RADIOACTIVITY SURVEY DATA in Japan

NUMBER 2

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National Institute of Radiological Sciences

Chiba, Japan

In April 1963, in compilance with directives set forth by the Japan Atomic Energy Commission, the Division of Radioactivity Survey, National Institute of Radiological Sciences was directed to :

1, Collect, record and maintain information on radiation from National and International sources.

2. Analyze the information collected.

3. Establish a radiation survey information exchange center.

As a part of the assignment, data from the Nationwide Radioactivity Survey Network were assembled and compiled in this publication. Present plans are to issue this type of publication on a quarterly basis.

For further information on any subject reported in this issue, readers are referred to the contributors indicated in the table headings.

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Contents

National Institute of Radiological Sciences

Meteorological Data

Strontium-90 and Cesium-137 in Rain and Dry Fallout

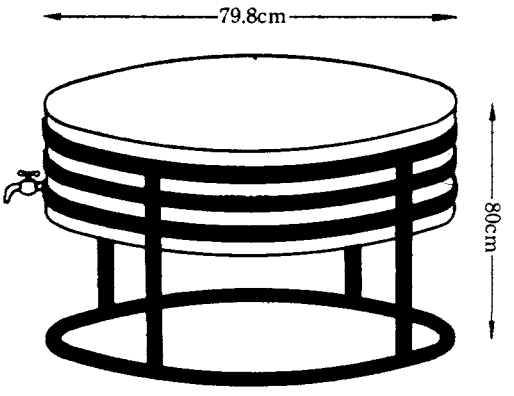
(Japan Analytical Chemistry Research Institute)

Since May 1963, the Japan Analytical Chemistry Research Institute, on commission by the Science and Technology Agency, and in cooperation with 24 prefectural public health laboratories, has measured the monthly deposits of strontium-90 and cesium-137 at various locations throughout Japan.

Precipitation and dry fallout samples were collected with large trays (Figure 1) by the prefectural public health laboratories. Strontium-90 and cesium-137 with carriers in the sample was adsorbed on cation exchange resin, and was sent to the Japan Analytical Chemistry Research Institute. The cation exchange column used is shown in Figure 4, page 8. After those nuclides were eluted from the resin, the chemical analysis was carried out using the method recommended by the Science and Technology Agency.

The results obtained during the period July to November 1963 are shown in Table 1.

Figure 1. Sampling Tray recommended by the Science and Technology Agency



The tray has a collection area of 5000 cm^2. Water is maintained at a +10 mm level to prevent dust from being blown away.

Table 1. Strontium-90 and Cesium-137 in Rain and Dry Fallout - July to November 1963 -

By T. Asari, M. Chiba and M. Kuroda
(Japan Analytical Chemistry Research Institute)

July 1963

Station	Duration days	Precipitation mm	^{90}Sr mc/km^2	^{89}Sr mc/km^2	^{137}Cs mc/km^2
Sapporo, HOKKAIDO	31	98.9	2.30	8.34	2.43
Aomori, AOMORI	31	134.5	2.42	7.51	1.60
Sendai, MIYAGI	31	153.6	3.03	10.62	4.82
Akita, AKITA	31	201.8	1.92	6.37	5.77
Mito, IBARAGI	31	134.6	3.02	5.09	1.65
Kumagaya, SAITAMA	31	142.5	3.99	12.07	4.63
Tokyo	31	65.9	3.15	11.60	3.09
Yokohama, KANAGAWA	31	134.2	1.39	4.79	1.52
Niigata, NIIGATA	31	123.3	1.38	3.99	1.52
Kanazawa, ISHIKAWA	31	176.0	0.82	2.65	1.12
Fukui, FUKUI	31	142.7	1.49	4.94	1.81
Shizuoka, SHIZUOKA	31	159.1	2.87	9.61	2.97
Nagoya, AICHI	31	157.8	2.31	7.36	2.18
Kyoto, KYOTO	31	220.0	2.35	8.46	2.50
Osaka, OSAKA	31	70.1	0.88	3.36	1.04
Kobe, HYOGO	31	65.7	0.93	3.48	1.20
Wakayama, WAKAYAMA	31	21.7	0.36	1.04	0.85
Tottori, TOTTORI	31	129.0	1.31	3.86	1.48
Okayama, OKAYAMA	31	76.0	0.55	2.10	0.55
Hiroshima, HIROSHIMA	31	141.8	1.10	4.94	1.35
Kochi, KOCHI	31	85.4	1.69	4.14	1.97
Fukuoka, FUKUOKA	31	218.2	1.07	3.92	1.33
Nagasaki, NAGASAKI	31	403.9	1.71	5.22	2.06
Kagoshima, KAGOSHIMA	31	204.9	2.21	7.54	2.42

August 1963

Station	Duration days	Precipitation mm	^{90}Sr mc/km^2	^{89}Sr mc/km^2	^{137}Cs mc/km^2
Sapporo, HOKKAIDO	31	79.3	1.94	4.32	3.21
Aomori, AOMORI	31	91.9	0.91	6.67	0.80
Sendai, MIYAGI	33	103.1	1.22	3.24	1.96
Akita, AKITA	28	263.5	2.45	6.89	3.32
Mito, IBARAGI	32	115.3	0.72	2.65	1.07
Kumagaya, SAITAMA	32	147.7	1.39	3.41	5.37
Tokyo	31	382.2	0.88	2.66	1.32
Yokohama, KANAGAWA	31	178.3	1.30	1.45	1.98
Niigata, NIIGATA	31	191.7	1.03	2.88	1.18
Kanazawa, ISHIKAWA	31	157.6	1.14	2.93	1.39
Fukui, FUKUI	31	198.0	0.71	1.40	1.04
Shizuoka, SHIZUOKA	31	200.2	0.87	2.72	1.04
Nagoya, AICHI	31	139.6	0.68	0.94	1.09
Kyoto, KYOTO	31	237.0	1.31	2.74	1.55
Osaka, OSAKA	31	191.7	0.38	0.35	0.73
Kobe, HYOGO	31	104.8	0.64	1.84	0.75
Wakayama, WAKAYAMA	31	101.6	0.57	1.18	0.92
Tottori, TOTTORI	32	216.7	0.75	2.13	1.16
Okayama, OKAYAMA	31	199.5	1.84	4.23	0.86
Hiroshima, HIROSHIMA	31	310.8	1.03	2.22	1.65
kochi, KOCHI	31	408.6	1.27	2.74	1.57
Fukuoka, FUKUOKA	31	318.9	0.90	2.33	1.23
Nagasaki, NAGASAKI	31	456.5	0.93	2.56	1.41
Kagoshima, KAGOSHIMA	31	304.7	0.93	2.35	1.14

Table 1. Strontium-90 and Cesium-137 in Rain and Dry Fallout -Jul to Nov 63- *(continued)*

September 1963

Station	Duration days	Precipitation mm	^{90}Sr mc/km^2	^{89}Sr mc/km^2	^{137}Cs mc/km^2
Sapporo, HOKKAIDO	30	190.5	2.28	1.17	2.70
Aomori, AOMORI	30	108.6	1.14	1.97	0.73
Sendai, MIYAGI	29	46.0	0.70	1.26	0.58
Akita, AKITA	26	139.4	2.47	3.20	3.40
Mito, IBARAGI	29	137.0	1.84	2.53	2.19
Kumagaya, SAITAMA	30	64.8	0.79	1.41	1.19
Tokyo	29	144.2	0.21	0.37	0.36
Yokohama, KANAGAWA	31	175.9	2.46	3.18	3.24
Niigata, NIIGATA	30	171.3	2.17	4.17	3.14
Kanazawa, ISHIKAWA	31	142.9	1.60	2.32	2.16
Fukui, FUKUI	14	77.5	0.84	1.60	1.63
Shizuoka, SHIZUOKA	30	129.7	0.99	1.26	1.41
Nagoya, AICHI	30	122.9	0.75	1.36	1.82
Kyoto, KYOTO	30	91.0	0.85	1.45	1.02
Osaka, OSAKA	31	103.0	0.80	0.65	1.09
Kobe, HYOGO	29	131.0	0.73	1.23	0.96
Wakayama, WAKAYAMA	30	169.5	1.38	2.11	0.99
Tottori, TOTTORI	30	110.3	0.68	1.58	0.99
Okayama, OKAYAMA	30	145.9	0.56	0.97	0.76
Hiroshima, HIROSHIMA	30	178.3	0.76	0.77	1.05
Kochi, KOCHI	30	200.9	2.29	4.61	3.24
Fukuoka, FUKUOKA	30	114.2	0.53	0.82	0.78
Nagasaki, NAGASAKI	30	219.0	0.89	1.68	1.35
Kagoshima, KAGOSHIMA	30	72.3	0.29	0.49	0.32

