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RADIOACTIVITY SURVEY DATA in Japan

Part 2
= Dietary Materials =

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National Institute of Radiological Sciences
Chiba, Japan

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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 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. Thetray 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 andcesium carriers were added to the filtered water sample. The subsequent process was the same as that describedin thesection (1). Freshwater was treated inthe sameway as the service water.

(4) Soil

Soil was collected from the location in the spacious and flat area without past surface disturbance caused by duststorms, 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 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 givento weather conditions.

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

Immediately after the collection, the samples were acidified to a pH lower than 3 by adding concentrated hydrochloric acid in a ratio of 1mℓ to 1 ℓ of sea water, and then stored in 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 thesample in wet weight was spread on a stainless steel dish after removed of the pebbles, shells and other foreign materials, and ried 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 areaswhen 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 samplewas dried and carbonized in a stainless steelpan 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 wasused 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. Afterremoving 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 persons
(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 0.25mm 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 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 thesame 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. Thesupernatant 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 andthe precipitate was filtered off, washed and counted.

(2) Cesium-137

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

After filtered off and washed with hydrochlotric 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 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 forextraction.
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 90min. 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 theresults, concentrations of these nuclides in the original samples were calculated.

6. Results

(1) Strontium-90 and Cesium-137 in Total Diet
(from Apr. 1994 to Sep. 1994)
-continued from No, 109 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)	
May, 1994											
Wakayama, WAKAYAMA	12.0	399	1760	0.040	± 0.0062	0.10	± 0.015	0.025	± 0.0065	0.014	± 0.0037
Kitayama-mura, WAKAYAMA	13.9	845	1800	0.20	± 0.011	0.24	± 0.013	0.073	± 0.0089	0.040	± 0.0049
Kochi, KOCHI	14.3	444	1820	0.043	± 0.0061	0.098	± 0.014	0.072	± 0.0093	0.039	± 0.0051
Saga-machi, KOCHI	15.6	367	1950	0.12	± 0.009	0.33	± 0.025	0.082	± 0.010	0.042	± 0.0053
June, 1994											
Sapporo, HOKKAIDOU	18.8	924	2660	0.068	± 0.013	0.074	± 0.014	0.076	± 0.010	0.029	± 0.0038
Iwanai-machi, HOKKAIDOU	14.3	531	1930	0.051	± 0.013	0.096	± 0.025	0.071	± 0.012	0.037	± 0.0062
Aomori, AOMORI	18.9	529	2310	0.14	± 0.016	0.27	± 0.030	0.079	± 0.0092	0.034	± 0.0040
Ajigasawa-machi, AOMORI	15.1	496	1970	0.057	± 0.012	0.12	± 0.025	0.050	± 0.0079	0.026	± 0.0040
Morioka, IWATE	15.6	437	1750	0.058	± 0.011	0.13	± 0.024	0.042	± 0.0073	0.024	± 0.0042
Iwaizumi-machi, IWATE	17.4	635	1450	0.065	± 0.0074	0.10	± 0.012	0.12	± 0.011	0.083	± 0.0076
Yamagata, YAMAGATA	12.1	245	1520	0.032	± 0.010	0.13	± 0.041	0.037	± 0.0069	0.025	± 0.0046
Sagae, YAMAGATA	10.0	382	1350	0.042	± 0.0092	0.11	± 0.024	0.21	± 0.013	0.16	± 0.009
Fukushima, FUKUSHIMA	13.2	480	1770	0.051	± 0.0061	0.11	± 0.013	0.062	± 0.0086	0.035	± 0.0049
Ookuma-machi, FUKUSHIMA	12.3	437	1480	0.055	± 0.0061	0.13	± 0.014	0.10	± 0.010	0.069	± 0.0067
Mito, IBARAKI	13.5	437	1990	0.054	± 0.0061	0.12	± 0.014	0.066	± 0.0086	0.033	± 0.0043
Tokai-mura, IBARAKI	16.9	532	2240	0.082	± 0.0070	0.15	± 0.013	0.050	± 0.0077	0.022	± 0.0034
Utsunomiya, TOCHIGI	13.8	501	2020	0.052	± 0.010	0.10	± 0.020	0.055	± 0.0082	0.027	± 0.0041
Mooka, TOCHIGI	15.0	350	1440	0.031	± 0.0056	0.088	± 0.016	0.088	± 0.010	0.061	± 0.0070
Maebashi, GUNMA	14.7	461	2150	0.037	± 0.011	0.080	± 0.025	0.11	± 0.011	0.051	± 0.0051
Nakanojou-machi, GUNMA	14.2	545	1910	0.053	± 0.0064	0.098	± 0.012	0.092	± 0.010	0.048	± 0.0052
Urawa, SAITAMA	18.2	1250	2180	0.030	± 0.0053	0.024	± 0.0042	0.047	± 0.0085	0.021	± 0.0039
Kumagaya, SAITAMA	16.1	889	1870	0.051	± 0.0083	0.057	± 0.0093	0.025	± 0.0060	0.014	± 0.0032

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)
Ichihara, CHIBA	13.5	438	1620	0.038 ± 0.0093	0.086 ± 0.021	0.026 ± 0.0064	0.016 ± 0.0040
Chikura-machi, CHIBA	26.6	743	3370	0.059 ± 0.0072	0.080 ± 0.0097	0.097 ± 0.010	0.029 ± 0.0030
Shinjuku, TOKYO	13.3	446	2010	0.054 ± 0.010	0.12 ± 0.023	0.055 ± 0.0077	0.027 ± 0.0038
Hachijou-machi, TOKYO	13.2	1090	1560	0.045 ± 0.0051	0.041 ± 0.0047	0.037 ± 0.0062	0.024 ± 0.0040
Yokohama, KANAGAWA	12.7	414	1760	0.044 ± 0.015	0.11 ± 0.036	0.074 ± 0.012	0.042 ± 0.0067
Hiratsuka, KANAGAWA	18.9	439	2430	0.044 ± 0.0099	0.10 ± 0.022	0.052 ± 0.0076	0.021 ± 0.0031
Kashiwazaki, NIIGATA	22.5	493	2520	0.11 ± 0.012	0.23 ± 0.024	0.047 ± 0.010	0.019 ± 0.0041
Nishikawa-machi, NIIGATA	22.0	950	3090	0.076 ± 0.0070	0.080 ± 0.0074	0.036 ± 0.0064	0.012 ± 0.0021
Toyama, TOYAMA	14.0	392	1990	0.058 ± 0.0063	0.15 ± 0.016	0.13 ± 0.011	0.066 ± 0.0056
Takaoka, TOYAMA	12.5	302	1950	0.036 ± 0.0054	0.12 ± 0.018	0.094 ± 0.0094	0.048 ± 0.0048
Kanazawa, ISHIKAWA	15.5	407	1520	0.023 ± 0.0080	0.057 ± 0.020	0.036 ± 0.0079	0.024 ± 0.0052
Yoshinodani-mura, ISHIKAWA	14.7	600	1990	0.080 ± 0.012	0.13 ± 0.019	0.077 ± 0.0096	0.038 ± 0.0048
Fukui, FUKUI	16.1	609	2120	0.036 ± 0.012	0.059 ± 0.020	0.042 ± 0.0085	0.020 ± 0.0040
Koufu, YAMANASHI	12.6	410	1540	0.054 ± 0.0063	0.13 ± 0.015	0.037 ± 0.0071	0.024 ± 0.0046
Nirasaki, YAMANASHI	17.0	507	2110	0.054 ± 0.0063	0.11 ± 0.012	0.099 ± 0.010	0.047 ± 0.0048
Nagano, NAGANO	13.7	510	1740	0.044 ± 0.0057	0.086 ± 0.011	0.039 ± 0.0072	0.022 ± 0.0041
Toubu-machi, NAGANO	15.3	380	1910	0.045 ± 0.013	0.12 ± 0.035	0.050 ± 0.011	0.026 ± 0.0059
Gifu, GIFU	13.7	453	1900	0.048 ± 0.0060	0.11 ± 0.013	0.036 ± 0.0075	0.019 ± 0.0039
Takayama, GIFU	13.2	734	1580	0.054 ± 0.015	0.074 ± 0.021	0.095 ± 0.012	0.060 ± 0.0074
Shizuoka, SHIZUOKA	16.5	593	2420	0.034 ± 0.0057	0.057 ± 0.0096	0.095 ± 0.0099	0.039 ± 0.0041
Hamaoka-machi, SHIZUOKA	12.9	335	1640	0.022 ± 0.0047	0.065 ± 0.014	0.039 ± 0.0068	0.024 ± 0.0042
Nagoya, AICHI	15.3	597	2260	0.044 ± 0.0064	0.073 ± 0.011	0.060 ± 0.0092	0.027 ± 0.0041
Shinshiro, AICHI	15.8	538	1940	0.016 ± 0.017	0.029 ± 0.031	0.053 ± 0.011	0.027 ± 0.0059
Tsu, MIE	14.7	386	1910	0.044 ± 0.0066	0.11 ± 0.017	0.082 ± 0.010	0.043 ± 0.0052
Owase, MIE	14.9	435	2090	0.14 ± 0.009	0.32 ± 0.021	0.046 ± 0.0073	0.022 ± 0.0035

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)
Ootsu, SHIGA	14.1	467	1910	0.063 ± 0.014	0.13 ± 0.029	0.036 ± 0.010	0.019 ± 0.0054
Imazu-machi, SHIGA	13.7	498	1810	0.086 ± 0.0091	0.17 ± 0.018	0.12 ± 0.013	0.066 ± 0.0073
Kyoto, KYOTO	16.7	666	2450	0.065 ± 0.0070	0.097 ± 0.011	0.068 ± 0.0093	0.028 ± 0.0038
Maizuru, KYOTO	16.9	927	1980	0.045 ± 0.0061	0.049 ± 0.0066	0.089 ± 0.0099	0.045 ± 0.0050
Osaka, OSAKA	14.2	591	2130	0.042 ± 0.0053	0.072 ± 0.0089	0.063 ± 0.0085	0.030 ± 0.0040
Sakai, OSAKA	11.5	359	1640	0.050 ± 0.015	0.14 ± 0.043	0.075 ± 0.012	0.046 ± 0.0072
Hamasaka-machi, HYOUGO	16.6	840	2060	0.056 ± 0.017	0.067 ± 0.020	0.051 ± 0.012	0.025 ± 0.0058
Gojou, NARA	12.9	1390	1530	0.053 ± 0.0061	0.038 ± 0.0044	0.045 ± 0.0082	0.030 ± 0.0054
Kashihara, NARA	13.1	711	1590	0.039 ± 0.0051	0.055 ± 0.0071	0.037 ± 0.0075	0.023 ± 0.0047
Tottori, TOTTORI	14.6	405	2190	0.056 ± 0.0083	0.14 ± 0.021	0.096 ± 0.014	0.044 ± 0.0062
Fukube-mura, TOTTORI	12.5	307	1760	0.069 ± 0.0078	0.22 ± 0.025	0.027 ± 0.0065	0.015 ± 0.0037
Kashima-machi, SHIMANE	15.6	855	1910	0.076 ± 0.0079	0.089 ± 0.0092	0.057 ± 0.0089	0.030 ± 0.0047
Okayama, OKAYAMA	18.2	532	2430	0.041 ± 0.0061	0.078 ± 0.011	0.082 ± 0.0089	0.034 ± 0.0037
Kamisaibara-mura, OKAYAMA	14.2	347	1740	0.10 ± 0.009	0.30 ± 0.027	0.053 ± 0.0089	0.030 ± 0.0051
Miyoshi, HIROSHIMA	12.5	430	1430	0.049 ± 0.0054	0.11 ± 0.013	0.076 ± 0.0088	0.053 ± 0.0061
Yamaguchi, YAMAGUCHI	14.4	384	1910	0.049 ± 0.0060	0.13 ± 0.016	0.067 ± 0.0090	0.035 ± 0.0047
Ajisu-machi, YAMAGUCHI	21.9	596	3000	0.040 ± 0.0098	0.068 ± 0.016	0.089 ± 0.017	0.030 ± 0.0058
Tokushima, TOKUSHIMA	15.5	543	1950	0.061 ± 0.0065	0.11 ± 0.012	0.054 ± 0.0089	0.027 ± 0.0046
Takamatsu, KAGAWA	17.4	519	2160	0.049 ± 0.0061	0.095 ± 0.012	0.080 ± 0.0093	0.037 ± 0.0043
Kokubunji-machi, KAGAWA	13.5	506	1820	0.049 ± 0.0055	0.097 ± 0.011	0.046 ± 0.0076	0.026 ± 0.0042
Matsuyama, EHIME	12.1	415	1600	0.023 ± 0.0041	0.056 ± 0.0099	0.053 ± 0.0078	0.033 ± 0.0049
Ikata-machi, EHIME	10.6	368	1170	0.027 ± 0.0054	0.074 ± 0.015	0.023 ± 0.0077	0.020 ± 0.0066
Dazaifu, FUKUOKA	15.2	523	2200	0.045 ± 0.0065	0.087 ± 0.012	0.070 ± 0.0096	0.032 ± 0.0044
Fukuoka, FUKUOKA	10.7	216	1330	0.025 ± 0.0049	0.12 ± 0.023	0.032 ± 0.0055	0.024 ± 0.0041
Saga, SAGA	18.0	940	2030	0.042 ± 0.0058	0.045 ± 0.0062	0.035 ± 0.0076	0.017 ± 0.0037

