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Part 2
= Dietary Materials =

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(Japan Chemical Analysis Center)

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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℃. 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℃.

(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℃ 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℃ 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. 1996 to Sep. 1996)
-continued from No. 117 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, 1996							
Kochi, KOCHI	16.4	539	2090	0.097 ± 0.0081	0.18 ± 0.015	0.070 ± 0.0084	0.034 ± 0.0040
Saga-machi, KOCHI	16.5	441	1960	0.072 ± 0.011	0.16 ± 0.026	0.034 ± 0.0065	0.017 ± 0.0033
June, 1996							
Sapporo, HOKKAIDOU	17.0	432	2100	0.059 ± 0.016	0.14 ± 0.038	0.024 ± 0.0090	0.011 ± 0.0043
Iwanai-machi, HOKKAIDOU	13.6	513	1860	0.088 ± 0.012	0.17 ± 0.024	0.039 ± 0.0069	0.021 ± 0.0037
Aomori, AOMORI	14.7	375	1520	0.045 ± 0.0063	0.12 ± 0.017	0.018 ± 0.0053	0.012 ± 0.0035
Ajigasawa-machi, AOMORI	15.7	491	1810	0.076 ± 0.012	0.16 ± 0.023	0.052 ± 0.0073	0.028 ± 0.0040
Morioka, IWATE	17.1	463	1940	0.086 ± 0.018	0.18 ± 0.038	0.081 ± 0.013	0.042 ± 0.0066
Iwaizumi-machi, IWATE	10.4	341	1250	0.021 ± 0.0075	0.062 ± 0.022	0.18 ± 0.013	0.15 ± 0.010
Yamagata, YAMAGATA	16.1	417	1400	0.045 ± 0.0055	0.11 ± 0.013	0.045 ± 0.0074	0.032 ± 0.0053
Sagae, YAMAGATA	9.78	416	1510	0.075 ± 0.0078	0.18 ± 0.019	0.015 ± 0.0047	0.010 ± 0.0031
Fukushima, FUKUSHIMA	14.9	524	1790	0.075 ± 0.0074	0.14 ± 0.014	0.035 ± 0.0064	0.019 ± 0.0036
Ookuma-machi, FUKUSHIMA	10.6	464	1410	0.048 ± 0.0099	0.10 ± 0.021	0.040 ± 0.0073	0.028 ± 0.0052
Mito, IBARAKI	18.0	568	2460	0.058 ± 0.011	0.10 ± 0.019	0.054 ± 0.0081	0.022 ± 0.0033
Tokai-mura, IBARAKI	16.3	633	2410	0.064 ± 0.011	0.10 ± 0.018	0.065 ± 0.0084	0.027 ± 0.0035
Utsunomiya, TOCHIGI	16.6	528	2300	0.030 ± 0.016	0.057 ± 0.030	0.064 ± 0.013	0.028 ± 0.0056
Mooka, TOCHIGI	12.4	656	1840	0.039 ± 0.0094	0.060 ± 0.014	0.043 ± 0.0065	0.023 ± 0.0036
Maebashi, GUNMA	13.9	758	1810	0.053 ± 0.0066	0.069 ± 0.0087	0.039 ± 0.0066	0.022 ± 0.0037
Nakanojou-machi, GUNMA	16.3	785	1960	0.058 ± 0.0067	0.074 ± 0.0086	0.063 ± 0.0082	0.032 ± 0.0042
Urawa, SAITAMA	14.5	492	1950	0.035 ± 0.012	0.070 ± 0.025	0.044 ± 0.0092	0.023 ± 0.0047
Kumagaya, SAITAMA	14.9	674	1960	0.044 ± 0.010	0.065 ± 0.015	0.021 ± 0.0054	0.011 ± 0.0027
Ichihara, CHIBA	14.8	488	1630	0.033 ± 0.012	0.067 ± 0.024	0.019 ± 0.0079	0.012 ± 0.0049
Chikura-machi, CHIBA	21.5	563	2860	0.052 ± 0.0060	0.092 ± 0.011	0.15 ± 0.012	0.051 ± 0.0042

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)
Shinjuku, TOKYO	13.5	425	1920	0.038 ± 0.0089	0.090 ± 0.021	0.032 ± 0.0069	0.017 ± 0.0036
Hachijou-machi, TOKYO	12.9	546	1470	0.047 ± 0.0060	0.085 ± 0.011	0.049 ± 0.0070	0.034 ± 0.0048
Yokohama, KANAGAWA	13.7	403	1710	0.053 ± 0.011	0.13 ± 0.028	0.050 ± 0.0077	0.029 ± 0.0045
Hiratsuka, KANAGAWA	16.7	553	2340	0.056 ± 0.0061	0.10 ± 0.011	0.047 ± 0.0070	0.020 ± 0.0030
Nishikawa-machi, NIIGATA	22.3	676	2630	0.11 ± 0.008	0.16 ± 0.012	0.062 ± 0.0082	0.024 ± 0.0031
Kashiwazaki, NIIGATA	17.8	529	2170	0.051 ± 0.0062	0.097 ± 0.012	0.033 ± 0.0070	0.015 ± 0.0032
Takaoka, TOYAMA	15.1	373	1930	0.019 ± 0.010	0.050 ± 0.027	0.023 ± 0.0078	0.012 ± 0.0040
Takaoka, TOYAMA	14.4	421	1830	0.033 ± 0.0087	0.079 ± 0.021	0.025 ± 0.0059	0.014 ± 0.0032
Kanazawa, ISHIKAWA	12.1	378	1330	0.026 ± 0.0088	0.068 ± 0.023	0.023 ± 0.0056	0.017 ± 0.0042
Yoshinodani-mura, ISHIKAWA	13.7	530	2070	0.10 ± 0.013	0.19 ± 0.024	0.047 ± 0.0073	0.023 ± 0.0035
Koufu, YAMANASHI	18.9	431	2370	0.045 ± 0.016	0.10 ± 0.038	0.019 ± 0.0099	0.0081 ± 0.0042
Nirasaki, YAMANASHI	13.7	563	2030	0.057 ± 0.0071	0.10 ± 0.013	0.055 ± 0.0078	0.027 ± 0.0038
Sanada-machi, NAGANO	14.1	552	1890	0.051 ± 0.010	0.092 ± 0.018	0.022 ± 0.0056	0.012 ± 0.0030
Gifu, GIFU	14.6	378	2100	0.036 ± 0.0058	0.096 ± 0.015	0.024 ± 0.0057	0.011 ± 0.0027
Takayama, GIFU	15.0	826	1900	0.063 ± 0.0064	0.077 ± 0.0078	0.029 ± 0.0058	0.015 ± 0.0031
Shizuoka, SHIZUOKA	14.6	514	2190	0.064 ± 0.011	0.12 ± 0.022	0.056 ± 0.0083	0.026 ± 0.0038
Hamaoka-machi, SHIZUOKA	13.2	362	2050	0.061 ± 0.0093	0.17 ± 0.026	0.020 ± 0.0070	0.0096 ± 0.0034
Nagoya, AICHI	17.2	900	2320	0.062 ± 0.015	0.068 ± 0.017	0.039 ± 0.0096	0.017 ± 0.0041
Shinshiro, AICHI	14.0	585	1660	0.046 ± 0.0094	0.079 ± 0.016	0.033 ± 0.0060	0.020 ± 0.0036
Tsu, MIE	14.8	427	2230	0.066 ± 0.016	0.16 ± 0.038	0.032 ± 0.0085	0.014 ± 0.0038
Owase, MIE	14.0	646	1860	0.062 ± 0.0065	0.095 ± 0.010	0.038 ± 0.0065	0.021 ± 0.0035
Ootsu, SHIGA	13.0	464	2010	0.040 ± 0.0060	0.086 ± 0.013	0.016 ± 0.0048	0.0078 ± 0.0024
Imazu-machi, SHIGA	13.7	699	1920	0.078 ± 0.0072	0.11 ± 0.010	0.033 ± 0.0069	0.017 ± 0.0036
Kyoto, KYOTO	17.0	581	2670	0.039 ± 0.0054	0.068 ± 0.0093	0.030 ± 0.0065	0.011 ± 0.0024
Maizuru, KYOTO	21.0	580	2460	0.048 ± 0.0060	0.082 ± 0.010	0.034 ± 0.0067	0.014 ± 0.0027