October 1963

Station	Duration days	Precipitation mm	^{90}Sr mc/km^2	^{89}Sr mc/km^2	^{137}Cs mc/km^2
Sapporo, HOKKAIDO	31	104.2	0.95	1.01	1.12
Aomori, AOMORI	31	49.0	0.95	1.06	0.54
Sendai, MIYAGI	31	149.8	0.59	1.13	1.18
Akita, AKITA	30	107.6	1.27	2.48	2.01
Mito, IBARAGI	31	269	2.13	0	2.94
Kumagaya, SAITAMA	30	167.3	1.28	0.99	2.19
Tokyo	31	294.7	1.00	1.73	1.68
Yokohama, KANAGAWA	30	278.9	1.54	2.80	2.41
Niigata, NIIGATA	31	158.6	1.57	2.04	2.67
Kanazawa, ISHIKAWA	32	109.0	0.52	0.79	0.92
Fukui, FUKUI	31	114.8	1.13	1.27	1.88
Shizuoka, SHIZUOKA	31	181.5	0.89	0.95	1.69
Nagoya, AICHI	31	85.6	0.50	0.43	0.76
Kyoto, KYOTO	31	92.9	0.45	0.70	0.70
Osaka, OSAKA	32	102.0	0.27	0.11	0.39
Kobe, HYOGO	32	69.0	0.21	0.09	0.28
Wakayama, WAKAYAMA	31	124.0	0.30	0.09	0.61
Tottori, TOTTORI	32	128.7	1.42	0.32	1.98
Okayama, OKAYAMA	31	109.6	0.16	0.27	0.37
Hiroshima, HIROSHIMA	32	91.8	0.46	0.45	0.47
Kochi, KOCHI	31	252.0	1.90	2.15	1.98
Fukuoka, FUKUOKA	31	73.7	0.43	0.96	0.71
Nagasaki, NAGASAKI	31	50.4	0.49	1.09	0.69
Kagoshima, KAGOSHIMA	32	25.0	0.14	0.14	0.15

Table 1. Strontium-90 and Cesium-137 in Rain and Dry Fallout -Jul to Nov 63 *(continued)*

November 1963

Station	Duration days	Precipitation mm	^{90}Sr mc/km^2	^{89}Sr mc/km^2	^{137}Cs mc/km^2
Sapporo, HOKKAIDO	30	82.9	0.88	0.53	1.37
Aomori, AOMORI	30	83.3	0.92	0.05	0.52
Sendai, MIYAGI	32	118.7	0.43	1.19	1.00
Akita, AKITA	29	180.7	2.15	0.57	3.03
Mito, IBARAGI	30	100.4	0.83	0.31	1.53
Kumagaya, SAITAMA	31	52.2	0.24	0.15	0.44
Tokyo	30	90.6	0.30	0.33	0.56
Yokohama, KANAGAWA	31	86	0.90	1.43	1.40
Niigata, NIIGATA	30	161.5	2.46	1.67	3.23
Kanazawa, ISHIKAWA	30	200.9	2.54	2.13	4.67
Fukui, FUKUI	30	186.8	2.51	2.62	3.81
Shizuoka, SHIZUOKA	30	57.2	0.45	0.46	1.06
Nagoya, AICHI	30	37.2	0.27	0.27	0.58
Kyoto, KYOTO	30	30.2	0.26	0.09	0.46
Osaka, OSAKA	31	36.8	0.18	0.38	0.50
Kobe, HYOGO	31	27.3	0.19	0.48	0.37
Wakayama, WAKAYAMA	30	36.4	0.24	0.42	0.48
Tottori, TOTTORI	32	101.1	1.03	1.14	1.54
Okayama, OKAYAMA	30	40.8	0.20	0.33	0.34
Hiroshima, HIROSHIMA	31	48.0	0.39	0.09	0.41
Kochi, KOCHI	30	39.1	0.18	0.13	0.31
Fukuoka, FUKUOKA	30	81.0	0.76	0.35	1.10
Nagasaki, NAGASAKI	31	56.4	0.84	0	1.48
Kagoshima, KAGOSHIMA	29	96.9	0.53	0.59	0.77

※ ※ ※ ※ ※

Table 2 shows the monthly values of strontium-90 and cesium-137 averaged values of the 24 stations during the period May to November 1963. Figure 2 shows the strontium-90 deposited over a 2 month period at areas indicated on the map. In May and June, strontium-90 deposits were very high, then rapidly decreased. Table 3 shows the total amounts of strontium-90 and cesium-137 deposits during the period July to November 1963, and Figure 3 graphically illustrates these values on the map. Table 4 shows the ratios of strontium-89 to strontium-90 and cesium-137 to strontium-90.

Table 2. Monthly Mean Values of 24 Stations
— May to Nov 63 —

Month	Number of Stations	Precipitation (mm)	Strontium-90 (mc/km^2)	Strontium-89 (mc/km^2)	Cesium-137 (mc/km^2)
May	23*1	252.7	4.14	26.74	4.61
Jun	23*1	255.8	4.20	17.72	4.21
Jul	24	144.2	1.84	5.96	2.16
Aug	24	212.5	1.07	2.79	1.57
Sep	23*2	129.8	1.18	1.72	1.54
Oct	24	131.0	0.86	0.96	1.26
Nov	24	84.7	0.82	0.64	1.29

Note; *1Osaka, *2Fukui excepted

Figure 2. ^{90}Sr Deposits over a 2 Month Period

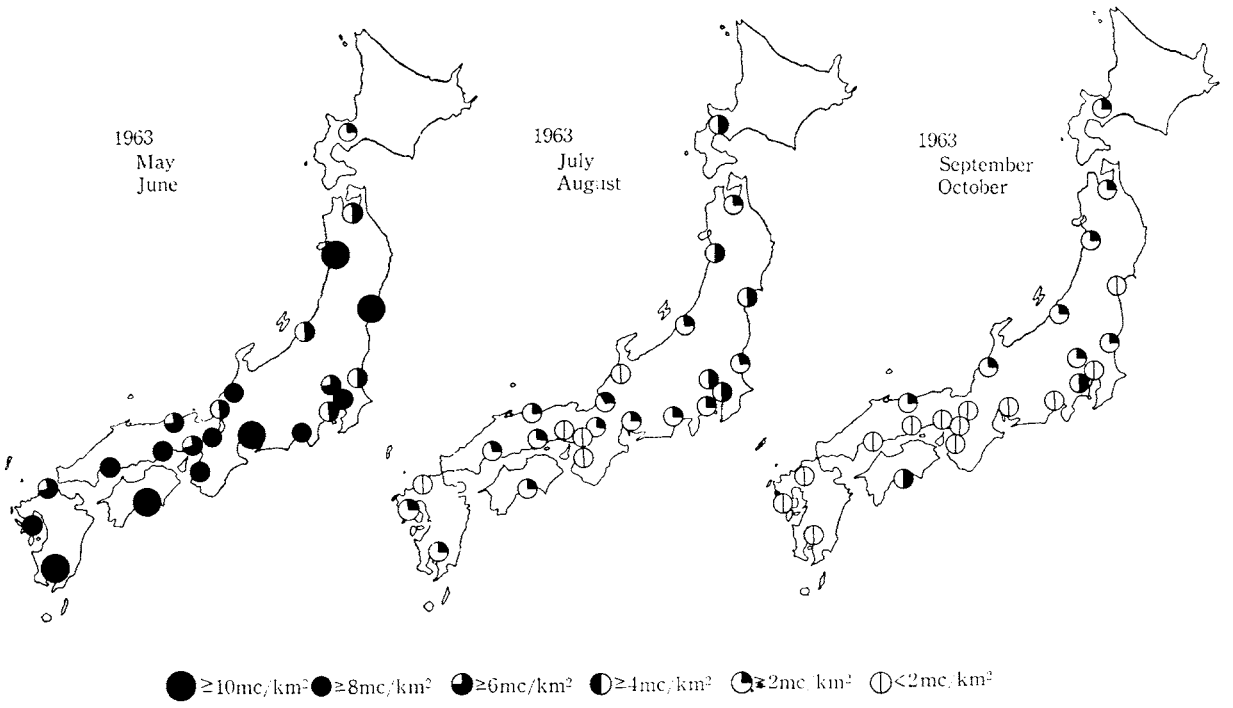


Table 3. Total Amounts of ^{90}Sr and ^{137}Cs since Jul 63 to Nov 63

Station	Strontium-90 (mc/km²)	Cesium-137 (mc/km²)
Sapporo	8.35	10.83
Aomori	6.34	4.19
Sendai	5.97	9.54
Akita	10.26	17.53
Mito	8.54	9.38
Kumagaya	7.69	13.82
Tokyo	5.54	7.01
Yokohama	7.59	10.55
Niigata	8.61	11.74
Kanazawa	6.62	10.26
Fukui	6.68	10.17
Shizuoka	6.07	8.17
Nagoya	4.51	6.43
Kyoto	5.22	6.23
Osaka	2.51	3.75
Kobe	2.70	3.56
Wakayama	2.85	3.85
Tottori	5.19	7.15
Okayama	3.31	2.88
Hiroshima	3.74	4.93
Kochi	7.33	9.07
Fukuoka	3.69	5.15
Nagasaki	4.86	6.99
Kagoshima	4.10	4.80
Mean	5.76	7.71