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)
Nagasaki, NAGASAKI	16.6	520	2350	0.059 ± 0.0068	0.11 ± 0.013	0.070 ± 0.0080	0.030 ± 0.0034
Matsuura, NAGASAKI	13.8	798	1760	0.048 ± 0.0064	0.060 ± 0.0080	0.049 ± 0.0081	0.028 ± 0.0046
Kumamoto, KUMAMOTO	15.1	216	1990	0.036 ± 0.0058	0.17 ± 0.027	0.063 ± 0.0077	0.032 ± 0.0039
Aso-machi, KUMAMOTO	18.2	608	1940	0.049 ± 0.0060	0.080 ± 0.0098	0.091 ± 0.010	0.047 ± 0.0054
Ooita, OOITA	13.3	507	1880	0.038 ± 0.0059	0.076 ± 0.012	0.028 ± 0.0061	0.015 ± 0.0032
Saiki, OOITA	11.7	373	1330	0.029 ± 0.0055	0.078 ± 0.015	0.10 ± 0.010	0.075 ± 0.0074
Miyazaki, MIYAZAKI	16.1	454	2050	0.068 ± 0.0071	0.15 ± 0.016	0.11 ± 0.009	0.052 ± 0.0046
Takahara-machi, MIYAZAKI	20.1	619	2650	0.10 ± 0.009	0.17 ± 0.015	0.16 ± 0.014	0.060 ± 0.0051
Sendai, MIYAGI	14.0	444	1560	0.033 ± 0.0054	0.074 ± 0.012	0.10 ± 0.011	0.066 ± 0.0069
Ookuchi, KAGOSHIMA	17.3	517	2110	0.070 ± 0.0069	0.14 ± 0.013	0.092 ± 0.0097	0.044 ± 0.0046
July, 1994							
Ishinomaki, MIYAGI	15.1	516	1960	0.058 ± 0.0069	0.11 ± 0.013	0.051 ± 0.0082	0.026 ± 0.0042
Onagawa-machi, MIYAGI	16.5	745	2160	0.053 ± 0.0064	0.071 ± 0.0086	0.044 ± 0.0076	0.020 ± 0.0035
Akita, AKITA	18.8	567	2350	0.081 ± 0.012	0.14 ± 0.021	0.053 ± 0.0081	0.023 ± 0.0035
Oomagari, AKITA	12.9	504	2050	0.071 ± 0.0085	0.14 ± 0.017	0.069 ± 0.011	0.034 ± 0.0053
Tsuruga, FUKUI	14.2	646	2020	0.014 ± 0.014	0.021 ± 0.022	0.032 ± 0.0098	0.016 ± 0.0049
Kakogawa, HYOUGO	13.8	581	1930	0.061 ± 0.0065	0.10 ± 0.011	0.075 ± 0.010	0.039 ± 0.0052
Matsue, SHIMANE	27.5	751	3000	0.084 ± 0.0077	0.11 ± 0.010	0.095 ± 0.0098	0.032 ± 0.0033
Karatsu, SAGA	21.7	904	2420	0.054 ± 0.0066	0.060 ± 0.0073	0.049 ± 0.0089	0.020 ± 0.0037
Naha, Okinawa	16.2	810	2430	0.040 ± 0.0060	0.050 ± 0.0074	0.037 ± 0.0073	0.015 ± 0.0030
Ginowan, Okinawa	13.9	334	2200	0.053 ± 0.0072	0.16 ± 0.022	0.053 ± 0.0078	0.024 ± 0.0036
August, 1994							
Hiroshima, HIROSHIMA	13.3	1230	1510	0.038 ± 0.0054	0.031 ± 0.0044	0.074 ± 0.0091	0.049 ± 0.0060
September, 1994							
Kamiita-machi, TOKUSHIMA	12.2	477	1760	0.042 ± 0.0094	0.087 ± 0.020	0.048 ± 0.0074	0.027 ± 0.0042

(2)-1 Strontium-90 and Cesium-137 in Rice (producing districts)
(from Apr. 1994 to Sep. 1994)
-continued from No, 109 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, 1994							
Gifu, GIFU	0.508	0.035	0.935	0.0048 ± 0.0030	0.14 ± 0.085	0.042 ± 0.0067	0.045 ± 0.0072
Matsusaka, MIE	0.570	0.037	0.980	0.0013 ± 0.0030	0.037 ± 0.082	0.017 ± 0.0063	0.017 ± 0.0064
Shiga-machi, SHIGA	0.538	0.043	1.11	0.011 ± 0.0037	0.25 ± 0.088	0.017 ± 0.0058	0.015 ± 0.0053
Sadohara-machi, MIYAZAKI	0.495	0.032	0.931	0.0055 ± 0.0036	0.17 ± 0.11	0.012 ± 0.0066	0.012 ± 0.0071

(2)-2 Strontium-90 and Cesium-137 in Rice (consuming districts)
(from Apr. 1994 to Sep. 1994)
-continued from No, 109 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)
September, 1994							
Akita, AKITA	0.460	0.029	0.695	0.018 ± 0.0043	0.60 ± 0.15	0.041 ± 0.0067	0.059 ± 0.0096

(3)-1 Strontium-90 and Cesium-137 in Milk (producing districts for domestic program)
(from Apr. 1994 to Sep. 194)
-continued from No, 109 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)
June, 1994							
Yamato-machi, SAGA	7.54	1.08	1.70	0.038 ± 0.0061	0.035 ± 0.0056	0.045 ± 0.0076	0.026 ± 0.0045
August, 1994							
Aomori, AOMORI	7.38	1.08	1.52	0.17 ± 0.010	0.16 ± 0.009	0.11 ± 0.010	0.072 ± 0.0066
Takizawa-mura, IWATE	6.41	0.978	1.46	0.027 ± 0.0076	0.027 ± 0.0077	0.042 ± 0.0066	0.029 ± 0.0045
Mito, IBARAKI	7.32	1.14	1.62	0.050 ± 0.010	0.044 ± 0.0092	0.074 ± 0.0087	0.046 ± 0.0054
Fujimi-mura, GUNMA	7.17	1.03	1.66	0.024 ± 0.0073	0.023 ± 0.0071	0.047 ± 0.0087	0.028 ± 0.0052
Yachimata, CHIBA	7.57	1.11	1.68	0.029 ± 0.0048	0.026 ± 0.0043	0.032 ± 0.0062	0.019 ± 0.0037
Tonami, TOYAMA	7.44	1.14	1.62	0.028 ± 0.012	0.025 ± 0.011	0.041 ± 0.0088	0.025 ± 0.0054
Oshimizu-machi, ISHIKAWA	7.07	1.05	1.68	0.053 ± 0.0064	0.051 ± 0.0061	0.12 ± 0.011	0.074 ± 0.0063
Takane-machi, YAMANASHI	5.92	0.858	1.36	0.023 ± 0.0050	0.027 ± 0.0059	0.0083 ± 0.0047	0.0061 ± 0.0035
Kasamatsu-machi, GIFU	7.00	1.08	1.51	0.059 ± 0.013	0.055 ± 0.012	0.052 ± 0.0088	0.035 ± 0.0058
Oouchiyama-mura, MIE	7.29	1.09	1.66	0.097 ± 0.011	0.089 ± 0.010	0.014 ± 0.0052	0.0082 ± 0.0031
Hino-machi, SHIGA	7.01	1.07	1.62	0.027 ± 0.012	0.025 ± 0.011	0.022 ± 0.0068	0.014 ± 0.0042
Mihara-machi, HYOUGO	7.24	1.14	1.59	0.035 ± 0.0053	0.031 ± 0.0046	0.015 ± 0.0062	0.0092 ± 0.0039
Oouda-machi, NARA	6.73	1.05	1.45	0.044 ± 0.0056	0.042 ± 0.0053	0.017 ± 0.0064	0.012 ± 0.0044
Takase-machi, KAGAWA	7.46	1.10	1.62	0.017 ± 0.0052	0.015 ± 0.0047	0.032 ± 0.0078	0.020 ± 0.0048
Matsuyama, EHIME	7.16	1.10	1.51	0.024 ± 0.0052	0.022 ± 0.0047	0.074 ± 0.0096	0.049 ± 0.0064
Koushi-machi, KUMAMOTO	7.11	1.04	1.61	0.025 ± 0.0056	0.024 ± 0.0054	0.019 ± 0.0072	0.012 ± 0.0045
Kujuu-machi, OOITA	7.31	1.12	1.59	0.018 ± 0.0044	0.016 ± 0.0039	0.087 ± 0.0087	0.055 ± 0.0055
Takahara-machi, MIYAZAKI	7.05	1.03	1.66	0.025 ± 0.0056	0.025 ± 0.0055	0.022 ± 0.0070	0.013 ± 0.0042
September, 1994							
Nishinasuno-machi, TOCHIGI	7.40	1.23	1.59	0.038 ± 0.0051	0.031 ± 0.0042	0.036 ± 0.0068	0.023 ± 0.0043
Kamiita-machi, TOKUSHIMA	7.28	1.10	1.58	0.014 ± 0.0043	0.012 ± 0.0039	0.011 ± 0.0069	0.0067 ± 0.0043

(3)-2 Strontium-90 and Cesium-137 in Milk (producing districts for WHO program)
(from Apr. 1994 to Sep. 1994)
-continued from No. 109 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, 1994							
Hokudainoujou, HOKKAIDOU	7.37	1.07	1.66	0.051 ± 0.0065	0.048 ± 0.0060	0.087 ± 0.0094	0.052 ± 0.0057
Hachijo-Island, TOKYO	6.63	0.971	1.48	0.041 ± 0.0056	0.042 ± 0.0057	0.15 ± 0.011	0.10 ± 0.008
Nishikawa-machi, NIIGATA	7.29	1.01	1.78	0.029 ± 0.0056	0.029 ± 0.0055	0.053 ± 0.0090	0.030 ± 0.0051
Katsuyama, FUKUI	7.32	1.15	1.59	0.020 ± 0.0044	0.017 ± 0.0038	0.073 ± 0.0087	0.046 ± 0.0055
Shijounawate, OSAKA	7.35	1.04	1.51	0.031 ± 0.0053	0.030 ± 0.0051	0.093 ± 0.0092	0.062 ± 0.0061
Hikawa-machi, SHIMANE	7.34	1.17	1.60	0.044 ± 0.0064	0.038 ± 0.0055	0.17 ± 0.013	0.10 ± 0.008
Takamiya-machi, HIROSHIMA	7.02	1.02	1.50	0.011 ± 0.0040	0.010 ± 0.0039	0.071 ± 0.0083	0.047 ± 0.0055
Kochi, KOCHI	7.28	1.17	1.59	0.069 ± 0.0071	0.059 ± 0.0061	0.069 ± 0.0087	0.043 ± 0.0055
Yasu-machi, FUKUOKA	7.07	1.03	1.59	0.039 ± 0.0057	0.038 ± 0.0056	0.046 ± 0.0069	0.029 ± 0.0043
June, 1994							
Kajiki-machi, KAGOSHIMA	7.29	1.10	1.64	0.038 ± 0.0097	0.035 ± 0.0088	0.060 ± 0.0082	0.037 ± 0.0050
August, 1994							
Hokudainoujou, HOKKAIDOU	7.05	1.15	1.64	0.035 ± 0.0094	0.030 ± 0.0082	0.18 ± 0.013	0.11 ± 0.008
Hachijo-Island, TOKYO	6.71	0.932	1.39	0.055 ± 0.0090	0.059 ± 0.0097	0.059 ± 0.0071	0.042 ± 0.0051
Nishikawa-machi, NIIGATA	7.24	1.03	1.77	0.021 ± 0.0051	0.021 ± 0.0049	0.038 ± 0.0080	0.021 ± 0.0045
Katsuyama, FUKUI	7.34	1.16	1.61	0.015 ± 0.0079	0.013 ± 0.0068	0.089 ± 0.0097	0.055 ± 0.0060
Shijounawate, OSAKA	7.14	1.08	1.54	0.028 ± 0.0091	0.026 ± 0.0084	0.096 ± 0.0097	0.062 ± 0.0063
Hikawa-machi, SHIMANE	7.13	1.09	1.54	0.032 ± 0.0082	0.029 ± 0.0075	0.064 ± 0.0075	0.042 ± 0.0049
Takamiya-machi, HIROSHIMA	6.97	1.05	1.55	0.024 ± 0.0085	0.023 ± 0.0081	0.060 ± 0.0078	0.039 ± 0.0050
Kochi, KOCHI	7.70	1.10	1.61	0.037 ± 0.0061	0.033 ± 0.0056	0.038 ± 0.0077	0.024 ± 0.0047
Yasu-machi, FUKUOKA	7.16	1.07	1.61	0.033 ± 0.0055	0.031 ± 0.0052	0.042 ± 0.0078	0.026 ± 0.0048
September, 1994							
Kajiki-machi, KAGOSHIMA	7.20	1.09	1.57	0.029 ± 0.0073	0.027 ± 0.0066	0.025 ± 0.0053	0.016 ± 0.0034

