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RADIOACTIVITY SURVEY DATA in Japan

Part 2
= Dietary Materials =

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National Institute of Radiological Sciences
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Radioactivity Survey Data in Japan

Number 101

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Contents

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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 monthly on asampling tray, approximately 5000 cm^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 5 ℓ of distilled water and the washing was combined to the filtrate.

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

(2) Airborne dust

Airborne dust was collected by an electrostatic precipitator or a filter air sampler for every threemonths at a rate of more than 3000 m^3 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 andcesium carriers were added to the filtered water sample. The subsequent process was the same as that describedin the section (1). Freshwater was treated inthe 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 dustst0rms, inflow and out flow due to precipitation, etc.. Any places located under trees in a forest, in astony 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 driedin a drying oven regulated 105℃. The soil was then passed through a 2 mm 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 1m ℓ 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 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 1 m 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℃.

(7) Total diet

A full one day ordinary diet including three meals, water, tea and otherin-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 transfered to a porcelain dish and then ashed at 450℃ 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.

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* 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 non-starch 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 4 kg 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 detailes 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 p
ersons		
(8) Rice		
1. Producing districts	yearly (harvesting season)	5 kg (polished rice)
2. Consuming districts	yaerly (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 0.25 mm in size by a crusher. The sieved sample was ashed in an electric muffle furnace regulated at 450℃. The sample was then heated with hydrochloric acid, strontium and cesium carrier solutions and the mixture washeated. The insoluble constituent was filtered off and washed with water.

The dried sample was crushed to smaller ones than 0.25 mm 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 0.35 mm sieve. The sievedsample 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 retainedfor cesium-137 determination. The carbonates weredissolved 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 hydrochlotric acid the precipitate was dissolved in 2.5 N 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 cesiumwas 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 ℃ 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 andpotassium were determined by atomic absorption andflame 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 90 min.

Net sample counting rates were corrected for counter efficiency, recovery, self-absorption and decay to obtain the content of strontium-90 and cesium-137 per 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 (from Jun. 1991 to Aug. 1991)

-continued from No. 99 of this publication-

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

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	(g/p·d)	(mg/p·d)	(mg/p·d)	(Bq/p·d)	(Bq/gCa)	(Bq/p·d)	(Bq/gK)
June, 1991							
Aomori, AOMORI	16.8	422	1810	0.081 ± 0.011	0.19 ± 0.025	0.095 ± 0.0097	0.052 ± 0.0053
Ajigasawa, AOMORI	16.1	551	2330	0.087 ± 0.011	0.16 ± 0.020	0.078 ± 0.0088	0.033 ± 0.0038
Ichihara, CHIBA	16.4	421	2330	0.074 ± 0.0066	0.18 ± 0.016	0.056 ± 0.0081	0.024 ± 0.0035
Chikura-machi, CHIBA	15.5	436	1910	0.042 ± 0.0052	0.096 ± 0.012	0.045 ± 0.0073	0.024 ± 0.0038
Imatsu, SHIGA	12.1	518	1630	0.056 ± 0.011	0.11 ± 0.021	0.052 ± 0.0092	0.032 ± 0.0056
Ootsu, SHIGA	16.7	605	2090	0.074 ± 0.012	0.12 ± 0.020	0.062 ± 0.0094	0.030 ± 0.0045
Maitsuru, KYOTO	13.5	483	1890	0.052 ± 0.0088	0.11 ± 0.018	0.055 ± 0.0067	0.029 ± 0.0035
Kyoto, KYOTO	18.9	1460	2170	0.067 ± 0.011	0.046 ± 0.0077	0.015 ± 0.0021	0.0067 ± 0.00098
Ooita, OOITA	14.8	343	1840	0.043 ± 0.011	0.13 ± 0.031	0.045 ± 0.0088	0.025 ± 0.0048
Sahaku, OOITA	13.2	532	1660	0.048 ± 0.011	0.091 ± 0.021	0.019 ± 0.0078	0.012 ± 0.0047
July, 1991							
Maebashi, GUNMA	16.2	564	2070	0.057 ± 0.0065	0.10 ± 0.012	0.064 ± 0.0096	0.031 ± 0.0047
Nakanojyo, GUNMA	13.9	528	1850	0.033 ± 0.0052	0.062 ± 0.0099	0.044 ± 0.0087	0.024 ± 0.0047
Wakayama, WAKAYAMA	8.75	466	1190	0.031 ± 0.0092	0.067 ± 0.020	0.036 ± 0.0074	0.030 ± 0.0062
Koza-machi, WAKAYAMA	13.6	473	1590	0.021 ± 0.0099	0.044 ± 0.021	0.040 ± 0.0081	0.025 ± 0.0051
Septembe, 1991							
Uesaka-machi, TOKUSHIMA	11.9	455	1490	0.055 ± 0.011	0.12 ± 0.025	0.050 ± 0.0086	0.034 ± 0.0058
Nobember, 1991							
Chikura-machi, CHIBA	21.9	589	3020	0.068 ± 0.012	0.12 ± 0.020	0.051 ± 0.0081	0.017 ± 0.0027
Toyama, TOYAMA	13.4	386	1820	0.045 ± 0.011	0.12 ± 0.029	0.046 ± 0.0067	0.025 ± 0.0037
Nagano, NAGANO	16.7	800	1890	0.070 ± 0.012	0.087 ± 0.015	0.063 ± 0.0095	0.034 ± 0.0051
Hamaoka-machi, SHIZUOKA	15.0	470	2180	0.048 ± 0.0061	0.10 ± 0.013	0.064 ± 0.0092	0.030 ± 0.0042
Shizuoka, SHIZUOKA	18.1	1050	2300	0.053 ± 0.0062	0.051 ± 0.0059	0.13 ± 0.012	0.030 ± 0.0042
Otaka, MIE	11.5	360	1300	0.049 ± 0.0081	0.14 ± 0.022	0.050 ± 0.0084	0.038 ± 0.0065
Hamasaka, HYOGO	12.5	510	1750	0.081 ± 0.0098	0.16 ± 0.019	0.036 ± 0.0080	0.020 ± 0.0046
Kaehara, NARA	14.2	907	1590	0.069 ± 0.0096	0.076 ± 0.011	0.048 ± 0.0090	0.030 ± 0.0057
Gojyou, NARA	14.0	990	1750	0.077 ± 0.010	0.078 ± 0.010	0.085 ± 0.011	0.049 ± 0.0063
Wakayama, WAKAYAMA	16.1	546	1820	0.072 ± 0.0068	0.13 ± 0.012	0.023 ± 0.0061	0.013 ± 0.0034
Koza-machi, WAKAYAMA	11.8	400	1370	0.086 ± 0.0069	0.22 ± 0.017	0.044 ± 0.0071	0.061 ± 0.0043
Tottori, TOTTORI	18.9	667	2120	0.13 ± 0.013	0.19 ± 0.020	0.11 ± 0.012	0.050 ± 0.0050
Fukube-mura, TOTTORI	13.5	365	1850	0.10 ± 0.012	0.28 ± 0.034	0.074 ± 0.0095	0.040 ± 0.0052
Kashima-machi, SHIMANE	16.5	959	2110	0.11 ± 0.011	0.11 ± 0.012	0.058 ± 0.0089	0.028 ± 0.0042