Figure 3. Total Amounts of ^{90}Sr and ^{137}Cs Deposits since Jul 63

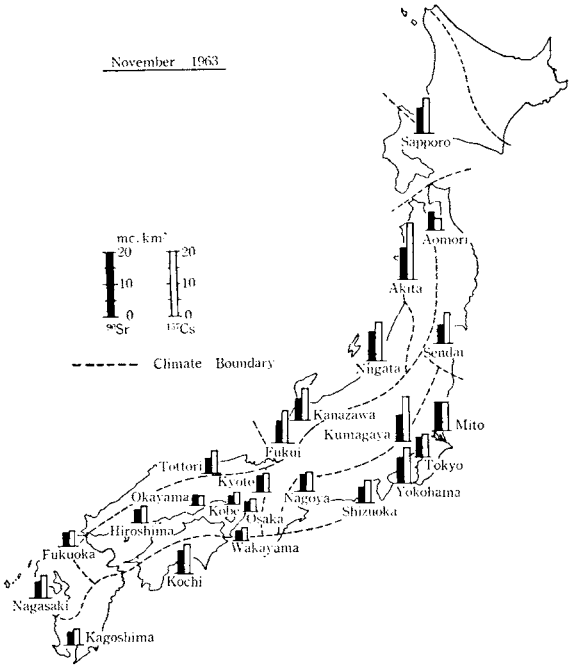


Table 4. Ratio of ^{89}Sr to ^{90}Sr and ^{137}Cs to ^{90}Sr – Jul to Nov 63 –

Station	^{89}Sr / ^{90}Sr					^{137}Cs / ^{90}Sr				
	Jul	Aug	Sep	Oct	Nov	Jul	Aug	Sep	Oct	Nov
Sapporo	3.6	2.2	0.5	1.1	0.6	1.1	1.7	1.2	1.2	1.6
Aomori	3.1	7.3	1.7	1.1	0.5	0.7	0.9	0.6	0.6	0.6
Sendai	3.5	2.7	1.8	1.9	2.8	1.6	1.6	0.8	2.0	2.3
Akita	3.3	2.8	1.3	2.0	0.3	3.0	1.4	1.4	1.6	1.4
Mito	1.7	3.7	1.4	0	0.4	0.5	1.5	1.2	1.4	1.8
Kumagaya	3.0	2.5	1.8	0.8	0.6	1.2	3.9	1.5	1.7	1.8
Tokyo	3.7	3.0	1.8	1.7	1.1	1.0	1.5	1.7	1.7	1.9
Yokohama	3.4	1.1	1.3	1.8	1.6	1.1	1.5	1.3	1.6	1.6
Niigata	2.9	2.8	1.9	1.3	0.7	1.1	1.1	1.4	1.7	1.3
Kanazawa	3.2	2.6	1.5	1.5	0.8	1.4	1.2	1.4	1.8	1.8
Fukui	3.3	2.0	1.9	1.1	1.0	1.2	1.5	1.9	1.7	1.5
Shizuoka	3.3	3.1	1.3	1.1	1.0	1.0	1.2	1.4	1.9	2.4
Nagoya	3.2	1.4	1.8	0.9	1.0	0.9	1.6	2.4	1.5	2.1
Kyoto	3.6	2.1	1.7	1.6	0.3	1.1	1.2	1.2	1.6	1.8
Osaka	3.8	0.9	0.8	0.4	2.1	1.2	1.9	1.4	1.4	2.8
Kobe	3.7	2.9	1.7	0.4	2.5	1.3	1.2	1.3	1.3	1.9
Wakayama	2.9	2.1	1.5	0.3	1.8	2.4	1.6	0.7	2.0	2.0
Tottori	2.9	2.8	2.3	0.2	1.1	1.1	1.5	1.5	1.4	1.5
Okayama	3.8	2.3	1.7	1.7	1.7	1.0	0.5	1.4	2.3	1.7
Hiroshima	4.5	2.2	1.0	1.0	0.2	1.2	1.6	1.4	1.0	1.1
Kochi	2.4	2.2	2.0	1.1	0.7	1.2	1.2	1.4	1.0	1.7
Fukuoka	3.7	2.6	1.5	2.2	0.5	1.2	1.4	1.5	1.7	1.4
Nagasaki	3.1	2.8	1.9	2.2	0	1.2	1.5	1.5	1.4	1.8
Kagoshima	3.4	2.5	1.7	1.0	1.1	1.1	1.2	1.1	1.1	1.5
Mean	3.3	2.6	1.6	1.2	1.0	1.2	1.5	1.4	1.5	1.7

Water Data

Strontium-90 and Cesium-137 in City Water

(National Institute of Radiological Sciences)

Since December 1961, the National Institute of Radiological Sciences, in cooperation with 24 prefectural public health laboratories, has analyzed the strontium-90 and cesium-137 content in city water. However, since April 1963, this operation has been conducted by the Japan Analytical Chemistry Research Institute, except for samples from Tokyo, Niigata and Osaka Prefecture.

Two types of city water samples were collected at each city. One was the "source water" collected before treatment and the other, the "treated water" collected from a water tap. During the period December 1961 to March 1962, only strontium-90 content in the source water was analyzed monthly, but, since April 1962, strontium-90 and also cesium-137 content in both the source and treated water have been analyzed bimonthly.

The "A" type column, containing sodium type cation exchange resin (Dowex 50 W-X 8, 50 ~100 mesh), and 100 mg each of strontium and cesium carrier solution in polyethylen bottles were sent by the National Institute of Radiological Sciences in advance. The column is shown in Figure 4. A 100 *l* of water was passed through the column at the rate of 12 *l* per hour at each prefectural public health laboratory. Then, the "column A" was sent to the National Institute of Radiological Sciences. After 2 *l* of 5%-oxalic acid was passed through the column, strontium and cesium adsorbed in the resin were eluted by 3 *l* of 3 N-hydrochloric acid. The hydrochloric acid fraction was analyzed using the method recommended by the Science and Technology Agency.

Results obtained during the period December 1961 to July 1963 are shown in Tables 5, 6 and 7. Figure 5 shows the ratio between "source water" and "treated water" during the period April 1962 to March 1963.

Figure 4. Treatment for concentration of Sample

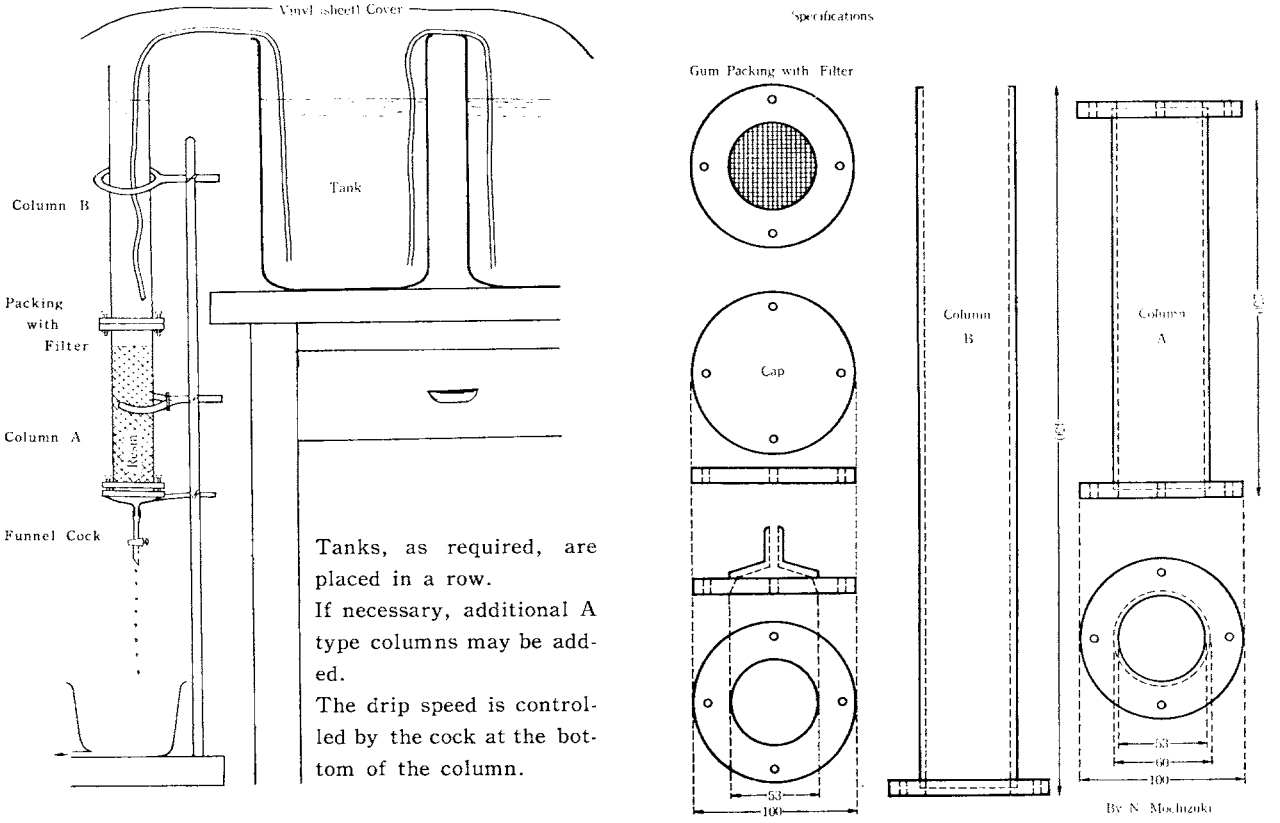


Table 5. ^{90}Sr ($\mu\mu c/l$) in Source Water Prior to Purification - Dec 61 to Mar 62 -

