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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 montly on a sampling tray, approximately 5000cm² in area. which was filled with water to a depth of 1 cm at the beginning of every manth.

Strontium and cesium carrier solutions were added to the sample.

(2) Airborne dust

Airborne dust was collected by a filter air sampler for every three-months at a rate of more than 3000m³ per month.

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

(3) Service water and freshwater

Service water, 100 ℓ 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 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 dephes, 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 1 ℓ of sea water, and then stored in 20 ℓ 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 staions for the demermination of chlorinity.

(6) Sea sediments

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

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 tranferred 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 47 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 leaf vegetables and for nonstarch roots, respectively. After removing soil, the edible part of vegetable sample was dried and carbonized ashing 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) Airborne dust	quarterly	>3000m ³ /month
(3) Service water and freshwater		
1. Service water (source water)	semiyearly	100 ℓ
2. Servicewater (tap water)	semiyearly	100 ℓ
3. Freshwater	yearly (fishing season)	100 ℓ
(4) Soil		
1. 0 ~ 5cm	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 domestic program	quarterly (February, May, August and November)	3 ℓ
	semiyearly (February and August)	3 ℓ

Sample	Frequency of sampling	Quantity of sample
3. Consumng districts	semiyearly (February and August)	3 ℓ
4. Powdered milk	semiyearly (January and Jun)	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

The dried sample was decomposed with nitric acid and dissolved in hydrochlovic acid 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.

(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, 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 2.5M sodium hydroxide solution. The soluion was adjusted to pH8.2 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.

Stable calcium and strontium were determined by ICP-AES and potassium were determined by flame emission spectrometry.

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 stontium-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 Rain and Dry Fallout(for domestic program) (form Apr.2000 to Sep.2000)

-continued from No. 132 for this publication-

Table (1) Strontium-90 and Cesium-137 in Rain and Dry Fallout

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Apr, 2000								
Sapporo, HOKKAIDO	31	114	0.049	±	0.0087	0.033	±	0.013
Aomori, AOMORI	28	65.8	0.066	±	0.016	0.1	±	0.013
Morioka, IWATE	28	167.8	0.023	±	0.016	0.12	±	0.016
Onagawa-machi, MIYAGI	28	188.5	0.084	±	0.017	0.067	±	0.015
Akita, AKITA	28	161.3	0.043	±	0.014	0.19	±	0.02
Yamagata, YAMAGATA	28	99.6	0.12	±	0.012	0.19	±	0.02
Okuma-machi, FUKUSHIMA	28	207.5	0.078	±	0.011	0.067	±	0.012
Mito, IBARAKI	28	159.5	0.033	±	0.0085	0.12	±	0.017
Kawachi-machi, TOCHIGI	30	169.6	0.03	±	0.0084	0.052	±	0.011
Maebashi, GUNMA	29	113.5	0.041	±	0.0094	0.061	±	0.012
Urawa, SAITAMA	29	157.5	0.0091	±	0.0059	0.052	±	0.011
Chiba, CHIBA	29	112.4	0.021	±	0.0074	0.09	±	0.012
Ichihara, CHIBA	28	107.3	0.025	±	0.0079	0.034	±	0.014
Shinjuku, TOKYO	28	164.8	0.026	±	0.013	0.048	±	0.014
Yokohama, KANAGAWA	28	121.5	0.035	±	0.0084	0.066	±	0.015
Niigata, NIIGATA	28	76.9	0.083	±	0.018	0.19	±	0.019
Kosugi-machi, TOYAMA	31	115.2	0.073	±	0.011	0.18	±	0.016
Kanazawa, ISHIKAWA	28	156	0.097	±	0.017	0.23	±	0.021
Fukui, FUKUI	28	155.4	0.06	±	0.041	0.071	±	0.071
Kofu, YAMANASHI	28	86.5	0.0077	±	0.0069	0.071	±	0.014
Nagano, NAGANO	30	51.1	0.02	±	0.013	0.086	±	0.015

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km ²)			137Cs (MBq/km ²)		
				±			±	
Gifu, Gifu	30	168.6	0	±	0.0084	0.017	±	0.009
Shizuoka, SHIZUOKA	29	197.5	0.045	±	0.011	0.076	±	0.012
Nagoya, AICHI	24	144.4	0.039	±	0.012	0.055	±	0.012
Tsu, MIE	28	155.5	0.042	±	0.0082	0.098	±	0.014
Otsu, SHIGA	28	94	0.013	±	0.014	0.083	±	0.016
Kyoto, KYOTO	31	81.5	0.081	±	0.018	0.068	±	0.013
Osaka, OSAKA	31	75	0.058	±	0.02	0.058	±	0.016
Kobe, HYOGO	28	63	0.019	±	0.013	0.05	±	0.014
Nara, NARA	28	78.3	0.015	±	0.014	0.053	±	0.012
Wakayama, WAKAYAMA	31	95.5	0.041	±	0.016	0.053	±	0.012
Tottori, TOTTORI	28	99	0.12	±	0.02	0.23	±	0.019
Matsue, SHIMANE	28	99.5	0.043	±	0.0068	0.12	±	0.011
Okayama, OKAYAMA	28	90.1	0.038	±	0.0091	0.066	±	0.012
Hiroshima, HIROSHIMA	31	135	0.066	±	0.021	0.16	±	0.029
Yamaguchi, YAMAGUCHI	30	114	0	±	0.011	0.036	±	0.014
Ishii-machi, TOKUSHIMA	28	48	0	±	0.016	0.036	±	0.011
Takamatsu, KAGAWA	28	43.5	0.04	±	0.018	0.032	±	0.011
Matsuyama, EHIME	28	84.5	0.017	±	0.0066	0.036	±	0.016
Kochi, KOCHI	28	118.4	0.026	±	0.015	0.015	±	0.013
Dazaifu, FUKUOKA	28	96.4	0.016	±	0.012	0.08	±	0.013
Saga, SAGA	29	97.1	0.038	±	0.013	0.051	±	0.012
Nagasaki, NAGASAKI	28	79.5	0.024	±	0.015	0.049	±	0.011
Uto, KUMAMOTO	28	55.5	0.017	±	0.011	0.031	±	0.014
Oita, OITA	28	107	0.03	±	0.013	0.043	±	0.015
Miyazaki, MIYAZAKI	28	181.6	0.057	±	0.017	0.045	±	0.012
Kagoshima, KAGOSHIMA	28	82.5	0.053	±	0.017	0.025	±	0.011

Location	Duration (Days)	Precipitation (mm)	90Sr			137Cs		
			(MBq/km2)			(MBq/km2)		
Yonagusuku-machi, OKINAWA	27	358	0.032	±	0.01	0.14	±	0.016
May, 2000								
Sapporo, HOKKAIDO	31	72	0.015	±	0.01	0.035	±	0.014
Aomori, AOMORI	31	83.2	0.019	±	0.012	0.053	±	0.011
Morioka, IWATE	31	159.9	0.008	±	0.014	0.03	±	0.01
Onagawa-machi, MIYAGI	31	139	0.038	±	0.013	0.029	±	0.014
Akita, AKITA	31	121.5	0.019	±	0.012	0.043	±	0.015
Yamagata, YAMAGATA	31	113	0.0059	±	0.0071	0.048	±	0.014
Okuma-machi, FUKUSHIMA	31	142	0.014	±	0.0088	0.024	±	0.0095
Mito, IBARAKI	31	145	0.031	±	0.012	0.018	±	0.013
Kawachi-machi, TOCHIGI	30	139.5	0.013	±	0.0073	0.018	±	0.009
Maebashi, GUNMA	31	132.5	0.017	±	0.0092	0.028	±	0.01
Urawa, SAITAMA	31	118.4	0.016	±	0.0059	0.018	±	0.0095
Chiba, CHIBA	30	133.2	0.015	±	0.0073	0.041	±	0.011
Ichihara, CHIBA	31	119.9	0.015	±	0.0079	0.012	±	0.014
Shinjuku, TOKYO	31	92.4	0.016	±	0.011	0.021	±	0.014
Yokohama, KANAGAWA	33	54.9	0.0077	±	0.0096	0.018	±	0.013
Niigata, NIIGATA	31	73.6	0	±	0.012	0.098	±	0.016
Kosugi-machi, TOYAMA	31	42.9	0.01	±	0.0079	0.035	±	0.011
Kanazawa, ISHIKAWA	33	26.5	0.023	±	0.012	0.042	±	0.015
Fukui, FUKUI	31	86.7	0.077	±	0.052	0.023	±	0.067
Kofu, YAMANASHI	31	26	0.004	±	0.012	0.0099	±	0.0098
Nagano, NAGANO	31	54	0.0047	±	0.0068	0.035	±	0.013
Kagamigahara, Gifu	31	139.9	0.013	±	0.011	0.016	±	0.009
Shizuoka, SHIZUOKA	30	122	0	±	0.0087	0.042	±	0.012
Nagoya, AICHI	35	131	0.02	±	0.011	0.048	±	0.011
Tsu, MIE	31	221	0.015	±	0.0066	0.041	±	0.011