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)
Osaka, OSAKA	15.1	504	2170	0.037 ± 0.0091	0.073 ± 0.018	0.031 ± 0.0064	0.014 ± 0.0030
Sakai, OSAKA	13.1	531	1880	0.049 ± 0.0061	0.093 ± 0.011	0.043 ± 0.0071	0.023 ± 0.0038
Kakogawa, HYOUGO	13.0	582	1640	0.043 ± 0.0095	0.074 ± 0.016	0.019 ± 0.0051	0.012 ± 0.0031
Hamasaka-machi, HYOUGO	13.5	705	1520	0.055 ± 0.0069	0.078 ± 0.0098	0.024 ± 0.0057	0.016 ± 0.0038
Kashihara, NARA	13.2	960	1470	0.030 ± 0.0055	0.032 ± 0.0057	0.021 ± 0.0058	0.014 ± 0.0039
Gojou, NARA	11.5	588	1640	0.052 ± 0.0065	0.088 ± 0.011	0.019 ± 0.0054	0.012 ± 0.0033
Wakayama, WAKAYAMA	13.2	466	1790	0.074 ± 0.0074	0.16 ± 0.016	0.029 ± 0.0062	0.016 ± 0.0035
Shinguu, WAKAYAMA	16.6	501	1750	0.045 ± 0.0058	0.089 ± 0.012	0.053 ± 0.0076	0.030 ± 0.0043
Fukube-mura, TOTTORI	14.1	514	2230	0.080 ± 0.011	0.15 ± 0.022	0.024 ± 0.0062	0.011 ± 0.0028
Tottori, TOTTORI	14.6	563	2160	0.056 ± 0.0066	0.099 ± 0.012	0.051 ± 0.0076	0.024 ± 0.0035
Matsue, SHIMANE	19.9	711	2480	0.064 ± 0.0061	0.089 ± 0.0086	0.032 ± 0.0063	0.013 ± 0.0025
Okayama, OKAYAMA	21.0	683	2460	0.071 ± 0.0071	0.10 ± 0.010	0.044 ± 0.0072	0.018 ± 0.0029
Kamisaibara-mura, OKAYAMA	12.4	316	1470	0.11 ± 0.008	0.34 ± 0.026	0.047 ± 0.0068	0.032 ± 0.0047
Hiroshima, HIROSHIMA	11.6	430	1580	0.039 ± 0.0059	0.091 ± 0.014	0.019 ± 0.0056	0.012 ± 0.0036
Yamaguchi, YAMAGUCHI	13.6	486	1790	0.035 ± 0.0085	0.072 ± 0.017	0.022 ± 0.0059	0.012 ± 0.0033
Ajisu-machi, YAMAGUCHI	16.0	540	1820	0.035 ± 0.0091	0.064 ± 0.017	0.040 ± 0.0069	0.022 ± 0.0038
Takamatsu, KAGAWA	17.2	532	1660	0.035 ± 0.0051	0.065 ± 0.0097	0.029 ± 0.0060	0.018 ± 0.0036
Tuda-machi, KAGAWA	17.1	510	2240	0.041 ± 0.0058	0.080 ± 0.011	0.018 ± 0.0055	0.0081 ± 0.0024
Matsuyama, EHIME	12.5	449	1830	0.040 ± 0.0055	0.090 ± 0.012	0.022 ± 0.0057	0.012 ± 0.0031
Ikata-machi, EHIME	8.95	375	1300	0.032 ± 0.0048	0.084 ± 0.013	0.012 ± 0.0049	0.0096 ± 0.0038
Dazaifu, FUKUOKA	13.2	488	1890	0.057 ± 0.010	0.12 ± 0.021	0.019 ± 0.0057	0.0099 ± 0.0030
Fukuoka, FUKUOKA	12.1	234	1150	0.022 ± 0.0045	0.095 ± 0.019	0.010 ± 0.0045	0.0088 ± 0.0039
Saga, SAGA	13.1	398	1850	0.030 ± 0.0051	0.075 ± 0.013	0.028 ± 0.0065	0.015 ± 0.0035
Karatsu, SAGA	15.6	502	1860	0.056 ± 0.0065	0.11 ± 0.013	0.022 ± 0.0055	0.012 ± 0.0029
Nagasaki, NAGASAKI	17.8	791	2080	0.044 ± 0.0063	0.056 ± 0.0079	0.035 ± 0.0062	0.017 ± 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)
Matsuura, NAGASAKI	13.0	462	1410	0.041 ± 0.0059	0.090 ± 0.013	0.0050 ± 0.0043	0.0035 ± 0.0031
Kumamoto, KUMAMOTO	12.7	397	1880	0.027 ± 0.0046	0.067 ± 0.011	0.038 ± 0.0068	0.020 ± 0.0036
Tomiai-machi, KUMAMOTO	15.4	536	1890	0.060 ± 0.0065	0.11 ± 0.012	0.027 ± 0.0057	0.014 ± 0.0030
Ooita, OOITA	12.9	296	1850	0.032 ± 0.0047	0.11 ± 0.016	0.022 ± 0.0056	0.012 ± 0.0030
Saiki, OOITA	13.4	304	3210	0.029 ± 0.0090	0.095 ± 0.029	0.025 ± 0.0055	0.0079 ± 0.0017
Miyazaki, MIYAZAKI	16.8	423	1660	0.028 ± 0.0046	0.067 ± 0.011	0.034 ± 0.0066	0.020 ± 0.0040
Takahara-machi, MIYAZAKI	10.5	362	1180	0.040 ± 0.0063	0.11 ± 0.018	0.022 ± 0.0064	0.019 ± 0.0054
Sendai, MIYAGI	13.1	409	1730	0.036 ± 0.0054	0.088 ± 0.013	0.039 ± 0.0068	0.023 ± 0.0039
Ookuchi, KAGOSHIMA	12.8	338	1550	0.036 ± 0.0056	0.11 ± 0.017	0.031 ± 0.0068	0.020 ± 0.0044
July, 1996							
Ishinomaki, MIYAGI	14.5	610	1960	0.030 ± 0.0085	0.048 ± 0.014	0.035 ± 0.0064	0.018 ± 0.0033
Onagawa-machi, MIYAGI	19.1	805	1930	0.045 ± 0.010	0.056 ± 0.012	0.051 ± 0.0079	0.026 ± 0.0041
Akita, AKITA	15.9	433	2060	0.031 ± 0.012	0.072 ± 0.028	0.059 ± 0.011	0.029 ± 0.0052
Akita, AKITA	15.7	438	2290	0.051 ± 0.0061	0.12 ± 0.014	0.069 ± 0.0083	0.030 ± 0.0036
Fukui, FUKUI	12.9	369	1980	0.011 ± 0.0063	0.030 ± 0.017	0.016 ± 0.0053	0.0079 ± 0.0027
Tsuruga, FUKUI	12.8	531	1780	0.025 ± 0.0077	0.047 ± 0.014	0.037 ± 0.0067	0.021 ± 0.0038
Nagano, NAGANO	11.8	460	1560	0.045 ± 0.016	0.098 ± 0.034	0.0000 ± 0.0069	0.0000 ± 0.0044
Kashima-machi, SHIMANE	17.7	899	2180	0.068 ± 0.0066	0.076 ± 0.0073	0.047 ± 0.0073	0.021 ± 0.0033
Miyoshi, HIROSHIMA	10.4	280	1520	0.031 ± 0.0052	0.11 ± 0.018	0.014 ± 0.0051	0.0093 ± 0.0033
Tokushima, TOKUSHIMA	14.4	364	1790	0.045 ± 0.0093	0.12 ± 0.026	0.013 ± 0.0049	0.0073 ± 0.0028
Naha, Okinawa	12.2	583	1770	0.043 ± 0.0069	0.074 ± 0.012	0.014 ± 0.0056	0.0081 ± 0.0031
Kochinda-machi, Okinawa	13.8	550	1960	0.038 ± 0.0058	0.069 ± 0.011	0.030 ± 0.0065	0.016 ± 0.0033
September, 1996							
Kamiita-machi, TOKUSHIMA	15.6	400	2040	0.045 ± 0.0093	0.11 ± 0.023	0.023 ± 0.0052	0.011 ± 0.0025

(2) Strontium-90 and Cesium-137 in Rice (producing districts)
(from Apr. 1996 to Sep. 1996)
-continued from No. 117 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)
September, 1996							
Utsunomiya, TOCHIGI	0.663	0.023	0.782	0.0003 ± 0.0027	0.01 ± 0.12	0.0092 ± 0.0045	0.012 ± 0.0057
Matsusaka, MIE	0.569	0.038	0.814	0.013 ± 0.0054	0.34 ± 0.14	0.0000 ± 0.0046	0.0000 ± 0.0057
Sadohara-machi, MIYAZAKI	0.717	0.028	0.889	0.0038 ± 0.0053	0.13 ± 0.19	0.0000 ± 0.0051	0.0000 ± 0.0057

(3)-1 Strontium-90 and Cesium-137 in Milk (producing districts for domestic program)
(from Apr. 1996 to Sep. 1996)
-continued from No. 117 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, 1996							
Yamato-machi, SAGA	7.30	1.07	1.65	0.018 ± 0.0059	0.017 ± 0.0055	0.010 ± 0.0054	0.0061 ± 0.0033
August, 1996							
Aomori, AOMORI	7.45	1.05	1.55	0.087 ± 0.013	0.083 ± 0.012	0.052 ± 0.0080	0.034 ± 0.0051
Takizawa-mura, IWATE	7.18	1.07	1.60	0.028 ± 0.0048	0.026 ± 0.0044	0.051 ± 0.0073	0.032 ± 0.0046
Mito, IBARAKI	7.43	1.15	1.62	0.026 ± 0.0051	0.022 ± 0.0045	0.013 ± 0.0047	0.0082 ± 0.0029
Nishinasuno-machi, TOCHIGI	7.53	1.19	1.52	0.043 ± 0.0056	0.036 ± 0.0047	0.017 ± 0.0049	0.011 ± 0.0032
Fujimi-mura, GUNMA	7.43	1.05	1.85	0.027 ± 0.0047	0.025 ± 0.0045	0.0081 ± 0.0041	0.0044 ± 0.0022
Yachimata, CHIBA	7.67	1.14	1.58	0.023 ± 0.0049	0.020 ± 0.0043	0.025 ± 0.0061	0.016 ± 0.0038
Oshimizu-machi, ISHIKAWA	7.65	1.16	1.61	0.032 ± 0.0060	0.027 ± 0.0052	0.0031 ± 0.0041	0.0019 ± 0.0026
Takane-machi, YAMANASHI	6.58	1.02	1.36	0.025 ± 0.0049	0.024 ± 0.0048	0.0047 ± 0.0047	0.0035 ± 0.0035
Kasamatsu-machi, GIFU	6.87	1.03	1.40	0.034 ± 0.0052	0.033 ± 0.0051	0.0085 ± 0.0043	0.0061 ± 0.0031
Hino-machi, SHIGA	7.15	1.05	1.71	0.029 ± 0.0047	0.028 ± 0.0045	0.011 ± 0.0043	0.0066 ± 0.0025
Oouchiyama-mura, MIE	7.31	1.08	1.60	0.024 ± 0.0070	0.022 ± 0.0064	0.0049 ± 0.0038	0.0031 ± 0.0024
Mihara-machi, HYOUGO	7.08	1.07	1.46	0.032 ± 0.0076	0.030 ± 0.0071	0.0080 ± 0.0039	0.0055 ± 0.0027
Oouda-machi, NARA	7.34	1.06	1.53	0.032 ± 0.0071	0.031 ± 0.0067	0.0096 ± 0.0059	0.0063 ± 0.0038
Takase-machi, KAGAWA	7.16	1.09	1.52	0.019 ± 0.0060	0.017 ± 0.0055	0.013 ± 0.0055	0.0088 ± 0.0036
Matsuyama, EHIME	7.05	1.05	1.53	0.022 ± 0.0052	0.021 ± 0.0050	0.0020 ± 0.0036	0.0013 ± 0.0024
Koushi-machi, KUMAMOTO	7.20	1.09	1.56	0.024 ± 0.0064	0.022 ± 0.0059	0.0058 ± 0.0057	0.0037 ± 0.0037
Kujuu-machi, OOITA	7.23	1.11	1.58	0.024 ± 0.0042	0.021 ± 0.0038	0.18 ± 0.012	0.11 ± 0.008
Takahara-machi, MIYAZAKI	7.04	1.09	1.66	0.019 ± 0.0059	0.017 ± 0.0054	0.030 ± 0.0068	0.018 ± 0.0041
September, 1996							
Tonami, TOYAMA	7.27	1.10	1.53	0.0089 ± 0.0039	0.0081 ± 0.0036	0.043 ± 0.0067	0.028 ± 0.0044
Kamiita-machi, TOKUSHIMA	7.37	1.13	1.65	0.019 ± 0.0047	0.017 ± 0.0041	0.011 ± 0.0045	0.0065 ± 0.0027