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	(g/p·d)	(mg/p·d)	(mg/p·d)	(Bq/p·d)	(Bq/gCa)	(Bq/p·d)	(Bq/gK)
Okayama, OKAYAMA	17.1	515	2410	0.069 ± 0.011	0.13 ± 0.022	0.063± 0.0094	0.026 ± 0.0039
Jyosaibara-mura, OKAYAMA	14.9	735	1820	0.16 ± 0.016	0.22 ± 0.021	0.17 ± 0.013	0.096 ± 0.0071
Matsuyama, EHIME	12.3	455	1530	0.050 ± 0.010	0.11 ± 0.022	0.030± 0.0071	0.020 ± 0.0047
Ikata-machi, EHIME	12.9	738	1470	0.060 ± 0.0058	0.081± 0.0079	0.038± 0.0062	0.026 ± 0.0042
Dazaifu, FUKUOKA	17.3	585	2160	0.068 ± 0.0089	0.12 ± 0.015	0.051± 0.0083	0.023 ± 0.0038
Fukuoka, FUKUOKA	14.0	490	1410	0.037 ± 0.0077	0.076± 0.016	0.027± 0.0072	0.019 ± 0.0051
Matsuura, NAGASAKI	19.0	718	2000	0.067 ± 0.0067	0.093± 0.0093	0.072± 0.0084	0.036 ± 0.0042
Nagasaki, NAGASAKI	13.8	393	1820	0.049 ± 0.0058	0.12 ± 0.015	0.071± 0.0083	0.039 ± 0.0046
Sahaku, OOITA	14.5	467	1730	0.058 ± 0.0064	0.12 ± 0.014	0.049± 0.0071	0.028 ± 0.0041
Ooita, OOITA	11.9	372	1540	0.042 ± 0.0050	0.11 ± 0.013	0.043± 0.0061	0.028 ± 0.0040
Ooguchi, KAGOSHIMA	12.6	334	1350	0.059 ± 0.011	0.18 ± 0.034	0.019± 0.0056	0.014 ± 0.0042
Sendai, KAGOSHIMA	20.5	1980	1480	0.28 ± 0.018	0.14 ± 0.009	0.035± 0.0073	0.024 ± 0.0049
Decenber, 1991							
Sapporo, HOKKAIDO	16.8	566	2640	0.12 ± 0.008	0.20 ± 0.014	0.086± 0.0095	0.032 ± 0.0036
Iwanai-machi, HOKKAIDO	13.5	360	1620	0.065 ± 0.0069	0.18 ± 0.019	0.084± 0.0095	0.052 ± 0.0059
Aomori, AOMORI	16.0	548	1840	0.067 ± 0.011	0.12 ± 0.020	0.050± 0.0078	0.027 ± 0.0042
Ajigasawa-machi, AOMORI	12.6	404	1700	0.091 ± 0.010	0.22 ± 0.025	0.033± 0.0043	0.019 ± 0.0025
Ishimaki, MIYAGI	15.8	626	2050	0.080 ± 0.0069	0.13 ± 0.011	0.072± 0.0091	0.035 ± 0.0045
Omegawa-machi, MIYAGI	14.0	371	1550	0.044 ± 0.0061	0.12 ± 0.016	0.050± 0.0093	0.032 ± 0.0060
Morioka, IWATE	14.0	349	1750	0.052 ± 0.011	0.15 ± 0.032	0.068± 0.0078	0.039 ± 0.0045
Fukushima, FUKUSHIMA	11.9	486	1360	0.081 ± 0.0054	0.17 ± 0.011	0.037± 0.0054	0.027 ± 0.0040
Ookuma-machi, FUKUSHIMA	16.0	837	1580	0.045 ± 0.0051	0.054± 0.0061	0.050± 0.0068	0.032 ± 0.0043
Tokai-mura, IBARAKI	15.3	572	2190	0.058 ± 0.0093	0.10 ± 0.016	0.069± 0.0085	0.031 ± 0.0039
Mito, IBARAKI	20.0	598	2240	0.087 ± 0.013	0.15 ± 0.021	0.048± 0.010	0.022 ± 0.0045
Ichihara, CHIBA	15.9	555	1970	0.062 ± 0.0099	0.11 ± 0.018	0.050± 0.0065	0.025 ± 0.0033
Shinzyuku, TOKYO	14.1	706	1620	0.053 ± 0.0099	0.075± 0.014	0.064± 0.011	0.039 ± 0.0066
Hachijo-machi, TOKYO	17.2	1170	2060	0.11 ± 0.008	0.092± 0.0066	0.13 ± 0.010	0.061 ± 0.0049
Hiratsuka, KANAGAWA	16.9	608	2160	0.059 ± 0.011	0.098± 0.018	0.14 ± 0.011	0.065 ± 0.0050
Yokohama, KANAGAWA	13.4	414	1840	0.053 ± 0.011	0.13 ± 0.027	0.045± 0.0067	0.024 ± 0.0037
Nakanojyo-machi, GUNMA	13.9	528	1850	0.033 ± 0.0052	0.062± 0.0099	0.044± 0.0087	0.024 ± 0.0047
Maebashi, GUNMA	16.8	504	2050	0.075 ± 0.0065	0.15 ± 0.013	0.072± 0.0083	0.035 ± 0.0040
Utsunomiya, TOCHIGI	14.5	756	1890	0.067 ± 0.0094	0.089± 0.012	0.069± 0.0073	0.037 ± 0.0038
Maoka, TOCHIGI	16.8	648	2080	0.074 ± 0.011	0.11 ± 0.016	0.083± 0.0087	0.040 ± 0.0042
Kashiwazaki, NIIGATA	19.3	483	2450	0.10 ± 0.013	0.21 ± 0.027	0.058± 0.010	0.024 ± 0.0041
Nishikawa-machi, NIIGATA	22.9	682	2790	0.092 ± 0.0080	0.13 ± 0.012	0.056± 0.0090	0.020 ± 0.0032
Takaoka, TOYAMA	16.3	476	1970	0.067 ± 0.011	0.14 ± 0.024	0.066± 0.0073	0.034 ± 0.0037
Tsuruga, FUKUI	17.9	847	2080	0.067 ± 0.012	0.079± 0.014	0.20 ± 0.013	0.095 ± 0.0061
Fukui, FUKUI	13.3	411	1720	0.050 ± 0.011	0.12 ± 0.028	0.059± 0.0073	0.034 ± 0.0042
Koufu, YAMANASHI	16.0	635	2120	0.046 ± 0.0089	0.072± 0.014	0.048± 0.0069	0.023 ± 0.0032

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	(g/p·d)	(mg/p·d)	(mg/p·d)	(Bq/p·d)	(Bq/gCa)	(Bq/p·d)	(Bq/gK)
Nagasaka-machi, YAMANASHI	14.4	499	2250	0.053 ± 0.0093	0.11 ± 0.019	0.087 ± 0.0085	0.039 ± 0.0038
Gifu, GIFU	13.0	364	1720	0.079 ± 0.013	0.22 ± 0.035	0.062 ± 0.0073	0.036 ± 0.0042
Takayama, GIFU	12.5	339	1790	0.051 ± 0.011	0.15 ± 0.033	0.046 ± 0.0063	0.026 ± 0.0035
Otaka, MIE	11.5	360	1300	0.049 ± 0.0081	0.14 ± 0.022	0.050 ± 0.0084	0.038 ± 0.0065
Tsu, MIE	18.5	631	1750	0.046 ± 0.0097	0.072 ± 0.015	0.053 ± 0.0091	0.030 ± 0.0052
Kyoto, KYOTO	18.0	538	2280	0.062 ± 0.012	0.11 ± 0.022	0.085 ± 0.0096	0.037 ± 0.0042
Maizuru, KYOTO	17.2	763	2540	0.063 ± 0.011	0.083 ± 0.015	0.061 ± 0.0082	0.024 ± 0.0032
Neyagawa, OSAKA	15.4	484	2460	0.040 ± 0.010	0.083 ± 0.021	0.048 ± 0.0075	0.019 ± 0.0030
Osaka, OSAKA	16.8	615	2450	0.059 ± 0.0061	0.096 ± 0.0099	0.048 ± 0.0079	0.020 ± 0.0032
Kakogawa, HYOGO	12.2	592	1560	0.061 ± 0.0092	0.10 ± 0.016	0.035 ± 0.0080	0.022 ± 0.0051
Matsue, SHIMANE	27.1	1090	3980	0.14 ± 0.015	0.13 ± 0.014	0.12 ± 0.013	0.029 ± 0.0032
Yamaguchi, YAMAGUCHI	14.2	648	1660	0.059 ± 0.0088	0.090 ± 0.014	0.089 ± 0.011	0.053 ± 0.0067
Ajisu-machi, YAMAGUCHI	17.9	874	2520	0.054 ± 0.0082	0.062 ± 0.0094	0.045 ± 0.0083	0.018 ± 0.0033
Tokushima, TOKUSHIMA	15.5	468	2220	0.085 ± 0.011	0.18 ± 0.024	0.031 ± 0.0081	0.014 ± 0.0036
Tsuda-machi, KAGAWA	11.2	355	1470	0.037 ± 0.0090	0.10 ± 0.025	0.036 ± 0.0063	0.024 ± 0.0043
Takamatsu, KAGAWA	13.6	524	1810	0.074 ± 0.012	0.14 ± 0.023	0.077 ± 0.0097	0.043 ± 0.0053
Kumamoto, KUMAMOTO	13.7	396	1990	0.052 ± 0.0060	0.13 ± 0.015	0.057 ± 0.0084	0.029 ± 0.0042
Aso-machi, KUMAMOTO	17.0	401	1840	0.091 ± 0.0077	0.23 ± 0.019	0.16 ± 0.012	0.089 ± 0.0067
Takahara-machi, MIYAZAKI	19.6	664	2900	0.080 ± 0.012	0.12 ± 0.019	0.19 ± 0.014	0.064 ± 0.0050
Miyazaki, MIYAZAKI	16.5	432	2050	0.061 ± 0.010	0.14 ± 0.024	0.066 ± 0.0085	0.032 ± 0.0041
January, 1991							
Miyoshi, HIROSHIMA	12.2	672	1670	0.065 ± 0.0098	0.096 ± 0.015	0.060 ± 0.0083	0.036 ± 0.0050
Hiroshima, HIROSHIMA	14.9	960	1860	0.080 ± 0.012	0.083 ± 0.013	0.050 ± 0.0088	0.027 ± 0.0047
Naha, OKINAWA	15.5	715	1690	0.051 ± 0.0056	0.072 ± 0.0078	0.032 ± 0.0074	0.019 ± 0.0044
Ginowan, OKINAWA	16.5	1090	2330	0.078 ± 0.0062	0.071 ± 0.0057	0.060 ± 0.0074	0.026 ± 0.0032
March, 1991							
Kamisaka-machi, TOKUSHIMA	14.0	579	2170	0.050 ± 0.0084	0.086 ± 0.014	0.037 ± 0.0058	0.017 ± 0.0027

(2)-1 Strontium-90 and Cesium-137 in Rice(producing districts)
(from Aug. 1991 to Nov. 1991)

-continued from No. 99 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	Bq/kgwet	Bq/gCa	Bq/kgwet	Bq/gK
September, 1991							
Chiba, CHIBA	0.583	0.041	0.781	0.0049±0.0032	0.12 ±0.078	0.0035±0.0058	0.0044±0.0074
October, 1991							
Maki-machi, NIIGATA	0.517	0.028	0.791	0.0004±0.0070	0.02 ±0.25	0.051 ±0.0074	0.065 ±0.0093
Shiga-machi, SHIGA	0.665	0.042	0.871	0.0076±0.0095	0.18 ±0.23	0.028 ±0.0072	0.033 ±0.0083
Kaebara, NARA	0.659	0.040	0.679	0.0000±0.0095	0.00 ±0.24	0.0059±0.0057	0.0087±0.0084
Ishii-machi, TOKUSHIMA	0.497	0.034	0.646	0.0060±0.0079	0.17 ±0.23	0.0021±0.0041	0.0032±0.0063
Tsuda-machi, KAGAWA	0.602	0.041	0.951	0.0025±0.010	0.60 ±0.24	0.0000±0.0042	0.0000±0.0045
Aishi-machi, KUMAMOTO	0.607	0.030	0.971	0.0095±0.0074	0.31 ±0.24	0.0000±0.0035	0.0000±0.0036
Usa, OOITA	0.738	0.037	0.967	0.003 ±0.011	0.09 ±0.30	0.0051±0.0070	0.0052±0.0073
November, 1991							
Maebashi, GUNMA	0.486	0.035	0.627	0.017 ±0.0077	0.47 ±0.22	0.0070±0.0046	0.011 ±0.0073
Utsunomiya, TOCHIGI	0.632	0.035	0.708	0.0000±0.0083	0.00 ±0.23	0.012 ±0.0059	0.017 ±0.0084
Chosaka-machi, YAMANASHI	0.719	0.032	0.971	0.0000±0.0056	0.00 ±0.17	0.0086±0.0063	0.0088±0.0065
Yamaguchi, YAMAGUCHI	0.551	0.044	0.860	0.0043±0.0051	0.10 ±0.12	0.061 ±0.0076	0.072 ±0.0088
Kagochima, KAGOCHIMA	0.581	0.039	0.825	0.0032±0.0052	0.08 ±0.13	0.18 ±0.012	0.22 ±0.014
December, 1991							
Fukushima, FUKUSHIMA	0.684	0.037	1.08	0.007 ±0.010	0.19 ±0.28	0.021 ±0.0071	0.020 ±0.0066
Chikushino, FUKUOKA	0.638	0.039	0.868	0.0091±0.0091	0.23 ±0.23	0.013 ±0.0064	0.015 ±0.0074