Location	Duration (Days)	Precipitation (mm)	90Sr			137Cs		
			(MBq/km ²)			(MBq/km ²)		
Otsu, SHIGA	31	117.6	0.021	±	0.012	0.055	±	0.014
Kyoto, KYOTO	35	160	0.067	±	0.016	0.034	±	0.01
Osaka, OSAKA	31	79.4	0	±	0.35	0.06	±	0.02
Kobe, HYOGO	33	54.9	0	±	0.014	0.029	±	0.015
Nara, NARA	31	157.7	0.009	±	0.012	0.047	±	0.011
Wakayama, WAKAYAMA	34	76.5	0.009	±	0.015	0.052	±	0.012
Tottori, TOTTORI	31	125	0.03	±	0.011	0.11	±	0.015
Matsue, SHIMANE	31	63.3	0.014	±	0.0057	0.042	±	0.0073
Okayama, OKAYAMA	31	88.2	0.0038	±	0.0068	0.022	±	0.0095
Hiroshima, HIROSHIMA	31	135.1	0.016	±	0.013	0.035	±	0.014
Yamaguchi, YAMAGUCHI	31	149.5	0	±	0.012	0.037	±	0.015
Ishii-machi, TOKUSHIMA	31	94.1	0.004	±	0.015	0.048	±	0.012
Takamatsu, KAGAWA	31	82.5	0.02	±	0.0096	0.028	±	0.0097
Matsuyama, EHIME	31	101.5	0.025	±	0.0073	0.02	±	0.016
Kochi, KOCHI	31	175.2	0.047	±	0.014	0.034	±	0.014
Dazaifu, FUKUOKA	31	121.7	0.023	±	0.013	0.058	±	0.012
Saga, SAGA	31	149.4	0.016	±	0.012	0.05	±	0.012
Nagasaki, NAGASAKI	31	148	0.058	±	0.019	0.04	±	0.017
Uto, KUMAMOTO	31	91	0.005	±	0.01	0.025	±	0.014
Oita, OITA	31	175.6	0.041	±	0.014	0.056	±	0.015
Miyazaki, MIYAZAKI	31	313.2	0.045	±	0.016	0.056	±	0.012
Kagoshima, KAGOSHIMA	33	257.5	0.091	±	0.016	0.022	±	0.0096
Yonagusuku-machi, OKINAWA	31	51	0	±	0.0091	0.016	±	0.011
Jun, 2000								
Sapporo, HOKKAIDO	29	57	0	±	0.01	0.0046	±	0.0097
Aomori, AOMORI	32	31	0.034	±	0.014	0.013	±	0.0088
Morioka, IWATE	30	52.6	0	±	0.015	0.011	±	0.0097

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Onagawa-machi, MIYAGI	32	84	0.017	±	0.012	0.021	±	0.013
Akita, AKITA	32	77.4	0.019	±	0.014	0.007	±	0.01
Yamagata, YAMAGATA	32	94.4	0.037	±	0.012	0.003	±	0.013
Okuma-machi, FUKUSHIMA	32	143.5	0	±	0.0085	0.013	±	0.0088
Mito, IBARAKI	32	190	0.023	±	0.013	0.014	±	0.0094
Kawachi-machi, TOCHIGI	33	189.3	0	±	0.0066	0.013	±	0.0088
Maebashi, GUNMA	32	175.5	0.0015	±	0.0078	0.0066	±	0.0089
Urawa, SAITAMA	32	195.6	0	±	0.0057	0.019	±	0.0067
Chiba, CHIBA	32	207.5	0.016	±	0.0075	0.014	±	0.0089
Ichihara, CHIBA	32	218.3	0.019	±	0.0083	0.006	±	0.013
Shinjuku, TOKYO	32	231.2	0	±	0.014	0.023	±	0.0093
Yokohama, KANAGAWA	30	250.2	0.04	±	0.014	0.015	±	0.013
Niigata, NIIGATA	32	124.1	0.15	±	0.011	0.013	±	0.012
Kosugi-machi, TOYAMA	29	196.7	0	±	0.0068	0.017	±	0.0091
Kanazawa, ISHIKAWA	30	200	0.016	±	0.012	0	±	0.012
Fukui, FUKUI	32	96	0.1	±	0.039	0.043	±	0.047
Kofu, YAMANASHI	32	173.5	0.002	±	0.013	0	±	0.008
Nagano, NAGANO	32	125.8	0.021	±	0.0078	0.007	±	0.012
Kagamigahara, GIFU	32	268.5	0.0018	±	0.0086	0.011	±	0.0085
Shizuoka, SHIZUOKA	32	433.5	0.003	±	0.01	0.047	±	0.011
Nagoya, AICHI	34	183.2	0.032	±	0.012	0.008	±	0.01
Yokkaichi, MIE	32	286	0.009	±	0.011	0	±	0.0085
Otsu, SHIGA	32	218	0.014	±	0.013	0	±	0.0083
Kyoto, KYOTO	28	125.5	0.015	±	0.012	0.016	±	0.0099
Osaka, OSAKA	32	202.1	0.026	±	0.013	0.018	±	0.013
Kobe, HYOGO	30	178.9	0.026	±	0.0078	0.01	±	0.0094

Location	Duration (Days)	Precipitation (mm)	90Sr			137Cs		
			(MBq/km ²)			(MBq/km ²)		
Nara, NARA	32	396.8	0.012	±	0.016	0.0083	±	0.0097
Wakayama, WAKAYAMA	28	195	0.037	±	0.015	0.021	±	0.0095
Tottori, TOTTORI	32	143.6	0.095	±	0.018	0.026	±	0.011
Matsue, SHIMANE	32	121.9	0.012	±	0.0085	0	±	0.0058
Okayama, OKAYAMA	32	123.7	0.0039	±	0.0059	0.015	±	0.0084
Hiroshima, HIROSHIMA	29	157.5	0.016	±	0.0078	0	±	0.01
Yamaguchi, YAMAGUCHI	30	265	0.018	±	0.0081	0.0039	±	0.0075
Ishii-machi, TOKUSHIMA	32	145.2	0.022	±	0.037	0.14	±	0.021
Takamatsu, KAGAWA	32	102	0	±	0.008	0.003	±	0.0085
Matsuyama, EHIME	29	219	0.038	±	0.008	0.012	±	0.016
Kochi, KOCHI	32	277.9	0.045	±	0.0098	0	±	0.0087
Dazaifu, FUKUOKA	32	250.2	0.004	±	0.0074	0.003	±	0.016
Saga, SAGA	32	330.9	0.033	±	0.014	0.0052	±	0.0089
Nagasaki, NAGASAKI	32	258	0.021	±	0.013	0.024	±	0.0097
Uto, KUMAMOTO	32	439.4	0.0036	±	0.0063	0	±	0.014
Oita, OITA	32	378.7	0.01	±	0.012	0.0018	±	0.009
Miyazaki, MIYAZAKI	32	619.9	0.022	±	0.0094	0.025	±	0.01
Kagoshima, KAGOSHIMA	30	614.5	0.06	±	0.015	0.015	±	0.0093
Yonagusuku-machi, OKINAWA	32	187	0	±	0.0092	0	±	0.01
Jul, 2000								
Sapporo, HOKKAIDO	32	194.5	0	±	0.0086	0.014	±	0.0096
Aomori, AOMORI	29	252.7	0.007	±	0.012	0.0029	±	0.0097
Morioka, IWATE	31	221.9	0.012	±	0.015	0.0036	±	0.0096
Onagawa-machi, MIYAGI	29	143	0.003	±	0.011	0	±	0.011
Akita, AKITA	29	167.4	0.018	±	0.015	0.0007	±	0.0093
Yamagata, YAMAGATA	29	220.7	0.025	±	0.01	0	±	0.0081
Okuma-machi, FUKUSHIMA	29	252.5	0.0087	±	0.0095	0	±	0.0076

