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

The sample was filtered after strontium and cesium carriers were added. 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 (500 mℓ of Dowex 50W X8, 50 ~ 100 mesh, Na form) at a rate of 80 mℓ/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 3000 m^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 an intake of the water-treatment plant and at the tap after water was left running for five minutes. Water, to which added carriers of strontium and cesium immediately after sampling, was vigorously stirred and filtered. 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 disturbance on the surface caused by duststorms, inflow and outflow due to precipitation, and so on. 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 ~ 5 cm and 5 ~ 20 cm. In the course of air-drying, lumps were crushed by hand, and roots of plants and pebbles were removed. The soil was then passed through a 2 mm sieve to remove small gravels.

(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 1 mℓ to 1 ℓ of sea water, and then stored in 20 ℓ polyethylene containers. The sampling equipments as well as containers were thoroughly rinsed with dilute hydrochloric acid and then with distilled water before use. Two hundred milliliters of sea water was also collected at the same stations for the determination of chlorinity.

(6) Sea sediments

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

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

A conventional sediment sampling device was used for collecting the top few centimeters of surface sediment. Approximately 4 kg of the sample in wet weight was spread on a large porcelain dish and dried in an electric oven at 105 to 110 °C to a constant weight.

(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 500°C in an electric muffle furnace.

(8) Rice

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

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* Samples were sent to the Center from 32 contracted prefectures.

(9) Milk

Raw milk was collected in producing districts and commercial milk was purchased in consuming districts. Milk in a stainless steel pan or a porcelain dish was evaporated to dryness followed by carbonization and ashing.

(10) Vegetables

Spinach and Japanese radish were selected as the representatives for leaf vegetables and for non-starch roots, respectively. After removing soil, the edible part of vegetable sample was dried and carbonized in a stainless steel pan or a porcelain dish.

(11) Tea

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

(12) Fish, shellfish and seaweeds

a. Sea fish and freshwater fish

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

b. Shellfish

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

c. Seaweeds

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

Table 1 shows detailes of sample collection.

Table 1 Details of sample collection

Sample	Frequency of sampling	Quantity of sample
= Environmental materials =		
(1) Rain and dry fallout		
1 for domestic program	monthly	
2 for WHO program	monthly	
(2) Airborne dust	quarterly	>3000 m^3/month
(3) Service water and freshwater		
1 Service water (sourse water)	semiyearly (June and December)	100 ℓ
2 Service water (tap water)	semiyearly (June and December)	100 ℓ
3 Freshwater	yearly (fishing season)	100 ℓ
(4) Soil		
1 0 ~ 5 cm	yearly (June or July)	4 kg
2 5 ~ 20 cm	yearly (June or July)	4 kg
(5) Sea water	yearly (July or August)	40 ℓ
(6) Sea sediments	yearly (July or August)	4 kg
= Dietary materials =		
(7) Total diet	semiyearly (June, November or December)	daily amount for 5 person
(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)	500 g (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

Air-dried soil was passed through a 20 mesh sieve. The sieved sample was heated, in the presence of strontium and cesium carriers, together with sodium hydroxide. The sample was then heated with hydrochloric acid and the insoluble part was filtered and washed. The combined solution of the filtrate and washings was used for radiochemical analysis.

(3) Sea sediments

After removal of pebbles, shells and other foreign matters, the sediment sample was dried in a hot-air oven and ground finely with a mortar. The sample was passed through a 20 mesh sieve. The further preparation of the sample was the same as that described in the section 2-(2).

(4) Rice

The ashed sample was pulverlized with a porcelain mortar and passed through a 42 mesh sieve. The sieved sample to which both strontium and cesium carriers were added, was digested with hydrochloric 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 part was filtered and washed. The filtrate and washings were combined for subsequent radiochemical analysis.

(5) Airborne dust, diet, milk, vegetable, 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-(5), 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 calcium and strontium were precipitated as oxalates. The precipitate was dissolved in nitric acid and strontium was separated from calcium by successive fuming nitric acid separations. 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 the iron carrier was added. The solution was allowed to stand

for two weeks for strontium-90 and yttrium-90 to attain equilibrium. The 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 in the solution was acidified with hydrochloric acid. While stirring the solution, cesium was adsorbed on ammonium molybdophosphate.

After filtered off and washed with dilute nitric acid, the precipitate was dissolved in 2.5N sodium hydroxide solution. Ammonia was removed completely from the solution by boiling. The solution was adjusted to pH 8.2 with hydrochloric acid and allowed to cool. Molybdenum hydroxide which came out in the solution, was filtered off and washed with water. In such circumstance that ontamination by rubidium-87 was not negligible for the measurement of cesium-137, the following ion-exchange procedure was applied. A fixed amount of ferric chloride solution was added to the solution dissolved with 2.5N sodium hydroxide. Ammonia and molybdenum hydroxide were removed as described above. Ethylenediaminetetraaceticacid tetrasodium salt was added to the filtrate and washings. Cesium and rubidium were adsorbed on a cation exchange resin. Cesium was separated from rubidium by eluting with hydrochloric acid.

To this eluate or the filtrate and washings after removing molybdenum hydroxide, chloroplatinic acid solution was added to precipitate cesium. The precipitate was filtered onto a tared paper in a demountable filter and washed with water and then ethanol. After fixing the filter paper on a tared planchette and drying it, the chemical yield of cesium was determined by weighing the precipitate with the planchette. Radioactivity from cesium-137 was measured for this precipitate.

4. Determination of stable strontium, calcium and potassium

A weighed amount of soil or sea sediment was treated under heating with sodium hydroxide and then with hydrochloric acid for extraction. A weighed aliquot of ashed samples of total diet, vegetables, milk, fish, shellfish or seeweeds was digested using hydrochloric acid or nitric acid, hydrofluoric acid being used when necessary. 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 min. Net sample counting rates were corrected for counter efficiency, recovery, self-absorption and decay to obtain the content of strontium-90 and cesium-137 radio activity per sample aliquot. From the results, concentrations of these nuclides in the original samples were calculated.

6. Results

(1)-1 Strontium-90 Cesium-137 in Rain and dry fallout (for domestic program) (from Jun. 1981 to Dec. 1981)

– continued from No. 58 of this publication –

Table (1)-1: Strontium-90 and Cesium-137 Rain and dry fallout

Location	Duration (days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
June, 1981				
Ojika-gun, MIYAGI	31	183.6	0.11 ± 0.002	0.17 ± 0.003
Mito, IBARAGI	31	91.0	0.080 ± 0.0021	0.13 ± 0.003
Fukui, FUKUI	32	295.2	0.058 ± 0.0020	0.096 ± 0.0025
Matsue, SHIMANE	31	294.3	0.56 ± 0.0018	0.10 ± 0.002
Matsuyama, EHIME	30	309.0	0.021 ± 0.0012	0.066 ± 0.0020
Tsukushi-gun, FUKUOKA	32	385.4	0.062 ± 0.0020	0.089 ± 0.0023
Saga, SAGA	31	405.6	0.046 ± 0.0016	0.069 ± 0.0020
July, 1981				
Sapporo, HOKKAIDO	32	41.0	0.013 ± 0.0010	0.021 ± 0.0012
Aomori, AOMORI	32	134.0	0.029 ± 0.0013	0.047 ± 0.0017
Ojika-gun, MIYAGI	34	42.7	0.020 ± 0.0011	0.027 ± 0.0013
Futaba-gun, FUKUSHIMA	32	75	0.021 ± 0.0012	0.034 ± 0.0014
Mito, IBARAGI	32	81.5	0.020 ± 0.0012	0.031 ± 0.0014
Shinjuku, TOKYO	32	218	0.035 ± 0.0014	0.053 ± 0.0018
Yokohama, KANAGAWA	32	149.3	0.030 ± 0.0014	0.053 ± 0.0018
Fukui, FUKUI	33	203.4	0.017 ± 0.0012	0.030 ± 0.0014
Shizuoka, SHIZUOKA	32	332.0	0.050 ± 0.0018	0.084 ± 0.0021
Kyoto, KYOTO	34	52.9	0.009 ± 0.0009	0.014 ± 0.0010
Wakayama, WAKAYAMA	32	46.5	0.005 ± 0.0007	0.015 ± 0.0011
Tottori, TOTTORI	32	269.86	0.037 ± 0.0016	0.048 ± 0.0017
Matsue, SHIMANE	31	150.7	0.017 ± 0.0011	0.028 ± 0.0013
Hiroshima, HIROSHIMA	29	80.5	0.016 ± 0.0010	0.018 ± 0.0011
Matsuyama, EHIME	32	120	0.015 ± 0.0011	0.028 ± 0.0013
Tsukushi-gun, FUKUOKA	32	345.2	0.027 ± 0.0014	0.041 ± 0.0015
Saga, SAGA	41	160.3	0.017 ± 0.0011	0.026 ± 0.0014
Nagasaki, NAGASAKI	32	119.5	0.008 ± 0.0008	0.013 ± 0.0011
Nakagami-gun, OKINAWA	34	154.0	0.007 ± 0.0008	0.012 ± 0.0010

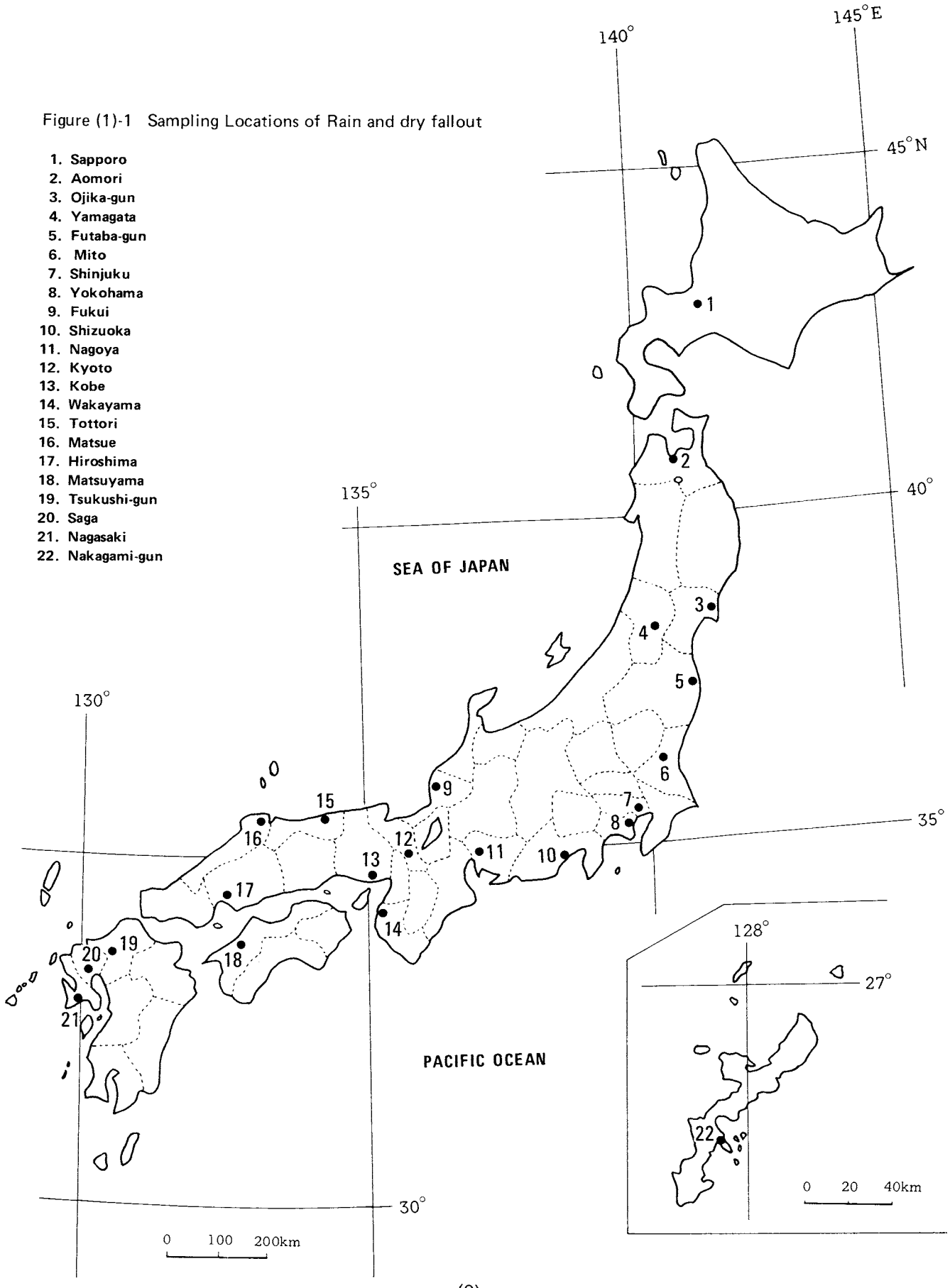
Location	Duration (days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
August, 1981				
Sapporo, HOKKAIDO	32	644.0	0.054 ± 0.0018	0.083 ± 0.0040
Aomori, AOMORI	33	205.9	0.023 ± 0.0013	0.034 ± 0.0015
Ojika-gun, MIYAGI	31	158.1	0.019 ± 0.0010	0.020 ± 0.0012
Yamagata, YAMAGATA	32	274.9	0.009 ± 0.0008	0.019 ± 0.0011
Futaba-gun, FUKUSHIMA	32	110	0.009 ± 0.0008	0.013 ± 0.0011
Mito, IBARAGI	32	96.0	0.008 ± 0.0009	0.013 ± 0.0010
Shinjuku, TOKYO	32	137.1	0.017 ± 0.0011	0.027 ± 0.0014
Yokohama, KANAGAWA	32	166.4	0.013 ± 0.0010	0.020 ± 0.0012
Fukui, FUKUI	30	163.1	0.015 ± 0.0011	0.024 ± 0.0013
Shizuoka, SHIZUOKA	32	378.0	0.015 ± 0.0011	0.021 ± 0.0013
Nagoya, AICHI	32	154	0.010 ± 0.0009	0.014 ± 0.0010
Kyoto, KYOTO	31	119.1	0.010 ± 0.0008	0.012 ± 0.0009
Kobe, HYOGO	29	23.8	0.010 ± 0.0010	0.018 ± 0.0012
Wakayama, WAKAYAMA	30	27.4	0.007 ± 0.0008	0.009 ± 0.0010
Tottori, TOTTORI	32	106.58	0.018 ± 0.0012	0.020 ± 0.0014
Matsue, SHIMANE	32	138.1	0.013 ± 0.0010	0.015 ± 0.0010
Hiroshima, HIROSHIMA	32	85.6	0.019 ± 0.0011	0.014 ± 0.0011
Matsuyama, EHIME	33	79.5	0.009 ± 0.0009	0.011 ± 0.0010
Tsukushi-gun, FUKUOKA	32	166.2	0.007 ± 0.0009	0.012 ± 0.0011
Saga, SAGA	24	238.6	0.007 ± 0.0008	0.009 ± 0.0008
Nagasaki, NAGASAKI	32	263.5	0.010 ± 0.0009	0.015 ± 0.0011
Nakagami-gun, OKINAWA	30	26.0	0.004 ± 0.0007	0.009 ± 0.0009
September, 1981				
Sapporo, HOKKAIDO	31	176.5	0.011 ± 0.0009	0.017 ± 0.0010
Aomori, AOMORI	30	95.7	0.014 ± 0.0010	0.018 ± 0.0012
Ojika-gun, MIYAGI	31	127.8	0.011 ± 0.0009	0.012 ± 0.0010
Yamagata, YAMAGATA	31	80.9	0.006 ± 0.0008	0.008 ± 0.0009
Futaba-gun, FUKUSHIMA	31	96	0.007 ± 0.0009	0.010 ± 0.0011
Mito, IBARAGI	31	119.0	0.008 ± 0.0009	0.013 ± 0.0010
Shijuku, TOKYO	31	139	0.014 ± 0.0010	0.016 ± 0.0010
Yokohama, KANAGAWA	31	174.7	0.010 ± 0.0009	0.012 ± 0.0010
Fukui, FUKUI	31	130.1	0.012 ± 0.0009	0.016 ± 0.0011
Shizuoka, SHIZUOKA	31	239.0	0.007 ± 0.0008	0.010 ± 0.0010
Nagoya, AICHI	31	231	0.010 ± 0.0010	0.014 ± 0.0011
Kyoto, KYOTO	31	169.7	0.009 ± 0.0008	0.010 ± 0.0009
Kobe, HYOGO	33	123.5	0.008 ± 0.0009	0.013 ± 0.0011
Wakayama, WAKAYAMA	31	170	0.008 ± 0.0008	0.008 ± 0.0008
Tottori, TOTTORI	31	106.46	0.014 ± 0.0010	0.009 ± 0.0010