(2)-2 Strontium-90 and Cesium-137 in Rice(consuming districts)
(from Oct. 1991 to Nov. 1991)

-continued from No. 97 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	Bq/kgwet	Bq/gCa	Bq/kgwet	Bq/gK
October, 1991							
Niigata, NIIGATA	0.424	0.029	0.691	0.0031±0.0057	0.11 ±0.20	0.011 ±0.0044	0.015 ±0.0064
November, 1991							
Akita, AKITA	0.687	0.041	0.989	0.015 ±0.011	0.37 ±0.26	0.059 ±0.0087	0.059 ±0.0087
Yamagata, YAMAGATA	0.553	0.036	0.708	0.0000±0.0082	0.00 ±0.22	0.023 ±0.0054	0.033 ±0.0077
Yokohama, KANAGAWA	0.597	0.034	0.716	0.0084±0.0057	0.25 ±0.17	0.021 ±0.0058	0.029 ±0.0081
Shizuoka, SHIZUOKA	0.464	0.037	0.719	0.0081±0.0046	0.22 ±0.12	0.025 ±0.0054	0.035 ±0.0075
Kyoto, KYOTO	0.543	0.036	0.749	0.0083±0.0078	0.23 ±0.21	0.0069±0.0047	0.0092±0.0062
Wakayama, WAKAYAMA	0.647	0.037	0.990	0.023 ±0.011	0.62 ±0.30	0.017 ±0.0067	0.017 ±0.0067
Hiroshima, HIROSHIMA	0.470	0.035	0.799	0.0000±0.0034	0.000 ±0.098	0.030 ±0.0054	0.037 ±0.0068
Saga, SAGA	0.503	0.043	0.775	0.016 ±0.0055	0.38 ±0.13	0.0000±0.0040	0.0000±0.0051
Yonagi-mura, OKINAWA	0.615	0.039	0.941	0.0063±0.0082	0.16 ±0.21	0.014 ±0.0064	0.015 ±0.0068
December, 1991							
Tajiri-machi, MIYAGI	0.699	0.039	0.867	0.007 ±0.011	0.19 ±0.28	0.058 ±0.0086	0.067 ±0.0099
Nagoya, AICHI	0.485	0.032	0.849	0.0021±0.0069	0.07 ±0.21	0.012 ±0.0048	0.014 ±0.0056
Tottori, TOTTORI	0.538	0.032	0.710	0.016 ±0.0081	0.51 ±0.26	0.065 ±0.0081	0.092 ±0.011
Matsue, SHIMANE	0.613	0.034	0.889	0.010 ±0.0089	0.30 ±0.26	0.017 ±0.0065	0.019 ±0.0073
Seto-machi, OKAYAMA	0.742	0.044	1.14	0.000 ±0.010	0.00 ±0.23	0.012 ±0.0065	0.010 ±0.0057
Kochi, KOCHI	0.459	0.039	0.693	0.0059±0.0044	0.15 ±0.11	0.078 ±0.0075	0.11 ±0.011
Kasuga, FUKUOKA	0.537	0.033	0.967	0.014 ±0.0075	0.42 ±0.23	0.0000±0.0051	0.0000±0.0053
January, 1991							
Hiromae, AOMORI	0.571	0.039	0.919	0.0038±0.0082	0.10 ±0.21	0.016 ±0.0056	0.018 ±0.0061
Nagasaki, NAGASAKI	0.670	0.036	0.831	0.0074±0.0094	0.21 ±0.26	0.020 ±0.0070	0.024 ±0.0084

(3)-1 Strontium-90 and Cesium-137 in Milk(producing districts for domestic program)
(from Aug. 1991 to Mar, 1992)

-continued from No. 99 of this publication-

Table (3)-1: Strontium-90 and Cesium-137 in Milk

Location	Component			^{90}Sr		^{137}Cs	
	Ash(g/ℓ)	Ca(g/ℓ)	K(g/ℓ)	Bq/ℓ	Bq/gCa	Bq/ℓ	Bq/gK
August, 1991							
Yachimata, CHIBA	7.49	1.15	1.62	0.033 ± 0.0065	0.029 ± 0.0056	0.11 ± 0.010	0.069 ± 0.0062
Fujimi-mura, GUNMA	7.20	1.09	1.67	0.020 ± 0.0051	0.018 ± 0.0046	0.064 ± 0.0082	0.038 ± 0.0049
December, 1991							
Akita, AKITA	5.96	0.906	1.21	0.027 ± 0.0055	0.030 ± 0.0061	0.053 ± 0.0065	0.044 ± 0.0054
Febrary, 1992							
Sapporo, HOKKAIDO	7.31	1.13	1.62	0.037 ± 0.0084	0.032 ± 0.0074	0.075 ± 0.0092	0.046 ± 0.0056
Takisawa-mura, IWATE	7.10	1.02	1.64	0.022 ± 0.0078	0.021 ± 0.0076	0.081 ± 0.0081	0.049 ± 0.0049
Mito, IBARAKI	7.64	1.18	1.61	0.034 ± 0.0083	0.028 ± 0.0071	0.016 ± 0.0056	0.0097 ± 0.0035
Yachimata, CHIBA	7.61	1.11	1.67	0.038 ± 0.0066	0.034 ± 0.0060	0.021 ± 0.0059	0.013 ± 0.0035
Fujimi-mura, GUNMA	7.35	1.01	1.76	0.033 ± 0.0080	0.032 ± 0.0079	0.020 ± 0.0057	0.012 ± 0.0032
Nishinasuno-machi, TOCHOGI	7.47	1.11	1.68	0.051 ± 0.0073	0.046 ± 0.0065	0.037 ± 0.0068	0.022 ± 0.0040
Suzurinami, TOYAMA	7.45	1.10	1.60	0.024 ± 0.0078	0.022 ± 0.0070	0.0059 ± 0.0079	0.0037 ± 0.0050
Oshimizu-machi, ISHIKAWA	7.17	1.20	1.45	0.067 ± 0.0093	0.056 ± 0.0077	0.50 ± 0.019	0.34 ± 0.013
Kasamatsu-machi, GIFU	6.59	0.995	1.39	0.018 ± 0.0066	0.018 ± 0.0066	0.016 ± 0.0044	0.012 ± 0.0032
Oouchi-mura, MIE	7.32	1.09	1.63	0.031 ± 0.0071	0.029 ± 0.0065	0.013 ± 0.0052	0.0081 ± 0.0032
Hino-machi, SHIGA	7.60	1.16	1.65	0.023 ± 0.0077	0.020 ± 0.0066	0.039 ± 0.0070	0.024 ± 0.0042
Mihara-machi, HYOGO	7.10	1.12	1.57	0.029 ± 0.0066	0.026 ± 0.0059	0.0000 ± 0.0046	0.0000 ± 0.0029
Oouda-machi, NARA	6.69	0.988	1.39	0.021 ± 0.0052	0.022 ± 0.0053	0.014 ± 0.0051	0.010 ± 0.0037
Matsuyama, EHIME	7.34	1.12	1.53	0.0042 ± 0.0069	0.0038 ± 0.0062	0.019 ± 0.0052	0.013 ± 0.0034
Kamisaka-machi, TOKUSHIMA	7.42	1.14	1.64	0.031 ± 0.0073	0.027 ± 0.0064	0.0095 ± 0.0046	0.0058 ± 0.0028
Takase-machi, KAGAWA	7.08	1.10	1.52	0.011 ± 0.0070	0.010 ± 0.0063	0.017 ± 0.0053	0.011 ± 0.0035
Aishi-machi, KUMAMOTO	7.23	1.14	1.58	0.033 ± 0.0078	0.029 ± 0.0068	0.012 ± 0.0055	0.0075 ± 0.0035
Kusumi-machi, OOITA	7.46	1.15	1.63	0.023 ± 0.0078	0.020 ± 0.0068	0.094 ± 0.0090	0.058 ± 0.0056
March, 1992							
Aomori, AOMORI	7.34	1.13	1.47	0.066 ± 0.0082	0.058 ± 0.0073	0.026 ± 0.0054	0.018 ± 0.0036
Takane-machi, YAMANASHI	6.99	1.07	1.52	0.024 ± 0.0070	0.022 ± 0.0065	0.0089 ± 0.0049	0.0059 ± 0.0032

(3)-2 Strontium-90 and Cesium-137 in Milk(producing districts for WHO program)
(from Nov. 1991 to Feb. 1992)

-continued from No. 97 of this publication-

Table (3)-2: Strontium-90 and Cesium-137 in Milk

Location	Component			^{90}Sr		^{137}Cs	
	Ash(g/ℓ)	Ca(g/ℓ)	K(g/ℓ)	Bq/ℓ	Bq/gCa	Bq/ℓ	Bq/gK
November, 1991							
Nishikawa-machi, NIIGATA	8.20	1.11	1.57	0.024 ± 0.0070	0.022 ± 0.0063	0.042 ± 0.0078	0.027 ± 0.0050
Hikawa-machi, SHIMANE	8.06	1.28	1.67	0.059 ± 0.0093	0.046 ± 0.0073	0.12 ± 0.011	0.075 ± 0.0065
February 1992							
Hokudainoujou, HOKKAIDO	7.31	1.13	1.62	0.037 ± 0.0084	0.032 ± 0.0074	0.075 ± 0.0092	0.046 ± 0.0056
Hachijo-island, TOKYO	6.57	0.983	1.31	0.070 ± 0.0083	0.071 ± 0.0085	0.097 ± 0.0086	0.074 ± 0.0065
Nishikawa-machi, NIIGATA	8.36	1.26	1.69	0.036 ± 0.0094	0.029 ± 0.0074	0.10 ± 0.011	0.061 ± 0.0064
Katsuyama, FUKUI	7.36	1.17	1.62	0.023 ± 0.0071	0.019 ± 0.0061	0.036 ± 0.0067	0.022 ± 0.0041
Hikawa-machi, SHIMANE	8.04	1.14	1.74	0.026 ± 0.0065	0.023 ± 0.0057	0.031 ± 0.0057	0.018 ± 0.0033
Takamiya-machi, HIROSHIMA	6.69	1.02	1.47	0.030 ± 0.0067	0.030 ± 0.0066	0.0000 ± 0.0045	0.0000 ± 0.0031
Kochi, KOCHI	7.47	1.20	1.52	0.052 ± 0.0086	0.043 ± 0.0071	0.022 ± 0.0056	0.015 ± 0.0037
Yasu-machi, FUKUOKA	7.62	1.13	1.62	0.026 ± 0.0072	0.023 ± 0.0064	0.032 ± 0.0062	0.020 ± 0.0038
Kajiki-machi, KAGOSHIMA	7.71	1.17	1.67	0.026 ± 0.0078	0.022 ± 0.0067	0.020 ± 0.0057	0.012 ± 0.0035

