

Food Safety in Japan: One Year after the Nuclear Disaster 日本における食品安全性—一原発事故より一年

Martin J. Frid

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The issue of food safety in the wake of 3.11 remains the subject of deep concern in Japan and abroad. In this article consumer policy specialist Martin J. Frid examines the question of risk in light of international standards on radiation. The Asia-Pacific Journal welcomes further discussion of radiation risk in food and all other realms. APJ

As we approach the one-year anniversary of the March 11, 2011 earthquake, tsunami and nuclear disaster, what can be said about Japan's food safety? Clearly, the issue continues to worry many people. Having worked in the field of consumer policy for over 15 years, I understand that contamination by radioactive substances is terrifying because it cannot be tasted, smelled or seen. Immediately after an accident like Chernobyl or Fukushima, many people are exposed to radioactivity through the air or by touching items that have been contaminated.



Minami Sanriku pharmacy after 3.11 (all photos by Martin Frid)

Food is only one of several sources of internal exposure. But we have to eat, and drink to survive, thus food safety becomes a huge concern. As I noted in a previous article on food safety¹, the first test results after March 11, 2011 showed very high levels of radioactive substances on crops that were growing outdoors on fields, including spinach and bamboo shoots. Other foods were also tested, and it became clear that crops were seriously contaminated in certain areas around the nuclear reactors that had been damaged.

Such foods were not put on sale, and farmers and local authorities struggled to figure out what to do next. The government set a provisional regulation limit of 500 Bq/kg and mandated that food that had levels below the limits could be sold. While there was criticism² that the limits were too high, that is, that they allowed too much contamination, the key was that they were provisional. New, much stricter

limits of 100 Bq/kg were announced in December, and will be implemented from April 1, 2012³.

What is interesting to a food safety expert is the actual data showing the contamination levels consumers face. Anything else is speculation, and of course there is a lot of that after such a huge disaster. The data from actual measurements done in Japan with state-of-the-art detectors over the past 12 months present a very interesting picture.

Starting with Fukushima prefecture, 19,929 food items had been measured as of March 9, 2012. Out of these, only 683 were found to be contaminated at levels exceeding the provisional limits (500 Bq/kg). That includes 302 types of vegetables (including spinach and bamboo shoots), 206 fishery products, 18 milk products (raw milk) 151 meat products (including 84 cases of boar meat and 59 cases of beef). Only 3.4% of all the food samples that have been produced and carefully tested in Fukushima during the year since the nuclear disaster show levels above the safety standard.

For the entire country, over 120,000 food products have been tested, and the total number of cases that exceeded the limit was 1,162 or just below 1%. Thus, looking at these numbers we realize that the food contamination situation could have been a lot worse!

Fig. 1 list all prefectures in which contaminated food has been found:

Prefecture	Number of food samples tested	Number of foods at high levels
Fukushima	19,929	683
Ibaraki	11,949	85
Tochigi	10,376	75
Gunma	10,366	26
Saltama	3,345	127
Chiba	3,033	32
Tokyo	475	7

Kanagawa	942	21
Nagano	6,083	1
Iwate	7,930	30
Miyagi	12,551	61
Akita	1,656	2
Yamagata	11,477	2
Shizuoka	1,376	10
Total	114,488	1,162

Fig. 1: List of prefectures where food samples contaminated at levels above 500 Bq/kg have been found between March 19, 2011 and March 6, 2012. Source: Ministry of Health, Labour and Welfare⁴.

Out of 43 prefectures in Japan, contaminated food samples above the 500 Bq/kg limit have been found in the above 14 prefectures. For the rest of the country, or 29 prefectures, the situation is even better.

It would be interesting to analyze the levels of all 120,000 food samples and calculate the number of contaminated samples using the new more demanding 100 Bq/kg standard. But that is beyond the scope of this article.

It is worth noting that most of these food samples fall into four categories, which helps us understand the situation in Japan. First, there are the vegetables that were growing outdoors, such as spinach, bamboo shoots and mushrooms, which were contaminated by airborne particles emitted directly after the hydrogen explosions in March 2011. The second category is the beef and meat products, as well as milk, which were contaminated due to cattle being fed hay and straw that had been contaminated at that early stage. The third category is the tea, for which it is thought that the same airborne particles led to the contamination (even though it may seem strange that they would reach all the way to Shizuoka prefecture). Finally, the fourth category is fish caught either in rivers and lakes in Fukushima prefecture, where

contamination is high, or in the Pacific Ocean along the Tohoku coast, especially near Fukushima prefecture.



Pacific coast of Japan

This suggests that unless there are new hydrogen explosions at the Fukushima Daiichi Nuclear Plant, it is not likely that food grown from now on will be highly contaminated, or at least the number of such cases will be very limited. While that is reassuring, it is important that radiation measurements not be discontinued. This is especially the case in the prefectures where there has been contamination of the same types of food samples.

With the new, more stringent safety standard in place from April 1, 2012, the likelihood is that media will draw attention to the food safety issue. However, even if the new standard limit of 100 Bq/kg had been used since March 11, 2011 rather than the provisional 500 Bq/kg limit, it would not have made a large difference except in the initial period. Most important, one year after the disaster, the number of samples that are found to be highly contaminated has decreased, in most cases dramatically.