Location	Duration (days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
Matsue, SHIMANE	31	93.9	0.005 ± 0.0007	0.007 ± 0.0008
Hiroshima, HIROSHIMA	31	74.8	0.015 ± 0.0010	0.015 ± 0.0010
Matsuyama, EHIME	31	82.5	0.004 ± 0.0007	0.009 ± 0.0008
Tsukushi-gun, FUKUOKA	31	97.5	0.004 ± 0.0007	0.004 ± 0.0006
Saga, SAGA	32	124.3	0.004 ± 0.0006	0.004 ± 0.0007
Nagasaki, NAGASAKI	31	287.5	0.005 ± 0.0007	0.007 ± 0.0008
Nakagami-gun, OKINAWA	30	58.5	0.002 ± 0.0006	0.004 ± 0.0007
October, 1981				
Sapporo, HOKKAIDO	33	81.5	0.009 ± 0.0009	0.017 ± 0.0011
Aomori, AOMORI	33	87.7	0.017 ± 0.0011	0.018 ± 0.0011
Ojika-gun, MIYAGI	31	165.8	0.009 ± 0.0008	0.008 ± 0.0008
Yamagata, YAMAGATA	32	115.5	0.006 ± 0.0007	0.014 ± 0.0010
Futaba-gun, FUKUSHIMA	33	192	0.004 ± 0.0007	0.004 ± 0.0007
Mito, IBARAGI	35	228.5	0.006 ± 0.0008	0.009 ± 0.0009
Shinjuku, TOKYO	32	321.5	0.008 ± 0.0010	0.010 ± 0.0010
Yokohama, KANAGAWA	31	296.7	0.008 ± 0.0008	0.010 ± 0.0009
Fukui, FUKUI	33	276	0.020 ± 0.0012	0.030 ± 0.0014
Shizuoka, SHIZUOKA	33	370	0.007 ± 0.0008	0.010 ± 0.0009
Nagoya, AICHI	36	225	0.007 ± 0.0008	0.008 ± 0.0009
Kyoto, KYOTO	34	238.9	0.005 ± 0.0007	0.006 ± 0.0008
Kobe, HYOGO	29	116.8	0.008 ± 0.0008	0.013 ± 0.0010
Wakayama, WAKAYAMA	33	139.3	0.007 ± 0.0008	0.008 ± 0.0008
Tottori, TOTTORI	33	120.24	0.018 ± 0.0012	0.022 ± 0.0013
Matsue, SHIMANE	32	120.2	0.013 ± 0.0010	0.020 ± 0.0011
Hiroshima, HIROSHIMA	32	105.3	0.009 ± 0.0009	0.007 ± 0.0008
Matsuyama, EHIME	33	149	0.006 ± 0.0009	0.009 ± 0.0009
Tsukushi-gun, FUKUOKA	32	138.5	0.007 ± 0.0008	0.007 ± 0.0009
Saga, SAGA	31	165.0	0.009 ± 0.0010	0.008 ± 0.0009
Nagasaki, NAGASAKI	33	266.0	0.015 ± 0.0010	0.019 ± 0.0012
Nakagami-gun, OKINAWA	34	104.5	0.006 ± 0.0008	0.006 ± 0.0009
November, 1981				
Sapporo, HOKKAIDO	30	73.5	0.007 ± 0.0008	0.011 ± 0.0009
Aomori, AOMORI	30	84.4	0.016 ± 0.0011	0.024 ± 0.0012
Yamagata, YAMAGATA	31	45.55	0.008 ± 0.0009	0.011 ± 0.0010
Futaba-gun, FUKUSHIMA	31	45	0.006 ± 0.0007	0.005 ± 0.0008
Mito, IBARAGI	28	47.0	0.004 ± 0.0007	0.003 ± 0.0007
Shinjuku, TOKYO	31	90.6	0.005 ± 0.0008	0.007 ± 0.0008
Yokohama, KANAGAWA	32	112.9	0.007 ± 0.0008	0.006 ± 0.0008
Fukui, FUKUI	29	185.1	0.017 ± 0.0011	0.027 ± 0.0014
Shizuoka, SHIZUOKA	30	176.0	0.006 ± 0.0009	0.015 ± 0.0011
Nagoya, AICHI	27	56	0.003 ± 0.0007	0.004 ± 0.0008

Location	Duration (days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
Kyoto, KYOTO	28	43.1	0.003 ± 0.0008	0.003 ± 0.0007
Kobe, HYOGO	35	77.0	0.004 ± 0.0008	0.005 ± 0.0008
Wakayama, WAKAYAMA	29	38	0.004 ± 0.0007	0.005 ± 0.0009
Tottori, TOTTORI	32	203.48	0.025 ± 0.0014	0.039 ± 0.0016
Matsue, SHIMANE	32	136.4	0.018 ± 0.0012	0.026 ± 0.0013
Hiroshima, HIROSHIMA	31	77.4	0.006 ± 0.0007	0.007 ± 0.0007
Matsuyama, EHIME	30	76.5	0.008 ± 0.0008	0.018 ± 0.0011
Tsukushi-gun, FUKUOKA	31	126.4	0.008 ± 0.0009	0.012 ± 0.0010
Saga, SAGA	32	105.4	0.004 ± 0.0007	0.006 ± 0.0008
Nagasaki, NAGASAKI	30	142.0	0.007 ± 0.0009	0.007 ± 0.0009
Nakagami-gun, OKINAWA	29	65.0	0.004 ± 0.0007	0.006 ± 0.0008
December, 1981				
Sapporo, HOKKAIDO	28	82.0	0.004 ± 0.0007	0.008 ± 0.0009
Aomori, AOMORI	36	92.7	0.009 ± 0.0009	0.024 ± 0.0012
Ojika-gun, MIYAGI	28	35.4	0.006 ± 0.0007	0.005 ± 0.0007
Yamagata, YAMAGATA	35	70.1	0.005 ± 0.0007	0.010 ± 0.0009
Futaba-gun, FUKUSHIMA	35	44	0.004 ± 0.0007	0.002 ± 0.0007
Mito, IBARAGI	36	52.0	0.002 ± 0.0007	0.004 ± 0.0006
Shinjuku, TOKYO	32	4	0.003 ± 0.0007	0.003 ± 0.0006
Yokohama, KANAGAWA	29	11.8	0.003 ± 0.0006	0.002 ± 0.0007
Fukui, FUKUI	37	248.8	0.029 ± 0.0015	0.046 ± 0.0017
Shizuoka, SHIZUOKA	35	20.0	0.005 ± 0.0008	0.010 ± 0.0009
Nagoya, AICHI	36	0	0.008 ± 0.0008	0.006 ± 0.0009
Kyoto, KYOTO	36	31.0	0.003 ± 0.0007	0.005 ± 0.0008
Kobe, HYOGO	26	19.2	0.004 ± 0.0007	0.004 ± 0.0008
Wakayama, WAKAYAMA	37	32	0.004 ± 0.0007	0.003 ± 0.0008
Tottori, TOTTORI	35	181.72	0.023 ± 0.0012	0.036 ± 0.0015
Matsue, SHIMANE	31	84.0	0.009 ± 0.0009	0.022 ± 0.0012
Hiroshima, HIROSHIMA	29	29.8	0.006 ± 0.0008	0.005 ± 0.0006
Matsuyama, EHIME	28	18.5	0.006 ± 0.0009	0.009 ± 0.0010
Tsukushi-gun, FUKUOKA	36	23.6	0.005 ± 0.0008	0.008 ± 0.0009
Saga, SAGA	36	18.6	0.002 ± 0.0006	0.003 ± 0.0007
Nagasaki, NAGASAKI	35	16.0	0.003 ± 0.0006	0.002 ± 0.0007
Nakagami-gun, OKINAWA	38	105.0	0.006 ± 0.0008	0.007 ± 0.0007

Figure (1)-1 Sampling Locations of Rain and dry fallout

1. Sapporo
2. Aomori
3. Ojika-gun
4. Yamagata
5. Futaba-gun
6. Mito
7. Shinjuku
8. Yokohama
9. Fukui
10. Shizuoka
11. Nagoya
12. Kyoto
13. Kobe
14. Wakayama
15. Tottori
16. Matsue
17. Hiroshima
18. Matsuyama
19. Tsukushi-gun
20. Saga
21. Nagasaki
22. Nakagami-gun



(1)-2 Strontium-90 and Cesium-137 in Rain and dry fallout (for WHO program) (from Jul. 1981 to Jan. 1982)

– continued from No. 58 of this publication –

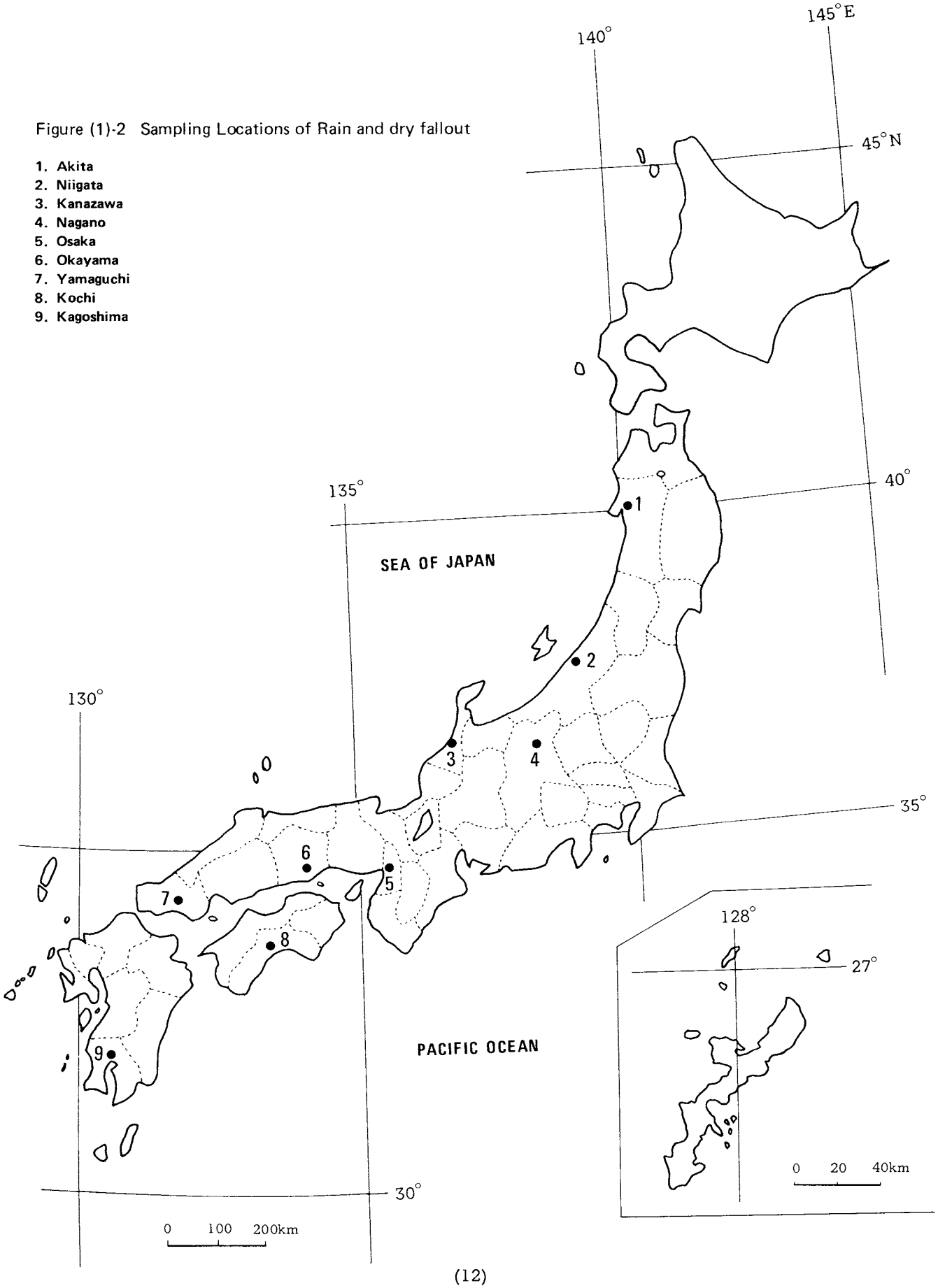
Table (1)-2: Strontium-90 and Cesium-137 in Rain and dry fallout

Location	Duration (days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
July, 1981				
Akita, AKITA	32	353.0	0.038 ± 0.0015	0.057 ± 0.0018
Niigata, NIIGATA	32	113.52	0.017 ± 0.0011	0.036 ± 0.0015
Kanazawa, ISHIKAWA	31	143.5	0.013 ± 0.0010	0.022 ± 0.0012
Nagano, NAGANO	32	193.0	0.017 ± 0.0010	0.029 ± 0.0013
Osaka, OSAKA	32	72.20	0.010 ± 0.0009	0.016 ± 0.0011
Okayama, OKAYAMA	32	85.5	0.014 ± 0.0011	0.020 ± 0.0012
Yamaguchi, YAMAGUCHI	33	174.5	0.024 ± 0.0014	0.040 ± 0.0016
Kochi, KOCHI	32	401.4	0.025 ± 0.0012	0.039 ± 0.0015
Kagoshima, KAGOSHIMA	32	155	0.006 ± 0.0009	0.016 ± 0.0011
August, 1981				
Akita, AKITA	32	325.2	0.038 ± 0.0015	0.059 ± 0.0018
Niigata, NIIGATA	32	113.52	0.017 ± 0.0011	0.036 ± 0.0015
Kanazawa, ISHIKAWA	32	232.5	0.017 ± 0.0011	0.030 ± 0.0014
Nagano, NAGANO	32	167.0	0.009 ± 0.0009	0.013 ± 0.0011
Osaka, OSAKA	32	65.58	0.009 ± 0.0008	0.008 ± 0.0010
Okayama, OKAYAMA	32	26.5	0.006 ± 0.0007	0.009 ± 0.0009
Yamaguchi, YAMAGUCHI	30	197.5	0.014 ± 0.0010	0.013 ± 0.0011
Kochi, KOCHI	32	316.6	0.014 ± 0.0010	0.018 ± 0.0012
Kagoshima, KAGOSHIMA	32	109.2	0.007 ± 0.0008	0.010 ± 0.0009
Chiba, CHIBA	33	117	0.007 ± 0.0013	0.013 ± 0.0011
September, 1981				
Akita, AKITA	31	136.4	0.010 ± 0.0009	0.014 ± 0.0011
Niigata, NIIGATA	31	102.85	0.009 ± 0.0009	0.013 ± 0.0010
Kanazawa, ISHIKAWA	31	118.0	0.009 ± 0.0009	0.012 ± 0.0010
Nagano, NAGANO	31	59.50	0.007 ± 0.0008	0.011 ± 0.0010
Osaka, OSAKA	31	137.13	0.006 ± 0.0008	0.008 ± 0.0009
Okayama, OKAYAMA	31	54.2	0.004 ± 0.0008	0.003 ± 0.0008
Yamaguchi, YAMAGUCHI	30	79.0	0.012 ± 0.0009	0.008 ± 0.0008
Kochi, KOCHI	31	203.1	0.012 ± 0.0009	0.016 ± 0.0011
Kagoshima, KAGOSHIMA	31	60.2	0.005 ± 0.0007	0.007 ± 0.0009
Chiba, CHIBA	31	179	0.005 ± 0.0009	0.011 ± 0.0011

Location	Duration (days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
October, 1981				
Akita, AKITA	33	242.0	0.015 ± 0.0010	0.025 ± 0.0013
Niigata, NIIGATA	33	186.71	0.019 ± 0.0011	0.029 ± 0.0014
Kanazawa, ISHIKAWA	33	308.0	0.031 ± 0.0015	0.042 ± 0.0016
Nagano, NAGANO	33	81.0	0.003 ± 0.0006	0.006 ± 0.0009
Osaka, OSAKA	33	160.44	0.007 ± 0.0008	0.007 ± 0.0009
Okayama, OKAYAMA	33	87.1	0.005 ± 0.0007	0.004 ± 0.0007
Yamaguchi, YAMAGUCHI	36	95.0	0.011 ± 0.0010	0.011 ± 0.0010
Kochi, KOCHI	35	122.4	0.010 ± 0.0009	0.010 ± 0.0009
Kagoshima, KAGOSHIMA	33	157.6	0.007 ± 0.0008	0.010 ± 0.0010
Chiba, CHIBA	33	214	0.004 ± 0.0007	0.009 ± 0.0010
November, 1981				
Akita, AKITA	30	182.2	0.018 ± 0.0012	0.027 ± 0.0013
Niigata, NIIGATA	30	163.45	0.021 ± 0.0013	0.035 ± 0.0015
Kanazawa, ISHIKAWA	31	237.5	0.023 ± 0.0013	0.036 ± 0.0016
Nagano, NAGANO	30	26.0	0.002 ± 0.0007	0.003 ± 0.0007
Osaka, OSAKA	30	76.36	0.004 ± 0.0006	0.004 ± 0.0008
Okayama, OKAYAMA	30	16	0.004 ± 0.0007	0.005 ± 0.0008
Yamaguchi, YAMAGUCHI	30	82.0	0.010 ± 0.0008	0.011 ± 0.0010
Kochi, KOCHI	28	123.5	0.007 ± 0.0008	0.007 ± 0.0009
Kagoshima, KAGOSHIMA	30	125	0.004 ± 0.0007	0.005 ± 0.0008
Chiba, CHIBA	30	86.1	0.006 ± 0.0008	0.006 ± 0.0009
December, 1981				
Akita, AKITA	32	239.3	0.022 ± 0.0011	0.040 ± 0.0016
Niigata, NIIGATA	36	80.63	0.014 ± 0.0010	0.022 ± 0.0012
Kanazawa, ISHIKAWA	34	145.0	0.019 ± 0.0011	0.030 ± 0.0014
Nagano, NAGANO	35	13.5	0.002 ± 0.0006	0.005 ± 0.0008
Osaka, OSAKA	31	15.42	0.004 ± 0.0006	0.003 ± 0.0007
Okayama, OKAYAMA	35	18.5	0.002 ± 0.0006	0.002 ± 0.0007
Yamaguchi, YAMAGUCHI	34	53.5	0.006 ± 0.0007	0.008 ± 0.0009
Kochi, KOCHI	36	18.1	0.007 ± 0.0007	0.005 ± 0.0008
Kagoshima, KAGOSHIMA	36	20.5	0.004 ± 0.0006	0.003 ± 0.0008
Chiba, CHIBA	36	66.7	0.003 ± 0.0008	0.005 ± 0.0008
January, 1982				
Chiba, CHIBA	28	10.6	0.004 ± 0.0010	0.005 ± 0.0007

Figure (1)-2 Sampling Locations of Rain and dry fallout

1. Akita
2. Niigata
3. Kanazawa
4. Nagano
5. Osaka
6. Okayama
7. Yamaguchi
8. Kochi
9. Kagoshima



(2) Strontium-90 and Cesium-137 in Airborne dust (from Apr. 1981 to Sep. 1981)

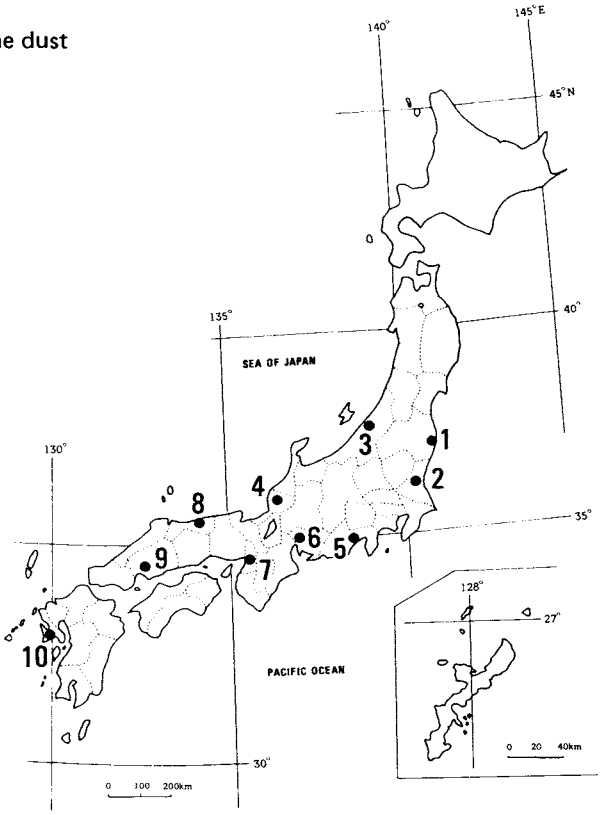
– continued from No. 58 of this publication –

