

NIRS-RSD-35

**RADIOACTIVITY
SURVEY DATA
in Japan**

NUMBER 35

May. 1972

National Institute of Radiological Sciences

Chiba, Japan

Radioactivity Survey Data in Japan

Number 35

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Science and Technology Agency
National Institute of Radiological Sciences

Dietaly Data

Strontium-90 and Cesium-137 in Standard Diet

(National Institute of Radiological Sciences)

Since May 1966, National Institute of Radiological Sciences has conducted analyses of individual foodstuff samples from four prefectures (Hokkaido, Niigata, Tokyo and Kagoshima). The sampling locations are shown in Figure 1.

Individual foodstuffs produced in each prefecture were collected separately according to nine categories: cereals, beans, potatos, milk, eggs, meat, fish and shellfish, leafy vegetables and root vegetables.

The standard diet, taken in this study, was based

on the following diet components, indicated by Resource Council, Science and Technology Agency, in 1964: cereals: 422g, beans: 35g, potatos: 85g, milk: 180g, eggs: 30g, meat: 30g, fish and shellfish: 75g, leafy vegetables: 144g, root vegetables: 96g.

Collected foodstuffs were ashed and analyzed separately.

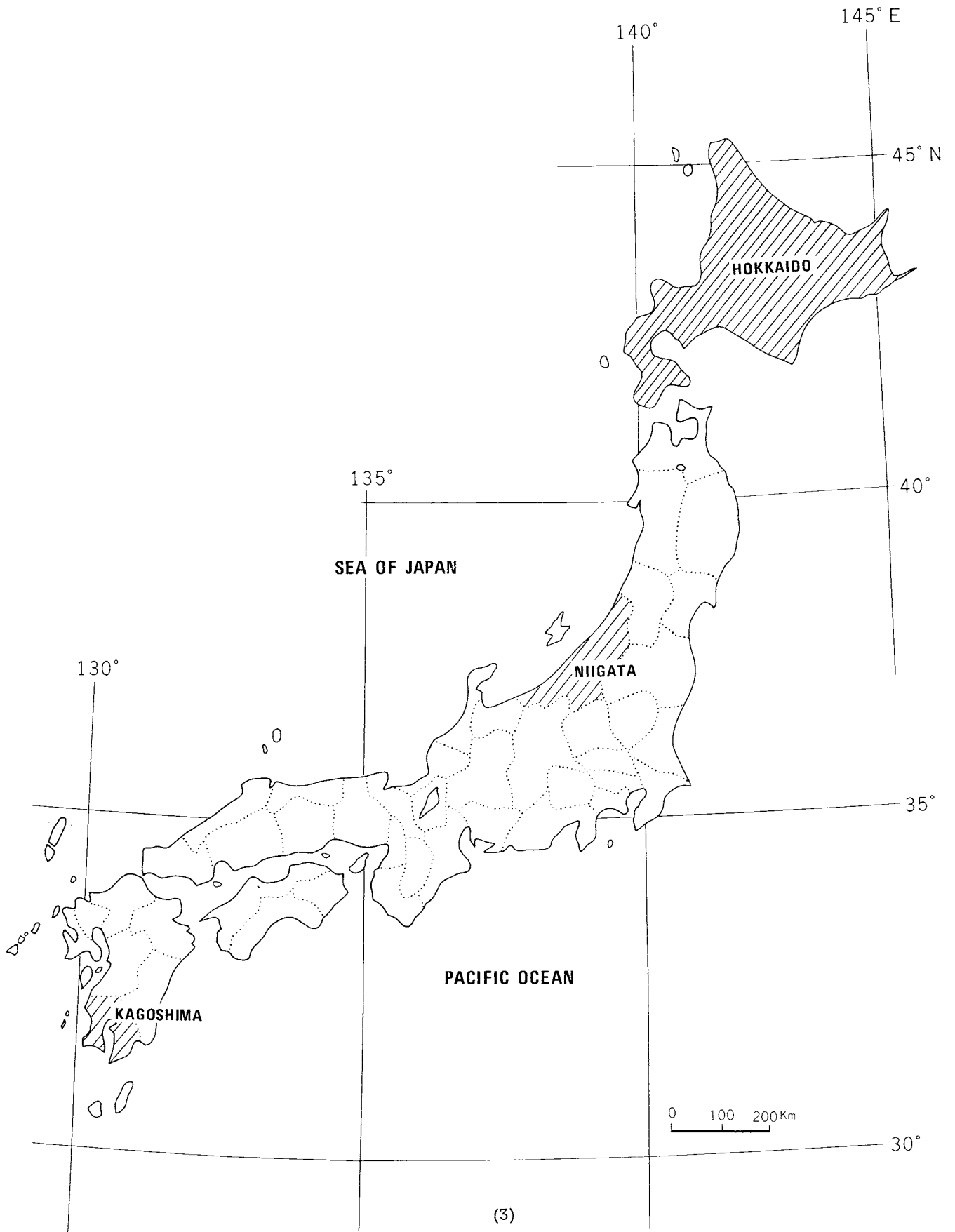
Results obtained during the period May to November, 1971 are shown in Table 1.

Table 1. ^{90}Sr and ^{137}Cs in Standard diet
– May, June and November, 1971 –
by T. Ueda, Y. Suzuki, R. Nakamura and E. Kase
(National Institute of Radiological Sciences)
(Continued from Table 7, Issue No. 32 of this Publication)

Foodstuff Samples	Daily Intake / Person					
	^{90}Sr (pCi)	Ca(mg)	^{90}Sr (pCi/gCa)	^{137}Cs (pCi)	K(mg)	^{137}Cs (pCi/gK)
– HOKKAIDO May 1971 –						
Cereals	1.14	45	25.3	5.2	360	14.4
Beans	0.38	23	16.5	0.4	130	3.1
Potatos	0.82	12	68.3	1.1	315	3.5
Milk	2.36	183	12.9	4.8	270	17.8
Eggs	0.02	18	1.1	0.1	41	2.4
Meat	0.01	1	10.0	0.5	72	6.9
Fish and shellfish	0.04	28	1.4	1.1	253	4.3
Leafy vegetables	1.27	40	31.8	0.4	357	1.1
Root vegetables	0.58	16	36.3	1.3	218	6.0
– NIIGATA June 1971 –						
Cereals	0.63	37	17.0	4.8	347	13.8
Beans	0.42	31	13.5	0.6	163	3.7
Potatos	0.22	11	20.0	1.2	308	3.9
Milk	1.19	176	6.7	3.7	268	13.8
Eggs	0.02	14	1.4	0.1	36	2.8
Meat	0.01	1	10.0	0.6	84	7.1
Fish and shellfish	0.04	33	1.2	1.0	208	4.8
Leafy vegetables	1.58	47	33.6	1.5	362	4.1
Root vegetables	1.16	22	52.7	0.4	207	1.9

Foodstuff Samples	Daily Intake/Person					
	⁹⁰ Sr(pCi)	Ca(mg)	⁹⁰ Sr(pCi/gCa)	¹³⁷ Cs(pCi)	K(mg)	¹³⁷ Cs(pCi/gK)
– KAGOSHIMA June 1971 –						
Cereals	1.60	45	35.6	4.3	352	12.2
Beans	0.40	29	13.8	0.4	118	3.4
Potatos	0.29	10	29.0	1.1	293	3.8
Milk	1.48	182	8.1	1.3	287	4.5
Eggs	0.03	16	1.9	0.1	51	2.0
Meat	0.01	1	10.0	0.6	74	8.1
Fish and shellfish	0.03	35	0.9	1.0	216	4.6
Leafy vegetables	1.41	41	34.4	1.6	376	4.3
Root vegetables	0.88	16	55.0	2.4	224	10.7
– HOKKAIDO November 1971 –						
Cereals	1.13	44	25.7	4.4	334	13.2
Beans	0.40	28	14.3	0.5	154	3.2
Potatos	0.57	10	57.0	0.9	265	3.4
Milk	1.64	171	9.6	3.8	270	14.1
Eggs	0.02	16	1.3	0.1	40	2.5
Meat	0.01	2	5.0	0.6	76	7.9
Fish and shellfish	0.02	27	0.7	1.1	244	4.5
Leafy vegetables	1.44	43	33.5	0.8	366	2.2
Root vegetables	0.67	16	41.9	1.2	238	5.0
– NIIGATA November 1971 –						
Cereals	1.12	38	29.5	3.9	319	12.2
Beans	0.36	36	10.0	0.2	160	1.3
Potatos	0.26	12	21.7	0.6	292	2.1
Milk	1.04	174	6.0	4.2	256	16.4
Eggs	0.02	20	1.0	0.1	40	2.5
Meat	0.01	1	10.0	0.5	82	6.1
Fish and shellfish	0.03	35	0.9	1.0	203	4.9
Leafy vegetables	1.36	52	26.2	1.3	354	3.7
Root vegetables	1.04	25	41.6	0.6	218	2.8
– KAGOSHIMA November 1971 –						
Cereals	1.28	40	32.0	4.2	372	11.3
Beans	0.26	25	10.4	0.4	151	2.6
Potatos	0.31	13	23.8	1.3	318	4.1
Milk	1.15	183	6.3	1.4	288	4.9
Eggs	0.03	22	1.4	0.1	48	2.1
Meat	0.01	1	10.0	0.5	70	7.1
Fish and shellfish	0.03	39	0.8	1.0	216	4.6
Leafy vegetables	1.26	37	34.1	1.2	334	3.6
Root vegetables	0.62	18	34.4	2.0	261	7.7

Figure 1 Sampling Locations of Standard Diet



Strontium-90 and Cesium-137 in Total Diet

(National Institute of Radiological Sciences)

Since June 1963, National Institute of Radiological Sciences has conducted analyses of total diet samples collected from 8 prefectures. Sampling locations are shown in Figure 2.

One city and one village in each prefecture were chosen as representative of urban and rural district of these prefectures respectively. Seven families were

chosen at random from each location, and each family presented a normal portion of the regular diet consumed in one day by an adult, diets at special occasions were avoided. Composite samples from the 5 families were ashed together and analyzed.

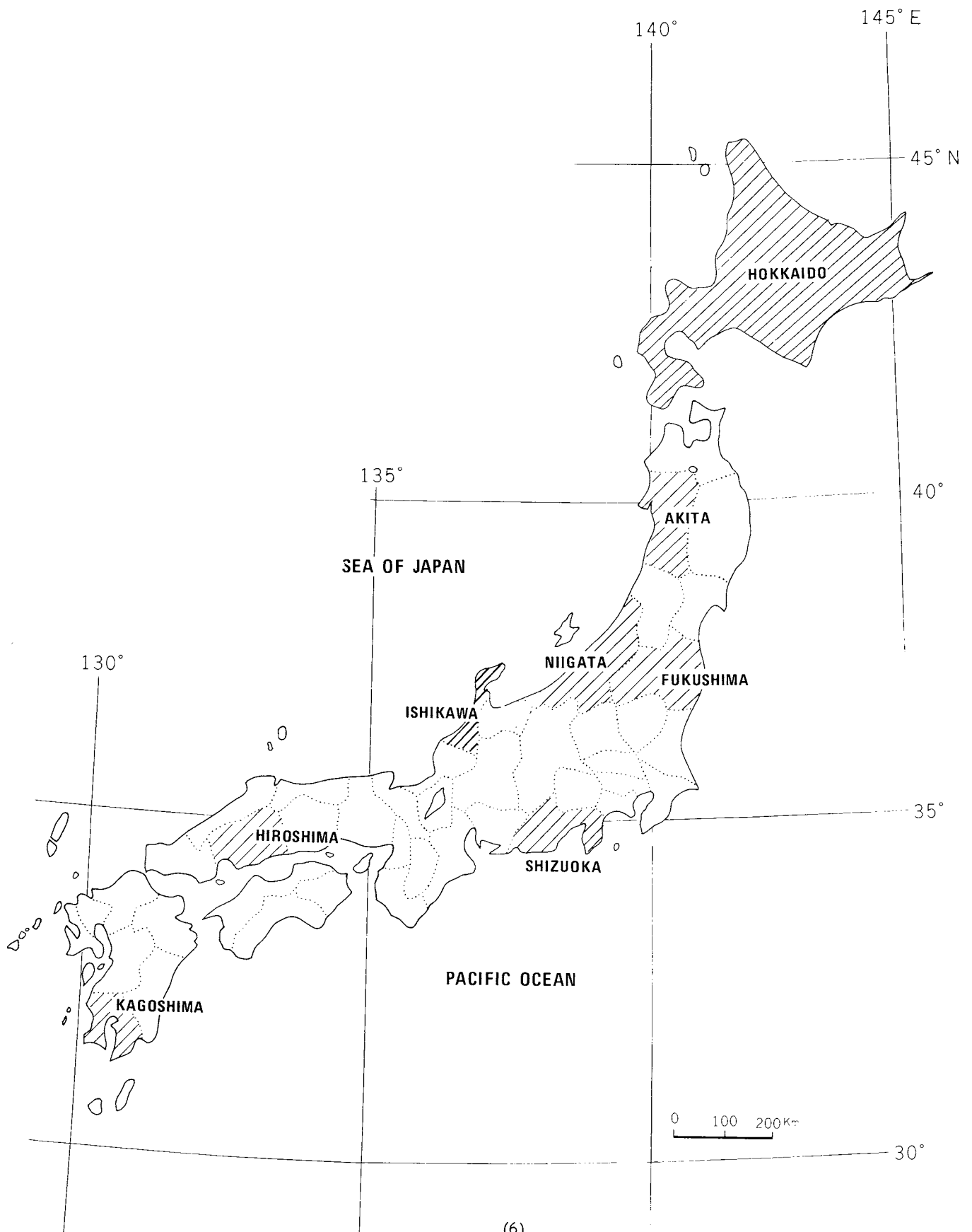
Results obtained during the period from June to November, 1971 are shown in Table 2.

