§6. Validity of the Limits for Radionuclides in Foods, Japan - From the Aspect of Tritium

Iwaoka, K. (Hirosaki Univ.)

## 1. Introduction

In April 2012, the current limits in Japan on the radionuclide contamination of food were established to mitigate the internal exposure of the general public to radiation from ingestion of contaminated food due to the TEPCO Fukushima Daiichi Nuclear Power Plant (FDNPP) accident<sup>1,2)</sup>. The current limits for radioactive cesium (sum of Cs-134 and Cs-137) are established for effective dose of radionuclides (Cs-134, Cs-137, Sr-90, Ru-106, and Pu). However, since the current limits were established on the basis of monitoring data on 2011, amount of released radionuclides, and typical values of transfer factor of each radionuclide according to the transfer pathway from its origin to human consumption, it is necessary to confirm whether the current limits also are suitable under present circumstances.

In this study, we focused on exposure to tritium and checked the validity of the current limits by using recent monitoring data on tritium concentrations in the FDNPP harbor.

## 2. Materials and methods

The activity concentration of radioactive cesium in food, which is derived by using food intake rates and dose coefficients for 13-18 years old males and a permissible dose for food ingestion (1mSv/y), is 120 Bq/kg, which is the lowest of all generations. On the basis of this lowest value, 100Bq/kg is adopted as the current limit considering the safety margin. Therefore, the current limit has an extra dose for safety margin. The validity of the current limits were carried out by comparing the extra dose with the ingestion dose of food contaminated with tritium.

## 3. Results and discussion

The extra dose for safety margin in one year after the FDNPP accidents was calculated to be 0.2mSv/y. Since the tritium concentration of seawater in October, 2014 of the FDNPP harbor was 32000 Bq/L (maximum value at that time), the tritium concentration of fish living in the FDNPP harbor was assumed to be 32000 Bq/kg on the safe side. The dose due to daily ingestion of its fish was calculated to be 0.055mSv/y, which was below the extra dose for safety margin (0.2 mSv/y). The dose of food ingestion including contributions of tritium will not exceed 1mSv/y (permissible dose for food ingestion) as long as regulatory controls are carried out using the current limits of radioactive cesium (Fig.1).

Iwaoka, K.: Clean Technology 23 (2012) 40. (in Japanese)
Iwaoka, K.: Food sanitation research 63 (2012) 29. (in

2) Iwaoka, K.: Food sanitation research **63** (2012) 29. (in Japanese)

0.8	3mSv
-----	------

0.2mSv

Cs, Sr, Ru, Pu	ЗН
Dose by taking food contaminated with the concentrations of the current limits	Dose for safety margin

Fig.1. Breakdown for 1mSv/y on the current limits