ISSN 0441-2516
NIRS-RSD-131

RADIOACTIVITY SURVEY DATA in Japan

Part 2
= Dietary Materials =

NUMBER 131
January 2002

National Institute of Radiological Sciences
Chiba, Japan

Radioactivity Survey Data in Japan Number 131

August 2001 part 2 = Dietary Materials =

Contents

Editted by National Institute of Radiological Sciences, under the supervision of Ministry of Education, Culture, Sports, Science and Technology of Japanese Government.

Environmental and Dietary Materials*

(Japan Chemical Analysis Center)

1. Collection and pretreatment of samples

(1) Rain and dry fallout

Rain and dry fallout was collected monthly on a sampling tray, approximately 5000cm^2 in area, which was filled with water to a depth of 1 cm at the beginning of every month.

Strontium and cesium carrier solutions were added after the sample was filtered. The tray was washed with 5ℓ of distilled water and the washing was combined to the filtrate.

The sample was passed through a cation exchange column (500mℓ of Dowex 50W X8, 50~100 mesh, Na form) at a rate flow of 80mℓ/min.

(2) Airborne dust

Airborne dust was collected by an electrostatic precipitator or a filter air sampler for every three-months at a rate of more than 3000m^3 per month.

The sampling was done 1 to 1.5 meters above the ground.

(3) Service water and freshwater

Service water, 100ℓ each, was collected at the intake of the water-treatment plant and at the tap after water was left running for five minutes. Strontium and cesium carriers were added to the filtered water sample. The subsequent process was the same as that described in the section (1). Freshwater was treated in the same way as the service water.

(4) Soil

Soil was collected from the location in the spacious and flat area without past surface disturbance caused by dust storms, inflow and out flow due to precipitation, etc.. Any places located under trees in a forest, in a stony area or inside of river banks were avoided. Soil was taken from two layers of different depths, 0-5cm and 5-20cm. The soil lumps were crushed by hands and dried in a drying oven regulated 105°C. The soil was then passed through a 2mm sieve to remove plant roots and pebbles.

(5) Sea water

Sea water was collected at the fixed stations where the effect of terrestrial fresh water from rivers was expected to be negligibly small. A special consideration was also given to weather conditions.

The sampling was carried out when there was no rainfall for the last few days. To prevent contamination, water samples were collected at the bow of a sampling boat just before she stood still by scooping surface water using a polyethylene bucket.

Immediately after the collection, the samples were acidified to a pH lower than 3 by adding concentrated hydrochloric acid in a ratio of 1mℓ to 1ℓ of sea water, and then stored in 20ℓ polyethylene containers. The sampling equipments as well as containers were thoroughly rinsed with dilute hydrochloric acid and then with distilled water before use. Two hundred milliliters of sea water was also collected at the same stations for the determination of chlorinity.

(6) Sea sediments

Sediment was collected in the same area as that for the sea water sample, taking the following criteria into account:

a. The depth of water exceeds 1m at low tide.
b. No significant sedimental movement is observed in the vicinity of concern.
c. Mud, silt and fine sand are preferable.

A conventional sediment sampling device was used for collecting the top few centimeters of surface sediment. Approximately 4kg of the sample in wet weight was spread on a stainless steel dish after removed of the pebbles, shells and other foreign materials, and dried in a drying oven regulated at 105°C.

(7) Total diet

A full one day ordinary diet including three meals, water, tea and other in-between snacks for five persons was collected as a sample of "total diet".

The sample in a large stainless steel pan was carbonized carefully by direct application of gas flame, and was transferred to a porcelain dish and then ashed at 450°C in an electric muffle furnace.

(8) Rice

Polished rice was collected in producing districts at the harvest and in consuming areas when new crops were first put on sale. The sample was carbonized and ashed in a porcelain dish.

---

* Samples were sent to the Center from 46 contracted prefectures.

(9) Milk

Raw milk was collected in producing districts and commercial milk was purchased in consuming districts. Milk in a stainless steel pan or a porcelain dish was evaporated to dryness followed by carbonization and ashing.

(10) Vegetables

Spinach and Japanese radish were selected as the representatives for left vegetables and for nonstarch roots, respectively. After removing soil, the edible part of vegetable sample was dried and carbonized in a stainless steel pan or a porcelain dish.

(11) Tea

Five hundred grams of manufactured green tea was collected, carbonized and ashed in a stainless steel pan or a porcelain dish.

(12) Fish, shellfish and seaweeds

a. Sea fish and freshwater fish

Fish was rinsed with water and blotted with a filter paper. Only the edible part was used in case of larger sized fish, and the whole part was used in case of smaller ones. Each sample was weighed and placed in a stainless steel pan or a porcelain dish. After carbonized, the sample was ashed in an electric muffle furnace.

b. Shellfish

Approximately 4kg of shellfish including the shells was collected or purchased. After removing the shells, it was treated in the same way as that for the sea fish.

c. Seaweeds

Edible seaweeds were collected and rinsed with water to remove sand and other adhering matters on the surface. These were removed of excess water, weighed dried and ashed.

Table 1 shows details of sample collection.

Table 1 Details of sample collection

Sample	Frequency of sampling	Quantity of sample
=Environmental materials=		
(1) Rain and dry fallout		
1. For domestic program	monthly	
2. For WHO program	monthly	
(2) Airborne dust	quarterly	>3000 m^3/month
(3) Service water and freshwater		
1. Service water (source water)	semiyearly	100 ℓ
2. Service water (tap water)	semiyearly	100 ℓ
3. Freshwater	yearly (fishing season)	100 ℓ
(4) Soil		
1. 0～ 5 cm	yearly	4 kg
2. 5～ 20cm	yearly	4 kg
(5) Sea water	yearly	40 ℓ
(6) Sea sediments	yearly	4 kg
=Dietary materials=		
(7) Total diet	semiyearly	daily amount for 5 persons
(8) Rice		
1. Producing districts	yearly (harvesting season)	5 kg (polished rice)
2. Consuming districts	yearly (harvesting season)	5 kg (polished rice)
(9) Milk		
1. Producing districts for WHO program	quarterly (February, May, August and November)	3 ℓ
2. Producing districts for domestic program	semiyearly (February and August)	3 ℓ

Sample	Frequency of sampling	Quantity of sample
3. Consuming districts	semiyearly (February and August)	3 ℓ
4. Powdered milk	semiyearly (April and October)	2～ 3 kg
(10) Vegetables		
1. Producing districts	yearly (harvesting season)	4 kg
2. Consuming districts	yearly (harvesting season)	4 kg
(11) Tea	yearly (the first harvesting season)	500g (manufactured tea)
(12) Fish, shellfish and seaweeds		
1. Sea fish	yearly (fishing season)	4 kg
2. Freshwater fish	yearly (fishing season)	4 kg
3. Shellfish	yearly (fishing season)	4 kg
4. Seaweeds	yearly (fishing season)	2～ 3 kg

2. Preparation of samples for analysis

(1) Rain, service water and freshwater

Strontium and cesium were eluted with hydrochloric acid from the cation exchange column. The residue of rain sample on the filter paper was ashed in an electric muffle furnace and the ash was dissolved in hydrochloric acid. The insoluble part was filtered and washed. The filtrate and the washings were combined to the previous eluate and used for radiochemical analysis.

(2) Soil and Sea sediment

Dried soil was crushed to smaller ones than 0.25mm in size by a crusher. The sieved sample was ashed in an electric muffle furnace regulated at 450 °C. The sample was then heated with hydrochloric acid, strontium and cesium carrier solutions and the mixture was heated. The insoluble constituent was filtered off and washed with water.

The dried sample was crushed to smaller ones than 0.25mm by a crushing machine. The further preparation of the sample was the same as that described in the section 2-(2).