(3)-3 Strontium-90 and Cesium-137 in Milk (consuming districts)
(from Apr. 1994 to Sep. 1994)
-continued from No. 109 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, 1994							
Sendai, MIYAGI	7.18	1.09	1.58	0.025 ± 0.0052	0.023 ± 0.0048	0.047 ± 0.0082	0.030 ± 0.0052
Kyoto, KYOTO	7.25	1.09	1.66	0.028 ± 0.0051	0.026 ± 0.0047	0.072 ± 0.0094	0.044 ± 0.0057
Hiroshima, HIROSHIMA	6.90	1.05	1.52	0.027 ± 0.0049	0.026 ± 0.0047	0.018 ± 0.0069	0.012 ± 0.0045
August, 1994							
Sapporo, HOKKAIDOU	7.44	1.14	1.71	0.053 ± 0.0098	0.047 ± 0.0087	0.13 ± 0.012	0.078 ± 0.0068
Akita, AKITA	7.08	1.03	1.60	0.031 ± 0.0086	0.030 ± 0.0084	0.035 ± 0.0066	0.022 ± 0.0041
Yamagata, YAMAGATA	6.70	0.999	1.54	0.028 ± 0.0073	0.028 ± 0.0073	0.056 ± 0.0081	0.037 ± 0.0053
Fukushima, FUKUSHIMA	7.31	1.08	1.60	0.025 ± 0.0050	0.024 ± 0.0046	0.089 ± 0.010	0.056 ± 0.0064
Urawa, SAITAMA	7.14	1.06	1.62	0.042 ± 0.0089	0.040 ± 0.0084	0.054 ± 0.0086	0.033 ± 0.0053
Shinjuku, TOKYO	7.01	1.03	1.56	0.038 ± 0.0058	0.037 ± 0.0056	0.0054 ± 0.0052	0.0035 ± 0.0033
Yokohama, KANAGAWA	7.13	1.07	1.61	0.021 ± 0.0043	0.020 ± 0.0040	0.019 ± 0.0056	0.012 ± 0.0035
Niigata, NIIGATA	7.66	1.11	1.63	0.024 ± 0.0076	0.022 ± 0.0068	0.038 ± 0.0063	0.023 ± 0.0039
Fukui, FUKUI	7.30	1.10	1.66	0.017 ± 0.0081	0.015 ± 0.0074	0.11 ± 0.010	0.067 ± 0.0062
Nagano, NAGANO	6.28	0.944	1.40	0.015 ± 0.010	0.016 ± 0.011	0.015 ± 0.0061	0.011 ± 0.0044
Shizuoka, SHIZUOKA	7.03	1.06	1.60	0.028 ± 0.0052	0.027 ± 0.0050	0.096 ± 0.010	0.060 ± 0.0064
Nagoya, AICHI	7.38	1.08	1.66	0.044 ± 0.014	0.041 ± 0.013	0.039 ± 0.0087	0.024 ± 0.0052
Osaka, OSAKA	7.04	1.05	1.60	0.028 ± 0.012	0.027 ± 0.011	0.084 ± 0.010	0.052 ± 0.0063
Yonago, TOTTORI	7.08	1.08	1.60	0.028 ± 0.0070	0.025 ± 0.0065	0.036 ± 0.0066	0.023 ± 0.0041
Matsue, SHIMANE	7.42	1.12	1.58	0.032 ± 0.0086	0.028 ± 0.0077	0.025 ± 0.0052	0.016 ± 0.0033
Okayama, OKAYAMA	6.98	1.03	1.57	0.033 ± 0.0089	0.032 ± 0.0086	0.027 ± 0.0062	0.017 ± 0.0039
Yamaguchi, YAMAGUCHI	6.96	0.997	1.55	0.040 ± 0.0055	0.040 ± 0.0056	0.013 ± 0.0065	0.0082 ± 0.0042
Matsuyama, EHIME	6.87	1.01	1.48	0.022 ± 0.0048	0.021 ± 0.0047	0.055 ± 0.0088	0.037 ± 0.0059
Kochi, KOCHI	7.12	1.07	1.63	0.021 ± 0.0086	0.020 ± 0.0080	0.059 ± 0.0080	0.036 ± 0.0049
Chikushino, FUKUOKA	7.06	1.05	1.55	0.044 ± 0.0065	0.042 ± 0.0061	0.038 ± 0.0077	0.025 ± 0.0049
Nagasaki, NAGASAKI	6.81	1.02	1.55	0.029 ± 0.0055	0.028 ± 0.0053	0.026 ± 0.0069	0.017 ± 0.0044
Kagoshima, KAGOSHIMA	6.98	1.05	1.57	0.025 ± 0.0083	0.024 ± 0.0079	0.090 ± 0.0093	0.058 ± 0.0059

Location	Component			^{90}Sr		^{137}Cs	
	Ash(g/ ℓ)	Ca(g/ ℓ)	K(g/ ℓ)	(Bq/ ℓ)	(Bq/gCa)	(Bq/ ℓ)	(Bq/gK)
Yonagusuku-mura, Okinawa	7.21	1.06	1.60	0.013 ± 0.0059	0.012 ± 0.0055	0.0057 ± 0.0037	0.0035 ± 0.0023
Yonagusuku-mura, Okinawa September, 1994	7.11	1.09	1.55	0.013 ± 0.0040	0.012 ± 0.0037	0.0007 ± 0.0041	0.0005 ± 0.0026
Sendai, MIYAGI	7.30	1.08	1.63	0.033 ± 0.0058	0.031 ± 0.0053	0.090 ± 0.010	0.055 ± 0.0063

(3)-4 Strontium-90 and Cesium-137 in Milk (powdered milk)
(from Apr. 1994 to Sep. 1994)
-continued from No. 109 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)
July, 1994							
Sample C,	7.97	12.0	18.1	0.68 ± 0.036	0.056 ± 0.0030	1.8 ± 0.05	0.098 ± 0.0027
August, 1994							
Sample A,	8.03	12.1	17.8	0.36 ± 0.027	0.030 ± 0.0022	0.48 ± 0.026	0.027 ± 0.0014
Sample B,	2.53	3.24	6.07	0.044 ± 0.0083	0.014 ± 0.0026	0.18 ± 0.013	0.030 ± 0.0021
Sample D,	2.71	4.01	6.50	0.048 ± 0.0080	0.012 ± 0.0020	0.089 ± 0.0093	0.014 ± 0.0014
Sample E,	2.48	3.84	5.56	0.074 ± 0.0099	0.019 ± 0.0026	0.27 ± 0.015	0.048 ± 0.0027
Sample F,	2.56	3.40	5.56	0.050 ± 0.0088	0.015 ± 0.0026	0.25 ± 0.015	0.045 ± 0.0027

(4)-1 Strontium-90 and cesium-137 in Vegetables (producing districts)
(from Apr. 1994 to Sep. 1994)

-continued from No. 109 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, 1994											
Oota, SHIMANE	1.62	3.06	4.46	1.1	± 0.02	0.37	± 0.008	1.3	± 0.03	0.30	± 0.007
(Japanese radish)											
May, 1994											
Tahara-machi, AICHI	0.501	0.202	2.14	0.0060	± 0.0035	0.030	± 0.017	0.025	± 0.0064	0.012	± 0.0030
Koushi-machi, KUMAMOTO	0.542	0.214	2.19	0.021	± 0.0041	0.10	± 0.019	0.017	± 0.0062	0.0079	± 0.0029
July, 1994											
Oota, SHIMANE	0.533	0.237	1.77	0.23	± 0.011	0.99	± 0.048	0.81	± 0.026	0.46	± 0.015
August, 1994											
Ishikari-machi, HOKKAIDOU	0.542	0.163	2.39	0.25	± 0.009	1.5	± 0.06	0.052	± 0.0058	0.022	± 0.0024
(Onion)											
July, 1994											
Kumatori-machi, OSAKA	0.404	0.167	1.61	0.030	± 0.0044	0.18	± 0.027	0.0000	± 0.0049	0.0000	± 0.0031
(Potato)											
July, 1994											
Mutsu, AOMORI	0.881	0.063	3.53	0.023	± 0.0052	0.37	± 0.084	0.12	± 0.011	0.035	± 0.0030
(Spinach)											
May, 1994											
Tahara-machi, AICHI	1.55	0.731	6.20	0.13	± 0.008	0.17	± 0.011	0.014	± 0.0054	0.0022	± 0.00088
Koushi-machi, KUMAMOTO	1.76	0.649	7.16	0.074	± 0.0073	0.11	± 0.011	0.015	± 0.0076	0.0021	± 0.0011
August, 1994											
Sapporo, HOKKAIDOU	1.70	0.412	7.09	0.047	± 0.0059	0.11	± 0.014	0.020	± 0.0065	0.0029	± 0.00091

(4)-2 Strontium-90 and cesium-137 in Vegetables (consuming districts)
(from Apr. 1994 to Sep. 1994)

-continued from No, 109 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, 1994							
Sendai, MIYAGI	0.490	0.250	1.85	0.32 ± 0.013	1.3 ± 0.05	0.092 ± 0.0090	0.050 ± 0.0049
Urawa, SAITAMA	0.526	0.181	2.23	0.17 ± 0.010	0.92 ± 0.056	0.0015 ± 0.0052	0.0007 ± 0.0023
(Spinach)							
May, 1994							
Sendai, MIYAGI	1.97	1.14	6.70	0.059 ± 0.0069	0.052 ± 0.0061	0.026 ± 0.0080	0.0039 ± 0.0012
June, 1994							
Niigata, NIIGATA	1.79	0.986	5.56	0.046 ± 0.0060	0.047 ± 0.0061	0.081 ± 0.011	0.015 ± 0.0019
September, 1994							
Urawa, SAITAMA	1.67	0.370	7.53	0.053 ± 0.0056	0.14 ± 0.015	0.024 ± 0.0065	0.0032 ± 0.00086

(5) Strontium-90 and Cesium-137 in Tea (Japanese Tea)
(from May. 1994 to Jun. 1994)
-continued from No. 107 of this publication-