By N. Mochizuki, G. Tanaka, Y. Kurosawa, Y. Suzuki and S. Yoshizawa

(National Institute of Radiological Sciences)

City	Source	1961 Dec	1962 Jan	Feb	Mar
Wakkanai, HOKKAIDO	Masuhoro River	0.19	0.34	0.22	0.55
Obihiro, HOKKAIDO	Satsunai River rb.	0.04	0.04	0.04	0.09
Sapporo, HOKKAIDO	Toyohira River sf.	0.10	0.16	0.10	0.20
Aomori, AOMORI	Yokouchi River sf.	0.09	0.10	0.22	0.21
Sendai, MIYAGI	Okura Rever sf.	0.05	0.12	0.25	0.40
Akita, AKITA	Asahi River sf.	0.07	0.17	0.28	0.42
Mito, IBARAGI	Naka River sf. and rb.	0.01	—	0.06	—
Urawa, SAITAMA	Well	0.01	0.00	0.02	0.00
Ome, TOKYO	Tama River	0.02	0.06	0.06	0.07
Odawara, KANAGAWA	Sakawa River rb.	0.02	0.03	0.02	0.02
Niigata, NIIGATA	Shinano River sf.	0.21	0.36	0.45	0.54
Kanazawa, ISHIKAWA	Sai River sf. and rb.	0.05	0.04	0.04	0.07
Shimizu, SHIZUOKA	Okitsu River sf.	0.01	0.10	0.07	0.06
Nagoya, AICHI	Kiso River sf.	0.12	0.07	0.06	0.06
Kyoto, KYOTO	Lake Biwa sf.	0.50	0.51	0.40	0.47
Osaka, OSAKA	Yodo River sf.	0.40	0.41	0.46	0.47
Kobe, HYOGO	Chikaru River sf.	0.11	0.08	0.08	0.21
Wakayama, WAKAYAMA	Kino River sf. and rb.	—	0.06	—	—
Tottori, TOTTORI	Bitani Storing Reservoir sf.	0.40	0.20	0.33	0.52
Okayama, OKAYAMA	Asahi River rb.	0.06	0.10	0.15	0.20
Hiroshima. HIROSHIMA	Ota River sf. and rb.	0.27	0.14	0.12	0.27
Tosayamada, KOCHI	Monobe River rb.	0.04	0.02	0.04	0.14
Fukuoka, FUKUOKA	Muromi River rb.	0.15	0.36	0.36	0.50
Nagasaki, NAGASAKI	Storing Reservoir sf.	0.15	0.20	0.30	0.40
Kagoshima, KAGOSHIMA	Nanakubo Spring	0.10	0.08	0.03	0.05

Note: sf and rb indicates surface and river bed water respectively

Table 6. ^{90}Sr and ^{137}Cs in Source and Treated Water

By M.Saiki, H. Kamada and E. Shimizu
(National Institute of Radiological Sciences)

Source Water ($\mu\mu c/l$)

City		1962 Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	1963 Jan	Feb	Mar
Asahikawa, HOKKAIDO	^{90}Sr		0.20		0.29		0.21		0.26		0.31		0.32
	^{137}Cs		0.05		0.08		0.09		0.11		0.13		0.13
Obihiro, HOKKAIDO	^{90}Sr		0.30		0.18		0.10		0.06		0.09		0.09
	^{137}Cs		0.17		0.06		0.03		0.03		0.04		0.04
Sapporo, HOKKAIDO	^{90}Sr	0.18		0.41		0.18		0.25		0.30		0.33	
	^{137}Cs	0.02		0.42		0.08		0.16		0.18		0.16	
Aomori, AOMORI	^{90}Sr		0.16		0.16		0.15		0.17		0.30		0.34
	^{137}Cs		0.14		0.16		0.13		0.14		0.23		0.26
Sendai, MIYAGI	^{90}Sr		0.60	0.55		0.27		0.27		0.48		0.40	
	^{137}Cs		0.13	0.31		0.12		0.12		0.19		0.16	
Akita, AKITA	^{90}Sr			0.36	0.32		0.22		0.29		0.46		0.56
	^{137}Cs			0.22	0.07		0.32		0.24		0.25		0.65
Mito, IBARAGI	^{90}Sr		0.31	0.30		0.17		0.10		0.14		0.12	
	^{137}Cs		0.18	0.11		0.06		0.05		0.06		0.06	
Urawa, SAITAMA	^{90}Sr			0.00	0.02		0.05		0.02		0.03		0.02
	^{137}Cs			0.00	0.01		0.03		0.00		0.01		0.00
Tokyo	^{90}Sr	0.21		0.61		0.40		0.21		0.22		0.21	
	^{137}Cs	0.08		0.23		0.07		0.09		0.10		0.16	
Odawara, KANAGAWA	^{90}Sr		0.05		0.07		0.07		0.05		0.06		0.06
	^{137}Cs		0.00		0.03		0.02		0.02		0.02		0.02
Niitsu, NIIGATA	^{90}Sr	0.50		0.65		0.52		0.40		0.49		0.59	
	^{137}Cs	0.12		0.15		0.15		0.17		0.18		0.66	
Kanazawa, ISHIKAWA	^{90}Sr		0.61		0.60		0.84		0.19		0.81		0.69
	^{137}Cs		0.14		0.05		0.05		0.15		0.59		0.31
Shimizu, SHIZUOKA	^{90}Sr		0.10	0.10		0.11		0.08		0.10		0.09	
	^{137}Cs		0.06	0.08		0.09		0.06		0.08		0.07	
Nagoya, AICHI	^{90}Sr	0.22			0.19		0.13		0.12		0.26		0.31
	^{137}Cs	0.11			0.04		0.06		0.11		0.09		0.22
Kyoto, KYOTO	^{90}Sr			0.71		0.48	0.34		0.29		0.44		0.50
	^{137}Cs			0.22		0.11	0.15		0.12		0.10		0.13
Osaka, OSAKA	^{90}Sr	0.68		0.91		0.49		0.24		0.62		0.49	
	^{137}Cs	0.13		0.18		0.25		0.08		0.17		0.13	
Nishinomiya, HYOGO	^{90}Sr		0.22		0.26		0.29		0.20		0.31		0.27
	^{137}Cs		0.09		0.11		0.07		0.05		0.13		0.11
Wakayama, WAKAYAMA	^{90}Sr	0.08		0.15		0.11		0.07		0.12		[0.10	
	^{137}Cs	0.02		0.06		0.05		0.04		0.06		0.06	
Tottori, TOTTORI	^{90}Sr		0.41		0.36		0.30		0.48		0.85		0.81
	^{137}Cs		0.59		0.10		0.11		0.22		0.96		0.86
Okayama, OKAYAMA	^{90}Sr	0.38		0.39		0.24		0.16		0.29		0.32	
	^{137}Cs	0.14		0.06		0.05		0.04		0.08		0.09	
Hiroshima, HIROSHIMA	^{90}Sr		0.29		0.26		0.14		0.17		0.59		0.78
	^{137}Cs		0.11		0.10		0.13		0.13		0.31		0.20
Kochi, KOCHI	^{90}Sr		0.15		0.12		0.13		0.04		0.10		0.12
	^{137}Cs		0.01		0.03		0.02		0.02		0.05		0.05
Fukuoka, FUKUOKA	^{90}Sr	0.30		0.37		0.21		0.23		0.44		0.57	
	^{137}Cs	0.01		0.11		0.12		0.11		0.27		0.63	
Nagasaki, NAGASAKI	^{90}Sr	0.40		0.29		0.24	0.14		0.29		0.67		0.63
	^{137}Cs			0.25		0.24	0.21		0.12		0.90		0.59
Kagoshima, KAGOSHIMA	^{90}Sr	0.05		0.06		0.03		0.03		0.09		0.03	
	^{137}Cs	0.01		0.02		0.00		0.00		0.02		0.01	
* * *													
Yoshida, FUKUI	^{90}Sr		0.10	0.14		0.10		0.10		0.12			0.13
	^{137}Cs		0.05	0.07		0.03		0.03		0.06			0.08

Table 6. ^{90}Sr and ^{137}Cs in Source and Treated Water *(continued)*

Treated Water ($\mu\mu c/l$)