(3) Rice

The ashed sample was pulverized with a porcelain mortar and passed through a 0.35mm sieve. The sieved sample to which both strontium and cesium carriers were added, was digested with nitric acid by heating. After the sample was heated again with nitric acid to dryness, strontium and cesium were extracted with hydrochloric acid and water. The insoluble constituent was filtered and washed. The filtrate and washings were combined for subsequent radiochemical analysis.

(4) Airborne dust, diet, milk, vegetables, fish and shellfish, seaweeds, tea and others

These ashed samples were treated with the same procedure as that described in the section 2-(4).

3. Separation of strontium-90 and cesium-137

(1) Strontium-90

Sample solutions, prepared as in the foregoing sections 2-(1) through 2-(4), were neutralized with sodium hydroxide. After sodium carbonate was added, the precipitate of strontium and calcium carbonates was separated. The supernatant solution was retained for cesium-137 determination.

The carbonates were dissolved in hydrochloric acid and strontium and calcium were precipitated as oxalates. The precipitate was dissolved in nitric acid and strontium was separated from calcium by successive fuming nitric acid separation. Iron scavenge was made after addition of ferric iron carrier followed by barium chromate separation after addition of barium carrier to remove radium, its daughters and lead. Strontium was recovered as carbonate, and the precipitate was dried and weighed to determine strontium recovery. The strontium carbonate was dissolved in hydrochloric acid and iron carrier was added. The solution was allowed to stand for two weeks for strontium-90 and yttrium-90 to attain equilibrium. Yttrium-90 was coprecipitated with ferric hydroxide and the precipitate was filtered off, washed and counted.

(2) Cesium-137

The supernatant separated from the strontium fraction was acidified with hydrochloric acid. While stirring, cesium was adsorbed on the ammonium molybdophosphate added.

After filtered off and washed with hydrochloric acid the precipitate was dissolved in 2.5N sodium hydroxide solution. The solution was adjusted to pH 8.2 with hydrochloric acid and allowed to cool.

Resultant molybdenum hydroxide which separated

out in the solution, was filtered off and washed with water. EDTA was added to the filtrate and washings. Cesium and rubidium were adsorbed on a cation exchange column and cesium was separated from rubidium by eluting with hydrochloric acid.

The eluate was evaporated to dryness and was dissolved. The solution was filtered.
Chloroplatinic acid was added to precipitate cesium. The precipitate was filtered onto a tared paper using a demountable filter and washed with water and then ethanol. After drying, the chemical yield of cesium was determined by weighing the precipitate. Cesium-137 radioactivity was measured for this precipitate.

4. Determination of stable strontium, calcium and potassium

A weighed amount of soil or sea sediment was heated in a electric muffle furnace at 450°C and then treated with hydrochloric acid for extraction.
A weighed aliquot of ashed samples of total diet, vegetables, milk, fish, shellfish or seaweeds was digested with hydrofluoric acid and nitric acid.
The extract was made up to an appropriate volume with dilute hydrochloric acid. The sample solution was analyzed for calcium by titration with standard potassium permanganate solution after separating calcium as oxalate. Atomic absorption spectroscopy was applied when appropriate. Stable strontium and potassium were determined by atomic absorption and flame emission spectrometry, respectively.

5. Counting

After the radiochemical separation the mounted precipitates were counted for activity using low background beta counters normally for 60 to 90min. Net sample counting rates were corrected for counter efficiency, recovery, self-absorption and decay to obtain the content of strontium-90 and cesium-137per sample aliquot. From the results, concentrations of these nuclides in the original samples were calculated.

6. Results

(1) Strontium-90 and Cesium-137 in Total Diet

(form Apr. 1999 to Sep. 1999)

-continued from No. 129 for this publication-

Table (1) : Strontium-90 and Cesium-137 in Total Diet

Location	Ash	Ca	K	90Sr		137Cs	
	(g/p/d)	(mg/p/d)	(mg/p/d)	(Bq/p/d)	(Bq/g Ca)	(Bq/p/d)	(Bq/g K)
May, 1999							
Iwanai-machi, HOKKAIDO	12.4	528	1850	0.059 ± 0.0093	0.11 ± 0.018	0.041 ± 0.0067	0.022 ± 0.0036
Yamagata, YAMAGATA	12.6	348	1570	0.061 ± 0.01	0.18 ± 0.029	0.012 ± 0.0052	0.0078 ± 0.0033
Higashine, YAMAGATA	15.8	344	1630	0.064 ± 0.01	0.19 ± 0.029	0.031 ± 0.0059	0.019 ± 0.0036
Otsu, SHIGA	16.1	777	2430	0.057 ± 0.0092	0.074 ± 0.012	0.031 ± 0.0063	0.013 ± 0.0026
Imazu-machi, SHIGA	15.3	673	2150	0.058 ± 0.0098	0.086 ± 0.015	0.048 ± 0.0088	0.022 ± 0.0041
Jun, 1999							
Sapporo, HOKKAIDO	17.2	465	2220	0.043 ± 0.0086	0.092 ± 0.019	0.026 ± 0.0061	0.012 ± 0.0028
Aomori, AOMORI	21.1	673	2470	0.066 ± 0.011	0.097 ± 0.017	0.06 ± 0.0094	0.024 ± 0.0038
Ajigasawa-machi, AOMORI	16.7	1070	1820	0.079 ± 0.012	0.073 ± 0.011	0.032 ± 0.0083	0.017 ± 0.0045
Morioka, IWATE	13.9	540	1800	0.04 ± 0.0099	0.075 ± 0.018	0.043 ± 0.0072	0.024 ± 0.004
Iwaizumi-machi, IWATE	13.2	510	1960	0.044 ± 0.0094	0.086 ± 0.018	0.099 ± 0.0094	0.051 ± 0.0048
Fukushima, FUKUSHIMA	14.3	329	1560	0.023 ± 0.0072	0.071 ± 0.022	0.032 ± 0.006	0.02 ± 0.0038
Okuma-machi, FUKUSHIMA	10.8	465	1620	0.051 ± 0.0083	0.11 ± 0.018	0.025 ± 0.0055	0.016 ± 0.0034
Mito, IBARAKI	20.4	603	3090	0.059 ± 0.0093	0.098 ± 0.015	0.098 ± 0.0096	0.032 ± 0.0031
Tokai-mura, IBARAKI	15.4	627	1950	0.029 ± 0.0077	0.046 ± 0.012	0.04 ± 0.0063	0.021 ± 0.0032
Utsunomiya, TOCHIGI	12	394	1780	0.044 ± 0.0086	0.11 ± 0.022	0.02 ± 0.0053	0.011 ± 0.003
minamikawachi-machi, TOCHIGI	14.4	630	1820	0.042 ± 0.0089	0.067 ± 0.014	0.063 ± 0.0078	0.035 ± 0.0043
Maebashi, GUNMA	15.7	471	2070	0.046 ± 0.0098	0.098 ± 0.021	0.058 ± 0.0079	0.028 ± 0.0038
Nakanojo-machi, GUNMA	15.4	554	2000	0.056 ± 0.0096	0.1 ± 0.017	0.046 ± 0.007	0.023 ± 0.0035
Urawa, SAITAMA	20.5	613	2430	0.072 ± 0.011	0.12 ± 0.018	0.039 ± 0.007	0.016 ± 0.0029
Kumagaya, SAITAMA	13.3	407	1470	0.018 ± 0.0071	0.044 ± 0.017	0.012 ± 0.0047	0.0083 ± 0.0032
Chiba, CHIBA	16.5	464	2150	0.036 ± 0.0082	0.078 ± 0.018	0.028 ± 0.0063	0.013 ± 0.0029