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

Location	Component			^{90}Sr				^{137}Cs			
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kg)		(Bq/gCa)		(Bq/kg)		(Bq/gK)	
May, 1994											
Ikeda-machi, GIFU	5.22	3.37	17.6	1.6	± 0.06	0.47	± 0.017	0.90	± 0.057	0.051	± 0.0032
Shirakawa-machi, GIFU	4.98	2.51	19.1	0.53	± 0.035	0.21	± 0.014	0.57	± 0.047	0.030	± 0.0025
Iwata, SHIZUOKA	1.21	0.538	4.44	0.095	± 0.011	0.18	± 0.020	0.12	± 0.009	0.027	± 0.0021
Shuzenji-machi, SHIZUOKA	1.45	0.738	5.32	0.48	± 0.024	0.65	± 0.032	0.13	± 0.011	0.024	± 0.0021
Oodai-machi, MIE	5.42	2.26	21.3	0.49	± 0.050	0.21	± 0.022	0.76	± 0.047	0.036	± 0.0022
Kameyama, MIE	4.88	2.29	21.8	0.77	± 0.059	0.34	± 0.026	0.53	± 0.039	0.024	± 0.0018
Nara, NARA	5.23	2.50	20.0	0.32	± 0.025	0.13	± 0.010	2.2	± 0.08	0.11	± 0.004
Nara, NARA	4.94	2.44	17.5	0.48	± 0.040	0.20	± 0.016	0.84	± 0.067	0.048	± 0.0038
Mifune-machi, KUMAMOTO	5.18	1.92	20.8	0.24	± 0.037	0.13	± 0.019	0.71	± 0.044	0.034	± 0.0021
Ue-mura, KUMAMOTO	4.70	3.43	15.5	1.4	± 0.08	0.41	± 0.022	0.86	± 0.052	0.055	± 0.0033
Miyakonojou, MIYAZAKI	5.28	2.28	20.1	0.095	± 0.016	0.042	± 0.0072	2.3	± 0.08	0.12	± 0.004
Kawaminami-machi, MIYAZAKI	5.38	1.94	20.7	0.51	± 0.035	0.26	± 0.018	2.9	± 0.10	0.14	± 0.005
June, 1994											
Tokorozawa, SAITAMA	5.47	3.15	19.6	0.61	± 0.037	0.19	± 0.012	0.89	± 0.058	0.045	± 0.0030
Iruma, SAITAMA	5.40	2.75	19.5	0.57	± 0.037	0.21	± 0.013	0.82	± 0.055	0.042	± 0.0028
Uji, KYOTO	5.46	2.44	20.0	1.0	± 0.07	0.41	± 0.030	0.58	± 0.045	0.029	± 0.0023
Kaya-machi, KYOTO	5.56	3.64	19.3	1.2	± 0.08	0.32	± 0.021	0.88	± 0.055	0.046	± 0.0029
Chiran-machi, KAGOSHIMA	5.06	2.04	20.1	0.19	± 0.021	0.093	± 0.010	2.5	± 0.09	0.12	± 0.004
Miyanojou-machi, KAGOSHIMA	5.77	2.89	21.6	0.95	± 0.042	0.33	± 0.015	1.2	± 0.06	0.054	± 0.0027

(6) Strontium-90 and cesium-137 in Sea Fish
(from Apr. 1994 to Sep. 1994)

-continued from No, 109 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)
(Ammodytes personatus)							
April, 1994							
Akashi, HYOUGO	2.16	3.18	3.75	0.0070 ± 0.0046	0.0022 ± 0.0014	0.13 ± 0.013	0.035 ± 0.0034
(Katsuwonus pelamis)							
June, 1994							
Tosa, KOCHI	1.23	0.110	3.83	0.0000 ± 0.0057	0.000 ± 0.052	0.29 ± 0.016	0.076 ± 0.0042
(Limanda herzensteini)							
June, 1994							
Sendai, MIYAGI	3.31	6.71	4.52	0.013 ± 0.0091	0.0020 ± 0.0014	0.081 ± 0.0088	0.018 ± 0.0019
(Mugil cephalus)							
September, 1994							
Morodomi-machi, SAGA	1.19	0.195	4.38	0.014 ± 0.0072	0.070 ± 0.037	0.11 ± 0.010	0.025 ± 0.0023
(Oncorhynchus keta)							
September, 1994							
Urakawa-machi, HOKKAIDOU	1.41	0.545	4.09	0.0000 ± 0.0054	0.0000 ± 0.0099	0.096 ± 0.0092	0.023 ± 0.0023
(Pagrus sp)							
July, 1994							
Tennou-machi, AKITA	2.59	5.32	3.80	0.011 ± 0.0068	0.0020 ± 0.0013	0.17 ± 0.014	0.045 ± 0.0036
Fukuoka, FUKUOKA	1.49	0.413	4.51	0.0000 ± 0.0052	0.000 ± 0.013	0.18 ± 0.014	0.041 ± 0.0030
(Sardinops melanostictus)							
August, 1994							
Yamagata, YAMAGATA	2.89	6.21	2.25	0.0095 ± 0.0059	0.0015 ± 0.00095	0.067 ± 0.0092	0.030 ± 0.0041
(Scomber sp)							
August, 1994							
Matsuyama, EHIME	1.36	0.566	4.13	0.0082 ± 0.0066	0.015 ± 0.012	0.20 ± 0.014	0.049 ± 0.0034
(Sebastiscus marmoratus)							

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kgwet)	(Bq/gCa)	(Bq/kgwet)	(Bq/gK)
May, 1994							
Hamada, SHIMANE (Sillago sp)	6.20	19.3	2.17	0.026 ± 0.0096	0.0013 ± 0.00050	0.14 ± 0.016	0.064 ± 0.0074
June, 1994							
Minamichita-machi, AICHI (Trachurus sp)	4.36	11.5	3.59	0.0077 ± 0.0063	0.00067 ± 0.00055	0.13 ± 0.012	0.036 ± 0.0033
September, 1994							
Miyake-Island, TOKYO	1.43	1.66	2.86	0.011 ± 0.0038	0.0068 ± 0.0023	0.10 ± 0.010	0.036 ± 0.0035

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
Tai	Sea bream	Pagrus sp
Aji	Horse mackerel	Trachurus 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. 1994 to Sep. 1994)

-continued from No. 109 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)
(Carassius auratus)							
July, 1994							
Ishikari-machi, HOKKAIDOU	5.19	15.9	2.78	0.58 ± 0.030	0.037 ± 0.0019	0.16 ± 0.013	0.057 ± 0.0048
(Cyprinus carpio)							
April, 1994							
Kasumigaura-lake, IBARAKI	1.03	0.196	3.27	0.0000 ± 0.0041	0.000 ± 0.021	0.25 ± 0.016	0.077 ± 0.0048
August, 1994							
Akita, AKITA	3.71	10.1	2.94	2.3 ± 0.05	0.23 ± 0.005	0.27 ± 0.016	0.092 ± 0.0054

Freshwater Fish

Japanese name	English name	Scientific name
Funa	Crucian carp	Carassius anratus
Koi	Carp	Cyprinus carpio

(8) Strontium-90 and cesium-137 in Shellfish
(from Apr. 1994 to Sep. 1994)

-continued from No. 109 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 edulis)							
June, 1994							
Mutsu, AOMORI	2.66	0.468	1.09	0.0000 ± 0.0043	0.0000 ± 0.0091	0.014 ± 0.0067	0.013 ± 0.0061
(Ruditapes phillipinarum)							
May, 1994							
Konagai-machi, NAGASAKI	2.72	0.781	1.64	0.0027 ± 0.0060	0.0035 ± 0.0077	0.019 ± 0.0053	0.012 ± 0.0033
June, 1994							
Minamichita-machi, AICHI	1.91	0.554	3.45	0.000 ± 0.010	0.000 ± 0.019	0.11 ± 0.016	0.031 ± 0.0047
(Turbo cornutus)							
April, 1994							
Ryotsu, NIIGATA	2.35	0.745	3.08	0.0010 ± 0.0077	0.001 ± 0.010	0.076 ± 0.012	0.025 ± 0.0040
June, 1994							
Sakata, YAMAGATA	2.86	2.14	2.73	0.0045 ± 0.0039	0.0021 ± 0.0018	0.053 ± 0.0086	0.019 ± 0.0032
August, 1994							
Togi-machi, ISHIKAWA	3.04	1.41	2.30	0.0000 ± 0.0059	0.0000 ± 0.0042	0.038 ± 0.0082	0.017 ± 0.0036

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. 1994 to Sep. 1994)

-continued from No. 109 of this publication-

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

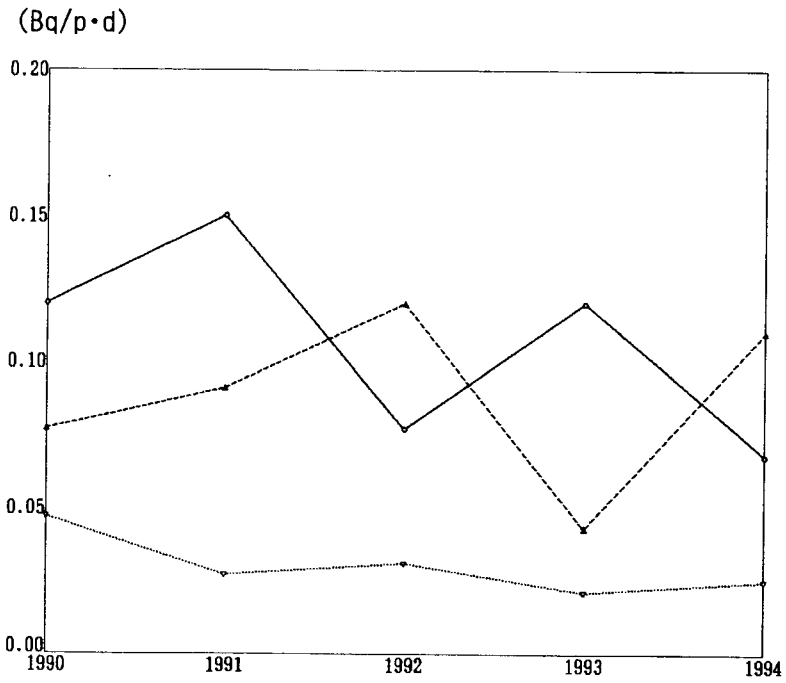
Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kgwet)	(Bq/gCa)	(Bq/kgwet)	(Bq/gK)
(Undaria pinnatifida)							
April, 1994							
Ryotsu, NIIGATA	3.70	1.12	6.80	0.015 ± 0.0059	0.014 ± 0.0053	0.11 ± 0.011	0.016 ± 0.0016
Togi-machi, ISHIKAWA	3.87	0.799	6.25	0.018 ± 0.0047	0.022 ± 0.0059	0.074 ± 0.0092	0.012 ± 0.0015
May, 1994							
Mutsu, AOMORI	3.60	0.763	9.25	0.016 ± 0.0048	0.022 ± 0.0063	0.042 ± 0.0077	0.0045 ± 0.00083
Fukaura-machi, AOMORI	3.13	0.770	7.11	0.025 ± 0.0052	0.033 ± 0.0067	0.026 ± 0.0071	0.0037 ± 0.0010
June, 1994							
Sakata, YAMAGATA	3.38	1.27	6.33	0.026 ± 0.0051	0.020 ± 0.0040	0.077 ± 0.0092	0.012 ± 0.0014

Seaweeds

Japanese name	English name	Scientific name
Wakame	Wakame seaweed	Undaria pinnatifida

＊ ＊ Total Diet ＊ ＊

<Strontium-90>



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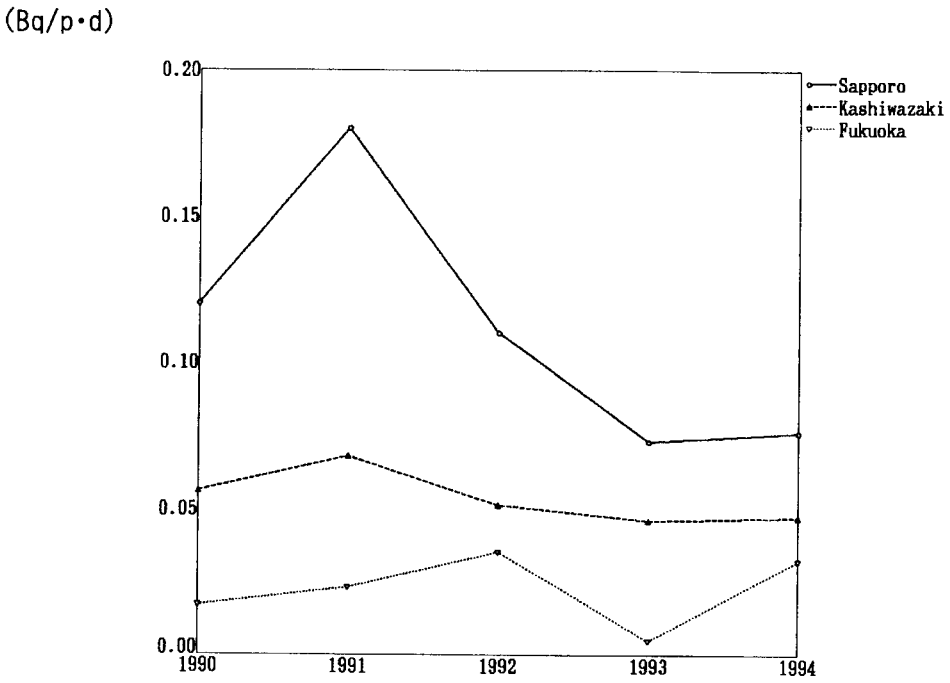