(3)-2 Strontium-90 and Cesium-137 in Milk (producing districts for WHO program)
(from Apr. 1996 to Sep. 1996)
-continued from No. 117 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)
April, 1996							
Kochi, KOCHI	7.45	1.16	1.54	0.026 ± 0.0055	0.023 ± 0.0048	0.0022 ± 0.0044	0.0014 ± 0.0029
May, 1996							
Hokudainoujou, HOKKAIDOU	7.25	1.08	1.55	0.044 ± 0.0064	0.041 ± 0.0059	0.047 ± 0.0071	0.030 ± 0.0046
Hachijou-machi, TOKYO	7.12	0.954	1.42	0.061 ± 0.0067	0.064 ± 0.0070	0.054 ± 0.0079	0.038 ± 0.0056
Nishikawa-machi, NIIGATA	7.42	1.02	1.65	0.010 ± 0.0052	0.0098 ± 0.0051	0.0089 ± 0.0045	0.0054 ± 0.0027
Katsuyama, FUKUI	7.46	1.11	1.64	0.013 ± 0.0049	0.011 ± 0.0044	0.0017 ± 0.0034	0.0011 ± 0.0021
Shijounawate, OSAKA	7.58	1.10	1.46	0.036 ± 0.0063	0.033 ± 0.0058	0.0097 ± 0.0048	0.0067 ± 0.0033
Matsue, SHIMANE	7.45	1.07	1.56	0.036 ± 0.0089	0.034 ± 0.0083	0.0038 ± 0.0043	0.0024 ± 0.0027
Yasu-machi, FUKUOKA	7.10	1.06	1.52	0.027 ± 0.0056	0.025 ± 0.0053	0.010 ± 0.0047	0.0067 ± 0.0031
Kajiki-machi, KAGOSHIMA	7.37	1.11	1.58	0.016 ± 0.0053	0.014 ± 0.0048	0.016 ± 0.0056	0.010 ± 0.0036
June, 1996							
Takamiya-machi, HIROSHIMA	7.18	1.07	1.56	0.014 ± 0.0055	0.013 ± 0.0051	0.0039 ± 0.0054	0.0025 ± 0.0034
July, 1996							
Takamiya-machi, HIROSHIMA	7.19	1.06	1.52	0.029 ± 0.0064	0.027 ± 0.0060	0.027 ± 0.0058	0.018 ± 0.0038
August, 1996							
Hokudainoujou, HOKKAIDOU	7.20	1.13	1.63	0.041 ± 0.0058	0.037 ± 0.0051	0.026 ± 0.0071	0.016 ± 0.0043
Hachijou-machi, TOKYO	7.29	1.01	1.51	0.055 ± 0.011	0.054 ± 0.011	0.041 ± 0.0071	0.027 ± 0.0047
Iwamuro-mura, NIIGATA	7.32	1.06	1.57	0.025 ± 0.0060	0.024 ± 0.0056	0.012 ± 0.0047	0.0078 ± 0.0030
Katsuyama, FUKUI	7.46	1.06	1.69	0.028 ± 0.0055	0.027 ± 0.0051	0.027 ± 0.0061	0.016 ± 0.0036
Shijounawate, OSAKA	7.41	1.12	1.46	0.030 ± 0.0064	0.027 ± 0.0058	0.018 ± 0.0050	0.012 ± 0.0034
Kochi, KOCHI	7.31	1.11	1.61	0.031 ± 0.0049	0.028 ± 0.0044	0.021 ± 0.0061	0.013 ± 0.0038
Yasu-machi, FUKUOKA	7.06	1.07	1.56	0.029 ± 0.0052	0.027 ± 0.0049	0.0087 ± 0.0046	0.0056 ± 0.0030
Kajiki-machi, KAGOSHIMA	7.17	1.08	1.61	0.013 ± 0.0051	0.012 ± 0.0047	0.016 ± 0.0049	0.010 ± 0.0030
September, 1996							
Matsue, SHIMANE	7.80	1.12	1.64	0.039 ± 0.0090	0.035 ± 0.0080	0.0075 ± 0.0051	0.0046 ± 0.0031

(3)-3 Strontium-90 and Cesium-137 in Milk (consuming districts)
(from Apr. 1996 to Sep. 1996)
-continued from No. 117 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, 1996							
Sendai, MIYAGI	7.40	1.11	1.60	0.016 ± 0.0047	0.015 ± 0.0042	0.0042 ± 0.0047	0.0026 ± 0.0029
Shinguu, WAKAYAMA	6.92	1.04	1.60	0.026 ± 0.0049	0.025 ± 0.0047	0.0025 ± 0.0043	0.0016 ± 0.0027
June, 1996							
Kyoto, KYOTO	7.32	1.07	1.67	0.045 ± 0.0088	0.042 ± 0.0082	0.024 ± 0.0054	0.014 ± 0.0032
July, 1996							
Hiroshima, HIROSHIMA	6.90	1.03	1.49	0.017 ± 0.0062	0.016 ± 0.0059	0.020 ± 0.0055	0.014 ± 0.0037
August, 1996							
Sapporo, HOKKAIDOU	7.33	1.11	1.58	0.069 ± 0.010	0.062 ± 0.0094	0.022 ± 0.0055	0.014 ± 0.0035
Akita, AKITA	6.39	0.939	1.38	0.035 ± 0.0056	0.038 ± 0.0059	0.015 ± 0.0048	0.011 ± 0.0035
Yamagata, YAMAGATA	6.94	1.05	1.51	0.031 ± 0.0070	0.029 ± 0.0066	0.0098 ± 0.0053	0.0065 ± 0.0035
Fukushima, FUKUSHIMA	7.42	1.10	1.60	0.018 ± 0.0044	0.016 ± 0.0040	0.018 ± 0.0054	0.011 ± 0.0033
Urawa, SAITAMA	6.83	1.01	1.50	0.023 ± 0.0050	0.023 ± 0.0049	0.012 ± 0.0051	0.0082 ± 0.0034
Shinjuku, TOKYO	6.69	0.998	1.49	0.039 ± 0.0054	0.039 ± 0.0054	0.055 ± 0.0075	0.037 ± 0.0051
Yokohama, KANAGAWA	7.40	1.13	1.61	0.044 ± 0.0082	0.039 ± 0.0073	0.14 ± 0.012	0.087 ± 0.0072
Niigata, NIIGATA	7.32	1.08	1.60	0.023 ± 0.0054	0.021 ± 0.0050	0.012 ± 0.0050	0.0074 ± 0.0031
Fukui, FUKUI	7.29	1.08	1.57	0.025 ± 0.0051	0.023 ± 0.0047	0.0085 ± 0.0045	0.0054 ± 0.0029
Nagano, NAGANO	6.49	0.975	1.33	0.014 ± 0.0045	0.014 ± 0.0046	0.0030 ± 0.0046	0.0022 ± 0.0035
Shizuoka, SHIZUOKA	7.01	1.06	1.57	0.027 ± 0.0047	0.025 ± 0.0045	0.024 ± 0.0057	0.015 ± 0.0036
Nagoya, AICHI	7.26	1.10	1.58	0.022 ± 0.0071	0.020 ± 0.0064	0.020 ± 0.0051	0.012 ± 0.0032
Osaka, OSAKA	7.05	1.06	1.57	0.032 ± 0.0072	0.030 ± 0.0068	0.093 ± 0.0096	0.060 ± 0.0061
Yonago, TOTTORI	7.00	1.07	1.58	0.013 ± 0.0055	0.012 ± 0.0052	0.012 ± 0.0057	0.0077 ± 0.0036
Matsue, SHIMANE	7.25	1.07	1.49	0.021 ± 0.0070	0.020 ± 0.0065	0.0095 ± 0.0050	0.0064 ± 0.0033
Okayama, OKAYAMA	7.03	1.02	1.55	0.022 ± 0.0065	0.021 ± 0.0064	0.017 ± 0.0054	0.011 ± 0.0035
Yamaguchi, YAMAGUCHI	7.20	1.09	1.64	0.045 ± 0.0058	0.041 ± 0.0053	0.026 ± 0.0058	0.016 ± 0.0035
Matsuyama, EHIME	7.03	1.05	1.53	0.024 ± 0.0055	0.023 ± 0.0053	0.0088 ± 0.0045	0.0057 ± 0.0030
Kochi, KOCHI	7.12	1.06	1.53	0.014 ± 0.0054	0.013 ± 0.0050	0.012 ± 0.0051	0.0081 ± 0.0033

Location	Component			^{90}Sr		^{137}Cs	
	Ash(g/ ℓ)	Ca(g/ ℓ)	K(g/ ℓ)	(Bq/ ℓ)	(Bq/gCa)	(Bq/ ℓ)	(Bq/gK)
Chikushino, FUKUOKA	7.10	1.07	1.57	0.019 ± 0.0061	0.018 ± 0.0057	0.0059 ± 0.0054	0.0038 ± 0.0034
Nagasaki, NAGASAKI	5.50	0.846	1.19	0.018 ± 0.0044	0.021 ± 0.0052	0.0019 ± 0.0057	0.0016 ± 0.0048
Kagoshima, KAGOSHIMA	7.28	1.13	1.56	0.015 ± 0.0052	0.013 ± 0.0046	0.017 ± 0.0054	0.011 ± 0.0035
Yonagusuku-machi, Okinawa	7.17	1.09	1.62	0.032 ± 0.0047	0.030 ± 0.0043	0.0051 ± 0.0039	0.0032 ± 0.0024
September, 1996							
Sendai, MIYAGI	8.60	1.06	1.55	0.037 ± 0.0076	0.035 ± 0.0072	0.018 ± 0.0050	0.011 ± 0.0033

(3)-4 Strontium-90 and Cesium-137 in Milk (powdered milk)
(from Apr. 1996 to Sep. 1996)
-continued from No. 117 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, 1996							
Sample A,	7.91	12.3	18.1	0.42 ± 0.032	0.034 ± 0.0026	0.35 ± 0.023	0.019 ± 0.0013
Sample B,	2.63	3.31	6.68	0.034 ± 0.0081	0.010 ± 0.0025	0.075 ± 0.0080	0.011 ± 0.0012
Sample C,	7.89	12.2	18.2	0.52 ± 0.041	0.043 ± 0.0034	2.0 ± 0.05	0.11 ± 0.003
Sample D,	2.59	4.14	5.98	0.023 ± 0.0073	0.0057 ± 0.0018	0.089 ± 0.0089	0.015 ± 0.0015
Sample E,	2.53	4.23	5.54	0.12 ± 0.013	0.028 ± 0.0030	0.12 ± 0.010	0.022 ± 0.0018
Sample F,	2.78	3.22	5.48	0.043 ± 0.0095	0.013 ± 0.0030	0.11 ± 0.010	0.021 ± 0.0019

(4)-1 Strontium-90 and cesium-137 in Vegetables (producing districts)
(from Apr. 1996 to Sep. 1996)

-continued from No. 117 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, 1996											
Oota, SHIMANE	1.12	1.08	3.63	0.93	± 0.023	0.86	± 0.021	0.61	± 0.023	0.17	± 0.006
(Japanese radish)											
May, 1996											
Tahara-machi, AICHI	0.613	0.166	2.61	0.012	± 0.0047	0.070	± 0.028	0.0000	± 0.0055	0.0000	± 0.0021
Koushi-machi, KUMAMOTO	0.660	0.172	2.77	0.030	± 0.0049	0.17	± 0.029	0.0000	± 0.0051	0.0000	± 0.0019
July, 1996											
Oota, SHIMANE	0.563	0.184	2.15	0.37	± 0.015	2.0	± 0.08	0.10	± 0.011	0.048	± 0.0051
August, 1996											
Hiroshima-machi, HOKKAIDOU	0.512	0.143	2.29	0.30	± 0.013	2.1	± 0.09	0.010	± 0.0061	0.0045	± 0.0027
(Onion)											
July, 1996											
Kumatori-machi, OSAKA	0.389	0.176	1.54	0.034	± 0.0054	0.19	± 0.030	0.0044	± 0.0056	0.0029	± 0.0037
(Potato)											
August, 1996											
Mutsu, AOMORI	0.984	0.015	3.98	0.038	± 0.0052	2.6	± 0.35	0.066	± 0.0090	0.016	± 0.0023
(Spinach)											
May, 1996											
Tahara-machi, AICHI	1.63	0.462	7.25	0.019	± 0.0051	0.041	± 0.011	0.0052	± 0.0054	0.00072	± 0.00075
Koushi-machi, KUMAMOTO	1.80	0.553	7.65	0.061	± 0.0068	0.11	± 0.012	0.012	± 0.0067	0.0016	± 0.00088
August, 1996											
Hiroshima-machi, HOKKAIDOU	1.67	0.371	7.72	0.31	± 0.014	0.84	± 0.037	0.015	± 0.0071	0.0019	± 0.00091

