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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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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 a sampling tray, approximately 5000cm^2 in area, which was filled with water to a depth of 1 cm at the beginning of every month.

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

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

(2) Airborne dust

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

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

(3) Service water and freshwater

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

(4) Soil

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

(5) Sea water

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

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

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

(6) Sea sediments

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

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

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

(7) Total diet

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

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

(8) Rice

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

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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 nonstarch roots, respectively. After removing soil, the edible part of vegetable sample was dried and carbonized in a stainless steel pan or a porcelain dish.

(11) Tea

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

(12) Fish, shellfish and seaweeds

a. Sea fish and freshwater fish

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

b. Shellfish

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

c. Seaweeds

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

Table 1 shows details of sample collection.

Table 1 Details of sample collection

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

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

2. Preparation of samples for analysis

(1) Rain, service water and freshwater

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

(2) Soil and Sea sediment

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

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

(3) Rice

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

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

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

3. Separation of strontium-90 and cesium-137

(1) Strontium-90

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

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

(2) Cesium-137

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

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

Resultant molybdenum hydroxide which separated

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

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

4. Determination of stable strontium, calcium and potassium

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

5. Counting

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

6. Results

(1) Strontium-90 and Cesium-137 in Total Diet
(from Apr. 1997 to Sep. 1997)
-continued from No, 121 of this publication-
Table (1) Strontium-90 and Cesium-137 in Total Diet

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	Ash(g/p·d)	Ca(mg/p·d)	K(mg/p·d)	(Bq/p·d)	(Bq/gCa)	(Bq/p·d)	(Bq/gK)
June, 1997							
Sapporo, HOKKAIDOU	17.4	632	2340	0.047 ± 0.0062	0.047 ± 0.0099	0.031 ± 0.0064	0.013 ± 0.0027
Iwanai-machi, HOKKAIDOU	13.5	660	1600	0.054 ± 0.0061	0.082 ± 0.0093	0.036 ± 0.0066	0.022 ± 0.0041
Aomori, AOMORI	18.2	397	2110	0.031 ± 0.0084	0.079 ± 0.021	0.047 ± 0.0073	0.022 ± 0.0034
Ajigasawa-machi, AOMORI	17.5	838	1870	0.066 ± 0.0062	0.078 ± 0.0074	0.037 ± 0.0079	0.020 ± 0.0042
Morioka, IWATE	12.4	376	1760	0.067 ± 0.0069	0.18 ± 0.018	0.030 ± 0.0066	0.017 ± 0.0038
Iwaizumi-machi, IWATE	16.0	412	1860	0.050 ± 0.0095	0.12 ± 0.023	0.086 ± 0.0091	0.046 ± 0.0049
Yamagata, YAMAGATA	15.5	374	1460	0.032 ± 0.0052	0.084 ± 0.014	0.032 ± 0.0059	0.022 ± 0.0041
Sagae, YAMAGATA	14.6	549	1660	0.073 ± 0.0075	0.13 ± 0.014	0.030 ± 0.0061	0.018 ± 0.0037
Fukushima, FUKUSHIMA	14.0	464	1800	0.044 ± 0.0067	0.096 ± 0.015	0.040 ± 0.0066	0.022 ± 0.0037
Ookuma-machi, FUKUSHIMA	13.6	510	1360	0.045 ± 0.0062	0.089 ± 0.012	0.043 ± 0.0065	0.032 ± 0.0048
Mito, IBARAKI	17.2	617	2480	0.034 ± 0.0056	0.055 ± 0.0091	0.027 ± 0.0061	0.011 ± 0.0024
Tokai-mura, IBARAKI	18.1	637	2160	0.050 ± 0.0064	0.078 ± 0.010	0.050 ± 0.0074	0.023 ± 0.0034
Utsunomiya, TOCHIGI	14.0	572	2030	0.046 ± 0.010	0.081 ± 0.018	0.053 ± 0.0077	0.026 ± 0.0038
Mooka, TOCHIGI	16.0	509	2050	0.049 ± 0.0093	0.097 ± 0.018	0.048 ± 0.0071	0.023 ± 0.0035
Maebashi, GUNMA	12.2	462	1770	0.044 ± 0.0060	0.095 ± 0.013	0.013 ± 0.0050	0.0076 ± 0.0028
Nakanojou-machi, GUNMA	13.0	697	1580	0.045 ± 0.0094	0.064 ± 0.013	0.017 ± 0.0056	0.011 ± 0.0035
Urawa, SAITAMA	17.0	694	2410	0.095 ± 0.013	0.14 ± 0.019	0.040 ± 0.0070	0.016 ± 0.0029
Kumagaya, SAITAMA	16.3	761	1780	0.042 ± 0.0084	0.055 ± 0.011	0.027 ± 0.0060	0.015 ± 0.0033
Ichihara, CHIBA	18.9	509	2010	0.030 ± 0.0054	0.059 ± 0.011	0.025 ± 0.0056	0.012 ± 0.0028
Chikura-machi, CHIBA	21.1	620	2950	0.055 ± 0.010	0.088 ± 0.017	0.045 ± 0.0071	0.015 ± 0.0024
Shinjuku, TOKYO	14.0	265	1760	0.029 ± 0.0051	0.11 ± 0.019	0.060 ± 0.0079	0.034 ± 0.0045
Hachijou-machi, TOKYO	13.6	421	1620	0.031 ± 0.0086	0.073 ± 0.020	0.060 ± 0.0077	0.037 ± 0.0048
Nishikawa-machi, NIIGATA	24.4	650	2910	0.063 ± 0.0099	0.097 ± 0.015	0.018 ± 0.0055	0.0062 ± 0.0019

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	Ash(g/p·d)	Ca(mg/p·d)	K(mg/p·d)	(Bq/p·d)	(Bq/gCa)	(Bq/p·d)	(Bq/gK)
Kashiwazaki, NIIGATA	19.5	442	2130	0.081 ± 0.011	0.18 ± 0.025	0.055 ± 0.0076	0.026 ± 0.0036
Takaoka, TOYAMA	14.2	410	2120	0.043 ± 0.0057	0.010 ± 0.014	0.034 ± 0.0068	0.016 ± 0.0032
Takaoka, TOYAMA	15.9	415	1840	0.023 ± 0.0085	0.055 ± 0.020	0.019 ± 0.0056	0.010 ± 0.0030
Kanazawa, ISHIKAWA	16.7	466	2060	0.040 ± 0.0060	0.056 ± 0.013	0.018 ± 0.0058	0.0087 ± 0.0028
Yoshinodani-mura, ISHIKAWA	12.9	757	1380	0.046 ± 0.0064	0.061 ± 0.0085	0.031 ± 0.0063	0.022 ± 0.0046
Fukui, FUKUI	15.8	654	1950	0.050 ± 0.0094	0.076 ± 0.014	0.041 ± 0.0059	0.021 ± 0.0035
Koufu, YAMANASHI	15.1	372	1750	0.042 ± 0.0057	0.11 ± 0.015	0.034 ± 0.0068	0.019 ± 0.0039
Nirasaki, YAMANASHI	15.4	604	1940	0.048 ± 0.0064	0.080 ± 0.011	0.030 ± 0.0062	0.015 ± 0.0032
Nagano, NAGANO	13.4	511	1940	0.051 ± 0.0064	0.099 ± 0.012	0.031 ± 0.0066	0.016 ± 0.0034
Sanada-machi, NAGANO	14.6	612	1970	0.044 ± 0.0060	0.071 ± 0.0098	0.040 ± 0.0066	0.020 ± 0.0033
Gifu, GIFU	14.3	306	1910	0.021 ± 0.0070	0.067 ± 0.023	0.029 ± 0.0061	0.015 ± 0.0032
Takayama, GIFU	17.0	893	2130	0.059 ± 0.0071	0.066 ± 0.0079	0.028 ± 0.0062	0.013 ± 0.0029
Shizuoka, SHIZUOKA	17.6	600	2470	0.045 ± 0.0060	0.076 ± 0.010	0.059 ± 0.0078	0.024 ± 0.0032
Hamaoka-machi, SHIZUOKA	13.4	303	1690	0.020 ± 0.0048	0.065 ± 0.016	0.011 ± 0.0049	0.0068 ± 0.0029
Nagoya, AICHI	15.5	629	1980	0.036 ± 0.0079	0.058 ± 0.012	0.043 ± 0.0067	0.022 ± 0.0034
Shinshiro, AICHI	15.8	444	2210	0.031 ± 0.0084	0.069 ± 0.019	0.052 ± 0.0074	0.023 ± 0.0033
Ootsu, SHIGA	13.8	484	1960	0.040 ± 0.0079	0.082 ± 0.016	0.023 ± 0.0060	0.012 ± 0.0031
Imazu-machi, SHIGA	13.9	572	2360	0.054 ± 0.0094	0.095 ± 0.016	0.040 ± 0.0066	0.017 ± 0.0028
Tsu, MIE	14.7	367	1900	0.037 ± 0.0084	0.10 ± 0.023	0.010 ± 0.010	0.054 ± 0.0051
Owase, MIE	11.8	361	1570	0.069 ± 0.010	0.19 ± 0.028	0.027 ± 0.0057	0.017 ± 0.0036
Kyoto, KYOTO	13.3	413	1750	0.029 ± 0.0090	0.071 ± 0.022	0.017 ± 0.0059	0.0098 ± 0.0034
Maizuru, KYOTO	16.7	374	2000	0.040 ± 0.0099	0.11 ± 0.026	0.088 ± 0.0048	0.0044 ± 0.0024
Osaka, OSAKA	15.9	556	2260	0.058 ± 0.0064	0.11 ± 0.012	0.028 ± 0.0059	0.012 ± 0.0026
Sakai, OSAKA	14.8	523	1920	0.044 ± 0.010	0.085 ± 0.020	0.018 ± 0.0052	0.0095 ± 0.0027
Kakogawa, HYOUGO	13.4	532	1740	0.042 ± 0.0059	0.080 ± 0.011	0.012 ± 0.0051	0.0070 ± 0.0030

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	Ash(g/p·d)	Ca(mg/p·d)	K(mg/p·d)	(Bq/p·d)	(Bq/gCa)	(Bq/p·d)	(Bq/gK)
Hamasaka-machi, HYOUGO	13.6	646	1630	0.050 ± 0.011	0.077 ± 0.017	0.014 ± 0.0050	0.0088 ± 0.0031
Kashihara, NARA	13.3	716	1690	0.056 ± 0.0098	0.078 ± 0.014	0.017 ± 0.0054	0.010 ± 0.0032
Gojou, NARA	11.5	1310	1610	0.050 ± 0.0059	0.038 ± 0.0045	0.022 ± 0.0052	0.014 ± 0.0032
Fukube-mura, TOTTORI	15.4	384	2120	0.055 ± 0.0094	0.14 ± 0.025	0.024 ± 0.0059	0.012 ± 0.0028
Tottori, TOTTORI	13.1	462	2330	0.039 ± 0.0092	0.084 ± 0.020	0.038 ± 0.0066	0.016 ± 0.0028
Kashima-machi, SHIMANE	18.5	1250	2070	0.035 ± 0.0086	0.028 ± 0.0068	0.035 ± 0.0064	0.017 ± 0.0031
Okayama, OKAYAMA	18.6	692	2180	0.024 ± 0.0080	0.034 ± 0.011	0.033 ± 0.0062	0.015 ± 0.0029
Kamisaibara-mura, OKAYAMA	17.1	668	2050	0.080 ± 0.011	0.12 ± 0.017	0.021 ± 0.0078	0.010 ± 0.0038
Hiroshima, HIROSHIMA	10.9	252	1450	0.056 ± 0.0069	0.22 ± 0.027	0.018 ± 0.0057	0.013 ± 0.0040
Miyoshi, HIROSHIMA	11.0	455	1490	0.027 ± 0.0082	0.059 ± 0.018	0.018 ± 0.0052	0.012 ± 0.0035
Yamaguchi, YAMAGUCHI	15.7	484	1800	0.049 ± 0.010	0.10 ± 0.021	0.035 ± 0.0069	0.019 ± 0.0038
Ajisu-machi, YAMAGUCHI	16.8	458	2330	0.037 ± 0.0086	0.082 ± 0.019	0.038 ± 0.0069	0.016 ± 0.0029
Takamatsu, KAGAWA	15.2	421	2020	0.037 ± 0.0056	0.087 ± 0.013	0.023 ± 0.0057	0.011 ± 0.0028
Marugame, KAGAWA	15.1	433	2020	0.031 ± 0.0052	0.072 ± 0.012	0.019 ± 0.0065	0.0092 ± 0.0032
Matsuyama, EHIME	14.9	447	2010	0.014 ± 0.0065	0.031 ± 0.015	0.030 ± 0.0062	0.015 ± 0.0031
Ikata-machi, EHIME	9.26	394	1270	0.029 ± 0.0078	0.073 ± 0.020	0.012 ± 0.0045	0.0096 ± 0.0035
Kochi, KOCHI	16.5	520	2010	0.045 ± 0.0096	0.086 ± 0.018	0.020 ± 0.0060	0.010 ± 0.0030
Saga-machi, KOCHI	15.1	564	2060	0.094 ± 0.0083	0.17 ± 0.015	0.045 ± 0.0071	0.022 ± 0.0034
Dazaifu, FUKUOKA	14.3	400	2010	0.023 ± 0.0050	0.058 ± 0.012	0.011 ± 0.0046	0.0053 ± 0.0023
Fukuoka, FUKUOKA	13.7	489	1420	0.045 ± 0.0061	0.091 ± 0.012	0.029 ± 0.0071	0.021 ± 0.0050
Saga, SAGA	11.1	245	1390	0.030 ± 0.0084	0.12 ± 0.034	0.018 ± 0.0051	0.013 ± 0.0037
Karatsu, SAGA	16.8	607	2130	0.033 ± 0.0090	0.054 ± 0.015	0.018 ± 0.0053	0.0083 ± 0.0025
Nagasaki, NAGASAKI	16.7	553	1970	0.049 ± 0.0064	0.089 ± 0.012	0.034 ± 0.0075	0.017 ± 0.0038
Matsuura, NAGASAKI	11.9	465	1670	0.038 ± 0.0078	0.081 ± 0.017	0.018 ± 0.0058	0.011 ± 0.0035
Kumamoto, KUMAMOTO	14.3	323	2100	0.031 ± 0.0057	0.096 ± 0.018	0.028 ± 0.0071	0.013 ± 0.0034