Location	Ash	Ca	K	90Sr		137Cs	
	(g/p/d)	(mg/p/d)	(mg/p/d)	(Bq/p/d)	(Bq/g Ca)	(Bq/p/d)	(Bq/g K)
Chikura-machi, CHIBA	18.5	546	2610	0.04 ± 0.0082	0.073 ± 0.015	0.035 ± 0.0067	0.013 ± 0.0026
Shinjuku, TOKYO	9.1	298	957	0.035 ± 0.0086	0.12 ± 0.029	0.018 ± 0.0052	0.018 ± 0.0054
Hachijo-machi, TOKYO	12	611	1550	0.034 ± 0.0083	0.055 ± 0.014	0.03 ± 0.0063	0.02 ± 0.004
Nishikawa-machi, NIIGAT	21.3	678	2590	0.046 ± 0.0094	0.068 ± 0.014	0.055 ± 0.008	0.021 ± 0.0031
Kashiwazaki, NIIGATA	19.5	537	2410	0.052 ± 0.0098	0.097 ± 0.018	0.036 ± 0.0069	0.015 ± 0.0028
Toyama, TOYAMA	14.9	407	2310	0.036 ± 0.0091	0.088 ± 0.022	0.017 ± 0.0055	0.0075 ± 0.0024
Shinminato, TOYAMA	13	503	1740	0.051 ± 0.01	0.1 ± 0.02	0.026 ± 0.0062	0.015 ± 0.0035
Kanazawa, ISHIKAWA	17.7	526	1890	0.029 ± 0.0067	0.056 ± 0.013	0.02 ± 0.0051	0.01 ± 0.0027
Torigoe-mura, ISHIKAWA	18.9	839	2640	0.057 ± 0.0087	0.068 ± 0.011	0.051 ± 0.0073	0.019 ± 0.0028
Kofu, YAMANASHI	13.5	475	2110	0.056 ± 0.0095	0.12 ± 0.02	0.065 ± 0.0082	0.031 ± 0.0039
Ichinomiya-machi, YAMANASHI	11.6	435	1620	0.04 ± 0.0083	0.091 ± 0.019	0.03 ± 0.006	0.018 ± 0.0037
Nagano, NAGANO	15.4	480	1790	0.03 ± 0.0086	0.063 ± 0.018	0.068 ± 0.0081	0.038 ± 0.0045
Toyono-machi, NAGANO	14.4	561	1800	0.027 ± 0.0076	0.048 ± 0.014	0.021 ± 0.0056	0.012 ± 0.0031
Gifu, GIFU	11.2	481	1560	0.037 ± 0.008	0.077 ± 0.017	0.016 ± 0.005	0.01 ± 0.0032
Takayama, GIFU	9	503	1120	0.02 ± 0.0065	0.041 ± 0.013	0.008 ± 0.0043	0.0071 ± 0.0039
Shizuoka, SHIZUOKA	16.1	749	2250	0.035 ± 0.0086	0.047 ± 0.011	0.069 ± 0.0082	0.031 ± 0.0036
Hamaoka-machi, SHIZUOKA	13.5	536	1730	0.034 ± 0.008	0.064 ± 0.015	0.017 ± 0.0046	0.0096 ± 0.0027
Nagoya, AICHI	14.3	448	2030	0.038 ± 0.0084	0.085 ± 0.019	0.035 ± 0.0067	0.017 ± 0.0033
Shinshiro, AICHI	13	467	1640	0.035 ± 0.0083	0.075 ± 0.018	0.02 ± 0.0055	0.012 ± 0.0034
Tsu, MIE	16.9	483	1630	0.046 ± 0.0091	0.095 ± 0.019	0.019 ± 0.0054	0.011 ± 0.0033
Owase, MIE	13.6	468	1470	0.055 ± 0.0088	0.12 ± 0.019	0.023 ± 0.0054	0.015 ± 0.0037
Kyoto, KYOTO	13.4	415	1720	0.046 ± 0.011	0.11 ± 0.025	0.05 ± 0.0076	0.029 ± 0.0044
Maizuru, KYOTO	13.1	515	1880	0.048 ± 0.0099	0.093 ± 0.019	0.013 ± 0.0053	0.0071 ± 0.0028
Osaka, OSAKA	16.4	712	2020	0.034 ± 0.0078	0.047 ± 0.011	0.077 ± 0.0088	0.038 ± 0.0043
Izumiotsu, OSAKA	12.9	372	1820	0.033 ± 0.007	0.089 ± 0.019	0.048 ± 0.0069	0.026 ± 0.0038
Kakogawa, HYOGO	13.3	536	1620	0.045 ± 0.0093	0.084 ± 0.017	0.034 ± 0.0066	0.021 ± 0.0041
Hamasaka-machi, HYOGO	14.9	708	1730	0.055 ± 0.0093	0.078 ± 0.013	0.024 ± 0.0058	0.014 ± 0.0034
Kashihara, NARA	12.3	631	1510	0.029 ± 0.008	0.046 ± 0.013	0.016 ± 0.0056	0.011 ± 0.0037

Location	Ash	Ca	K	90Sr		137Cs	
	(g/p/d)	(mg/p/d)	(mg/p/d)	(Bq/p/d)	(Bq/g Ca)	(Bq/p/d)	(Bq/g K)
Gojo, NARA	13.1	825	1740	0.038 ± 0.0087	0.046 ± 0.011	0.019 ± 0.0055	0.011 ± 0.0032
Wakayama, WAKAYAMA	13.2	385	1800	0.027 ± 0.0075	0.07 ± 0.02	0.019 ± 0.0071	0.01 ± 0.004
Shingu, WAKAYAMA	11.4	493	1320	0.021 ± 0.0082	0.042 ± 0.017	0.023 ± 0.0055	0.017 ± 0.0042
Tottori, TOTTORI	12.8	462	1530	0.021 ± 0.007	0.046 ± 0.015	0.033 ± 0.0061	0.022 ± 0.004
Fukube-mura, TOTTORI	10.3	354	1640	0.06 ± 0.01	0.17 ± 0.028	0.031 ± 0.0061	0.019 ± 0.0037
Okayama, OKAYAMA	18.2	612	2210	0.065 ± 0.01	0.11 ± 0.017	0.041 ± 0.0068	0.018 ± 0.0031
Kamisaibara-mura, OKAYA	13.4	523	1660	0.031 ± 0.0086	0.06 ± 0.016	0.042 ± 0.0067	0.025 ± 0.004
Hiroshima, HIROSHIMA	12.6	473	1700	0.05 ± 0.0089	0.1 ± 0.019	0.029 ± 0.0057	0.017 ± 0.0034
Miyoshi, HIROSHIMA	14.2	663	1420	0.0079 ± 0.0066	0.012 ± 0.0099	0.024 ± 0.0057	0.017 ± 0.004
Yamaguchi, YAMAGUCHI	13.3	473	1660	0.019 ± 0.0074	0.04 ± 0.016	0.02 ± 0.0058	0.012 ± 0.0035
Mine, YAMAGUCHI	16	469	1840	0.04 ± 0.0085	0.086 ± 0.018	0.03 ± 0.0061	0.016 ± 0.0033
Tokushima, TOKUSHIMA	16.3	898	1850	0.07 ± 0.011	0.077 ± 0.012	0.035 ± 0.0084	0.019 ± 0.0045
Kamiita-machi, TOKUSHIM	15.2	396	2150	0.031 ± 0.0086	0.079 ± 0.022	0.0098 ± 0.0048	0.0046 ± 0.0022
Takamatsu, KAGAWA	17.4	517	1800	0.022 ± 0.0078	0.043 ± 0.015	0.036 ± 0.0068	0.02 ± 0.0038
Marugame, KAGAWA	15.5	533	1910	0.041 ± 0.0089	0.077 ± 0.017	0.016 ± 0.005	0.0082 ± 0.0026
Matsuyama, EHIME	9.8	408	1440	0.012 ± 0.0067	0.029 ± 0.017	0.015 ± 0.005	0.01 ± 0.0035
Ikata-machi, EHIME	9.9	307	1100	0.025 ± 0.0081	0.083 ± 0.026	0.0026 ± 0.0038	0.0023 ± 0.0035
Kochi, KOCHI	15.4	660	2100	0.056 ± 0.0092	0.085 ± 0.014	0.031 ± 0.0059	0.015 ± 0.0028
Saga-machi, KOCHI	12.8	455	1480	0.041 ± 0.0096	0.09 ± 0.021	0.01 ± 0.0051	0.0069 ± 0.0035
Dazaifu, FUKUOKA	14.2	576	2020	0.035 ± 0.0077	0.061 ± 0.013	0.033 ± 0.0064	0.017 ± 0.0032
Fukuoka, FUKUOKA	10.8	343	1200	0.023 ± 0.0078	0.066 ± 0.023	0.013 ± 0.0051	0.011 ± 0.0042
Saga, SAGA	13.3	717	1370	0.025 ± 0.0087	0.034 ± 0.012	0.01 ± 0.0064	0.0076 ± 0.0047
Nagasaki, NAGASAKI	18.2	499	2320	0.071 ± 0.012	0.14 ± 0.024	0.041 ± 0.0086	0.018 ± 0.0037
Matsuura, NAGASAKI	12.1	335	1450	0.033 ± 0.009	0.1 ± 0.027	0.013 ± 0.0052	0.0087 ± 0.0036
Kumamoto, KUMAMOTO	15.4	646	1930	0.037 ± 0.0087	0.058 ± 0.013	0.021 ± 0.0073	0.011 ± 0.0038
Tomiai-machi, KUMAMOTO	14.3	413	1880	0.054 ± 0.0095	0.13 ± 0.023	0.025 ± 0.0061	0.014 ± 0.0032
Oita, OITA	12.4	420	1600	0.025 ± 0.009	0.059 ± 0.021	0.015 ± 0.0052	0.0096 ± 0.0032
Saeki, OITA	13.9	289	1340	0.015 ± 0.0069	0.053 ± 0.024	0.012 ± 0.0047	0.0093 ± 0.0035