Location	Duration (Days)	Precipitation (mm)	90Sr			137Cs		
			(MBq/km ²)			(MBq/km ²)		
Mito, IBARAKI	29	225.5	0.007	±	0.0065	0.013	±	0.012
Kawachi-machi, TOCHIGI	29	284.9	0	±	0.011	0	±	0.0068
Maebashi, GUNMA	29	168	0.003	±	0.0091	0.012	±	0.009
Urawa, SAITAMA	28	165.4	0.0017	±	0.008	0.0059	±	0.0059
Chiba, CHIBA	29	240.9	0.019	±	0.0076	0.0095	±	0.0074
Ichihara, CHIBA	29	238.6	0.024	±	0.0085	0.03	±	0.015
Shinjuku, TOKYO	29	254.4	0.03	±	0.019	0.011	±	0.0085
Yokohama, KANAGAWA	31	151.5	0.019	±	0.016	0.011	±	0.0091
Niigata, NIIGATA	29	197.4	0.04	±	0.013	0.013	±	0.011
Kosugi-machi, TOYAMA	31	59.4	0.019	±	0.0082	0.016	±	0.0089
Kanazawa, ISHIKAWA	31	74	0.022	±	0.014	0.01	±	0.0094
Fukui, FUKUI	29	68.7	0	±	0.072	0	±	0.046
Kofu, YAMANASHI	29	105	0	±	0.012	0.013	±	0.0097
Nagano, NAGANO	29	63	0.014	±	0.0078	0.014	±	0.012
Kagamigahara, Gifu	29	94.4	0.0008	±	0.0073	0.0075	±	0.0088
Shizuoka, SHIZUOKA	29	205	0.022	±	0.021	0.056	±	0.012
Nagoya, AICHI	27	92.8	0.013	±	0.01	0.0064	±	0.0087
Yokkaichi, MIE	29	32.5	0.0048	±	0.0077	0	±	0.011
Otsu, SHIGA	29	80	0	±	0.011	0	±	0.0083
Kyoto, KYOTO	32	53.5	0.011	±	0.012	0.01	±	0.0091
Osaka, OSAKA	29	49.7	0.0022	±	0.0079	0	±	0.01
Kobe, HYOGO	31	21.1	0.0098	±	0.0065	0	±	0.0076
Nara, NARA	29	127.9	0.057	±	0.015	0.0043	±	0.0097
Wakayama, WAKAYAMA	29	64.5	0.017	±	0.013	0.0048	±	0.0084
Tottori, TOTTORI	29	78.9	0.15	±	0.025	0.028	±	0.012
Matsue, SHIMANE	29	98.5	0.05	±	0.01	0	±	0.0049

Location	Duration (Days)	Precipitation (mm)	90Sr			137Cs		
			(MBq/km ²)			(MBq/km ²)		
Okayama, OKAYAMA	29	51.8	0.01	±	0.0069	0	±	0.0074
Hiroshima, HIROSHIMA	32	80.7	0.039	±	0.0091	0	±	0.01
Yamaguchi, YAMAGUCHI	31	93	0.029	±	0.076	0.0035	±	0.0093
Ishii-machi, TOKUSHIMA	29	51	0.013	±	0.013	0.011	±	0.0094
Takamatsu, KAGAWA	29	9	0.039	±	0.014	0.012	±	0.009
Matsuyama, EHIME	32	31.5	0.0048	±	0.0067	0.0006	±	0.0084
Kochi, KOCHI	29	197.5	0	±	0.0088	0	±	0.0079
Dazaifu, FUKUOKA	29	127.8	0.0032	±	0.0075	0	±	0.013
Saga, SAGA	29	150.5	0.009	±	0.016	0	±	0.0089
Nagasaki, NAGASAKI	29	113.5	0.015	±	0.015	0.0046	±	0.0094
Uto, KUMAMOTO	29	167.4	0	±	0.0081	0	±	0.013
Oita, OITA	29	83	0.025	±	0.016	0	±	0.0093
Miyazaki, MIYAZAKI	29	197.3	0.018	±	0.023	0	±	0.0089
Kagoshima, KAGOSHIMA	31	341	0.086	±	0.016	0	±	0.0077
Yonagusuku-machi, OKINAWA	32	539.5	0.02	±	0.015	0.018	±	0.01
Aug. 2000								
Sapporo, HOKKAIDO	31	108.5	0.021	±	0.0077	0.0073	±	0.0084
Aomori, AOMORI	31	23.8	0.01	±	0.014	0.0047	±	0.0081
Morioka, IWATE	31	28.7	0.024	±	0.02	0	±	0.009
Onagawa-machi, MIYAGI	31	16	0.028	±	0.015	0.0018	±	0.0077
Akita, AKITA	31	23.4	0.035	±	0.014	0.001	±	0.013
Yamagata, YAMAGATA	31	67.5	0.003	±	0.012	0.01	±	0.011
Okuma-machi, FUKUSHIMA	31	21	0	±	0.0083	0	±	0.0072
Mito, IBARAKI	31	62.5	0.009	±	0.013	0.012	±	0.013
Kawachi-machi, TOCHIGI	31	184.5	0	±	0.012	0.0018	±	0.0086
Maebashi, GUNMA	34	86	0.0056	±	0.0092	0.0043	±	0.0092
Urawa, SAITAMA	32	231.7	0.0031	±	0.0056	0	±	0.0055

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Chiba, CHIBA	31	95.9	0.023	±	0.0081	0	±	0.0067
Ichihara, CHIBA	31	167.3	0	±	0.0066	0	±	0.011
Shinjuku, TOKYO	31	200	0.015	±	0.0093	0.0044	±	0.0089
Yokohama, KANAGAWA	31	124	0.015	±	0.0097	0	±	0.0075
Niigata, NIIGATA	31	10.2	0.005	±	0.012	0.0035	±	0.0081
Kosugi-machi, TOYAMA	32	50.1	0.0055	±	0.0077	0	±	0.0079
Kanazawa, ISHIKAWA	31	6.5	0.02	±	0.015	0	±	0.0068
Fukui, FUKUI	31	44.4	0	±	0.044	0	±	0.074
Kofu, YAMANASHI	31	265	0	±	0.012	0.0035	±	0.0088
Nagano, NAGANO	31	79.2	0	±	0.0074	0.004	±	0.011
Kagamigahara, Gifu	31	30	0	±	0.0062	0	±	0.0082
Shizuoka, SHIZUOKA	31	249	0	±	0.013	0	±	0.0083
Nagoya, AICHI	31	20.2	0	±	0.0074	0.005	±	0.013
Yokkaichi, MIE	31	50.5	0	±	0.008	0.016	±	0.012
Otsu, SHIGA	31	12.6	0.019	±	0.0076	0.0067	±	0.0078
Kyoto, KYOTO	28	21.5	0.016	±	0.015	0.01	±	0.01
Osaka, OSAKA	30	6.3	0.052	±	0.017	0	±	0.015
Kobe, HYOGO	31	1.6	0	±	0.0093	0	±	0.0091
Nara, NARA	31	25.4	0	±	0.0099	0	±	0.0068
Wakayama, WAKAYAMA	31	23.5	0.024	±	0.015	0	±	0.0079
Matsue, SHIMANE	31	23	0.02	±	0.0058	0	±	0.0048
Okayama, OKAYAMA	31	53.1	0.02	±	0.0073	0	±	0.0071
Hiroshima, HIROSHIMA	31	30.6	0.026	±	0.014	0	±	0.0073
Yamaguchi, YAMAGUCHI	31	88.5	0.032	±	0.0071	0	±	0.014
Ishii-machi, TOKUSHIMA	31	41.8	0.016	±	0.013	0.014	±	0.0093
Takamatsu, KAGAWA	31	11	0.029	±	0.014	0	±	0.0086