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	Ash(g/p·d)	Ca(mg/p·d)	K(mg/p·d)	(Bq/p·d)	(Bq/gCa)	(Bq/p·d)	(Bq/gK)
Tomiai-machi, KUMAMOTO	11.9	514	1590	0.043 ± 0.0081	0.083 ± 0.016	0.024 ± 0.0060	0.015 ± 0.0038
Ooita, OOITA	10.5	379	1350	0.027 ± 0.0056	0.072 ± 0.015	0.026 ± 0.0067	0.019 ± 0.0050
Saiki, OOITA	9.75	326	1220	0.024 ± 0.0051	0.073 ± 0.016	0.0059 ± 0.0044	0.0049 ± 0.0036
Miyazaki, MIYAZAKI	14.4	463	1840	0.011 ± 0.0068	0.023 ± 0.015	0.050 ± 0.0073	0.027 ± 0.0040
Takachiho-machi, MIYAZAKI	13.0	441	2070	0.046 ± 0.0067	0.10 ± 0.015	0.029 ± 0.0067	0.014 ± 0.0033
Sendai, MIYAGI	17.4	806	2390	0.034 ± 0.0088	0.042 ± 0.011	0.019 ± 0.0053	0.0078 ± 0.0022
Ookuchi, KAGOSHIMA	15.4	389	1880	0.047 ± 0.010	0.12 ± 0.026	0.040 ± 0.0070	0.021 ± 0.0037
July, 1997							
Akita, AKITA	12.8	493	1930	0.10 ± 0.009	0.21 ± 0.017	0.057 ± 0.0081	0.029 ± 0.0042
Akita, AKITA	13.1	427	1600	0.034 ± 0.0055	0.079 ± 0.013	0.042 ± 0.0070	0.027 ± 0.0044
Yokohama, KANAGAWA	15.5	439	2050	0.044 ± 0.0090	0.099 ± 0.021	0.035 ± 0.0063	0.017 ± 0.0031
Hiratsuka, KANAGAWA	17.8	671	2490	0.025 ± 0.0048	0.038 ± 0.0071	0.048 ± 0.0073	0.019 ± 0.0029
Tsuruga, FUKUI	14.9	648	1910	0.031 ± 0.0069	0.048 ± 0.011	0.018 ± 0.0055	0.0093 ± 0.0029
Wakayama, WAKAYAMA	11.6	314	1620	0.026 ± 0.0083	0.082 ± 0.026	0.013 ± 0.0051	0.0078 ± 0.0031
Shinguu, WAKAYAMA	13.6	468	1600	0.034 ± 0.0083	0.073 ± 0.018	0.035 ± 0.0079	0.022 ± 0.0049
Matsue, SHIMANE	23.5	860	2700	0.051 ± 0.0097	0.059 ± 0.011	0.042 ± 0.0068	0.016 ± 0.0025
Tokushima, TOKUSHIMA	12.5	338	1600	0.048 ± 0.0063	0.14 ± 0.019	0.029 ± 0.0063	0.0018 ± 0.0039
Ginowan, Okinawa	10.5	431	1480	0.038 ± 0.0054	0.087 ± 0.012	0.013 ± 0.0050	0.0087 ± 0.0034
August, 1997							
Ishinomaki, MIYAGI	17.2	881	2130	0.057 ± 0.0063	0.065 ± 0.0071	0.047 ± 0.0068	0.022 ± 0.0032
Onagawa-machi, MIYAGI	14.7	895	1530	0.038 ± 0.0053	0.043 ± 0.0060	0.042 ± 0.0066	0.028 ± 0.0043
September, 1997							
Naha, Okinawa	11.1	360	1630	0.045 ± 0.0064	0.12 ± 0.018	0.039 ± 0.0071	0.024 ± 0.0044

(2) Strontium-90 and Cesium-137 in Rice(producting districts)
(from Apr. 1997 to Sep. 1997)
-continued from No, 121 of this publication-
Table (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)
July, 1997							
Sadohara-machi, MIYAZAKI	0.625	0.017	0.950	0.0032 ± 0.0047	0.19 ± 0.28	0.0000 ± 0.0030	0.0000 ± 0.0031
September, 1997							
Chiba, CHIBA	0.538	0.022	0.850	0.0057 ± 0.0053	0.25 ± 0.24	0.0056 ± 0.0040	0.0065 ± 0.0047
Kanazawa, ISHIKAWA	0.603	0.026	0.995	0.014 ± 0.0068	0.56 ± 0.26	0.0022 ± 0.0045	0.0022 ± 0.0045
Gifu, GIFU	0.439	0.025	0.751	0.0045 ± 0.0051	0.18 ± 0.20	0.0000 ± 0.0031	0.0000 ± 0.0042
Matsusaka, MIE	0.560	0.022	1.11	0.013 ± 0.0061	0.58 ± 0.28	0.0054 ± 0.0045	0.0048 ± 0.0040
	0.660	0.033	0.713	0.0055 ± 0.0029	0.17 ± 0.090	0.0027 ± 0.0038	0.0039 ± 0.0054

(3)-1 Strontium-90 and Cesium-137 in Milk(producting districts for domestic program)
(from Apr. 1997 to Sep. 1997)
-continued from No. 121 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)
May, 1997							
Shinguu, WAKAYAMA	6.71	0.899	1.50	0.018 ± 0.0069	0.020 ± 0.0077	0.0052 ± 0.0039	0.0035 ± 0.0026
June, 1997							
Yamato-machi, SAGA	7.56	1.15	1.65	0.031 ± 0.0056	0.027 ± 0.0048	0.0000 ± 0.0048	0.0000 ± 0.0029
August, 1997							
Aomori, AOMORI	7.34	1.10	1.54	0.088 ± 0.013	0.080 ± 0.012	0.045 ± 0.0075	0.0229 ± 0.0049
Takizawa-mura, IWATE	7.18	1.08	1.58	0.016 ± 0.0068	0.015 ± 0.0063	0.015 ± 0.0076	0.0095 ± 0.0048
Mito, IBARAKI	7.47	1.14	1.55	0.037 ± 0.0094	0.033 ± 0.0082	0.012 ± 0.0052	0.0078 ± 0.0034
Nishinasuno-machi, TOCHIGI	7.18	1.12	1.42	0.018 ± 0.0045	0.017 ± 0.0040	0.031 ± 0.0059	0.022 ± 0.0042
Fujimi-mura, GUNMA	7.16	1.16	1.72	0.016 ± 0.0044	0.013 ± 0.0038	0.0042 ± 0.0038	0.0024 ± 0.0022
Yachimata, CHIBA	7.21	1.04	1.54	0.014 ± 0.0069	0.014 ± 0.0067	0.0070 ± 0.0067	0.0046 ± 0.0043
Oshimizu-machi, ISHIKAWA	7.61	1.18	1.67	0.031 ± 0.0093	0.026 ± 0.0079	0.013 ± 0.0053	0.0080 ± 0.0032
Takane-machi, YAMANASHI	7.45	1.12	1.52	0.028 ± 0.0083	0.025 ± 0.0073	0.0051 ± 0.0070	0.0034 ± 0.0046
Gifu, GIFU	7.24	1.11	1.47	0.060 ± 0.011	0.054 ± 0.0097	0.018 ± 0.0073	0.012 ± 0.0049
Hino-machi, SHIGA	7.14	1.05	1.67	0.035 ± 0.0083	0.033 ± 0.0080	0.0030 ± 0.0040	0.0018 ± 0.0024
Oouchiyama-mura, MIE	7.13	1.08	1.59	0.026 ± 0.0081	0.024 ± 0.0075	0.011 ± 0.0050	0.0070 ± 0.0031
Mihara-machi, HYOUGO	6.91	1.07	1.49	0.014 ± 0.0068	0.013 ± 0.0064	0.0038 ± 0.0060	0.0026 ± 0.0041
Oouda-machi, NARA	6.98	1.06	1.57	0.0088 ± 0.0062	0.0083 ± 0.0058	0.0070 ± 0.0048	0.0045 ± 0.0031
Takase-machi, KAGAWA	7.19	1.11	1.60	0.017 ± 0.0076	0.015 ± 0.0068	0.0009 ± 0.0064	0.0005 ± 0.0040
Kawauchi-machi, EHIME	7.09	1.08	1.53	0.030 ± 0.0086	0.028 ± 0.0080	0.0021 ± 0.0041	0.0014 ± 0.0027
Koushi-machi, KUMAMOTO	7.24	1.09	1.55	0.016 ± 0.0042	0.015 ± 0.0038	0.0094 ± 0.0044	0.0061 ± 0.0028
Kujuu-machi, OOITA	7.19	1.15	1.53	0.031 ± 0.0050	0.027 ± 0.0044	0.11 ± 0.010	0.069 ± 0.0067
Takahara-machi, MIYAZAKI	7.27	1.04	1.63	0.023 ± 0.0046	0.022 ± 0.0045	0.027 ± 0.0056	0.017 ± 0.0034
September, 1997							
Tonami, TOYAMA	7.29	1.08	1.56	0.035 ± 0.0057	0.032 ± 0.0052	0.047 ± 0.0073	0.030 ± 0.0047