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

Location	Sampling period	Absorption volume (m^3)	^{90}Sr (10^{-3} pCi/m^3)	^{137}Cs (10^{-3} pCi/m^3)
April ~ June 1981				
Mito, IBARAGI	4 ~ 6	11,232	0.7 ± 0.05	1.0 ± 0.05
Niigata, NIIGATA	4 ~ 6	14,613	2.7 ± 0.07	4.5 ± 0.08
July ~ September 1981				
Futaba-gun, FUKUSHIMA	7 ~ 9	13,885	0.1 ± 0.02	0.3 ± 0.03
Mito, IBARAGI	7 ~ 9	10,368	0.3 ± 0.04	0.5 ± 0.04
Niigata, NIIGATA	7 ~ 9	14,805	0.4 ± 0.03	0.6 ± 0.03
Fukui, FUKUI	7 ~ 9	25,324	0.3 ± 0.02	0.5 ± 0.02
Shizuoka, SHIZUOKA	7 ~ 9	10,491	0.3 ± 0.03	0.4 ± 0.03
Nagoya, AICHI	7 ~ 9	11,794	0.3 ± 0.03	0.4 ± 0.03
Osaka, OSAKA	7 ~ 9	8,424	0.2 ± 0.04	0.3 ± 0.04
Tottori, TOTTORI	7 ~ 9	11,196	0.3 ± 0.03	0.4 ± 0.03
Hiroshima, HIROSHIMA	7 ~ 9	10,800	0.3 ± 0.04	0.4 ± 0.03
Nagasaki, NAGASAKI	7 ~ 9	10,726	0.3 ± 0.04	0.7 ± 0.04

Figure (2) Sampling Locations of Airborne dust

1. **Futaba-gun**
2. **Mito**
3. **Niigata**
4. **Fukui**
5. **Shizuoka**
6. **Nagoya**
7. **Osaka**
8. **Tottori**
9. **Hiroshima**
10. **Nagasaki**



(3) Strontium-90 and Cesium-137 in Service water (from Jun. 1981 to Dec. 1981)

– continued from No. 58 of this publication –

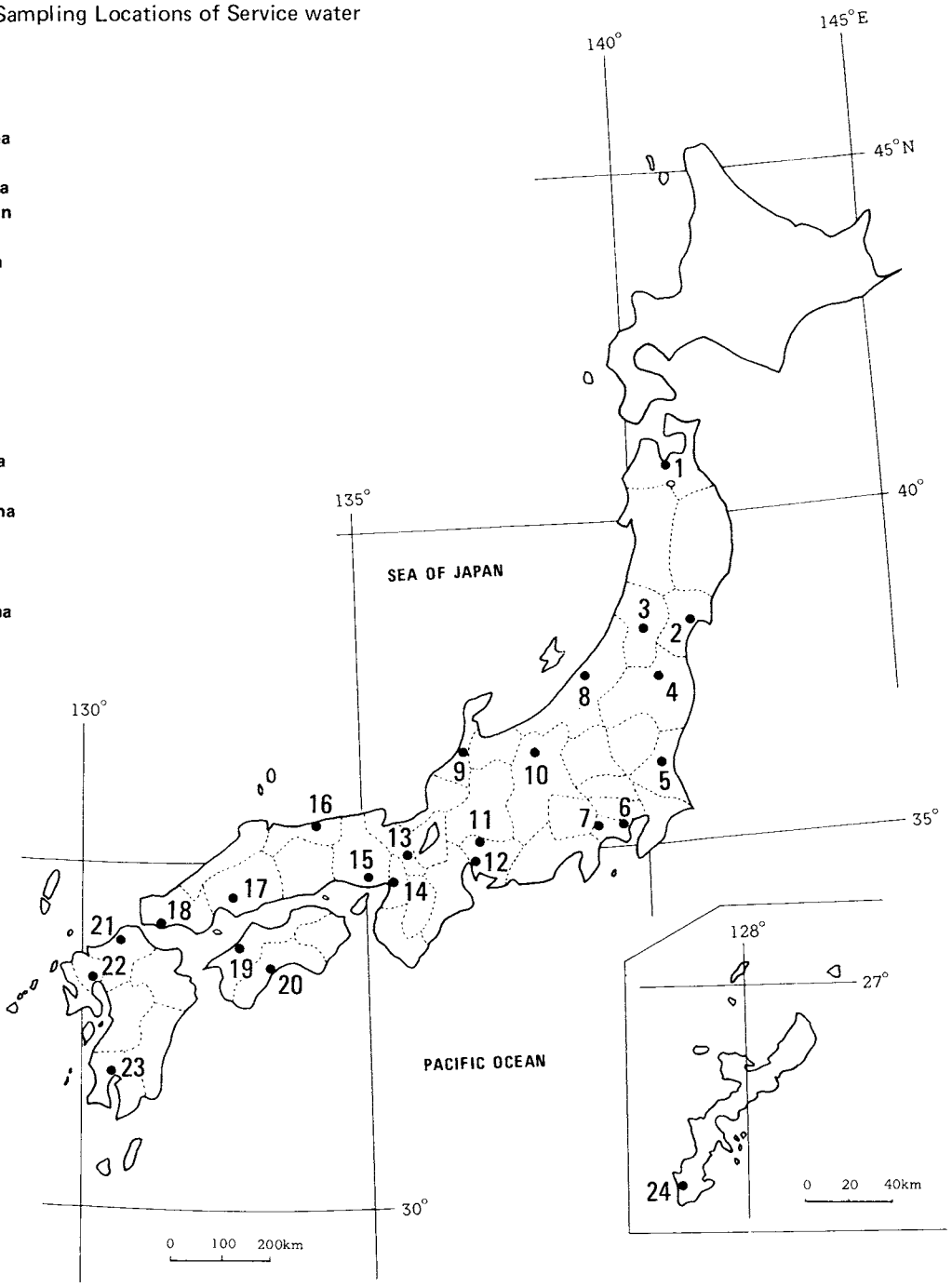
Table (3): Strontium-90 and Cesium-137 in Service water

Location	pH	^{90}Sr (pCi/ℓ)	^{137}Cs (pCi/ℓ)
(Source Water)			
June, 1981			
Fukuoka, FUKUOKA	6.95	0.10 ± 0.006	0.01 ± 0.003
August, 1981			
Kyoto, KYOTO	8.21	0.29 ± 0.009	0.02 ± 0.004
December, 1981			
Tsukui, KANAGAWA	7.8	0.02 ± 0.003	0.00 ± 0.003
Inuyama, AICHI	6.7	0.10 ± 0.005	0.02 ± 0.004
Fukuoka, FUKUOKA	7.05	0.09 ± 0.005	0.01 ± 0.002
(Tap Water)			
June, 1981			
Fukuoka, FUKUOKA	6.50	0.17 ± 0.007	0.01 ± 0.003
Saga, SAGA	7.44	0.10 ± 0.006	0.01 ± 0.004
July, 1981			
Sendai, MIYAGI	7.88	0.10 ± 0.006	0.01 ± 0.004
Fukushima, FUKUSHIMA	–	0.16 ± 0.007	0.004 ± 0.003
Naha, OKINAWA	7.68	0.16 ± 0.007	0.01 ± 0.003
August, 1981			
Kyoto, KYOTO	7.12	0.27 ± 0.009	0.02 ± 0.004
Hiroshima, HIROSHIMA	7.7	0.14 ± 0.007	0.01 ± 0.003
October, 1981			
Sendai, MIYAGI	6.45	0.11 ± 0.006	0.01 ± 0.003
December, 1981			
Aomori, AOMORI	7.3	0.05 ± 0.005	0.01 ± 0.003
Yamagata, YAMAGATA	7.4	0.12 ± 0.007	0.01 ± 0.003
Mito, IBARAGI	5.2	0.05 ± 0.005	0.002 ± 0.003
Yokohama, KANAGAWA	6.8	0.03 ± 0.004	0.003 ± 0.003
Niigata, NIIGATA	7.00	0.15 ± 0.007	0.01 ± 0.004
Kanazawa, ISHIKAWA	7.1	0.13 ± 0.006	0.01 ± 0.002
Nagano, NAGANO	6.96	0.05 ± 0.004	0.01 ± 0.003
Nagoya, AICHI	6.7	0.09 ± 0.006	0.01 ± 0.003
Osaka, OSAKA	6.8	0.14 ± 0.007	0.002 ± 0.003
Kobe, HYOGO	6.68	0.18 ± 0.007	0.005 ± 0.003

Location	pH	^{90}Sr (pCi/ℓ)	^{137}Cs (pCi/ℓ)
Tottori, TOTTORI	7.5	0.10 ± 0.005	0.01 ± 0.003
Ube, YAMAGUCHI	7.0	0.09 ± 0.005	0.003 ± 0.002
Matsuyama, EHIME	7.16	0.05 ± 0.004	0.003 ± 0.003
Kochi, KOCHI	7.1	0.08 ± 0.005	0.003 ± 0.003
Kagoshima, KAGOSHIMA	7.2	0.002 ± 0.002	0.01 ± 0.004

Figure (3) Sampling Locations of Service water

1. Aomori
2. Sendai
3. Yamagata
4. Fukushima
5. Mito
6. Yokohama
7. Tsukui-gun
8. Niigata
9. Kanazawa
10. Nagano
11. Inuyama
12. Nagoya
13. Kyoto
14. Osaka
15. Kobe
16. Tottori
17. Hiroshima
18. Ube
19. Matsuyama
20. Kochi
21. Fukuoka
22. Saga
23. Kagoshima
24. Naha



(4) Strontium-90 and Cesium-137 in Freshwater (from Jul. 1981 to Nov. 1981)

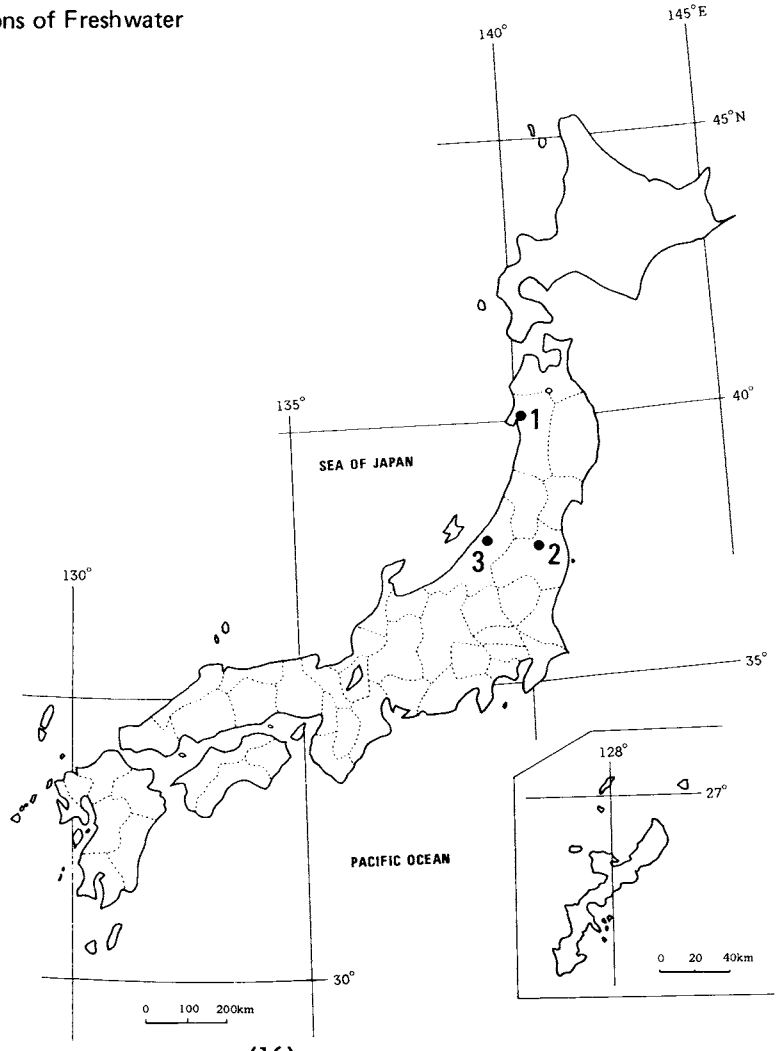
– continued from No. 58 of this publication –

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

Location	pH	^{90}Sr (pCi/ℓ)	^{137}Cs (pCi/ℓ)
July, 1981			
Akita, AKITA	7.3	0.16 ± 0.007	0.02 ± 0.004
October, 1981			
Fukushima, FUKUSHIMA	–	0.10 ± 0.006	0.01 ± 0.003
November, 1981			
Niigata, NIIGATA	6.78	0.025 ± 0.007	0.03 ± 0.004

Figure (4) Sampling Locations of Freshwater

1. **Akita**
2. **Fukushima**
3. **Niigata**



(5) Strontium-90 and Cesium-137 in Soil (from Jun. 1981 to Sep. 1981)

– continued from No. 58 of this publication –

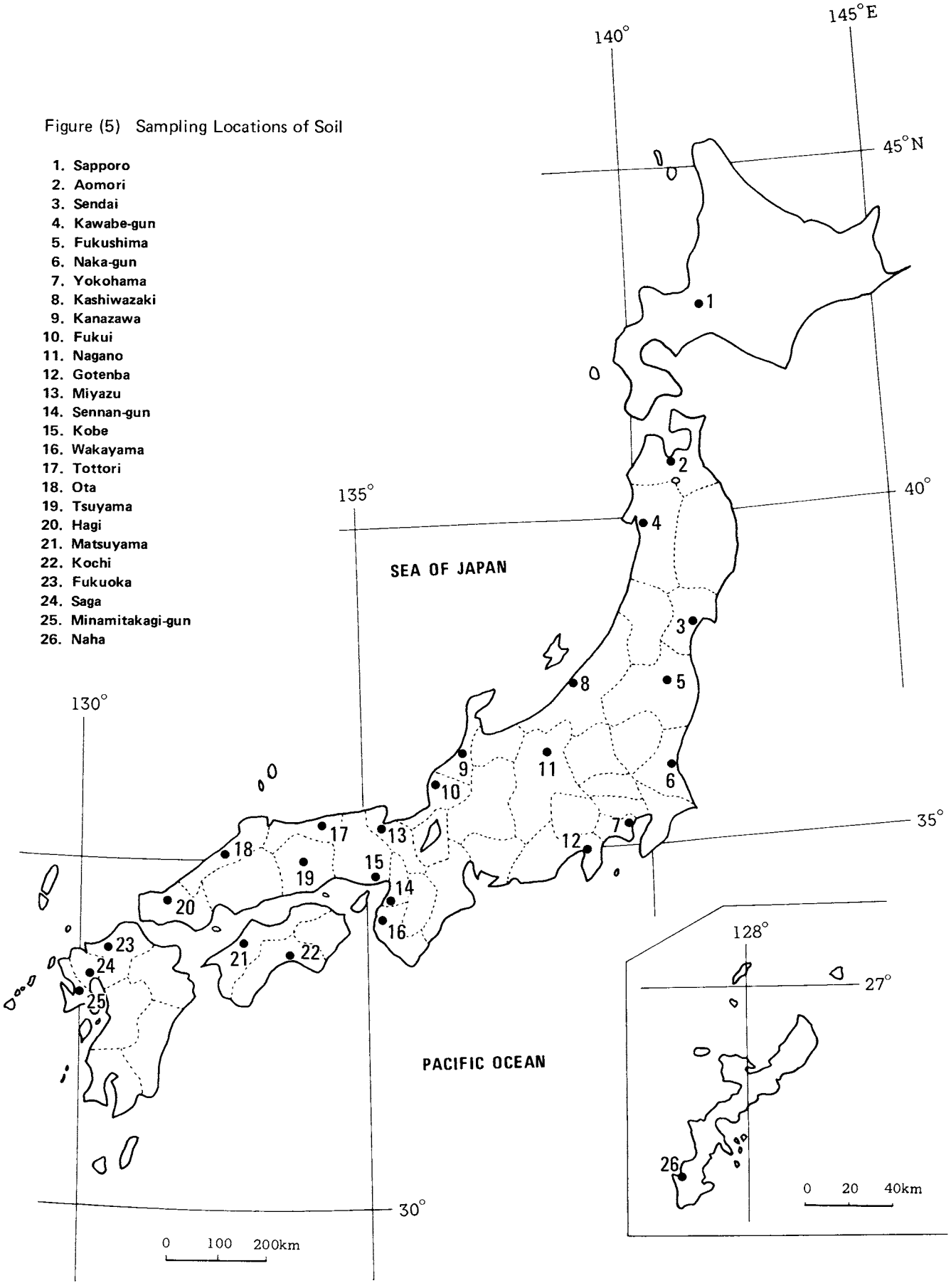
Table (5): Strontium-90 and Cesium-137 in Soil