Table 2. ^{90}Sr and ^{137}Cs in Total Diet
– June to November, 1971 –
by T. Ueda, Y. Suzuki, R. Nakamura and E. Kase
(National Institute of Radiological Sciences)
(Continued from Table 6, Issue No.32 of this Publication)

Location	Daily Intake				^{90}Sr (pCi/gCa)	^{137}Cs (pCi/gK)
	Ca(mg)	K(mg)	^{90}Sr (pCi)	^{137}Cs (pCi)		
URBAN ADULT DIET						
June-July 1971						
HOKKAIDO	413	1757	7.7	12.3	18.6	7.0
AKITA	467	1584	11.3	14.6	24.2	9.2
FUKUSHIMA	533	1802	6.4	10.8	12.0	6.0
NIIGATA	317	1591	5.6	10.7	17.7	6.7
ISHIKAWA	427	2219	6.1	12.0	14.3	5.4
SHIZUOKA	605	1649	7.7	12.1	14.3	7.3
HIROSHIMA	535	1037	5.5	7.1	10.3	6.8
KAGOSHIMA	330	1488	4.7	10.4	14.2	7.0
RURAL ADULT DIET						
HOKKAIDO	403	2215	10.5	13.1	26.1	5.9
AKITA	356	1553	8.1	13.2	22.8	8.5
FUKUSHIMA	410	2264	8.5	12.1	20.7	5.3
NIIGATA	467	1805	9.4	9.6	20.1	5.3
ISHIKAWA	350	867	3.8	9.3	10.9	10.7
SHIZUOKA	240	1047	3.8	8.3	15.8	7.9
HIROSHIMA	471	1133	6.3	6.6	13.4	5.8
KAGOSHIMA	283	1215	4.4	7.9	15.5	6.5
RURAL INFANT DIET						
AKITA	276	854	5.9	7.4	21.4	8.7
ISHIKAWA	267	907	3.1	7.9	11.6	8.7
SHIZUOKA	213	686	2.5	5.9	11.7	8.6
HIROSHIMA	287	915	3.4	6.5	11.8	7.1
KAGOSHIMA	246	1022	3.4	10.1	13.8	9.9

Location	Daily Intake			⁹⁰ Sr(pCi/gCa)	¹³⁷ Cs(pCi/gK)	
	Ca(mg)	K(mg)	⁹⁰ Sr(pCi)			¹³⁷ Cs(pCi)
URBAN ADULT DIET						
November 1971						
HOKKAIDO	421	1787	8.8	12.8	20.9	7.2
AKITA	388	1116	9.2	11.4	23.7	10.2
FUKUSHIMA	572	1514	6.7	10.1	10.8	4.8
NIIGATA	387	1610	8.0	9.3	20.7	5.8
ISHIKAWA	398	1814	6.1	11.4	15.3	6.3
SHIZUOKA	391	1102	5.3	8.8	13.6	8.0
HIROSHIMA	486	1532	4.6	8.1	9.5	5.3
KAGOSHIMA	416	1856	6.8	14.0	16.3	7.5
RURAL ADULT DIET						
HOKKAIDO	597	2568	11.8	17.8	19.8	6.9
AKITA	380	1369	9.5	12.0	25.0	8.8
FUKUSHIMA	623	1985	6.7	9.6	10.8	4.8
NIIGATA	424	2459	10.8	13.9	25.5	5.7
ISHIKAWA	450	2032	9.7	14.6	21.6	7.2
SHIZUOKA	407	1546	5.3	11.5	13.0	7.4
HIROSHIMA	497	2011	5.2	12.2	10.5	6.1
KAGOSHIMA	386	1673	6.0	10.8	15.5	6.5
RURAL INFANT DIET						
AKITA	304	1086	6.5	7.7	21.4	7.1
ISHIKAWA	288	796	2.9	5.8	10.1	7.3
SHIZUOKA	279	687	3.3	4.1	11.8	6.0
HIROSHIMA	352	1104	4.2	7.0	11.9	6.3
KAGOSHIMA	293	854	3.2	6.4	10.9	7.5

Figure 2 Sampling Locations of Total Diet



Strontium-90 and Cesium-137 in Total Diet

(The Japan Analytical Chemistry Research Institute)

Since June 1963, the Japan Analytical Chemistry Research Institute has conducted analyses of Total Diet samples from the 28 prefectures shown in Figure 3.

One city and One village in each prefecture were chosen as representative of urban and rural districts of these prefectures, respectively. Five families from each

location presented a normal portion of the regular diet consumed in one day by an adult or a child.

Diets at special occasions were avoided.

Composite samples from the 5 families were ashed together and analyzed using the method recommended by the Science and Technology Agency.

Results obtained during the period from May to December, 1971 are shown in Table 3.

Table 3. ^{90}Sr and ^{137}Cs in Total Diet
– May to December, 1971 –
by T. Asari, M. Chiba and M. Kuroda
(Japan Analytical Chemistry Research Institute)
(Continued from Table 3, Issue No.30, of this Publication)

name of I.P.H.*	sampling		sort.** ing	Age	Ash		Ca (mg/p/d)	K (mg/p/d)	^{90}Sr		^{137}Cs	
	station	date			g/p/d	g			(pCi/p/d)	(pCi/gCa)	(pCi/p/d)	(pCi/gK)
-- 1971 --												
OSAKA	Neyagawa	5	A	—	14.4	30	529	1945	5.0±0.3	8.4±0.5	8.1±0.5	4.2±0.3
	Hajikino	5	B	38–52	15.8	"	463	1775	6.1±0.3	13.2±0.6	6.1±0.4	3.4±0.2
WAKAYAMA	Wakayama	5.21	A	32–64	15.0	"	722	1187	3.2±0.2	4.4±0.3	4.4±0.3	3.7±0.3
	Yuasa	5.22	B	18–46	11.3	"	337	1046	3.3±0.2	9.8±0.6	3.1±0.3	3.0±0.3
	"	5.23	C	3–6	7.0	20	157	568	1.7±0.1	10.8±0.6	1.9±0.2	3.3±0.4
KOCHI	Kochi	5.16	A	25–53	12.8	30	282	1951	5.7±0.3	20.2±1.1	6.9±0.5	3.5±0.3
	Haruno	5.23	B	28–58	20.3	"	520	2874	6.2±0.3	11.9±0.6	12.6±1.1	4.4±0.4
	"	"	C	2–5	6.2	20	288	1087	2.9±0.2	10.1±0.7	5.3±0.5	4.9±0.5
OKAYAMA	Okayama	5.9	A	42–54	20.3	30	426	1892	4.7±0.3	11.0±0.7	9.2±0.7	4.9±0.4
	"	"	B	27–34	14.2	"	297	1336	3.1±0.2	10.4±0.7	5.0±0.4	3.7±0.3
	"	"	C	1–5	7.1	"	305	936	1.6±0.1	5.2±0.3	3.2±0.3	3.4±0.3
AOMORI	Aomori	6.2	A	21–41	18.7	"	991	1674	9.4±0.4	9.5±0.4	8.3±0.6	5.0±0.4
	"	6.7	B	25–71	11.6	"	241	880	6.9±0.3	28.5±1.2	5.2±0.4	5.9±0.5
	"	"	C	2–5	11.2	"	215	812	4.3±0.3	20.0±1.4	3.9±0.4	4.8±0.5
FUKUI	Fukui	5.16~19	A	24–39	12.5	"	506	1586	5.8±0.5	11.5±1.0	9.7±0.8	6.1±0.5
	Kanazu	5.23	B	25–61	9.5	"	197	965	6.1±0.4	31.0±2.0	3.3±0.3	3.4±0.3
NAGASAKI	Nagasaki	5.28	A	23–38	14.4	"	302	1358	3.3±0.3	10.9±1.0	5.8±0.5	4.3±0.4
	Tokitsu	5.16	B	25–36	16.6	"	549	1872	6.7±0.5	12.2±0.9	9.4±0.7	5.0±0.4
	"	"	C	1–7	10.4	"	504	1263	4.1±0.4	8.1±0.8	6.1±0.4	4.8±0.3
TOTTORI	Tottori	6.1	A	27–76	19.3	"	540	2121	10.6±0.8	19.6±1.5	9.2±0.8	4.3±0.4
	Fukube	5.30	B	29–37	16.6	"	365	1457	10.9±0.7	29.9±1.9	7.4±0.6	5.1±0.4
	"	"	C	3–6	8.3	"	248	901	4.7±0.2	19.0±0.8	5.2±0.5	5.8±0.6
AICHI	Kariya	6.13	A	39–54	18.5	"	968	2096	5.5±0.3	5.7±0.3	9.3±0.6	4.4±0.3
	Nishio	"	B	25–44	21.8	"	656	2108	4.2±0.3	6.4±0.5	7.9±0.7	3.7±0.3
SHIMANE	Matsue	6.6	A	33–45	18.0	"	540	2207	10.3±0.5	19.1±0.9	9.6±0.9	4.3±0.4