(3)-2 Strontium-90 and Cesium-137 in Milk(producting districts for WHO program)
(from Apr. 1997 to Sep. 1997)
-continued from No. 121 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)
May, 1997							
Hokudainoujou, HOKKAIDOU	7.14	1.13	1.72	0.045 ± 0.0058	0.040 ± 0.0052	0.069 ± 0.0092	0.040 ± 0.0053
Hachijou-machi, TOKYO	6.90	1.01	1.52	0.030 ± 0.0089	0.030 ± 0.0088	0.036 ± 0.0066	0.024 ± 0.0043
Iwamuro-mura, NIIGATA	7.36	1.12	1.61	0.036 ± 0.0095	0.032 ± 0.0085	0.0047 ± 0.0046	0.0029 ± 0.0028
Katsuyama, FUKUI	7.11	1.12	1.52	0.028 ± 0.0083	0.025 ± 0.0073	0.0051 ± 0.0070	0.0071 ± 0.0030
Shijounawate, OSAKA	7.24	1.07	1.46	0.035 ± 0.0055	0.032 ± 0.0051	0.0009 ± 0.0040	0.0006 ± 0.0027
Matsue, SHIMANE	7.36	1.11	1.58	0.0063 ± 0.0063	0.0057 ± 0.0057	0.0078 ± 0.0043	0.0049 ± 0.0028
Takamiya-machi, HIROSHIMA	7.35	1.09	1.57	0.012 ± 0.0072	0.011 ± 0.0067	0.014 ± 0.0058	0.0089 ± 0.0043
Kochi, KOCHI	7.45	1.12	1.70	0.028 ± 0.0052	0.025 ± 0.0046	0.011 ± 0.0052	0.0065 ± 0.0031
Yasu-machi, FUKUOKA	7.19	1.10	1.60	0.018 ± 0.0046	0.017 ± 0.0042	0.0079 ± 0.0052	0.0050 ± 0.0032
Kajiki-machi, KAGOSHIMA	7.30	1.10	1.63	0.019 ± 0.0077	0.017 ± 0.0070	0.0080 ± 0.0051	0.0049 ± 0.0031
August, 1997							
Hokudainoujou, HOKKAIDOU	7.31	1.12	1.71	0.034 ± 0.0062	0.030 ± 0.0055	0.053 ± 0.0077	0.031 ± 0.0045
Hachijou-machi, TOKYO	7.07	1.00	1.45	0.039 ± 0.0088	0.039 ± 0.0088	0.024 ± 0.0077	0.017 ± 0.0053
Iwamuro-mura, NIIGATA	7.14	1.09	1.59	0.034 ± 0.010	0.031 ± 0.0092	0.0046 ± 0.0041	0.0029 ± 0.0026
Katsuyama, FUKUI	7.40	1.08	1.46	0.022 ± 0.0072	0.020 ± 0.0067	0.0000 ± 0.0057	0.0051 ± 0.0031
Shijounawate, OSAKA	7.42	1.11	1.42	0.034 ± 0.0093	0.030 ± 0.0084	0.0078 ± 0.0049	0.0055 ± 0.0035
Takamiya-machi, HIROSHIMA	6.95	1.05	1.55	0.031 ± 0.0085	0.029 ± 0.0081	0.010 ± 0.0052	0.0067 ± 0.0034
Kochi, KOCHI	7.34	1.13	1.61	0.053 ± 0.011	0.047 ± 0.0095	0.0054 ± 0.0064	0.0034 ± 0.0040
Yasu-machi, FUKUOKA	7.10	1.08	1.54	0.012 ± 0.0074	0.011 ± 0.0069	0.0058 ± 0.0048	0.0038 ± 0.0031
Kajiki-machi, KAGOSHIMA	7.32	1.11	1.67	0.021 ± 0.0081	0.019 ± 0.0073	0.018 ± 0.0058	0.011 ± 0.0034
September, 1997							
Matsue, SHIMANE	6.90	1.03	1.40	0.027 ± 0.0049	0.026 ± 0.0047	0.0000 ± 0.0036	0.0000 ± 0.0026

(3)-3 Strontium-90 and Cesium-137 in Milk(comsuming districts)
(from Apr. 1997 to Sep. 1997)
-continued from No, 121 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)
May, 1997							
Sendai, MIYAGI	7.00	1.04	1.48	0.043 ± 0.0088	0.041 ± 0.0084	0.015 ± 0.0052	0.0099 ± 0.0035
Kyoto, KYOTO	8.92	1.05	1.54	0.017 ± 0.0066	0.016 ± 0.0063	0.012 ± 0.0050	0.0075 ± 0.0033
August, 1997							
Sapporo, HOKKAIDOU	7.24	1.11	1.52	0.047 ± 0.0096	0.043 ± 0.0086	0.029 ± 0.0086	0.019 ± 0.0056
Akita, AKITA	6.96	1.04	1.48	0.015 ± 0.0058	0.014 ± 0.0056	0.049 ± 0.0072	0.033 ± 0.0048
Yamagata, YAMAGATA	6.83	1.04	1.44	0.022 ± 0.0072	0.022 ± 0.0069	0.023 ± 0.0069	0.016 ± 0.0048
Fukushima, FUKUSHIMA	7.58	1.12	1.68	0.014 ± 0.0082	0.013 ± 0.0073	0.041 ± 0.0073	0.025 ± 0.0043
Urawa, SAITAMA	6.74	1.03	1.45	0.021 ± 0.0071	0.020 ± 0.0069	0.011 ± 0.0060	0.0078 ± 0.0041
Shinjuku, TOKYO	6.79	0.982	1.49	0.026 ± 0.0049	0.027 ± 0.0050	0.020 ± 0.0055	0.013 ± 0.0037
Yokohama, KANAGAWA	7.31	1.08	1.60	0.022 ± 0.0048	0.020 ± 0.0045	0.016 ± 0.0056	0.010 ± 0.0035
Niigata, NIIGATA	7.64	1.06	1.53	0.036 ± 0.0084	0.034 ± 0.0079	0.039 ± 0.0065	0.026 ± 0.0043
Fukui, FUKUI	7.28	1.08	1.66	0.017 ± 0.0053	0.016 ± 0.0049	0.020 ± 0.0064	0.012 ± 0.0038
Shizuoka, SHIZUOKA	7.23	1.10	1.58	0.011 ± 0.0072	0.010 ± 0.0065	0.013 ± 0.0049	0.0086 ± 0.0031
Nagoya, AICHI	7.18	1.09	1.64	0.049 ± 0.010	0.045 ± 0.0094	0.042 ± 0.0087	0.026 ± 0.0053
Osaka, OSAKA	7.13	1.03	1.58	0.028 ± 0.0083	0.027 ± 0.0080	0.038 ± 0.0070	0.024 ± 0.0045
Yonago, TOTTORI	7.00	1.09	1.59	0.032 ± 0.0085	0.030 ± 0.0078	0.015 ± 0.0045	0.0092 ± 0.0028
Matsue, SHIMANE	7.46	1.07	1.60	0.021 ± 0.0040	0.020 ± 0.0037	0.0091 ± 0.0043	0.0057 ± 0.0027
Hiroshima, HIROSHIMA	6.94	1.02	1.48	0.031 ± 0.0078	0.031 ± 0.0077	0.0099 ± 0.0051	0.0067 ± 0.0034
Yamaguchi, YAMAGUCHI	6.92	1.03	1.47	0.017 ± 0.0076	0.016 ± 0.0074	0.0082 ± 0.0067	0.0056 ± 0.0046
Kawauchi-machi, EHIME	6.94	1.05	1.54	0.016 ± 0.0063	0.015 ± 0.0061	0.011 ± 0.0051	0.0073 ± 0.0033
Kochi, KOCHI	7.14	1.07	1.59	0.022 ± 0.0053	0.021 ± 0.0050	0.0088 ± 0.0056	0.0055 ± 0.0035
Chikushino, FUKUOKA	7.04	1.06	1.51	0.020 ± 0.0043	0.019 ± 0.0041	0.0094 ± 0.0071	0.0062 ± 0.0047
Nagasaki, NAGASAKI	6.80	1.02	1.43	0.031 ± 0.0083	0.030 ± 0.0081	0.0049 ± 0.0043	0.0034 ± 0.0030
Kagoshima, KAGOSHIMA	7.18	1.06	1.59	0.026 ± 0.010	0.024 ± 0.0099	0.0099 ± 0.0045	0.0062 ± 0.0028
September, 1997							
Sendai, MIYAGI	7.26	1.08	1.52	0.023 ± 0.010	0.021 ± 0.0092	0.0038 ± 0.0041	0.0025 ± 0.0027

Location	Component			^{90}Sr		^{137}Cs	
	Ash(g/ ℓ)	Ca(g/ ℓ)	K(g/ ℓ)	(Bq/ ℓ)	(Bq/gCa)	(Bq/ ℓ)	(Bq/gK)
Nagano, NAGANO	6.70	1.02	1.47	0.024 ± 0.0072	0.024 ± 0.0071	0.012 ± 0.0043	0.0084 ± 0.0029
Okayama, OKAYAMA	7.22	1.08	1.74	0.0089 ± 0.0066	0.0083 ± 0.0061	0.010 ± 0.0044	0.0058 ± 0.0025
Yonagusuku-machi, Okinawa	7.02	1.07	1.49	0.021 ± 0.0049	0.021 ± 0.0046	0.0073 ± 0.0044	0.0049 ± 0.0029

(3)-4 Strontium-90 and Cesium-137 in Milk(powdered milk)
(from Apr. 1997 to Sep. 1997)
-continued from No, 121 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kg)	(Bq/gCa)	(Bq/kg)	(Bq/gK)
June, 1997							
Sample A,	7.97	12.4	16.9	0.36 ± 0.029	0.030 ± 0.0024	0.28 ± 0.020	0.016 ± 0.0012
Sample B,	2.66	3.48	6.06	0.043 ± 0.0092	0.012 ± 0.0026	0.057 ± 0.0078	0.0095 ± 0.0013
Sample C,	7.97	12.0	17.1	0.59 ± 0.037	0.049 ± 0.0031	1.6 ± 0.05	0.093 ± 0.0027
Sample D,	2.57	4.03	5.42	0.032 ± 0.0085	0.0080 ± 0.0021	0.096 ± 0.0086	0.013 ± 0.0016
Sample E,	2.59	4.22	5.18	0.11 ± 0.014	0.025 ± 0.0032	0.099 ± 0.0099	0.019 ± 0.0019
Sample F,	2.53	3.44	4.78	0.042 ± 0.0095	0.012 ± 0.0028	0.10 ± 0.010	0.022 ± 0.0021

(4)-1 Strontium-90 and cesium-137 in Vegetables(producting districts)
(from Apr. 1997 to Sep. 1997)

-continued from No. 121 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)
(Cabbege)							
July, 1997							
Oota, SHIMANE	0.610	0.515	1.93	0.33 ± 0.022	0.65 ± 0.042	0.47 ± 0.020	0.25 ± 0.011
(Japanese radish)							
May, 1997							
Tahara-machi, AICHI	0.657	0.186	2.98	0.011 ± 0.0066	0.059 ± 0.036	0.0000 ± 0.0042	0.0000 ± 0.0014
June, 1997							
Koushi-machi, KUMAMOTO	0.515	0.218	2.12	0.025 ± 0.0078	0.11 ± 0.036	0.0023 ± 0.0043	0.0011 ± 0.0020
July, 1997							
Oota, SHIMANE	0.609	0.182	2.31	0.073 ± 0.012	0.40 ± 0.064	0.21 ± 0.013	0.091 ± 0.0056
August, 1997							
Hiroshima-machi, HOKKAIDOU	0.344	0.145	2.43	0.13 ± 0.014	0.87 ± 0.093	0.011 ± 0.0045	0.0046 ± 0.0018
(Onion)							
July, 1997							
Kumatori-machi, OSAKA	0.365	0.085	1.52	0.014 ± 0.0072	0.17 ± 0.085	0.0014 ± 0.0035	0.0009 ± 0.0023
(Potato)							
July, 1997							
Mutsu, AOMORI	0.910	0.026	3.89	0.0000 ± 0.0034	0.00 ± 0.13	0.073 ± 0.0084	0.019 ± 0.0022
(Spinach)							
May, 1997							
Tahara-machi, AICHI	1.39	1.10	4.93	0.021 ± 0.0077	0.019 ± 0.0069	0.0040 ± 0.0047	0.00082 ± 0.00095
Koushi-machi, KUMAMOTO	1.70	0.605	6.44	0.072 ± 0.011	0.12 ± 0.019	0.0037 ± 0.0047	0.00057 ± 0.00072
August, 1997							
Hiroshima-machi, HOKKAIDOU	1.60	0.466	7.31	0.32 ± 0.022	0.68 ± 0.046	0.024 ± 0.0061	0.0033 ± 0.00083

(4)-2 Strontium-90 and cesium-137 in Vegetables(consuming districts)
(from Apr. 1997 to Sep. 1997)

-continued from No. 121 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)							
September, 1997							
Rifu-machi, MIYAGI	0.620	0.124	2.67	0.056 ± 0.010	0.45 ± 0.084	0.0060 ± 0.0048	0.0022 ± 0.0018
Urawa, SAITAMA	0.497	0.216	1.96	0.20 ± 0.018	0.95 ± 0.084	0.058 ± 0.0084	0.034 ± 0.0043
(Spinach)							
May, 1997							
Rifu-machi, MIYAGI	1.98	0.622	8.55	0.071 ± 0.011	0.11 ± 0.018	0.018 ± 0.0054	0.0021 ± 0.00063
July, 1997							
Niigata, NIIGATA	1.56	0.232	6.91	0.0040 ± 0.0059	0.017 ± 0.025	0.0043 ± 0.0046	0.00062 ± 0.00067
September, 1997							
Urawa, SAITAMA	1.67	0.317	7.75	0.15 ± 0.016	0.47 ± 0.050	0.0000 ± 0.0039	0.00000 ± 0.00050