(4)-2 Strontium-90 and cesium-137 in Vegetables (consuming districts)
(from Apr. 1996 to Sep. 1996)

-continued from No. 117 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, 1996							
Rifu-machi, MIYAGI	0.502	0.215	2.12	0.086 ± 0.013	0.40 ± 0.058	0.039 ± 0.0081	0.018 ± 0.0038
Urawa, SAITAMA	0.535	0.201	2.37	0.063 ± 0.010	0.31 ± 0.051	0.0093 ± 0.0061	0.0039 ± 0.0026
(Spinach)							
May, 1996							
Sendai, MIYAGI	1.90	1.12	6.84	0.084 ± 0.011	0.075 ± 0.010	0.0000 ± 0.0057	0.00000 ± 0.00084
June, 1996							
Niigata, NIIGATA	1.25	0.568	4.69	0.035 ± 0.0078	0.062 ± 0.014	0.022 ± 0.0071	0.0047 ± 0.0015
September, 1996							
Urawa, SAITAMA	1.76	0.452	7.99	0.14 ± 0.015	0.30 ± 0.033	0.0000 ± 0.0057	0.00000 ± 0.00072

(5) Strontium-90 and Cesium-137 in Tea (Japanese Tea)
(from Apr. 1996 to Sep. 1996)
-continued from No, 115 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, 1996											
Ikeda-machi, GIFU	5.22	3.59	15.6	0.96	± 0.073	0.27	± 0.020	0.099	± 0.022	0.0064	± 0.0014
Shirakawa-machi, GIFU	5.28	2.24	17.4	0.33	± 0.044	0.15	± 0.020	0.12	± 0.024	0.0068	± 0.0014
Iwata, SHIZUOKA	1.27	0.590	4.43	0.078	± 0.012	0.13	± 0.020	0.015	± 0.0051	0.0033	± 0.0012
Iwata, SHIZUOKA	1.48	0.781	5.15	1.8	± 0.05	2.3	± 0.07	0.31	± 0.017	0.060	± 0.0032
Kameyama, MIE	6.29	3.60	20.6	2.0	± 0.09	0.56	± 0.026	0.24	± 0.028	0.012	± 0.0014
Oodai-machi, MIE	3.64	1.63	13.5	0.21	± 0.033	0.13	± 0.020	0.11	± 0.020	0.0079	± 0.0015
Nara, NARA	5.00	2.21	15.9	0.70	± 0.059	0.32	± 0.027	0.28	± 0.031	0.018	± 0.0020
Nara, NARA	5.11	2.48	17.4	0.46	± 0.048	0.19	± 0.019	0.39	± 0.035	0.022	± 0.0020
Mifune-machi, KUMAMOTO	6.77	3.63	22.1	0.29	± 0.026	0.081	± 0.0072	0.043	± 0.018	0.0020	± 0.00083
Ue-mura, KUMAMOTO	6.08	2.17	18.5	0.46	± 0.030	0.21	± 0.014	0.45	± 0.036	0.024	± 0.0020
Miyakonojou, MIYAZAKI	5.80	3.06	18.7	0.22	± 0.021	0.071	± 0.0068	1.5	± 0.07	0.083	± 0.0035
Kawaminami-machi, MIYAZAKI	5.44	2.34	18.2	0.60	± 0.038	0.26	± 0.016	2.3	± 0.09	0.13	± 0.005
June, 1996											
Iruma, SAITAMA	5.45	2.43	16.5	0.39	± 0.030	0.16	± 0.012	0.31	± 0.034	0.019	± 0.0021
Tokorozawa, SAITAMA	5.28	2.65	16.5	0.49	± 0.032	0.18	± 0.012	0.50	± 0.042	0.031	± 0.0025
Kaya-machi, KYOTO	5.47	3.07	17.8	1.7	± 0.09	0.56	± 0.028	0.29	± 0.030	0.017	± 0.0017
Uji, KYOTO	5.09	2.58	17.2	1.0	± 0.07	0.41	± 0.026	0.058	± 0.018	0.0034	± 0.0011
Chiran-machi, KAGOSHIMA	5.20	2.19	18.3	0.28	± 0.042	0.13	± 0.019	1.3	± 0.06	0.070	± 0.0035
Miyanojou-machi, KAGOSHIMA	5.80	2.68	20.0	0.58	± 0.052	0.22	± 0.020	0.33	± 0.032	0.016	± 0.0016

(6) Strontium-90 and cesium-137 in Sea Fish
(from Apr. 1996 to Sep. 1996)

-continued from No. 117 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, 1996							
Akashi, HYOUGO	2.22	2.45	3.44	0.0033 ± 0.0052	0.0014 ± 0.0021	0.085 ± 0.0094	0.025 ± 0.0027
(Hexagrammos otakii)							
September, 1996							
Souma, FUKUSHIMA	1.74	1.71	3.98	0.0071 ± 0.0031	0.0041 ± 0.0018	0.15 ± 0.013	0.038 ± 0.0032
(Katsuwonus pelamis)							
June, 1996							
Tosa, KOCHI	1.23	0.059	3.92	0.0098 ± 0.0066	0.17 ± 0.11	0.28 ± 0.016	0.070 ± 0.0040
(Limanda herzensteini)							
June, 1996							
Sendai, MIYAGI	2.74	5.64	3.14	0.011 ± 0.0036	0.0019 ± 0.00064	0.046 ± 0.0083	0.015 ± 0.0026
(Mugil cephalus)							
August, 1996							
Morodomi-machi, SAGA	1.33	0.725	3.79	0.0034 ± 0.0071	0.0047 ± 0.0098	0.063 ± 0.0082	0.017 ± 0.0022
(Oncorhynchus keta)							
September, 1996							
Urakawa-machi, HOKKAIDOU	1.41	0.486	3.82	0.0048 ± 0.0029	0.0099 ± 0.0059	0.076 ± 0.0097	0.020 ± 0.0025
(Pagrus sp)							
July, 1996							
Fukuoka, FUKUOKA	1.33	0.539	4.03	0.0014 ± 0.0033	0.0026 ± 0.0062	0.15 ± 0.012	0.037 ± 0.0030
August, 1996							
Tennou-machi, AKITA	1.64	1.88	3.33	0.0051 ± 0.0032	0.0027 ± 0.0017	0.12 ± 0.011	0.036 ± 0.0032
September, 1996							
Owase, MIE	1.43	0.216	4.57	0.0051 ± 0.0034	0.024 ± 0.016	0.19 ± 0.014	0.042 ± 0.0030
(Sardinops melanostictus)							

Location	Component			^{90}Sr		^{137}Cs	
	Ash(%)	Ca(g/kg)	K(g/kg)	(Bq/kgwet)	(Bq/gCa)	(Bq/kgwet)	(Bq/gK)
August, 1996							
Yamagata, YAMAGATA	2.45	5.55	2.36	0.0035 ± 0.0033	0.00063 ± 0.00060	0.047 ± 0.0078	0.020 ± 0.0033
(Scomber sp)							
August, 1996							
Matsuyama, EHIME	1.42	0.567	3.99	0.0055 ± 0.0030	0.0097 ± 0.0053	0.17 ± 0.013	0.044 ± 0.0033
(Sebastiscus marmoratus)							
May, 1996							
Hamada, SHIMANE	5.59	17.8	1.75	0.020 ± 0.0048	0.0011 ± 0.00027	0.078 ± 0.012	0.045 ± 0.0070
(Sillago sp)							
June, 1996							
Minamichita-machi, AICHI	4.07	10.4	3.61	0.017 ± 0.0079	0.0016 ± 0.00076	0.10 ± 0.012	0.029 ± 0.0033

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. 1996 to Sep. 1996)

-continued from No. 117 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, 1996							
Ishikari-machi, HOKKAIDOU	5.31	16.5	2.68	0.49 ± 0.027	0.029 ± 0.0017	0.039 ± 0.0073	0.015 ± 0.0027
(Cyprinus carpio)							
May, 1996							
Kasumigaura-lake, IBARAKI	0.835	0.202	2.59	0.0091 ± 0.0062	0.045 ± 0.031	0.34 ± 0.018	0.13 ± 0.007
August, 1996							
Akita, AKITA	3.34	9.42	2.30	1.7 ± 0.05	0.18 ± 0.005	0.20 ± 0.013	0.087 ± 0.0058
(Salvelinus leucomaenis)							
September, 1996							
Fukushima, FUKUSHIMA	1.27	0.506	3.85	0.0015 ± 0.0035	0.0029 ± 0.0069	0.13 ± 0.011	0.034 ± 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. 1996 to Sep. 1996)

-continued from No. 117 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, 1996							
Mutsu, AOMORI	2.56	0.515	1.27	0.0094 ± 0.0037	0.018 ± 0.0072	0.018 ± 0.0050	0.014 ± 0.0039
(Ruditapes phillipinarum)							
May, 1996							
Konagai-machi, NAGASAKI	1.62	0.809	1.35	0.0086 ± 0.0038	0.011 ± 0.0048	0.012 ± 0.0050	0.0091 ± 0.0037
June, 1996							
Minamichita-machi, AICHI	1.80	0.472	3.33	0.018 ± 0.0096	0.037 ± 0.020	0.039 ± 0.0080	0.012 ± 0.0024
(Turbo cornutus)							
April, 1996							
Ryotsu, NIIGATA	2.43	0.953	3.04	0.0010 ± 0.0064	0.0011 ± 0.0067	0.040 ± 0.010	0.013 ± 0.0034
June, 1996							
Sakata, YAMAGATA	1.68	0.862	1.54	0.0019 ± 0.0033	0.0022 ± 0.0038	0.0083 ± 0.0054	0.0054 ± 0.0035
August, 1996							
Togi-machi, ISHIKAWA	3.11	1.45	1.62	0.012 ± 0.0056	0.0083 ± 0.0039	0.027 ± 0.0060	0.017 ± 0.0037

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. 1996 to Sep. 1996)

-continued from No. 117 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, 1996							
Ryotsu, NIIGATA	3.81	0.818	7.60	0.027 ± 0.0050	0.033 ± 0.0061	0.032 ± 0.0063	0.0042 ± 0.00083
Togi-machi, ISHIKAWA	2.57	0.668	3.03	0.016 ± 0.0058	0.024 ± 0.0086	0.013 ± 0.0050	0.0043 ± 0.0016
May, 1996							
Mutsu, AOMORI	2.98	0.783	6.15	0.013 ± 0.0037	0.017 ± 0.0047	0.023 ± 0.0057	0.0037 ± 0.00093
Fukaura-machi, AOMORI	3.16	0.873	8.47	0.027 ± 0.0046	0.031 ± 0.0053	0.031 ± 0.0060	0.0037 ± 0.00071
June, 1996							
Sakata, YAMAGATA	4.11	1.78	5.21	0.049 ± 0.0056	0.027 ± 0.0032	0.042 ± 0.0068	0.0081 ± 0.0013