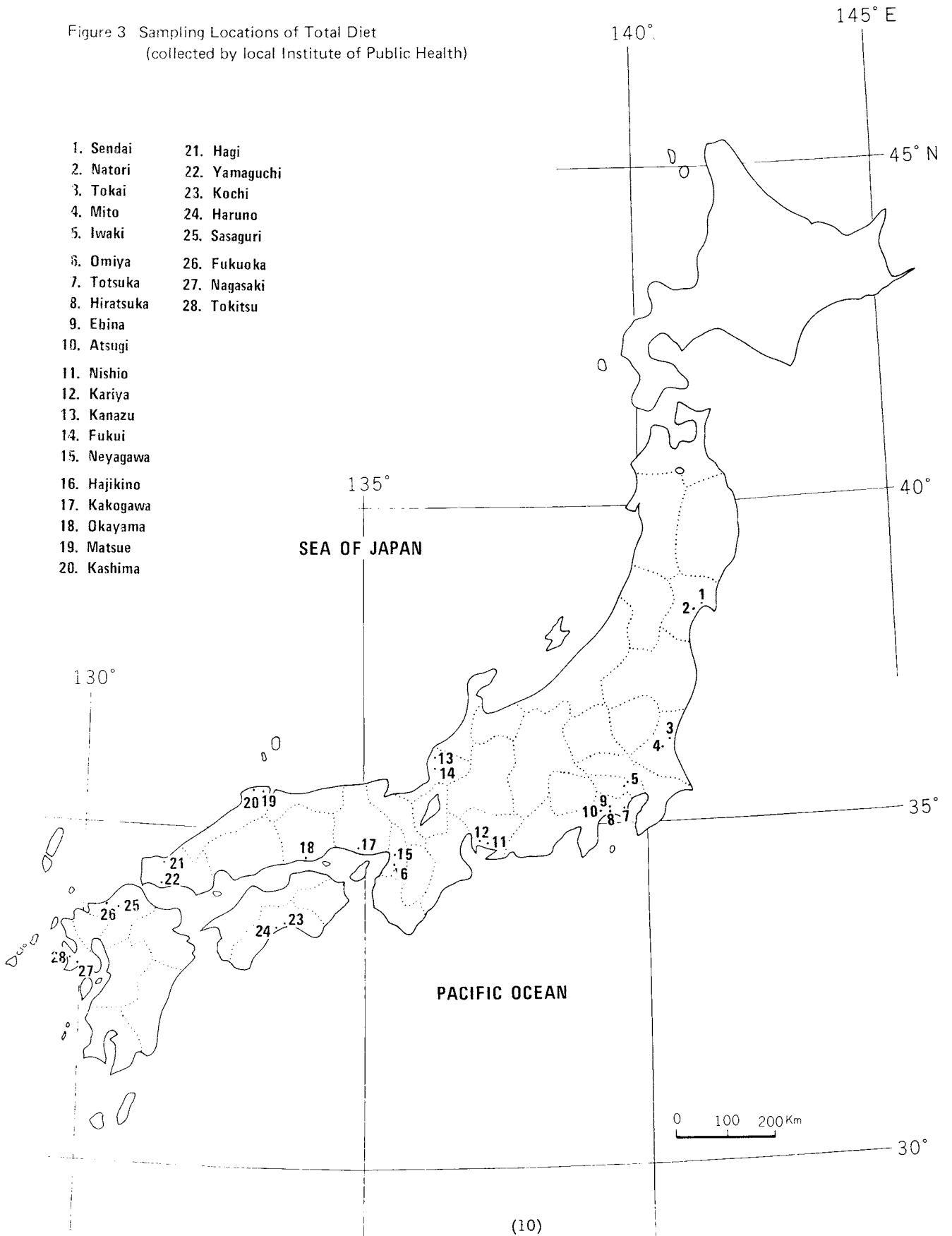
name of I.P.H*	sampling		sort- ing	Age	Ash		Ca (mg/p/d)	K (mg/p/d)	⁹⁰ Sr		¹³⁷ Cs	
	station	date			g/p/d	g			(pCi/p/d)	(pCi/gCa)	(pCi/p/d)	(pCi/gK)
KANAGAWA	Kashima	6.17~23	B	25-48	14.0	"	927	1349	5.3±0.4	5.7±0.4	4.4±0.5	3.3±0.4
	"	"	C	1-5	6.6	"	488	900	3.9±0.2	8.0±0.4	4.5±0.2	5.0±0.2
	Hiratsuka	6.22	A	49-62	21.2	"	534	2292	4.5±0.3	8.4±0.6	11.4±0.9	5.0±0.4
IBARAKI	Ebina	"	B	43-63	17.5	"	896	1671	5.3±0.3	5.9±0.3	11.3±1.0	6.8±0.6
	Mito	6.21	A	19-48	20.4	"	447	1526	4.6±0.3	10.3±0.7	9.0±0.8	5.9±0.5
HYOGO	Tokai	6.14	B	38-65	18.7	"	484	1767	5.9±0.3	12.2±0.6	8.3±0.7	4.7±0.4
	Kakogawa	6.15~16	A	26-58	16.2	"	899	1482	4.0±0.2	4.4±0.2	6.2±0.6	4.2±0.4
	"	"	B	27-35	22.3	"	818	2571	6.3±0.4	7.7±0.5	10.6±0.9	4.1±0.4
MIYAGI	Sendai	6.16	A	32-39	20.2	"	689	2313	7.7±0.4	11.2±0.6	11.6±0.8	5.0±0.3
	Natori	"	B	31-61	26.6	"	892	2583	7.5±0.4	7.5±0.4	12.2±1.0	4.7±0.4
SAITAMA	"	"	C	5-11	18.8	"	1055	1906	4.9±0.3	4.6±0.3	8.0±0.7	4.2±0.4
	Omiya	6.25	A	32-40	18.4	"	379	1886	4.4±0.3	11.6±0.8	8.5±0.6	4.5±0.3
	Iwaki	6.28	B	47-53	26.6	"	548	2484	5.1±0.4	9.3±0.7	8.7±0.6	3.5±0.2
FUKUOKA	Fukuoka	6	A	33-50	15.0	"	362	1401	4.1±0.3	11.3±0.8	5.8±0.4	4.1±0.3
	Sasagori	"	B	31-50	15.6	"	480	1808	6.1±0.3	12.7±0.6	5.9±0.4	3.3±0.2
SAGA	Saga	6.1	A	14-42	15.9	"	609	1708	4.6±0.3	7.6±0.5	7.7±0.5	4.5±0.3
	Nakahara	6.20	B	26-56	15.4	"	647	1437	4.2±0.3	6.5±0.5	5.3±0.4	3.7±0.3
KYOTO	Kyoto	5.18	A	27-51	15.1	"	417	1534	6.9±0.4	16.5±1.0	8.7±0.5	5.7±0.3
	Miyama	5.30	B	32-55	23.7	"	540	2294	28.0±1.0	51.9±1.9	14.3±0.7	6.2±0.3
	"	"	C	4-15	16.0	"	371	1354	14.2±0.5	38.3±1.3	6.8±0.4	5.0±0.3
YAMAGUCHI	Yamaguchi	7.25	A	26-49	11.1	"	337	1102	3.3±0.2	9.8±0.6	4.5±0.3	4.1±0.3
	Hagi	6.29	B	27-45	16.7	"	337	1921	5.1±0.3	15.1±0.9	5.8±0.4	3.0±0.2
	"	"	C	2-5	8.2	"	344	1077	3.1±0.2	9.0±0.6	4.3±0.2	4.0±0.2
TOTTORI	Tottori	11.11	A	41-76	20.1	"	732	2088	10.4±0.5	14.2±0.7	8.1±0.5	3.9±0.2
TOTTORI	Fukube	11.14	B	25-38	18.2	30	666	1878	10.5±0.5	18.9±0.9	13.2±0.6	7.0±0.3
FUKUOKA	"	"	C	1-6	10.9	"	372	1115	5.6±0.3	15.1±0.8	6.5±0.3	5.8±0.3
	Fukuoka	10	A	33-46	16.7	"	481	2877	9.6±0.4	20.0±0.8	5.6±0.5	1.9±0.2
	Sasaguri	"	B	32-50	21.6	"	644	2987	7.9±0.5	12.3±0.8	9.0±0.8	3.0±0.3
MIYAGI	Sendai	11.19	A	24-39	17.2	"	549	1699	5.5±0.3	10.2±0.6	7.6±0.6	4.5±0.4
	Natori	"	B	31-60	24.9	"	1128	2535	9.2±0.6	8.2±0.5	13.5±1.0	5.3±0.4
KANAGAWA	"	"	C	6-12	17.0	"	724	1899	6.8±0.4	9.4±0.6	8.3±0.7	4.4±0.4
	Totsuka	11.22	A	49-63	20.6	"	694	2258	5.5±0.5	7.9±0.7	8.7±0.8	3.9±0.4
	Atsugi	"	B	39-58	21.5	"	548	2172	7.1±0.6	13.0±1.1	11.9±0.9	5.5±0.4
KOCHI	Kochi	11.7	A	26-55	15.4	"	360	1905	4.1±0.4	11.4±1.1	6.2±0.5	3.3±0.3
	Haruno	11.14	B	29-59	20.9	"	669	2393	11.2±1.3	16.7±1.9	5.4±0.5	2.3±0.2
AICHI	"	"	C	4-6	9.8	"	268	1346	5.7±0.3	21.3±1.1	7.7±0.6	5.7±0.4
	Kariya	11.28	A	40-62	16.6	"	530	2073	8.4±0.6	15.8±1.1	7.5±0.6	3.6±0.3
	Nishio	"	B	25-45	23.1	"	492	2275	4.7±0.5	9.6±1.0	6.7±0.7	2.9±0.3
OSAKA	Neyagawa	11.18	A	24-58	14.5	"	477	1865	5.0±0.4	10.5±0.8	9.7±0.9	5.2±0.5
	Hajikino	12.2	B	32-52	17.6	"	503	2028	7.1±0.6	14.1±1.2	8.9±0.8	4.4±0.4
WAKAYAMA	Wakayama	11.29	A	24-62	22.7	"	863	1877	5.1±0.4	5.9±0.5	6.7±0.5	3.6±0.3
	Yuasa	"	B	22-36	8.0	"	538	828	3.7±0.3	6.9±0.6	3.2±0.2	3.9±0.2
	"	"	C	3-5	6.6	25	545	867	2.3±0.2	4.2±0.4	4.1±0.3	4.7±0.3
NAGASAKI	Nagasaki	11.30	A	24-41	13.0	30	358	1348	4.0±0.3	11.2±0.8	4.5±0.3	3.3±0.2
	Tokitsu	11.28	B	26-36	16.8	"	417	2490	3.2±0.3	7.7±0.2	6.4±0.4	2.6±0.2

name of I.P.H*	sampling		sort.** ing	Age	Ash		Ca (mg/p/d)	K (mg/p/d)	⁹⁰ Sr		¹³⁷ Cs	
	station	date			p/d/b	g			(pCi/p/d)	(pCi/gCa)	(pCi/p/d)	(pCi/gK)
HYOGO	"	"	C	4-9	12.8	"	325	1279	5.2±0.4	16.0±1.2	7.7±0.4	6.0±0.3
	Kakogawa	11.18	A	26-58	18.1	"	371	1558	6.3±0.7	17.0±1.9	7.7±0.5	4.9±0.3
IBARAKI	"	"	B	27-46	12.6	"	600	1259	6.7±0.3	11.2±0.5	15.1±0.5	12.0±0.4
	Mito	12.12	A	19-50	19.5	"	684	1542	6.2±0.3	9.1±0.4	6.0±0.5	3.9±0.3
FUKUI	Tokai	12.5	B	30-62	19.9	"	874	1765	8.1±0.4	9.3±0.5	6.0±0.4	3.4±0.2
	Fukui	11.22	A	23-40	18.6	"	703	1767	7.2±0.4	10.2±0.6	11.7±0.6	6.6±0.3
SAGA	Kanazu	11.21	B	27-61	13.1	"	252	1227	11.2±0.7	44.4±2.8	4.4±0.3	3.6±0.2
	Saga	12.5	A	28-44	16.1	"	531	1797	5.3±0.4	10.0±0.8	7.7±0.5	4.3±0.3
YAMAGUCHI	Nakahara	12.3	B	23-83	20.4	"	916	1883	7.9±0.6	8.6±0.7	4.2±0.4	2.2±0.2
	Yamaguchi	12.8	A	23-41	15.9	"	442	1620	9.5±0.7	21.5±1.1	5.3±0.4	3.3±0.2
AOMORI	Hagi	11.29	B	27-45	18.4	"	478	2291	8.2±0.7	17.2±1.5	10.0±0.5	4.4±0.2
	"	"	C	3-6	16.0	"	619	2435	7.1±0.6	11.5±1.0	12.0±1.1	4.9±0.5
SHIMANE	Aomori	11.29	A	21-40	19.2	"	845	1548	9.6±0.8	11.4±0.9	12.5±1.1	8.1±0.7
	"	11.12	B	26-72	11.1	"	412	1142	6.2±0.5	15.0±1.2	8.4±0.7	7.4±0.6
OKAYAMA	"	"	C	2-4	9.2	"	349	817	6.0±0.4	17.2±1.1	7.2±0.8	9.4±1.0
	Matsue	12.12	A	41-52	18.8	"	1042	2425	13.3±0.8	12.8±0.8	10.9±1.1	4.5±0.5
KYOTO	Kashima	12.3	B	26-63	16.0	"	829	1626	10.7±0.8	12.9±1.0	5.5±0.5	3.4±0.3
	"	"	C	3-6	6.5	"	398	729	3.8±0.3	9.5±0.8	4.7±0.3	6.4±0.4
SAITAMA	Okayama	11.28	A	42-55	18.3	"	408	1936	6.7±0.5	16.4±1.2	8.7±0.7	4.5±0.3
	"	"	B	37-59	15.4	"	431	1882	13.8±0.9	32.0±2.1	10.5±0.9	5.6±0.5
KYOTO	"	"	C	2-4	8.3	"	378	969	3.3±0.3	8.7±0.8	5.5±0.4	5.7±0.4
	Kyoto	11.11	A	42-60	15.8	"	409	1686	6.3±0.6	15.4±1.5	7.7±0.8	4.6±0.5
SAITAMA	Miyama	11.23	B	15-55	21.4	"	698	2204	7.5±0.6	10.7±0.9	9.0±0.9	4.1±0.4
	"	"	C	3-8	15.2	"	420	1625	10.0±0.6	23.8±1.4	6.3±0.6	3.9±0.4
SAITAMA	Omiya	11.29	A	33-40	16.6	"	473	1678	5.7±0.4	12.1±0.8	7.2±0.6	4.3±0.4
	Iwaki	12.17	B	47-53	28.7	"	1300	2623	7.9±0.6	6.1±0.5	8.2±0.8	3.1±0.3

* I.P.H: Institute of Public Health

** A: Urban adult, B: Rural adult, C: Rural infant

Figure 3 Sampling Locations of Total Diet
(collected by local Institute of Public Health)



Marine Data

Radioactivity in Marine Products, Sea Water and Bottom of the Sea Soil

(The Japan Analytical Chemistry Research Institute)

Radiochemical analysis of marine samples such as sea water, bottom of the sea soil, marine fishes, shells and sea weeds have been carried out at the Japan Analytical Chemistry Research Institute.

Sampling were performed by each local Institute of Public Health, and these stations are shown in

Figure 4, 5, 6, 7 and 8.

These samples were sent to the Japan Analytical Chemistry Research Institute and analyzed for strontium-90 and cesium-137 content, using the method recommended by the Science and Technology Agency.

Results obtained during the period from May 1971 to March 1972, are shown in Table 4, 5, 6, 7 and 8.