(5) Strontium-90 and Cesium-137 in Tea (Japanese Tea)
(from Apr. 1997 to Sep. 1997)
-continued from No. 121 of this publication-

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

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kg)	(Bq/gCa)	(Bq/kg)	(Bq/gK)
April, 1997							
Mifune-machi, KUMAMOTO	5.66	2.71	17.8	0.21 ± 0.031	0.079 ± 0.011	0.000 ± 0.017	0.00000 ± 0.00097
May, 1997							
Ikeda-machi, GIFU	4.95	3.16	17.3	1.2 ± 0.05	0.39 ± 0.017	0.11 ± 0.026	0.0063 ± 0.0015
Shirakawa-machi, GIFU	5.06	2.20	19.2	0.35 ± 0.036	0.16 ± 0.016	0.071 ± 0.025	0.0037 ± 0.0013
Iwata, SHIZUOKA	1.24	0.806	4.37	0.072 ± 0.0066	0.089 ± 0.0082	0.021 ± 0.0051	0.0048 ± 0.0012
Shuzenji-machi, SHIZUOKA	1.47	0.855	5.16	0.32 ± 0.015	0.37 ± 0.017	0.095 ± 0.010	0.018 ± 0.0020
Oodai-machi, MIE	5.70	2.26	21.1	0.35 ± 0.050	0.15 ± 0.022	0.21 ± 0.030	0.0098 ± 0.0014
Kameyama, MIE	5.60	3.49	19.2	1.1 ± 0.08	0.31 ± 0.022	0.22 ± 0.032	0.011 ± 0.0016
Nara, NARA	5.19	2.69	19.5	0.37 ± 0.052	0.14 ± 0.019	1.4 ± 0.07	0.071 ± 0.0037
Nara, NARA	5.11	2.49	19.4	0.42 ± 0.052	0.17 ± 0.021	0.076 ± 0.022	0.0039 ± 0.0011
Ue-mura, KUMAMOTO	4.84	3.38	15.6	0.91 ± 0.078	0.27 ± 0.023	0.19 ± 0.030	0.012 ± 0.0019
Miyakonojou, MIYAZAKI	4.89	2.64	18.4	0.14 ± 0.033	0.055 ± 0.013	0.27 ± 0.032	0.015 ± 0.0017
Kawaminami-machi, MIYAZAKI	5.19	2.58	19.7	0.22 ± 0.039	0.085 ± 0.015	1.7 ± 0.08	0.088 ± 0.0039
June, 1997							
Iruma, SAITAMA	5.15	2.18	17.9	0.36 ± 0.049	0.17 ± 0.022	0.23 ± 0.033	0.013 ± 0.0019
Tokorozawa, SAITAMA	5.09	2.56	17.2	0.41 ± 0.066	0.16 ± 0.026	0.46 ± 0.053	0.027 ± 0.0031
Kaya-machi, KYOTO	5.51	3.00	18.7	1.2 ± 0.06	0.42 ± 0.020	0.35 ± 0.038	0.018 ± 0.0020
Uji, KYOTO	4.66	2.56	15.5	0.27 ± 0.030	0.10 ± 0.012	0.009 ± 0.013	0.00058 ± 0.00032
Chiran-machi, KAGOSHIMA	5.27	2.78	19.1	0.26 ± 0.028	0.093 ± 0.0099	1.3 ± 0.07	0.070 ± 0.0035
Miyanojou-machi, KAGOSHIMA	5.67	2.77	20.6	0.56 ± 0.040	0.20 ± 0.014	0.58 ± 0.049	0.028 ± 0.0024

(6) Strontium-90 and cesium-137 in Sea Fish (18)
(from Apr. 1997 to Sep. 1997)

-continued from No, 121 of this publication-

Table (5) :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)
(Ammodytes personatus)							
April, 1997							
Akashi, HYOUGO	2.32	3.16	4.38	0.0042 ± 0.0034	0.0013 ± 0.0011	0.074 ± 0.0088	0.017 ± 0.0020
(Hexagrammos otakii)							
September, 1997							
Souma, FUKUSHIMA	1.66	1.71	3.97	0.010 ± 0.0055	0.0058 ± 0.0032	0.15 ± 0.012	0.038 ± 0.0030
(Katsuwonus pelamis)							
May, 1997							
Tosa, KOCHI	1.17	0.049	3.53	0.0008 ± 0.0030	0.017 ± 0.062	0.23 ± 0.014	0.065 ± 0.0039
(Limanda herzensteini)							
June, 1997							
Sendai, MIYAGI	2.72	5.60	2.94	0.0013 ± 0.0038	0.00023 ± 0.00068	0.043 ± 0.0071	0.015 ± 0.0024
(Mugil cephalus)							
August, 1997							
Morodomi-machi, SAGA	1.12	0.433	3.22	0.0013 ± 0.0045	0.003 ± 0.010	0.053 ± 0.0079	0.017 ± 0.0025
(Oncorhynchus keta)							
September, 1997							
Urakawa-machi, HOKKAIDOU	1.37	0.452	3.88	0.0000 ± 0.0048	0.000 ± 0.011	0.081 ± 0.0087	0.021 ± 0.0022
(Pagrus sp)							
May, 1997							
Owase, MIE	1.53	0.246	4.89	0.0062 ± 0.0052	0.025 ± 0.021	0.17 ± 0.012	0.034 ± 0.0024
July, 1997							
Fukuoka, FUKUOKA	1.35	0.309	4.24	0.0007 ± 0.0046	0.002 ± 0.015	0.16 ± 0.012	0.038 ± 0.0028
August, 1997							
Tennou-machi, AKITA	1.57	2.10	3.42	0.016 ± 0.0064	0.0076 ± 0.0030	0.13 ± 0.011	0.037 ± 0.0032
(Sardinops melanostictus)							

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kgwet)	(Bq/gCa)	(Bq/kgwet)	(Bq/gK)
August, 1997							
Yamagata, YAMAGATA	2.31	5.12	1.63	0.0054 ± 0.0056	0.0011 ± 0.0011	0.025 ± 0.0057	0.015 ± 0.0035
(Scomber sp)							
August, 1997							
Matsuyama, EHIME	1.33	0.547	3.72	0.0013 ± 0.0039	0.0024 ± 0.0071	0.15 ± 0.011	0.040 ± 0.0030
(Sebastiscus marmoratus)							
May, 1997							
Hamada, SHIMANE	5.97	16.1	2.66	0.031 ± 0.0077	0.0020 ± 0.00048	0.095 ± 0.010	0.036 ± 0.0039
(Sillago sp)							
June, 1997							
Minamichita-machi, AICHI	3.97	8.73	2.99	0.015 ± 0.0045	0.0017 ± 0.00052	0.10 ± 0.010	0.034 ± 0.0034

Sea Fish

Japanese name	English name	Scientific name
Magarei	Brown sole	Limanda herzensteini
Bora	Gray mullet	Mugil cephalus
Maiwashi	Japanese pilchard	Sardinops melanostictus
Saba	Mackerel	Scomber sp
Ainame	Fat greenling	Hexagrammos otakii
Tai	Sea bream	Pagrus sp
Ikanago	Japanese sand lance	Ammodytes personatus
Katsuo	Skipjack tuna	Katsuwonus pelamis
Sake	Chum Salmon	Oncorhynchus Keta
Kasago	Scorpion-fish	Sebastiscus marmoratus
Kisu	Whiting	Sillago sp

(7) Strontium-90 and cesium-137 in Freshwater Fish
(from Apr. 1997 to Sep. 1997)

-continued from No, 121 of this publication-

Table (6) :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)
(Carassius auratus)							
July, 1997							
Ishikari-machi, HOKKAIDOU	5.20	16.1	2.55	0.50 ± 0.027	0.031 ± 0.0017	0.062 ± 0.0081	0.024 ± 0.0032
(Cyprinus carpio)							
May, 1997							
Kasumigaura-lake, IBARAKI	1.11	0.267	3.63	0.015 ± 0.0040	0.056 ± 0.015	0.32 ± 0.017	0.088 ± 0.0046
August, 1997							
Akita, AKITA	2.88	7.89	2.05	1.0 ± 0.04	0.13 ± 0.005	0.14 ± 0.012	0.068 ± 0.0059
(Salvelinus leucomaenis)							
September, 1997							
Fukushima, FUKUSHIMA	1.20	0.466	3.23	0.014 ± 0.0062	0.031 ± 0.013	0.093 ± 0.0094	0.029 ± 0.0029

Freshwater Fish

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

(8) Strontium-90 and cesium-137 in Shellfish
(from Apr. 1997 to Sep. 1997)

-continued from No. 121 of this publication-

Table (7) :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 edulis)							
June, 1997							
Mutsu, AOMORI	3.01	0.590	1.50	0.0084 ± 0.0084	0.014 ± 0.014	0.0086 ± 0.0053	0.0057 ± 0.0035
(Ruditapes phillipinarum)							
May, 1997							
Konagai-machi, NAGASAKI	1.57	0.685	1.82	0.0077 ± 0.0055	0.011 ± 0.0080	0.013 ± 0.0046	0.0073 ± 0.0025
June, 1997							
Minamichita-machi, AICHI	2.04	0.657	3.48	0.010 ± 0.0069	0.015 ± 0.010	0.035 ± 0.011	0.010 ± 0.0030
(Turbo cornutus)							
April, 1997							
Ryotsu, NIIGATA	2.20	0.564	2.85	0.006 ± 0.011	0.011 ± 0.019	0.007 ± 0.011	0.0024 ± 0.0038
Monzen-machi, ISHIKAWA	2.64	1.59	1.63	0.0090 ± 0.0038	0.0057 ± 0.0024	0.031 ± 0.0064	0.019 ± 0.0039
July, 1997							
Sakata, YAMAGATA	2.85	2.38	2.82	0.015 ± 0.0060	0.0063 ± 0.0025	0.029 ± 0.0058	0.010 ± 0.0021

Shellfish

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

(9) Strontium-90 and cesium-137 in Seaweeds
(from Apr. 1997 to Sep. 1997)

-continued from No, 121 of this publication-

Table (8) :Strontium-90 and cesium-137 in Seaweeds

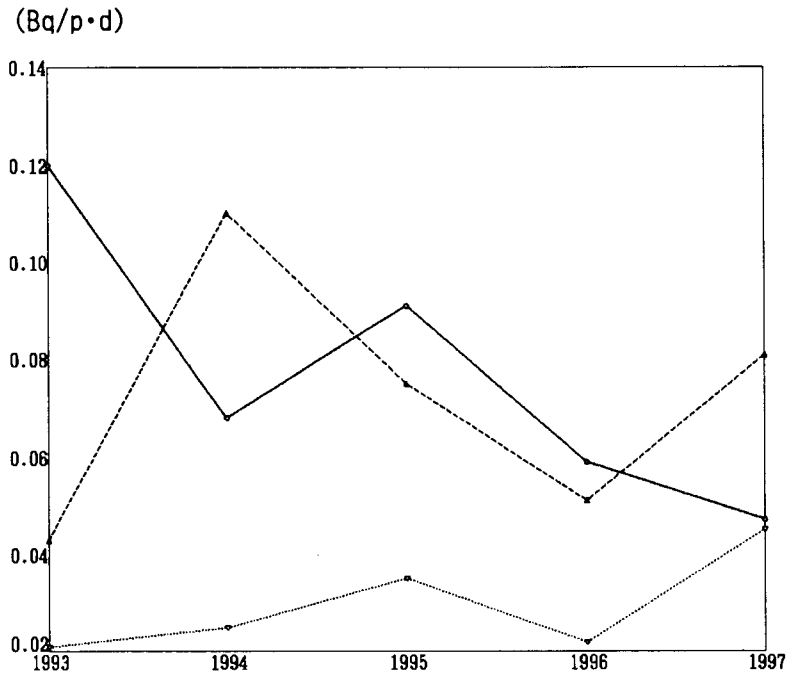
Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kgwet)	(Bq/gCa)	(Bq/kgwet)	(Bq/gK)
(Undaria pinnatifida)							
April, 1997							
Ryotsu, NIIGATA	2.23	0.865	4.39	0.015 ± 0.0062	0.017 ± 0.0072	0.026 ± 0.0061	0.0059 ± 0.0014
Monzen-machi, ISHIKAWA	3.86	0.841	6.72	0.022 ± 0.0048	0.026 ± 0.0057	0.024 ± 0.0056	0.0035 ± 0.00084
May, 1997							
Mutsu, AOMORI	2.26	0.710	4.95	0.021 ± 0.0068	0.030 ± 0.0096	0.024 ± 0.0061	0.0048 ± 0.0012
Fukaura-machi, AOMORI	1.88	0.701	4.61	0.033 ± 0.0076	0.047 ± 0.011	0.021 ± 0.0055	0.0045 ± 0.0012
Sakata, YAMAGATA	2.42	1.22	4.22	0.030 ± 0.0051	0.025 ± 0.0042	0.025 ± 0.0058	0.0060 ± 0.0014

