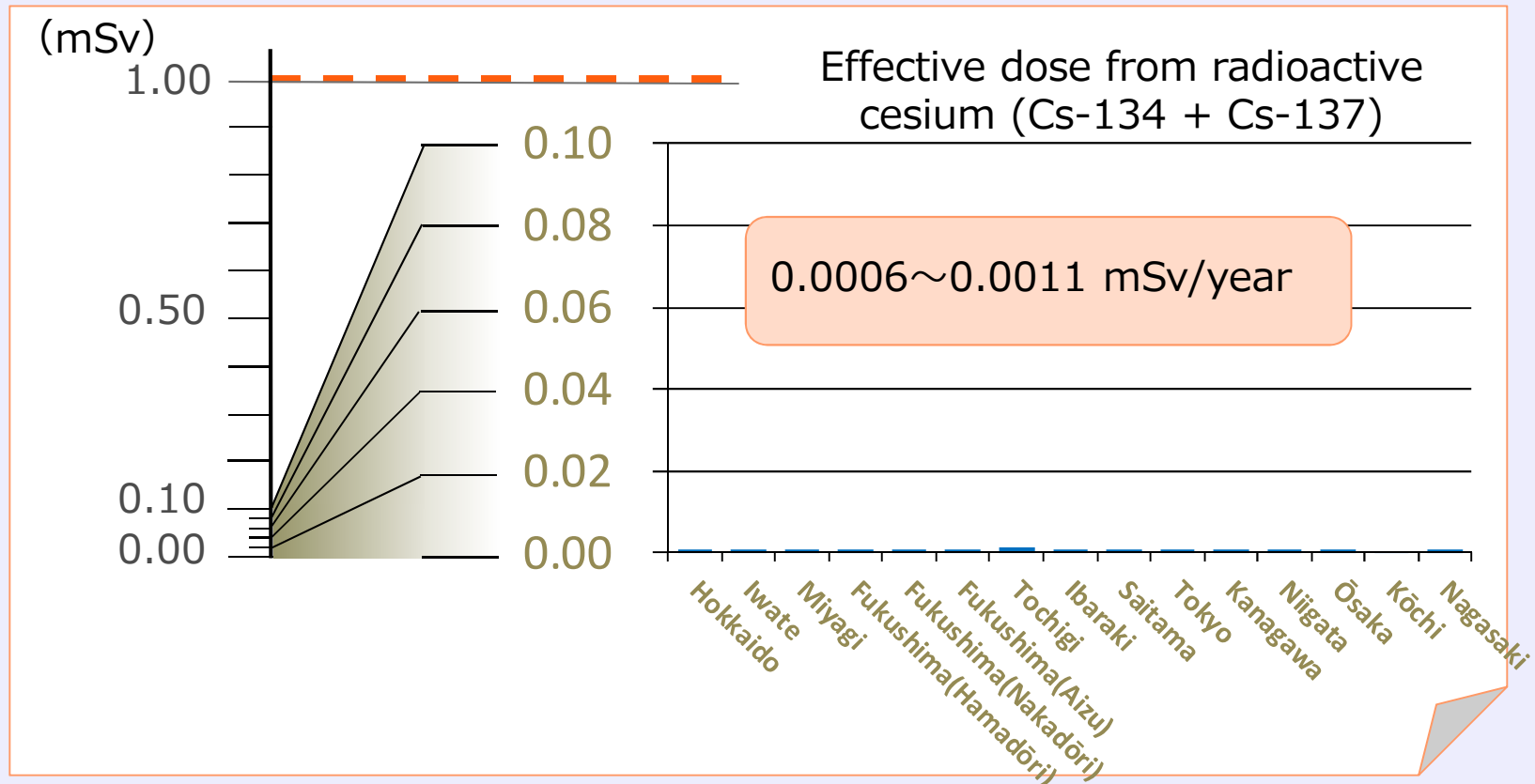


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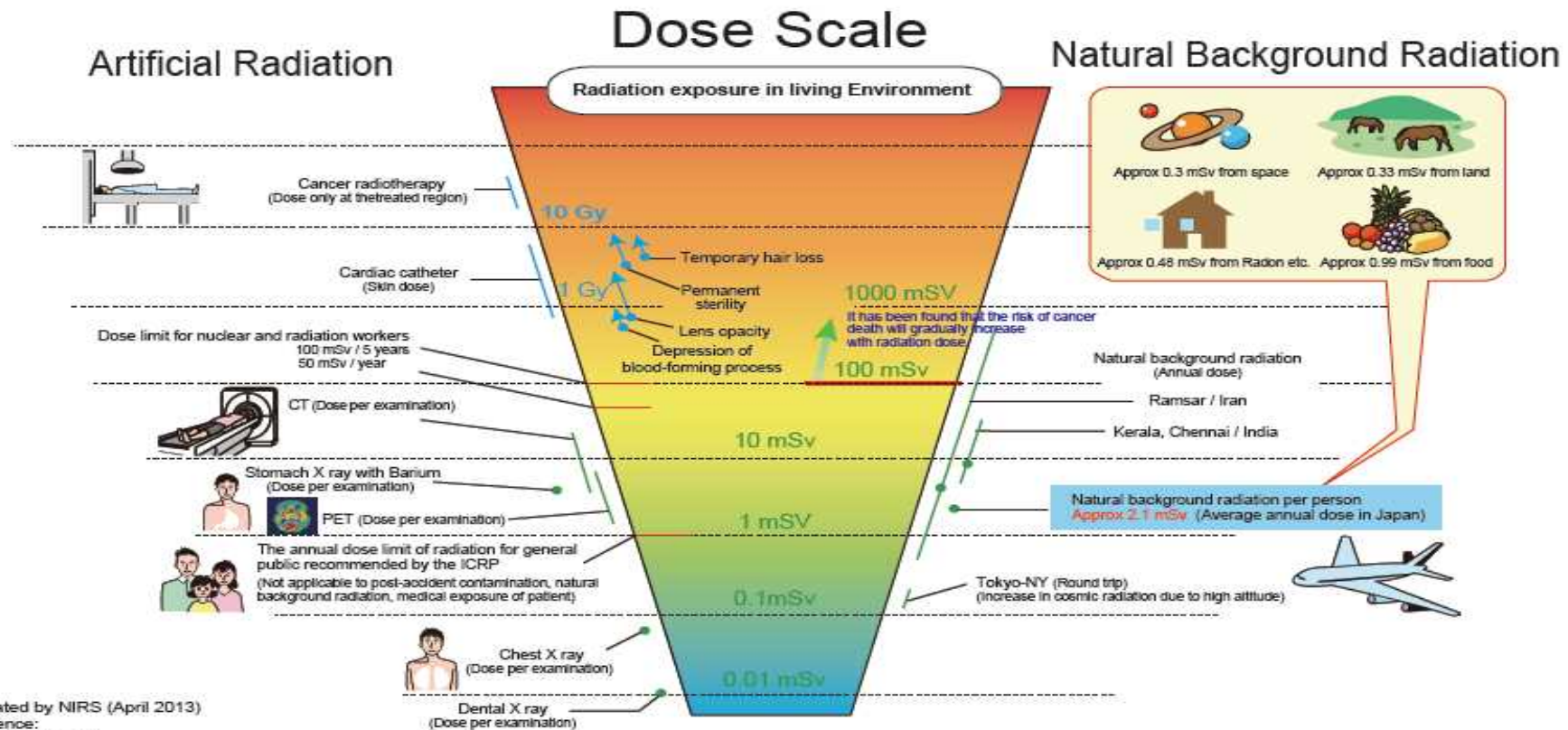
■ Estimations of effective dose from radioactive materials in foods

- The Ministry of Health, Labour and Welfare (MHLW) surveyed the dietary intake of radionuclides in 15 areas across Japan in the February–March 2016 period and estimated the annual effective doses from radioactive materials derived from standard meals.
 - ※ Foods were purchased in 15 areas in Japan including three areas in Fukushima Prefecture. Local grown products were selected, wherever possible.



The annual effective doses from radioactive cesium in foods were less than 1 % of 1 mSv/year as the basis of setting of the current limits in this study.

Natural Background Radiation



Illustrated by NIRS (April 2013)

Reference:

- UNSCEAR 2008.
- ICRP 2007 Recommendations.
- The Guidelines for Medical Exposure by Japan Association of Radiological Technologists.
- Radiation in the living environment, new version. (Radiation Safety Research Association, 2011) etc.

[Note]

1. The numerical values are approximate figures based on significant digits.
2. The scales shown by the dotted lines are a logarithmic display. Each step up on the scale represents ten times more than the previous step.
3. This chart is subject to revision without notice.

Reference:



National Institute of Radiological Sciences, Japan

<http://www.nirs.go.jp>

Ver.130502

Compared with natural background radiation, additional radioactive cesium from the accident is quite small.



■ Enhancing Transparency

○ Information dissemination on MHLW website

The website are revised and updated materials that summarize the new limits and FAQ are posted for media and consumers. All testing results of radioactive materials in foods of local governments are reported immediately to MHLW, and they are also available on this website:

JP http://www.mhlw.go.jp/shinsai_jouhou/shokuhin.html

EN http://www.mhlw.go.jp/english/topics/2011eq/index_food.html



○ Dialogues with consumers and producers, etc. (Risk communication)

Informal meetings about radioactive materials in foods were held in cooperation with the Consumer Affairs Agency, Food Safety Commission of the Cabinet Office, MAFF and local governments across the country. Consumers, producers, academics, and other interested parties are participated in and share information and their concern.