Fig. 1

＊ ＊ Rice (producing districts) ＊ ＊

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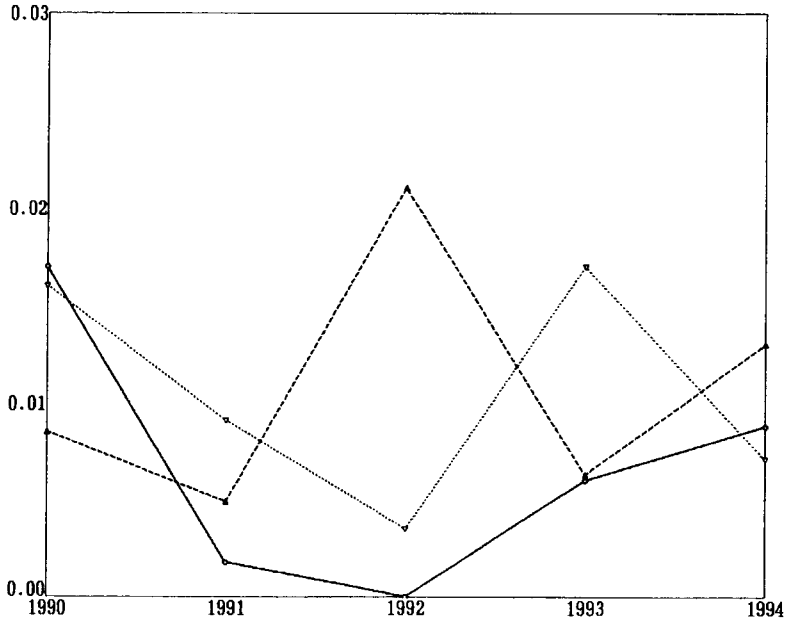
(Bq/kgwet)



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(Bq/kgwet)

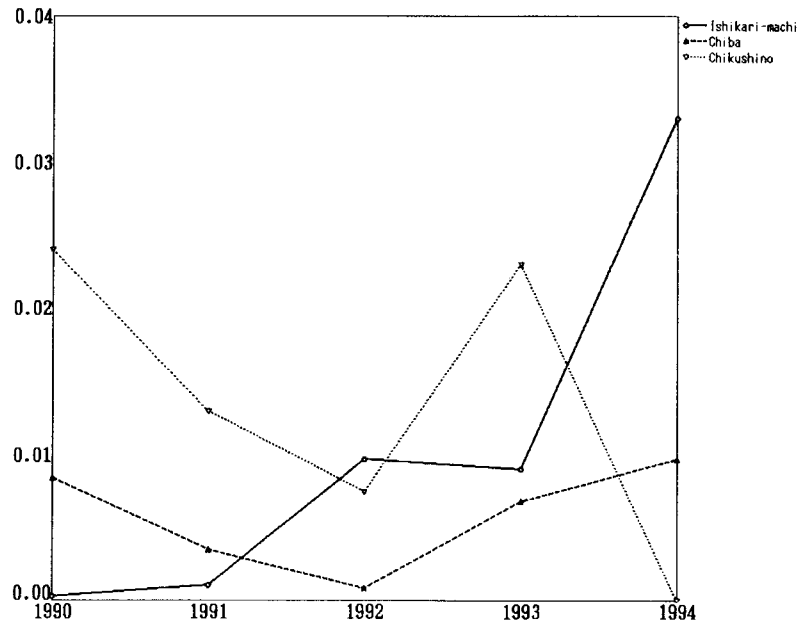

Fig. 2—1

* * Rice (consuming districts) * *

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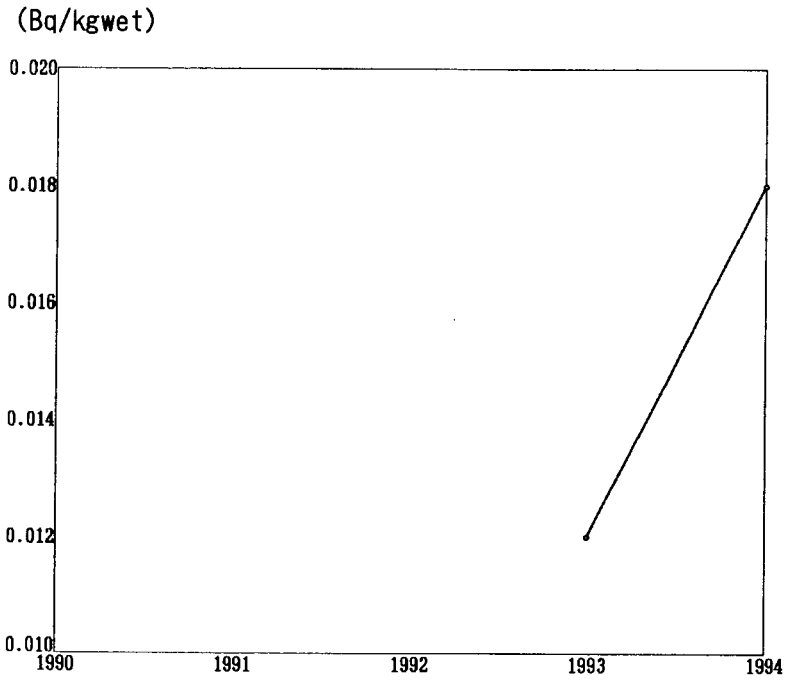

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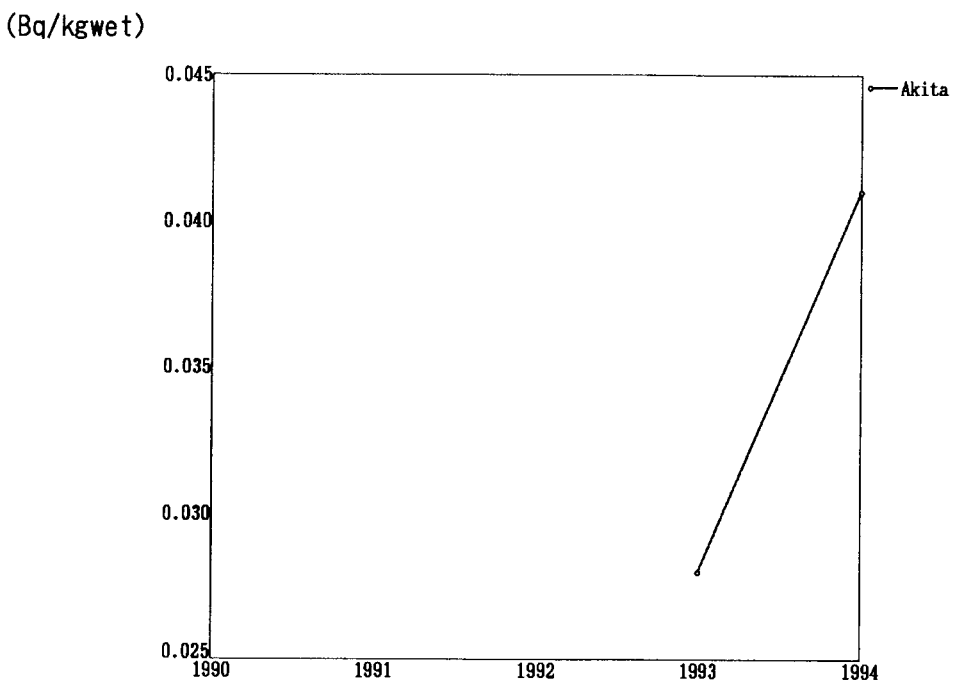

Fig. 2—2

＊＊ Milk (producing districts for domestic program)

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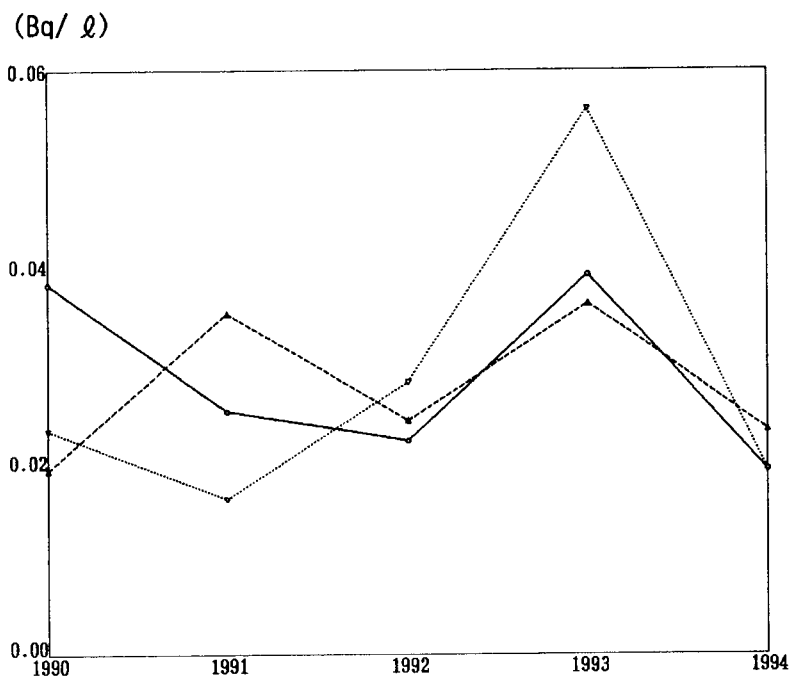

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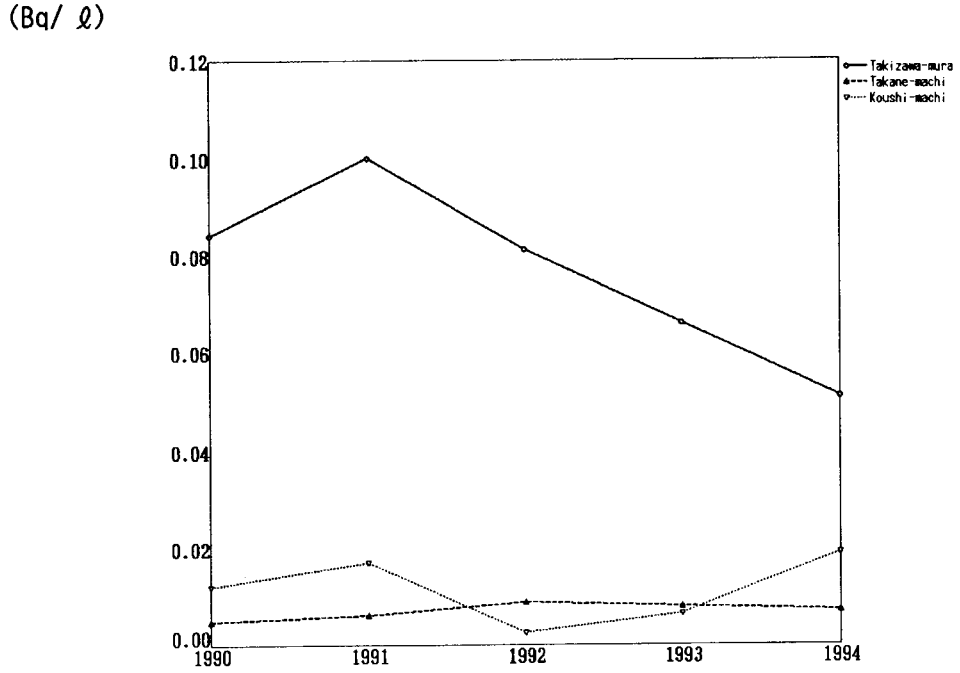