Seaweeds

Japanese name	English name	Scientific name
Wakame	Wakame seaweed	Undaria pinnatifida

＊ ＊ Total Diet ＊ ＊

<Strontium-90>



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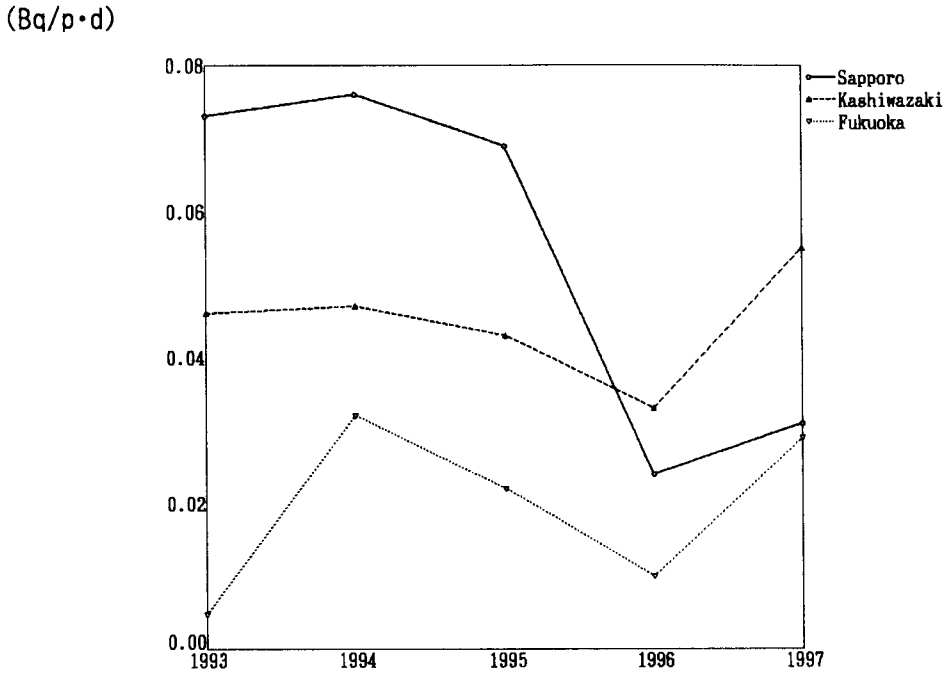
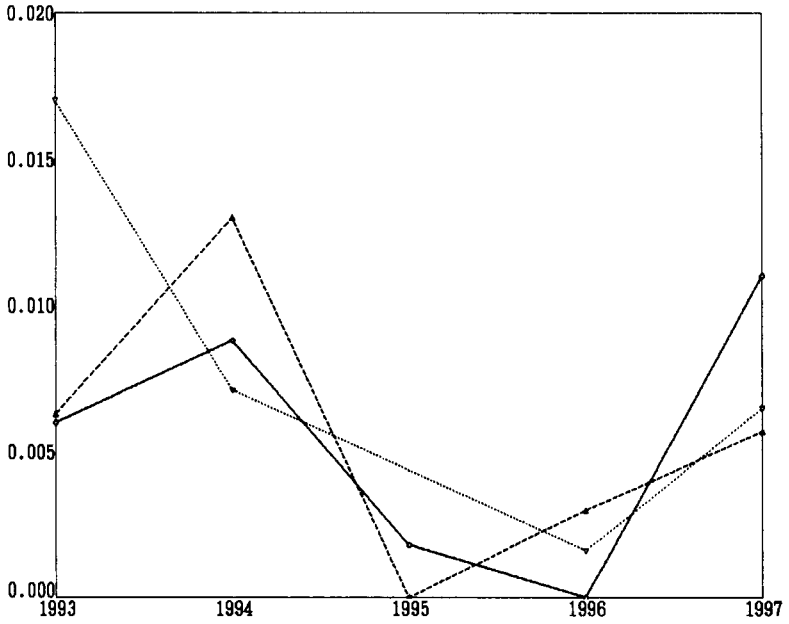


Fig. 1

* * Rice (producing districts) * *

<Strontium-90>

(Bq/kgwet)



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(Bq/kgwet)

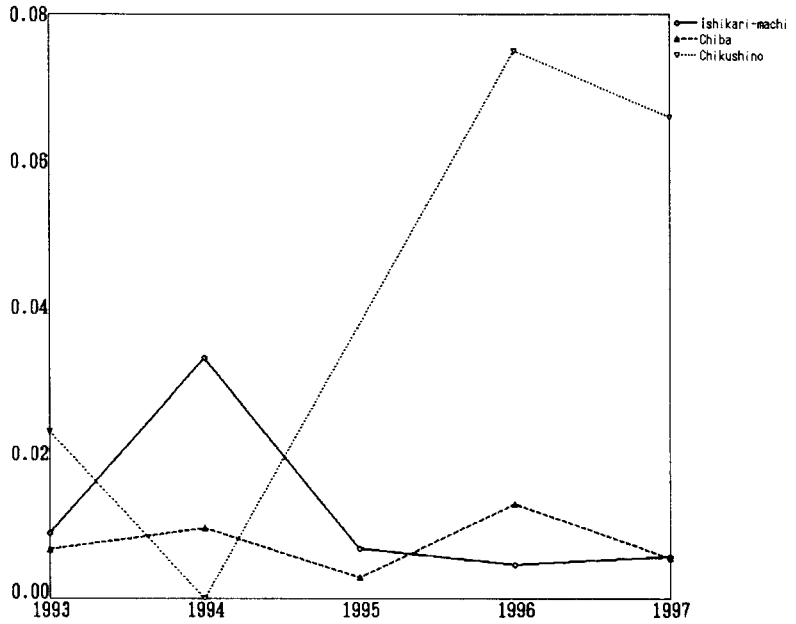

Fig. 2

＊ ＊ Milk (producing districts for domestic program)

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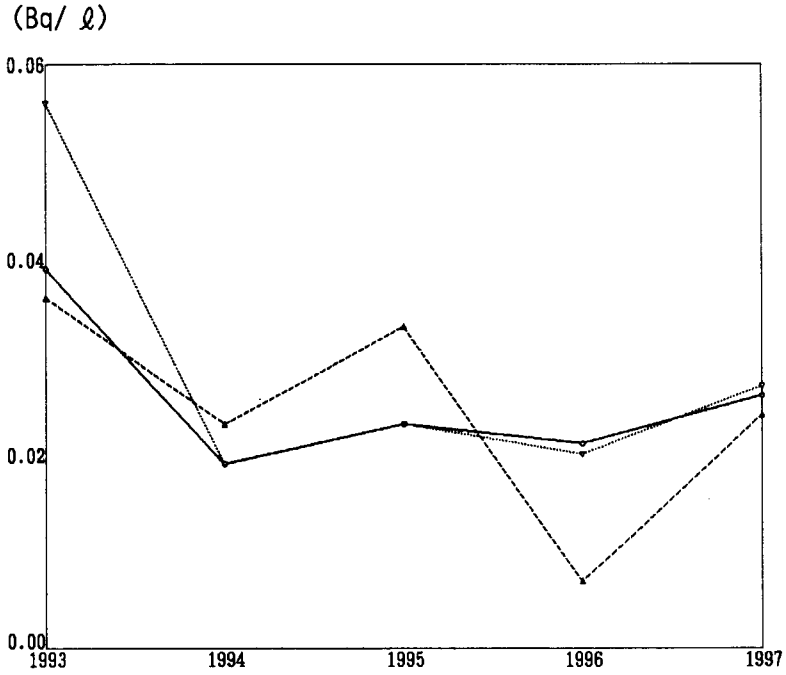

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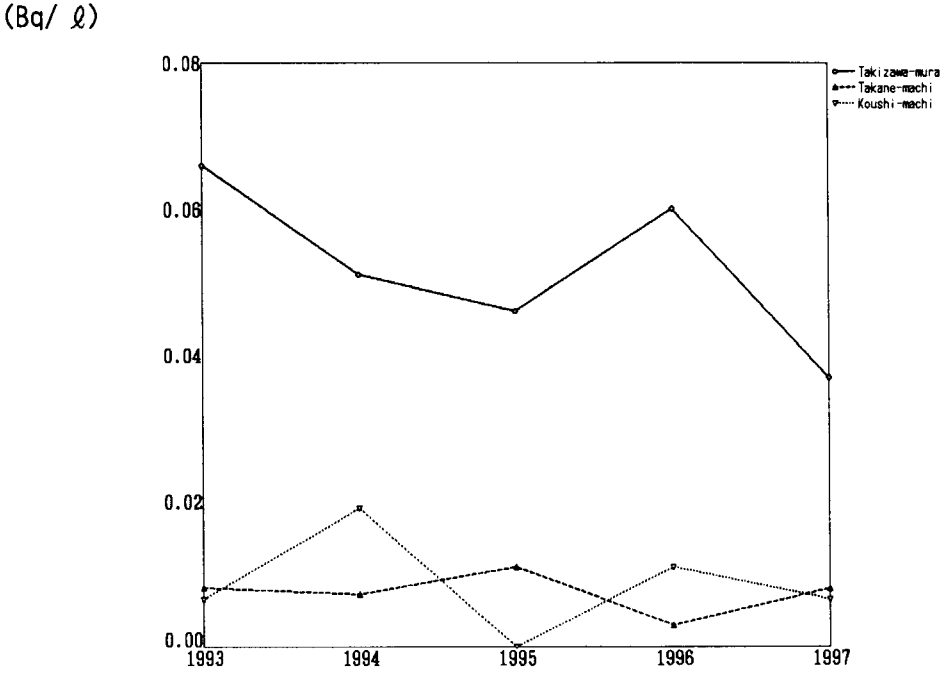

Fig. 3—1

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

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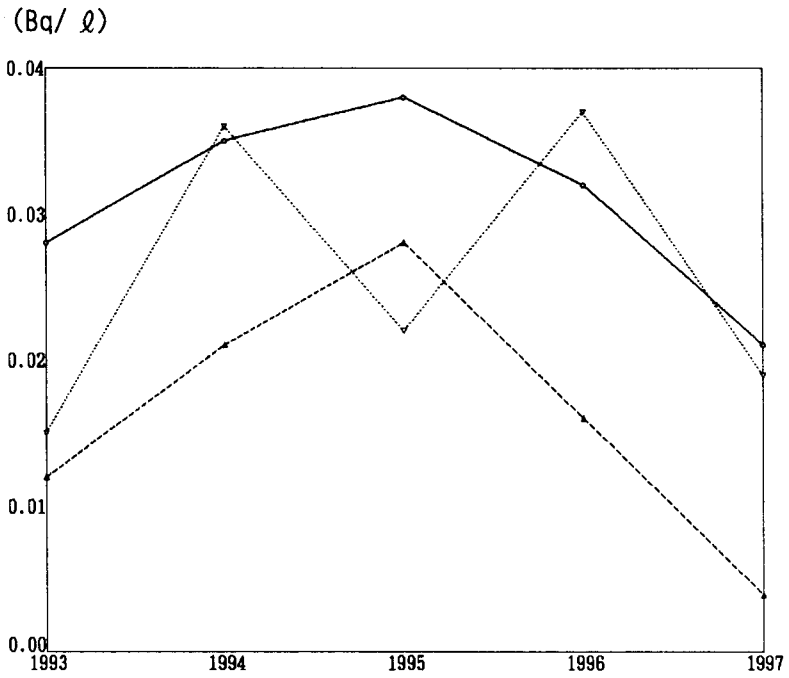