Seaweeds

Japanese name	English name	Scientific name
Wakame	Wakame seaweed	Undaria pinnatifida

＊ ＊ Total Diet ＊ ＊

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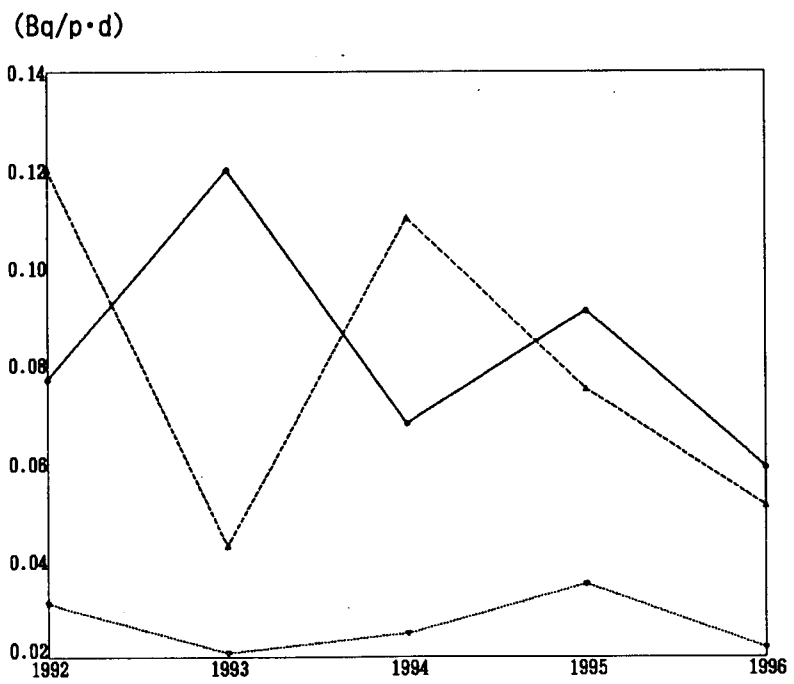

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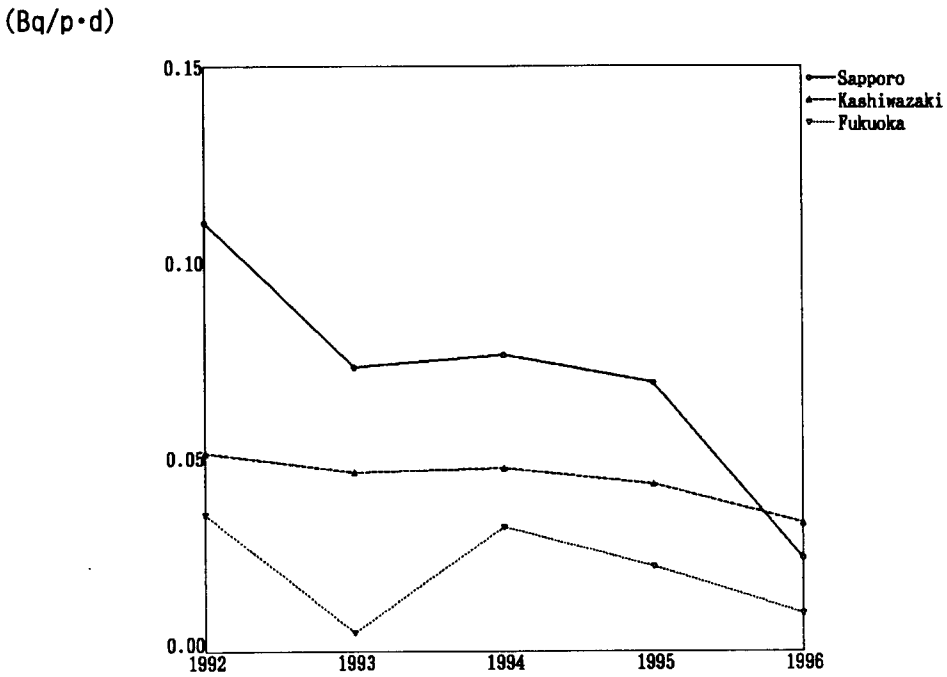

Fig. 1

* * Rice (producing districts) * *

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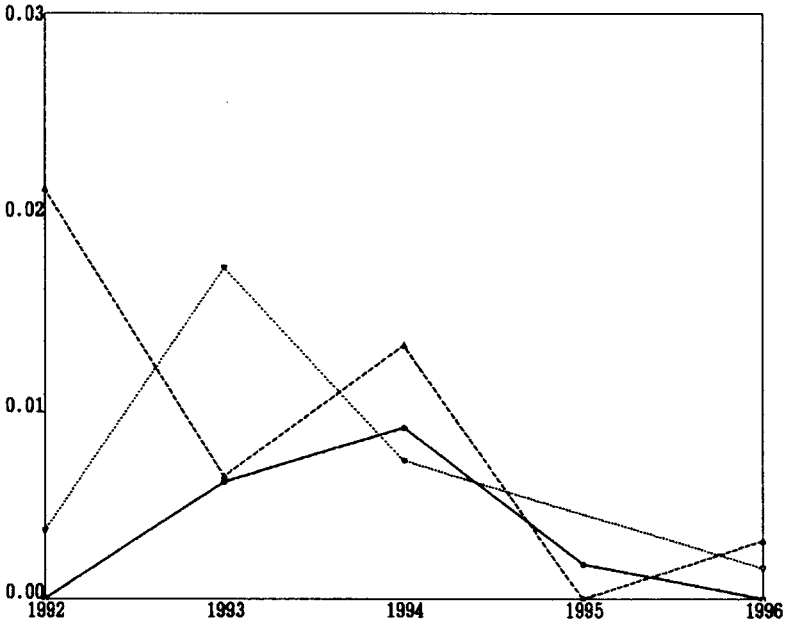

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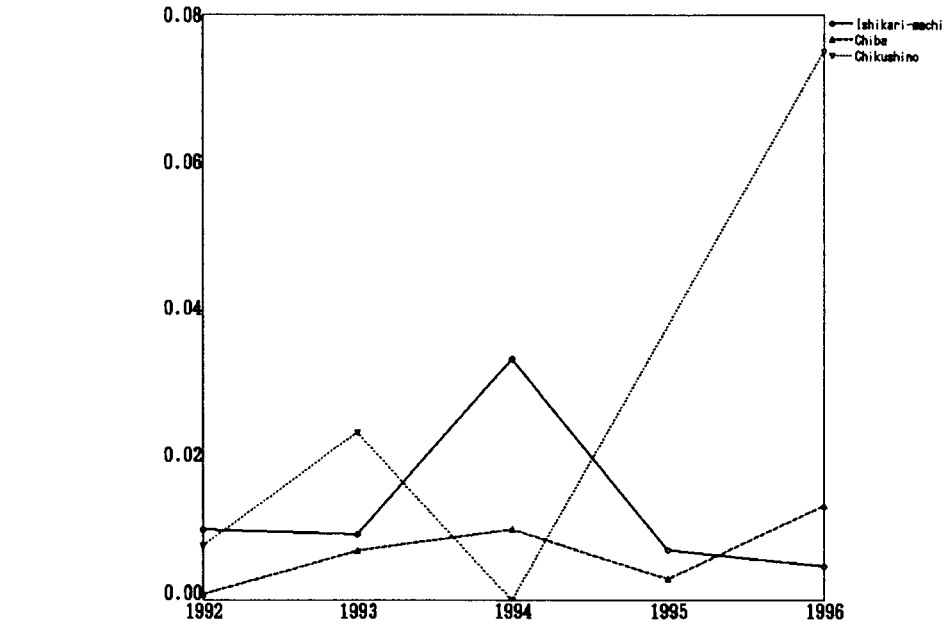

Fig. 2

＊＊ Milk (producing districts for domestic program)

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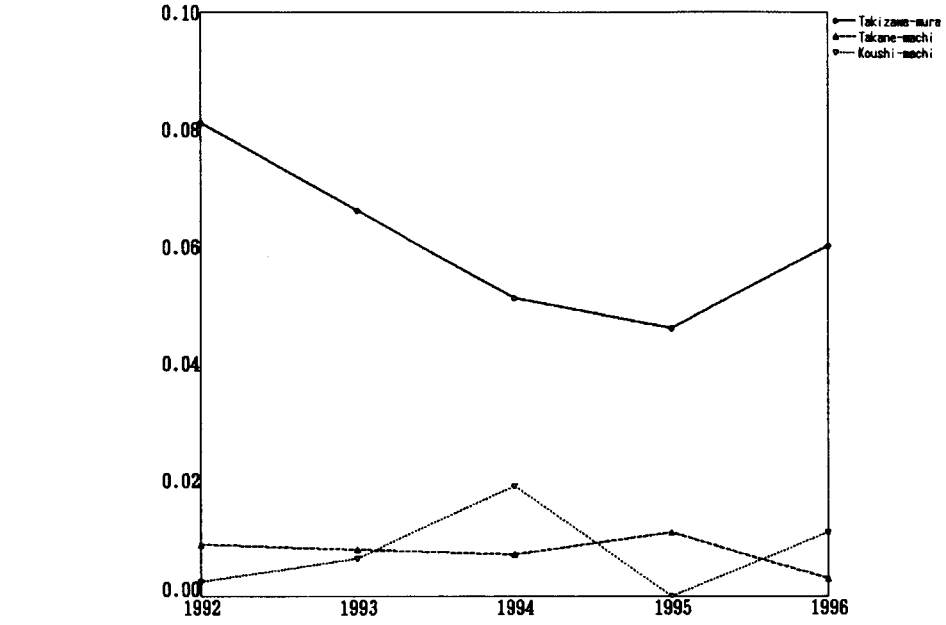

Fig. 3-1

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

<Strontium-90>

(Bq/ ℓ)

<Cesium-137>

(Bq/ ℓ)