Location	Ash	Ca	K	90Sr		137Cs	
	(g/p/d)	(mg/p/d)	(mg/p/d)	(Bq/p/d)	(Bq/g Ca)	(Bq/p/d)	(Bq/g K)
Miyazaki, MIYAZAKI	10.9	461	1520	0.053 ± 0.011	0.11 ± 0.023	0.019 ± 0.008	0.013 ± 0.0053
Takachiho-machi, MIYAZA	19.3	836	2750	0.047 ± 0.0097	0.056 ± 0.012	0.03 ± 0.0069	0.011 ± 0.0025
Sendai, KAGOSHIMA	11.2	398	1690	0.055 ± 0.0095	0.14 ± 0.024	0.028 ± 0.0062	0.016 ± 0.0037
Okuchi, KAGOSHIMA	16.5	492	2080	0.045 ± 0.0091	0.091 ± 0.019	0.042 ± 0.0072	0.02 ± 0.0035
Jul, 1999							
Ishinomaki, MIYAGI	14.6	607	1840	0.023 ± 0.008	0.038 ± 0.013	0.035 ± 0.0066	0.019 ± 0.0036
Onagawa-machi, MIYAGI	18.2	466	2130	0.056 ± 0.01	0.12 ± 0.021	0.044 ± 0.007	0.021 ± 0.0033
Akita, AKITA	11.1	507	1580	0.033 ± 0.0095	0.065 ± 0.019	0.054 ± 0.0072	0.034 ± 0.0046
Yokote, AKITA	12	386	1490	0.039 ± 0.0081	0.1 ± 0.021	0.056 ± 0.0073	0.038 ± 0.0049
Yokohama, KANAGAWA	13.6	364	1450	0.029 ± 0.008	0.079 ± 0.022	0.025 ± 0.0056	0.017 ± 0.0039
Hiratsuka, KANAGAWA	14.3	630	2490	0.04 ± 0.0085	0.064 ± 0.014	0.03 ± 0.0065	0.012 ± 0.0026
Fukui, FUKUI	17.6	452	1990	0.027 ± 0.0076	0.059 ± 0.017	0.018 ± 0.0053	0.009 ± 0.0026
Tsuruga, FUKUI	15.1	643	1940	0.049 ± 0.0092	0.076 ± 0.014	0.045 ± 0.0069	0.023 ± 0.0036
Matsue, SHIMANE	19.8	594	2480	0.071 ± 0.012	0.12 ± 0.02	0.033 ± 0.0065	0.013 ± 0.0026
Kashima-machi, SHIMANE	13.8	646	1610	0.051 ± 0.0092	0.08 ± 0.014	0.022 ± 0.006	0.014 ± 0.0037
Karatsu, SAGA	19.1	1180	1860	0.041 ± 0.0099	0.034 ± 0.0084	0.029 ± 0.0074	0.016 ± 0.004
Naha, OKINAWA	14.7	700	2470	0.062 ± 0.0097	0.089 ± 0.014	0.026 ± 0.0063	0.01 ± 0.0025
Itoman, OKINAWA	17	571	2330	0.056 ± 0.01	0.097 ± 0.018	0.04 ± 0.0084	0.017 ± 0.0036

(2) Strontium-90 and Cesium-137 in Rice(producing districts)
(form Apr. 1999 to Sep. 1999)

-continued from No. 129 for this publication-

Table (2)-1 : Strontium-90 and Cesium-137 in Rice(producing districts)

Location	Component			90Sr		137Cs	
	(%)	(g/kgwet)	(g/kgwet)	(Bq/kgwet)	(Bq/gCa)	(Bq/kgwet)	(Bq/gK)
Jul, 1999							
Sadohara-machi, MIYAZAKI	0.603	0.029	0.808	0.0045 ± 0.0056	0.16 ± 0.2	0 ± 0.0033	0 ± 0.0041
Aug, 1999							
Gifu, GIFU	0.574	0.044	0.752	0.014 ± 0.0067	0.32 ± 0.15	0 ± 0.0036	0 ± 0.0048
Shingu, WAKAYAMA	0.452	0.036	0.701	0.0029 ± 0.004	0.08 ± 0.11	0.0022 ± 0.0051	0.0032 ± 0.0072
Sep, 1999							
Chiba, CHIBA	0.508	0.033	0.955	0 ± 0.0057	0 ± 0.17	0.0032 ± 0.0037	0.0034 ± 0.0038
Matsusaka, MIE	0.709	0.039	0.865	0.006 ± 0.006	0.15 ± 0.15	0.0081 ± 0.0043	0.0093 ± 0.0049

(3)-1 Strontium-90 and Cesium-137 in Milk(producing districts for domestic proguram)
(form Apr. 1999 to Sep. 1999)

-continued from No. 129 for this publication-

Table (3)-1 : Strontium-90 and Cesium-137 in Milk(producing districts for domestic proguram)