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km ²)			137Cs (MBq/km ²)		
Matsuyama, EHIME	31	38	0.013	±	0.0078	0.0006	±	0.0081
Kochi, KOCHI	31	259.7	0.024	±	0.01	0.021	±	0.014
Dazaifu, FUKUOKA	31	144.4	0.0023	±	0.0069	0.017	±	0.0096
Saga, SAGA	31	254.5	0	±	0.011	0	±	0.0092
Nagasaki, NAGASAKI	31	209.5	0.019	±	0.013	0.0078	±	0.0088
Uto, KUMAMOTO	31	144.2	0	±	0.0076	0	±	0.013
Oita, OITA	31	45.9	0.014	±	0.014	0	±	0.0089
Miyazaki, MIYAZAKI	31	300.7	0.025	±	0.0092	0	±	0.0066
Kagoshima, KAGOSHIMA	31	139.5	0.047	±	0.014	0	±	0.0077
Yonagusuku-machi, OKINAWA	28	231.5	0.019	±	0.015	0.008	±	0.01
Sep, 2000								
Sapporo, HOKKAIDO	31	239	0.017	±	0.015	0.003	±	0.01
Aomori, AOMORI	31	165.3	0.012	±	0.014	0.0064	±	0.0089
Morioka, IWATE	31	897.9	0.008	±	0.017	0	±	0.0089
Onagawa-machi, MIYAGI	31	154.5	0.0014	±	0.0073	0.0055	±	0.0082
Akita, AKITA	31	255.3	0.055	±	0.02	0	±	0.008
Yamagata, YAMAGATA	31	119.1	0.006	±	0.013	0	±	0.0077
Okuma-machi, FUKUSHIMA	31	333	0	±	0.0096	0	±	0.0075
Mito, IBARAKI	31	212	0.01	±	0.0073	0.0039	±	0.008
Kawachi-machi, TOCHIGI	31	304.9	0.02	±	0.014	0.006	±	0.0085
Maebashi, GUNMA	28	328	0.021	±	0.012	0.0006	±	0.0086
Urawa, SAITAMA	31	265.7	0.0049	±	0.005	0.0061	±	0.0063
Chiba, CHIBA	31	208.3	0.027	±	0.0092	0.0018	±	0.0076
Ichihara, CHIBA	31	228.8	0.026	±	0.01	0.01	±	0.0088
Shinjuku, TOKYO	31	245.5	0.016	±	0.013	0	±	0.0071
Yokohama, KANAGAWA	29	250.3	0.023	±	0.014	0.016	±	0.012
Niigata, NIIGATA	31	204.1	0.011	±	0.013	0.0032	±	0.009

Location	Duration (Days)	Precipitation (mm)	90Sr			137Cs		
			(MBq/km2)			(MBq/km2)		
Kosugi-machi, TOYAMA	31	285.8	0.01	±	0.009	0.0047	±	0.0084
Kanazawa, ISHIKAWA	29	305.5	0.03	±	0.013	0.0077	±	0.0078
Fukui, FUKUI	33	384	0.081	±	0.061	0.054	±	0.043
Nagano, NAGANO	31	145	0.012	±	0.012	0.0053	±	0.0076
Kagamigahara, GIFU	31	261.5	0.004	±	0.013	0.0056	±	0.0093
Shizuoka, SHIZUOKA	30	354	0.0068	±	0.0083	0.016	±	0.0091
Nagoya, AICHI	31	590.3	0.01	±	0.014	0.021	±	0.013
Yokkaichi, MIE	31	594.5	0.002	±	0.021	0.0042	±	0.0076
Otsu, SHIGA	30	304.8	0.0058	±	0.0082	0	±	0.0077
Kyoto, KYOTO	34	305	0.025	±	0.014	0	±	0.008
Osaka, OSAKA	32	267.2	0.013	±	0.021	0.004	±	0.011
Kobe, HYOGO	29	234	0.0085	±	0.0061	0	±	0.0075
Nara, NARA	31	363.3	0.011	±	0.012	0.012	±	0.0088
Wakayama, WAKAYAMA	32	484.5	0	±	0.015	0.068	±	0.0093
Tottori, TOTTORI	31	262.3	0.008	±	0.013	0	±	0.0085
Matsue, SHIMANE	31	348.6	0.017	±	0.0055	0.0065	±	0.0053
Okayama, OKAYAMA	31	123	0.0051	±	0.0098	0.01	±	0.0088
Hiroshima, HIROSHIMA	31	151.2	0.017	±	0.017	0	±	0.0096
Yamaguchi, YAMAGUCHI	30	157.5	0.019	±	0.0076	0	±	0.0076
Ishii-machi, TOKUSHIMA	31	407.6	0.001	±	0.018	0	±	0.0086
Takamatsu, KAGAWA	31	86.5	0.012	±	0.016	0.0035	±	0.0097
Matsuyama, EHIME	31	221.5	0.0028	±	0.0068	0	±	0.0079
Kochi, KOCHI	31	586.6	0.11	±	0.023	0.0018	±	0.0093
Dazaifu, FUKUOKA	31	204.5	0.004	±	0.0071	0	±	0.008
Saga, SAGA	31	142.4	0	±	0.012	0	±	0.0085
Nagasaki, NAGASAKI	31	171.5	0.028	±	0.018	0.0021	±	0.0098

Location	Duration	Precipitation	90Sr			137Cs		
	(Days)	(mm)	(MBq/km ²)			(MBq/km ²)		
Uto, KUMAMOTO	31	124	0.21	±	0.013	0	±	0.0087
Oita, OITA	31	303.3	0.012	±	0.0095	0	±	0.0081
Miyazaki, MIYAZAKI	31	665.3	0.021	±	0.0092	0.0012	±	0.0075
Kagoshima, KAGOSHIMA	29	133.5	0.027	±	0.013	0	±	0.0087
Yonagusuku-machi, OKINAWA	31	299	0	±	0.016	0.032	±	0.011

(2) Strontium-90 and Cesium-137 in Airborn Dust
(form Apr. 2000 to Sep. 2000)