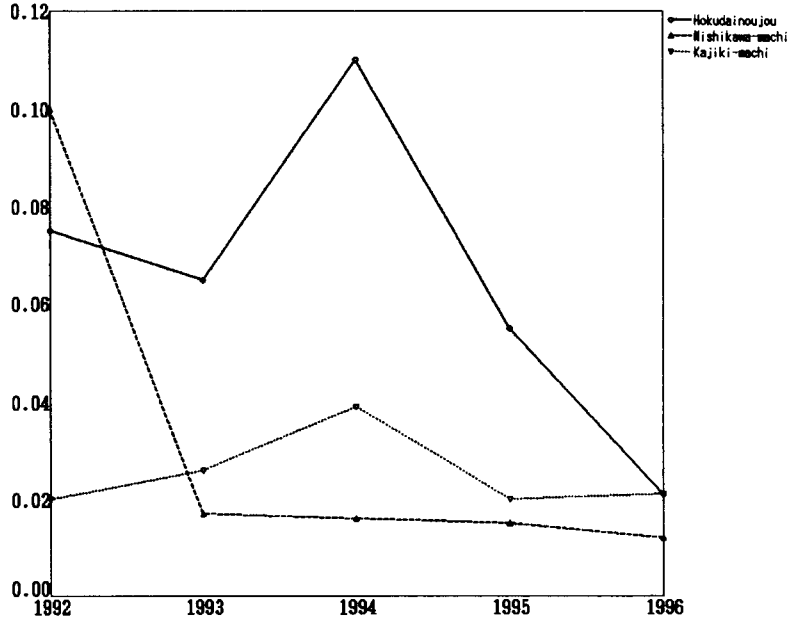

Fig. 3-2

* * Milk (consuming districts) * *

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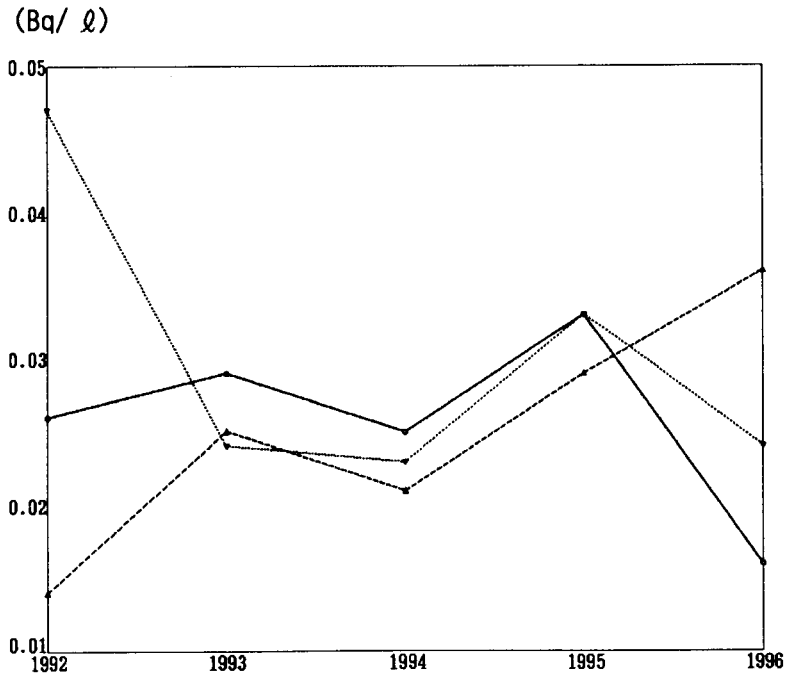

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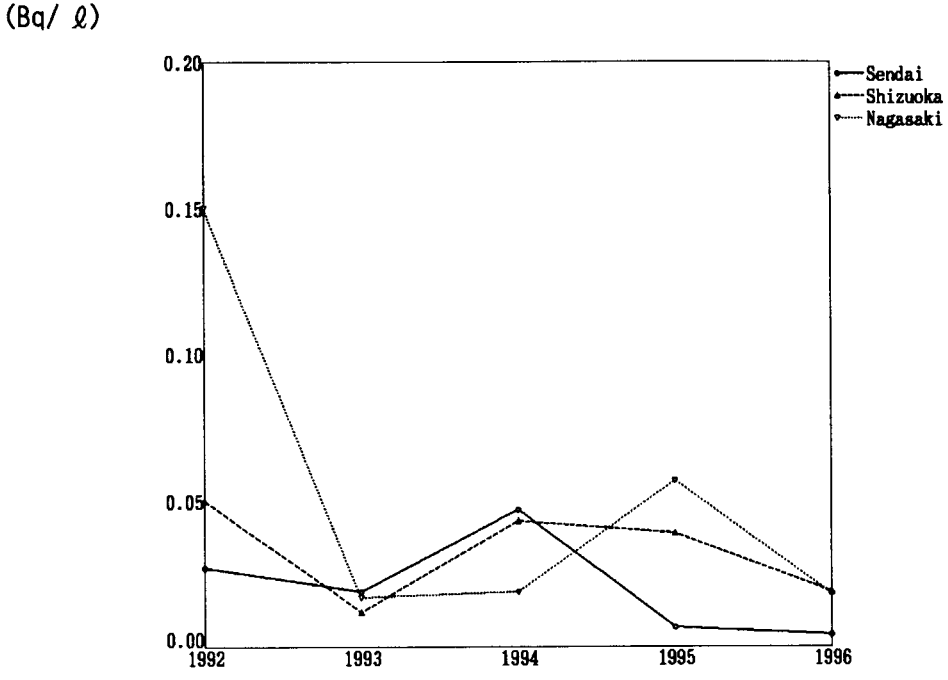

Fig. 3-3

* * Powdered Milk * *

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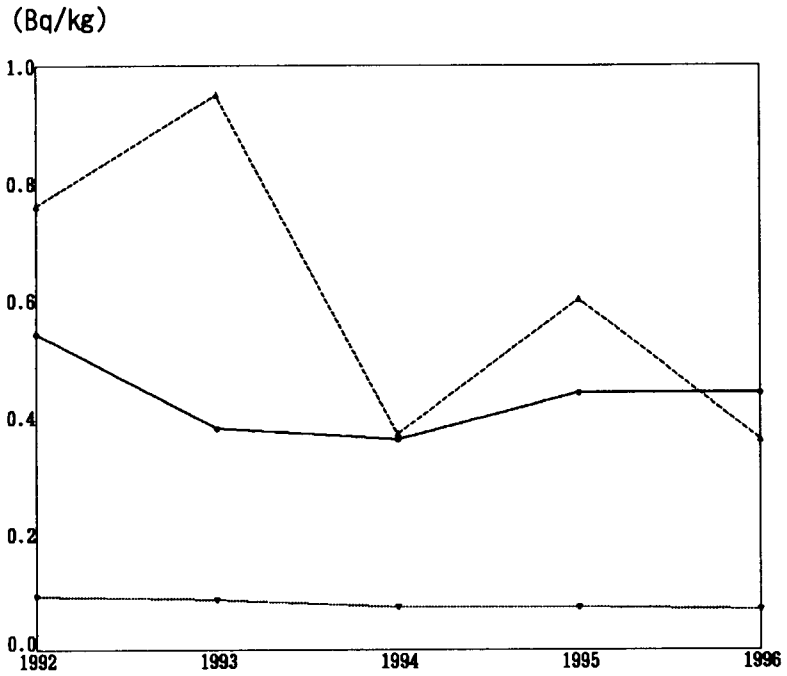

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Fig. 3-4

＊ ＊ Vegetables (producing districts) ＊ ＊

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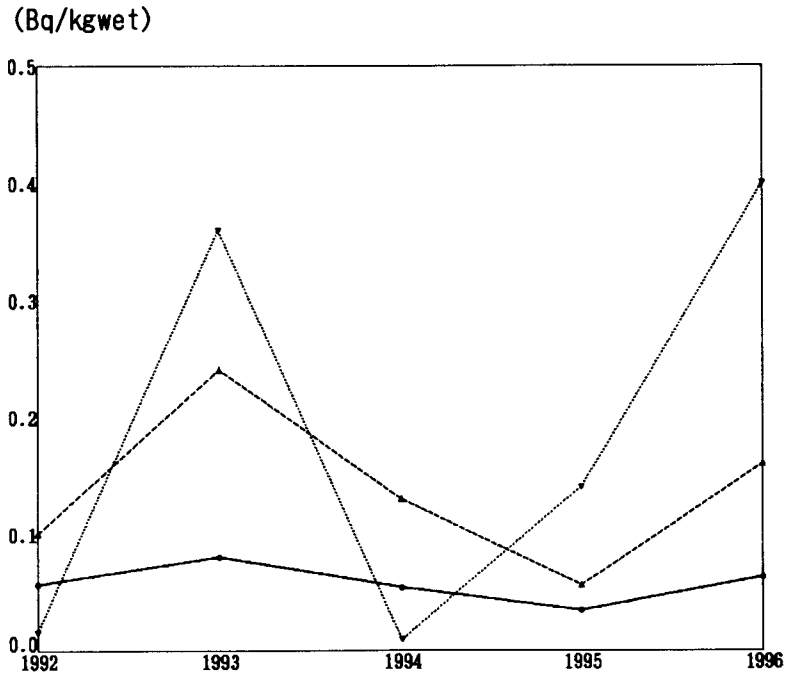

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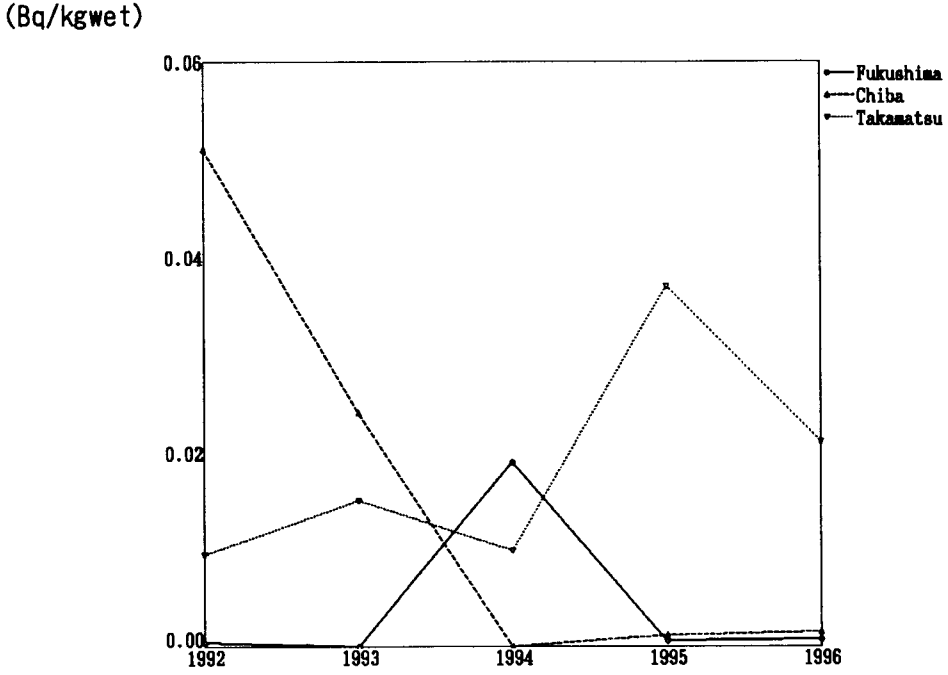

Fig. 4-1

＊ ＊ Vegetables (consuming districts) ＊ ＊

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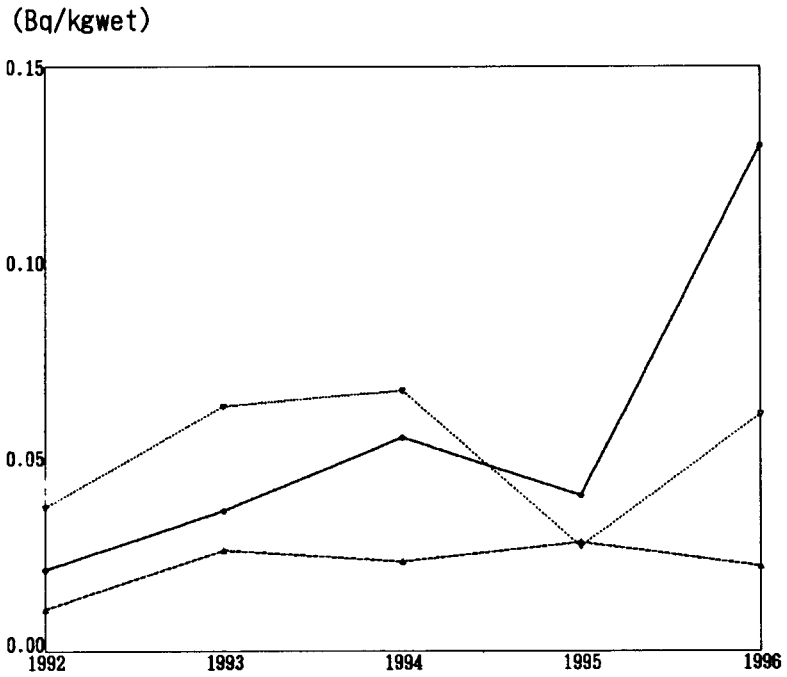