Fig. 2 shows the ratio of levels above 500 Bq/kg in some food samples in Fukushima prefecture during 2011:

	March-June	July-September	October-November
Vegetables	10.5%	0%	3%
Fruits	5.9%	0.8%	1.2%
Milk	0%	0%	0%
Beef	2.1%	4.8%	0.1%

Fig. 2: Ratio of excesses over the standard limit for radioactive cesium in monitoring tests. Source: Ministry of Health, Labour and Welfare.⁵

Fig. 3 shows the ratio of levels above 100 Bq/kg in the same food samples in Fukushima prefecture during 2011:

	March-June	July-September	October-November
Vegetables	20.4%	0.4%	1.2%
Fruits	37.8%	6.2%	10.0%
Milk	1.4%	0%	0%
Beef	27.7%	10.5%	1.1%

Fig. 3: Ratio of excesses over the standard limit for radioactive cesium in monitoring tests. Source: Ministry of Health, Labour and Welfare.⁵

Fig. 3 applies the new more rigorous safety standard that takes effect in April 2012. The data show the sharp drop in contamination after the initial three month period for vegetables, fruit, milk and beef.

Safety standards or levels differ from country to country. Moreover, there are international guidelines set by the FAO/WHO Codex Alimentarius Commission, to facilitate and regulate trade. The safety standards vary for a number of reasons, including estimates of intake and food habits. Special consideration is supposed to be taken for infants and children which is relevant in the areas close to the damaged nuclear reactors.

Fig. 4 shows Japan's levels compared to levels in the US, EU, and Codex:

Drinking Water	Milk	General foodstuffs	Food items for babies

Japan (New limits from April 1, 2012)	10	50	100 (Including dairy products)	50
Japan (Provisional limits from March, 2011)	200	200 (Including dairy products)	500	200
United States	1,200	1,200	1,200	1,200
European Union	1,000	1,000	1,250	400
Codex	1,000	1,000	1,000	1,000

Fig. 4: Japanese and overseas limits on radioactive cesium in food. Unit: Bq/kg⁶.

The data show that from the start in the immediate aftermath of 3.11, Japan applied more rigorous standards than either the US, European Union or Codex, and these standards are to be made even more rigorous in April 2012.

If the more lenient standard levels used abroad were applied to the foods that have been sampled so far in Japan, a lot more contaminated products might have reached consumers. The most important finding, however, is that so few foods from Fukushima or other parts of Japan are contaminated by any of these standards. This is confirmed by independent testing, for example by Eden Foods, a company based in Michigan, US. They test all products they import from Japan, such as rice products, shiitake, kombu and wasabi. As of November 17, 2011, they had not detected any radioactive materials in foods imported from Japan⁷.

It is important that farmers and food producers with government support find ways to ensure that food products with high levels of radiation do not reach consumers. Rice, for example, cannot be grown in certain areas near the Fukushima Daiichi Nuclear Plant⁸.



Messages of support from volunteers

An initial assessment of the damages due to the massive tsunami on the farm and fishery sector reveals tremendous losses, with over 25,000 fishing boats destroyed along the coast. Agricultural land and facilities for food production were destroyed in 16 prefectures and the estimated cost (which will most likely increase) was 2,341 billion yen⁹.

A large issue that remains to be solved is the compensation that must be paid to all those farmers and others who are unable to market their food products. David McNeill notes¹⁰:

About 285 Farmers, hundreds of fishermen and small-mid-sized business people have also been compensated for loss of earnings. After bitter public criticism of its application procedure the utility says it has tripled the number of staff to explain how to apply, bringing a total of 7,000 people working in call centers, 14 local offices and company back offices. It says it has paid out a total of 291.7 billion yen so far and estimates the total cost over two years at 1 trillion, 700 billion yen.

For all the losses imposed by the 3.11 disaster, an extraordinary fact is that Japan enjoys high levels of food safety, and foods from Japan can continue to be appreciated at home and abroad, after continued careful testing.

Martin J. Frid, born in Sweden, works for Consumers Union of Japan. He is the author of the food guide book *Nippon no Shoku no Anzen 555* (Kodansha) published in 2009. He has participated in food safety meetings on the local, national, and international levels, including as an expert at FAO/WHO Codex Alimentarius Commission meetings. He currently resides in Saitama, Japan.

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Notes:

¹ Martin J. Frid, *Food Safety: Addressing Radiation in Japan's Northeast after 3.11*, *The Asia-Pacific Journal* Vol 9, Issue 31 No 3, August 1, 2011. [here](#)

² Food Safety Citizens Watch & Consumers Union of Japan, *Food Contaminated by Radioactive Substances*, March 24, 2011. [here](#)

³ Tsuyoshi Nakamura and Tomoko Koizumi / *Yomiuri Shimbun*, *New radiation limits alarm local entities*, December 25, 2011. [here](#)

⁴ MHLW, *Sum up of radionuclide test results*

carried out since 19 March 2011 (Up-to-date Report as of 19:00, 6 March 2012). [here](#)

⁵ MHLW, *New Standard limits for Radionuclides in Foods*, March 7, 2012. [here](#)

⁶ Tsuyoshi Nakamura and Tomoko Koizumi / *Yomiuri Shimbun*, *New radiation limits alarm local entities*, December 25, 2011. [here](#)

⁷ Eden Foods, *Eden Traditional Japanese Foods Nuclear Radiation Food Safety and Related Concerns*, Update November 21, 2011. [here](#)

⁸ Martin Fackler, "Japanese Struggle to Protect Their Food Supply," *New York Times* January 21, 2012. It is worth noting that even with the new rigorous 100 Bq/kg limits, fewer than 10% of the farms in the most severely affected region in Fukushima would be unable to ship their rice. [here](#)

⁹ MAFF, *The Damages caused by the Great East Japan Earthquake and Actions taken by Ministry of Agriculture, Forestry and Fisheries*, November 25, 2011. [here](#)

¹⁰ David McNeill, *The Fukushima Nuclear Crisis and the Fight for Compensation*, *The Asia-Pacific Journal*, Vol 10, issue 10, No 6, March 5, 2012. [here](#)