City		1962 Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	1963 Jan	Feb	Mar
Asahikawa, HOKKAIDO	^{90}Sr		0.31		0.27		0.20		0.24		0.30		0.31
	^{137}Cs		0.04		0.04		0.07		0.08		0.09		0.09
Obihiro, HOKKAIDO	^{90}Sr		0.17		0.02		0.05		0.01		0.03		0.04
	^{137}Cs		0.00		0.01		0.03		0.00		0.01		0.02
Sapporo, HOKKAIDO	^{90}Sr	0.08		0.20		0.16		0.20		0.27		0.29	
	^{137}Cs	0.00		0.08		0.06		0.14		0.14		0.14	
Aomori, AOMORI	^{90}Sr		0.17		0.09		0.14		0.15		0.18		0.25
	^{137}Cs		0.01		0.00		0.04		0.04		0.06		0.08
Sendai, MIYAGI	^{90}Sr		0.50	0.58		0.28		0.19		0.38		0.32	
	^{137}Cs		0.07	0.11		0.08		0.10		0.12		0.16	
Akita, AKITA	^{90}Sr			0.25	0.31		0.22		0.23		0.29		0.47
	^{137}Cs			0.03	0.02		0.06		0.03		0.03		0.06
Mito, IBARAGI	^{90}Sr		0.15	0.14		0.16		0.07		0.11		0.09	
	^{137}Cs		0.09	0.07		0.06		0.03		0.04		0.04	
Urawa, SAITAMA	^{90}Sr			0.00	0.02		0.05		0.02		0.03		0.02
	^{137}Cs			0.00	0.01		0.01		0.00		0.00		0.00
Tokyo	^{90}Sr	0.14		0.15		0.35		0.12		0.20		0.16	
	^{137}Cs	0.02		0.08		0.07		0.07		0.06		0.10	
Odawara, KANAGAWA	^{90}Sr		0.05		0.07		0.07		0.05		0.06		0.06
	^{137}Cs		0.00		0.01		0.01		0.00		0.01		0.00
Niitsu, NIIGATA	^{90}Sr	0.50		0.50		0.43		0.40		0.40		0.50	
	^{137}Cs	0.05		0.10		0.09		0.11		0.15		0.63	
Kanazawa, ISHIKAWA	^{90}Sr		0.66		0.55		0.40		0.17		0.47		0.36
	^{137}Cs		0.03		0.05		0.04		0.05		0.06		0.08
Shimizu, SHIZUOKA	^{90}Sr		0.07	0.09		0.07		0.07		0.08		0.07	
	^{137}Cs		0.00	0.01		0.03		0.03		0.03		0.03	
Nagoya, AICHI	^{90}Sr	0.18			0.20		0.10		0.01		0.24		0.37
	^{137}Cs	0.05			0.02		0.05		0.00		0.07		0.17
Kyoto, KYOTO	^{90}Sr			0.68		0.36	0.28		0.28		0.37		0.55
	^{137}Cs			0.02		0.05	0.08		0.08		0.07		0.13
Osaka, OSAKA	^{90}Sr	0.41		0.62		0.42		0.11		0.51		0.41	
	^{137}Cs	0.07		0.12		0.11		0.07		0.10		0.07	
Nishinomiya, HYOGO	^{90}Sr		0.22		0.23		0.26		0.15		0.26		0.22
	^{137}Cs		0.08		0.09		0.03		0.01		0.03		0.02
Wakayama, WAKAYAMA	^{90}Sr	0.08		0.12		0.11		0.06		0.10		0.08	
	^{137}Cs	0.01		0.00		0.03		0.00		0.02		0.01	
Tottori, TOTTORI	^{90}Sr		0.29		0.33		0.27		0.16		0.69		0.32
	^{137}Cs		0.09		0.07		0.03		0.06		0.09		0.10
Okayama, OKAYAMA	^{90}Sr	0.09		0.04		0.14		0.10		0.14		0.14	
	^{137}Cs	0.02		0.01		0.02		0.02		0.02		0.02	
Hiroshima, HIROSHIMA	^{90}Sr		0.22		0.23		0.13		0.13		0.41		0.41
	^{137}Cs		0.07		0.08		0.08		0.07		0.08		0.18
Kochi, KOCHI	^{90}Sr		0.17		0.15		0.13		0.03		0.08		0.12
	^{137}Cs		0.00		0.01		0.00		0.02		0.03		0.05
Fukuoka, FUKUOKA	^{90}Sr	0.40		0.41		0.19		0.20		0.47		0.53	
	^{137}Cs	0.01		0.07		0.05		0.09		0.09		0.08	
Nagasaki, NAGASAKI	^{90}Sr			0.32		0.26	0.12		0.08		0.46		0.25
	^{137}Cs			0.14		0.04	0.10		0.09		0.14		0.15
Kagoshima, KAGOSHIMA	^{90}Sr	0.03		0.03		0.02		0.01		0.07		0.01	
	^{137}Cs	0.03		0.01		0.00		0.00		0.02		0.00	
* * *													
Yoshida, FUKUI	^{90}Sr		0.10	0.11		0.10		0.10		0.11			0.12
	^{137}Cs		0.01	0.03		0.02		0.02		0.03			0.03

Note of Table 6

City	Source	City	Source
Asahikawa	Ishikari River sf.	Kyoto	Biwa Lake sf.
Obihiro	Satsunai River rb.	Osaka	Yodo River sf.
Sapporo	Toyohira River sf.	Kobe	Chikari River sf.
Aomori	Yokouchi River sf.	Wakayama	Kino River sf. and rb.
Sendai	Okura and Aoshita River sf.	Tottori	Bitani Storing Reservoir sf.
Akita	Asahi River sf.	Okayama	Asahi River rb.
Mito	Naka River sf. and rb.	Hiroshima	Ota River sf. and rb.
Urawa	Well	Kochi	Kagami River rb.
Tokyo (Kanamachi)	Edo River sf.	Fukuoka	Muromi River rb.
Odawara	Sakawa River rb.	Nagasaki	Storing Reservoir sf.
Niitsu	Agano River sf.	Kagoshima	Nanakubo Spring
Kanazawa	Sai River sf. and rb.	* * *	
Shimizu	Okitsu River sf.	Yoshida-mura (Village)	Stream sf.
Nagoya	Kiso River sf.		

sf. and rb. indicates surface and river bed water respectively

Table 7. ^{90}Sr and ^{137}Cs ($\mu\mu c/l$) in Source and Treated Water -May to Jul 63-

By M.Saiki, H. Kamada and E. Shimizu
(National Institute of Radiological Sciences)

City	Source	Strontium-90 $\mu\mu c/l$ May	Jun	Jul	Cesium-137 $\mu\mu c/l$ May	Jun	Jul
Niitsu, NIIGATA	Agano River sf.	1.25	1.24	1.06	0.65	0.50	0.37
	Treated Water	1.23	1.06	0.86	0.41	0.34	0.33
Tokyo,	Edo River sf.		0.97	0.34		0.17	0.15
	Treated Water		0.82	0.32		0.16	0.09
Osaka, OSAKA	Yodo River sf.	1.26	1.15	1.32	0.32	0.22	0.32
	Treated Water	1.13	1.13	1.27	0.11	0.16	0.13

sf. indicates surface water

Figure 5. Comparison of ^{90}Sr and ^{137}Cs ($\mu\mu c/l$) in Source and Treated Water -Apr 62 to Mar 63-