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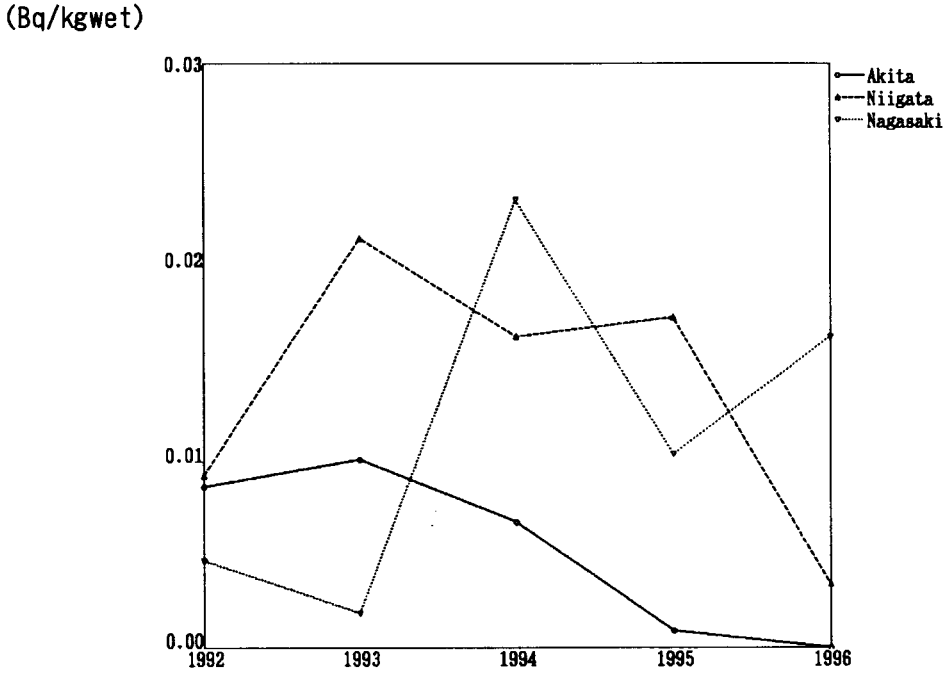

Fig. 4-2

＊ ＊ Tea (Japanese Tea) ＊ ＊

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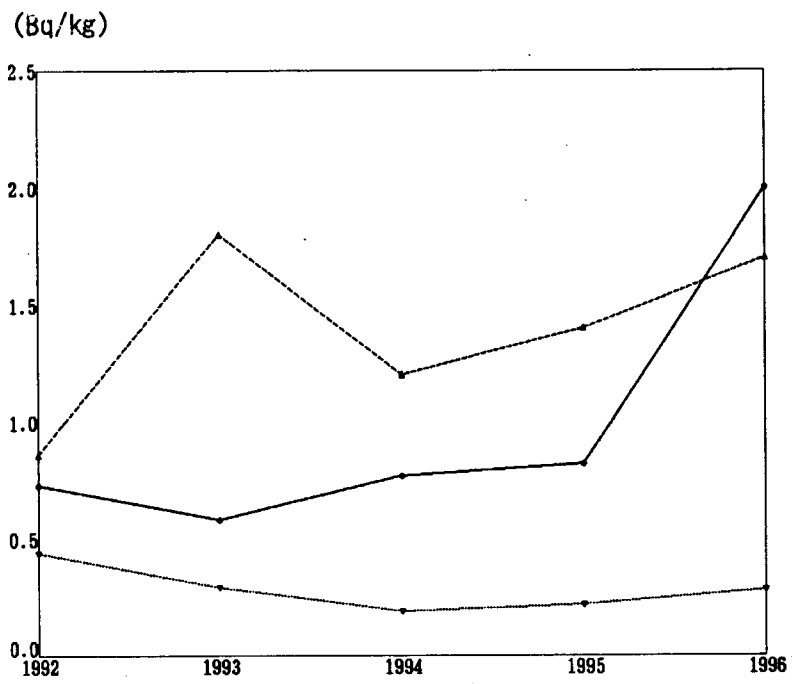

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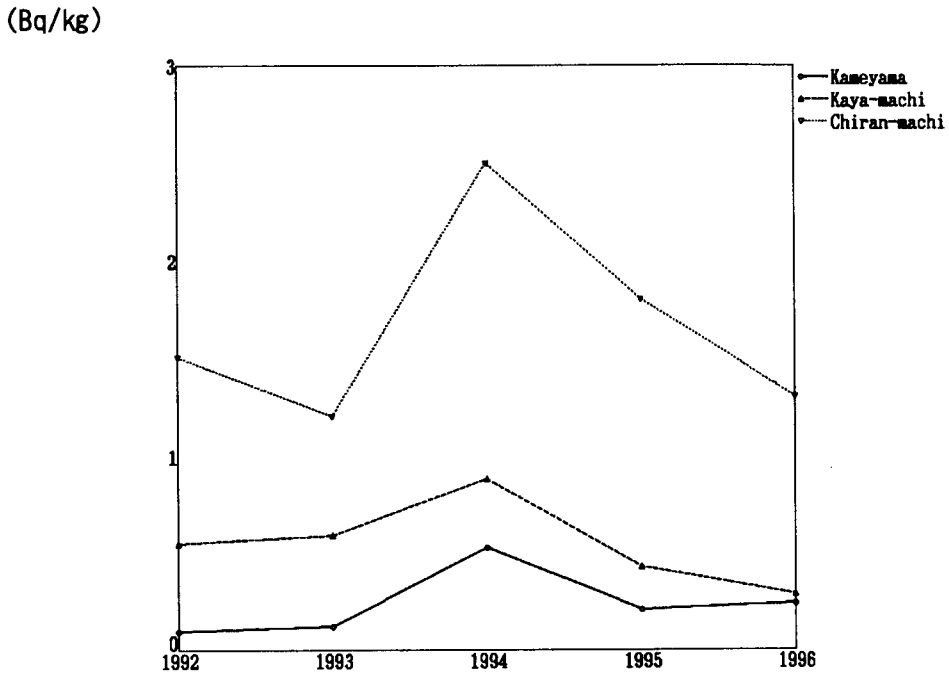

Fig. 5

* * Sea Fish * *

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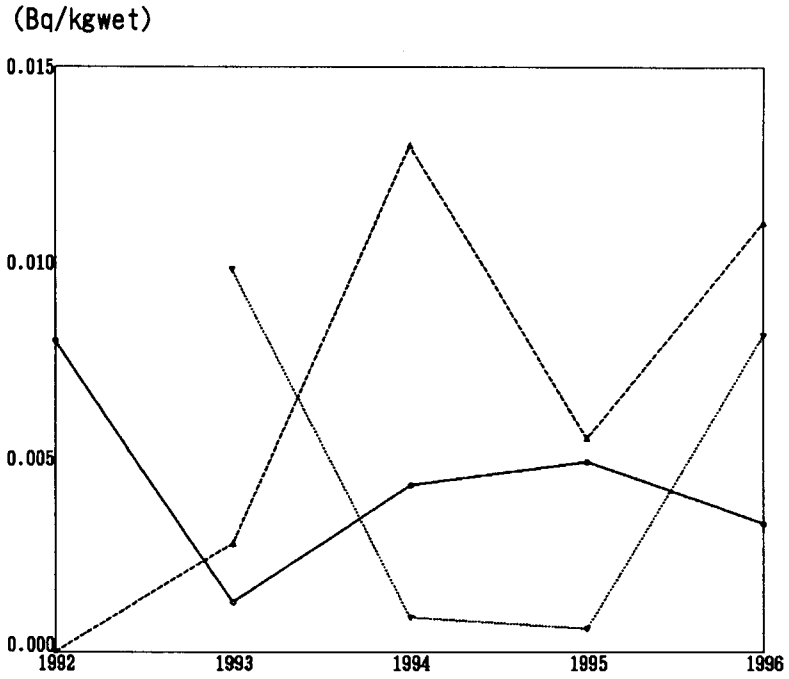

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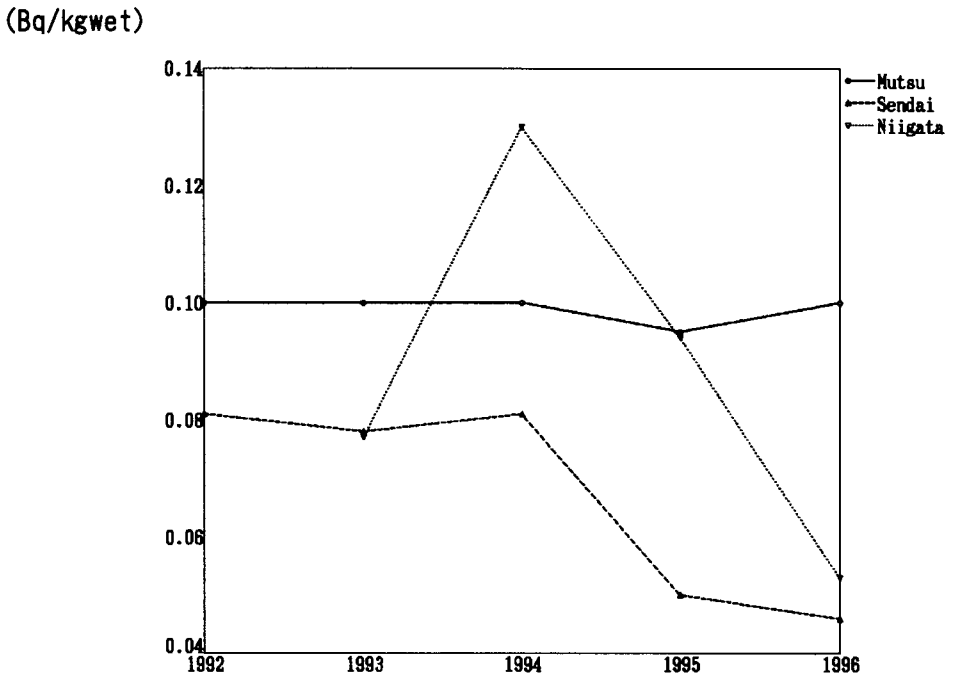