-continued from No. 132 for this publication-

Table (2) :Strontium-90 and Cesium-137 in Airborn Dust

Location	Sampling period	Absorption (m3)	90Sr (mBq/m3)			137Cs (mBq/m3)		
April ~ May, 2000								
Maebashi, GUNMA	04 ~ 05	10335.0	0.0005	±	0.00038	0.00015	±	0.00031
April ~ June, 2000								
Morioka, IWATE	04 ~ 06	10896.0	0.00061	±	0.00062	0.00016	±	0.00042
Akita, AKITA	04 ~ 06	10800.0	0.0013	±	0.00053	0.00061	±	0.00049
Yamagata, YAMAGATA	04 ~ 06	12960.0	0.00067	±	0.00041	0	±	0.00046
Okuma-machi, FUKUSHIMA	04 ~ 06	10051.0	0.0001	±	0.00057	0.00047	±	0.00042
Kawachi-machi, TOCHIGI	04 ~ 06	14011.0	0.00062	±	0.00041	0.00008	±	0.0003
Ichihara, CHIBA	04 ~ 06	10267.3	0.00067	±	0.00057	0.00022	±	0.00043
Yokohama, KANAGAWA	04 ~ 06	10214.0	0.0011	±	0.00057	0.00005	±	0.00047
Niigata, NIIGATA	04 ~ 06	10170.0	0.00039	±	0.00052	0.00018	±	0.00045
Kosugi-machi, TOYAMA	04 ~ 06	17011.0	0.00072	±	0.00041	0.00058	±	0.00027
Fukui, FUKUI	04 ~ 06	11534.4	0.00024	±	0.0004	0.00021	±	0.00042
Kofu, YAMANASHI	04 ~ 06	12796.0	0.00016	±	0.0004	0.00069	±	0.00036
Nagano, NAGANO	04 ~ 06	10531.0	0.00031	±	0.00051	0	±	0.00034
Gifu, Gifu	04 ~ 06	10657.8	0.0019	±	0.0007	0.0016	±	0.0005
Hamaoka-machi, SHIZUOKA	04 ~ 06	10472.0	0.00042	±	0.00051	0.00092	±	0.00046
Nagoya, AICHI	04 ~ 06	10367.0	0.00038	±	0.00052	0	±	0.0004
Tsu, MIE	04 ~ 06	14058.0	0.00055	±	0.00041	0.00015	±	0.00031
Otsu, SHIGA	04 ~ 06	10791.0	0	±	0.00047	0.0008	±	0.00044
Kyoto, KYOTO	04 ~ 06	10382.0	0.0006	±	0.00035	0.00085	±	0.00033
Osaka, OSAKA	04 ~ 06	12747.0	0.00094	±	0.00055	0.00034	±	0.00037
Kobe, HYOGO	04 ~ 06	10279.9	0.0017	±	0.00069	0	±	0.00041

Location	Sampling period	Absorption (m3)	90Sr			137Cs		
			(mBq/m3)			(mBq/m3)		
Nara, NARA	04 ~ 06	11394.5	0.00009	±	0.00049	0.001	±	0.00043
Wakayama, WAKAYAMA	04 ~ 06	7281.9	0.0006	±	0.00047	0.00032	±	0.00047
Tottori, TOTTORI	04 ~ 06	14882.0	0.00073	±	0.00044	0.00074	±	0.00034
Okayama, OKAYAMA	04 ~ 06	12463.0	0.00018	±	0.00046	0.00025	±	0.00034
Hiroshima, HIROSHIMA	04 ~ 06	9855.9	0.00057	±	0.0005	0.0011	±	0.00055
Yamaguchi, YAMAGUCHI	04 ~ 06	21552.0	0.00064	±	0.00032	0.00056	±	0.00024
Tokushima, TOKUSHIMA	04 ~ 06	10080.0	0.00043	±	0.00057	0.00076	±	0.00048
Takamatsu, KAGAWA	04 ~ 06	15099.0	0.00029	±	0.00036	0.0011	±	0.00034
Saga, SAGA	04 ~ 06	10250.3	0.0009	±	0.0006	0.00074	±	0.00044
Nagasaki, NAGASAKI	04 ~ 06	10368.0	0	±	0.00064	0	±	0.00041
Uto, KUMAMOTO	04 ~ 06	12033.0	0.00087	±	0.00052	0.0018	±	0.00045
Oita, OITA	04 ~ 06	9783.0	0.00038	±	0.00059	0.00047	±	0.00045
Miyazaki, MIYAZAKI	04 ~ 06	13213.0	0.00026	±	0.00045	0.00015	±	0.00033
April~July, 2000								
Mito, IBARAKI	04 ~ 07	11521.7	0.00057	±	0.00055	0.00022	±	0.00039
July~September, 2000								
Morioka, IWATE	07 ~ 09	11434.0	0.0001	±	0.0007	0	±	0.00036
Akita, AKITA	07 ~ 09	10800.0	0.00069	±	0.0005	0	±	0.00038
Yamagata, YAMAGATA	07 ~ 09	12960.0	0.00057	±	0.00041	0	±	0.00032
Okuma-machi, FUKUSHIMA	07 ~ 09	9946.1	0.00099	±	0.00067	0.00059	±	0.00043
Kawachi-machi, TOCHIGI	07 ~ 09	14381.0	0	±	0.00048	0	±	0.00029
Ichihara, CHIBA	07 ~ 09	10636.2	0.00038	±	0.0006	0	±	0.00028
Yokohama, KANAGAWA	07 ~ 09	10149.0	0	±	0.00042	0	±	0.00038
Niigata, NIIGATA	07 ~ 09	10534.0	0.00084	±	0.00065	0	±	0.00027
Kosugi-machi, TOYAMA	07 ~ 09	18065.0	0.00054	±	0.00031	0.00002	±	0.00016
Fukui, FUKUI	07 ~ 09	12962.5	0.00009	±	0.00057	0	±	0.00033
Kofu, YAMANASHI	07 ~ 09	16102.0	0.00007	±	0.00033	0.0002	±	0.00027
Nagano, NAGANO	07 ~ 09	9924.0	0	±	0.00049	0	±	0.0004

Location	Sampling period	Absorption (m3)	90Sr (mBq/m3)			137Cs (mBq/m3)		
Kagamigahara, GIFU	07 ~ 09	10178.4	0.00054	±	0.00056	0	±	0.00041
Hamaoka-machi, SHIZUOKA	07 ~ 09	10461.0	0.00079	±	0.00053	0	±	0.00035
Nagoya, AICHI	07 ~ 09	10349.0	0.00096	±	0.00053	0	±	0.0004
Yokkaichi, MIE	07 ~ 09	14350.0	0	±	0.00036	0	±	0.00029
Otsu, SHIGA	07 ~ 09	10329.0	0.0011	±	0.00059	0.00049	±	0.00035
Kyoto, KYOTO	07 ~ 09	10292.0	0.00049	±	0.00037	0.00023	±	0.00029
Osaka, OSAKA	07 ~ 09	12257.0	0.00018	±	0.00045	0	±	0.00033
Kobe, HYOGO	07 ~ 09	10443.9	0.00084	±	0.00059	0	±	0.00034
Nara, NARA	07 ~ 09	11518.0	0.0014	±	0.00063	0	±	0.00025
Wakayama, WAKAYAMA	07 ~ 09	7281.9	0.00072	±	0.00047	0.00062	±	0.00048
Tottori, TOTTORI	07 ~ 09	14334.0	0.00058	±	0.00039	0	±	0.00025
Okayama, OKAYAMA	07 ~ 09	12990.0	0.00041	±	0.00043	0	±	0.00022
Hiroshima, HIROSHIMA	07 ~ 09	9798.9	0.00028	±	0.00052	0.00031	±	0.00043
Yamaguchi, YAMAGUCHI	07 ~ 09	21585.0	0	±	0.0002	0	±	0.00019
Tokushima, TOKUSHIMA	07 ~ 09	10080.0	0	±	0.00051	0.00008	±	0.00042
Takamatsu, KAGAWA	07 ~ 09	14746.4	0.00068	±	0.00042	0.00006	±	0.00029
Saga, SAGA	07 ~ 09	10840.0	0	±	0.00058	0	±	0.00038
Nagasaki, NAGASAKI	07 ~ 09	10483.0	0.00041	±	0.00064	0	±	0.00027
Uto, KUMAMOTO	07 ~ 09	12464.4	0	±	0.00041	0	±	0.00031
Oita, OITA	07 ~ 09	11169.0	0.00072	±	0.00056	0	±	0.00037
Miyazaki, MIYAZAKI	07 ~ 09	13204.0	0.00057	±	0.00044	0	±	0.00022
July~October, 2000 Mito, IBARAKI	07 ~ 10	11733.6	0.00042	±	0.00045	0	±	0.00034
August~September, 2000 Maebashi, GUNMA	08 ~ 09	9994.0	0	±	0.00038	0	±	0.00029