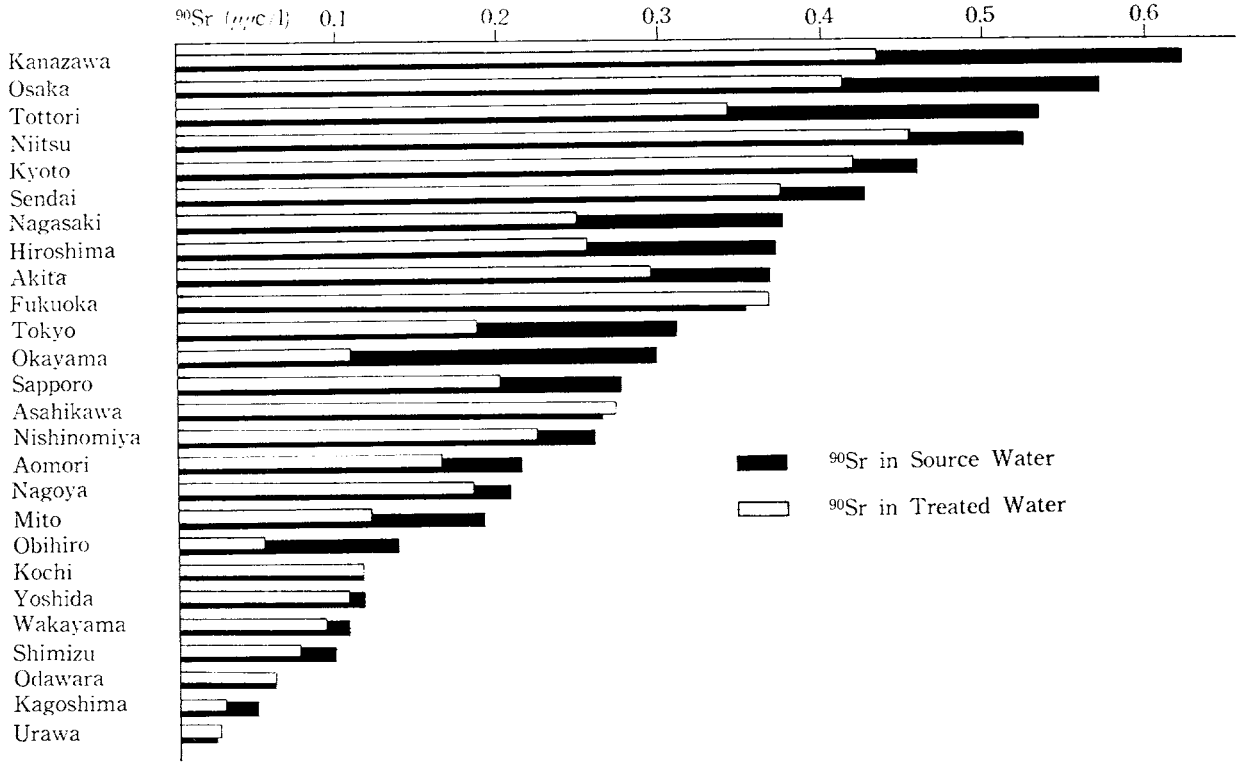
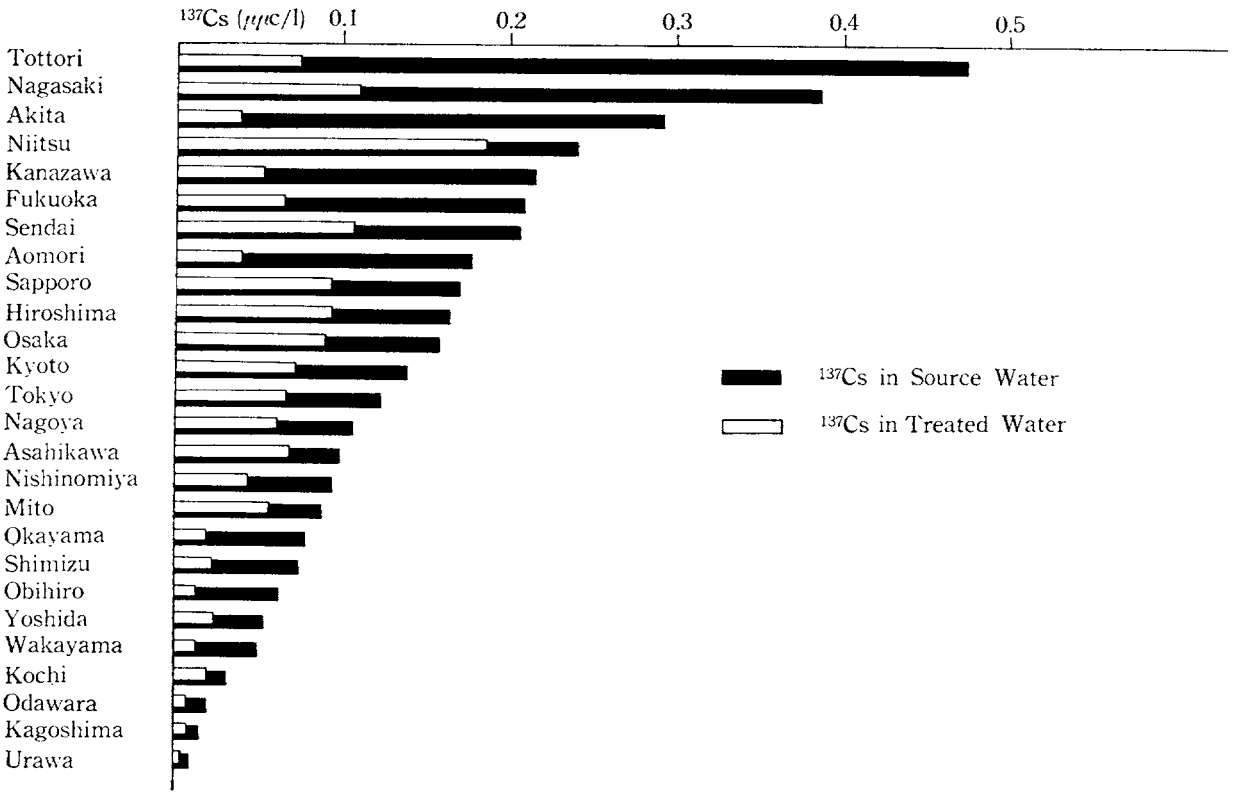


Figure 5. Comparison of ^{90}Sr and ^{137}Cs ($\mu\mu c/l$) in Source and Treated Water Apr 62 to Mar 63 *(continued)*



Strontium-90 in Well Water

(National Institute of Radiological Sciences)

During the period December 1961 to March 1962, the National Institute of Radiological Sciences, in cooperation with 24 prefectural public health laboratories analyzed the strontium-90 content in well water.

The same procedure which was used in the analysis of "City Water", page 7, was applied in this operation.

Results obtained are shown in Table 8.

Table 8. ^{90}Sr ($\mu\mu c/l$) in Well Water -Dec 1961 to Mar 1962-

By N. Mochizuki, G. Tanaka, Y. Kurosawa, Y. Suzuki and S. Yoshizawa

(National Institute of Radiological Sciences)

Location	Depth (m)	Cover	1961 Dec	1962 Jan	Feb	Mar
Wakkanai, HOKKAIDO	6	yes	0.05	0.03		
Obihiro, HOKKAIDO	8		0.00	0.02	0.09	0.09
Sapporo, HOKKAIDO	20		0.04	0.03	0.03	0.01
Aomori, AOMORI	6.7	no	0.13	0.12	0.06	0.09
Sendai, MIYAGI	4.5	yes	0.01	0.01	0.01	0.04
Akita, AKITA	2.7		0.08		0.15	0.20
Ami, IBARAGI	17.4	yes	0.03		0.01	0.07
Omiya, SAITAMA	7.2	yes		0.03	0.00	0.07
Hoya, TOKYO	75.8		0.03	0.01	0.02	0.01
Atsugi, KANAGAWA	11	yes	0.02		0.02	0.00
Yokouchi, NIIGATA	4		0.09	0.02	0.04	0.03
Matsuto, ISHIKAWA	25		0.02	0.01	0.01	0.01
Takefu, FUKUI	9	yes	0.05	0.01		0.01
Shizuoka, SHIZUOKA	40		0.01	0.09		0.05
Sanage, AICHI	18				0.01	0.01
Kyoto, KYOTO	51	yes			0.01	0.03
Sayama, OSAKA	3	no		0.02		
Kobe, HYOGO	7.4	yes	0.12		0.02	
Wakayama, WAKAYAMA		yes		0.05	0.00	
Kurayoshi, TOTTORI	6		0.03	0.03	0.02	0.05
Okayama, OKAYAMA	5	yes	0.02		0.01	0.01
Kabe, HIROSHIMA	4	yes			0.01	0.01
Kochi, KOCHI	2.9	yes	0.05	0.05	0.02	0.00
Fukuoka, FUKUOKA		yes		0.04	0.11	0.28
Nagasaki, NAGASAKI	4	yes	0.03			0.03
Kagoshima, KAGOSHIMA	0.7			0.01		0.09

Dietary Data

Strotium-90 and Cesium-137 in Vegetables

Part 1 *(National Institute of Radiological Sciences)*

Since 1961, the National Institute of Radiological Sciences, in cooperation with the prefectural public health laboratories has analyzed the strontium-90 and cesium-137 content of vegetable samples obtained from the various parts of Japan.

Three kg of the fresh sample was washed with water, then ashed at 450°C by the prefectural public health laboratories. The ashed sample was then sent to the National Institute of Radiological Sciences to analyze the strontium-90 and cesium-137 content. The usual chemical analysis method was used.

Results classified by species are shown in Tables 9 and 10.