Fig. 6

* * Freshwater Fish * *

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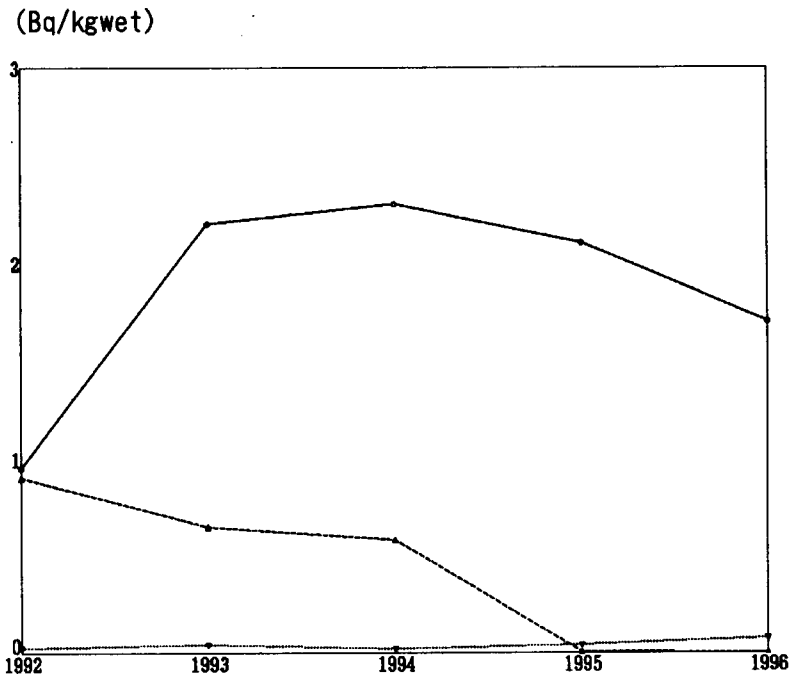

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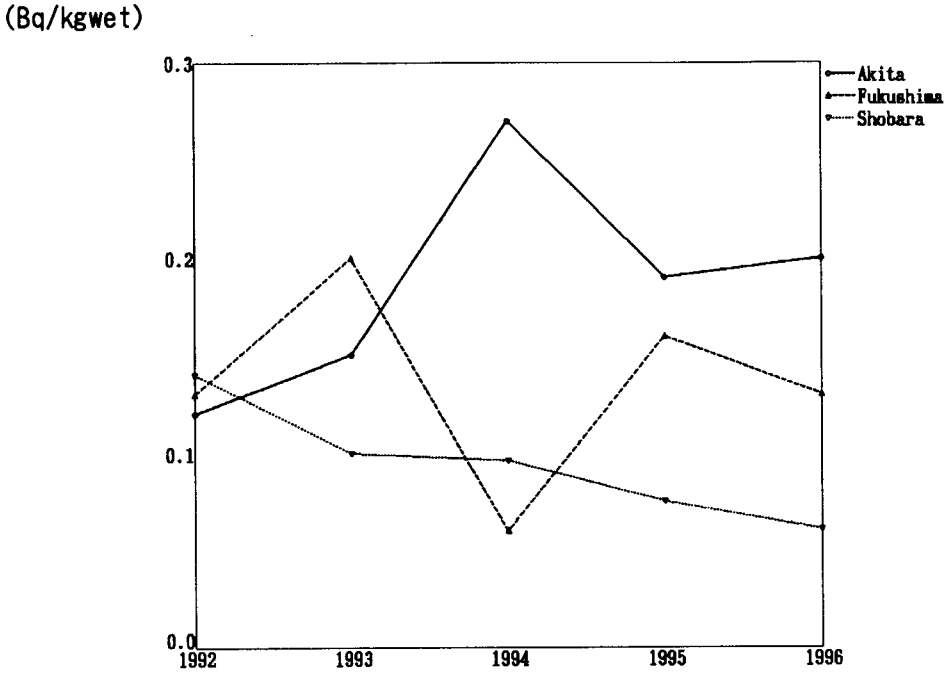
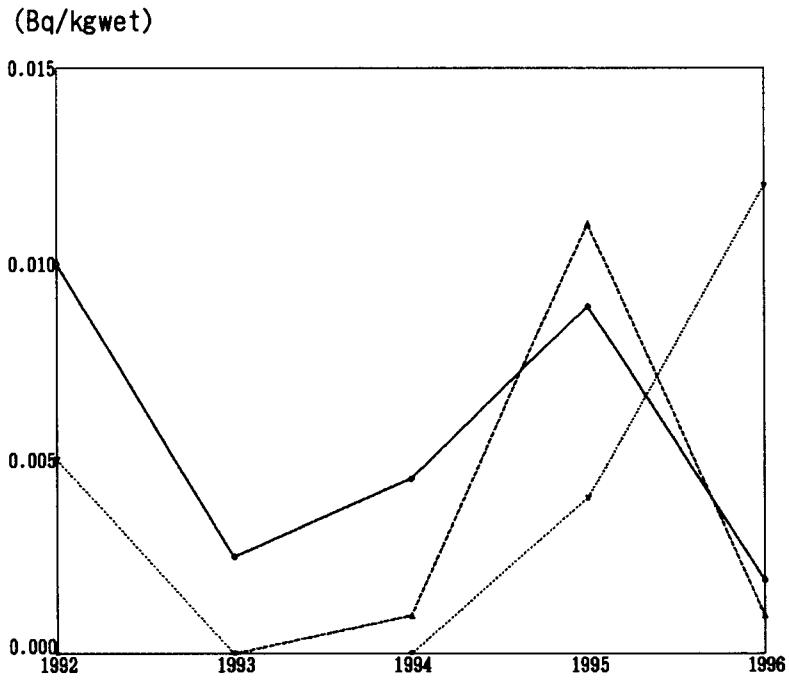


Fig. 7

* * Shellfish * *

<Strontium-90>



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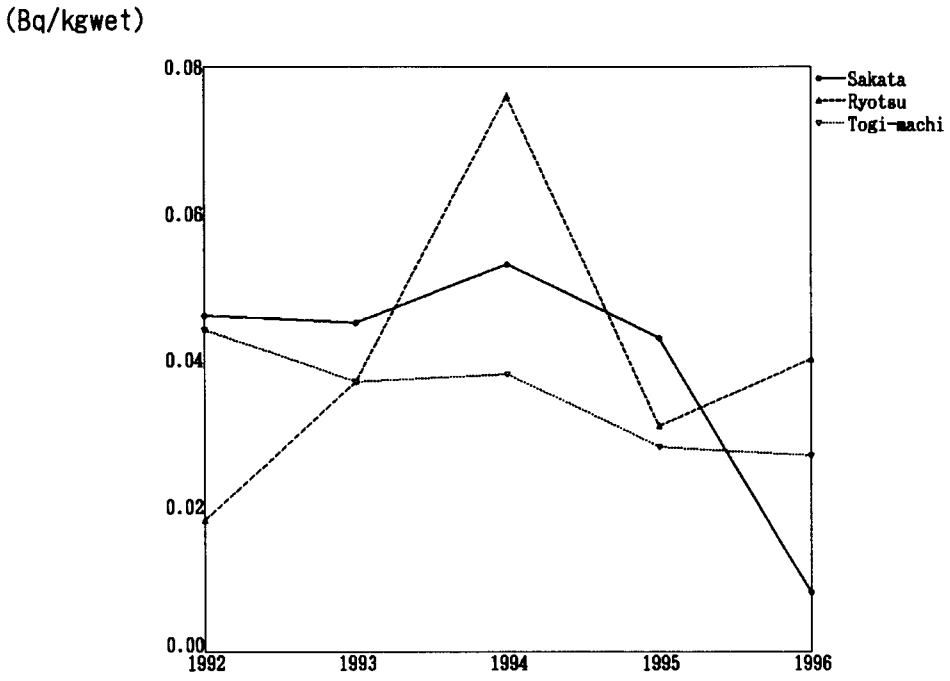

Fig. 8

＊ ＊ Seaweeds ＊ ＊

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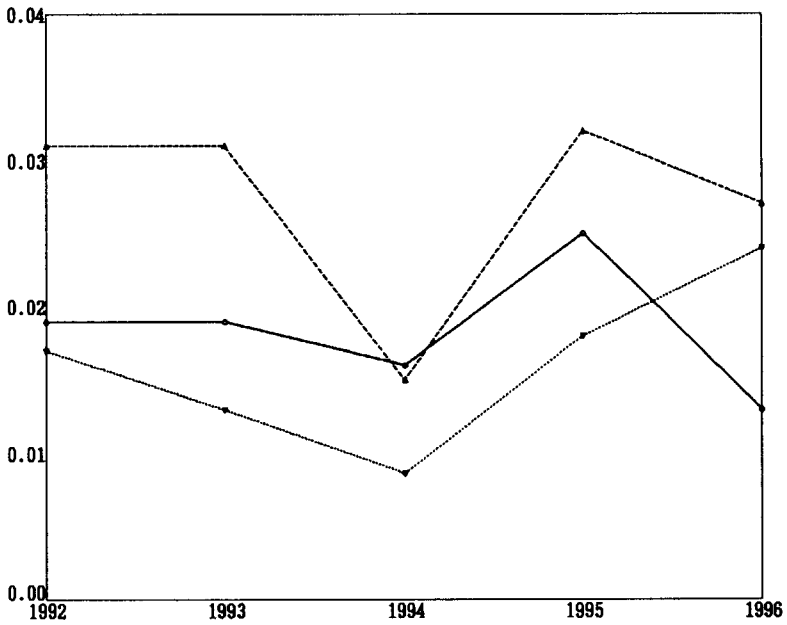

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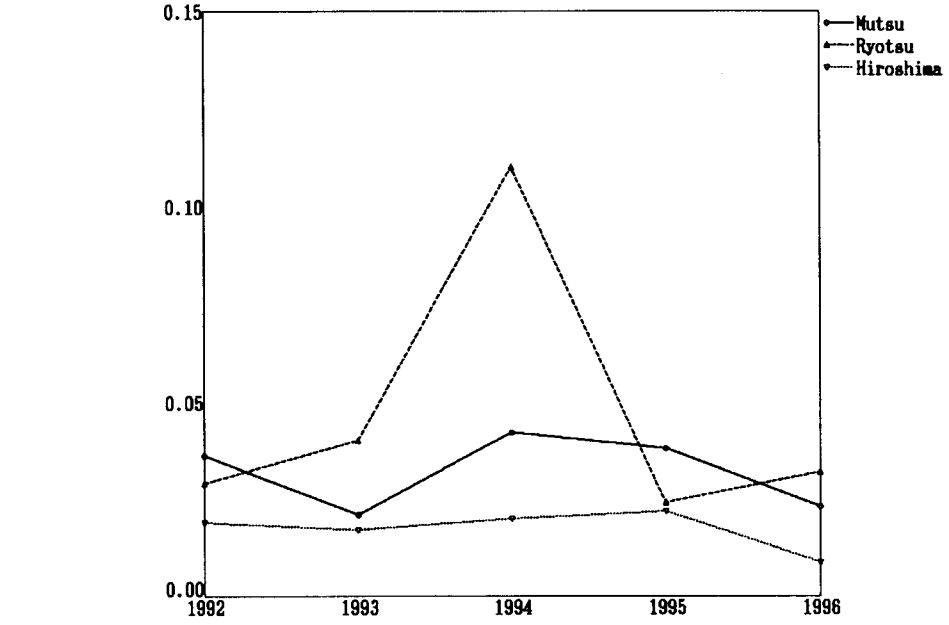

Fig. 9

* * 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