Fig. 3—1

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

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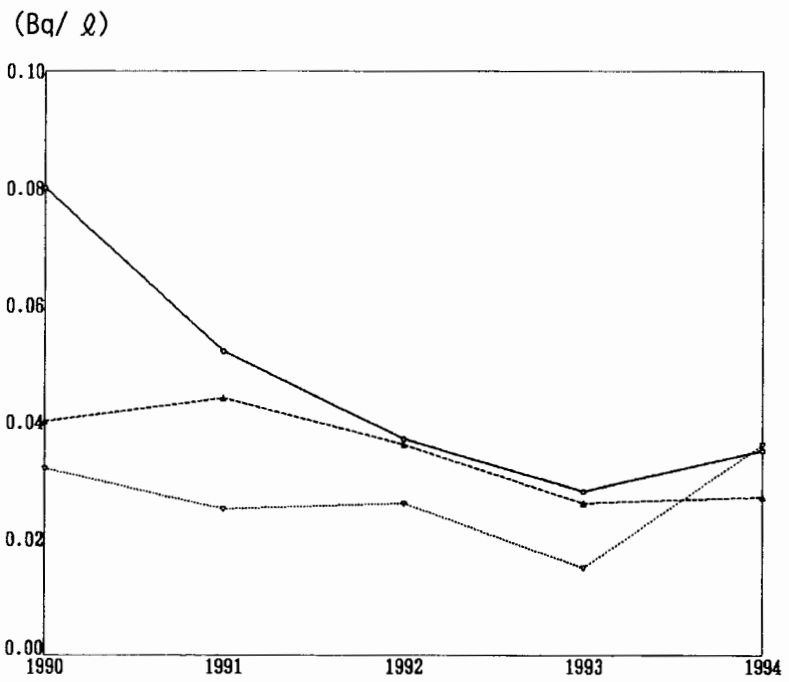

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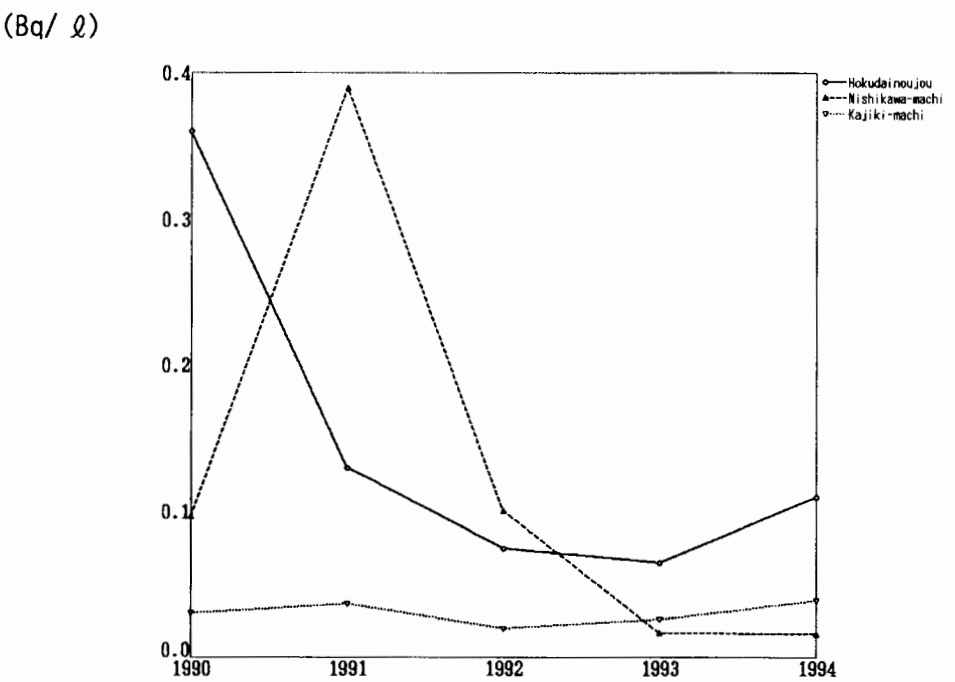

Fig. 3—2

＊ ＊ Milk (consuming districts) ＊ ＊

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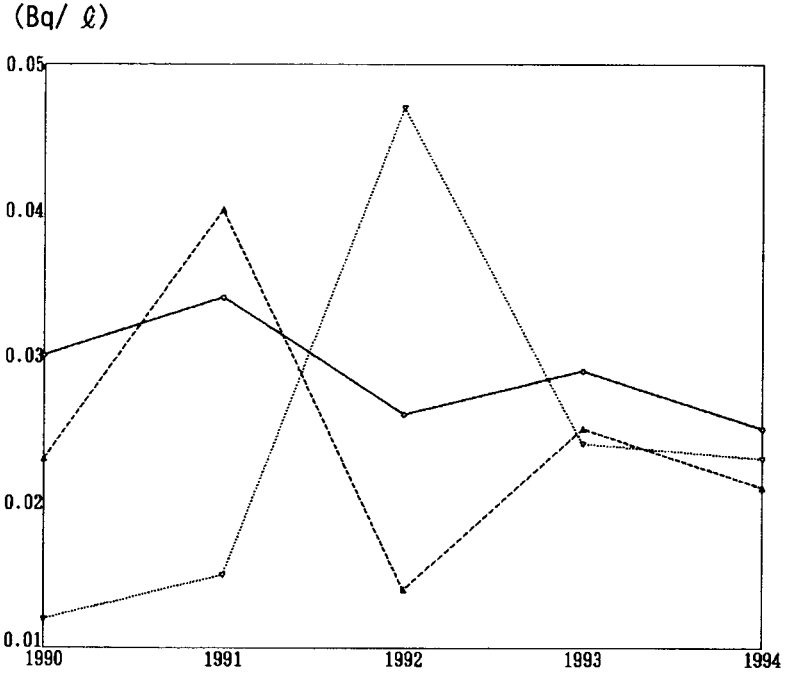

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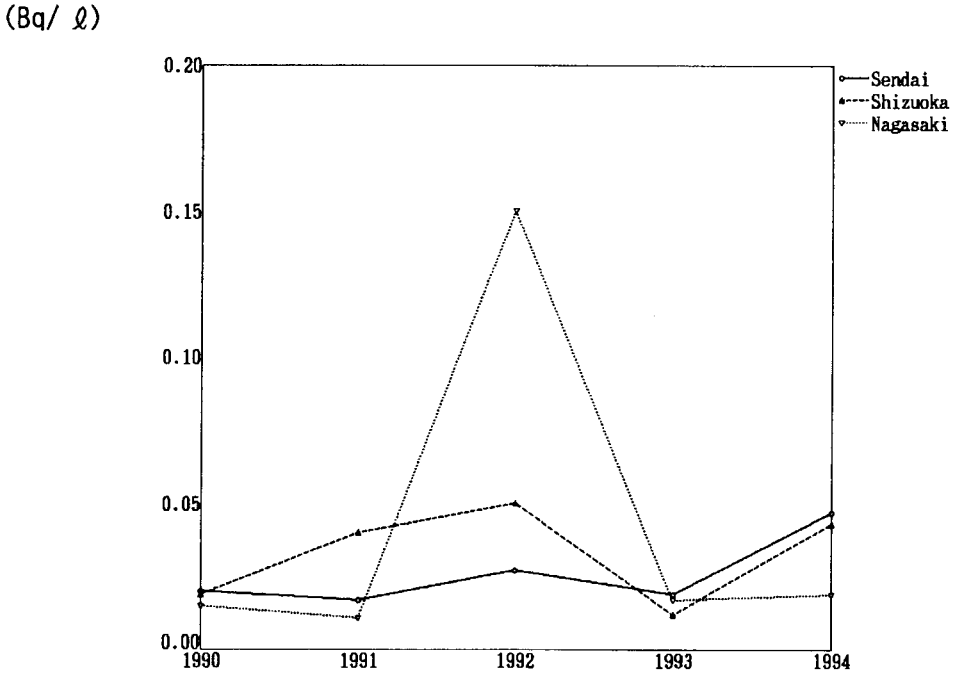

Fig. 3—3

* * Powdered Milk * *

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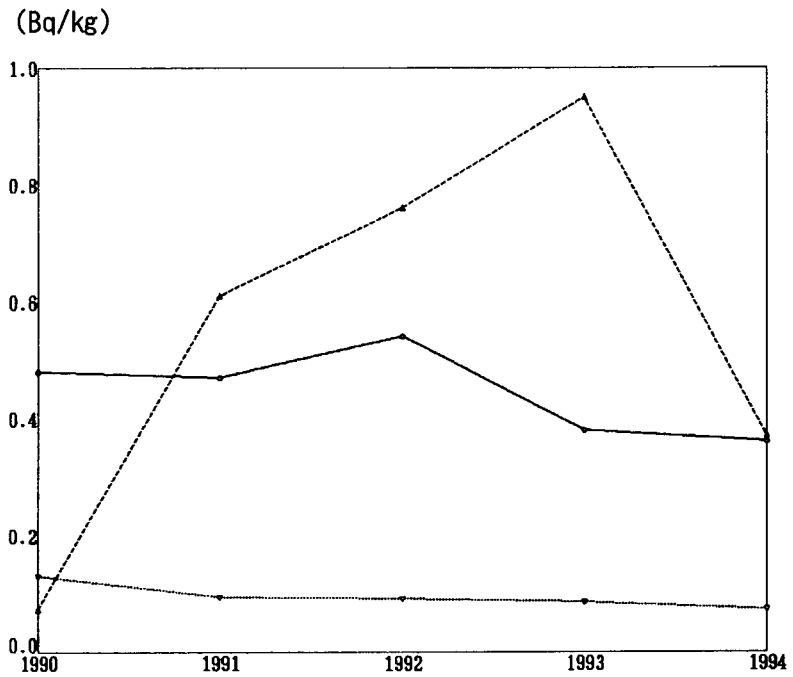

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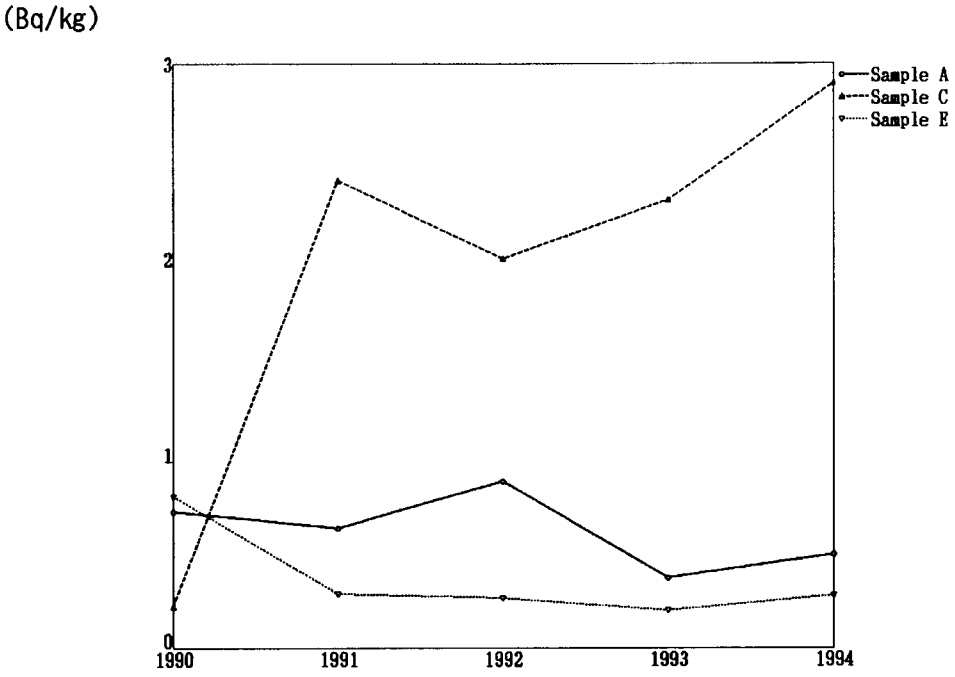

Fig.3—4

＊ ＊ Vegetables (producing districts) ＊ ＊

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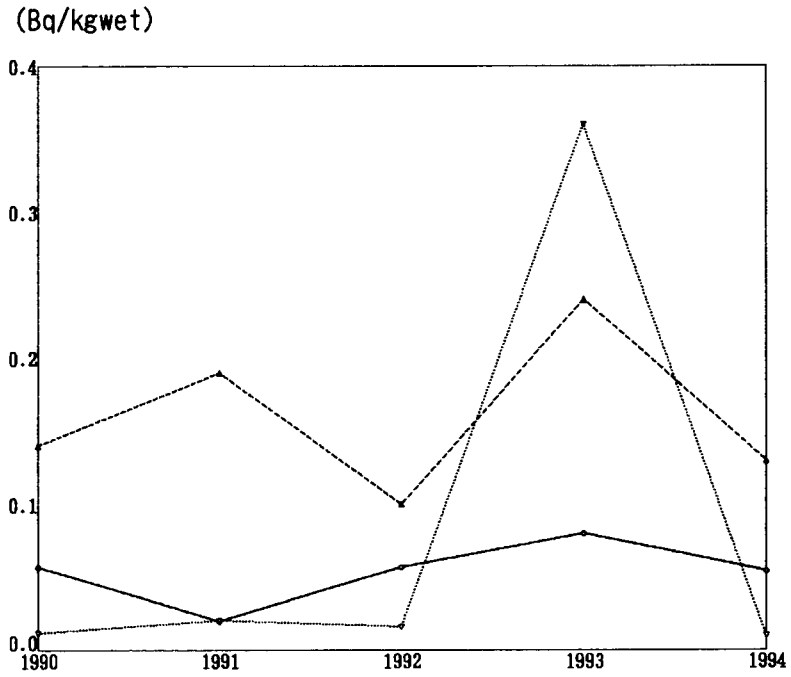