Table 4: ^{90}Sr and ^{137}Cs in Sea Water
– May 1971 to February 1972 –
by T. ASARI, M. CHIBA and M. KURODA
(Japan Analytical Chemistry Research Institute)

name of I.P.H*	collected weight (ℓ)	Location		depth (m)	Cl	^{90}Sr (pCi/ℓ)	^{137}Cs (pCi/ℓ)	(Ce + Pr) - 144 (pCi/ℓ)	^{65}Zn (pCi/ℓ)	Repletion
		latitudo	longitudo							
May 1971										
AOMORI	20	62°	157°	surface	18.42	0.16	0.24			Hachinohe port
"	"	46°16'11"	141°10'56"	"	18.43	0.23	0.26			Mutsu bay
IBARAKI	"	36°27.8'	140°38'	"	18.77	0.20	0.15	0.74	LTD	
"	"	36°17.2'	140°36.3'	"	18.09	0.18	0.24	0.52	"	
"	"	36°20.9'	140°42.4'	"	18.90	0.17	0.19	0.71	"	
KANAGAWA	"	35°28'	139°39.4'	"	15.90	0.16	0.21			Yokohama port
"	"	"	"	"	15.94	0.17	0.23			"
"	"	35°15'	139°37'	"	17.95	0.20	0.15			Odawa bay
AICHI	"	34°50'	136°47.6'	"	15.94	0.29	0.17			Ise bay
"	"	34°44.1'	137°12.6'	"	16.65	0.20	0.17			Mikawa bay
FUKUI	"	35°44'40"	136°40'11"	"	16.90	0.20	0.29	0.83	LTD	Urazoko bay
"	"	35°42'00"	135°58'15"	"	17.90	0.14	0.20	0.78	"	Niyu bay
OSAKA	"	38°20'	135°26'64"	"	18.40	0.34	0.12			Osaka port
"	"	38°20'	135°24'30"	"		0.26	0.14			"
HYOGO	"	34°38'6"	135°10'5"	"	16.53	0.20	0.22			Kobe port
"	"	34°40'8"	135°12'6"	"	16.61	0.21	0.26			"
SHIMANE	"	35°33'	130°00'	"	19.02	0.16	0.21			
"	"	35°32.5'	133°01.5'	"	19.23	0.16	0.17			off Mitsu
June 1971										
NIIGATA	"	37°58.5'	139°04'	2.0	16.20	0.31	0.21			Niigata port
"	"	37°56.5'	139°01.5'	"	17.50	0.22	0.26			
FUKUI	"	35°31'30"	135°30'00"	"	18.80	0.16	0.22	0.18	LTD	Uchiura bay
FUKUOKA	"	36°33'	130°22'	surface	18.40	0.18	0.16			Hakata bay
"	"	33°57'	130°58'	"	18.50	0.17	0.32			

Name of I.P.H*	collected weight(ℓ)	Location		depth (m)	C1	⁹⁰ Sr (pCi/ℓ)	¹³⁷ Cs (pCi/ℓ)	(Ce + Pr) - 144 (pCi/ℓ)	⁶⁵ Zn (pCi/ℓ)	Repletion
		latitudo	longitudo							
August 1971										
AOMORI	"	62°	157°	"	18.93	0.23	0.23			Hachinohe port
"	"	41°16'11"	141°10'16"	"	18.93	0.22	0.26			Mutsu bay
NIIGATA	"	37°58.5'	139°04'	2.0	16.80	0.22	0.27			Niigata port
"	"	37°56.5'	139°01.5'		18.20	0.21	0.28			
IBARAKI	15	37°28'	140°38'	surface	17.07	0.17	0.19	0.34	LTD	
"	"	36°17'	140°36'	"	18.67	0.20	0.28	0.36	"	
"	"	36°21'	140°42'	"	18.07	0.25	0.25	0.46	"	
KANAGAWA	20	35°28'	139°39.4'	"	18.00	0.21	0.19			Yokohama port
"	"	"	"	"	17.80	0.19	0.19			"
"	"	35°15'	139°37'	"	20.10	0.16	0.23			
AICHI	"	34°50'	136°47.6'	"	17.67	0.14	0.23			Ise bay
"	"	34°44.1"	137°12.6'	"	16.17	0.17	0.26			Mikawa bay
FUKUI	15	35°44'40"	136°01'30"	"	17.90	0.23	0.25	0.45	LTD	Urazoko bay
"	"	35°42'00"	135°58'15"	"	17.86	0.27	0.28	0.61	"	Niyu bay
"	"	35°31'30"	135°30'10"	"	18.10	0.17	0.24	0.69	"	Uchiura bay
KYOTO	20	35°38'25"	135°18'	"	18.40	0.21	0.24			Miyazu port
"	"	35°33'06"	135°18'40"	"	18.10	0.24	0.24			"
SHIMANE	"	35°33'	130°00'	"	18.17	0.22	0.24			
"	"	35°32.5'	133°01.5'	"	18.16	0.22	0.28			off Mitsu
SAGA	"	33°19'41"	129°50'18"	"	13.98	0.16	0.25			Imari
"	"	33°05'	131°11'	"	13.98	0.25	0.26			Kashima
NAGASAKI	"	32°42'56"	129°50'11"	"	16.20	0.21	0.28			Nagasaki port
"	"	32°42'30"	129°51'05"	"	16.30	0.19	0.27			"
"	"	32°43'	129°51'10"	"	16.20	0.15	0.20			"
MIYAGI	"	38°19'	141°03'25"	"	16.02	0.22	0.29			Shiogama bay
"	"	38°23'50"	141°30'50"	"	16.02	0.22	0.29			
September 1971										
OSAKA	"	38°30'	135°26'	"	11.38	0.26	0.24			Osaka port
"	"	38°20'	135°24'	"	12.19	0.20	0.19			"
HYOGO	20	34°38'6"	135°10'5"	"	12.11	0.20	0.18			Kobe port
"	"	34°40'8"	135°12'6"	"	12.43	0.19	0.25			"
HIROSHIMA	"	34°21'10"	135°25'20"	"	13.75	0.22	0.28			
"	"	34°19'	132°24'	"	14.20	0.19	0.23			
"	"	34°17'40"	132°23'	"	13.90	0.17	0.26			
FUKUOKA	"	33°36'	130°22'	"	17.00	0.24	0.29			Hakata port
"	"	33°57'	130°58'	"	17.80	0.25	0.28			Moji port
November 1971										
AOMORI	20	62°	157°	surface	18.93	0.17	0.25			Hachinohe port
"	"	41°16'11"	141°10'16"	"	18.93	0.18	0.20			Niyu bay
NIIGATA	"	37°58.5'	139°04'	"	13.80	0.28	0.26			off Niigata port
"	"	37°56.5'	139°01.5'	"	18.20	0.25	0.23			
IBARAKI	"	36°28'	140°38'	"	17.07	0.13	0.17	0.26	LTD	
"	"	36°17'	140°36'	"	18.67	0.18	0.20	0.24	"	
"	"	36°21'	140°42'	"	18.07	0.17	0.18	0.22	"	
FUKUI	"	35°44'40"	136°01'30"	"	18.00	0.23	0.29	0.25	"	Urazoko bay

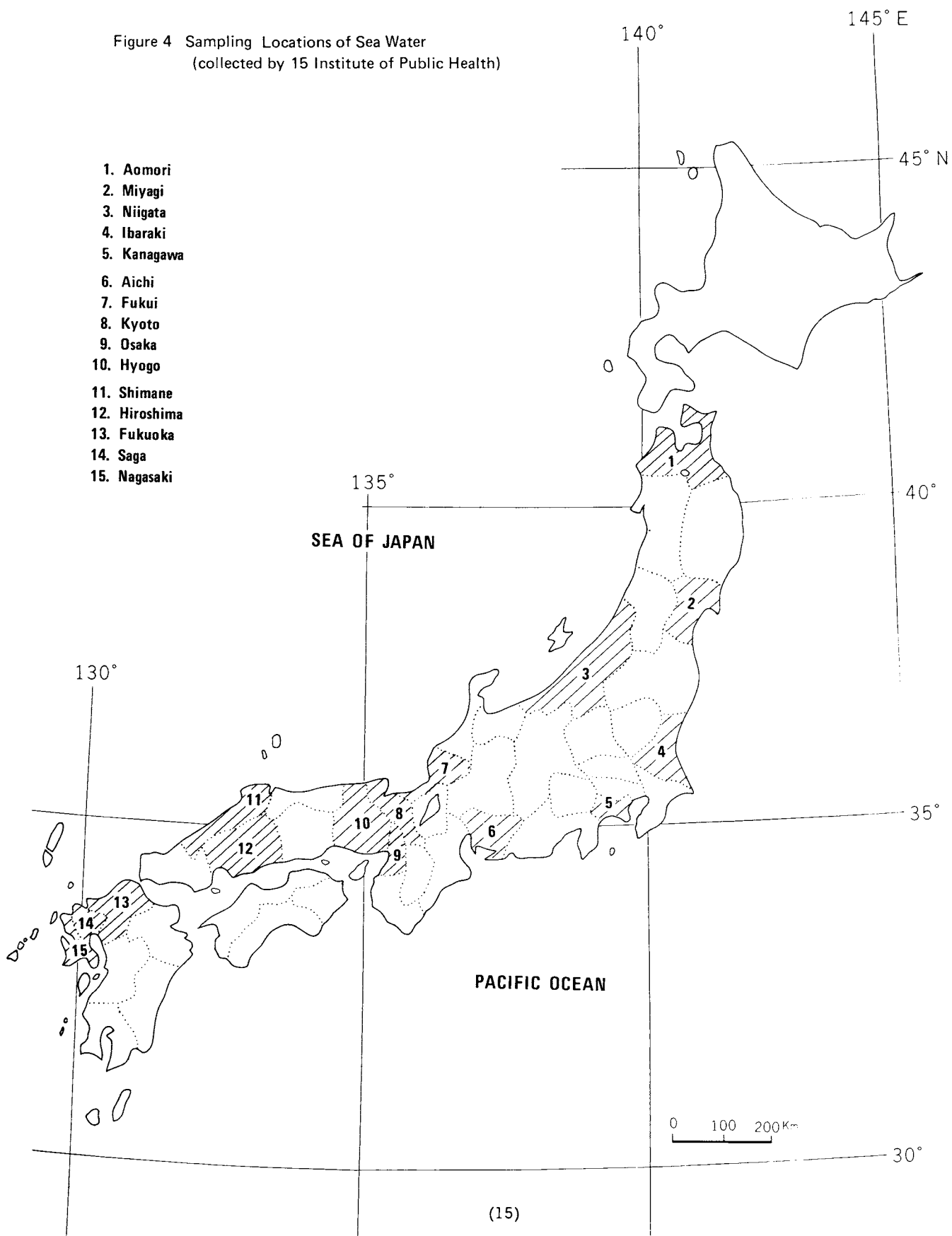
Name of I.P.H*	collected weight (ℓ)	Location		depth (m)	Cl	⁹⁰ Sr (pCi/ℓ)	¹³⁷ Cs (pCi/ℓ)	(Ce + Pr) - ¹⁴⁴ (pCi/ℓ)	⁶⁵ Zn (pCi/ℓ)	Repletion
		latitudo	longitudo							
"	"	35°42'00"	135°58'15"	"	18.10	0.20	0.21	0.22	"	Miyu bay
"	"	35°31'30"	135°30'00"	"	17.80	0.16	0.24	0.27	"	Uchiura bay
AICHI	"	34°50'	136°47.6'	"	17.47	0.15	0.23			Ise bay
"	"	34°44.1'	137°12.6'	"	16.68	0.20	0.24			Mikawa bay
OSAKA	"	34°48'	135°26'	"	11.60	0.24	0.23			Osaka port
"	"	34°38'	135°24'	"	12.70	0.23	0.23			"
HYOGO	"	34°38'	135°10'	"	17.27	0.15	0.22			Kobe port
"	"	34°46'	135°12'	"	17.19	0.18	0.18			"
SHIMANE	"	35°33'	133°00'	"	19.00	0.13	0.23			"
"	"	35°32'	133°01'	"	19.00	0.13	0.19			"
FUKUOKA	"	35°36'	130°22'	"	18.00	0.16	0.18			Hakata bay
"	"	33°59'	130°58'	"	18.10	0.17	0.23			Moji port
December 1971										
KANAGAWA	20	35°28'	139°39.4'	surface	19.20	0.17	0.23			Yokohama port
"	"	35°28'	139°39.4'	"	18.80	0.16	0.22			"
January 1972										
AOMORI	20	62°	157°	surface	18.43	0.19	0.25			Hachinohe port
Feburary 1972										
AOMORI	20	41°16'11"	141°10'16"	surface	19.14	0.18	0.24			Mutsu bay
MIYAGI	"	38°23'50"	141°30'50"	"	18.17	0.18	0.21			Ona river
IBARAKI	"	36°28'	140°38'	"	18.43	0.15	0.24	0.29	LTD	"
"	"	36°17'	140°36'	"	17.88	0.15	0.20	0.20	"	"
"	"	36°21'	140°42'	"	17.93	0.12	0.22	0.25	"	"
KANAGAWA	"	35°28'	139°39.4'	"	18.00	0.21	0.18			Yokohama port
"	"	35°28'	139°39.4'	"	17.50	0.16	0.17			"
"	"	35°15'	139°37'	"	20.60	0.17	0.19			Odawa bay
AICHI	"	34°50'	136°47.6'	"	17.82	0.15	0.19			Ise bay
"	"	34°44.1'	137°12.6'	"	16.93	0.20	0.23			Mikawa bay
KYOTO	"	35°38'25"	135°18'	"	18.80	0.22	0.21			Miyazu bay
"	"	35°33'06"	135°18'40"	"	18.80	0.22	0.19			"
OSAKA	"	34°28'	135°26'	"	10.71	0.29	0.14			Osaka port
"	"	34°38'	135°24'	"	13.00	0.23	0.14			"
HYOGO	"	34°38'06"	135°10'05"	"	16.56	0.18	0.19			Kobe port
"	"	34°46'08"	135°12'06"	"	16.56	0.19	0.20			"
HIROSHIMA	"	34°21'10"	132°25'20"	"	16.28	0.20	0.19			"
"	"	34°19'	132°24'	"	17.90	0.11	0.19			"
"	"	34°17'40"	132°23'	"	17.83	0.16	0.21			"
SAGA	"	33°19'41"	129°50'18"	"	17.91	0.17	0.17			Imari
"	"	33°05'	131°11'	"	16.95	0.21	0.19			Kashima
NAGASAKI	"	32°42'56"	129°50'11"	"	19.20	0.15	0.16			Nagasaki port
"	"	32°42'30"	129°51'05"	"	18.80	0.16	0.19			"
"	"	32°43'	129°51'10"	"	18.60	0.12	0.22			"
NIIGATA	"	37°58'	139°03.3'	2.0	18.40	0.29	0.26			Niigata port
"	"	37°58'	139°02'	"	18.20	0.20	0.25			"
MIYAGI	"	38°19'	141°03'25"	surface	17.72	0.16	0.19			Shiogama port