(3)-3 Strontium-90 and Cesium-137 in Milk(consuming districts)
(from May. 1991 to Jan. 1992)

-continued from No. 97 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(g/ℓ)	Ca(g/ℓ)	K(g/ℓ)	Bq/ℓ	Bq/gCa	Bq/ℓ	Bq/gK
August, 1991							
Fukushima, FUKUSHIMA	7.20	1.09	1.55	0.037 ± 0.0080	0.034 ± 0.0073	0.050 ± 0.0070	0.033 ± 0.0045
Nagasaki, NAGASAKI	6.91	1.00	1.46	0.021 ± 0.0037	0.021 ± 0.0037	0.015 ± 0.0056	0.011 ± 0.0038
October, 1991							
Kyoto, KYOTO	7.32	1.11	1.54	0.026 ± 0.0058	0.024 ± 0.0052	0.025 ± 0.0054	0.016 ± 0.0035
December, 1991							
Yonagi-mura, NAHA	7.46	1.07	1.64	0.026 ± 0.0077	0.024 ± 0.0072	0.0004 ± 0.0039	0.0002 ± 0.0024
February, 1992							
Sapporo, HOKKAIDO	7.37	1.15	1.56	0.071 ± 0.0095	0.062 ± 0.0083	0.089 ± 0.0094	0.057 ± 0.0060
Yamagata, YAMAGATA	7.17	1.08	1.51	0.036 ± 0.0081	0.033 ± 0.0075	0.026 ± 0.0061	0.017 ± 0.0040
Fukushima, FUKUSHIMA	7.81	1.09	1.59	0.035 ± 0.0084	0.032 ± 0.0077	0.025 ± 0.0059	0.016 ± 0.0037
Shinjuku, TOKYO	7.19	1.07	1.56	0.023 ± 0.0067	0.022 ± 0.0063	0.024 ± 0.0060	0.016 ± 0.0038
Niigata, NIIGATA	7.66	1.11	1.61	0.024 ± 0.0094	0.021 ± 0.0084	0.017 ± 0.0072	0.010 ± 0.0045
Fukui, FUKUI	7.32	1.10	1.59	0.016 ± 0.0069	0.015 ± 0.0062	0.016 ± 0.0055	0.0098 ± 0.0035
Nagano, NAGANO	7.05	1.07	1.52	0.035 ± 0.0077	0.033 ± 0.0072	0.016 ± 0.0050	0.011 ± 0.0033
Shizuoka, SHIZUOKA	6.89	1.03	1.50	0.014 ± 0.0059	0.013 ± 0.0057	0.050 ± 0.0069	0.034 ± 0.0046
Nagoya, AICHI	7.32	1.10	1.55	0.015 ± 0.0050	0.014 ± 0.0046	0.020 ± 0.0053	0.013 ± 0.0034
Yonago, TOTTORI	7.15	1.05	1.49	0.018 ± 0.0056	0.017 ± 0.0053	0.052 ± 0.0064	0.035 ± 0.0043
Matsue, SHIMANE	7.26	1.09	1.50	0.039 ± 0.0079	0.036 ± 0.0073	0.064 ± 0.0080	0.043 ± 0.0053
Okayama, OKAYAMA	7.12	1.06	1.53	0.026 ± 0.0069	0.024 ± 0.0065	0.019 ± 0.0055	0.013 ± 0.0036
Hiroshima, HIROSHIMA	7.23	1.08	1.58	0.030 ± 0.0074	0.028 ± 0.0068	0.019 ± 0.0055	0.012 ± 0.0035
Yamaguchi, YAMAGUCHI	7.35	1.06	1.57	0.030 ± 0.0086	0.028 ± 0.0081	0.015 ± 0.0057	0.0094 ± 0.0036
Matsuyama, EHIME	7.21	1.06	1.49	0.015 ± 0.0072	0.015 ± 0.0068	0.013 ± 0.0053	0.0090 ± 0.0036
Kochi, KOCHI	7.23	1.13	1.51	0.041 ± 0.0079	0.036 ± 0.0070	0.011 ± 0.0052	0.0074 ± 0.0034
Chikushino, FUKUOKA	7.45	1.10	1.56	0.035 ± 0.0074	0.032 ± 0.0068	0.016 ± 0.0056	0.010 ± 0.0036
Kagoshima, KAGOSHIMA	7.48	1.13	1.60	0.020 ± 0.0072	0.017 ± 0.0064	0.038 ± 0.0067	0.024 ± 0.0042
March, 1992							
Yokohama, KANAGAWA	7.34	1.10	1.60	0.010 ± 0.0064	0.0094 ± 0.0058	0.017 ± 0.0058	0.010 ± 0.0036

(4)-1 Strontium-90 and Cesium-137 in Vegetables(producing districts)
(from Oct. 1991 to Feb. 1992)

-continued from No. 97 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	Bq/kgwet	Bq/gCa	Bq/kgwet	Bq/gK
(Japanese radish)							
October, 1991							
Gifu, GIFU	0.628	0.226	2.66	0.067 ± 0.0079	0.30 ± 0.035	0.0000 ± 0.0038	0.0000 ± 0.0014
November, 1991							
Mito-machi, AOMORI	0.478	0.242	1.89	0.18 ± 0.011	0.76 ± 0.044	0.018 ± 0.0081	0.0095 ± 0.0043
Maebashi, GUNMA	0.544	0.367	1.70	0.11 ± 0.006	0.30 ± 0.016	0.026 ± 0.0048	0.015 ± 0.0028
Kanazawa, ISHIKAWA	0.542	0.205	2.18	0.072 ± 0.0080	0.35 ± 0.039	0.0000 ± 0.0060	0.0000 ± 0.0028
Utsunomiya, TOCHIGI	0.534	0.238	2.24	0.098 ± 0.017	0.41 ± 0.070	0.027 ± 0.0094	0.012 ± 0.0042
Hamamatsu, SHIZUOKA	0.623	0.213	2.84	0.12 ± 0.008	0.57 ± 0.036	0.0098 ± 0.0041	0.0035 ± 0.0015
Meiwa-machi, MIE	0.604	0.240	2.72	0.16 ± 0.012	0.65 ± 0.049	0.0000 ± 0.0099	0.0000 ± 0.0036
Azengawa-machi, SHIGA	0.464	0.144	1.98	0.14 ± 0.009	0.96 ± 0.065	0.018 ± 0.0067	0.0089 ± 0.0034
Kasai, HYOGO	0.799	0.221	3.60	0.15 ± 0.013	0.67 ± 0.057	0.0078 ± 0.0055	0.0022 ± 0.0015
Shinguu, WAKAYAMA	0.446	0.153	2.00	0.054 ± 0.0072	0.36 ± 0.047	0.0000 ± 0.0088	0.0000 ± 0.0044
Takamatsu, KAGAWA	0.612	0.219	2.34	0.021 ± 0.0059	0.095 ± 0.027	0.0005 ± 0.0055	0.0002 ± 0.0023
Shiitsu-machi, FUKUOKA	0.511	0.281	1.91	0.061 ± 0.0072	0.22 ± 0.025	0.016 ± 0.0058	0.0083 ± 0.0030
Aishi-machi, KUMAMOTO	0.614	0.301	2.35	0.072 ± 0.0085	0.24 ± 0.028	0.011 ± 0.0046	0.0047 ± 0.0019
December, 1991							
Fukushima, FUKUSHIMA	0.558	0.405	1.79	0.020 ± 0.0031	0.048 ± 0.0076	0.0000 ± 0.0039	0.0000 ± 0.0022
Kaebara, NARA	0.507	0.184	2.00	0.053 ± 0.0064	0.29 ± 0.035	0.0047 ± 0.0049	0.0023 ± 0.0025
Kokufu-machi, TOTTORI	0.488	0.226	1.97	0.089 ± 0.0075	0.39 ± 0.033	0.0061 ± 0.0057	0.0031 ± 0.0029
Hiroshima, HIROSHIMA	0.488	0.181	1.98	0.029 ± 0.0060	0.16 ± 0.033	0.0073 ± 0.0064	0.0037 ± 0.0032
Yutani-machi, YAMAGUCHI	0.538	0.221	2.09	0.26 ± 0.013	1.2 ± 0.06	0.0018 ± 0.0034	0.0008 ± 0.0016
Kubokawa-machi, KOCHI	0.548	0.242	2.36	0.22 ± 0.008	0.91 ± 0.035	0.0076 ± 0.0036	0.0032 ± 0.0015
Ishii-machi, TOKUSHIMA	0.510	0.255	2.16	0.062 ± 0.0077	0.24 ± 0.030	0.0042 ± 0.0059	0.0019 ± 0.0027
Usa, Ooita	0.637	0.171	2.85	0.083 ± 0.0057	0.49 ± 0.034	0.0060 ± 0.0042	0.0021 ± 0.0015
Takanabe-machi, MIYAZAKI	0.493	0.211	2.08	0.15 ± 0.011	0.71 ± 0.050	0.017 ± 0.0062	0.0083 ± 0.0030
Kaibun-machi, KAGOSHIMA	0.661	0.223	2.53	0.13 ± 0.007	0.60 ± 0.033	0.0085 ± 0.0050	0.0034 ± 0.0020
(cabbage)							
November, 1991							
Mito-machi, AOMORI	0.501	0.411	1.88	0.28 ± 0.014	0.69 ± 0.033	0.14 ± 0.013	0.075 ± 0.0070
January, 1992							
Kumatori-machi, OOSAKA	0.584	0.394	2.24	0.036 ± 0.0037	0.091 ± 0.0095	0.0059 ± 0.0035	0.0026 ± 0.0016