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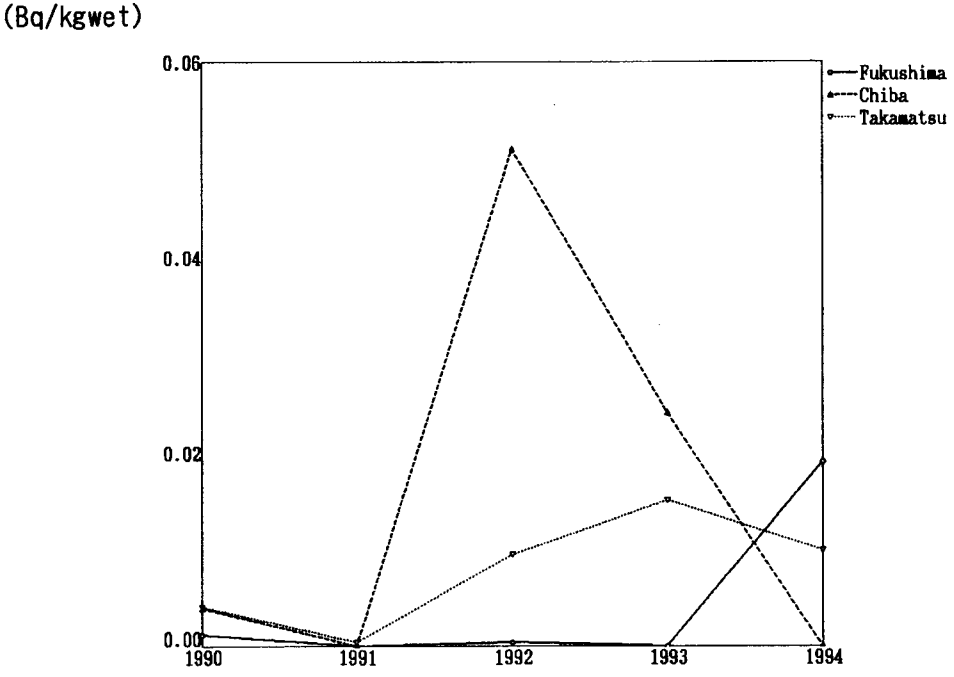

Fig. 4—1

＊ ＊ Vegetables (consuming districts) ＊ ＊

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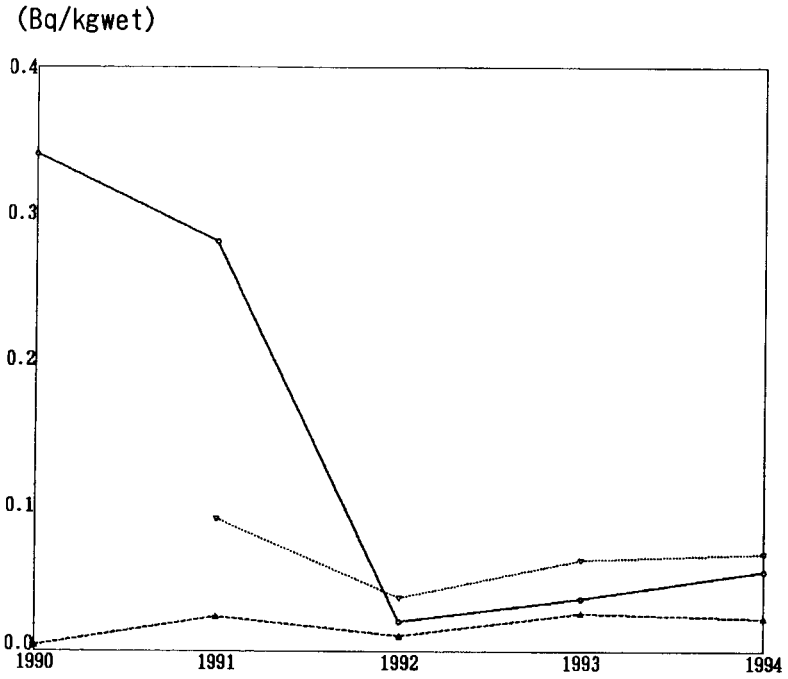

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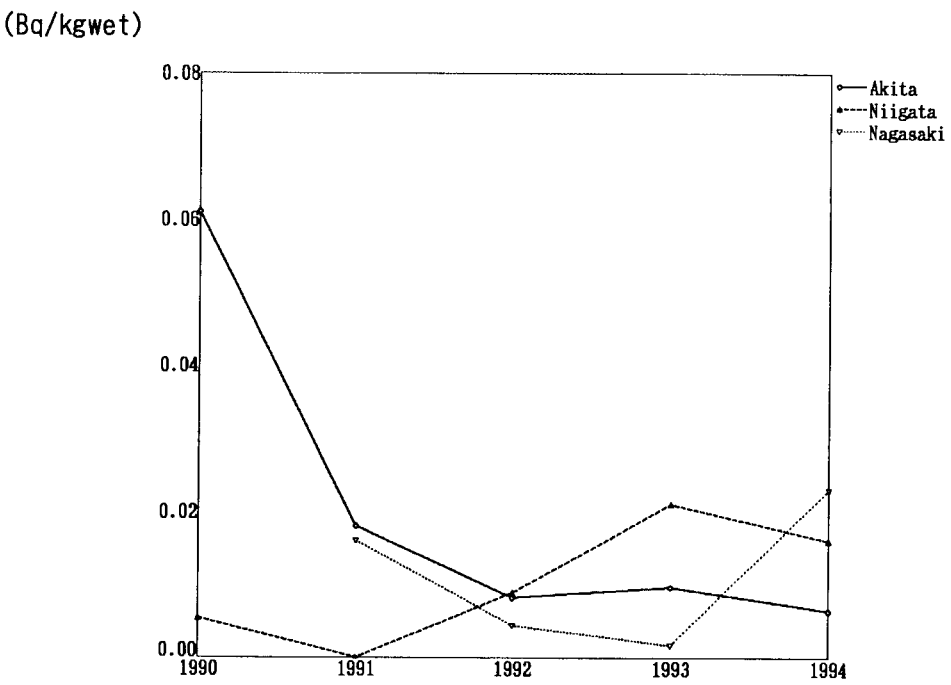

Fig. 4—2

＊ ＊ Tea (Japanese Tea) ＊ ＊

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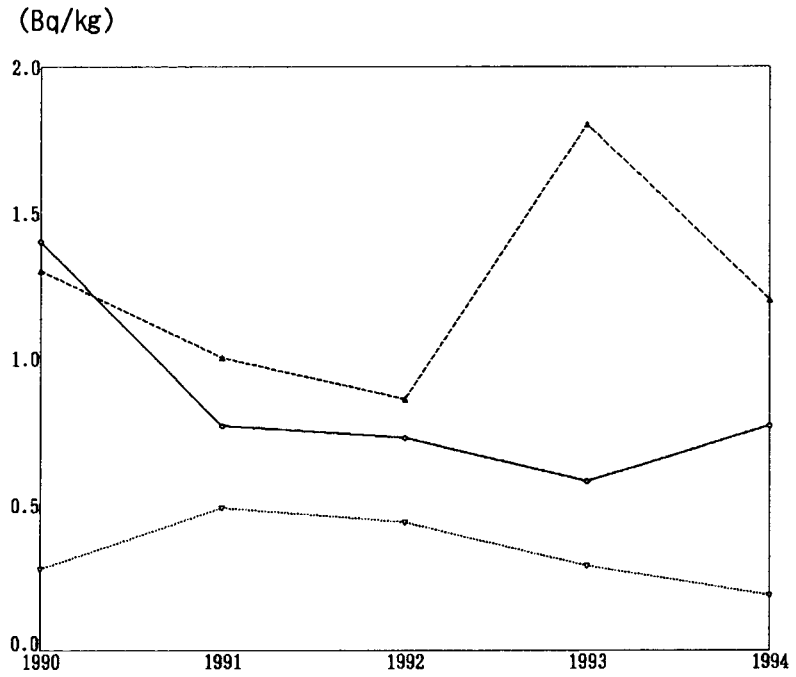

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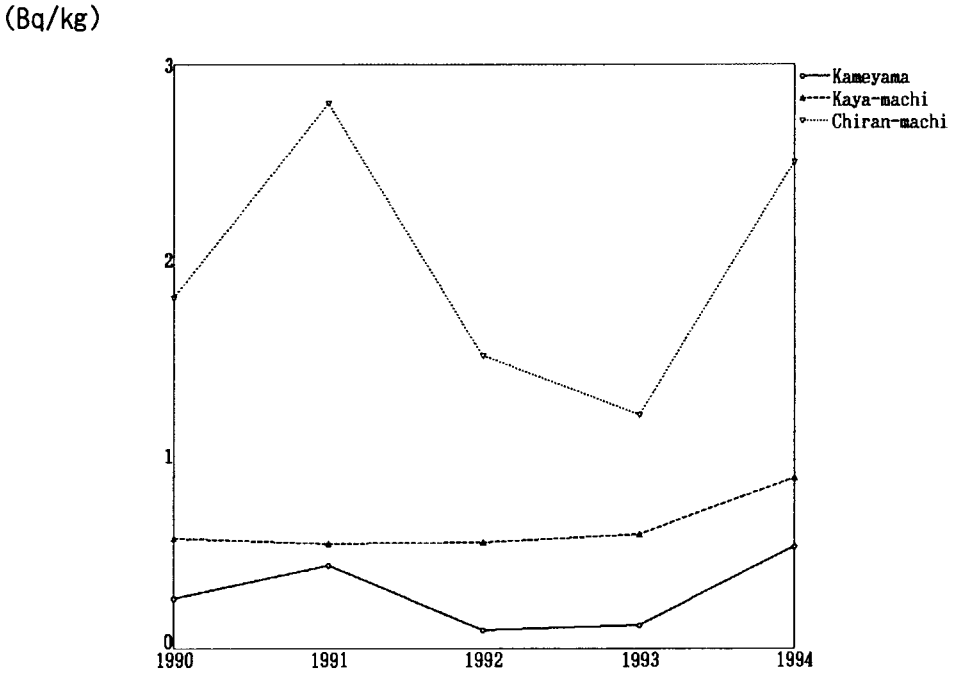
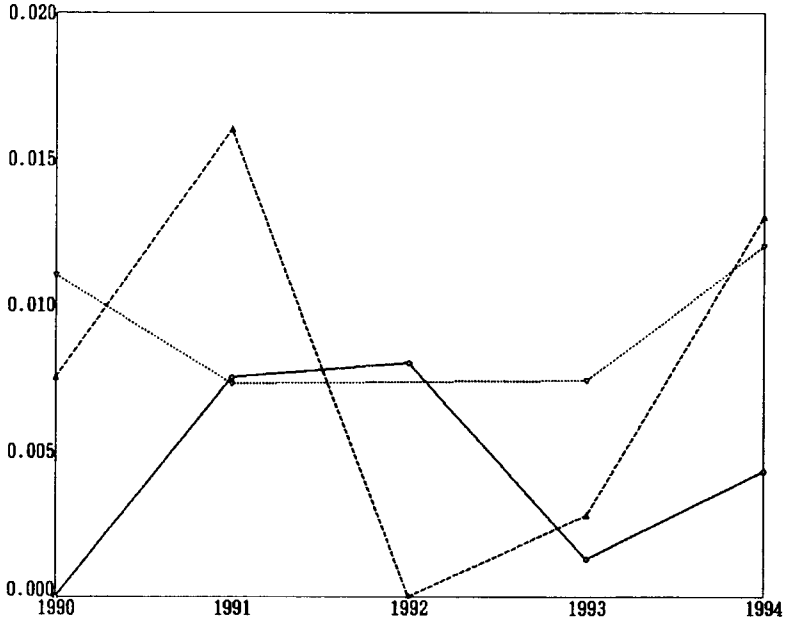