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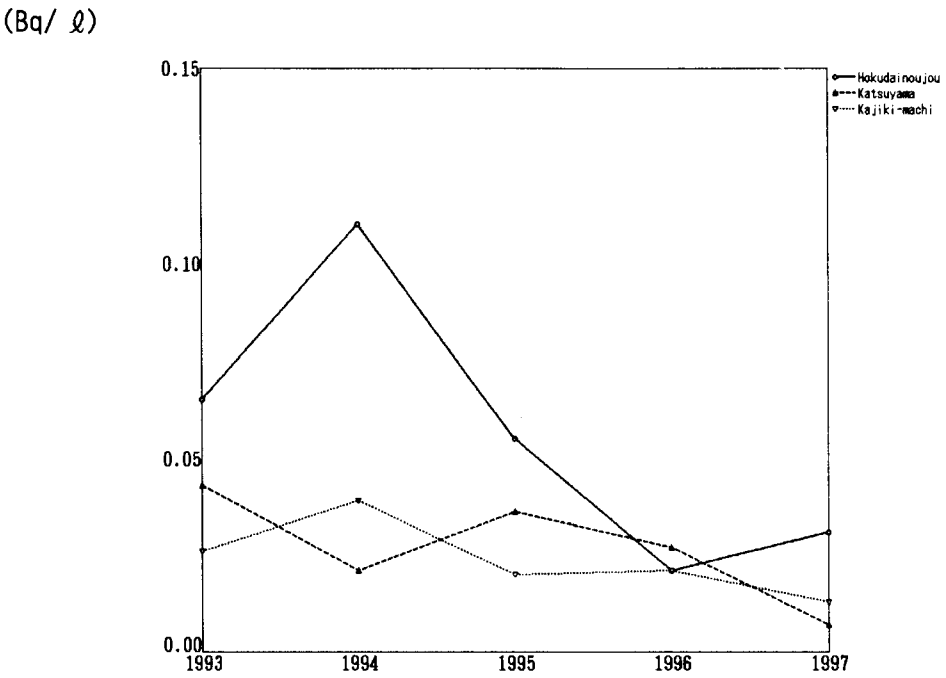

Fig. 3−2

＊ ＊ Milk (consuming districts) ＊ ＊

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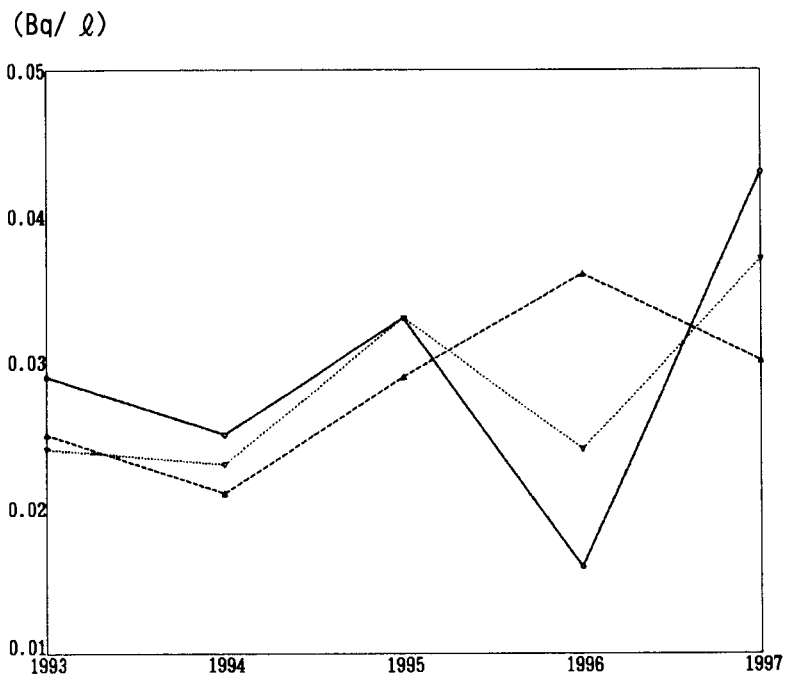

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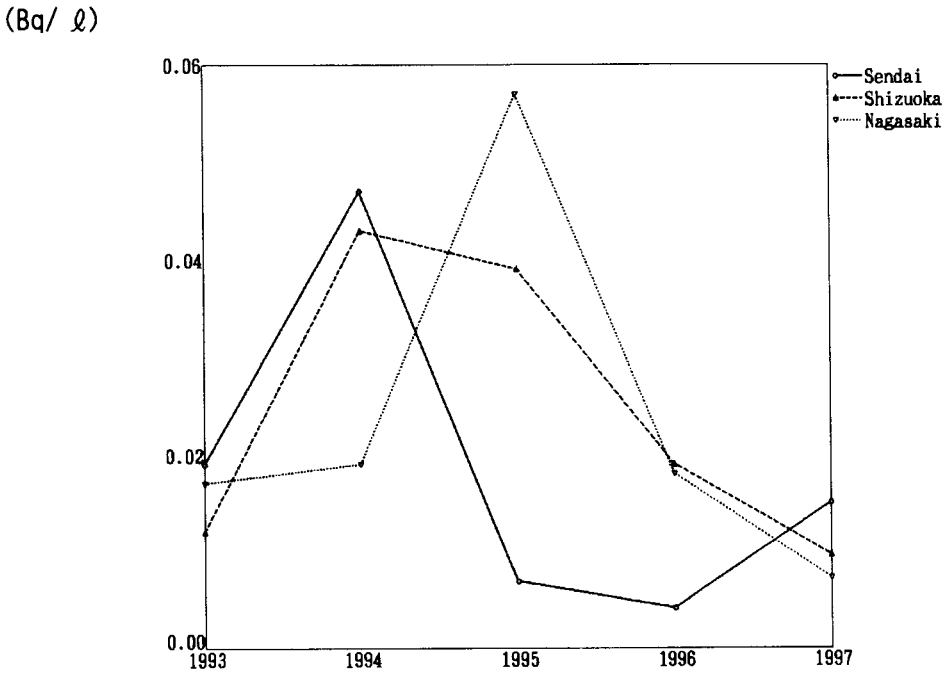
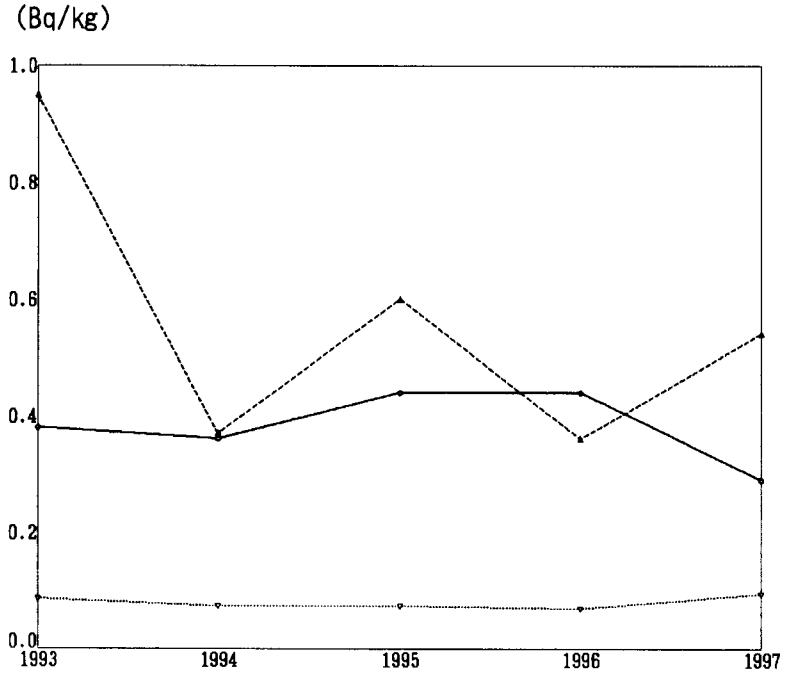


Fig. 3−3

* * Powdered Milk * *

<Strontium-90>



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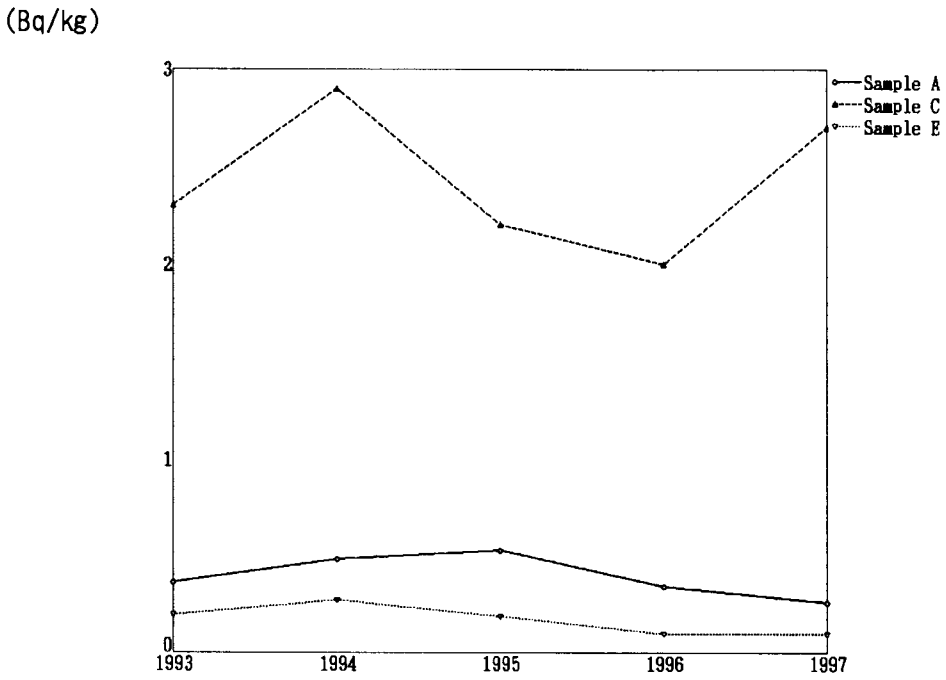

Fig. 3－4

＊ ＊ Vegetables (producing districts) ＊ ＊

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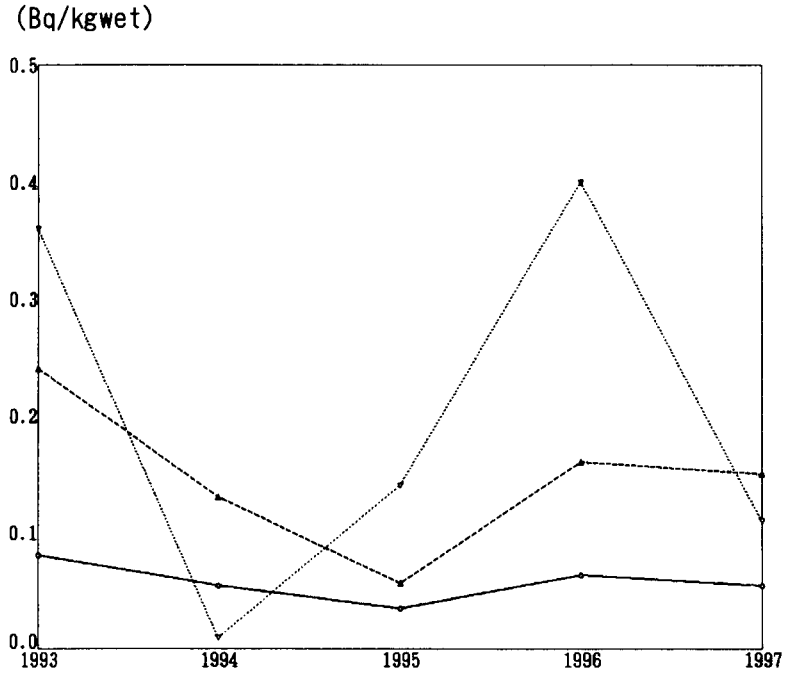