Location	Component			90Sr				137Cs			
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kgwet)		(Bq/g Ca)		(Bq/kgwet)		(Bq/g K)	
Jul, 1999											
Yamato-machi, SAGA	0.77	1.12	1.47	0.03	± 0.0076	0.027	± 0.0068	0.015	± 0.0044	0.0099	± 0.003
Aug, 1999											
Aomori, AOMORI	0.74	1.11	1.58	0.064	± 0.011	0.058	± 0.01	0.065	± 0.0096	0.041	± 0.0061
Takizawa-mura, IWATE	0.69	1.98	2.81	0.018	± 0.0084	0.0093	± 0.0042	0.064	± 0.0099	0.023	± 0.0035
Mito, IBARAKI	0.73	1.1	1.56	0.034	± 0.0091	0.031	± 0.0082	0.0096	± 0.0049	0.0061	± 0.0031
Nishinasuno-machi, TOCHIGI	0.78	1.2	1.51	0.038	± 0.0083	0.032	± 0.0069	0.037	± 0.0087	0.024	± 0.0057
Fujimi-mura, GUNMA	0.69	1.72	2.23	0.035	± 0.0084	0.02	± 0.0049	0.012	± 0.0069	0.0055	± 0.0031
Yachimata, CHIBA	0.73	1.28	1.7	0.025	± 0.0078	0.019	± 0.006	0.01	± 0.0066	0.006	± 0.0039
Tonami, TOYAMA	0.69	1.04	1.54	0.036	± 0.0081	0.034	± 0.0078	0.038	± 0.0082	0.025	± 0.0053
Oshimizu-machi, ISHIKAWA	0.76	1.17	1.53	0.014	± 0.0059	0.012	± 0.0051	0.011	± 0.0044	0.0073	± 0.0028
Takane-machi, YAMANASHI	0.65	1.02	1.37	0.029	± 0.0072	0.028	± 0.0071	0	± 0.0035	0	± 0.0026
Kasamatsu-machi, GIFU	0.65	1.01	1.27	0.027	± 0.0071	0.027	± 0.007	0.016	± 0.005	0.013	± 0.0039
Ouchiyama-mura, MIE	0.72	1.09	1.54	0.017	± 0.0071	0.016	± 0.0065	0.0018	± 0.0035	0.0012	± 0.0023
Hino-machi, SHIGA	0.7	1.06	1.56	0.018	± 0.0077	0.017	± 0.0072	0.0028	± 0.0039	0.0018	± 0.0025
Mihara-machi, HYOGO	0.69	1.12	1.48	0.027	± 0.0072	0.024	± 0.0064	0	± 0.0041	0	± 0.0028
Ouda-machi, NARA	0.73	1.13	1.5	0.026	± 0.0075	0.023	± 0.0066	0	± 0.0043	0	± 0.0029
Takase-machi, KAGAWA	0.69	1.06	1.49	0.011	± 0.0074	0.011	± 0.0069	0.014	± 0.0066	0.0092	± 0.0044
kawauchi-machi, EHIME	0.69	1.08	1.49	0.027	± 0.0073	0.025	± 0.0067	0.0055	± 0.0046	0.0037	± 0.0031
Koshi-machi, KUMAMOTO	0.7	1.08	1.54	0.016	± 0.0079	0.015	± 0.0073	0.004	± 0.0058	0.0026	± 0.0037
Kuju-machi, OITA	0.71	1.09	1.54	0.023	± 0.009	0.021	± 0.0082	0.074	± 0.01	0.048	± 0.0065
Takahara-machi, MIYAZAKI	0.72	1.08	1.6	0.019	± 0.0088	0.018	± 0.0082	0.035	± 0.008	0.022	± 0.005

(3)-2 Strontium-90 and Cesium-137 in Milk(producing districts for WHO proguram)
(form Apr.1999 to Sep.1999)

-continued from No. 129 for this publication-

Table (3)-2 : Strontium-90 and Cesium-137 in Milk(producing districts for WHO proguram)

Location	Component			90Sr				137Cs			
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kgwet)		(Bq/g Ca)		(Bq/kgwet)		(Bq/g K)	
May, 1999											
Hokudainojo, HOKKAIDO	0.75	1.28	1.68	0.04	± 0.0086	0.031	± 0.0067	0.048	± 0.0069	0.029	± 0.0041
Iwamuro-mura, NIIGATA	0.75	1.15	1.63	0.029	± 0.0078	0.025	± 0.0067	0.011	± 0.0044	0.0065	± 0.0027
Katsuyama, FUKUI	0.73	1.07	1.56	0.01	± 0.006	0.0097	± 0.0056	0.012	± 0.0044	0.0075	± 0.0028
Shijonawate, OSAKA	0.72	1.15	1.37	0.024	± 0.0071	0.021	± 0.0062	0.0067	± 0.004	0.0049	± 0.0029
Matsue, SHIMANE	0.74	1.18	1.48	0.0084	± 0.0052	0.0071	± 0.0044	0.0029	± 0.0036	0.002	± 0.0025
Chiyoda-machi, HIROSHIMA	0.69	1.04	1.48	0.023	± 0.0058	0.022	± 0.0055	0.0035	± 0.0038	0.0024	± 0.0026
Kochi, KOCHI	0.74	1.19	1.58	0.037	± 0.0081	0.031	± 0.0068	0.0099	± 0.0043	0.0063	± 0.0027
Yasu-machi, FUKUOKA	0.72	1.12	1.51	0.016	± 0.0075	0.015	± 0.0067	0.003	± 0.0043	0.002	± 0.0028
Kajiki-machi, KAGOSHIMA	0.74	1.13	1.57	0.022	± 0.0067	0.019	± 0.006	0.015	± 0.0047	0.0099	± 0.003
Aug, 1999											
Hokudainojo, HOKKAIDO	0.72	1.15	1.67	0.051	± 0.0083	0.044	± 0.0073	0.039	± 0.0062	0.023	± 0.0037
Hachijo-machi, TOKYO	0.7	1	1.32	0.035	± 0.0081	0.035	± 0.0081	0.0008	± 0.0063	0.0006	± 0.0048
Iwamuro-mura, NIIGATA	0.72	1.07	1.47	0.012	± 0.0071	0.011	± 0.0066	0.0061	± 0.0044	0.0042	± 0.003
Katsuyama, FUKUI	0.73	1.1	1.61	0.017	± 0.0054	0.016	± 0.0049	0.0074	± 0.0043	0.0046	± 0.0027
Shijonawate, OSAKA	0.74	1.2	1.42	0.026	± 0.0066	0.022	± 0.0055	0.01	± 0.0048	0.0072	± 0.0034
Matsue, SHIMANE	0.73	1.13	1.52	0.016	± 0.0067	0.014	± 0.0059	0.0017	± 0.0045	0.0011	± 0.003
Chiyoda-machi, HIROSHIMA	0.7	1.07	1.5	0.013	± 0.0056	0.012	± 0.0052	0.017	± 0.0048	0.012	± 0.0032
Kochi, KOCHI	0.74	1.12	1.6	0.024	± 0.0081	0.022	± 0.0072	0.012	± 0.0059	0.0072	± 0.0037
Yasu-machi, FUKUOKA	0.7	1.11	1.44	0.03	± 0.0086	0.027	± 0.0078	0.0067	± 0.0045	0.0047	± 0.0031
Kajiki-machi, KAGOSHIMA	0.74	1.14	1.56	0.014	± 0.0061	0.013	± 0.0053	0.011	± 0.0043	0.0074	± 0.0027

(3)-3 Strontium-90 and Cesium-137 in Milk(consuming districts)
(form Apr. 1999 to Sep. 1999)

-continued from No. 129 for this publication-

Table (3)-3 : Strontium-90 and Cesium-137 in Milk(consuming districts)