Fig. 5

* * Sea Fish * *

<Strontium-90>



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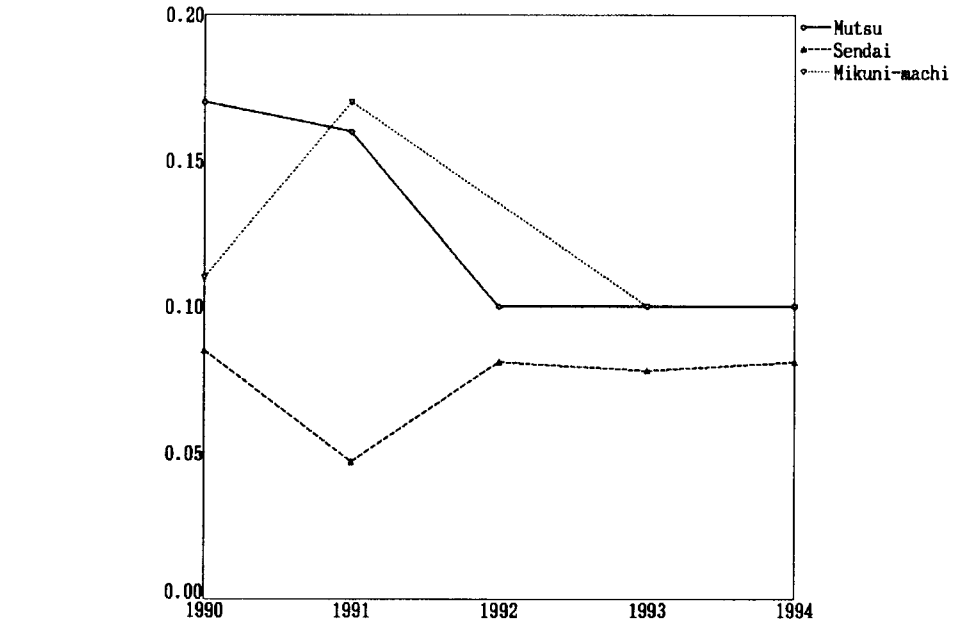
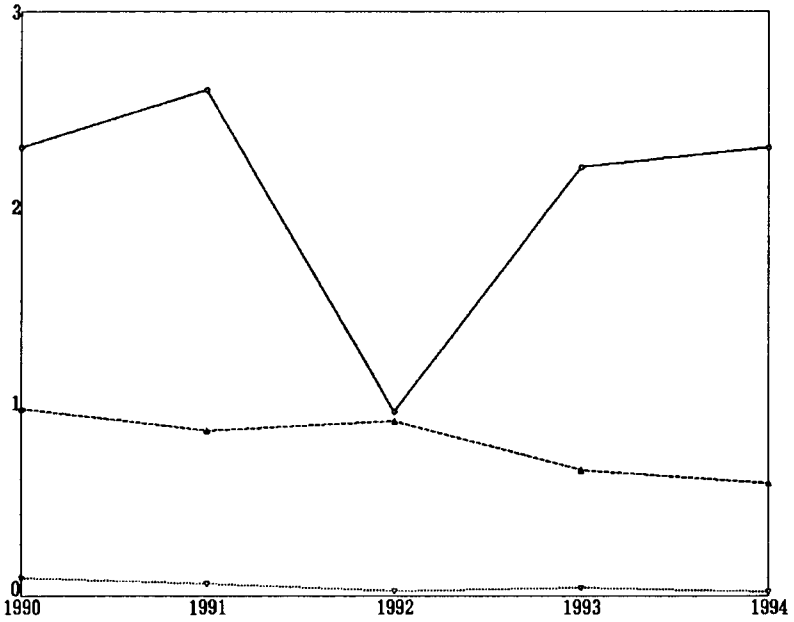


Fig. 6

* * Freshwater Fish * *

<Strontium-90>

(Bq/kgwet)



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(Bq/kgwet)

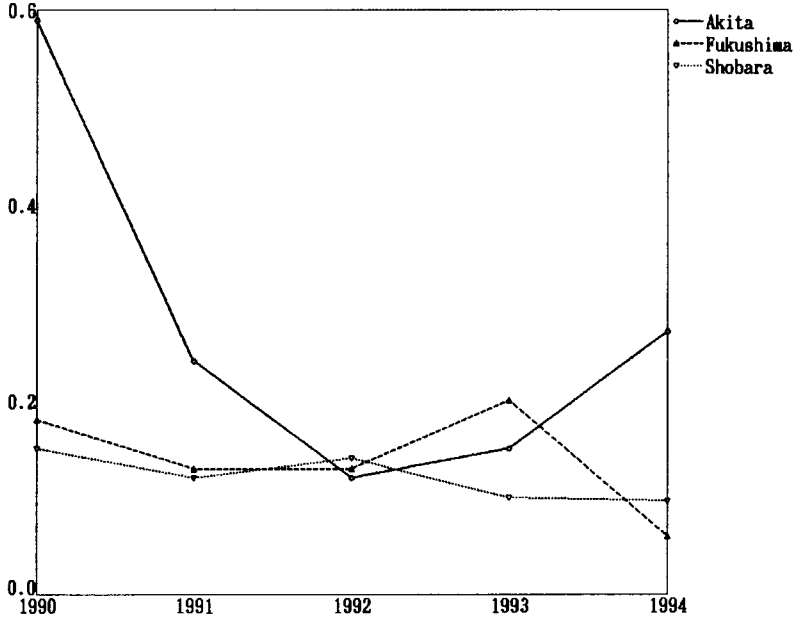
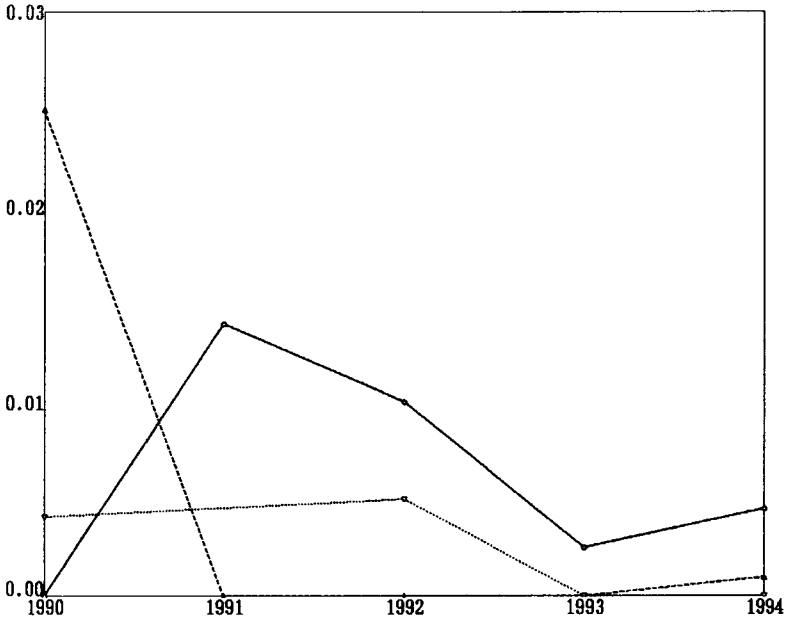


Fig. 7

* * Shellfish * *

<Strontium-90>



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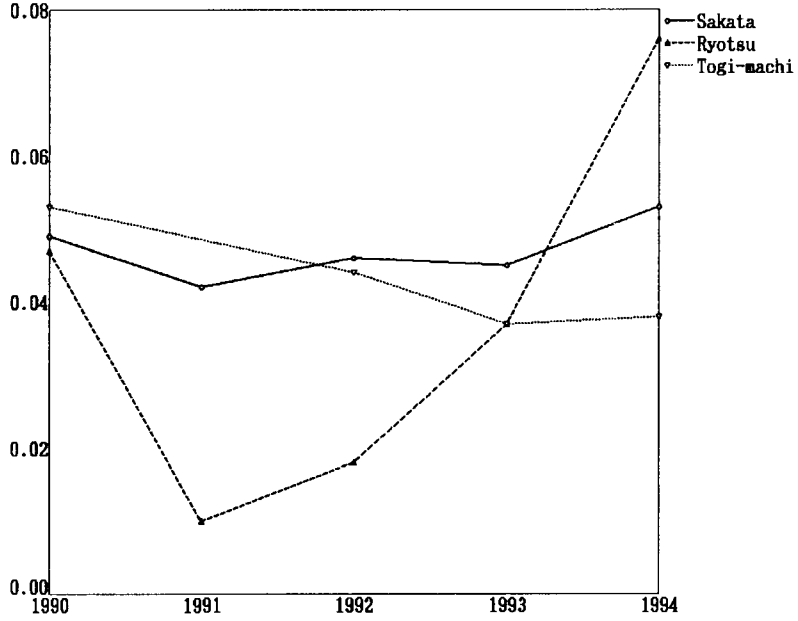
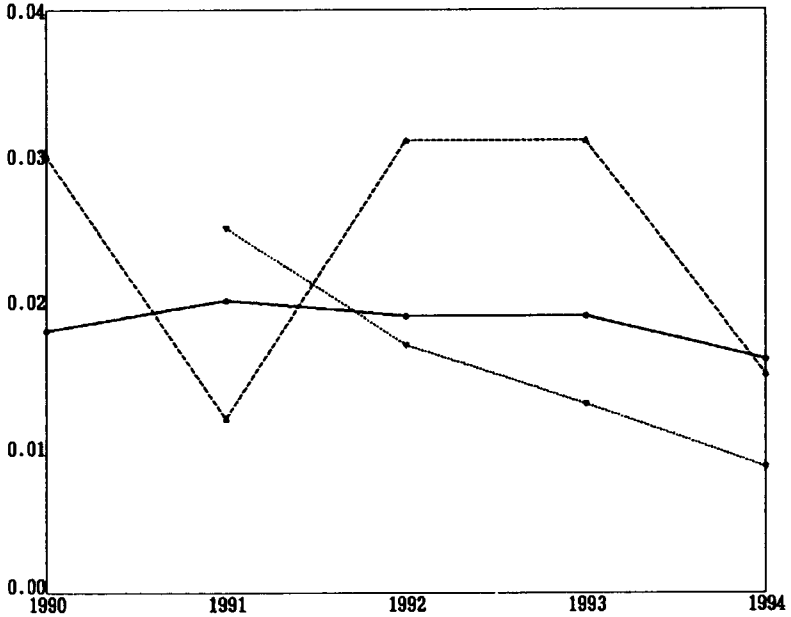


Fig. 8

* * Seaweeds * *

<Strontium-90>

(Bq/kgwet)



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(Bq/kgwet)

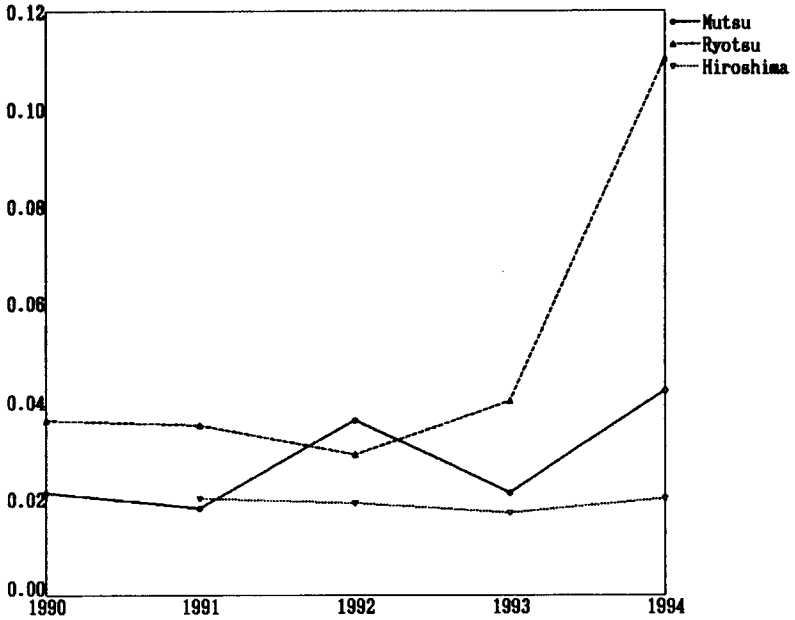

Fig. 9

* * Sampling Locations in Japan * * (42)

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