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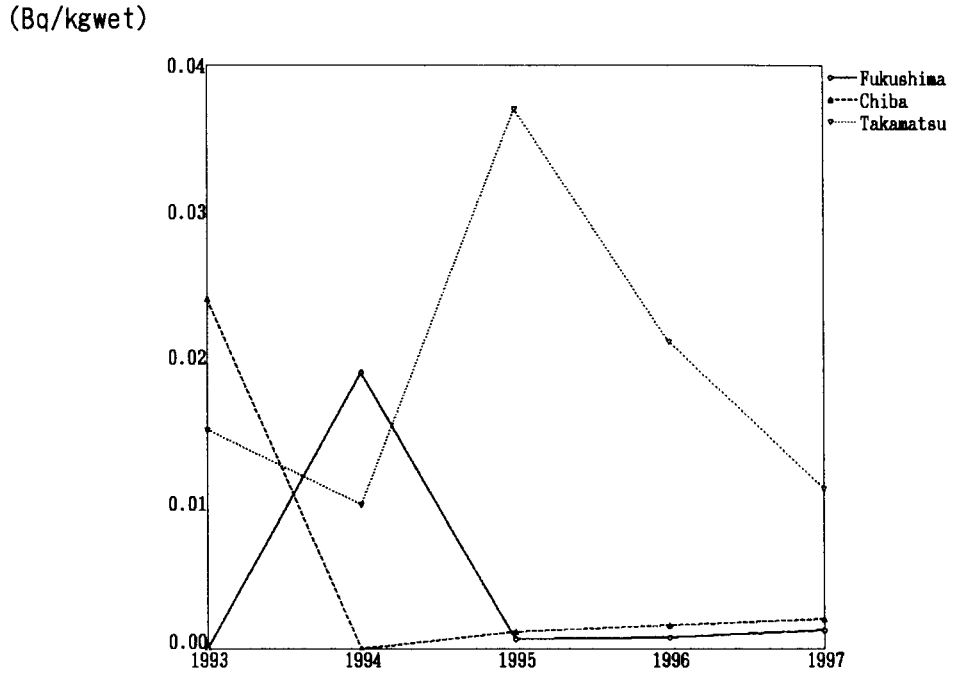
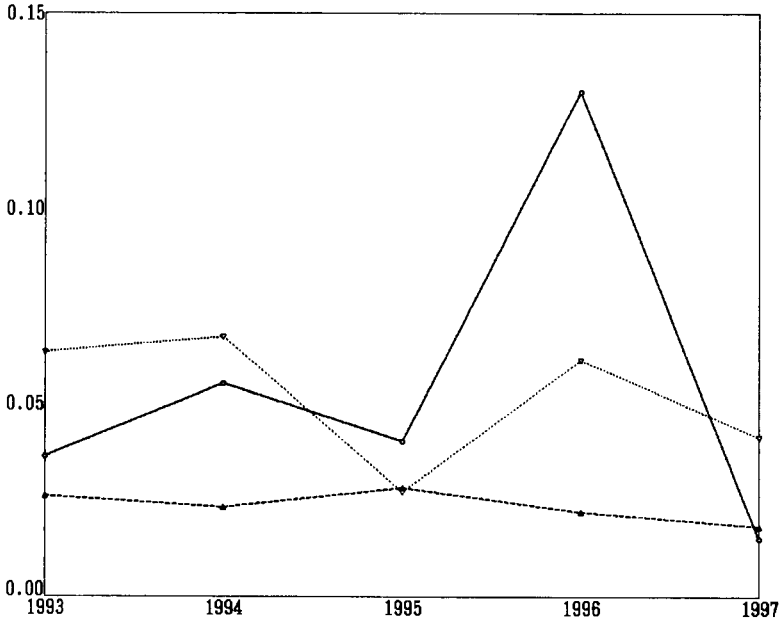


Fig. 4－1

＊ ＊ Vegetables (consuming districts) ＊ ＊

<Strontium-90>

(Bq/kgwet)



<Cesium-137>

(Bq/kgwet)

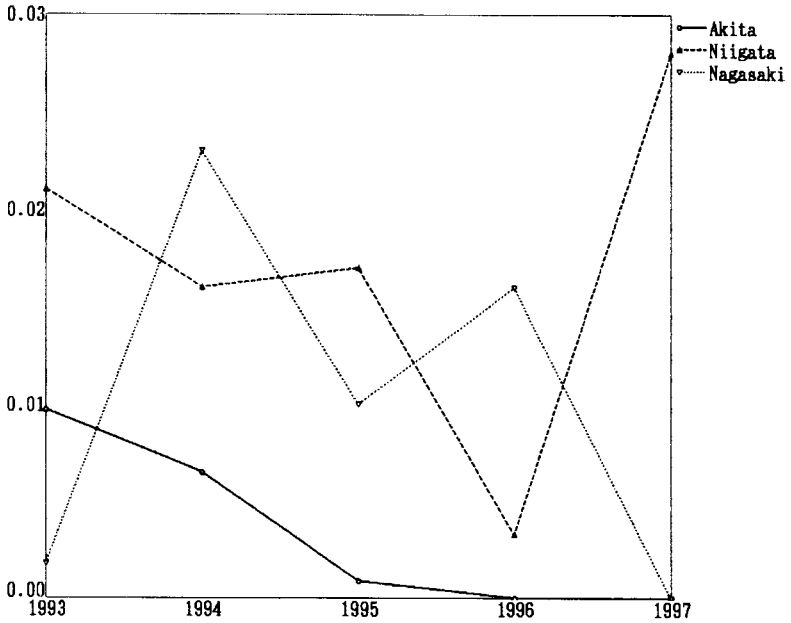
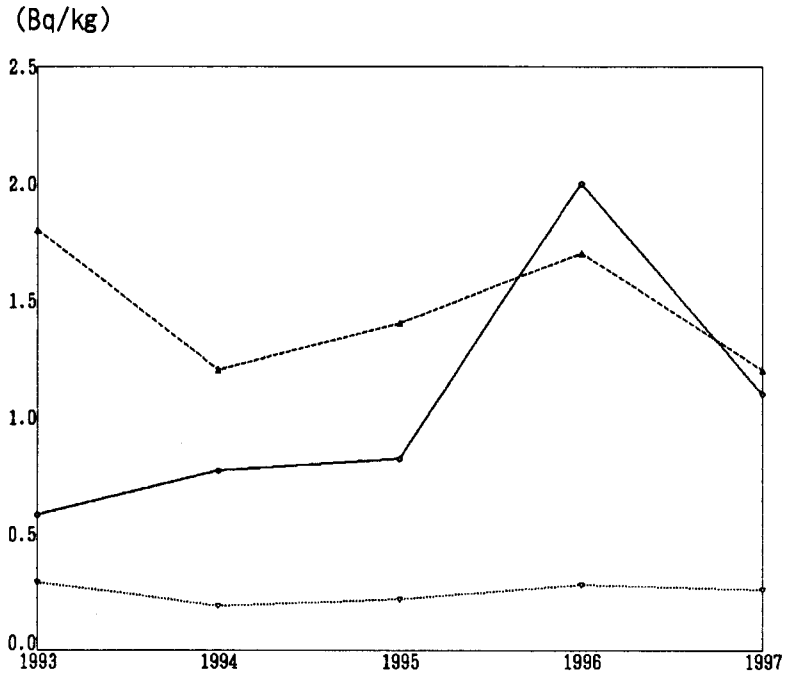


Fig. 4－2

＊ ＊ Tea (Japanese Tea) ＊ ＊

<Strontium-90>



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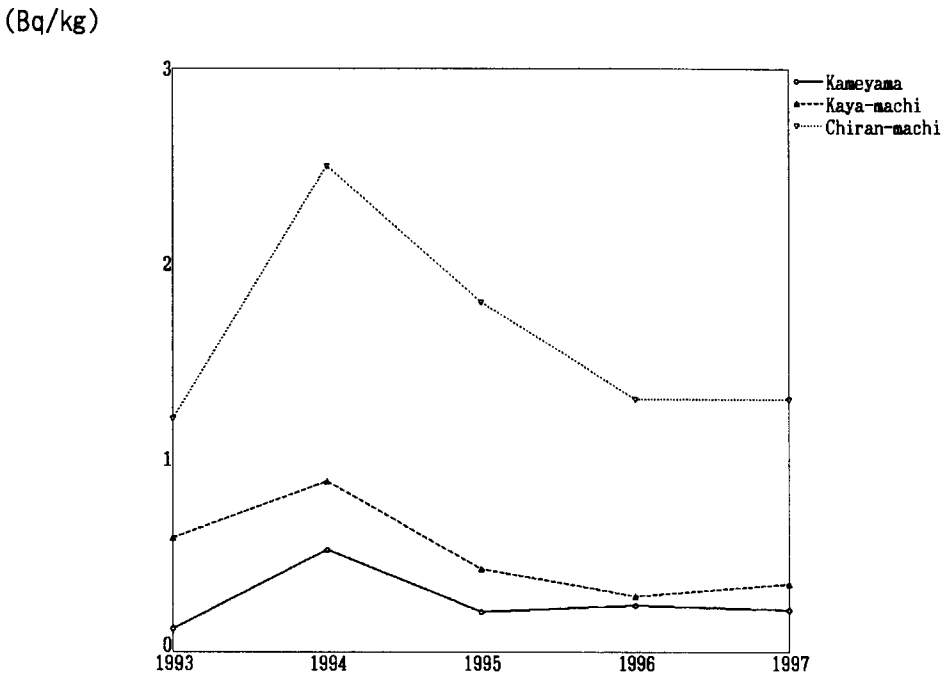
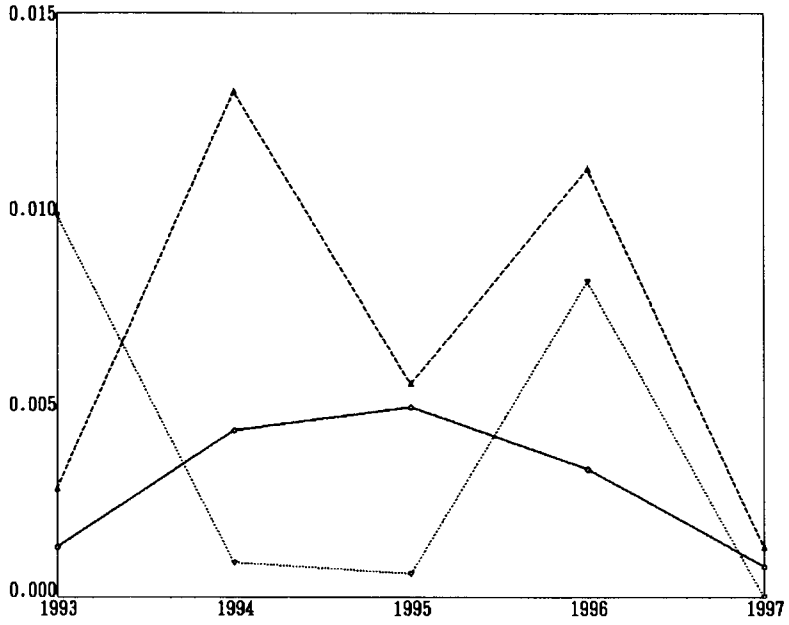


Fig. 5

* * Sea Fish * *

<Strontium-90>

(Bq/kgwet)



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(Bq/kgwet)