(3) Strontium-90 and Cesium-137 in Service Water
(form Apr.2000 to Sep.2000)

-continued from No. 132 for this publication-

Table (3) :Strontium-90 and Cesium-137 in Service Water

Location	pH (pH)	90Sr (mBq/l)			137Cs (mBq/l)		
(Source Water)							
May, 2000							
Nagano, NAGANO	7.24	0.91	±	0.12	0.069	±	0.045
Jun, 2000							
Urawa, SAITAMA	7.4	0.03	±	0.057	0	±	0.04
Kisarazu, CHIBA	7.4	1.9	±	0.016	0	±	0.045
Katsushika, TOKYO	7.1	1.3	±	0.29	0.24	±	0.058
Tsukui-machi, KANAGAWA	7.5	0.38	±	0.079	0	±	0.042
Inuyama, AICHI	6.8	1.3	±	0.013	0.26	±	0.052
Moriguchi, OSAKA	7.3	2.3	±	0.15	0.092	±	0.043
Fukuoka, FUKUOKA	7.8	1.7	±	0.15	0.099	±	0.042
Jul, 2000							
Sapporo, HOKKAIDO	7	1.2	±	0.13	0.12	±	0.05
Aug, 2000							
Kyoto, KYOTO	8.41	2.5	±	0.16	0.13	±	0.051
(Tap Water)							
May, 2000							
Nagano, NAGANO	7.18	0.73	±	0.11	0	±	0.041
Jun, 2000							
Wakkanai, HOKKAIDO	6.9	0.87	±	0.11	0.027	±	0.036
Aomori, AOMORI	7.7	1	±	0.11	0.074	±	0.045
Morioka, IWATE	7.3	1.2	±	0.15	0.068	±	0.043

Location	pH (pH)	90Sr (mBq/l)			137Cs (mBq/l)		
Yamagata, YAMAGATA	7.2	1.7	±	0.16	0.035	±	0.043
Mito, IBARAKI	7.9	1.3	±	0.13	0.044	±	0.045
Kawachi-machi, TOCHIGI	7.38	0.43	±	0.093	0.072	±	0.044
Maebashi, GUNMA	6.9	1.2	±	0.08	0	±	0.036
Urawa, SAITAMA	7	1.6	±	0.14	0	±	0.047
Ichihara, CHIBA	7.4	2.2	±	0.16	0	±	0.042
Katsushika, TOKYO	7.1	1.5	±	0.16	0.092	±	0.049
Yokohama, KANAGAWA	7.6	0.5	±	0.089	0	±	0.045
Niigata, NIIGATA	7.52	1.8	±	0.17	0.064	±	0.051
Kosugi-machi, TOYAMA	7.4	1.2	±	0.09	0	±	0.039
Kanazawa, ISHIKAWA	7.18	1.5	±	0.13	0.043	±	0.042
Fukui, FUKUI	6.9	0.47	±	0.085	0.11	±	0.048
Kofu, YAMANASHI	7.4	0.84	±	0.12	0.012	±	0.039
Kagamigahara, Gifu	7.5	0.051	±	0.064	0.033	±	0.047
Okayama, OKAYAMA	6.7	1.4	±	0.013	0.05	±	0.041
Hiroshima, HIROSHIMA	6.7	3.8	±	0.32	0	±	0.04
Ube, YAMAGUCHI	7.32	1.9	±	0.15	0	±	0.038
Tokushima, TOKUSHIMA	6.9	1.8	±	0.17	0	±	0.043
Takamatsu, KAGAWA	6.93	2.2	±	0.16	0	±	0.043
Matsuyama, EHIME	7.5	1.2	±	0.13	0	±	0.036
Kochi, KOCHI	7.24	1.6	±	0.18	0.013	±	0.045
Fukuoka, FUKUOKA	7.5	2.3	±	0.16	0.057	±	0.039
Saga, SAGA	7.7	1.3	±	0.16	0	±	0.039
Nagasaki, NAGASAKI	7.31	1	±	0.13	0	±	0.041
Uto, KUMAMOTO	7.49	0.095	±	0.074	0	±	0.041
Oita, OITA	7.9	0.63	±	0.12	0.18	±	0.056

Location	pH (pH)	90Sr (mBq/l)			137Cs (mBq/l)		
			±			±	
Miyazaki, MIYAZAKI	7.09	1.4	±	0.14	0	±	0.039
Naha, OKINAWA	7.8	1.9	±	0.15	0.034	±	0.038
Jul, 2000 Akita, AKITA	6.69	2.4	±	0.18	0.055	±	0.047

(4) Strontium-90 and Cesium-137 in Freshwater
(form Apr. 2000 to Sep. 2000)

-continued from No. 132 for this publication-

Table (4) :Strontium-90 and Cesium-137 in Freshwater

Location	pH (pH)	90Sr (mBq/l)			137Cs (mBq/l)		
(Fresh Water)							
May, 2000 Kasumigaura-lake, IBARAKI	8.1	2.3	±	0.15	0.3	±	0.063
Jul, 2000 Barato-lake, HOKKAIDO	6.9	1.5	±	0.14	0.094	±	0.051
Aug, 2000 Akita, AKITA	6.65	3.1	±	0.2	0.35	±	0.065
Inogaike, FUKUI	—	3.5	±	0.25	2	±	0.12
Sep, 2000 Fukushima, FUKUSHIMA	7.05	0.32	±	0.056	0	±	0.044

(5) Strontium-90 and Cesium-137 in Soil

(form Apr.2000 to Sep.2000)

-continued from No. 132 for this publication-

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

Location	Sampling period	90Sr			137Cs		
		(Bq/kg)	(MBq/km2)		(Bq/kg)	(MBq/km2)	
May~,							
Tokai-mura, IBARAKI	0 ~ 5	6.6 ± 0.3	370 ± 17		47 ± 0.7	2600 ± 40	
Tokai-mura, IBARAKI	5 ~ 20	5.1 ± 0.27	790 ± 42		8.3 ± 0.31	1300 ± 50	
Akabane-machi, AICHI	0 ~ 5	1.2 ± 0.13	59 ± 6.5		11 ± 0.3	520 ± 17	
Akabane-machi, AICHI	5 ~ 20	0.78 ± 0.11	120 ± 17		11 ± 0.3	1600 ± 50	
June~,							
Fukushima, FUKUSHIMA	0 ~ 5	5.6 ± 0.3	180 ± 9		33 ± 0.6	1000 ± 20	
Fukushima, FUKUSHIMA	5 ~ 20	3 ± 0.21	270 ± 19		8.4 ± 0.31	730 ± 27	
Naha, OKINAWA	0 ~ 5	0.77 ± 0.11	58 ± 8.3		4.9 ± 0.25	380 ± 19	
Naha, OKINAWA	5 ~ 20	1 ± 0.15	190 ± 28		2.5 ± 0.18	470 ± 34	
July~,							
Aomori, AOMORI	0 ~ 5	0.58 ± 0.1	21 ± 3.7		1.2 ± 0.13	44 ± 4.7	
Aomori, AOMORI	5 ~ 20	0.41 ± 0.088	44 ± 9.4		0.48 ± 0.09	51 ± 9.6	
Mutsu, AOMORI	0 ~ 5	0.67 ± 0.11	26 ± 4.1		3.6 ± 0.21	140 ± 8	
Mutsu, AOMORI	5 ~ 20	0.37 ± 0.086	54 ± 13		0.92 ± 0.12	140 ± 17	
Yamagata, YAMAGATA	0 ~ 5	3.2 ± 0.22	200 ± 14		17 ± 0.4	1100 ± 30	
Yamagata, YAMAGATA	5 ~ 20	1.2 ± 0.14	140 ± 17		2.3 ± 0.18	270 ± 21	
Imaichi, TOCHIGI	0 ~ 5	12 ± 0.4	200 ± 7		28 ± 0.6	450 ± 9	
Imaichi, TOCHIGI	5 ~ 20	3.1 ± 0.22	82 ± 5.9		7.4 ± 0.29	200 ± 8	
Katsushika, TOKYO	0 ~ 5	0.52 ± 0.1	16 ± 3.2		1.4 ± 0.14	45 ± 4.4	
Katsushika, TOKYO	5 ~ 20	0.78 ± 0.12	70 ± 11		2.3 ± 0.17	200 ± 15	
Kashiwazaki, NIIGATA	0 ~ 5	0.44 ± 0.092	20 ± 4.2		5.3 ± 0.25	250 ± 12	
Kashiwazaki, NIIGATA	5 ~ 20	0.59 ± 0.1	110 ± 19		6.5 ± 0.29	1200 ± 50	