Location	Sampling Depth (cm)	^{90}Sr (pCi/kg)	^{90}Sr (mCi/km^2)	^{137}Cs (pCi/kg)	^{137}Cs (mCi/km^2)
June, 1981					
Tsuyama, OKAYAMA	0 ~ 5	39 ± 4.3	1.3 ± 0.14	77 ± 5.2	2.8 ± 0.19
,,	5 ~ 20	30 ± 3.8	3.0 ± 0.38	46 ± 4.3	5.0 ± 0.46
July, 1981					
Aomori, AOMORI	0 ~ 5	97 ± 6.0	3.2 ± 0.19	120 ± 6	4.2 ± 0.22
,,	5 ~ 20	11 ± 3.5	1.2 ± 0.36	11 ± 2.5	1.3 ± 0.30
Kawabe-gun, AKITA	0 ~ 5	540 ± 15	26 ± 0.7	1500 ± 20	73 ± 1.1
,,	5 ~ 20	700 ± 17	77 ± 1.8	1500 ± 20	160 ± 2
Yokohama, KANAGAWA	0 ~ 5	410 ± 11	11 ± 0.3	1100 ± 20	30 ± 0.5
,,	5 ~ 20	290 ± 11	26 ± 0.9	520 ± 12	46 ± 1.1
Kashiwazaki, NIIGATA	0 ~ 5	110 ± 6	8.8 ± 0.47	1000 ± 20	80 ± 1.3
,,	5 ~ 20	430 ± 11	67 ± 1.7	1100 ± 20	180 ± 3
Kanazawa, ISHIKAWA	0 ~ 5	130 ± 7	5.2 ± 0.29	270 ± 9	11 ± 0.4
,,	5 ~ 20	110 ± 6	17 ± 1.0	250 ± 9	40 ± 1.4
Nagano, NAGANO	0 ~ 5	120 ± 6	6.4 ± 0.34	330 ± 10	18 ± 0.6
,,	5 ~ 20	64 ± 4.8	11 ± 0.8	95 ± 5.7	16 ± 1.0
Gotenba, SHIZUOKA	0 ~ 5	69 ± 4.7	1.9 ± 0.13	380 ± 11	11 ± 0.3
,,	5 ~ 20	110 ± 6	7.3 ± 0.38	190 ± 8	13 ± 0.5
Miyazu, KYOTO	0 ~ 5	120 ± 7	3.9 ± 0.21	2500 ± 30	80 ± 0.8
,,	5 ~ 20	120 ± 7	23 ± 1.3	270 ± 10	49 ± 1.8
Sennan-gun, OSAKA	0 ~ 5	140 ± 7	6.9 ± 0.35	260 ± 9	13 ± 0.5
,,	5 ~ 20	74 ± 5.2	14 ± 1.0	85 ± 5.5	16 ± 1.0
Kobe, HYOGO	0 ~ 5	57 ± 4.8	1.8 ± 0.15	220 ± 8	6.8 ± 0.26
,,	5 ~ 20	56 ± 4.7	3.8 ± 0.32	170 ± 8	12 ± 0.5
Tottori, TOTTORI	0 ~ 5	130 ± 7	7.5 ± 0.37	270 ± 11	21 ± 0.6
,,	5 ~ 20	83 ± 5.9	17 ± 1.2	200 ± 8	40 ± 1.6
Ota, SHIMANE	0 ~ 5	2000 ± 20	23 ± 0.3	7100 ± 40	84 ± 0.5
,,	5 ~ 20	340 ± 10	46 ± 1.4	1000 ± 20	140 ± 2
Hagi, YAMAGUCHI	0 ~ 5	260 ± 9	13 ± 0.4	320 ± 10	16 ± 0.5
,,	5 ~ 20	140 ± 7	10 ± 0.5	260 ± 9	18 ± 0.6
Matsuyama, EHIME	0 ~ 5	56 ± 4.6	2.4 ± 0.19	140 ± 7	5.2 ± 0.25
,,	5 ~ 20	62 ± 4.8	2.9 ± 0.23	180 ± 8	7.4 ± 0.31
Kochi, KOCHI	0 ~ 5	270 ± 10	18 ± 0.7	690 ± 15	46 ± 1.0
,,	5 ~ 20	150 ± 8	21 ± 1.0	160 ± 7	22 ± 1.0

Location	Sampling Depth (cm)	^{90}Sr		^{137}Cs	
		(pCi/kg)	(mCi/km^2)	(pCi/kg)	(mCi/km^2)
Fukuoka, FUKUOKA	0 ~ 5	370 ± 10	15 ± 0.4	560 ± 13	22 ± 0.5
"	5 ~ 20	130 ± 6	18 ± 0.9	55 ± 4.8	7.6 ± 0.67
Minamitakagi-gun, NAGASAKI	0 ~ 5	270 ± 9	7.8 ± 0.27	2400 ± 30	71 ± 0.8
"	5 ~ 20	180 ± 8	25 ± 1.0	950 ± 16	130 ± 2
Naha, OKINAWA	0 ~ 5	83 ± 5.4	7.2 ± 0.47	280 ± 10	25 ± 0.8
"	5 ~ 20	65 ± 5.7	12 ± 1.0	170 ± 7	30 ± 1.3
August, 1981					
Sapporo, HOKKAIDO	0 ~ 5	550 ± 13	16 ± 0.4	1600 ± 20	47 ± 0.6
"	5 ~ 20	250 ± 9	50 ± 1.8	290 ± 9	57 ± 1.8
Sendai, MIYAGI	0 ~ 5	22 ± 3.8	0.6 ± 0.09	75 ± 5.5	1.9 ± 0.14
"	5 ~ 20	28 ± 4.1	2.4 ± 0.35	41 ± 4.3	3.5 ± 0.36
Naka-gun, IBARAGI	0 ~ 5	340 ± 12	13 ± 0.4	1700 ± 20	63 ± 0.9
"	5 ~ 20	290 ± 11	27 ± 1.0	430 ± 12	41 ± 1.1
Fukui, FUKUI	0 ~ 5	160 ± 7	7.8 ± 0.36	730 ± 14	35 ± 0.7
"	5 ~ 20	140 ± 7	22 ± 1.1	770 ± 15	120 ± 2
Wakayama, WAKAYAMA	0 ~ 5	19 ± 3.4	0.8 ± 0.14	27 ± 3.5	1.0 ± 0.13
"	5 ~ 20	12 ± 3.2	2.8 ± 0.71	28 ± 3.6	5.9 ± 0.77
September, 1981					
Fukushima, FUKUSHIMA	0 ~ 5	280 ± 9	3.0 ± 0.10	620 ± 13	6.6 ± 0.14
"	5 ~ 20	90 ± 5.4	3.5 ± 0.21	71 ± 5.4	2.8 ± 0.21
Saga, SAGA	0 ~ 5	74 ± 7.0	2.6 ± 0.25	110 ± 6	3.9 ± 0.22
"	5 ~ 20	78 ± 6.1	10 ± 0.8	140 ± 7	18 ± 0.9

Figure (5) Sampling Locations of Soil

1. Sapporo
2. Aomori
3. Sendai
4. Kawabe-gun
5. Fukushima
6. Naka-gun
7. Yokohama
8. Kashiwazaki
9. Kanazawa
10. Fukui
11. Nagano
12. Gotenba
13. Miyazu
14. Sennan-gun
15. Kobe
16. Wakayama
17. Tottori
18. Ota
19. Tsuyama
20. Hagi
21. Matsuyama
22. Kochi
23. Fukuoka
24. Saga
25. Minamitakagi-gun
26. Naha



(6) Strontium-90 and Cesium-137 in Sea water (from Jul. 1981 to Jan. 1982)

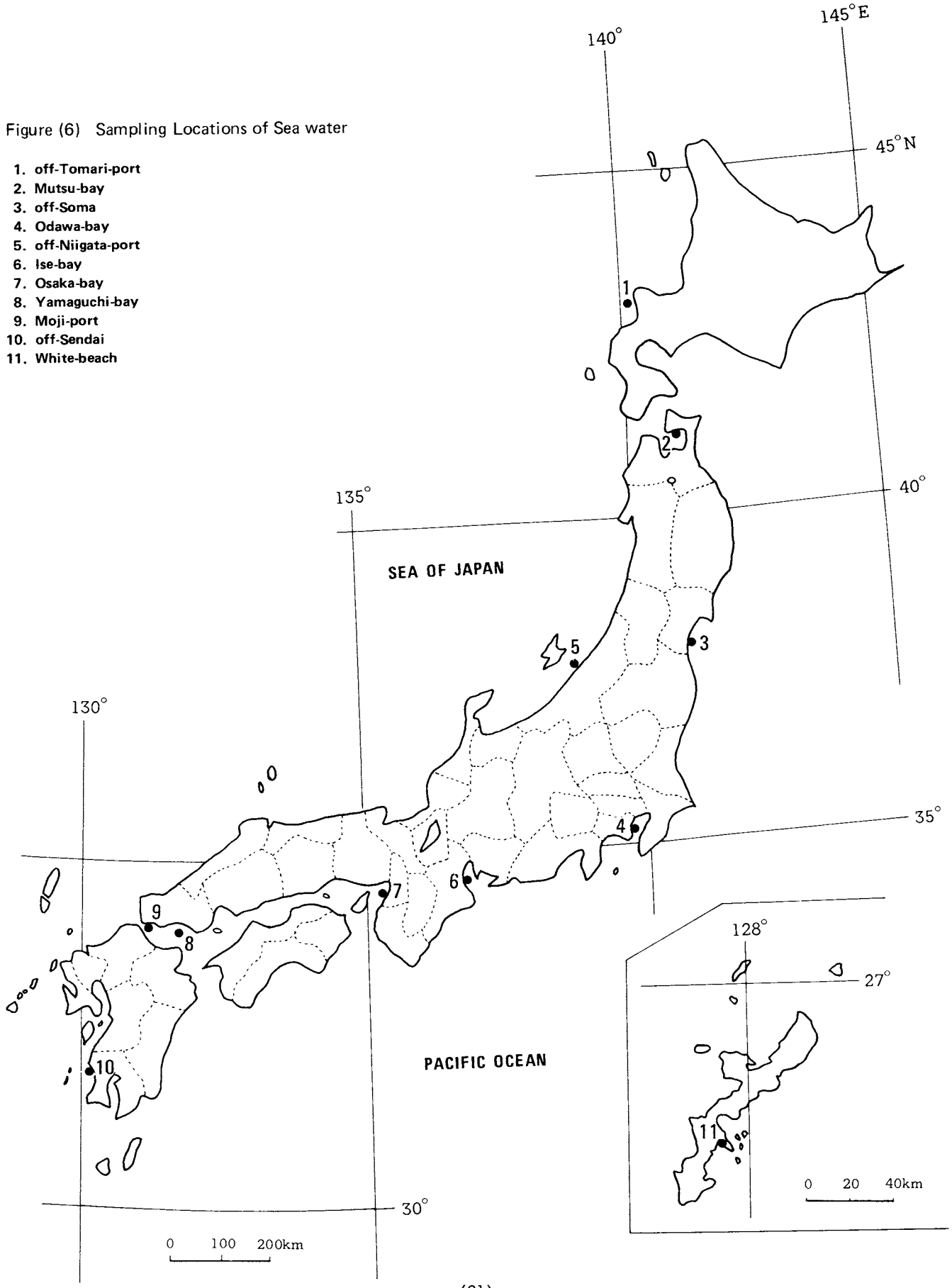
– continued from No. 54 of this publication –

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

Location	Cl ‰	Sample volume analyzed (ℓ)	^{90}Sr (pCi/ℓ)	^{137}Cs (pCi/ℓ)
July, 1981				
off-Tomari-port, HOKKAIDO	18.19	35.2	0.12 ± 0.012	0.15 ± 0.013
off-Niigata-port, NIIGATA	16.97	39.8	0.14 ± 0.011	0.14 ± 0.012
Ise-bay, AICHI	13.3	40.0	0.12 ± 0.010	0.10 ± 0.011
Moji-port, FUKUOKA	16.75	38.1	0.09 ± 0.012	0.16 ± 0.012
August, 1981				
Mutsu-bay, AOMORI	17.17	40.0	0.12 ± 0.011	0.17 ± 0.012
off-Soma, FUKUSHIMA	18.1	40.0	0.11 ± 0.010	0.13 ± 0.011
Odawa-bay, KANAGAWA	17.2	39.5	0.10 ± 0.011	0.15 ± 0.012
Osaka-bay, OSAKA	11.89	40.0	0.16 ± 0.012	0.09 ± 0.010
September, 1981				
off-Sendai, KAGOSHIMA	18.86	36.5	0.11 ± 0.011	0.14 ± 0.012
November, 1981				
Yamaguchi-bay, YAMAGUCHI	18.0	38.0	0.11 ± 0.012	0.14 ± 0.012
January, 1982				
White beach, OKINAWA	19.64	40.0	0.10 ± 0.011	0.15 ± 0.013

Figure (6) Sampling Locations of Sea water

1. off-Tomari-port
2. Mutsu-bay
3. off-Soma
4. Odawa-bay
5. off-Niigata-port
6. Ise-bay
7. Osaka-bay
8. Yamaguchi-bay
9. Moji-port
10. off-Sendai
11. White-beach



(7) Strontium-90 and Cesium-137 in Sea sediments (from Jul. 1981 to Jan. 1982)

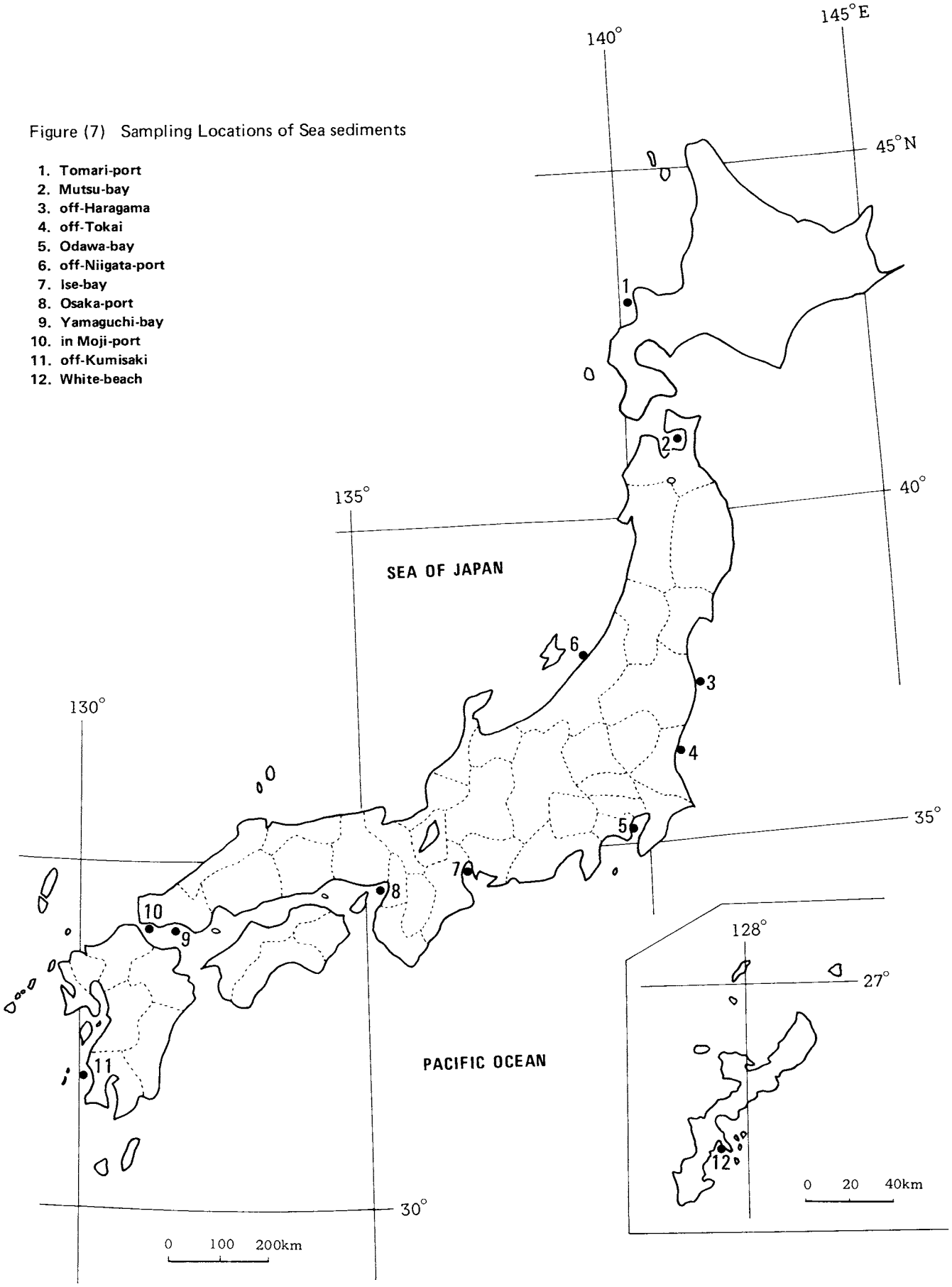
– continued from No. 54 of this publication –

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

Location	Depth (m)	^{90}Sr (pCi/kg)	^{137}Cs (pCi/kg)
July, 1981			
Tomari-port, HOKKAIDO	5	1 ± 2.5	22 ± 4.0
off-Tokai, IBARAGI	25	4 ± 2.7	54 ± 5.0
off-Niigata-port, NIIGATA	22	1 ± 2.6	45 ± 4.7
Ise-bay, AICHI	17.5	0 ± 2.4	70 ± 5.4
In Moji-port, FUKUOKA	10	2 ± 2.8	110 ± 6
August, 1981			
Mutsu-bay, AOMORI	13	22 ± 3.5	220 ± 8
off-Haragama, FUKUSHIMA	5	0 ± 2.4	21 ± 4.6
Odawa-bay, KANAGAWA	8	3 ± 2.7	97 ± 6.1
Osaka-port, OSAKA	11.1	7 ± 3.4	210 ± 8
September, 1981			
off-Kumisaki, KAGOSHIMA	3.3	0 ± 2.7	11 ± 3.7
November, 1981			
Yamaguchi-bay, YAMAGUCHI	10.0	10 ± 3.1	160 ± 7
January, 1982			
White-beach, OKINAWA	14.07	4 ± 2.4	12 ± 2.7

Figure (7) Sampling Locations of Sea sediments

1. Tomari-port
2. Mutsu-bay
3. off-Haragama
4. off-Tokai
5. Odawa-bay
6. off-Niigata-port
7. Ise-bay
8. Osaka-port
9. Yamaguchi-bay
10. in Moji-port
11. off-Kumisaki
12. White-beach



(8) Strontium-90 and Cesium-137 in Total diet (from Jun. 1981 to Dec. 1981)