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	Bq/kgwet	Bq/gCa	Bq/kgwet	Bq/gK
(Spinach)							
November, 1991							
Chiba, CHIBA	2.00	0.496	9.10	0.12 ± 0.015	0.24 ± 0.031	0.0000 ± 0.0063	0.00000 ± 0.00069
Saku, NAGANO	2.00	1.21	6.72	0.14 ± 0.017	0.12 ± 0.014	0.010 ± 0.0074	0.0015 ± 0.0011
Kanazawa, ISHIKAWA	1.45	0.964	4.90	0.078 ± 0.0074	0.081 ± 0.0077	0.030 ± 0.0078	0.0060 ± 0.0016
Takane-machi, YAMANASHI	2.18	1.25	8.62	0.15 ± 0.019	0.12 ± 0.015	0.0000 ± 0.0077	0.00000 ± 0.00090
Kurayoshi, TOTTORI	1.72	0.784	5.57	0.11 ± 0.012	0.13 ± 0.016	0.096 ± 0.011	0.017 ± 0.0020
Matsuyama, EHIME	2.06	0.546	8.94	0.011 ± 0.0042	0.019 ± 0.0077	0.0000 ± 0.0067	0.00000 ± 0.00074
December, 1991							
Fukushima, FUKUSHIMA	1.96	0.817	6.53	0.12 ± 0.009	0.15 ± 0.011	0.028 ± 0.0082	0.0044 ± 0.0013
Kusuno-machi, MIE	1.78	1.18	6.89	0.50 ± 0.016	0.42 ± 0.014	0.033 ± 0.0078	0.0048 ± 0.0011
Awahigashi-machi, SHIGA	1.73	1.02	7.03	0.058 ± 0.012	0.057 ± 0.012	0.0059 ± 0.0069	0.00084 ± 0.00098
Kaebara, NARA	1.59	0.398	6.85	0.053 ± 0.0073	0.13 ± 0.018	0.0000 ± 0.0088	0.0000 ± 0.0013
Hiroshima, HIROSHIMA	1.33	0.390	5.24	0.017 ± 0.0095	0.045 ± 0.024	0.0055 ± 0.0064	0.0010 ± 0.0012
Yutani-machi, YAMAGUCHI	1.58	0.522	6.42	0.26 ± 0.013	0.51 ± 0.026	0.038 ± 0.0081	0.0059 ± 0.0013
Kubokawa-machi, KOCHI	1.32	0.656	4.69	0.20 ± 0.010	0.30 ± 0.016	0.035 ± 0.0062	0.0075 ± 0.0013
Usa, Ooita	2.03	0.517	8.87	0.11 ± 0.009	0.21 ± 0.018	0.0000 ± 0.0087	0.00000 ± 0.00099
Takanabe-machi, MIYAZAKI	1.66	0.632	6.97	0.25 ± 0.012	0.40 ± 0.020	0.085 ± 0.010	0.012 ± 0.0015
Kaibun-machi, KAGOSHIMA	1.66	0.731	4.89	0.19 ± 0.010	0.26 ± 0.014	0.23 ± 0.016	0.047 ± 0.0032
Febrary, 1992							
Ishii-machi, TOKUSHIMA	1.70	0.717	5.58	0.067 ± 0.011	0.093 ± 0.016	0.0000 ± 0.0053	0.00000 ± 0.00095
(Chinese cabbage)							
November, 1991							
Utsunomiya, TOCHIGI	0.606	0.579	2.15	0.37 ± 0.011	0.64 ± 0.020	0.039 ± 0.0057	0.018 ± 0.0027

(4)-2 Strontium-90 and Cesium-137 in Vegetables(consuming districts)
(from Oct. 1991 to Feb. 1992)

-continued from No. 97 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	Bq/kgwet	Bq/gCa	Bq/kgwet	Bq/gK
(Japanese radish)							
October, 1991							
Kyoto, KYOTO	0.549	0.167	2.15	0.19 ± 0.012	1.1 ± 0.07	0.065 ± 0.011	0.030 ± 0.0051
November, 1991							
Shinzyuku, TOKYO	0.567	0.190	2.60	0.24 ± 0.014	1.3 ± 0.07	0.016 ± 0.0064	0.0063 ± 0.0025
Niigata, NIIGATA	0.407	0.162	1.58	0.024 ± 0.0041	0.15 ± 0.025	0.0000 ± 0.0050	0.0000 ± 0.0032
Oosaka, OOSAKA	0.509	0.160	2.05	0.027 ± 0.0091	0.17 ± 0.057	0.0005 ± 0.0064	0.0002 ± 0.0031
Okayama, OKAYAMA	0.399	0.157	1.47	0.18 ± 0.010	1.1 ± 0.06	0.032 ± 0.0066	0.022 ± 0.0045
Yonagi-mura, OKINAWA	0.613	0.277	2.44	0.010 ± 0.0053	0.038 ± 0.019	0.000 ± 0.010	0.0000 ± 0.0041
January, 1992							
Nagasaki, NAGASAKI	0.427	0.257	1.63	0.037 ± 0.0057	0.14 ± 0.022	0.0045 ± 0.0047	0.0028 ± 0.0029
Febrary, 1992							
Yokohama, KANAGAWA	0.455	0.240	1.69	0.021 ± 0.0045	0.086 ± 0.019	0.010 ± 0.0068	0.0060 ± 0.0041
(Spinach)							
November, 1991							
Kyoto, KYOTO	1.67	1.26	5.26	0.13 ± 0.011	0.11 ± 0.009	0.029 ± 0.012	0.0056 ± 0.0022
Okayama, OKAYAMA	1.69	0.607	6.39	0.028 ± 0.0048	0.047 ± 0.0080	0.013 ± 0.0062	0.0020 ± 0.00097
Matsuyama, EHIME	2.01	0.559	8.68	0.071 ± 0.0075	0.13 ± 0.013	0.0000 ± 0.0062	0.00000 ± 0.00071
Yonagi-mura, OKINAWA	1.51	0.788	4.27	0.0086 ± 0.0089	0.011 ± 0.011	0.010 ± 0.0067	0.0024 ± 0.0016
January, 1992							
Nagasaki, NAGASAKI	1.42	0.332	5.97	0.045 ± 0.0062	0.14 ± 0.019	0.011 ± 0.0058	0.0018 ± 0.00098
Febrary, 1992							
Yokohama, KANAGAWA	1.64	0.442	7.22	0.083 ± 0.0095	0.19 ± 0.022	0.0000 ± 0.0059	0.00000 ± 0.00082

(5) Strontium-90 and Cesium-137 in Sea Fish
(from Mar. 1991 to Sep. 1991)

-continued from No. 97 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	Bq/kgwet	Bq/gCa	Bq/kgwet	Bq/gK
(Limanda herzensteini)							
November, 1991							
Mutsu, AOMORI	1.44	0.796	4.04	0.0075±0.0079	0.009 ±0.010	0.16 ±0.013	0.039 ±0.0033
Niigata, NIIGATA	1.53	0.842	2.63	0.0082±0.0088	0.010 ±0.010	0.087 ±0.0097	0.033 ±0.0037
Norechi-machi, KAGAWA	1.34	0.348	4.31	0.0000±0.0047	0.000 ±0.014	0.12 ±0.013	0.029 ±0.0031
December, 1991							
Mikuni-machi, FUKUI	1.66	2.26	3.29	0.0073±0.0052	0.0032 ±0.0023	0.17 ±0.013	0.051 ±0.0038
February, 1992							
Ootake, HIROSHIMA	2.66	4.63	3.91	0.0085±0.0040	0.0018 ±0.00087	0.073 ±0.0096	0.019 ±0.0025
(Trachurus japonicus)							
November, 1991							
Shizuoka, SHIZUOKA	3.37	6.30	3.67	0.015 ±0.0040	0.0024 ±0.00064	0.22 ±0.015	0.060 ±0.0042
Shinguu, WAKAYAMA	3.90	6.59	3.14	0.016 ±0.0045	0.0024 ±0.00069	0.17 ±0.013	0.055 ±0.0042
December, 1991							
Odawara, KANAGAWA	0.854	0.529	2.24	0.0057±0.0047	0.011 ±0.0088	0.13 ±0.010	0.059 ±0.0047
(Scomber japonicus)							
November, 1991							
Kyoto, KYOTO	1.35	0.298	3.87	0.0027±0.0083	0.009 ±0.028	0.18 ±0.013	0.046 ±0.0035
Oosaka, OOSAKA	1.11	0.127	3.15	0.0000±0.0036	0.000 ±0.028	0.19 ±0.015	0.060 ±0.0046
December, 1991							
Sakaikou, TOTTORI	1.31	0.800	3.16	0.0014±0.0044	0.0017 ±0.0055	0.17 ±0.012	0.053 ±0.0038
(Sardinops melanosticta)							
August, 1991							
Yamagata, YAMAGATA	2.91	5.67	2.32	0.0048±0.0034	0.00084±0.00060	0.076 ±0.0093	0.033 ±0.0040
February, 1992							
Nagano, NAGANO	3.37	5.96	2.98	0.0065±0.0091	0.0011 ±0.0015	0.064 ±0.0090	0.021 ±0.0030
(Mugil cephalus)							
November, 1991							
Gyusou-machi, OKAYAMA	1.19	0.202	3.39	0.008 ±0.011	0.040 ±0.056	0.15 ±0.013	0.045 ±0.0039
Nagasaki, NAGASAKI	1.48	0.682	3.98	0.0000±0.0034	0.0000 ±0.0050	0.22 ±0.014	0.055 ±0.0036

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	Bq/kgwet	Bq/gCa	Bq/kgwet	Bq/gK
(Bembrops caudimacula) September, 1991 Souma, FUKUSHIMA	1.80	2.12	3.67	0.0054±0.0076	0.0026 ±0.0036	0.22 ±0.013	0.061 ±0.0037
(Seriola quinqueradiata) October, 1991 Tomirai-machi, ISHIKAWA	1.36	0.865	3.58	0.0005±0.0075	0.0006 ±0.0087	0.20 ±0.013	0.057 ±0.0036
(Sebastes inermis) February, 1992 Yamaguchi, YAMAGUCHI	4.69	10.0	3.21	0.021 ±0.0047	0.0021 ±0.00047	0.13 ±0.012	0.041 ±0.0036
(Spratelloides gracilis) December, 1991 Akune, KAGOSHIMA	2.87	4.79	3.27	0.0072±0.0077	0.0015 ±0.0016	0.22 ±0.014	0.066 ±0.0042
(Caesio chrysozonus) December, 1991 Yonaki-mura, OKINAWA	3.47	6.25	3.75	0.027 ±0.0090	0.0043 ±0.0014	0.16 ±0.012	0.042 ±0.0033