Location	Component			90Sr				137Cs			
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kgwet)		(Bq/g Ca)		(Bq/kgwet)		(Bq/g K)	
Jun, 1999											
Rifu-machi, MIYAGI	0.75	1.12	1.55	0.026	± 0.0068	0.023	± 0.0061	0.022	± 0.0054	0.014	± 0.0035
Fukushima, FUKUSHIMA	0.74	1.15	1.59	0.012	± 0.0063	0.01	± 0.0054	0.017	± 0.0049	0.011	± 0.0031
Kyoto, KYOTO	0.72	1.08	1.41	0.027	± 0.0078	0.025	± 0.0072	0.019	± 0.0052	0.014	± 0.0037
Aug, 1999											
Sapporo, HOKKAIDO	0.71	1.14	1.42	0.045	± 0.01	0.04	± 0.0089	0.047	± 0.0087	0.033	± 0.0061
Akita, AKITA	0.77	1.19	1.48	0.042	± 0.01	0.036	± 0.0084	0.016	± 0.0066	0.011	± 0.0045
Yamagata, YAMAGATA	0.7	1.08	1.47	0.034	± 0.0079	0.032	± 0.0073	0.0098	± 0.0069	0.0067	± 0.0047
Urawa, SAITAMA	0.72	1.11	1.46	0.043	± 0.0089	0.039	± 0.008	0.021	± 0.0073	0.015	± 0.005
Shinjuku, TOKYO	0.68	1.17	1.63	0.023	± 0.0071	0.02	± 0.0061	0.024	± 0.0074	0.015	± 0.0046
Yokohama, KANAGAWA	0.72	1.1	1.55	0.027	± 0.0073	0.024	± 0.0066	0.038	± 0.007	0.025	± 0.0046
Niigata, NIIGATA	0.74	1.1	1.58	0.03	± 0.008	0.027	± 0.0072	0.032	± 0.0059	0.02	± 0.0037
Fukui, FUKUI	0.71	1.12	1.6	0.026	± 0.0062	0.023	± 0.0056	0.019	± 0.005	0.012	± 0.0031
Shizuoka, SHIZUOKA	0.7	1.07	1.45	0.023	± 0.0077	0.022	± 0.0073	0.035	± 0.0074	0.024	± 0.0051
Nagoya, AICHI	0.73	1.11	1.56	0.026	± 0.0076	0.024	± 0.0068	0.005	± 0.004	0.0032	± 0.0026
Osaka, OSAKA	0.72	1.07	1.53	0.018	± 0.006	0.017	± 0.0056	0.012	± 0.0048	0.0076	± 0.0032
Shingu, WAKAYAMA	0.68	1.04	1.45	0.018	± 0.0065	0.017	± 0.0062	0.0057	± 0.005	0.0039	± 0.0035
Yonago, TOTTORI	0.7	1.07	1.46	0.038	± 0.0083	0.035	± 0.0078	0.0085	± 0.0049	0.0058	± 0.0034
Matsue, SHIMANE	0.73	1.1	1.51	0.024	± 0.0069	0.021	± 0.0062	0.0015	± 0.004	0.001	± 0.0026
Okayama, OKAYAMA	0.69	1.07	1.48	0.032	± 0.0075	0.03	± 0.007	0.0097	± 0.0047	0.0065	± 0.0032
Hiroshima, HIROSHIMA	0.67	1.03	1.41	0.027	± 0.007	0.026	± 0.0068	0.014	± 0.0049	0.01	± 0.0035
Yamaguchi, YAMAGUCHI	0.68	1.08	1.43	0.029	± 0.0088	0.027	± 0.0082	0.0086	± 0.0059	0.006	± 0.0041

Location	Component			90Sr				137Cs			
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kgwet)		(Bq/g Ca)		(Bq/kgwet)		(Bq/g K)	
kawauchi-machi, EHIME	0.68	1.05	1.46	0.024	± 0.0069	0.022	± 0.0066	0.011	± 0.0049	0.0074	± 0.0034
Kochi, KOCHI	0.71	1.1	1.52	0.017	± 0.0052	0.015	± 0.0047	0.0043	± 0.0039	0.0028	± 0.0026
Chikushino, FUKUOKA	0.71	1.08	1.54	0.018	± 0.0081	0.017	± 0.0075	0.018	± 0.0068	0.012	± 0.0044
Nagasaki, NAGASAKI	0.67	1.04	1.44	0.029	± 0.009	0.028	± 0.0087	0.011	± 0.0064	0.0074	± 0.0045
Kagoshima, KAGOSHIMA	0.73	1.12	1.58	0.03	± 0.0085	0.026	± 0.0076	0.021	± 0.0057	0.013	± 0.0036
Sep, 1999											
Rifu-machi, MIYAGI	0.73	1.08	1.54	0.013	± 0.0056	0.012	± 0.0051	0.017	± 0.0049	0.011	± 0.0032
Yonagusuku-machi, OKINAWA	0.72	1.12	1.56	0.035	± 0.0094	0.031	± 0.0084	0.0075	± 0.0063	0.0048	± 0.004

(3)-4 Strontium-90 and Cesium-137 in Milk(powdered milk)
(form Apr.1999 to Sep.1999)

-continued from No. 129 for this publication-

Table (3)-4 : Strontium-90 and Cesium-137 in Milk(powdered milk)

Location	Component			90Sr		137Cs	
	(%)	(g／kg)	(g／kg)	(Bq／kg)	(Bq／g Ca)	(Bq／Kg)	(Bq／g K)
Jun, 1999							
Sample C, サンプルC	7.79	12.2	18	0.56 ± 0.035	0.046 ± 0.0028	2 ± 0.05	0.11 ± 0.003
Sample A, サンプルA	7.85	12.5	17.6	0.34 ± 0.028	0.028 ± 0.0022	0.27 ± 0.019	0.015 ± 0.0011
Sample B, サンプルB	2.51	3.46	6.22	0.044 ± 0.0096	0.013 ± 0.0028	0.068 ± 0.008	0.011 ± 0.0013
Sample D, サンプルD	2.44	3.59	5.81	0.01 ± 0.0066	0.0029 ± 0.0018	0.02 ± 0.0051	0.0034 ± 0.00088
Sample F, サンプルF	2.5	3.58	5.6	0.033 ± 0.0095	0.0092 ± 0.0027	0.15 ± 0.011	0.027 ± 0.002
Sample E, サンプルE	2.47	4.08	5.56	0.077 ± 0.011	0.019 ± 0.0027	0.09 ± 0.009	0.016 ± 0.0016

(4)-1 Strontium-90 and Cesium-137 in Vegetables(producing districts)
(form Apr. 1999 to Sep. 1999)

-continued from No. 129 for this publication-

Table (4)-1 : Strontium-90 and Cesium-137 in Vegetables(producing districts)

Location	Component			90Sr		137Cs	
	Ash(%)	(g/kg)	(g/kg)	(Bq/kgwet)	(Bq/gCa)	(Bq/kgwet)	(Bq/kgK)
May, 1999							
Tahara-machi, AICHI	0.611	0.147	2.54	0.036 ± 0.0087	0.24 ± 0.059	0.015 ± 0.0062	0.0057 ± 0.0024
Tahara-machi, AICHI	1.48	0.86	4.92	0.072 ± 0.011	0.084 ± 0.013	0.023 ± 0.007	0.0046 ± 0.0014
Koshi-machi, KUMAMOTO	1.49	0.569	6.03	0.17 ± 0.016	0.29 ± 0.028	0.01 ± 0.0059	0.0017 ± 0.00097
Jun, 1999							
Koshi-machi, KUMAMOTO	0.658	0.195	2.53	0.085 ± 0.012	0.43 ± 0.06	0.0033 ± 0.0054	0.0013 ± 0.0021
Jul, 1999							
Mutsu, AOMORI	0.806	0.029	3.5	0.0015 ± 0.006	0.05 ± 0.21	0.076 ± 0.01	0.022 ± 0.0029
Kumatori-machi, OSAKA	0.395	0.158	1.47	0.039 ± 0.0092	0.25 ± 0.058	0.025 ± 0.0069	0.017 ± 0.0047
Ota, SHIMANE	0.65	0.229	2.4	0.63 ± 0.028	2.7 ± 0.12	0.022 ± 0.0065	0.0093 ± 0.0027
Ota, SHIMANE	1.36	2.24	2.9	2.1 ± 0.05	0.93 ± 0.023	0.27 ± 0.016	0.092 ± 0.0055
Aug, 1999							
Eniwa, HOKKAIDO	0.576	0.164	2.56	0.11 ± 0.013	0.7 ± 0.08	0.016 ± 0.0057	0.0063 ± 0.0022
Eniwa, HOKKAIDO	1.7	0.531	7.67	0.19 ± 0.017	0.35 ± 0.032	0.013 ± 0.0066	0.0016 ± 0.00086