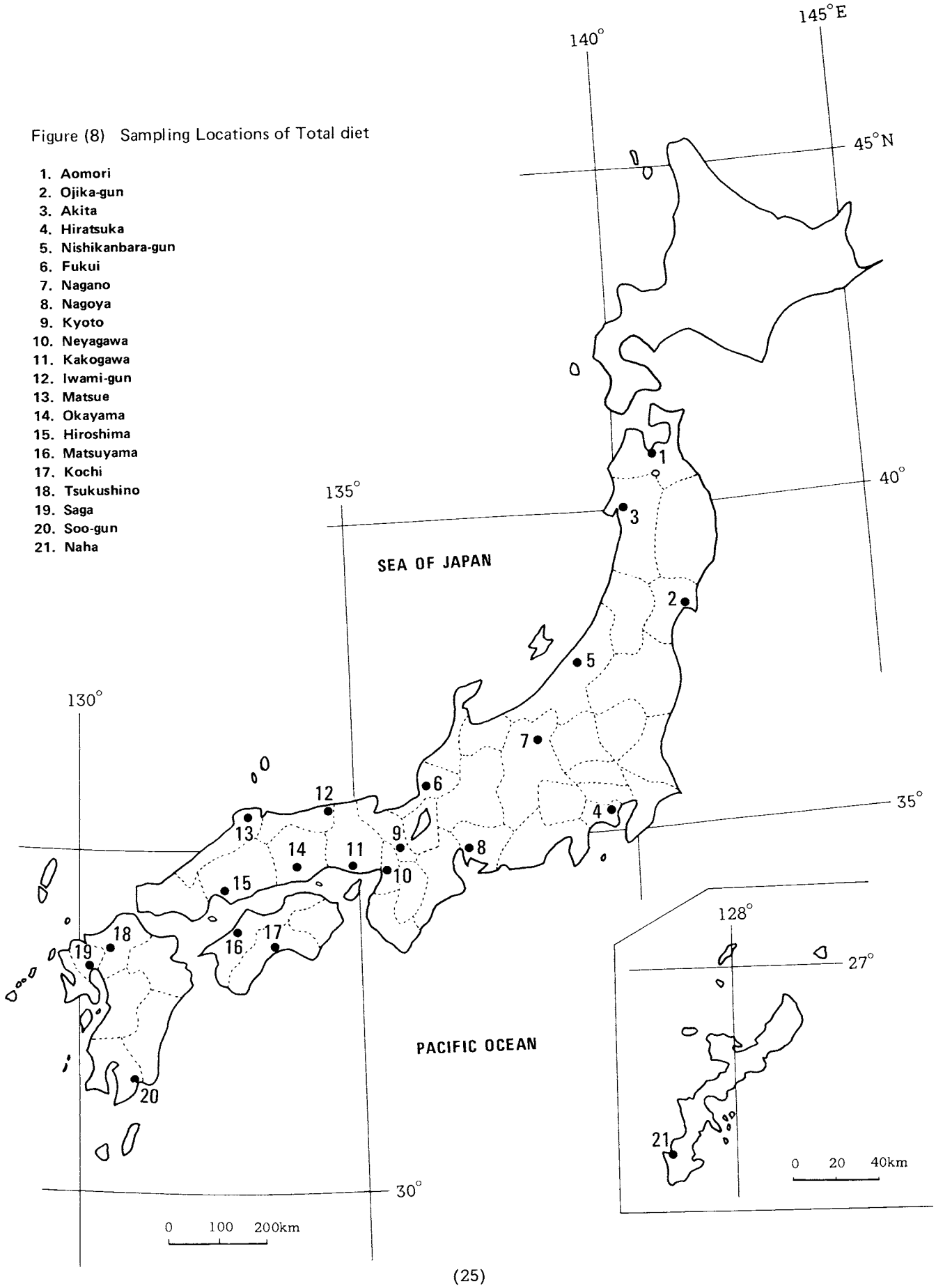
– continued from No. 58 of this publication –

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

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	($g \cdot p^{-1} \cdot d^{-1}$)	($mg \cdot p^{-1} \cdot d^{-1}$)	($mg \cdot p^{-1} \cdot d^{-1}$)	$pCi \cdot p^{-1} \cdot d^{-1}$	S.U.	$pCi \cdot p^{-1} \cdot d^{-1}$	C.U.
June, 1981							
Akita, AKITA	14.1	493	1730	5.4 ± 0.44	11 ± 0.9	27 ± 0.7	16 ± 0.4
Nishikanbara-gun, NIIGATA	20.4	624	2480	4.8 ± 0.43	7.7 ± 0.68	2.6 ± 0.33	1.1 ± 0.13
Fukui, FUKUI	13.9	595	1790	1.8 ± 0.34	3.0 ± 0.56	3.3 ± 0.27	1.8 ± 0.15
Kyoto, KYOTO	22.1	669	2610	5.1 ± 0.50	7.6 ± 0.75	2.4 ± 0.46	0.9 ± 0.18
Matsue, SHIMANE	20.0	867	2900	4.3 ± 0.40	4.9 ± 0.46	4.0 ± 0.36	1.4 ± 0.12
Matsuyama, EHIME	14.4	510	2310	2.4 ± 0.26	4.7 ± 0.52	2.0 ± 0.23	0.9 ± 0.10
Kochi, KOCHI	13.8	634	2110	2.6 ± 0.27	4.1 ± 0.43	3.4 ± 0.28	1.6 ± 0.13
Tsukushino, FUKUOKA	12.7	436	1810	2.3 ± 0.25	5.3 ± 0.58	3.1 ± 0.25	1.7 ± 0.14
Saga, SAGA	16.9	726	2300	2.3 ± 0.29	3.2 ± 0.4	3.1 ± 0.29	1.3 ± 0.23
July, 1981							
Hiratsuka, KANAGAWA	17.7	515	2520	3.3 ± 0.39	6.3 ± 0.76	3.4 ± 0.32	1.3 ± 0.13
Naha, OKINAWA	16.0	1120	1890	2.8 ± 0.30	2.5 ± 0.27	2.4 ± 0.26	1.3 ± 0.14
August, 1981							
Ojika-gun, MIYAGI	15.5	400	2090	2.7 ± 0.31	6.8 ± 0.77	3.6 ± 0.29	1.7 ± 0.14
Hiroshima, HIROSHIMA	16.1	497	1610	2.2 ± 0.31	4.5 ± 0.61	3.0 ± 0.28	1.9 ± 0.17
September, 1981							
Ojika-gun, KIYAGI	19.6	592	2570	3.1 ± 0.42	5.2 ± 0.71	4.1 ± 0.35	1.6 ± 0.14
November, 1981							
Akita, AKITA	16.2	513	2710	3.6 ± 0.43	7.0 ± 0.84	7.8 ± 0.50	2.9 ± 0.19
Hiratsuka, KANAGAWA	18.4	694	2690	4.0 ± 0.39	5.8 ± 0.56	5.4 ± 0.39	2.0 ± 0.14
Nagoya, AICHI	22.1	669	2610	5.1 ± 0.50	7.6 ± 0.75	2.4 ± 0.46	0.9 ± 0.18
Neyagawa, OSAKA	14.0	435	1800	2.0 ± 0.33	4.6 ± 0.76	2.4 ± 0.30	1.3 ± 0.17
Kakogawa, HYOGO	15.8	1040	2340	2.8 ± 0.31	2.7 ± 0.30	3.7 ± 0.30	1.6 ± 0.13
Iwami-gun, TOTTORI	17.2	528	2400	8.3 ± 0.50	16 ± 1.0	4.5 ± 0.33	1.9 ± 0.14
Okayama, OKAYAMA	16.0	440	1870	5.6 ± 0.43	13 ± 1.0	2.8 ± 0.28	1.5 ± 0.15
Matsuyama, EHIME	15.5	374	2020	2.2 ± 0.31	5.8 ± 0.82	2.9 ± 0.28	1.4 ± 0.14
Kochi, KOCHI	13.7	468	2030	2.8 ± 0.35	6.0 ± 0.75	2.8 ± 0.32	1.4 ± 0.16
Saga, SAGA	21.0	2040	2370	3.8 ± 0.40	1.8 ± 0.20	1.9 ± 0.29	0.8 ± 0.12
December, 1981							
Soo-gun, KAGOSHIMA	14.2	481	1830	2.3 ± 0.42	4.8 ± 0.88	5.1 ± 0.37	2.8 ± 0.20

Figure (8) Sampling Locations of Total diet

1. Aomori
2. Ojika-gun
3. Akita
4. Hiratsuka
5. Nishikanbara-gun
6. Fukui
7. Nagano
8. Nagoya
9. Kyoto
10. Neyagawa
11. Kakogawa
12. Iwami-gun
13. Matsue
14. Okayama
15. Hiroshima
16. Matsuyama
17. Kochi
18. Tsukushino
19. Saga
20. Soo-gun
21. Naha



(9)-1 Strontium-90 and Cesium-137 in Rice (producing districts) (from Oct. 1981 to Dec. 1981)

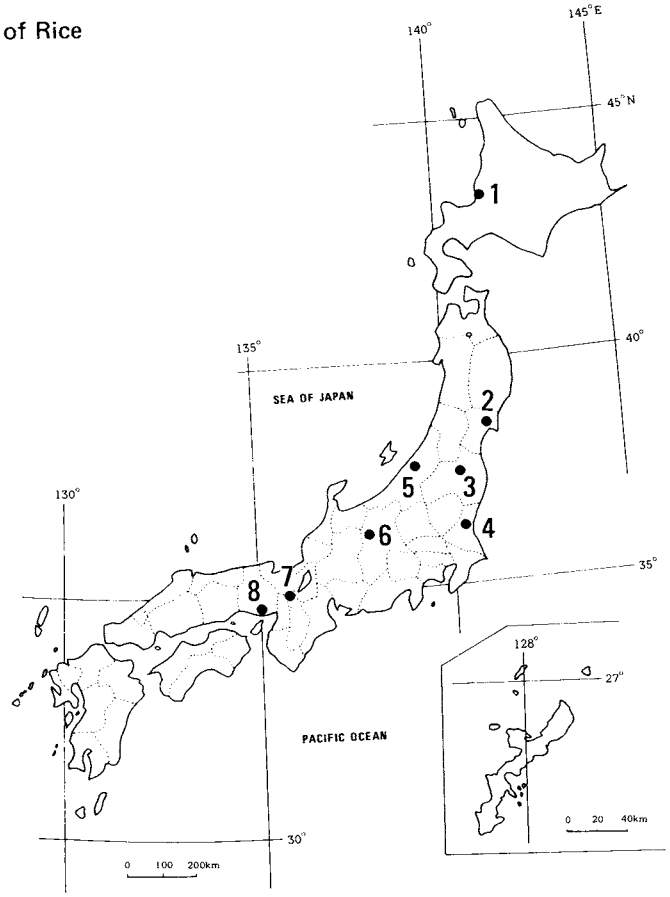
– continued from No. 54 of this publication –

Table (9)-1: Strontium-90 and Cesium-137 in Rice

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
October, 1981							
Mito, IBARAGI	0.409	0.0064	0.074	0.4 ± 0.18	6 ± 2.9	4.7 ± 0.30	6.4 ± 0.41
Nishikanbara-gun, NIIGATA	0.408	0.0050	0.081	0.7 ± 0.18	13 ± 3.6	2.0 ± 0.22	2.5 ± 0.28
Minamiazumi-gun, NAGANO	0.437	0.0060	0.11	0.3 ± 0.24	5 ± 3.9	1.2 ± 0.25	1.1 ± 0.23
Akashi, HYOGO	0.414	0.0049	0.083	1.3 ± 0.28	26 ± 5.6	0.8 ± 0.23	1.0 ± 0.27
November, 1981							
Ishikari-gun, HOKKAIDO	0.488	0.0041	0.15	0.4 ± 0.27	11 ± 6.5	4.8 ± 0.38	3.3 ± 0.26
Fukushima, FUKUSHIMA	0.427	0.0045	0.086	0.8 ± 0.34	17 ± 7.5	1.3 ± 0.33	1.5 ± 0.38
Kyoto, KYOTO	0.505	0.0054	0.093	0.6 ± 0.70	10 ±13	2.3 ± 0.69	2.5 ± 0.74
December, 1981							
Tooda-gun, MIYAGI	0.461	0.0036	0.10	0.2 ± 0.25	7 ± 6.9	2.2 ± 0.29	2.2 ± 0.29

Figure (9)-1 Sampling Locations of Rice

1. **Ishikari-gun**
2. **Tooda-gun**
3. **Fukushima**
4. **Mito**
5. **Nishikanbara-gun**
6. **Minamiazumi-gun**
7. **Kyoto**
8. **Akashi**



(9)-2 Strontium-90 and Cesium-137 in Rice (consuming districts) (from Sep. 1981 to Dec. 1981)

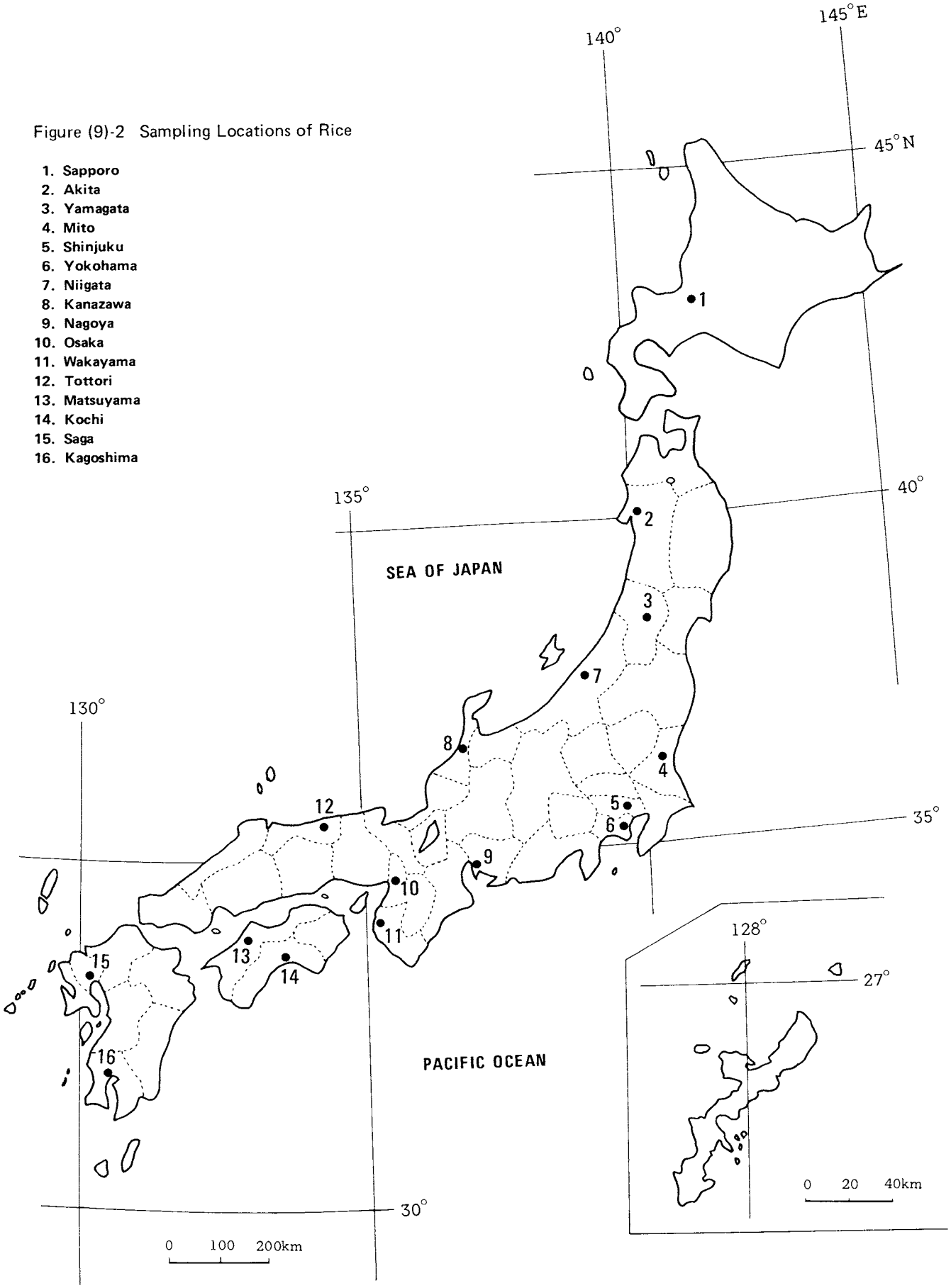
– continued from No. 54 of this publication –

Table (9)-2: Strontium-90 and Cesium-137 in Rice

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
September, 1981							
Kanazawa, ISHIKAWA	0.449	0.0056	0.098	0.7 ± 0.27	13 4.8	2.2 0.33	2.3 ± 0.34
October, 1981							
Akita, AKITA	0.350	0.004	0.11	0.8 ± 0.21	21 ± 5.1	6.1 ± 0.33	5.7 ± 0.30
Mito, IBARAGI	0.392	0.0049	0.079	0.3 ± 0.15	7 ± 3.1	1.8 ± 0.19	2.3 ± 0.24
Shinjuku, TOKYO	0.405	0.0049	0.079	0.7 ± 0.32	15 ± 6.5	2.9 ± 0.41	3.7 ± 0.52
Niigata, NIIGATA	0.371	0.0046	0.075	0.7 ± 0.13	15 ± 2.8	2.6 ± 0.18	3.5 ± 0.24
Matsuyama, EHIME	0.384	0.0049	0.084	0.7 ± 0.20	15 ± 4.2	1.2 ± 0.22	1.4 ± 0.26
November, 1981							
Sapporo, HOKKAIDO	0.464	0.0035	0.14	0.0 ± 0.22	0.0 ± 6.4	1.5 ± 0.27	1.0 ± 0.19
Osaka, OSAKA	0.442	0.0050	0.11	0.6 ± 0.24	12 ± 4.7	2.1 ± 0.28	1.9 ± 0.26
Saga, SAGA	0.648	0.0044	0.14	0.0 ± 0.31	00.0 ± 6.9	1.0 ± 0.33	0.7 ± 0.23
December, 1981							
Yamagata, YAMAGATA	0.489	0.0043	0.14	0.0 ± 0.24	0.0 ± 5.6	2.6 ± 0.31	1.9 ± 0.23
Yokohama, KANAGAWA	0.393	0.0038	0.11	0.5 ± 0.21	14 ± 5.4	0.8 ± 0.36	5.4 ± 0.34
Nagoya, AICHI	0.395	0.0038	0.074	0.3 ± 0.23	7 ± 5.9	1.2 ± 0.23	1.6 ± 0.31
Wakayama, WAKAYAMA	0.396	0.0041	0.079	0.3 ± 0.21	9 ± 5.2	1.2 ± 0.23	1.5 ± 0.30
Tottori, TOTTORI	0.380	0.0042	0.076	0.5 ± 0.21	11 ± 5.1	4.4 ± 0.31	5.8 ± 0.41
Kochi, KOCHI	0.525	0.0042	0.13	0.3 ± 0.27	7 ± 6.3	1.4 ± 0.29	1.0 ± 0.22
Kagoshima, KAGOSHIMA	0.421	0.0044	0.11	0.5 ± 0.23	11 ± 5.1	9.0 ± 0.46	8.6 ± 0.43

Figure (9)-2 Sampling Locations of Rice

1. Sapporo
2. Akita
3. Yamagata
4. Mito
5. Shinjuku
6. Yokohama
7. Niigata
8. Kanazawa
9. Nagoya
10. Osaka
11. Wakayama
12. Tottori
13. Matsuyama
14. Kochi
15. Saga
16. Kagoshima



(10)-1 Strontium-90 and Cesium-137 in Milk (producing districts for WHO program) (from Apr. 1981 to Nov. 1981)