Name of I.P.H.*	collected weight (ℓ)	Location		depth (m)	Cl	⁹⁰ Sr (pCi/ℓ)	¹³⁷ Cs (pCi/ℓ)	(Ce+Pr) - 144 (pCi/ℓ)	⁶⁵ Zn (pCi/ℓ)	Repletion
		latitudo	longitudo							
FUKUI	"	35°44'40"	136°01'30"	"	18.30	0.14	0.17	0.20	LTD	Urazoko bay
"	"	35°42'	135°58'15"	"	18.30	0.17	0.23	0.29	"	Niyu bay
"	"	35°31'30"	135°30'	"	17.90	0.19	0.20	0.20	"	Uchiura
SHIMANE	"	35°33'	133°	"	18.74	0.22	0.17			
"	"	35°32.5'	133°01.5'	"	18.68	0.21	0.23			off Mitsu
FUKUOKA	"	33°36'	130°22'	"	17.50	0.16	0.22			Hakata port
"	"	33°57'	130°58'	"	18.30	0.20	0.25			Moji port

* I.P.H.: Institute of Public Health

Figure 4 Sampling Locations of Sea Water
(collected by 15 Institute of Public Health)

- 1. Aomori
- 2. Miyagi
- 3. Niigata
- 4. Ibaraki
- 5. Kanagawa
- 6. Aichi
- 7. Fukui
- 8. Kyoto
- 9. Osaka
- 10. Hyogo
- 11. Shimane
- 12. Hiroshima
- 13. Fukuoka
- 14. Saga
- 15. Nagasaki



**Table 5. ^{90}Sr and ^{137}Cs in Bottom of the Sea Soil
 – May 1971 to March 1971 –
 by T. ASARI, M. CHIBA and M. KURODA
 (Japan Analytical Chemistry Research Institute)**

Name of I.P.H.*	Location		Sampled		Date	Ca (%)	K (%)	^{90}Sr (pCi/kg)	^{137}Cs (pCi/kg)	^{90}Sr (pCi/gCa)	^{137}Cs (pCi/gK)
	latitudo	longitudo	depth (m)	weight (g)							
May 1971											
AOMORI	Hachinohe port		7.0	100	17th	1.67	0.20	LTD	61±8		31±4
"	Mutsu bay		13.0	100	19th	1.28	0.39	36.5±3.5	241±18	2.9±0.3	62±5
IBARAKI	36° 27.8'	140° 38'	15.0	250	17th	1.68	0.19	LTD	47±7		25±4
"	36° 17.2'	140° 36.3'	28.0	250	17th	1.75	0.20	"	45±10		23±5
"	36° 20.9'	140° 42.4'	32.0	250	17th	1.03	0.15	"	36±7		24±4
KANAGAWA	Yokohama port		9.0	100	22nd	1.86	0.55	"	206±16	1.7±0.3	38±3
"	"		9.0	100	22nd	0.83	0.60	18.7±2.9	311±21	2.3±0.4	52±4
FUKUI	Urazoko bay		10.0	250	11th	1.63	0.17	12.7±2.3	152±12	0.8±0.1	89±7
"	Niyu bay		5.0	250	12th	15.67	0.10	17.0±2.7	27±4	0.1±0.07	27±4
"	Uchiura bay		18.0	250	26th	1.48	0.22	LTD	85±11		39±5
AICHI	Ise bay		24.5	100	13th	1.32	0.47	21.6±3.1	191±14	1.6±0.2	41±3
"	Mikawa bay		13.0	100	13th	1.35	0.56	16.2±2.8	337±25	1.9±0.2	60±5
OSAKA	Osaka port		10.0	100	14th	0.68	0.52	11.9±2.4	264±19	1.8±0.4	57±4
"	"		12.0	100	14th	0.46	0.51	10.8±2.4	241±18	2.4±0.5	47±4
HYOGO	Kobe port		7.0	100	11th	1.07	0.54	33.8±3.8	152±13	3.2±0.4	28±2
"	"		10.0	100	11th	0.82	0.42	13.8±2.5	257±25	1.7±0.3	66±6
SHIMANE	35° 33'	133° 00'	35.0	100	24th	27.57	0.04	LTD	37±5		93±13
"	off the coast of Mitsu		20.0	100	24th	8.21	0.31	"	34±5		11±2
June 1971											
NIIGATA	off Niigata port		22.0	100	3rd	0.55	0.24	LTD	64±7		27±3
"	37° 56.5'	139° 01.5'	12.0	100	3rd	0.60	0.08	"	55±6		69±7
KANAGAWA	35° 15'	139° 37'	7.0	100	11th	4.23	0.44	8.4±2.3	185±14	0.2±0.1	42±3
FUKUOKA	Hakata port		6.0	100	9th	2.58	0.47	9.6±2.5	86±11	0.4±0.1	18±2
"	Moji port		5.0	100	17th	2.59	0.41	15.4±2.4	187±16	0.6±0.1	46±4
August 1971											
AOMORI	Hachinohe port		5.0	100	16th	3.87	0.17	19.9±3.1	77±10	0.5±0.1	46±6
"	Mutsu bay		13.0	100	18th	1.72	0.23	15.2±3.2	130±13	0.9±0.2	56±6
NIIGATA	off Niigata port		22.0	100	4th	0.15	0.21	LTD	64±7		31±3
"	31° 15'	139° 37'	12.0	100	4th	0.67	0.09	8.5±2.4	48±5	1.3±0.4	53±6
MIYAGI	Shiogama port		2.5	100	27th	4.66	0.28	9.0±2.4	80±8	0.2±0.1	28±3
"	Ona river flood gate		16.0	100	27th	14.63	0.04	8.2±2.1	23±5	0.1±0.01	57±13
IBARAKI	36° 28'	140° 38'	15.0	250	3rd	5.40	0.15	LTD	44±5		29±3
"	36° 17'	140° 36'	27.0	250	3rd	4.90	0.15	"	39±6		26±4
"	36° 21'	140° 42'	30.0	250	3rd	1.41	0.19	"	51±8		27±4
KANAGAWA	Yokohama port		9.0	100	13th	1.86	0.45	15.1±3.6	210±20		47±4
"	"		9.0	100	13th	0.65	0.42	9.3±3.0	267±18	1.5±0.5	64±4
"	Odawa bay		7.0	100	4th	4.76	0.34	LTD	178±15		52±4
FUKUI	Urazoko bay		10.0	250	10th	2.16	0.12	16.8±2.7	157±11	0.8±0.1	131±10
"	Niyu bay		5.0	250	11th	9.56	0.05	8.8±2.1	26±6	0.1±0.02	26±6
"	Uchiura bay		18.0	250	12th	0.66	0.20	LTD	122±11		61±5

Name of I.P.H*	Location		Sampled		Date	Ca (%)	K (%)	⁹⁰ Sr (pCi/kg)	¹³⁷ Cs (pCi/kg)	⁹⁰ Sr (pCi/gCa)	¹³⁷ Cs (pCi/gK)
	latitudo	longitudo	depth (m)	weight (g)							
KYOTO	Miyazu bay		60.0	100	4th	3.88	0.39	21.6±3.6	175±14	0.6±0.1	45±4
"	"		40.0	100	4th	1.02	0.30	19.5±3.2	273±26	1.9±0.3	91±9
AICHI	Ise bay		25.0	100	18th	1.16	0.42	19.7±3.1	216±21	1.7±0.3	52±5
"	Mikawa bay		12.0	100	18th	2.45	0.49	30.8±4.3	373±30	1.3±0.2	76±6
SHIMANE	35° 33'	133° 00'	35.0	250	19th	35.25	0.11	LTD	22±6		20±5
"	off the coast of Mitsu		19.0	100	19th	31.76	0.10	LTD	38±7		38±7
SAGA	Imari		6.0	100	19th	3.83	0.29	21.6±3.5	239±18	0.6±0.1	82±6
"	Kashima		9.2	100	24th	0.73	0.45	20.7±5.2	229±19	2.8±0.7	51±4
NAGASAKI	Nagasaki port		5.0	100	20th	0.53	0.19	16.3±2.8	236±19	3.1±0.5	124±10
"	"		14.0	100	20th	6.19	0.16	20.2±3.0	167±14	0.3±0.1	105±9
"	"		20.0	100	20th	5.63	0.20	13.5±2.6	147±16	0.2±0.1	74±8
September 1971											
OSAKA	Osaka port		10.0	100	3rd	1.04	0.39	12.9±2.5	177±11	1.2±0.2	45±4
"	"		12.0	100	3rd	0.77	0.42	15.9±2.4	203±20	2.1±0.3	48±5
HIROSHIMA	35° 21' 10"	132° 25' 20"	15.0	100	13th	1.34	0.43	16.3±3.1	277±23	1.2±0.3	64±5
"	34° 19' 00"	132° 24' 00"	20.0	100	13th	1.65	0.50	16.6±3.5	314±27	1.0±0.2	63±5
"	34° 17' 40"	132° 23' 00"	30.0	100	13th	0.90	0.42	25.0±3.8	207±17	2.8±0.4	49±4
KYOGO	Kobe port		6.0	100	2nd	1.11	0.35	LTD	244±19		70±6
"	"		10.0	100	2nd	2.15	0.33	9.4±2.5	109±10	0.4±0.1	33±3
FUKUOKA	Hakata port		10.0	100	13th	1.61	0.40	LTD	95±10		24±3
"	Moji port		11.0	100	4th	3.99	0.40	12.1±2.4	148±15	0.3±0.1	37±4
November 1971											
AOMORI	Hachinohe port		3.0	100	8th	1.74	0.13	10.0±2.3	33±5	0.6±0.1	25±4
"	Mutsu bay		13.0	100	10th	1.02	0.31	21.2±3.3	177±9	1.1±0.2	57±3
NIIGATA	Niigata port		23.0	100	12th	0.48	0.22	LTD	24±6		11±3
"	37° 56.5'	139° 01.5'	12.0	100	12th	0.42	0.09	"	26±5		29±5
IBARAKI	36° 28'	140° 38'	15.0	250	15th	1.86	0.20	"	42±6		21±3
"	36° 17'	140° 36'	24.0	250	15th	1.72	0.20	"	55±6		28±3
"	36° 21'	140° 42'	25.0	250	15th	1.55	0.24	"	34±5		14±2
KANAGAWA	Odawa bay		7.0	100	22nd	1.23	0.37	"	248±11		67±3
AICHI	Ise bay		24.0	100	10th	2.33	0.40	11.3±3.8	208±11	0.5±0.2	52±3
"	Mikawa bay		13.0	100	10th	2.20	0.47	16.0±4.4	259±14	0.8±0.2	55±3
FUKUI	Urazoko bay		10.0	250	9th	0.75	0.23	10.6±3.7	187±10	1.4±0.5	81±4
"	Niyu bay		5.0	250	10th	1.82	0.05	18.0±3.4	16±4	1.0±0.2	33±7
"	Uchiura bay		8.0	250	11th	0.64	0.25	LTD	92±9		37±3
SHIMANE	35° 33'	133° 00'	35.0	100	12th	38.92	0.10	"	14±5		14±5
"	off the coast of Mitsu		1.0	100	12th	35.18	0.09	"	17±5		18±6
OSAKA	Osaka port		10.0	100	12th	1.35	0.37	"	124±8		34±2
"	"		12.0	100	12th	0.50	0.46	"	224±12		56±3
HYOGO	Kobe port		7.0	100	12th	1.74	0.38	14.0±3.5	219±11	0.8±0.2	58±3
"	"		12.0	100	12th	1.36	0.37	"	265±15		72±4
FUKUOKA	Hakata port		7.0	100	18th	3.68	0.39	LTD	94±8		24±2
"	Moji port		5.0	100	16th	3.24	0.40	"	170±14		42±4
December 1971											
KANAGAWA	Yokohama port		9.0	100	3rd	1.85	0.38	LTD	174±11		46±3
"	"		9.0	100	3rd	0.71	0.38	12.4±3.8	242±12	1.8±0.5	64±3