Table 9. ^{90}Sr and ^{137}Cs in Vegetables -May 1961 to May 1962-

By R. Ichikawa and M. Etō

(National Institute of Radiological Sciences)

LEAF VEGETABLE

Location	Month Harvested	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
(Spinach)					
HOKKAIDO	May～Jun 61	8	30	30	
MIYAGI	〃	16	22	58	
IBARAGI	〃	21	42	85	
FUKUI	〃	136	123	64	
TOTTORI	〃	9	40	22	
HOKKAIDO (Sapporo)	Oct 61	42	69	74	
IBARAGI	〃	40	91	75	16
FUKUOKA	〃	15	37	99	19
MIYAGI	Jan 62	102	137	138	
〃	〃	97	55	132	
AICHI	〃	75	83	154	
OKAYAMA	〃	47	49	75	
FUKUOKA	〃	90	138	126	
KAGOSHIMA	〃	113	112	145	
MIYAGI	Mar 62	173	254	142	
IBARAGI	〃	53	57	25	
KANAGAWA	〃	44	48	40	
KYOTO	〃	229	228	155	
FUKUOKA	〃	72	160	42	
KAGOSHIMA	〃	117	137	118	
MIYAGI	May 62	102	47		
IBARAGI	〃	51	37		
FUKUI	〃	108	61		
OKAYAMA	〃	43	29		
(Radish leaf)					
OKAYAMA	Oct 61	40	28	34	18
KYOTO	Jan 62	93	51	70	
(Other greens)					
*KYOTO	Oct 61	46	45	48	8.1
* 〃	Mar 62	128	96	67	
**AICHI	〃	123	94	37	

*; Potherb mustard (Kyona) **; *Brassica chinensis* L. *var.* (Komatuna)

HEAD VEGETABLE

Location	Month Harvested	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
(Cabbage)					
TOKYO	May～Jun 61	13	33	20	
AICHI	〃	6	19	17	
KYOTO	〃	11	32	16	
OKAYAMA	〃	18	40	76	
FUKUOKA	〃	17	77	34	
TOKYO	Oct 61	10	49	16	11
AICHI	〃	15	48	18	7.3
OKAYAMA	〃	19	55	25	17
ISHIKAWA	Jan 62	98	210	76	
FUKUI	〃	85	187	82	
ISHIKAWA	Mar 62	61	167	64	
FUKUI	〃	35	121	43	
ISHIKAWA	May 62	184	166		
OSAKA	〃	10	13		
TOTTORI	〃	118	134		
(Chinese cabbage)					
KAGOSHIMA	May～Jun 61	16	49	44	
MIYAGI	Oct 61	10	26	24	10
KANAGAWA	〃	23	77	24	9.2
FUKUI	〃	56	55	46	13
TOTTORI	〃	32	78	29	12

Table 9. ^{90}Sr and ^{137}Cs in Vegetables- -May 61 to May 62-*(continued)*

Location	Month Harvested	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
KAGOSHIMA	〃	63	61	64	15
IBARAGI	Jan 62	10	35	19	
KANAGAWA	〃	11	77	40	
AICHI	〃	36	110	31	
OSAKA	〃	37	56	39	
TOTTORI	〃	96	191	154	
AICHI	May 62	30	53		

ROOT VEGETABLE

Location	Month Harvested	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
(Radish)					
HOKKAIDO (Sapporo)	Oct 61	11	75	23	8.5
MIYAGI	〃	4	79	13	30
KYOTO	〃	26	86	31	4.2
OKAYAMA	〃	8	31	16	7.9
TOTTORI	〃	75	355	24	11
(Sweet potato)					
IBARAGI	Oct 61	6	15	32	12
KANAGAWA	〃	38	138	49	22
FUKUI	〃	18	87	52	37
AICHI	〃	17	37	43	13
KAGOSHIMA	〃	25	62	89	29
(Turnip)					
TOKYO	Oct 61	19	67	28	
(Carrot)					
FUKUOKA	Oct 61	6	27	48	14

Table 10. ^{90}Sr and ^{137}Cs in Vegetables -Feb 62 to Apr 63-

By Y. Kurosawa and S. Yoshizawa
(National Institute of Radiological Sciences)

LEAF VEGETABLE

Location	Month Harvested	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
(Spinach)						
Setagaya, TOKYO	Mar 62	1.47	11	15	102	50
Niiza, SAITAMA	Apr 62	1.37	20	15	64	35
Okayama, OKAYAMA	〃	1.63	43	29	44	15
Furukawa, MIYAGI	May 62	1.40	102	47	285	79
Tsuchiura, IBARAGI	〃	1.27	51	37	110	39
Tsuruga, FUKUI	〃	1.17	108	61	115	33
Tsuchiura, IBARAGI	Jun 62	0.25	40	274	26	27
Ono, FUKUI	〃	0.78	104	183	116	38
Tsuruga, FUKUI	Oct 62	1.14	53	53	39	9
Okayama, OKAYAMA	〃	0.51	15	26	11	5
Kaminaka, FUKUI	Nov 62	1.00	36	69	38	11
Tsuchiura, IBARAGI	Dec 62	1.70	42	120	53	7
Okayama, OKAYAMA	〃	1.85	29	28	11	3
Kokubu, KAGOSHIMA	〃	1.60	43	100	75	12
Furukawa, MIYAGI	Jan 63	1.51	83	224	68	12
Okayama, OKAYAMA	Feb 63	2.04	92	96	12	4
Kokubu, KAGOSHIMA	〃	1.55	156	192	250	56
Iwanuma, MIYAGI	Mar 63	1.09	36	86	88	52
Sanage, AICHI	〃	1.90	35	40	59	17
(Green leaves)						
Tannoji, AKITA	Apr 62	0.76	162	177	74	25
(Turnips leaf)						
Tenno, AKITA	May 62	1.37	49	38	93	29
(Radish leaf)						
Tenno, AKITA	May 62	1.42	72	41	75	22

Table 10. ^{90}Sr and ^{137}Cs in Vegetables Feb 62 to Apr 63- *(continued)*

HEAD VEGETABLE

Location	Month Harvested	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
(Cabbage)						
Yoshiwara, SHIZUOKA	Feb 62	0.97	99	63	94	39
Nagasaki, NAGASAKI	〃	1.06	73	36	64	26
Yoshiwara, SHIZUOKA	Mar 62	0.83	146	147	110	82
Nagasaki, NAGASAKI	〃	1.18	28	13	67	43
Tenno, AKITA	Apr 62	0.43	25	122	24	14
Yoshiwara, SHIZUOKA	〃	0.52	50	132	30	23
Fujieda, SHIZUOKA	〃	0.67	40	94	65	42
Kanazawa, ISHIKAWA	〃	0.70	184	166	273	144
Kokubu, KAGOSHIMA	〃	0.40	17	45	24	19
Nagaoka, NIIGATA	May 62	1.30	50	31	59	19
Kanazawa, ISHIKAWA	〃	0.55	86	227	39	20
Ikeda, OSAKA	〃	0.51	10	13	7	4
Akashi, HYOGO	〃	0.70	13	40	25	13
Yonago, TOTTORI	〃	0.67	188	134	52	27
Ikeda, OSAKA	Jun 62	0.52	17	30	16	7
Okayama, OKAYAMA	〃	1.38	68	86	12	2
Kokubu, KAGOSHIMA	〃	0.45	9	22	25	16
Iwanuma, MIYAGI	Jul 62	0.62	10	26	41	19
Sanage, AICHI	〃	0.68	17	30	103	36
Kyoto, KYOTO	〃	0.55	21	47	99	42
Yonago, TOTTORI	Aug 62	0.63	57	100	103	47
Kanazawa, ISHIKAWA	Sep 62	0.67	42	49	19	9
Yonago, TOTTORI	〃	0.65	48	104	8	3
Ikeda, OSAKA	Oct 62	0.80	14	19	6	3
Kanazawa, ISHIKAWA	Nov 62	0.85	99	73	73	19
Osaka, OSAKA	Dec 62	0.56	8	57	3	3
Kanazawa, ISHIKAWA	Jan 63	0.58	6	16	7	3
Kyoto, KYOTO	〃	0.70	14	31	32	16
Yonago, TOTTORI	〃	0.56	43	205	71	31
Kyoto, KYOTO	Feb 63	0.61	8	16	11	5
Osaka, OSAKA	〃	0.68	14	24	24	12
Kanazawa, ISHIKAWA	Mar 63	0.40	5	20	5	7
Kyoto, KYOTO	〃	0.61	4	17	16	14
Yonago, TOTTORI	Apr 63	0.78	57	158	49	33
(Chinese cabbage)						
Setagaya, TOKYO	Apr 62	1.27	33	26	60	24
〃 〃	〃	1.27	41	33	71	25
〃 〃	May 62	1.20	36	25	33	16
〃 〃	〃	1.07	54	55	58	21
Sanage, AICHI	〃	0.60	30	53	87	48
Aomori, AOMORI	Jul 62	0.79	90	175	28	14
Tsuchiura, IBARAGI	Aug 62	1.41	11	37	75	31
Okayama, OKAYAMA	〃	1.30	22	12	37	8
Iwanuma, MIYAGI	Sep 62	0.68	26	65	16	7
Sanage, AICHI	〃	1.79	75	39	25	4
Tsuchiura, IBARAGI	Oct 62	0.98	52	49	20	5
Aomori, AOMORI	Nov 62	0.81	26	72	62	18
Furukawa, MIYAGI	〃	0.54	26	163	38	24
Yokohama, KANAGAWA	〃	0.55	9	25	25	7
Kaminaka, FUKUI	〃	0.57	41	85	25	11
〃 〃	〃	0.64	21	43	25	11
Sanage, AICHI	〃	0.62	21	65	9	4
Tsuchiura, IBARAGI	Dec 62	0.47	14	64	17	9
Ono, FUKUI	〃	0.49	13	59	18	9
〃 〃	〃	0.53	11	40	22	10
Aomori, AOMORI	Jan 63	0.52	6	16	20	20
〃 〃	〃	0.59	51	64	42	24
Sanage, AICHI	〃	0.68	18	35	14	6
Yokohama, KANAGAWA	〃	0.70	6	13	20	9