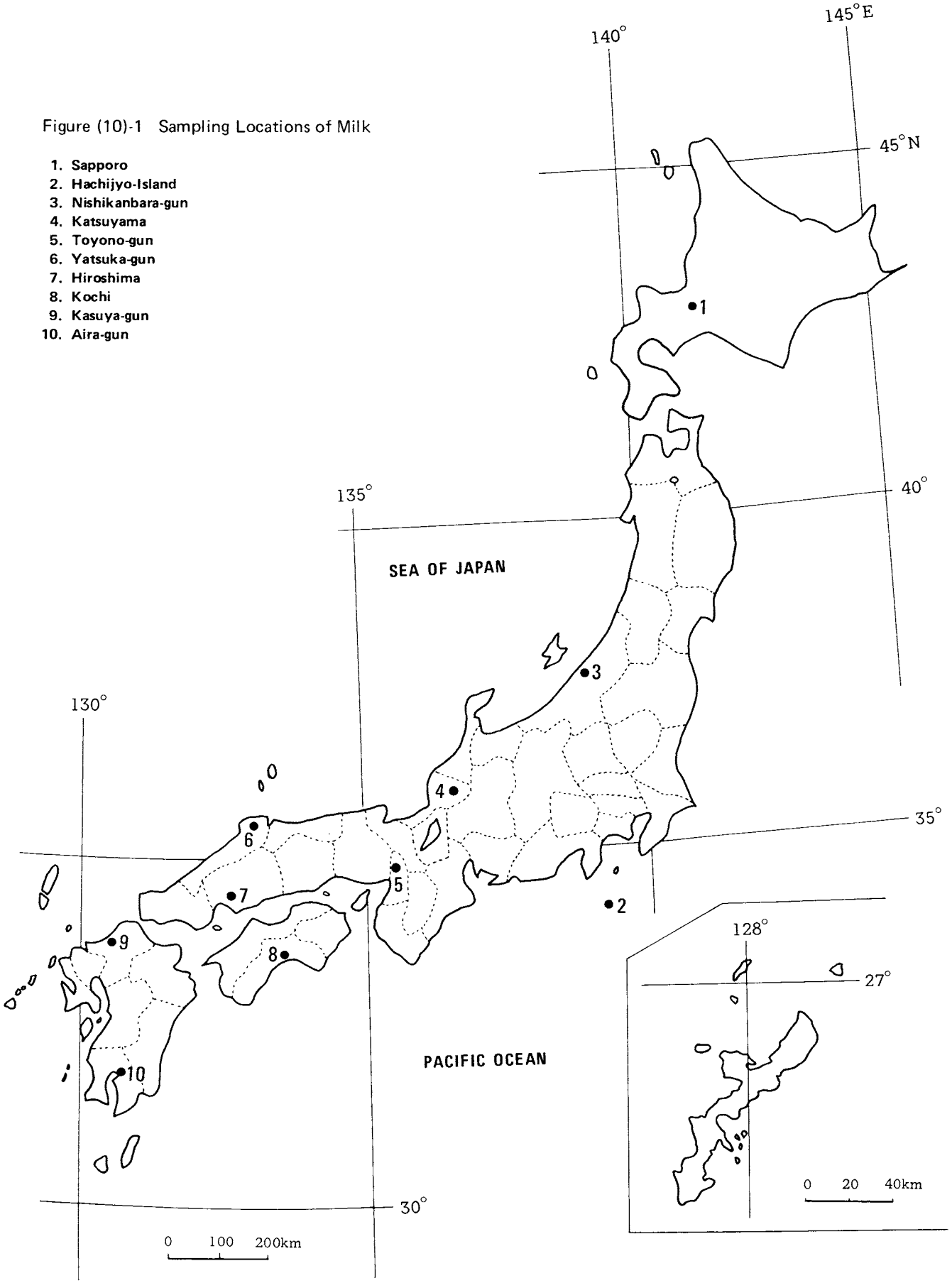
— continued from No. 58 of this publication —

Table (10)-1: Strontium-90 and Sesium-137 in Milk

Location	Component			^{90}Sr		^{137}Cs	
	Ash (g/ℓ)	Ca (g/ℓ)	K (g/ℓ)	pCi/ℓ	S.U.	pCi/ℓ	C.U.
April, 1981							
Yatsuka-gun, SHIMANE	6.90	1.09	1.55	2.5 ± 0.27	2.3 ± 0.25	3.0 ± 0.26	2.0 ± 0.17
May, 1981							
Kasuya-gun, FUKUOKA	7.14	1.07	1.59	1.6 ± 0.24	1.5 ± 0.22	1.9 ± 0.20	1.2 ± 0.12
June, 1981							
Katsuyama, FUKUI	7.25	1.10	1.67	4.2 ± 0.33	3.8 ± 0.30	8.4 ± 0.39	5.0 ± 0.23
Yatsuka-gun, SHIMANE	7.37	1.15	1.70	2.9 ± 0.28	2.6 ± 0.25	5.3 ± 0.34	3.1 ± 0.20
July, 1981							
Hiroshima, HIROSHIMA	6.77	1.02	1.64	1.4 ± 0.23	1.4 ± 0.22	3.2 ± 0.25	2.0 ± 0.15
August, 1981							
Sapporo, HOKKAIDO	7.34	1.20	1.73	2.9 ± 0.28	2.4 ± 0.23	6.6 ± 0.35	3.8 ± 0.20
Hachijo-Island, TOKYO	7.29	1.16	1.56	6.2 ± 0.39	5.4 ± 0.34	68 ± 1.1	44 ± 0.7
Nishikanbara-gun, NIIGATA	6.97	1.04	1.51	1.7 ± 0.23	1.6 ± 0.23	5.0 ± 0.31	3.3 ± 0.21
Katsuyama, FUKUI	7.23	1.12	1.50	2.9 ± 0.27	2.6 ± 0.24	5.9 ± 0.34	3.9 ± 0.23
Toyono-gun, OSAKA	7.26	1.12	1.64	1.1 ± 0.24	1.0 ± 0.21	1.6 ± 0.23	0.9 ± 0.14
Yatsuka-gun, SHIMANE	7.28	1.20	1.57	2.6 ± 0.26	2.2 ± 0.22	6.5 ± 0.35	4.1 ± 0.22
Hiroshima-HIROSHIMA	6.40	0.962	1.49	1.6 ± 0.24	1.6 ± 0.24	1.8 ± 0.20	1.2 ± 0.14
Kochi, KOCHI	6.85	0.959	1.65	3.2 ± 0.30	3.3 ± 0.31	3.5 ± 0.26	2.1 ± 0.15
Kasuya-gun, FUKUOKA	7.19	1.06	1.65	1.4 ± 0.24	1.3 ± 0.23	1.0 ± 0.21	0.6 ± 0.13
September, 1981							
Aira-gun, KAGOSHIMA	7.18	1.15	1.60	1.9 ± 0.25	1.6 ± 0.22	3.0 ± 0.27	1.9 ± 0.17
October, 1981							
Katsuyama, FUKUI	7.54	1.10	1.63	2.7 ± 0.28	2.5 ± 0.26	4.0 ± 0.30	2.4 ± 0.19
November, 1981							
Sapporo, HOKKAIDO	7.08	1.23	1.59	1.9 ± 0.23	1.5 ± 0.19	3.8 ± 0.27	2.4 ± 0.17
Hachijo-Island, TOKYO	7.09	1.13	1.48	4.7 ± 0.32	4.1 ± 0.29	34 ± 0.7	23 ± 0.5
Kochi, KOCHI	7.42	1.14	1.67	2.2 ± 0.29	1.9 ± 0.25	2.0 ± 0.28	1.2 ± 0.17
Aira-gun, KAGOSHIMA	7.30	1.12	1.61	1.7 ± 0.24	1.5 ± 0.21	5.2 ± 0.32	3.2 ± 0.20

Figure (10)-1 Sampling Locations of Milk

1. Sapporo
2. Hachijyo-Island
3. Nishikanbara-gun
4. Katsuyama
5. Toyono-gun
6. Yatsuka-gun
7. Hiroshima
8. Kochi
9. Kasuya-gun
10. Aira-gun



(10)-2 Strontium-90 Cesium-137 in Milk (producing districts for domestic program) (from June 1981 to Oct. 1981)

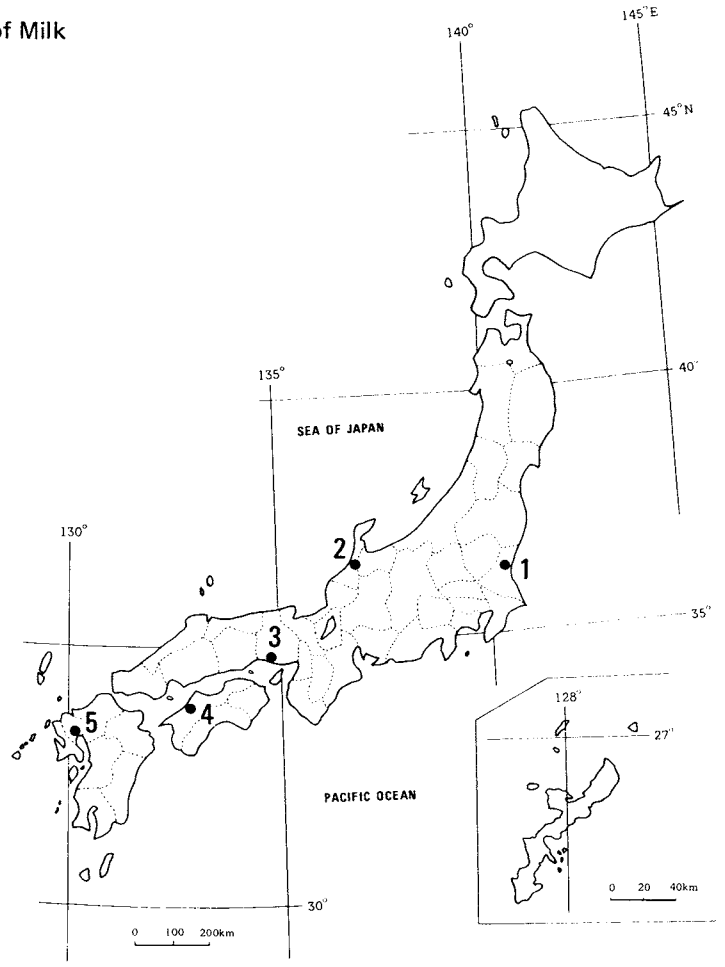
— continued from No. 57 of this publication —

Table (10)-2: Strontium-90 and Cesium-137 in Milk

Location	Component			^{90}Sr		^{137}Cs	
	Ash (g/ℓ)	Ca (g/ℓ)	K (g/ℓ)	pCi/ℓ)	S.U.	pCi/ℓ)	C.U.
June, 1981							
Saga, SAGA	6.89	0.986	1.67	1.6 ± 0.23	1.6 ± 0.24	1.7 ± 0.19	1.0 ± 0.11
August, 1981							
Mito, IBARAGI	7.24	1.23	1.58	2.1 ± 0.28	1.7 ± 0.23	1.6 ± 0.22	1.0 ± 0.14
Hakui-gun, ISHIKAWA	7.00	1.04	1.67	1.9 ± 0.26	1.8 ± 0.25	3.3 ± 0.28	2.0 ± 0.17
Himeji, HYOGO	6.59	1.02	1.49	1.0 ± 0.20	1.0 ± 0.20	7.9 ± 0.35	5.3 ± 0.23
Matsuyama, EHIME	7.28	1.13	1.58	1.4 ± 0.24	1.3 ± 0.21	2.1 ± 0.24	1.3 ± 0.15
October, 1981							
Saga, SAGA	7.21	1.11	1.58	0.6 ± 0.22	0.5 ± 0.20	2.0 ± 0.23	1.3 ± 0.15

Figure (10)-2 Sampling Locations of Milk

1. **Mito**
2. **Hakui-gun**
3. **Himeji**
4. **Matsuyama**
5. **Saga**



(10)-3 Strontium-90 and Cesium-137 in Milk (consuming districts) (from Apr. 1981 to Sep. 1981)

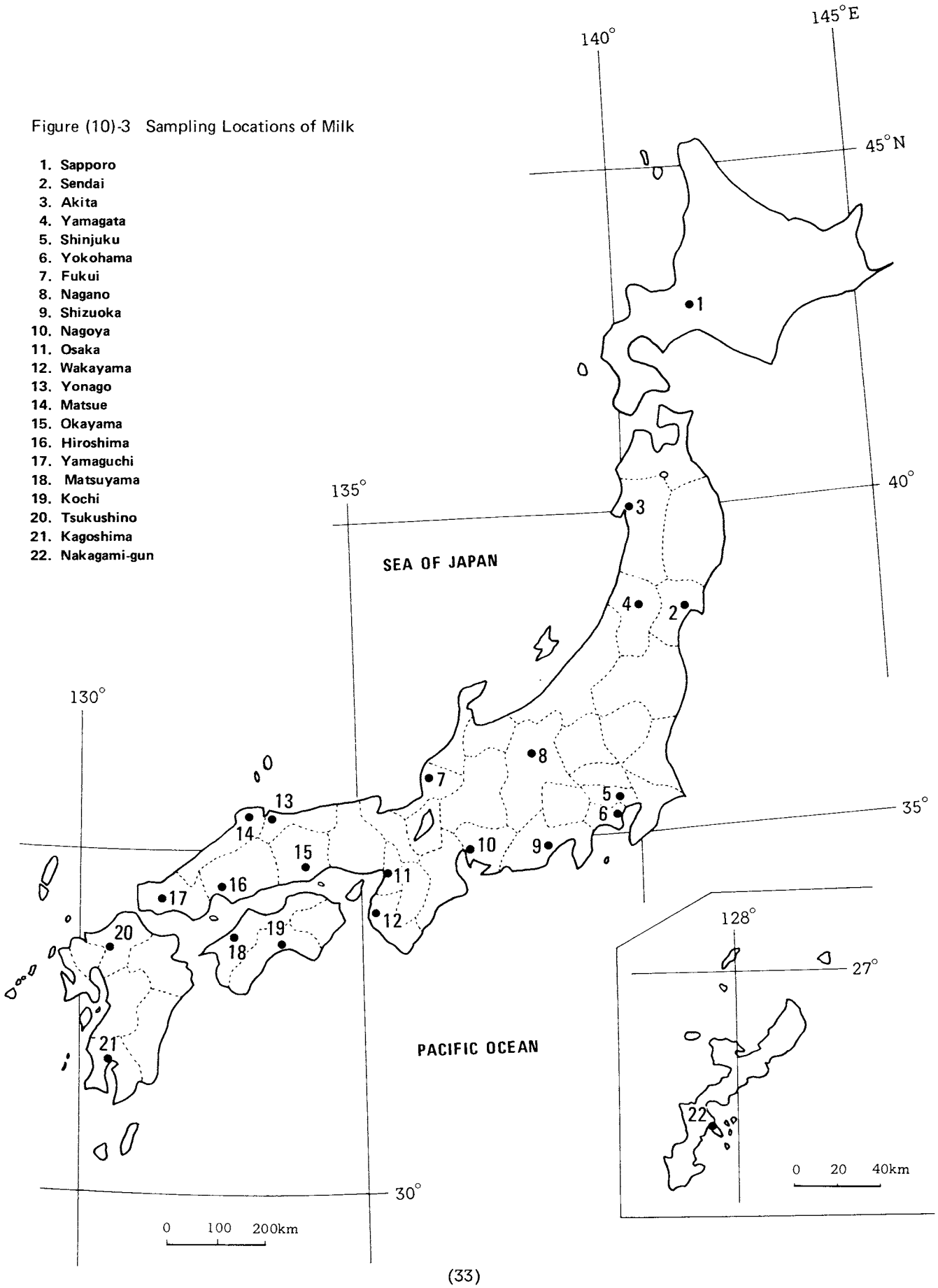
– continued from No. 58 of this publication –

Table (10)-3: Strontium-90 and Cesium-137 in Milk

Location	Component			^{90}Sr		^{137}Cs	
	Ash (g/ℓ)	Ca (g/ℓ)	K (g/ℓ)	pCi/ℓ	S.U.	pCi/ℓ	C.U.
April, 1981							
Sendai, MIYAGI	7.32	1.13	1.69	1.1 ± 0.26	1.0 ± 0.23	1.9 ± 0.22	1.1 ± 0.13
June, 1981							
Fukui, FUKUI	6.86	1.06	1.56	1.3 ± 0.26	1.2 ± 0.24	3.2 ± 0.26	2.0 ± 0.17
Matsue, SHIMANE	6.78	1.03	1.60	2.2 ± 0.25	2.1 ± 0.24	1.8 ± 0.23	1.1 ± 0.14
July, 1981							
Nakagami-gun, OKINAWA	6.61	1.01	1.55	1.2 ± 0.20	1.2 ± 0.20	2.3 ± 0.21	1.5 ± 0.13
August, 1981							
Sapporo, HOKKAIDO	7.13	1.09	1.67	2.6 ± 0.27	2.3 ± 0.24	6.6 ± 0.33	4.0 ± 0.20
Akita, AKITA	6.89	0.947	1.61	2.9 ± 0.28	3.0 ± 0.29	6.9 ± 0.35	4.3 ± 0.22
Yamagata, YAMAGATA	6.92	1.02	1.64	1.2 ± 0.22	1.2 ± 0.22	2.1 ± 0.24	1.3 ± 0.15
Shijuki, TOKYO	6.69	0.973	1.58	0.8 ± 0.20	0.9 ± 0.20	3.5 ± 0.27	2.2 ± 0.17
Nagano, NAGANO	7.28	1.12	1.70	1.0 ± 0.21	0.9 ± 0.19	3.3 ± 0.28	1.9 ± 0.17
Shizuoka, SHIZUOKA	7.21	1.10	1.62	1.3 ± 0.24	1.2 ± 0.21	1.6 ± 0.23	1.0 ± 0.14
Nagoya, AICHI	6.68	1.03	1.53	1.0 ± 0.22	0.9 ± 0.22	1.2 ± 0.22	0.8 ± 0.14
Osaka, OSAKA	7.10	1.08	1.65	1.5 ± 0.24	1.4 ± 0.23	1.7 ± 0.23	1.0 ± 0.14
Wakayama, WAKAYAMA	6.63	0.978	1.57	1.3 ± 0.21	1.3 ± 0.22	1.4 ± 0.21	0.9 ± 0.14
Yonato, TOTTORI	6.84	1.04	1.57	2.0 ± 0.24	1.9 ± 0.23	7.7 ± 0.36	4.9 ± 0.23
Okayama, OKAYAMA	7.18	1.13	1.69	1.3 ± 0.24	1.2 ± 0.21	3.1 ± 0.27	1.8 ± 0.16
Hiroshima, HIROSHIMA	6.80	1.01	1.61	1.7 ± 0.24	1.7 ± 0.24	2.5 ± 0.23	1.6 ± 0.15
Matsuyama, EHIME	7.34	1.07	1.56	1.2 ± 0.25	1.1 ± 0.23	2.8 ± 0.27	1.8 ± 0.17
Kochi, KOCHI	6.85	0.959	1.65	3.2 ± 0.30	3.3 ± 0.31	3.5 ± 0.26	2.1 ± 0.15
Tsukushino, FUKUOKA	7.04	1.05	1.60	1.0 ± 0.22	0.9 ± 0.21	3.5 ± 0.28	2.2 ± 0.17
Kagoshima, KAGOSHIMA	6.61	0.978	1.59	1.5 ± 0.22	1.5 ± 0.23	2.4 ± 0.21	1.5 ± 0.13
September, 1981							
Yamaguchi, YAMAGUCHI	7.19	1.08	1.65	1.0 ± 0.25	0.9 ± 0.23	1.3 ± 0.20	0.8 ± 0.12