Name of I.P.H.*	Location		Sampled		Date	Ca (%)	K (%)	⁹⁰ Sr (pCi/kg)	¹³⁷ Cs (pCi/kg)	⁹⁰ Sr (pCi/gCa)	¹³⁷ Cs (pCi/gK)
	latitudo	longitudo	depth (m)	weight (g)							
January 1972											
AOMORI	Hachinohe port		5.0	100	31st	1.49	0.16	LTD	28±5		17±3
February 1972											
AOMORI	Mutsu bay		13.0	100	1st	1.67	0.33	28.5±3.1	188±15	1.7±0.2	57±4
MIYAGI	Onagawa bay		15.0	100	3rd	22.42	0.07	LTD	26±8		37±8
IBARAKI	36° 28'	140° 38'	18.0	250	25th	4.00	0.23	"	39±5		17±2
"	36° 17'	140° 36'	22.0	250	25th	3.39	0.18	"	42±5		23±3
"	36° 21'	140° 42'	35.0	250	25th	2.41	0.17	"	34±4		20±2
KANAGAWA	Yokohama port		9.0	100	8th	0.86	0.34	16.3±5.0	256±21	1.9±0.6	75±6
"	"		7.6	100	8th	1.13	0.36	9.6±3.3	204±18	0.9±0.3	57±5
"	Odawa bay		8.0	100	18th	3.92	0.35	12.3±4.6	228±22	0.3±0.1	65±6
AICHI	Ise bay		24.0	100	8th	2.49	2.50	LTD	126±12		25±2
"	Mikawa bay		13.0	100	8th	2.60	0.44	21.4±5.8	198±15	0.8±0.2	45±4
KYOTO	Miyazu bay		57.0	100	1st	0.89	0.56	15.9±4.5	215±16	1.8±0.5	38±3
"	"		50.0	100	1st	1.29	0.43	16.7±3.1	208±15	1.3±0.2	48±3
OSAKA	Osaka port		10.0	100	17th	0.92	0.41	14.0±3.2	194±16	1.5±0.4	47±4
"	"		12.0	100	17th	0.59	0.46	LTD	159±13		35±3
HYOGO	Kobe port		7.5	100	18th	1.80	0.35	26.8±3.3	209±17	1.5±0.2	60±5
"	"		13.7	100	18th	1.15	0.42	12.2±4.3	302±25	1.1±0.4	72±6
HIROSHIMA	34° 21' 10"	132° 25' 20"	15.0	100	7th	0.68	0.42	15.0±2.0	285±19	2.2±0.3	136±9
"	34° 19'	132° 24'	20.0	100	7th	0.91	0.43	23.4±3.6	319±27	2.6±0.4	74±6
HIROSHIMA	34° 17' 40"	132° 23' 00"	30.0	100	7th	1.36	0.44	21.4±4.1	229±21	1.6±0.3	52±8
SAGA	Imari bay		10.1	100	25th	2.53	0.43	14.4±2.5	373±30	0.6±0.1	87±7
"	Kashima (sea of Ariake)		8.2	100	29th	0.81	0.40	13.2±2.0	235±17	1.6±0.2	59±4
NAGASAKI	Nagasaki bay		5.0	100	15th	1.21	0.24	15.7±4.6	364±33	1.3±0.4	152±14
"	"		14.0	100	15th	11.86	0.28	LTD	62±7		22±2
"	"		20.0	100	15th	14.09	0.20	"	101±11		51±5
March 1972											
MIYAGI	Shiogama bay		3.0	100	6th	2.02	0.32	10.7±2.4	122±11	0.5±0.1	38±3
NIIGATA	Niigata port		22.5	100	16th	0.45	0.10	LTD	35±7		35±7
"	37° 56.5'	139° 01.5'	12.0	100	18th	0.51	0.14	"	59±7		42±5
FUKUI	Uchiura bay		18.0	250	15th	1.14	0.29	"	100±11		35±4
"	Niyu bay		5.0	250	14th	7.75	0.05	9.4±2.5	14±5	0.1±0.03	27±1
"	Urazoko bay		10.0	250	13th	2.17	0.23	10.3±2.0	178±14	0.5±0.1	78±6
SHIMANE	35° 33'	133° 00'	35.0	100	31st	20.93	0.08	LTD	20±6		25±8
"	off the coast of Mitsu		19.0	100	31st	19.54	0.10	"	30±7		30±7
FUKUOKA	Hakata port		7.0	100	7th	2.43	0.35	"	91±10		26±3
"	Moji port		11.0	100	11th	3.29	0.40	10.4±3.4	217±17	0.3±0.1	54±4

* I.P.H.: Institute of Public Health

Figure 5 Sampling Locations of the Bottom of the Sea Soil
(collected by 15 Institute of Public Health)

1. Aomori
2. Miyagi
3. Niigata
4. Ibaraki
5. Kanagawa
6. Aichi
7. Fukui
8. Kyoto
9. Osaka
10. Hyogo
11. Shimane
12. Hiroshima
13. Fukuoka
14. Saga
15. Nagasaki

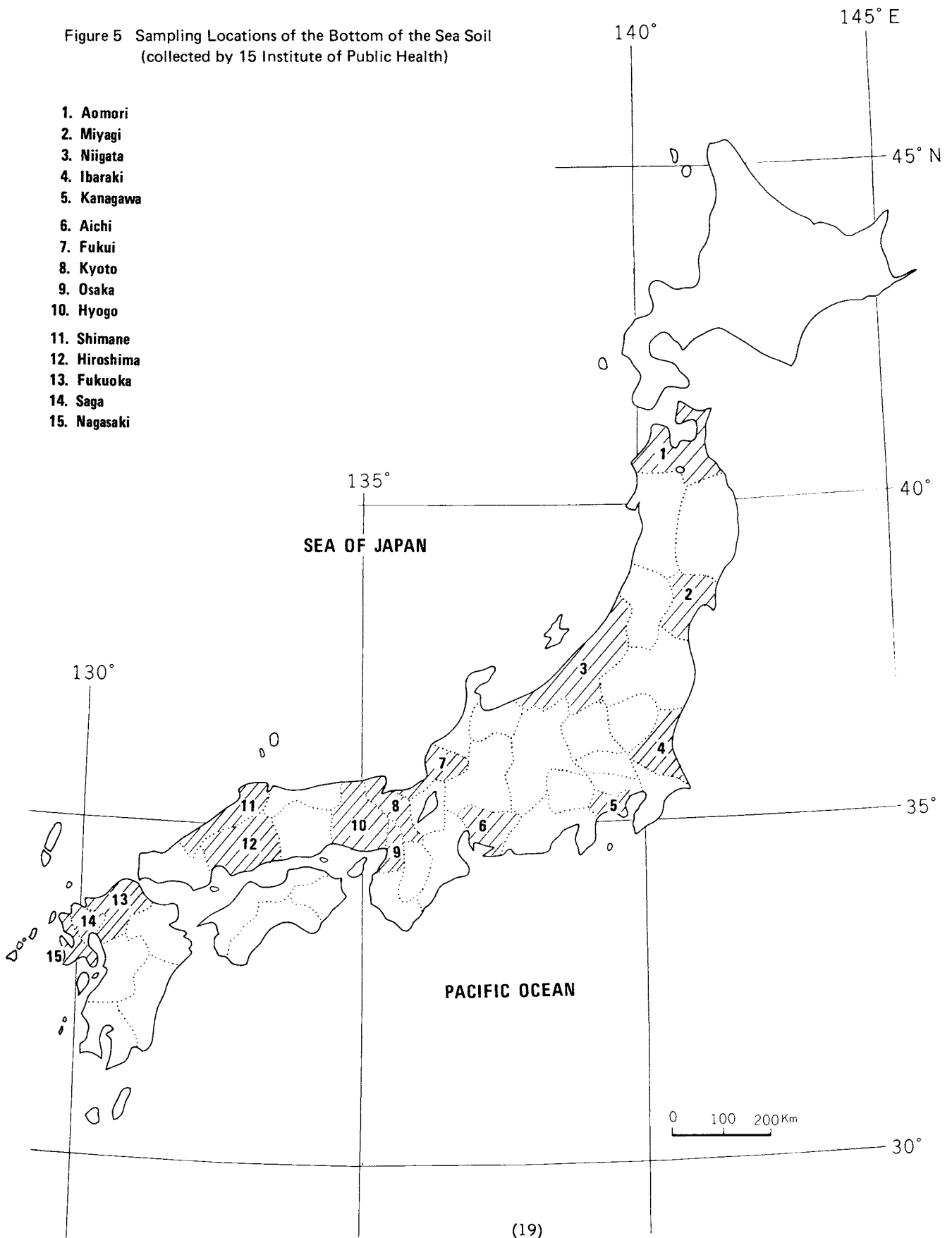


Table 6 ^{90}Sr and ^{137}Cs in Marine Fishers
 – May 1971 to March 1972 –
 by T. ASARI, M. CHIBA and M. KURODA
 (Japan Analytical Chemistry Research Institute)

Sample's name (scientific name)	Sampling		Ash		Ca (%)	K (%)	^{90}Sr		^{137}Cs		$^{144}(\text{Ce+Pr})$ (pCi/kg)
	Location	date	%	g			(pCi/kg)	(pCi/gCa)	(pCi/kg)	(pCi/gK)	
May 1971											
Limanda yokohamae	Mutsu pay, AOMORI	19th	2.99	29.9	0.69	0.11	1.1±0.5	0.2±0.1	4.2±0.6	3.8±0.5	
"	Enoshima, MIYAGI	25th	1.68	16.8	0.50	0.06	LTD	—	2.9±0.5	4.9±0.8	
Sebastes marmoratus	Oarai, IBARAKI	26th	4.52	45.2	1.53	0.10	1.7±0.3	0.1±0.02	6.2±0.8	6.2±0.8	4.3±0.4
Seriola quinqueradiata	off the coast of Kuji, IBARAKI	21st	1.75	17.5	0.54	0.07	LTD	—	4.6±0.6	6.5±0.8	3.3±0.4
Sebastes schlegeli	"	21st	4.33	43.3	1.52	0.08	1.4±0.3	0.9±0.02	4.7±0.6	5.9±0.8	3.9±0.4
Sillago sihama	Chita, AICHI	6th	3.28	32.8	1.01	0.13	2.0±0.3	0.2±0.03	3.3±0.5	2.5±0.4	
Trachurus trachurus	Tsuruga bay, FUKUI	24th	2.42	24.2	0.73	0.10	1.5±0.2	0.2±0.03	4.9±0.6	4.9±0.6	8.9±0.6
Argyrosomus argentatus	Mogi, NAGASAKI	27th	2.41	24.1	0.77	0.08	1.2±0.2	0.2±0.03	4.3±0.7	5.4±0.9	
Octopus vulgaris	Tsuruga bay, FUKUI	19th	1.48	10.0	0.04	0.13	LTD	—	1.9±0.6	1.4±0.4	8.1±0.5
June 1971											
Limanda yokohamae	Tateishi, FUKUI	21st	2.23	20.0	0.69	0.07	1.4±0.4	0.2±0.1	2.1±0.5	2.9±0.7	4.5±0.4
Halichoeres poecilopterus	Kashima, SHIMANE	26th	4.41	22.0	1.47	0.12	1.6±0.4	0.1±0.03	6.8±1.3	5.7±1.1	
August 1971											
Sebastes marmoratus	Hamada, SHIMANE	10th	4.54	22.7	1.57	0.06	3.5±0.6	0.2±0.04	3.0±0.9	4.9±1.5	
October 1971											
Sillago sihama	Chita, AICHI	8th	3.15	31.5	1.00	0.10	LTD	—	2.8±0.5	2.8±0.5	
November 1971											
Limanda yokohamae	Mutsu bay, AOMORI	10th	2.28	22.8	0.71	0.10	"	—	3.1±0.6	3.1±0.6	
"	Enoshima, MIYAGI	24th	2.80	28.0	0.82	0.13	2.1±0.4	0.3±0.04	2.1±0.5	1.7±0.4	
Argyrosomus argentatus	Mogi, NAGASAKI	12th	2.51	25.1	0.79	0.10	1.4±0.4	0.2±0.1	3.4±0.5	3.4±0.5	
December 1971											
Octopus vulgaris	Tsuruga bay, FUKUI	10th	1.60	20.0	0.02	0.02	LTD	—	3.2±0.5	16.2±2.3	2.1±0.3
January 1972											
Trachurus trachurus	Tsuruga, FUKUI	7th	5.03	25.2	1.49	0.27	1.6±0.4	0.1±0.03	8.6±1.2	3.2±0.4	10.2±1.4
February 1972											
Sebastes marmoratus	Mitsu port, SHIMANE	17th	4.74	23.7	2.24	0.07	2.7±0.6	0.1±0.03	LTD	—	
March 1972											
Limanda yokohamae	Tsuruga port, FUKUI	9th	3.33	33.3	1.07	0.26	1.4±0.3	1.3±0.2	5.2±0.7	2.0±0.3	3.9±0.4
Sebastes marmoratus	off the coast of Mannen- gahama, SHIMANE	23rd	5.19	26.0	2.46	0.08	2.0±0.5	0.1±0.02	3.3±0.9	4.2±1.1	