Location	Sampling period	90Sr			137Cs		
		(Bq/kg)	(MBq/km2)		(Bq/kg)	(MBq/km2)	
Kosugi-machi, TOYAMA	0 ~ 5	0.24 ± 0.075	15 ± 4.6		0.85 ± 0.11	52 ± 6.6	
Kosugi-machi, TOYAMA	5 ~ 20	0.12 ± 0.067	22 ± 12		0.35 ± 0.076	63 ± 13	
Takane-machi, YAMANASHI	0 ~ 5	5.6 ± 0.28	160 ± 8		27 ± 0.6	750 ± 15	
Takane-machi, YAMANASHI	5 ~ 20	4.9 ± 0.26	400 ± 21		3.6 ± 0.2	290 ± 17	
Nagano, NAGANO	0 ~ 5	3.2 ± 0.21	73 ± 4.9		33 ± 0.6	750 ± 14	
Nagano, NAGANO	5 ~ 20	1.2 ± 0.14	110 ± 12		3.8 ± 0.21	330 ± 18	
Gifu, GIFU	0 ~ 5	0.76 ± 0.12	32 ± 4.9		5.1 ± 0.24	210 ± 10	
Gifu, GIFU	5 ~ 20	1 ± 0.13	130 ± 17		5.7 ± 0.33	740 ± 42	
Gotenba, SHIZUOKA	0 ~ 5	0.4 ± 0.091	13 ± 2.8		9.4 ± 0.33	290 ± 10	
Gotenba, SHIZUOKA	5 ~ 20	0.29 ± 0.08	22 ± 6.2		4.8 ± 0.24	370 ± 18	
Yasu-machi, SHIGA	0 ~ 5	0.081 ± 0.064	4.8 ± 3.8		0.61 ± 0.096	36 ± 5.7	
Yasu-machi, SHIGA	5 ~ 20	0 ± 0.052	0 ± 8.3		1.6 ± 0.14	260 ± 23	
Kyoto, KYOTO	0 ~ 5	0.58 ± 0.097	12 ± 2.1		2.4 ± 0.17	51 ± 3.7	
Kyoto, KYOTO	5 ~ 20	0.48 ± 0.093	72 ± 14		0.85 ± 0.11	130 ± 16	
Kasai, HYOGO	0 ~ 5	3.5 ± 0.22	100 ± 6		36 ± 0.6	1000 ± 20	
Kasai, HYOGO	5 ~ 20	0.37 ± 0.09	55 ± 13		3.6 ± 0.21	530 ± 31	
Kashihara, NARA	0 ~ 5	0.94 ± 0.13	49 ± 6.8		5.5 ± 0.25	290 ± 13	
Kashihara, NARA	5 ~ 20	1.3 ± 0.15	150 ± 17		6.4 ± 0.27	730 ± 31	
Kokufu-machi, TOTTORI	0 ~ 5	0 ± 0.054	0 ± 5.1		0.33 ± 0.078	31 ± 7.4	
Kokufu-machi, TOTTORI	5 ~ 20	0.2 ± 0.076	24 ± 9.2		0.4 ± 0.083	48 ± 10	
Ota, SHIMANE	0 ~ 5	10 ± 0.4	230 ± 8		24 ± 0.5	520 ± 11	
Ota, SHIMANE	5 ~ 20	2.9 ± 0.21	260 ± 19		7.4 ± 0.3	670 ± 27	
Asahi-machi, OKAYAMA	0 ~ 5	1 ± 0.14	78 ± 11		0.93 ± 0.12	73 ± 9	
Asahi-machi, OKAYAMA	5 ~ 20	0.43 ± 0.1	54 ± 13		0.1 ± 0.055	13 ± 6.9	
Hiroshima, HIROSHIMA	0 ~ 5	0.12 ± 0.065	4.8 ± 2.7		0.56 ± 0.087	23 ± 3.6	
Hiroshima, HIROSHIMA	5 ~ 20	0.31 ± 0.084	80 ± 22		3.5 ± 0.2	900 ± 51	
Kamiita-machi, TOKUSHIMA	0 ~ 5	0.41 ± 0.081	48 ± 9.7		2.2 ± 0.17	260 ± 20	
Kamiita-machi, TOKUSHIMA	5 ~ 20	0.33 ± 0.08	83 ± 20		1.5 ± 0.15	380 ± 37	

Location	Sampling period	90Sr			137Cs		
		(Bq/kg)	(MBq/km2)		(Bq/kg)	(MBq/km2)	
Sakaide, KAGAWA	0 ~ 5	1.6 ± 0.15	53 ± 4.9		4.6 ± 0.25	150 ± 8	
Sakaide, KAGAWA	5 ~ 20	1.7 ± 0.16	150 ± 13		2.5 ± 0.18	210 ± 15	
Matsuyama, EHIME	0 ~ 5	2.3 ± 0.18	24 ± 1.9		16 ± 0.4	170 ± 5	
Matsuyama, EHIME	5 ~ 20	0.5 ± 0.1	28 ± 5.8		23 ± 0.5	1300 ± 30	
Kochi, KOCHI	0 ~ 5	4.4 ± 0.26	140 ± 9		19 ± 0.5	630 ± 16	
Kochi, KOCHI	5 ~ 20	4.6 ± 0.28	330 ± 20		14 ± 0.4	1000 ± 30	
Fukuoka, FUKUOKA	0 ~ 5	3.6 ± 0.23	240 ± 15		2.1 ± 0.17	140 ± 11	
Fukuoka, FUKUOKA	5 ~ 20	1.9 ± 0.17	240 ± 21		4 ± 0.088	51 ± 11	
Obama-machi, NAGASAKI	0 ~ 5	2.2 ± 0.17	70 ± 5.5		49 ± 0.8	1500 ± 20	
Obama-machi, NAGASAKI	5 ~ 20	2.1 ± 0.17	210 ± 17		17 ± 0.5	1700 ± 50	
Nishihara-mura, KUMAMOTO	0 ~ 5	3.2 ± 0.2	73 ± 4.7		56 ± 0.8	1300 ± 20	
Nishihara-mura, KUMAMOTO	5 ~ 20	3.8 ± 0.23	250 ± 15		12 ± 0.4	810 ± 26	
Kuju-machi, OITA	0 ~ 5	2 ± 0.17	29 ± 2.5		67 ± 0.9	970 ± 13	
Kuju-machi, OITA	5 ~ 20	1.1 ± 0.14	50 ± 6.2		20 ± 0.5	910 ± 22	
Sadohara-machi, MIYAZAKI	0 ~ 5	0.61 ± 0.11	37 ± 6.6		6.1 ± 0.28	370 ± 17	
Sadohara-machi, MIYAZAKI	5 ~ 20	0.77 ± 0.12	140 ± 22		4.4 ± 0.24	810 ± 43	
August ~,							
Sapporo, HOKKAIDO	0 ~ 5	5.6 ± 0.29	140 ± 7		27 ± 0.5	660 ± 13	
Sapporo, HOKKAIDO	5 ~ 20	6.6 ± 0.32	700 ± 34		13 ± 0.4	1300 ± 40	
Takizawa-mura, IWATE	0 ~ 5	7.6 ± 0.33	230 ± 10		44 ± 0.7	1300 ± 20	
Takizawa-mura, IWATE	5 ~ 20	9.5 ± 0.35	1000 ± 40		11 ± 0.4	1200 ± 40	
Maebashi, GUNMA	0 ~ 5	0.46 ± 0.087	24 ± 4.5		1 ± 0.12	51 ± 6	
Maebashi, GUNMA	5 ~ 20	0.27 ± 0.073	27 ± 7.3		0.34 ± 0.08	34 ± 8	
Urawa, SAITAMA	0 ~ 5	1.1 ± 0.13	27 ± 3.2		7.2 ± 0.29	180 ± 7	
Urawa, SAITAMA	5 ~ 20	0.96 ± 0.14	110 ± 16		0.88 ± 0.11	100 ± 13	
Ichihara, CHIBA	0 ~ 5	0.17 ± 0.064	4.7 ± 1.8		2.1 ± 0.16	60 ± 4.5	
Ichihara, CHIBA	5 ~ 20	0.2 ± 0.066	28 ± 9.4		1.2 ± 0.12	160 ± 17	
Yokohama, KANAGAWA	0 ~ 5	3.5 ± 0.23	120 ± 7		12 ± 0.4	380 ± 12	