Figure (10)-3 Sampling Locations of Milk

1. Sapporo
2. Sendai
3. Akita
4. Yamagata
5. Shinjuku
6. Yokohama
7. Fukui
8. Nagano
9. Shizuoka
10. Nagoya
11. Osaka
12. Wakayama
13. Yonago
14. Matsue
15. Okayama
16. Hiroshima
17. Yamaguchi
18. Matsuyama
19. Kochi
20. Tsukushino
21. Kagoshima
22. Nakagami-gun



(10)-4 Strontium-90 and Cesium-137 in Milk (powdered milk)

— continued from No. 58 of this publication —

Table (10)-4: Strontium-90 and Cesium-137 in Milk

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
Octobe, 1981							
Meiji	2.74	0.455	0.715	12 ± 0.14	2.7 ± 0.14	38 ± 0.9	5.3 ± 0.13
Morinaga	2.31	0.353	0.601	2.4 ± 0.31	0.7 ± 0.09	12 ± 0.5	2.0 ± 0.09
Wakodo	2.42	0.332	0.711	4.2 ± 0.39	1.3 ± 0.12	11 ± 0.5	1.6 ± 0.07
Yukijirushi	2.32	0.371	0.566	7.6 ± 0.50	2.0 ± 0.13	34 ± 0.8	5.9 ± 0.14
*Morinaga	8.13	1.28	2.03	16 ± 0.9	1.2 ± 0.07	26 ± 1.0	1.3 ± 0.05
*Meiji	8.16	1.23	1.89	46 ± 1.5	3.7 ± 0.12	140 ± 2	7.4 ± 0.11

*Skim milk

(11)-1 Strontium-90 and Cesium-137 in Vegetables (producing districts) (from Jul. 1981 to Dec. 1981)

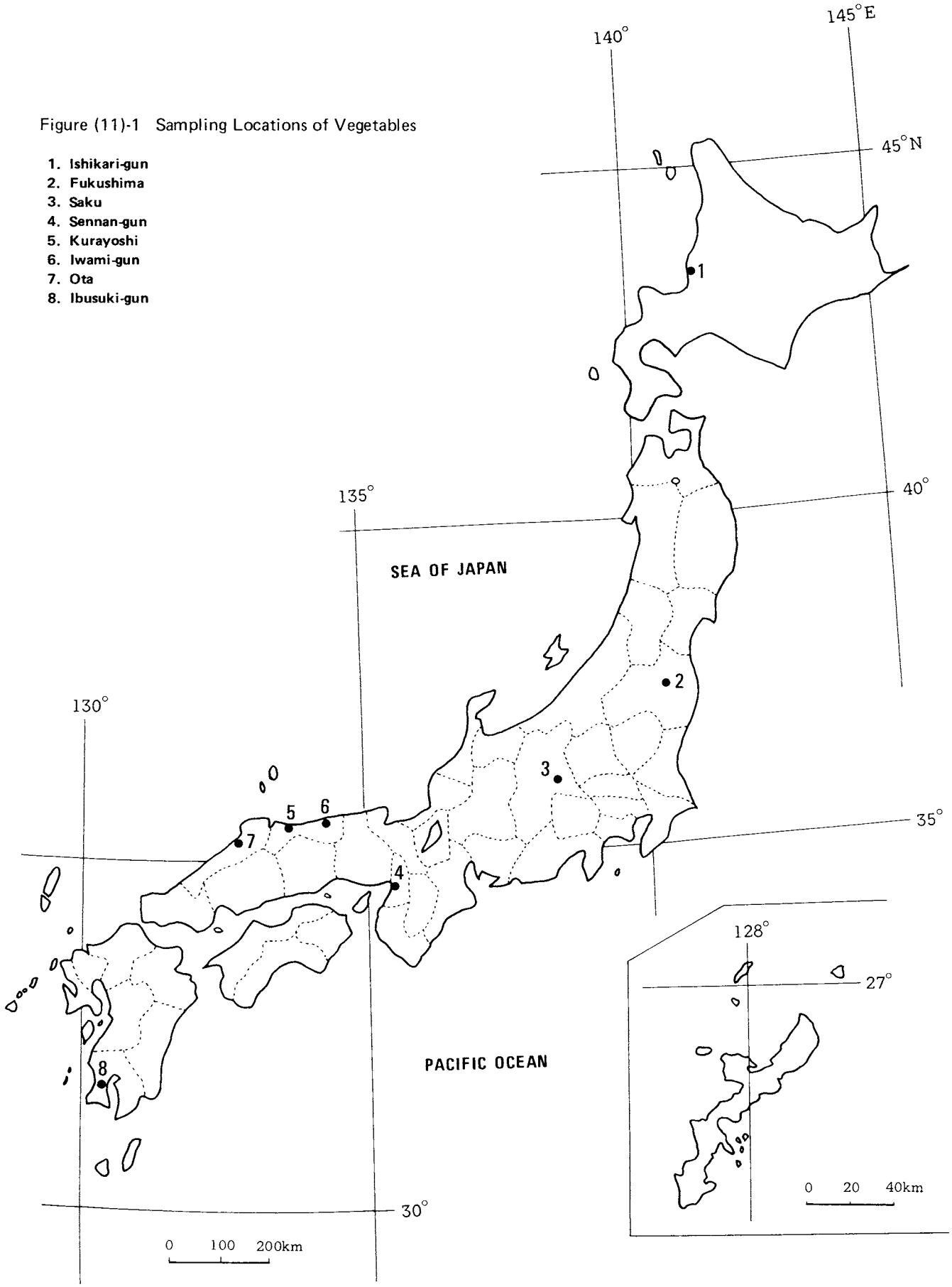
— continued from No. 58 of this publication —

Table (11)-1: Strontium-90 and Cesium-137 in Vegetables

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
(Japanese radish)							
July, 1981							
Ota, SHIMANE	0.763	0.022	0.358	8.9 ± 0.68	40 ± 3.1	2.2 ± 0.44	0.6 ± 0.12
September, 1981							
Ishikari-gun, HOKKAIDO	0.462	0.019	0.217	7.7 ± 0.52	41 ± 2.8	0.9 ± 0.24	0.4 ± 0.11
October, 1981							
Saku, NAGANO	0.624	0.024	0.265	2.3 ± 0.41	9.6 ± 1.7	1.1 ± 0.29	0.4 ± 0.11
November, 1981							
Fukushima, FUKUSHIMA	0.491	0.021	0.213	3.3 ± 0.29	16 ± 1.4	0.0 ± 0.15	0.0 ± 0.07
Ibusuki-gun, KAGOSHIMA	0.585	0.028	0.258	9.4 ± 0.51	34 ± 1.8	1.4 ± 0.25	0.5 ± 0.10
December, 1981							
Iwami-gun, TOTTORI	0.605	0.032	0.257	11 ± 0.6	35 ± 1.7	0.7 ± 0.22	0.3 ± 0.08
(Spinach)							
July, 1981							
Ota, SHIMANE	1.54	0.077	0.511	18 ± 0.8	24 ± 1.1	4.1 ± 0.41	0.8 ± 0.08
September, 1981							
Ishikari-gun, HOKKAIDO	1.66	0.074	0.789	10 ± 0.6	13 ± 0.9	1.0 ± 0.31	0.1 ± 0.04
October, 1981							
Saku, NAGANO	2.20	0.061	1.03	2.3 ± 0.39	3.8 ± 0.64	1.1 ± 0.32	0.1 ± 0.03
December, 1981							
Fukushima, FUKUSHIMA	1.55	0.057	0.629	3.6 ± 0.44	6.2 ± 0.77	0.7 ± 0.26	0.1 ± 0.04
Kurayoshi, TOTTORI	1.62	0.084	0.581	8.4 ± 0.49	10 ± 0.6	5.3 ± 0.36	0.9 ± 0.06
Ibusuki-gun, KAGOSHIMA	1.49	0.119	0.303	27 ± 0.9	23 ± 0.8	44 ± 1.0	15 ± 0.30
(Onion)							
July, 1981							
Sennan-gun, OSAKA	0.362	0.014	0.166	1.9 ± 0.30	13 ± 2.2	0.5 ± 0.02	0.3 ± 0.12

Figure (11)-1 Sampling Locations of Vegetables

1. Ishikari-gun
2. Fukushima
3. Saku
4. Sennan-gun
5. Kurayoshi
6. Iwami-gun
7. Ota
8. Ibusuki-gun



(11)-2 Strontium-90 and Cesium-137 in Vegetables (consuming districts) (from May 1981 to Nov. 1981)

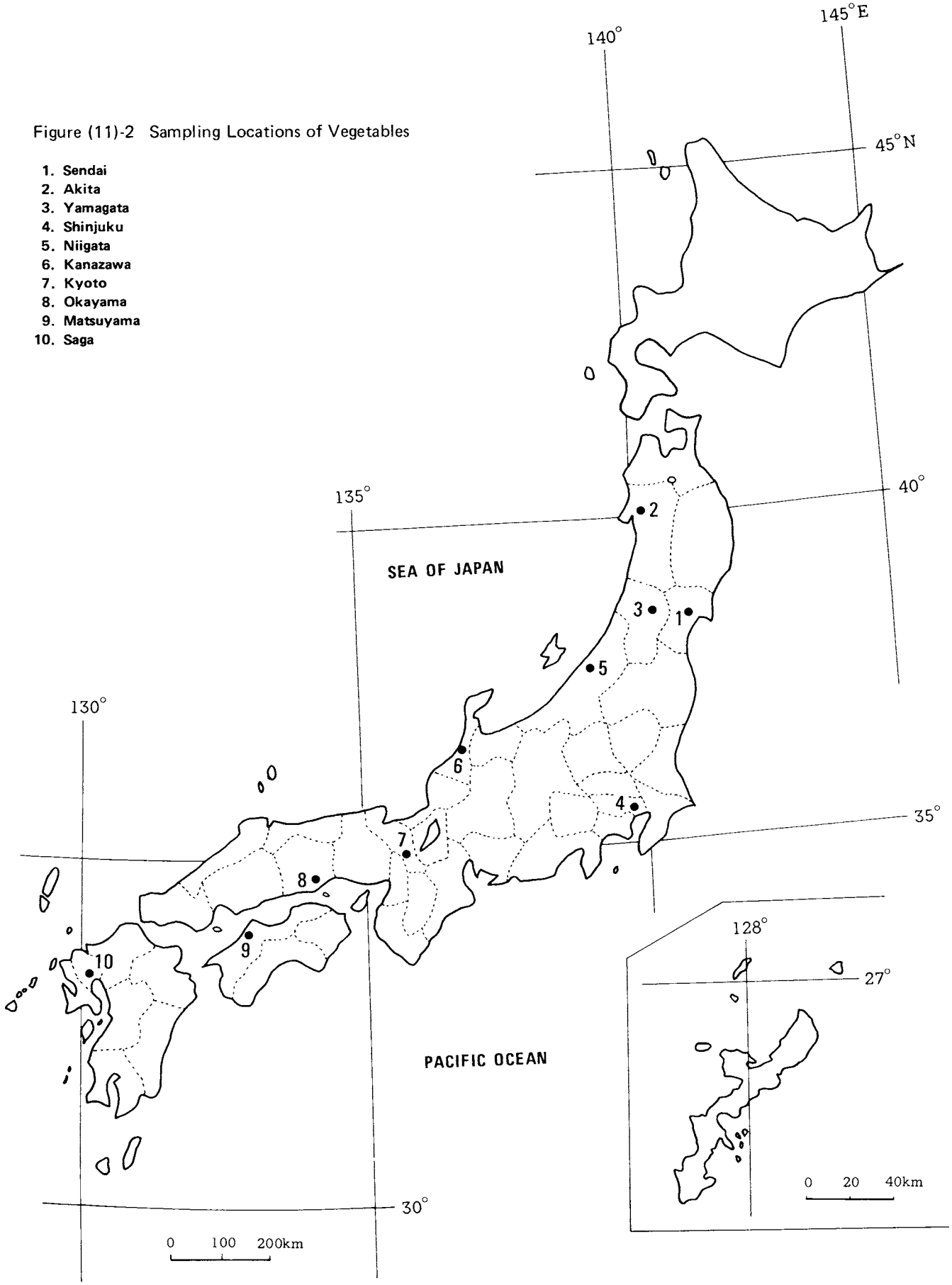
– continued from No. 58 of this publication –

Table (11)-2: Strontium-90 and Cesium-137 in Vegetables

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	PCi/kg	C.U.
(Japanese radish)							
September, 1981							
Sendai, MIYAGI	0.542	0.035	0.227	18 ± 0.7	53 ± 2.1	1.6 ± 0.26	0.7 ± 0.12
October, 1981							
Yamagata, YAMAGATA	0.404	0.031	0.160	53 ± 1.1	170 ± 4	2.0 ± 0.27	1.2 ± 0.17
Kyoto, KYOTO	0.537	0.021	0.247	8.1 ± 0.55	39 ± 2.7	0.5 ± 0.25	0.2 ± 0.10
Saga, SAGA	0.574	0.026	0.242	4.2 ± 0.31	16 ± 1.2	0.2 ± 0.15	0.1 ± 0.06
November, 1981							
Akita, AKITA	0.444	0.025	0.188	20 ± 0.7	78 ± 2.8	0.5 ± 0.23	0.3 ± 0.12
Shinjuku, TOKYO	0.641	0.030	0.293	4.0 ± 0.38	13 ± 1.3	0.7 ± 0.19	0.2 ± 0.06
Niigata, NIIGATA	0.398	0.017	0.155	2.1 ± 0.36	12 ± 2.1	0.4 ± 0.24	0.2 ± 0.16
Kanazawa, ISHIKAWA	0.464	0.022	0.198	8.4 ± 0.55	39 ± 2.5	1.1 ± 0.26	0.6 ± 0.13
Okayama, OKAYAMA	0.424	0.026	0.161	57 ± 1.2	220 ± 5	4.1 ± 0.32	2.6 ± 0.20
(Spinach)							
May, 1981							
Sendai, MIYAGI	1.46	0.041	0.699	5.6 ± 0.53	14 ± 1.3	3.3 ± 0.35	0.5 ± 0.05
October, 1981							
Yamagata, YAMAGATA	1.63	0.067	0.722	5.8 ± 0.54	8.6 ± 0.80	0.8 ± 0.31	0.1 ± 0.04
Saga, SAGA	1.84	0.094	0.700	11.5 ± 0.32	1.6 ± 0.34	1.1 ± 0.27	0.2 ± 0.04
November, 1981							
Kanazawa, ISHIKAWA	1.23	0.063	0.439	1.9 ± 0.32	3.0 ± 0.50	0.8 ± 0.24	0.2 ± 0.05
Okayama, OKAYAMA	1.43	0.110	0.451	7.5 ± 0.51	6.9 ± 0.47	1.9 ± 0.30	0.4 ± 0.07
Matsuyama, EHIME	1.56	0.107	0.398	3.6 ± 0.34	3.4 ± 0.32	1.6 ± 0.25	0.4 ± 0.06
(Cabbage)							
October, 1981							
Akita, AKITA	0.467	0.049	0.162	8.6 ± 0.55	18 ± 1.1	2.8 ± 0.33	1.7 ± 0.20

Figure (11)-2 Sampling Locations of Vegetables

1. Sendai
2. Akita
3. Yamagata
4. Shinjuku
5. Niigata
6. Kanazawa
7. Kyoto
8. Okayama
9. Matsuyama
10. Saga



(12) Strontium-90 and Cesium-137 in Sea fish (from Jun. 1981 to Dec. 1981)

– continued from No. 58 of this publication –

Table (12): Strontium-90 and Cesium-137 in Sea fish

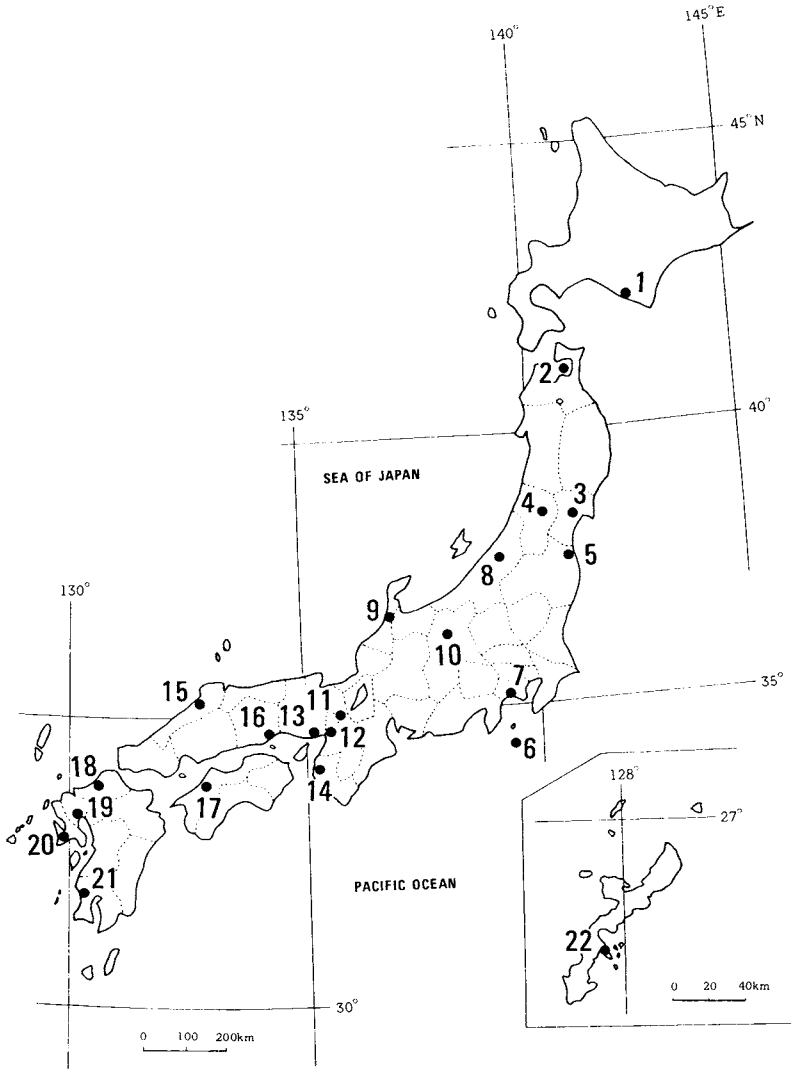
Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
(Oncorhynchus keta)							
Octobe, 1981							
Urakawa-gun, HOKKAIDO	1.33	4.77	33.8	0.5 ± 0.23	0.7 ± 0.36	7.0 ± 0.41	1.5 ± 0.09
(Limanda herensteini)							
June, 1981							
Sendai, MIYAGI	2.93	23.4	10.4	0.5 ± 0.26	0.1 ±0.04	1.9 ± 0.37	0.6 ± 0.12
November, 1981							
Mutsu-bay, AOMORI	1.30	8.30	27.9	0.6 ± 0.33	0.5 ± 0.30	4.8 ± 0.47	1.3 ± 0.13
Niigata, NIIGATA	0.586	8.23	26.6	0.1 ± 0.24	0.2 ± 0.49	2.9 ± 0.31	1.8 ± 0.20
Hakui-gun, ISHIKAWA	0.898	7.92	28.1	0.0 ± 0.48	0.0 ± 0.67	4.9 ± 0.55	1.9 ± 0.22
(Doryteuthis bleekeri)							
September, 1981							
Yamagata, YAMAGATA	1.13	0.890	26.6	0.0 ± 0.21	0.0 ± 0.2	1.6 ± 0.28	0.5 ± 0.09
(Decapterus muroadsi)							
September, 1981							
Miyake-Island, TOKYO	1.50	13.4	21.0	0.4 ± 0.24	0.2 ± 0.12	10 ± 0.5	3.2 ± 0.16
(Trachurus trachurus)							
August, 1981							
Akashi, HYOGO	2.67	23.7	13.5	0.4 ± 0.23	0.1 ± 0.04	6.8 ± 0.45	1.9 ± 0.12
September, 1981							
Wakayama, WAKAYAMA	2.97	24.3	9.65	0.6 ± 0.25	0.1 ±0.03	4.2 ± 0.38	1.4 ± 0.13
December, 1981							
Odawara, KANAGAWA	3.83	21.5	10.9	0.7 ± 0.26	0.1 ± 0.03	7.8 ± 0.44	1.8 ± 0.10
(Sardinops melanostictus)							
December, 1981							
Nagano, NAGANO	2.87	13.8	9.99	0.3 ± 0.33	0.05 ± 0.06	6.5 ± 0.58	1.6 ± 0.14
(Sebastiscus marmoratus)							
June, 1981							
Hamada, SHIMANE	5.94	20.9	5.30	1.4 ± 0.28	0.1 ± 0.02	7.1 ± 0.51	2.2 ± 0.16