Figure 6 Sampling Locations of Marine Fishes
(collected by local Institute of Public Health)

1. Mutsu Bay
2. Enoshima Island
3. Kuji
4. Oarai
5. Tsuruga Bay
6. Tateishi point
7. Chita point
8. Kashima
9. Umajima Island
10. Nagasaki City

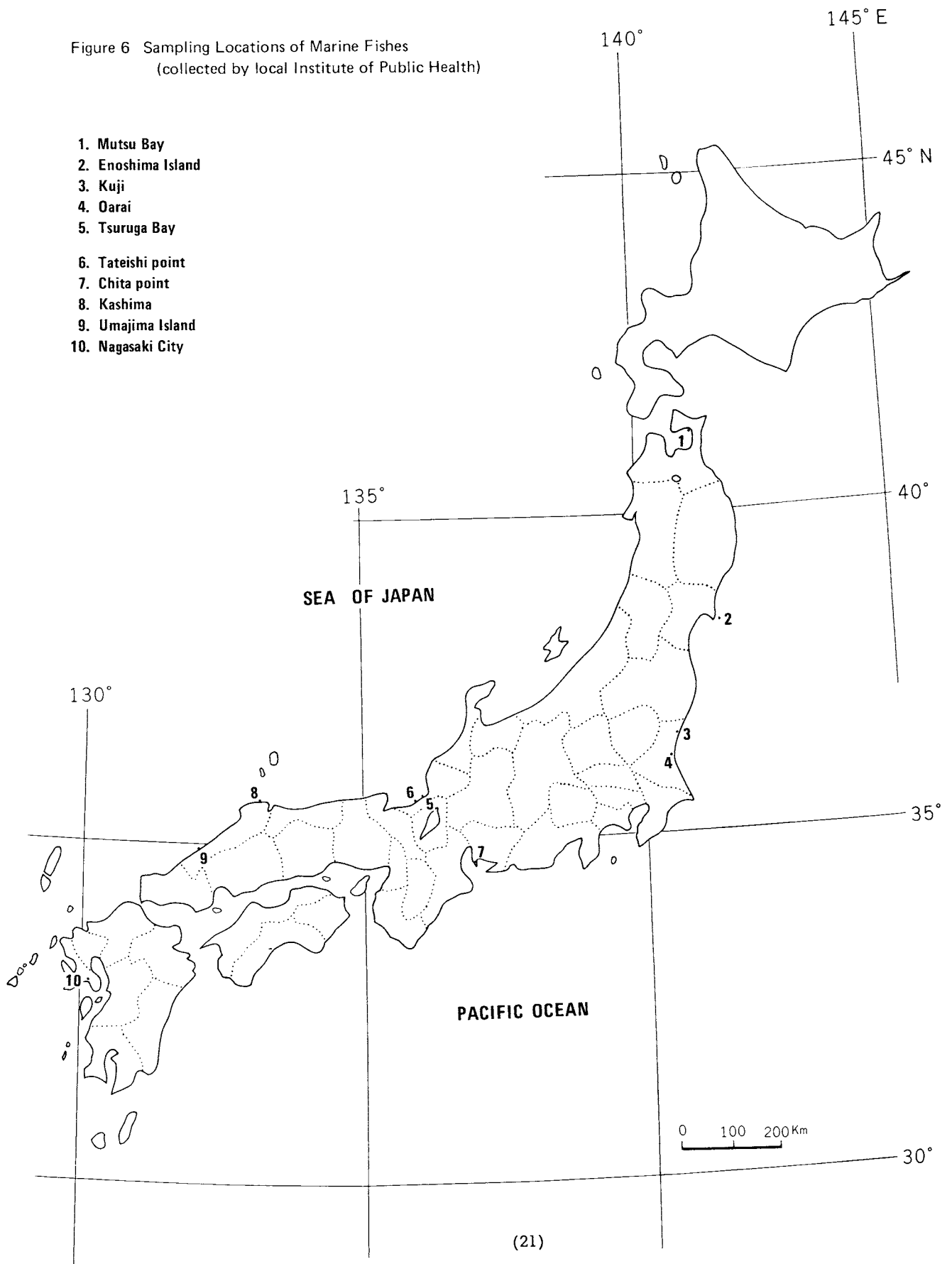


Table 7 ^{90}Sr and ^{137}Cs in Shell
 – May 1971 to March 1972 –
 by T. ASARI, M. CHIBA and M. KURODA
 (Japan Analytical Chemistry Research Institute)

Sample's name (scientific name)	Sampling		Ash		Ca (%)	K (%)	^{90}Sr		^{137}Cs		$^{144}\text{(Ce+Pr)}$ (pCi/kg)
	Location	date	%	g			(pCi/kg)	(pCi/gCa)	(pCi/kg)	(pCi/gK)	
May 1971											
<i>Patinopecten yessoensis</i>	Mutsu bay, AOMORI	19th	0.72	10.0	0.02	0.09	LTD	—	2.0±0.4	2.2±0.4	
<i>Tapes Philippinarum</i>	Minamichita, AICHI	6th	1.50	10.0	0.28	0.07	"	—	LTD	—	
"	Kamagori, AICHI	10th	2.42	10.0	0.56	0.10	9.8±0.8	1.8±0.1	"	—	
<i>Batillus cornutus</i>	Tsuruga bay, FUKUI	26th	1.45	2.0	0.29	0.04	LTD	—	"	—	264±10
<i>Patinopecten yessoensis</i>	Takaki, NAGASAKI	27th	2.21	10.0	0.51	0.06	"	—	"	—	
<i>Anadara broughtonii</i>	Takaki, NAGASAKI	27th	1.55	12.0	0.31	0.77	LTD	—	2.0±0.5	2.9±0.6	
June 1971											
<i>Tapes Philippinarum</i>	Minamichita, AICHI	3rd	1.49	7.0	0.33	0.06	"	—	3.5±0.9	5.9±1.4	
"	Kamagori, AICHI	7th	2.81	10.0	0.75	0.08	"	—	LTD	—	
<i>Haliotis gigantea</i>	Kashima, SHIMANE	26th	0.96	12.0	0.17	0.05	"	—	1.2±0.3	2.4±0.6	
<i>Batillus cornutus</i>	Umajima, Hamada City SHIMANE	28th	1.50	8.0	0.33	0.04	2.0±0.5	0.6±0.1	LTD	—	
July 1971											
<i>Haliotis gigantea</i>	Isozaki, IBARAKI	29th	1.24	7.0	0.19	0.06	"	—	1.2±0.3	2.0±0.5	68±2
August 1971											
<i>Batillus cornutus</i>	Niyu, mihama FUKUI	12th	1.00	3.0	0.16	0.02	LTD	—	LTD	—	156±8
October 1971											
<i>Batillus cornutus</i>	Umajima, Hamada City SHIMANE	4th	1.15	7.0	0.24	0.02	LTD	—	5.6±0.8	28.1±3.9	
November 1971											
<i>Patinopecten yessoensis</i>	Mutsu bay, AOMORI	10th	0.56	1.5	0.17	0.03	LTD	—	LTD	—	
<i>Mytilus edulis</i>	Isozaki, IBARAKI	29th	47.14	23.6	8.96	0.04	"	—	"	—	07±10
<i>Mytilus crassitesta</i>	Urazoko bay, FUKUI	10th	1.51	4.0	0.24	0.03	LTD	—	LTD	—	397±23
December 1971											
<i>Meretrix meretrix lusoria</i>	Oarai, IBARAKI	15th	1.80	6.0	0.73	0.08	LTD	—	LTD	—	39±3
<i>Haliotis gigantea</i>	Kashima, SHIMANE	23rd	0.77	7.7	0.14	0.03	"	—	1.8±0.5	6.0±1.7	
<i>Tapes philippinarum</i>	Takaki, NAGASAKI	23rd	1.47	7.0	0.34	0.06	"	—	LTD	—	
<i>Ostrea gigas</i>	"	23rd	0.78	4.5	0.11	0.03	3.5±0.7	3.2±0.7	2.7±0.9	9.0±2.9	
February 1972											
<i>Meretrix meretrix lusoria</i>	Oarai, IBARAKI	21st	4.72	12.0	1.90	0.06	LTD	—	LTD	—	27±3
March 1972											
<i>Patinopecten yessoensis</i>	Urazoko bay, FUKUI	31st	1.81	3.0	0.22	0.03	LTD	—	LTD	—	207±13

Figure 7 Sampling Locations of Shell
(collected by local Institute of Public Health)

1. Mutsu Bay
2. Isozaki, Nakaminato
3. Darai
4. Tsuruga Bay
5. Urazoko Bay
6. Niyu, Mihama
7. Gamagori
8. Minamichita
9. Kashima
10. Umajima, Hamada
11. Takaki