(4)-2 Strontium-90 and Cesium-137 in Vegetables(consuming districts)
(form Apr. 1999 to Sep. 1999)

-continued from No. 129 for this publication-

Table (4)-2 : Strontium-90 and Cesium-137 in Vegetables(consuming districts)

Location	Component			90Sr		137Cs	
	Ash(%)	(g/kg)	(g/kg)	(Bq/kgwet)	(Bq/gCa)	(Bq/kgwet)	(Bq/kgK)
Jun, 1999							
Rifu-machi, MIYAGI	1.93	0.699	5.46	0.086 ± 0.012	0.12 ± 0.018	0 ± 0.0053	0 ± 0.00097
Niigata, NIIGATA	1.02	0.307	3.68	0.028 ± 0.0087	0.09 ± 0.028	0.0028 ± 0.004	0.0007 ± 0.0011
Sep, 1999							
Rifu-machi, MIYAGI	0.55	0.238	2.15	0.06 ± 0.011	0.25 ± 0.046	0.053 ± 0.0074	0.025 ± 0.0035
Urawa, SAITAMA	0.593	0.18	2.57	0.2 ± 0.018	1.1 ± 0.1	0.041 ± 0.0069	0.016 ± 0.0027
Kanazawa, ISHIKAWA	0.597	0.242	2.48	0 ± 0.0058	0 ± 0.024	0 ± 0.0056	0 ± 0.0023
Urawa, SAITAMA	1.74	0.364	7.88	0.11 ± 0.014	0.31 ± 0.04	0.0069 ± 0.0047	0.00087 ± 0.0006
Kanazawa, ISHIKAWA	1.7	0.375	6.98	0.12 ± 0.015	0.33 ± 0.041	0.025 ± 0.006	0.0035 ± 0.00086

(5) Strontium-90 and Cesium-137 in Tea (Japanese Tea)
(form Apr. 1999 to Sep. 1999)
-continued from No. 129 for this publication-

Table (5) : Strontium-90 and Cesium-137 in Tea (Japanese Tea)

Location	Component			90Sr		137Cs	
	(%)	(g/kg)	(g/kg)	(Bq/kg)	(Bq/g Ca)	(Bq/kg)	(Bq/g K)
Apr, 1999							
Kawaminami-machi, MIYAZAKI	5.15	1.91	21.4	0.17 ± 0.037	0.092 ± 0.02	1.3 ± 0.07	0.059 ± 0.0033
Miyakonojo, MIYAZAKI	5.86	2.87	28.4	0.18 ± 0.038	0.062 ± 0.013	1.1 ± 0.07	0.04 ± 0.0025
May, 1999							
Ikeda-machi, GIFU	4.97	3.3	21.6	0.89 ± 0.067	0.27 ± 0.02	0.12 ± 0.028	0.0056 ± 0.0013
Shirakawa-machi, GIFU	4.93	2.4	20.8	0.23 ± 0.04	0.098 ± 0.017	0.18 ± 0.032	0.0087 ± 0.0015
Iwata, SHIZUOKA	1.3	0.65	5.7	0.063 ± 0.01	0.097 ± 0.016	0.012 ± 0.0062	0.0021 ± 0.0011
Shuzenji-machi, SHIZUOKA	1.36	0.855	4.98	0.83 ± 0.033	0.97 ± 0.038	0.18 ± 0.013	0.036 ± 0.0027
Kameyama, MIE	5.31	2.91	23.1	1 ± 0.07	0.36 ± 0.025	0.25 ± 0.034	0.011 ± 0.0015
Odai-machi, MIE	5.1	1.97	19.7	0.085 ± 0.027	0.043 ± 0.013	0.21 ± 0.031	0.011 ± 0.0016
Kaya-machi, KYOTO	4.93	2.37	18.1	0.27 ± 0.039	0.11 ± 0.017	0.45 ± 0.039	0.025 ± 0.0021
Nara, NARA	5.2	2.89	23.9	0.49 ± 0.056	0.17 ± 0.02	0.14 ± 0.033	0.006 ± 0.0014
Nara, NARA	5.18	2.88	23.2	0.37 ± 0.049	0.13 ± 0.017	0.38 ± 0.045	0.016 ± 0.002
Nachikatsuura-machi, WAKAYAMA	5.32	2.54	20.1	1.1 ± 0.09	0.45 ± 0.033	0.82 ± 0.058	0.041 ± 0.0029
Mifune-machi, KUMAMOTO	4.8	2.57	22.1	0.24 ± 0.039	0.093 ± 0.015	0.062 ± 0.023	0.0028 ± 0.001
Ue-mura, KUMAMOTO	4.86	2.97	19.5	0.47 ± 0.051	0.16 ± 0.017	0.15 ± 0.031	0.0076 ± 0.0016
Jun, 1999							
Tokorozawa, SAITAMA	5.24	2.95	21.9	0.47 ± 0.052	0.16 ± 0.018	0.42 ± 0.043	0.019 ± 0.002
Iruma, SAITAMA	5.22	2.7	22.7	0.38 ± 0.047	0.14 ± 0.017	0.38 ± 0.041	0.017 ± 0.0018
Uji, KYOTO	5.15	2.79	18.8	0.8 ± 0.069	0.29 ± 0.025	0.025 ± 0.016	0.0013 ± 0.00087
Chiran-machi, KAGOSHIMA	5.28	2.42	20.3	0.33 ± 0.047	0.13 ± 0.019	1.2 ± 0.07	0.059 ± 0.0034
Miyanojo-machi, KAGOSHI	5.4	2.42	22.6	0.35 ± 0.05	0.14 ± 0.021	0.45 ± 0.045	0.02 ± 0.002

(6) Strontium-90 and Cesium-137 in Sea Fish
(form Apr. 1999 to Sep. 1999)

-continued from No. 129 for this publication-

Table (6) : Strontium-90 and Cesium-137 in Sea Fish

Location	Component			90Sr				137Cs			
	(%)	(g/kgwet)	(g/kgwet)	(Bq/kgwet)		(Bq/gCa)		(Bq/kgwet)		(Bq/gK)	
(Ammodytes personatus)											
Apr, 1999											
Harimanada, HYOGO	2.27	2.84	3.89	0	± 0.0038	0	± 0.0013	0.095	± 0.0097	0.024	± 0.0025
(Katsuwonus pelamis)											
Jun, 1999											
Tosa, KOCHI	1.3	0.059	4.25	0.0082	± 0.0053	0.14	± 0.091	0.24	± 0.014	0.057	± 0.0033
(Limanda herzensteini)											
Jun, 1999											
Rifu-machi, MIYAGI	3.06	7.05	3.49	0.031	± 0.0076	0.0044	± 0.0011	0.044	± 0.0069	0.013	± 0.002
(Mugil cephalus)											
Aug, 1999											
Morodomi-machi, SAGA	1.13	0.313	3.28	0	± 0.0066	0	± 0.021	0.067	± 0.0083	0.02	± 0.0025
(Oncorhynchus keta)											
Sep, 1999											
Urakawa-machi, HOKKAIDO	1.26	0.507	3.64	0.013	± 0.006	0.026	± 0.012	0.086	± 0.0091	0.024	± 0.0025
(Pagrus sp)											
May, 1999											
Kumanonada, MIE	1.46	0.26	4.94	0.006	± 0.0054	0.023	± 0.021	0.21	± 0.013	0.042	± 0.0026
Jul, 1999											
Fukuoka, FUKUOKA	1.33	0.392	4.6	0.0018	± 0.0054	0.005	± 0.014	0.15	± 0.011	0.033	± 0.0025