Location	Sampling period	90Sr			137Cs		
		(Bq/kg)	(MBq/km2)		(Bq/kg)	(MBq/km2)	
Yokohama, KANAGAWA	5 ~ 20	3.9 ± 0.24	400 ± 25		6.7 ± 0.28	690 ± 28	
Kanazawa, ISHIKAWA	0 ~ 5	6.4 ± 0.29	220 ± 10		26 ± 0.6	870 ± 20	
Kanazawa, ISHIKAWA	5 ~ 20	5 ± 0.26	820 ± 43		22 ± 0.5	3600 ± 80	
Fukui, FUKUI	0 ~ 5	0.58 ± 0.11	29 ± 5.7		3.1 ± 0.2	150 ± 10	
Fukui, FUKUI	5 ~ 20	0.49 ± 0.11	120 ± 25		2.1 ± 0.16	490 ± 39	
Tsu, MIE	0 ~ 5	0.019 ± 0.05	0.9 ± 2.3		0.36 ± 0.079	16 ± 3.6	
Tsu, MIE	5 ~ 20	0.057 ± 0.055	9.8 ± 9.4		0.016 ± 0.049	2.8 ± 8.4	
Osaka, OSAKA	0 ~ 5	1.3 ± 0.013	60 ± 6.4		5.6 ± 0.26	270 ± 12	
Osaka, OSAKA	5 ~ 20	1.1 ± 0.13	190 ± 22		3.9 ± 0.22	660 ± 36	
Hagi, YAMAGUCHI	0 ~ 5	1.3 ± 0.13	69 ± 7.1		2.9 ± 0.2	160 ± 11	
Hagi, YAMAGUCHI	5 ~ 20	0.76 ± 0.11	140 ± 20		2.4 ± 0.18	460 ± 34	
Saga, SAGA	0 ~ 5	0.089 ± 0.053	6.6 ± 3.9		1 ± 0.12	77 ± 8.5	
Saga, SAGA	5 ~ 20	0.28 ± 0.077	58 ± 16		0.74 ± 0.1	150 ± 21	
September ~,							
Iwadeyama-machi, MIYAGI	0 ~ 5	2.3 ± 0.19	84 ± 7		5.1 ± 0.26	180 ± 9	
Iwadeyama-machi, MIYAGI	5 ~ 20	1.4 ± 0.16	240 ± 27		2.1 ± 0.17	370 ± 29	
Akita, AKITA	0 ~ 5	6.1 ± 0.29	210 ± 10		31 ± 0.6	1100 ± 20	
Akita, AKITA	5 ~ 20	5.9 ± 0.29	700 ± 34		26 ± 0.6	3100 ± 70	
Shingu, WAKAYAMA	0 ~ 5	0.21 ± 0.074	9.6 ± 3.5		2.1 ± 0.16	98 ± 7.5	
Shingu, WAKAYAMA	5 ~ 20	0.2 ± 0.075	37 ± 14		0.45 ± 0.087	83 ± 16	
Kaimon-machi, KAGOSHIMA	0 ~ 5	0.12 ± 0.059	8.5 ± 4.2		0.45 ± 0.084	32 ± 6	
Kaimon-machi, KAGOSHIMA	5 ~ 20	0.3 ± 0.084	45 ± 13		0.82 ± 0.11	120 ± 16	

(6) Strontium-90 and Cesium-137 in Seawater

(form Apr. 2000 to Sep. 2000)

-continued from No. 132 for this publication-

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

Location	Sample volume analyzed	Cl	90Sr		137Cs	
			(mBq/l)		(mBq/l)	
Jun, 2000						
Yoichi-bay, HOKKAIDO	40	18.7	1.9	± 0.32	2.3	± 0.34
Jul, 2000						
Mutsu, AOMORI	60	0	1.6	± 0.28	2.1	± 0.33
Soma, FUKUSHIMA	40	18.2	1.6	± 0.3	2.1	± 0.33
Tokai, IBARAKI	40	13.6	0.79	± 0.24	1.1	± 0.26
Niigata, NIIGATA	40	18.8	1.9	± 0.32	2.4	± 0.34
Tokoname, AICHI	40	16.1	1.7	± 0.31	1.9	± 0.32
Aug, 2000						
Mutsu-bay, AOMORI	60	0	2	± 0.32	2	± 0.32
Ichihara, CHIBA	40	14.8	2.1	± 0.31	1.8	± 0.31
Odawa-bay, KANAGAWA	40	16.7	1.4	± 0.29	2.3	± 0.34

Location	Sample volume analyzed	Cl	90Sr		137Cs	
			(mBq/l)		(mBq/l)	
Osaka-Port, OSAKA	40	10.9	2.2	± 0.33	1.4	± 0.29
Yamaguchi-bay, YAMAGUCHI	40	18.3	1	± 0.27	2.2	± 0.34
Moji-Port, FUKUOKA	40	19.3	1.3	± 0.25	2.1	± 0.33
Sep, 2000						
Kaseda, KAGOSHIMA	40	15.9	1.4	± 0.26	0.76	± 0.24
White-beach, OKINAWA	40	0	1.7	± 0.32	2.2	± 0.34

(7) Strontium-90 and Cesium-137 in Sea Sediments

(form Apr. 2000 to Sep. 2000)

-continued from No. 132 for this publication-

Table (7) :Strontium-90 and Cesium-137 in Sea Sediments

Location	(m)	90Sr		137Cs	
		(Bq/kg)		(Bq/kg)	
Jun, 2000					
Yoichi-bay, HOKKAIDO	13	0.013	0.049	0.73	0.1
Jul, 2000					
Mutsu, AOMORI	14	0.015	0.053	0.21	0.065
Soma, FUKUSHIMA	5	0	0.047	1.5	0.14
Tokai, IBARAKI	10	0.013	0.051	0.42	0.084
Niigata, NIIGATA	19.7	0.014	0.052	1.3	0.13
Tokoname, AICHI	22	0.08	0.067	3.1	0.2
Aug, 2000					
Mutsu-bay, AOMORI	13	0.31	0.075	5	0.25
Ichihara, CHIBA	15	0.049	0.062	2.8	0.18
Odawa-bay, KANAGAWA	8	0.14	0.065	1.8	0.16
Osaka-Port, OSAKA	17.6	0.039	0.051	2.2	0.17
Yamaguchi-bay, YAMAGUCHI	15	0.044	0.06	2.5	0.18
Moji-Port, FUKUOKA	10	0.15	0.06	3	0.2
Sep, 2000					
Kaseda, KAGOSHIMA	7	0.029	0.053	0.31	0.073
White-beach, OKINAWA	13.9	0.081	0.057	0.26	0.07

****Sampling Locations in Japan****

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