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
(Mugil cephalus)							
September, 1981							
Saga, SAGA	1.18	2.68	36.2	0.3 ± 0.22	0.9 ± 0.67	4.2 ± 0.33	0.9 ± 0.07
November, 1981							
Oku-gun, OKAYAMA	1.81	12.2	16.3	1.7 ± 0.31	0.6 ± 0.10	7.2 ± 0.42	1.8 ± 0.11
(Scomber japonicus)							
August, 1981							
Matsuyama, EHIME	1.41	4.52	21.4	0.1 ± 0.35	0.1 ± 0.40	9.9 ± 0.65	2.4 ± 0.16
November, 1981							
Kyoto, KYOTO	1.56	14.5	20.8	0.2 ± 0.20	0.1 ± 0.09	8.6 ± 0.40	2.6 ± 0.12
Osaka, OSAKA	0.934	0.843	32.7	0.4 ± 0.27	4 ± 3.4	7.9 ± 0.43	2.6 ± 0.14
(Pagrus major)							
July, 1981							
Fukuoka, FUKUOKA	1.38	2.89	32.3	0.0 ± 0.62	0.0 ± 0.62	8.1 ± 0.49	1.7 ± 0.10
(Argyrosomus argentatus)							
September, 1981							
Nagasaki, NAGASAKI	1.13	2.49	36.1	0.2 ± 0.51	0.6 ± 1.8	9.3 ± 0.80	2.3 ± 0.20
(Spratelloides gracilis)							
December, 1981							
Akune, KAGOSHIMA	2.93	21.6	11.5	0.5 ± 0.27	0.1 ± 0.04	8.3 ± 0.46	2.5 ± 0.14
(Lateolabrax japonicus)							
September, 1981							
Soma, FUKUSHIMA	1.55	6.67	19.8	0.0 ± 0.24	0.0 ± 0.18	19 ± 0.7	4.6 ± 0.16
(Caesio chrysozonus)							
December, 1981							
Nakagami-gun, OKINAWA	3.87	23.7	12.0	0.4 ± 0.25	0.04 ± 0.03	7.3 ± 0.42	1.6 ± 0.09

Japanese name	Scientific name
Sake	Oncorhynchus keta
Karei	Limanda herzensteini
Muroaji	Decapterus muroadsi
Aji	Trachurus trachurus
Iwashi	Sardinops melanostictus
Kasago	Sebastiscus marmoratus
Bora	Mugil cephalus
Saba	Scomber japonicus
Tai	Pagrus major
Guchi	Argyrosomus argentatus
Kibinago	Spratelloides gracilis
Suzuki	Lateolabrax japonicus
Gurukun	Caesio chrysozonus

Figure (12) Sampling Locations of Sea fish

1. Urakawa-gun
2. Mutsu-bay
3. Sendai
4. Yamagata
5. Soma
6. Miyake-Island
7. Odawara
8. Niigata
9. Hakui-gun
10. Nagano
11. Kyoto
12. Osaka
13. Akashi
14. Wakayama
15. Hamada
16. Oku-gun
17. Matsuyama
18. Fukuoka
19. Saga
20. Nagasaki
21. Akune
22. Nakagami-gun



(13) Strontium-90 and Cesium-137 in Freshwater fish (from Jul. 1981 to Dec. 1981)

– continued from No. 58 of this publication –

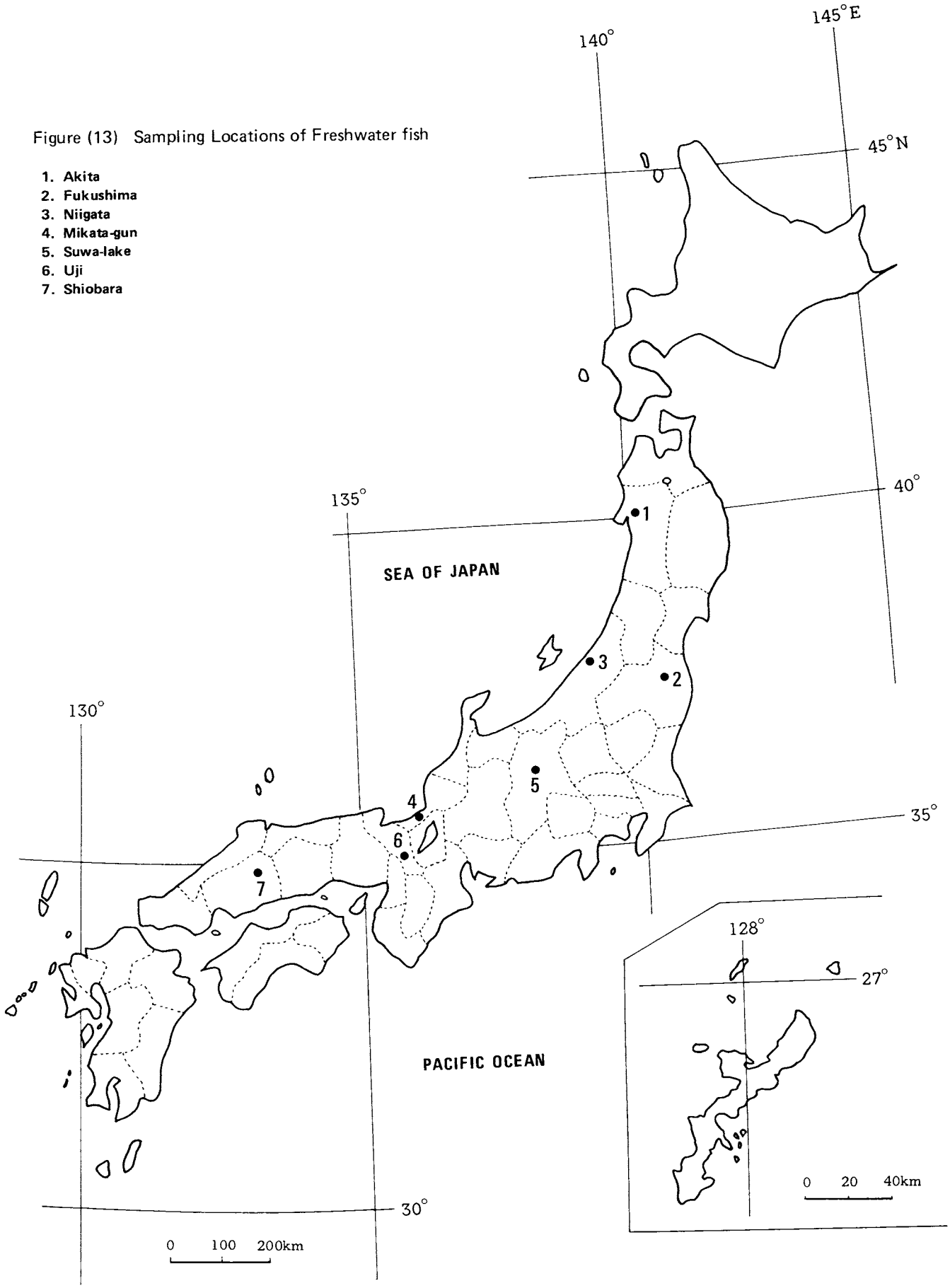
Table (13): Strontium-90 and Cesium-137 in Freshwater fish

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
(Carassis auratus)							
November, 1981							
Niigata, NIIGATA	1.67	18.8	18.3	22 ± 0.7	6.9 ± 0.22	9.7 ± 0.44	3.1 ± 0.14
December, 1981							
Mikata-gun, FUKUI	1.50	17.1	22.0	13 ± 0.8	5.0 ± 0.29	11 ± 0.6	3.3 ± 0.18
Uji, KYOTO	4.41	31.4	6.27	45 ± 1.2	3.2 ± 0.09	2.7 ± 0.36	1.0 ± 0.13
(Cyprinus carpio)							
July, 1981							
Akita, AKITA	3.18	28.3	8.69	140 ± 2	15 ± 0.2	13 ± 0.6	4.7 ± 0.22
October, 1981							
Fukushima, FUKUSHIMA	2.47	22.5	8.98	23 ± 0.8	3.6 ± 0.12	3.8 ± 0.33	1.5 ± 0.13
December, 1981							
Shobara, HIROSHIMA	2.47	28.9	9.38	34 ± 0.9	4.3 ± 0.11	4.0 ± 0.32	1.5 ± 0.12
(Hypomesus transpacificus nipponensis)							
December, 1981							
Suwa-lake, NAGANO	2.28	23.0	12.3	6.1 ± 0.47	1.1 ± 0.08	6.1 ± 0.38	2.1 ± 0.13

Japanese name	Scientific name
Funa	Carassius auratus
Koi	Cyprinus carpio
Wakasagi	Hypomesus transpacificus nipponensis

Figure (13) Sampling Locations of Freshwater fish

1. Akita
2. Fukushima
3. Niigata
4. Mikata-gun
5. Suwa-lake
6. Uji
7. Shiobara



(14) Strontium-90 and Cesium-137 in Shellfish (from Sep. 1981 to Nov. 1981)

– continued from No. 58 of this publication –

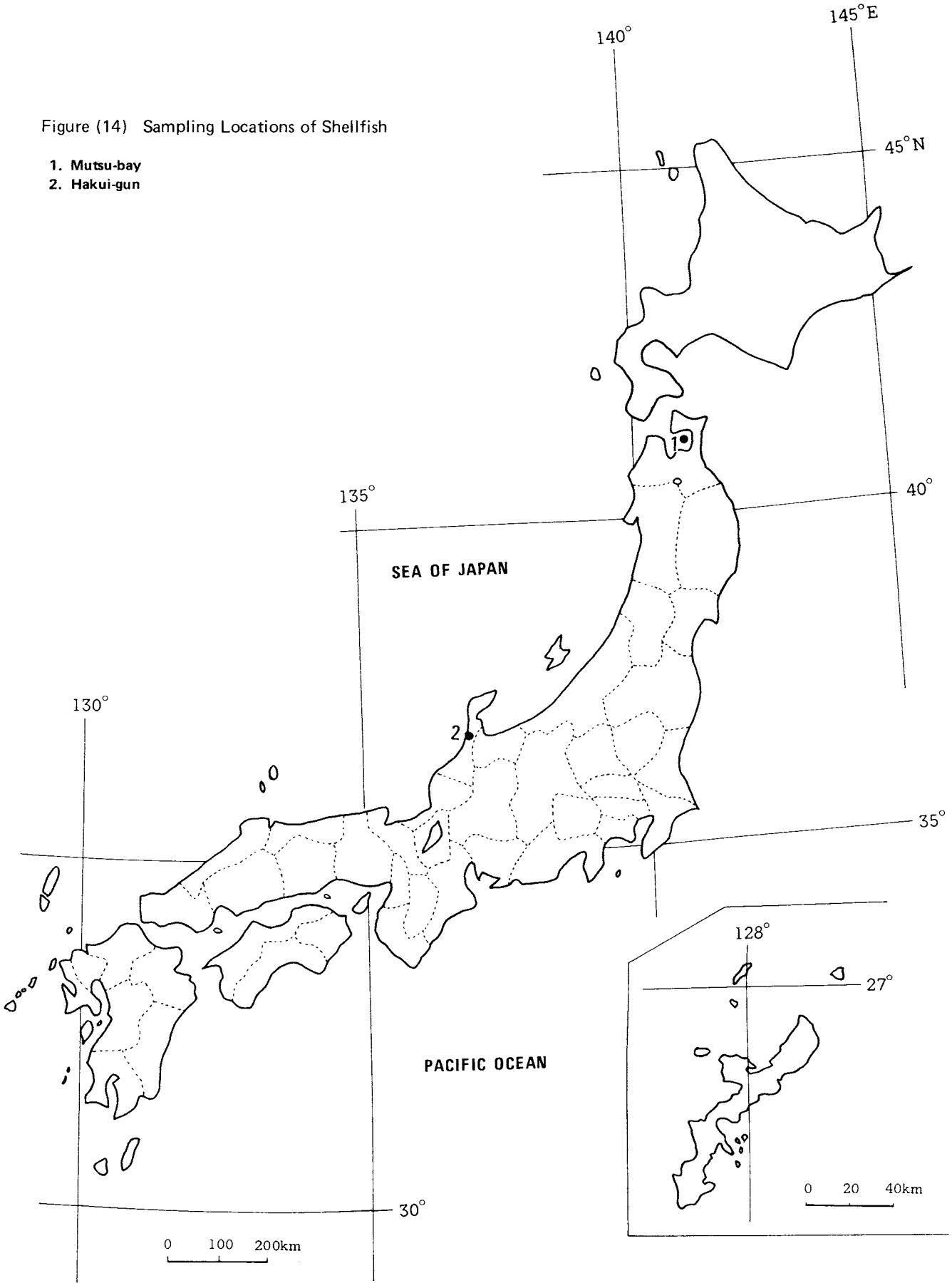
Table (14): Strontium-90 and Cesium-137 in Shellfish

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
(Turbo cornuts)							
September, 1981							
Hakui-gun, ISHIKAWA	2.23	6.69	6.63	0.0 ± 0.47	0.0 ± 0.31	2.2 ± 0.45	1.4 ± 0.30
(Patinopecten yessoensis)							
November, 1981							
Mutsu-bay, AOMORI	1.45	2.37	10.8	0.5 ± 0.38	1.4 ± 1.1	1.2 ± 0.36	0.7 ± 0.23

Japanese name	Scientific name
Sazae	Turbo cornuts
Hotategai	Patinopecten yessoensis

Figure (14) Sampling Locations of Shellfish

1. Mutsu-bay
2. Hakui-gun



(15) Strontium-90 and Cesium-137 in Seaweeds

– continued from No. 58 of this publication –

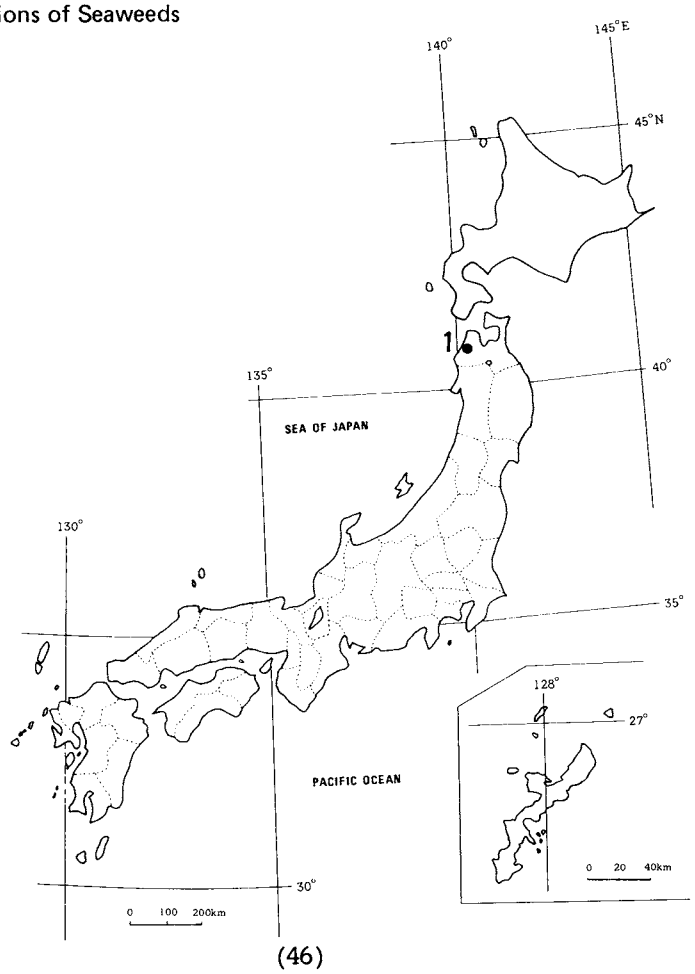
Table (15): Strontium-90 and Cesium-137 in Seaweeds

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
(Sargassum fulvellum)							
December, 1981							
Nishitsugaru-gun, AOMORI	1.30	12.8	8.59	4.2 ± 0.62	2.4 ± 0.35	0.3 ± 0.32	0.3 ± 0.27

Japanese name	Scientific name
Hondawara	Sargassum fulvellum

Figure (15) Sampling Locations of Seaweeds

1. Nishitsugaru-gun



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