Sea Fish

Japanese name	English name	Scientific name
Ainame	Fat cod	Bembrops caudimacula
Aji	Atlantic horse mackerel	Trachurus japonicus
Ikanago	Sando lance	Ammodytes personatus Girard
Iwashi	Sardine	Sardinops melanosticta
Kasago	Scorpion-fish	Sebastiscus marmoratus
Katakuchi-iwashi	Anchovy	Mouth sardine
Katsuo	Bonito	Katsuwonus pelamis
Karei	Flatfish	Limanda herzensteini
Kisu	Sillago	Sillago sihama
Kibinago	Banded blue-sprat	Spratelloides gracilis
Saba	Common mackerel	Scomber japonicus
Tai	Sea bream	Chrysophrys major
Takasago	Bananafish	Caesio chrysozonus
Fukuragi	Amberjacks	Seriola quinqueradiata
Bora	Gray mullet	Mugil cephalus
Mebaru	Black rockfish	Sebastes inerms

(6) Strontium-90 and Cesium-137 in Freshwater Fish
(from Jul. 1991 to Sep. 1991)

-continued from No. 97 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	Bq/kgwet	Bq/gCa	Bq/kgwet	Bq/gK
(Cyprinus carpio)							
August, 1991							
Akita, AKITA	3.45	6.38	2.67	2.6 ± 0.04	0.40 ± 0.006	0.24 ± 0.017	0.091 ± 0.0062
November, 1991							
Syouhara, HIROSHIMA	1.07	0.474	3.23	0.067 ± 0.010	0.14 ± 0.022	0.12 ± 0.011	0.036 ± 0.0036
(Carassius auratus)							
November, 1991							
Niigata, NIIGATA	1.14	0.489	3.19	0.055 ± 0.012	0.11 ± 0.025	0.17 ± 0.013	0.055 ± 0.0042
Sanhouko, FUKUI	3.48	7.45	2.98	0.92 ± 0.034	0.12 ± 0.004	0.27 ± 0.017	0.092 ± 0.0057
December, 1991							
Uji, KYOTO	4.61	8.62	2.72	1.4 ± 0.04	0.16 ± 0.004	0.042 ± 0.0088	0.016 ± 0.0032
(Hyponesus transpacificus nipponensis)							
December, 1991							
Suwa, NAGANO	2.76	6.21	3.23	0.13 ± 0.012	0.021 ± 0.0019	0.14 ± 0.011	0.042 ± 0.0034

Freshwater Fish

Japanese name	English name	Scientific name
Koi	Carp	Cyprinus carpio
Funa	A crucian carp	Carassius auratus
Wakasagi	Japanese smelt	Hypomesus transpacificus nipponensis

(7) Strontium-90 and Cesium-137 in Shellfish
(from May. 1991 to Jun. 1991)

-continued from No. 95 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	Bq/kgwet	Bq/gCa	Bq/kgwet	Bq/gK
(Mytilus eduls)							
June, 1991							
Mutsu, AOMORI	2.88	0.547	1.51	0.0000±0.0034	0.0000±0.0062	0.024 ±0.0059	0.016 ±0.0039
(Patinopecten yessoensis)							
November, 1991							
Mutsu, AOMORI	1.40	0.180	2.72	0.0061±0.0047	0.034 ±0.026	0.041 ±0.0079	0.015 ±0.0029
February, 1992							
Yamada-machi, IWATE	2.18	0.303	3.21	0.0000±0.0040	0.000 ±0.013	0.028 ±0.0075	0.0088±0.0023
(Ostrea gigas)							
February, 1992							
Hatsukaichi, HIROSHIMA	1.82	0.872	2.73	0.020 ±0.013	0.023 ±0.014	0.025 ±0.0083	0.0091±0.0030

Shellfish

Japanese name	English name	Scientific name
Asari	Short-necked clam	Venerupis phillipinarum
Kaki	Thunberg	Ostrea gigas
Sazae	Wreath shell	Turbo cornutus
Hotategai	Jay	Patinopecten yessoensis
Murasakigai	Linne	Mytilus eduls

(8) Strontium-90 and Cesium-137 in Seaweeds
(from Apr. 1991 to Jun. 1991)

-continued from No. 97 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	Bq/kgwet	Bq/gCa	Bq/kgwet	Bq/gK
(Undaria pinnatifida)							
May, 1991							
Fukatsu-machi, AOMORI	1.92	0.695	4.67	0.021 ± 0.0044	0.030 ± 0.0064	0.018 ± 0.0070	0.0040 ± 0.0015
Mutsu, AOMORI	1.94	0.838	4.07	0.020 ± 0.0042	0.024 ± 0.0050	0.018 ± 0.0053	0.0045 ± 0.0013
February, 1992							
Nachita-machi, AICHI	1.33	0.701	3.55	0.046 ± 0.0054	0.065 ± 0.0077	0.0095 ± 0.0043	0.0027 ± 0.0012
Hiroshima, HIROSHIMA	2.47	0.551	8.77	0.017 ± 0.0086	0.032 ± 0.016	0.019 ± 0.0058	0.0021 ± 0.00066
Shimabara, NAGASAKI	2.95	0.740	8.73	0.027 ± 0.0049	0.037 ± 0.0066	0.037 ± 0.0072	0.0042 ± 0.00083

Seaweeds

Japanese name	English name	Scientific name
Wakame	Wakame seaweed	Undaria pinnatifida