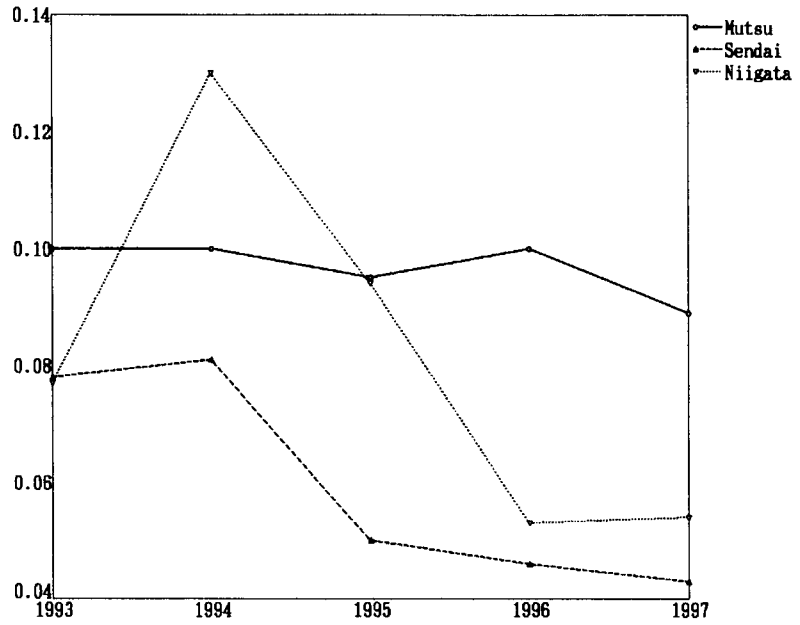
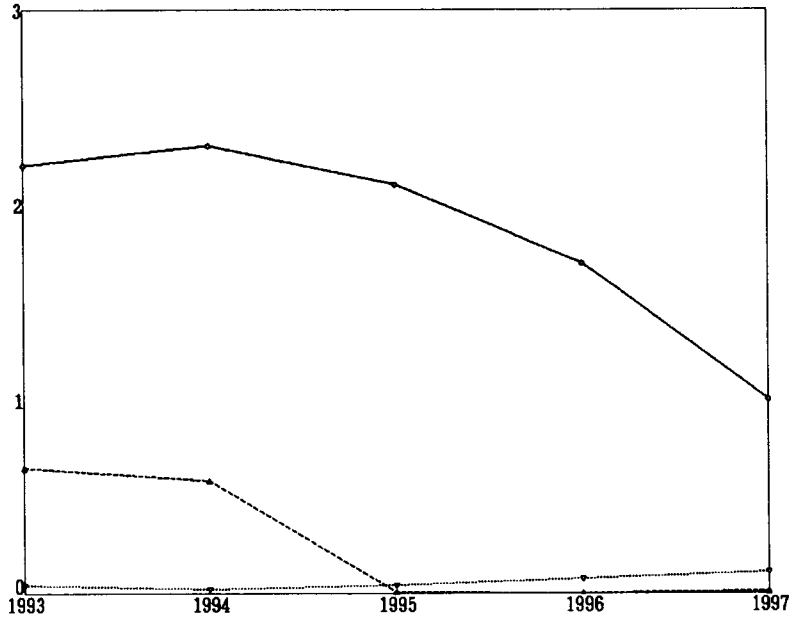


Fig. 6

* * Freshwater Fish * *

<Strontium-90>

(Bq/kgwet)



<Cesium-137>

(Bq/kgwet)

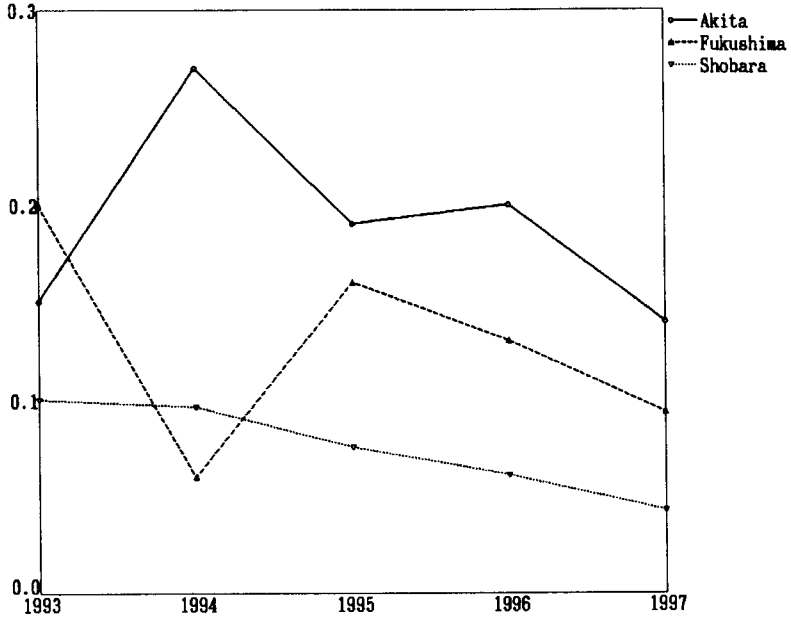
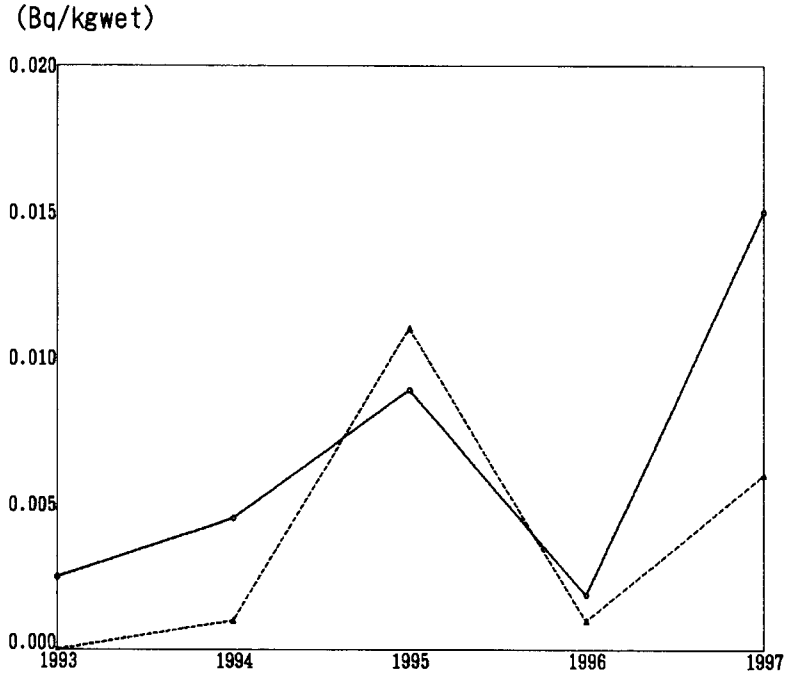


Fig. 7

* * Shellfish * *

<Strontium-90>



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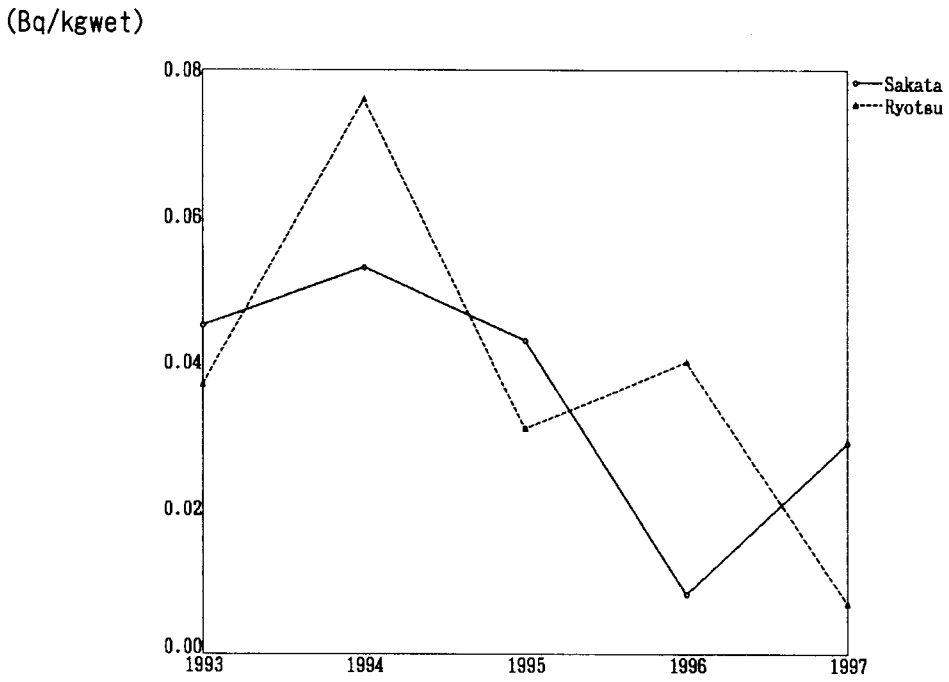
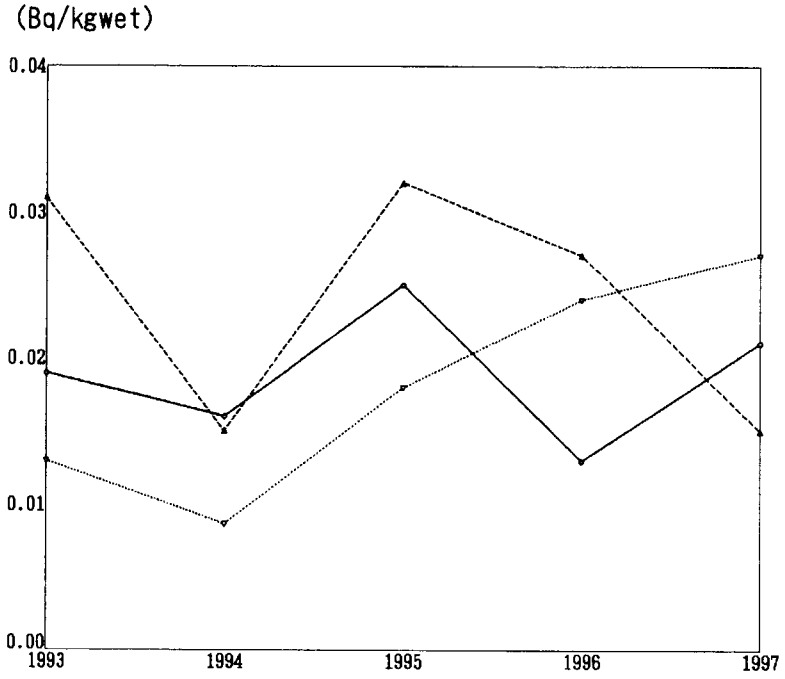


Fig. 8

* * Seaweeds * *

<Strontium-90>



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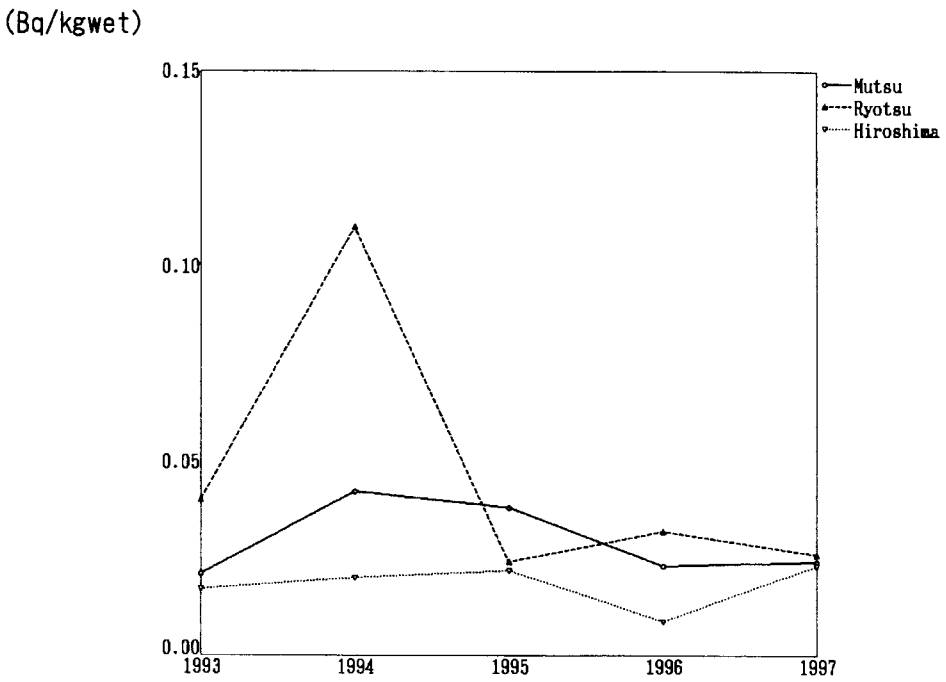

Fig. 9

* * 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: Maebashi
15: Nagano
16: Yokohama
17: Toyama
18: Kouhu
19: Kanazawa
20: Shizuoka
21: Gifu
22: Fukui
23: Nagoya
24: Tsu
25: Ootsu
26: Kyoto
27: Nara
28: Osaka
29: Tottori
30: Kobe
31: Wakayama
32: Okayama
33: Matsue
34: Tokushima
35: Takamatsu
36: Hiroshima
37: Kochi
38: Matsuyama
39: Yamaguchi
40: Ooita
41: Fukuoka
42: Saga
43: Kumamoto
44: Miyazaki
45: Nagasaki
46: Kagoshima
47: Naha