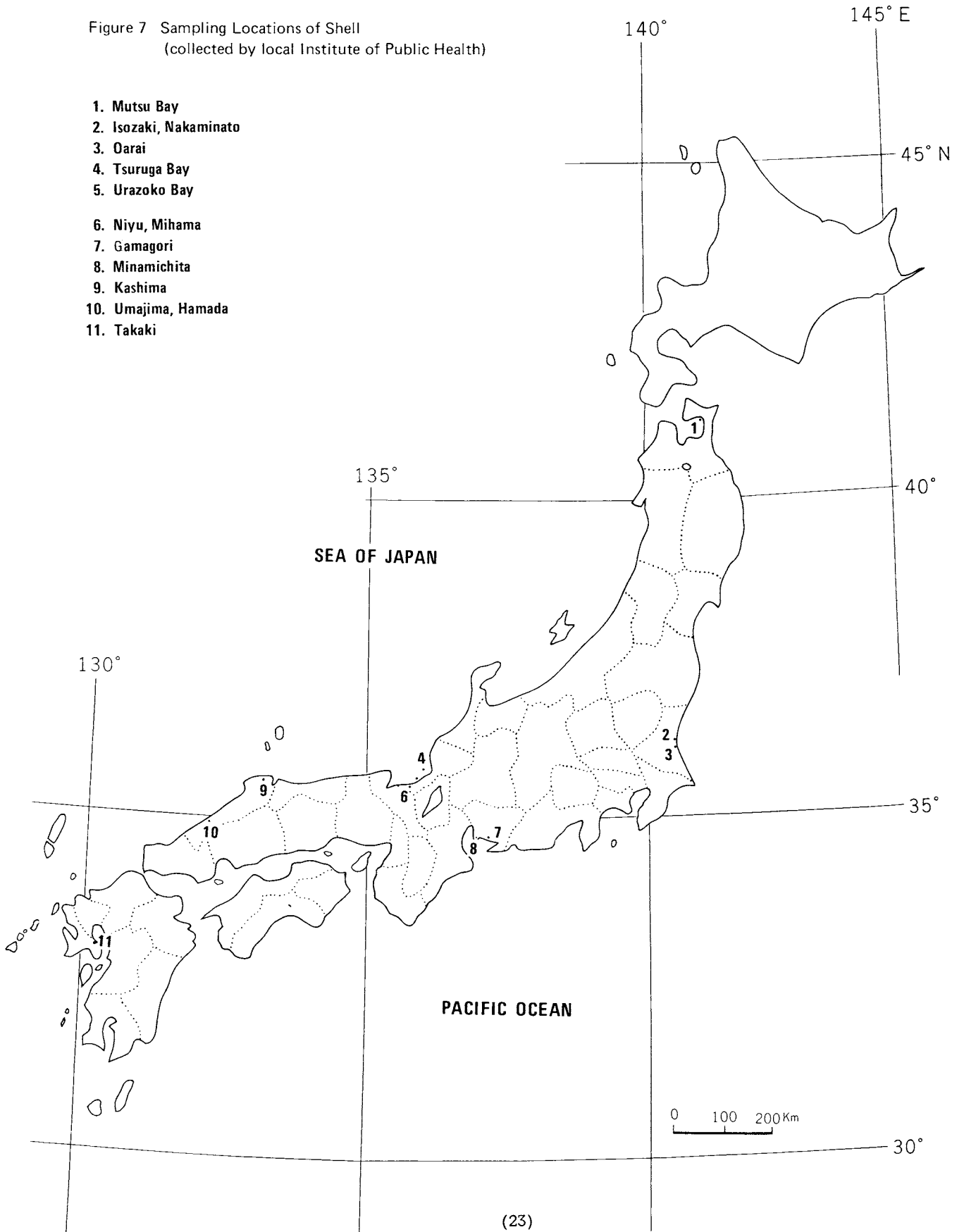
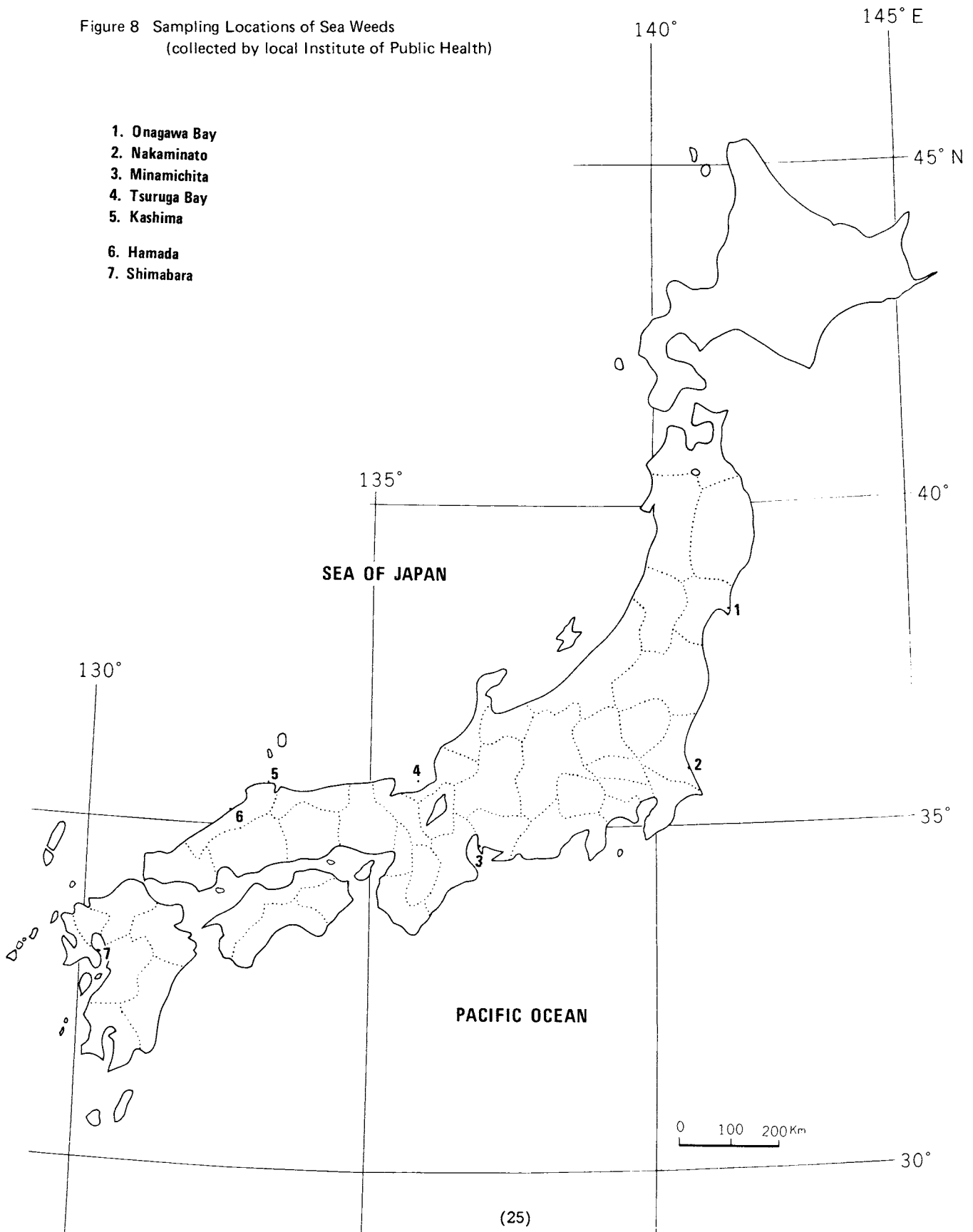


Table 8 ^{90}Sr and ^{137}Cs in Sea Weeds
 – April 1971 to February 1972 –
 by T. ASARI, M. CHIBA and M. KURODA
 (Japan Analytical Chemistry Research Institute)

Sample's name (scientific name)	Sampling		Ash		Ca (%)	K (%)	^{90}Sr		^{137}Cs		$^{144}\text{(Ce+Pr)}$ (pCi/kg)
	Location	date	%	g			(pCi/kg)	(pCi/gCa)	(pCi/kg)	(pCi/gK)	
April 1971											
Vncaria pinnatifida	Shindenhigashi, Shimabara NAGASAKI	21st	3.44	34.4	0.11	0.91	1.7±0.2	1.5±0.2	4.0±0.5	0.4±0.1	
Ulva	"	21st	1.41	14.1	0.04	0.16	2.3±0.3	5.7±0.8	3.7±0.5	2.3±0.3	
May 1971											
Vndaria pinnatifida	Onagawa bay, MIYAGI	25th	2.53	25.3	0.11	0.66	2.3±0.3	2.1±0.2	2.2±0.5	0.3±0.1	
Sargassum fulvellum	Mihama, Niyu bay, FUKUI	12th	4.54	30.0	0.251	0.33	2.8±0.7	1.1±0.3	5.8±0.9	1.8±0.3	845±36
"	Urazoko bay, FUKUI	11th	5.52	30.0	0.35	0.41	5.7±0.6	1.6±0.2	6.5±1.0	1.6±0.2	889±22
June 1971											
Vndaria pinnatifida	Tsuruga, FUKUI	23rd	4.99	30.0	0.15	0.39	4.2±0.6	2.8±0.4	5.1±0.8	1.3±0.2	93±6
"	Niyu, Mihama, FUKUI	23rd	4.49	30.0	0.16	0.40	5.4±0.6	3.4±0.4	6.3±0.9	1.6±0.2	80±6
Eisenia bicyclis	Umajima, Hamada, SHIMANE	28th	3.71	37.1	0.19	0.82	2.9±0.4	1.5±0.2	6.2±0.7	0.8±0.1	
"	Kashima, SHIMANE	25th	3.50	20.0	0.17	0.80	2.5±0.4	1.5±0.3	7.3±1.1	0.9±0.1	
July 1971											
Gelidium amansii	Minamichita, AICHI	5th	12.35	30.0	2.28	0.34	5.2±2.0	0.2±0.1	8.9±1.6	2.6±0.5	
August 1971											
Gelidium amansii	Minamichita, AICHI	9th	11.79	30.0	1.81	0.22	5.8±1.1	0.3±0.1	19.1±2.3	8.7±1.1	
Eisenia bicyclis	Isozaki, IBARAKI	2nd	2.94	25.0	0.21	0.20	2.9±0.6	1.4±0.3	7.6±0.8	3.8±0.4	
October 1971											
Eisenia bicyclis	Umajima, Hamada, SHIMANE	2nd	2.87	25.0	0.26	0.08	4.4±0.9	1.7±0.3	LTD	–	
"	Kashima, SHIMANE	22nd	3.43	25.0	0.29	0.23	4.6±0.9	1.6±0.3	7.5±0.8	3.2±0.4	159±12
December 1971											
Vndaria pinnatifida	Onagawa bay, MIYAGI	15th	1.14	20.0	0.07	0.10	2.1±0.3	3.0±0.5	1.2±0.3	1.2±0.3	
Hizikia fusiforme	Isozaki, Nakaminato IBARAKI	2nd	4.67	25.0	0.14	0.73	1.7±0.5	1.2±0.4	5.4±0.9	0.7±0.1	12±1
January 1972											
Vndaria pinnatifida	Minamichita, AICHI Shindenhigashi,	18th	3.14	25.0	0.06	0.29	LTD	–	2.6±0.5	0.9±0.2	
"	Shimabara, NAGASAKI	12th	3.50	25.0	0.08	0.36	1.5±0.3	1.8±0.4	1.8±0.5	0.5±0.2	
Porphyra fusiforme	"	12th	2.60	25.0	0.02	0.22	LTD	–	LTD	–	
February 1972											
Hizikia fusiforme	Isozaki, Nakaminato IBARAKI	22nd	3.73	37.3	0.13	1.06	1.4±0.3	1.1±0.2	2.1±0.6	0.2±0.1	10±1
Eisenia bicyclis	"	22nd	3.93	39.3	0.23	0.90	2.2±0.4	1.0±0.2	6.5±0.6	0.7±0.1	99±7
Vndaria pinnatifida	Minamichita, AICHI	3rd	1.95	19.5	0.09	0.45	1.7±0.3	1.9±0.3	2.9±0.5	0.6±0.1	

Figure 8 Sampling Locations of Sea Weeds
(collected by local Institute of Public Health)

- 1. Onagawa Bay
- 2. Nakaminato
- 3. Minamichita
- 4. Tsuruga Bay
- 5. Kashima
- 6. Hamada
- 7. Shimabara



**The Concentrations of Strontium-90 and Cesium-137
in Marine Organisms**

(National Institute of Radiological Sciences)

Since November 1963, radiochemical analysis of Strontium-90 and Cesium-137 in marine organisms have carried out at National Institute of Radiological Sciences.

Samples used were collected from adjacent sea of Japan through several prefectural public health laboratories once or twice a year, and ashed at 450°C in a electric muffle furnace.

Strontium-90 was analyzed by fuming nitric acid method and was counted in form of Y-oxalate. Cesium-137 was separated by use of AMP and was measured in form of chloroplatinate.

The results in 1971 were shown in Table 9, 10 and 11.

Sampling locations of these were shown in Figure 9.

**Table 9 Strontium-90 and Cesium-137 in weeds
– May, 1971 to Jan., 1972 –
by T. Ueda, Y. Suzuki, R. Nakamura and E. Kawachi
*(National Institute of Radiological Sciences)***

Sampling		Sample's Name	⁹⁰ Sr			¹³⁷ Cs
Location	Day		(pCi/kg)	(mgCa/kg)	(gCa)	(pCi/kg)
Niigata	1971 May	Undaria pinnatifida	3.4	1182	2.9	5.4
	Aug.	Gelidium amansii	4.6	1359	3.4	4.8
Ishikawa	May	Undaria pinnatifida	2.8	1265	2.2	2.6
	Nov.	Sargassum fulvellum	4.2	1314	3.2	4.4
Fukui	Sept.	Undaria pinnatifida	3.8	1159	2.7	5.0
		Ecklonia cava	3.8	1231	3.1	6.1
Fukushima	May	Undaria pinnatifida	3.1	1159	2.7	5.0
		Ecklonia cava	6.6	1637	4.0	8.4
	Aug.	Undaria pinnatifida	2.7	1236	2.2	4.3
	Nov.	Ecklonia cava	6.4	1574	4.1	10.2
Hiroshima	1972 Jan.	Porphyra tenera	2.1	367	5.7	3.6
		Undaria pinnatifida	4.2	1442	2.9	5.7

Table 10 Strontium-90 and Cesium-137 in shell
 – May, September and November, 1971 –
 by T. Ueda, Y. Suzuki, R. Nakamura and E. Kawachi
 (National Institute of Radiological Sciences)

Sampling		Sample's name	⁹⁰ Sr	Ca	⁹⁰ Sr	
Location	Day		(pCi/kg)	(g/kg)	(gCa)	
Niigata	1971	May	Nordotis discus	12.8	371	0.03
		Nov.	Tegillarca granosa	12.1	306	0.04
Fukushima		May	Meretrix meretrix lamarckii	10.3	302	0.03
		Sept.	"	9.4	293	0.03
		"	Nordotis discus	8.7	331	0.03
Hiroshima		May	Tapes philippinarum	6.9	391	0.02
		Nov.	"	7.1	388	0.02

Table 11 Strontium-90 and Cesium-137 in marine fishes
 – May and November, 1971 –
 by T. Ueda, Y. Suzuki, R. Nakamura and E. Kawachi
 (National Institute of Radiological Sciences)

Location	Sample's name	⁹⁰ Sr pCi/gCa *		¹³⁷ Cs pCi/kg **	
		May	Nov.	May	Nov.
Fukushima	Mugil caphalus	0.3	0.2	8.6	7.3
	Lateolabrax japonicus	0.3	0.2	5.3	2.5
	Sebastes güntherii	0.1>	0.1>	3.5	2.1
Niigata	Mugil cephalus	0.3	–	1.2	–
	Trachurus japonicus	0.1>	0.1>	8.5	7.6
	Sillago sihama	0.1	0.1	10.5	8.2
	Entosphenus japonicus	–	0.1>	–	3.0
Ishikawa	Limanda irrdorum	0.2	0.1	6.5	4.3
	Sebastes güntherii	0.1	0.1>	5.5	6.1
	Seriola quinqueradiata	0.1>	0.1>	3.9	4.3
Hiroshima	Mugil cephalus	0.1	0.1	6.9	8.5

*bone

** muscle

Figure 9 Sampling Locations of Marine Organisms