＊＊＊　Total Diet　＊＊＊

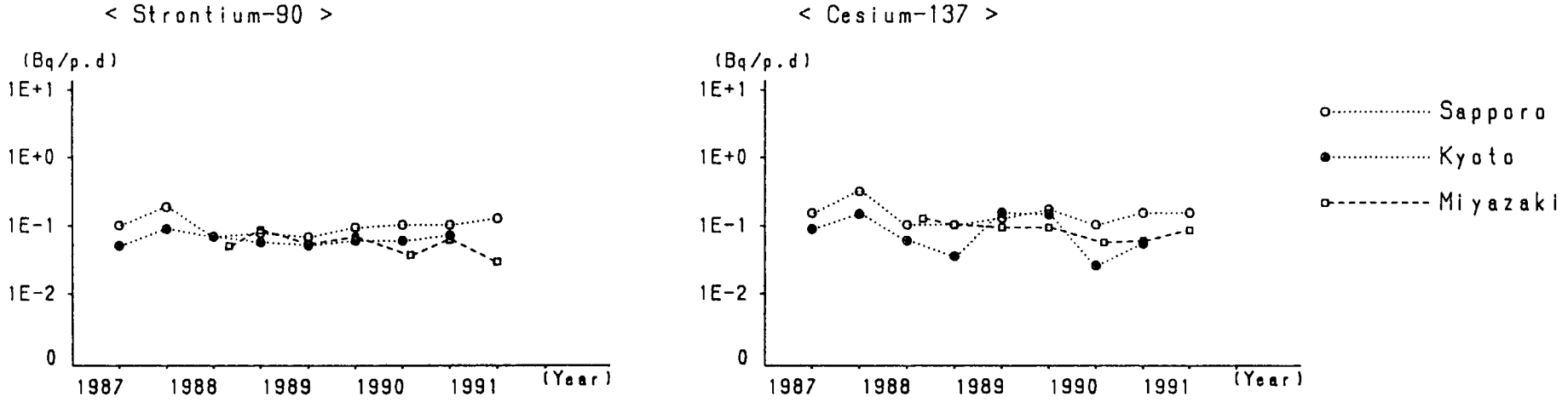

Fig.1

* * * Rice(producing districts) * * *

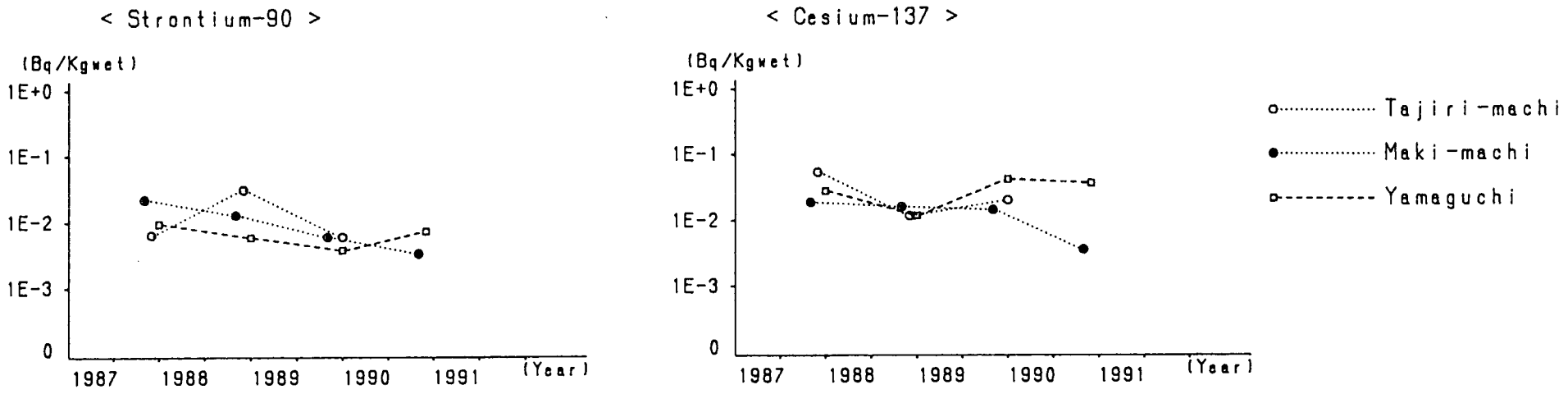

Fig.2-1

＊ ＊ ＊　Rice(consuming districts)　＊ ＊ ＊

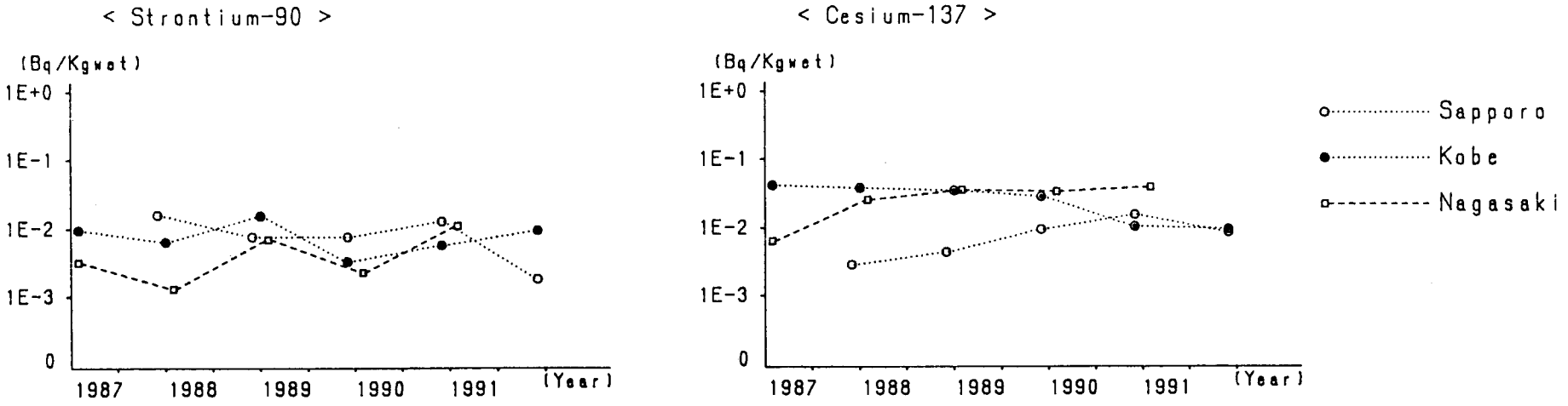

Fig.2-2

* * * Milk (producing districts for domestic program) * * *

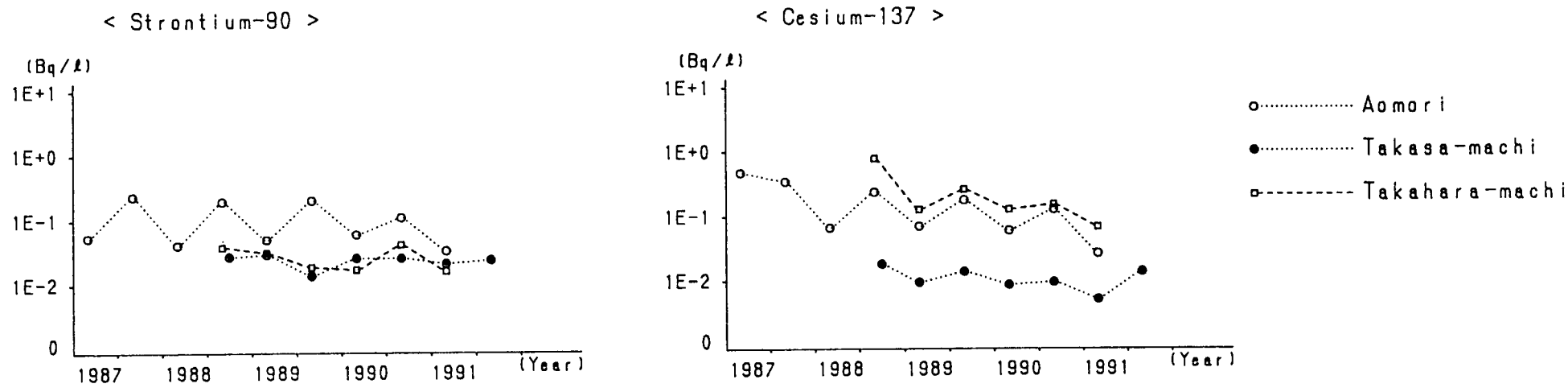

Fig. 3-1

* * * Milk(producing districts for WHO program) * * *

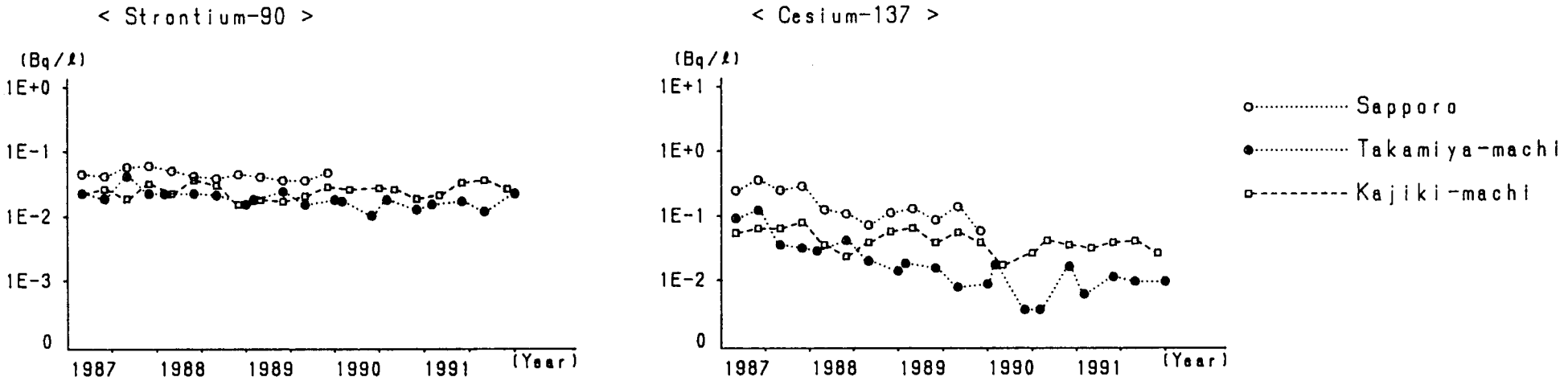

Fig.3-2

* * * Milk (consuming districts) * * *

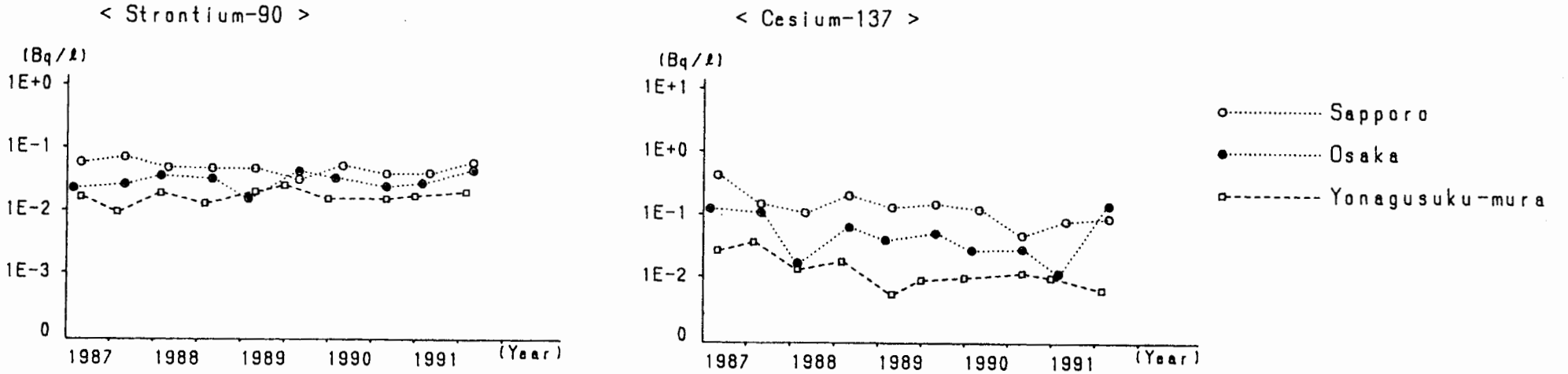

Fig. 3-3

* * * Vegetables(producing districts) * * *

[Japanese radish]

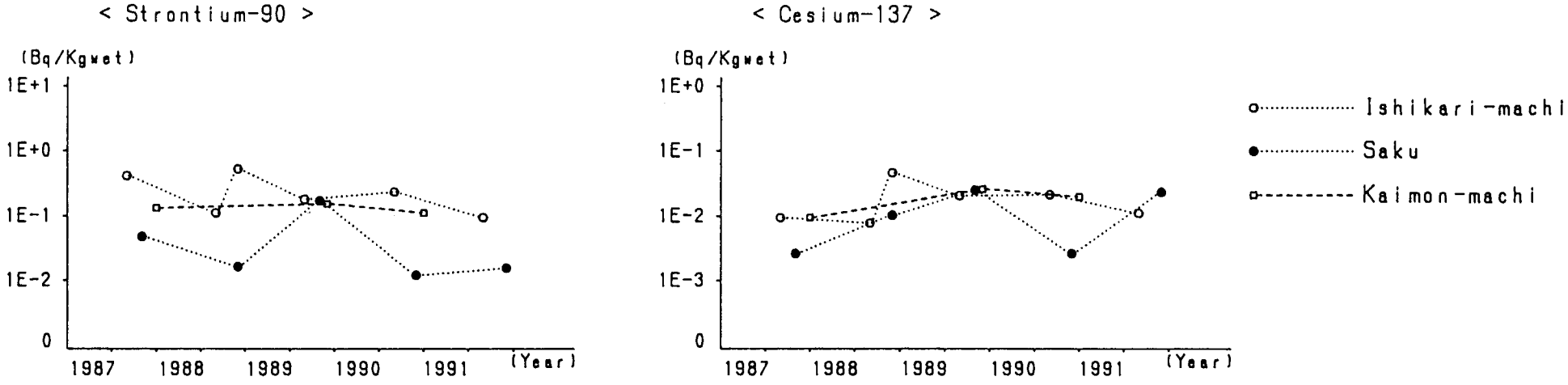

Fig.4-1

* * * Vegetables(consuming districts) * * *

(Japanese radish)