Location	Component			90Sr				137Cs			
	(%)	(g/kgwet)	(g/kgwet)	(Bq/kgwet)		(Bq/gCa)		(Bq/kgwet)		(Bq/gK)	
Aug, 1999											
Oga, AKITA	1.39	1.76	3.16	0.0018	± 0.0054	0.001	± 0.0031	0.081	± 0.0087	0.026	± 0.0028
(Sardinops melanostictus)											
Sep, 1999											
Yamagata, YAMAGATA	2.63	5.24	2.64	0.022	± 0.0076	0.0042	± 0.0015	0.044	± 0.007	0.016	± 0.0026
(Scomber japonicus)											
Aug, 1999											
Iyonada, EHIME	1.32	0.877	3.69	0	± 0.005	0	± 0.0057	0.1	± 0.01	0.028	± 0.0026
(Sebastiscus marmoratus)											
May, 1999											
Hamada, SHIMANE	6.29	19.6	3.2	0.03	± 0.0076	0.0015	± 0.00039	0.13	± 0.012	0.042	± 0.0036
(Sillago sp)											
Jun, 1999											
Minamichita-machi, AICHI	3.68	9.76	3.31	0.0057	± 0.0062	0.0005	± 0.00064	0.09	± 0.0097	0.027	± 0.0029

Sea Fish

Japanese name	English name	Scientific name
Bora	Gray mullet	Mugil cephalus
Ikanago	Japanese sand lance	Ammodytes personatus
Kasago	Scorpion-fish	Sebastiscus marmoratus
Katsuo	Skipjack tuna	Katsuwonus pelamis
Kisu	Whiting	Sillago sp
Magarei	Brown sole	Limanda herzensteini
Maiwashi	Japanese pilchard	Sardinops melanostictus
Masaba	Pacific mackerel	Scomber japonicus
Sake	Chum Salmon	Oncorhynchus keta
Tai	Sea bream	Pagrus sp

(7) Strontium-90 and Cesium-137 in Freshwater Fish
(form Apr. 1999 to Sep. 1999)

-continued from No. 129 for this publication-

Table (7) : Strontium-90 and Cesium-137 in Freshwater Fish

Location	Component			90Sr		137Cs	
	(%)	(g/kgwet)	(g/kgwet)	(Bq/kgwet)	(Bq/gCa)	(Bq/kgwet)	(Bq/gK)
(Carassius auratus)							
Jul, 1999 Barato-lake, HOKKAIDO	4.72	13.8	2.71	0.63 ± 0.027	0.046 ± 0.002	0.051 ± 0.0072	0.019 ± 0.0027
(Cyprinus carpio)							
May, 1999 Kasumigaura-lake, IBARAKI	1.11	0.209	3.69	0.012 ± 0.0059	0.058 ± 0.028	0.27 ± 0.015	0.072 ± 0.004
Aug, 1999 Akita, AKITA	3.07	8.48	2.76	1.6 ± 0.04	0.19 ± 0.005	0.17 ± 0.012	0.06 ± 0.0044
(Salvelinus leucomaeni							
Sep, 1999 Fukushima, FUKUSHIMA	1.29	0.583	3.81	0.0036 ± 0.0061	0.006 ± 0.011	0.17 ± 0.012	0.044 ± 0.0032

Freshwater Fish

Japanese name	English name	Scientific name
Funa	Crucian carp	Carassius auratus
Iwana		Salvelinus leucomaenis
Koi	Carp	Cyprinus carpio

(8) Strontium-90 and Cesium-137 in Shellfish
(form Apr. 1999 to Sep. 1999)

-continued from No. 129 for this publication-

Table (8) : Strontium-90 and Cesium-137 in Shellfish

Location	Component			90Sr				137Cs			
	(%)	(g/kgwet)	(g/kgwet)	(Bq/kgwet)		(Bq/gCa)		(Bq/kgwet)		(Bq/gK)	
(Mytilus edulis)											
Jun, 1999											
Mutsu, AOMORI	2.54	0.609	1.7	0	± 0.0053	0	± 0.0086	0.014	± 0.0049	0.0085	± 0.0029
(Ruditapes phillipinarum)											
May, 1999											
Konagai-machi, NAGASAKI	2.07	0.792	1.77	0.0041	± 0.005	0.0051	± 0.0063	0.014	± 0.005	0.008	± 0.0028
Jun, 1999											
Minamichita-machi, AICHI	1.99	0.717	3.73	0.002	± 0.015	0.002	± 0.021	0.034	± 0.014	0.0092	± 0.0037
(Turbo cornutus)											
May, 1999											
Ryotsu, NIIGATA	2.53	0.731	2.19	0.006	± 0.0089	0.008	± 0.012	0.02	± 0.0084	0.0093	± 0.0038
Monzen-machi, ISHIKAWA	3.54	2.7	2.98	0.013	± 0.0072	0.0049	± 0.0027	0.028	± 0.0063	0.0095	± 0.0021
Jul, 1999											
Sakata, YAMAGATA	2.58	1.18	2.72	0.013	± 0.0067	0.011	± 0.0057	0.026	± 0.0061	0.0096	± 0.0022

Shellfish

Japanese name	English name	Scientific name
Asari	Japanese littleneck	Ruditapes phillipinarum
Murasakiigai	Common blue mussel	Mytilus edulis
Sazae	Horned turban	Turbo cornutus

(9) Strontium-90 and Cesium-137 in Seaweeds
(form Apr. 1999 to Sep. 1999)

-continued from No. 129 for this publication-

Table (9) : Strontium-90 and Cesium-137 in Seaweeds

Location	Component			90Sr		137Cs	
	(%)	(g/kgwet)	(g/kgwet)	(Bq/kgwet)	(Bq/gCa)	(Bq/kgwet)	(Bq/gK)
(Undaria pinnatifida)							
Apr, 1999							
Monzen-machi, ISHIKAWA	4.09	0.883	6.75	0.013 ± 0.0062	0.014 ± 0.007	0.013 ± 0.0052	0.002 ± 0.00076
May, 1999							
Fukaura-machi, AOMORI	2.17	0.723	5.37	0.0054 ± 0.0073	0.007 ± 0.01	0.011 ± 0.0064	0.0021 ± 0.0012
Mutsu, AOMORI	3.01	0.786	6.92	0.016 ± 0.0082	0.02 ± 0.01	0.032 ± 0.008	0.0046 ± 0.0012
Ryotsu, NIIGATA	8.44	2.34	20.7	0.076 ± 0.052	0.033 ± 0.022	0.12 ± 0.045	0.006 ± 0.0022
Jun, 1999							
Sakata, YAMAGATA	2.27	1.16	4.13	0.031 ± 0.0085	0.026 ± 0.0073	0.02 ± 0.0054	0.0049 ± 0.0013

Seaweeds

Japanese name	English name	Scientific name
Wakame	Wakame seaweed	Undaria pinnatifida

＊＊Sampling Locations in Japan＊＊

1 : Sapporo
2 : Aomori
3 : Morioka
4 : Sendai
5 : Akita
6 : Yamagata
7 : Fukushima
8 : Mito
9 : Utsunomiya
10 : Maebashi
11 : Urawa
12 : Chiba
13 : Shinjuku
14 : Yokohama
15 : Niigata
16 : Toyama
17 : Kanazawa
18 : Fukui
19 : Kofu
20 : Nagano
21 : Gifu
22 : Shizuoka
23 : Nagoya
24 : Tsu
25 : Otsu
26 : Kyoto
27 : Osaka
28 : Kobe
29 : Nara
30 : Wakayama
31 : Tottori
32 : Matsue
33 : Okayama
34 : Hiroshima
35 : Yamaguchi
36 : Tokushima
37 : Takamatsu
38 : Matsuyama
39 : Kochi
40 : Fukuoka
41 : Saga
42 : Nagasaki
43 : Kumamoto
44 : Oita
45 : Miyazaki
46 : Kagoshima
47 : Naha