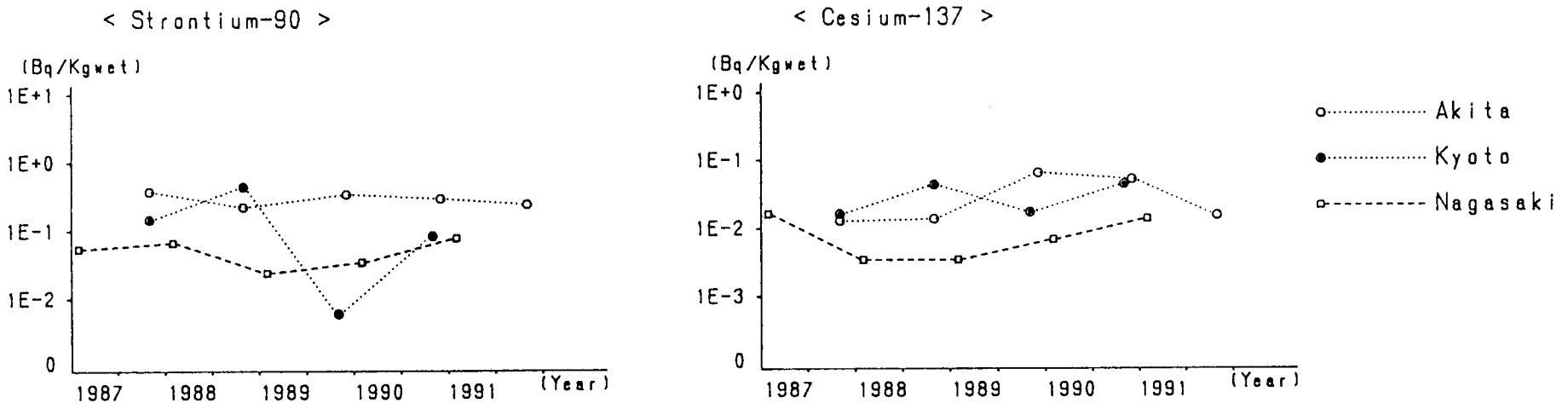

Fig.4-2

＊ ＊ ＊　Sea Fish　＊ ＊ ＊

[Chrysophrys major]

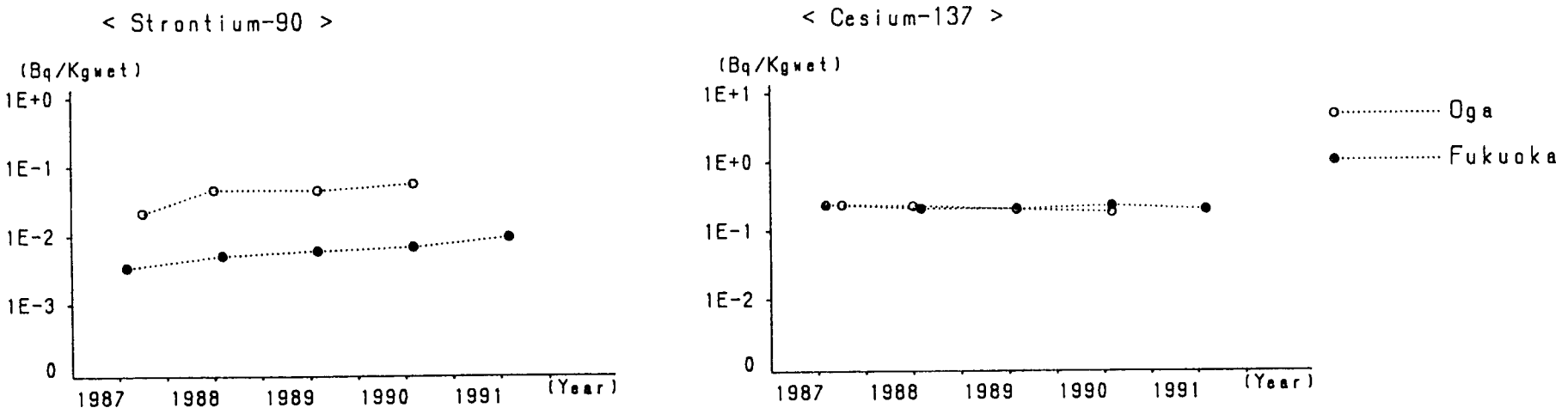

Fig.6

* * * Freshwater Fish * * *

(Cyprinus carpio)

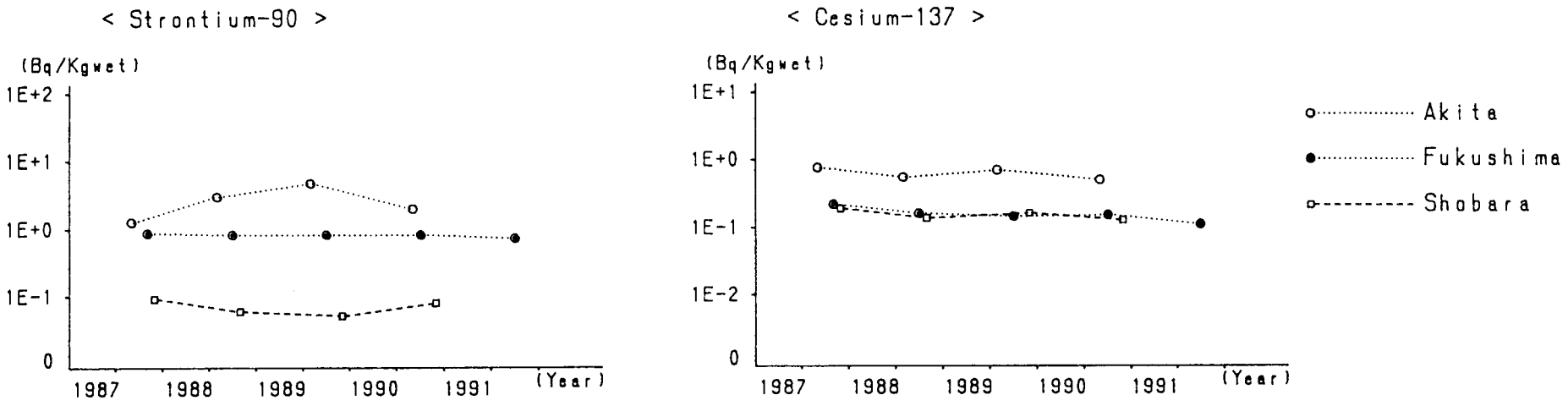

Fig.7

* * * Shellfish * * *

(Turbo cornutus)

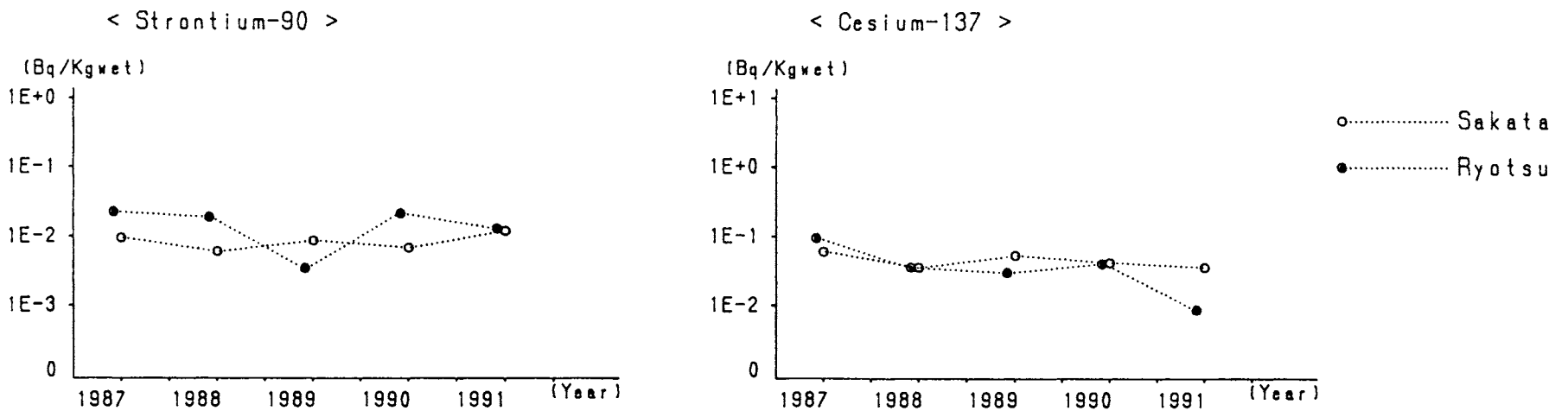

Fig.8

* * * Seaweeds * * *

(Undaria pinnatifida)

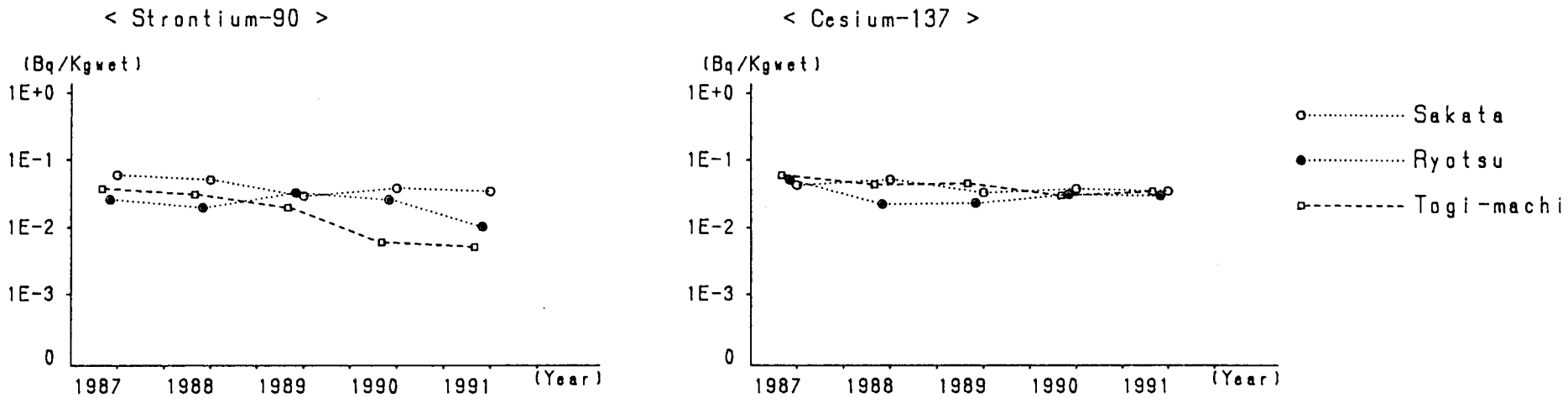

Fig.9

** Sampling Locations in Japan **

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