Table 10. ^{90}Sr and ^{137}Cs in Vegetables -Feb 62 to Apr 63- *(continued)*

ROOT VEGETABLE

Location	Month Harvested	Ash (%)	Strontium -90 (μμc/kg)	Strontium -90 (μμc/gCa)	Cesium -137 (μμc/kg)	Cesium -137 (μμc/gK)
(Welsh onion)						
Yokohama, KANAGAWA	Mar 62	0.71	31	32	34	14
Kochi, KOCHI	〃	0.61	142	181	37	29
(Radish)						
Ono, FUKUI	Jul 62	0.51	30	72	26	17
Kokubu, KAGOSHIMA	Aug 62	0.58	10	26	29	13
〃	Oct 62	0.67	9	19	26	9
Kaminaka, FUKUI	Nov 62	0.46	12	72	12	5
Ono, FUKUI	Dec 62	0.60	30	72	31	19
〃	〃	0.60	20	53	22	15
(Sweet potato)						
Yokohama, KANAGAWA	Sep 62	0.78	10	22	38	16

FRUITS PLANTS

Location	Month Harvested	Ash (%)	Strontium 90 (μμc/kg)	Strontium 90 (μμc/gCa)	Cesium -137 (μμc/kg)	Cesium -137 (μμc/gK)
(Eggplant fruit)						
Ikeda, OSAKA	Aug 62	0.58	10	29	26	15
Kyoto, KYOTO	〃	0.38	9	64	10	5

Part II *(Japan Analytical Chemistry Research Institute)*

Since November 1961, the Japan Analytical Chemistry Research Institute, on commission by the Science and Technology Agency, has analyzed the strontium-90 and cesium-137 content in vegetables.

The sampling and analytical procedures applied corresponds to those used in Part I.

Results obtained are shown in Table 11.

Table 11. ^{90}Sr and ^{137}Cs in Vegetables -Nov 61 to Oct 63-

By T. Asari, M. Chiba and M. Kuroda

(Japan Analytical Chemistry Research Institute)

LEAF VEGETABLE

Location	Month Harvested	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
(Spinach)						
Niiza, SAITAMA	Nov 61	1.47	19.6	30.2	46.9	13.0
〃 〃	Dec 61	1.78	24.8	26.2	58.8	13.7
Setagaya, TOKYO	〃	1.93	39.4	39.0	107	16.4
Kawasaki, KANAGAWA	〃	1.26	18.9	28.4	44.8	20.5
〃 〃	〃	1.72	27.5	30.8	153	29.2
〃 〃	〃	1.63	18.1	20.7	81.4	18.7
Kochi, KOCHI	〃	1.38	17.8	22.6	68.4	14.1
Nagasaki, NAGASAKI	〃	1.66	24.6	34.4	127	20.0
Niiza, SAITAMA	Jan 62	2.04	74.7	55.4	117	20.4
Kochi, KOCHI	〃	2.00	49	51	63	12
Niiza, SAITAMA	Feb 62	2.30	82	58	60	8
Setagaya, TOKYO	〃	1.70	6.4	6.4	55	15
Kochi, KOCHI	〃	1.63	65	70	62	11
Nagasaki, NAGASAKI	〃	2.20	231	175	164	24
Niiza, SAITAMA	Mar 62	2.11	11	6.0	55	11
Setagaya, TOKYO	〃	1.47	11	15	102	50
Kochi, KOCHI	〃	1.82	14	13	90	18
Niiza, SAITAMA	Apr 62	1.37	20	15	64	35
Asahikawa, HOKKAIDO	May 62	2.52	13	8.1	169	25
Obihiro, HOKKAIDO	〃	1.78	15	20	216	56
Sapporo, HOKKAIDO	〃	1.90	9.1	9.6	115	19
〃 〃	〃	1.67	12	12	94	20
Kabe, HIROSHIMA	〃	1.77	10.1	15	85	19
Fukuyama, HIROSHIMA	〃	1.67	19	16	99	39
Sapporo, HOKKAIDO	Jun 62	1.67	19	24	106	20
〃 〃	〃	1.68	46	83	188	32
Asahikawa, HOKKAIDO	Jul 62	1.43	12	23	76	13
Obihiro, HOKKAIDO	〃	1.65	11.3	20	42	7
Sapporo, HOKKAIDO	〃	2.40	7.0	12	220	32
Asahikawa, HOKKAIDO	Sep 62	1.33	33	40	74	19
Sapporo, HOKKAIDO	〃	1.87	10.2	12	79	14
Shime, FUKUOKA	〃	1.13	45	96	130	29
〃 〃	〃	1.10	24	47	49	13
Sapporo, HOKKAIDO	Oct 62	1.90	9.5	15	69	8
〃 〃	〃	2.22	12	14	75	79
Yoshiwara, SHIZUOKA	〃	1.78	29	28	152	21
Fujieda, SHIZUOKA	〃	1.63	27	31	130	189
Shime, FUKUOKA	〃	1.38	22	23	43	15
〃 〃	〃	1.55	10.2	17	171	26
Asahikawa, HOKKAIDO	Nov 62	1.60	90.1	147	134	24
Obihiro, HOKKAIDO	〃	1.99	66.3	97	83	11
Sapporo, HOKKAIDO	〃	1.98	92.6	79	156	24
Kabe, HIROSHIMA	〃	1.83	22	18	96	15
Fukuyama, HIROSHIMA	〃	1.13	12	21	87	39
Shime, FUKUOKA	〃	1.56	71.9	77	63	15
〃 〃	〃	1.38	84.9	71	71	25
Yoshiwara, SHIZUOKA	Dec 62	2.15	74.3	53.4	105	17
Fujieda, SHIZUOKA	〃	1.72	94.6	100.5	80	17
Wakayama, WAKAYAMA	〃	0.61	24.7	104	50	24
Iwaide, WAKAYAMA	〃	0.60	12.5	51	22	18
Shime, FUKUOKA	〃	1.35	60.4	40.2	91	35
〃 〃	〃	1.27	92.4	77.2	85	31
Wakayama, WAKAYAMA	Jan 63	1.27	8.0	10.7	116	30
Iwaide, WAKAYAMA	〃	0.46	24.3	79.8	48	31
Setagaya, TOKYO	〃	2.60	27.9	27.9	81	10
〃 〃	〃	2.37	26.2	28.9	75	11
Sugito, SAITAMA	Feb 63	2.30	159.3	62.0	148	58
Omiya, SAITAMA	〃	2.21	54.7	55.7	70	28
Setagaya, TOKYO	〃	1.83	60.6	66.9	100	24
〃 〃	〃	1.86	77.1	134.3	102	15

Table 11. ^{90}Sr and ^{137}Cs in Vegetables -Nov 61 to Oct 63- *(continued)*

Location	Month Harvested	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
Setagaya, TOKYO	Mar 63	1.61	54.2	64.5	75	17
〃 〃	〃	2.03	26.0	32.9	93	18
〃 〃	〃	1.40	52.4	72.1	92	43
〃 〃	〃	1.77	19.6	27.4	79	17
Ikeda, OSAKA	May 63	0.66	13.1	45.3	43	16
Kuroyama, OSAKA	〃	0.60	13.2	48.1	25	10
Akabane, AICHI	Oct 63	2.28	107.3	95.8	135	17
Sanage, AICHI	〃	1.54	24.2	33.8	46	9
(Komatsu-na)						
Niiza, SAITAMA	Mar 62	2.00	8	2.5	52	13
〃 〃	Jun 62	1.47	37	26	80	21
〃 〃	Aug 62	1.50	42	17	88	21
〃 〃	Dec 62	1.67	50	21	103	22
Sugito, SAITAMA	Feb 62	1.68	121.4	54.3	50	30
(Lettuce)						
Kabe, HIROSHIMA	May 62	0.98	37	61	62	22
(Tai-na)						
Aomori, AOMORI	May 62	1.28	62	106	102	28
(Rape)						
Sugito, SAITAMA	Jun 63	11.6	112.1	74	209	49
Niiza, SAITAMA	〃	11.4	249.8	197	213	42
(Greens or Chinese rape)						
Tenno, AKITA	Apr 62	0.76	162	177	74	25
(Radish leaf)						
Niiza, SAITAMA	Oct 61	1.30	79.3	40.0	62.0	21.4
〃 〃	Nov 61	1.76	117.0	41.0	57.0	36.3
〃 〃	Dec 61	1.65	52.1	21.4	52.7	17.2
〃 〃	Jan 62	2.42	179	41.6	105	36.6
Tenno, AKITA	May 62	1.42	72	41	75	22
Odawara, KANAGAWA	Jun 63	1.69	398.8	84	426	251
Miura, KANAGAWA	〃	1.65	183.6	64	286	106
Akabane, AICHI	〃	1.06	358.0	258	422	170
Sanage, AICHI	〃	1.31	34.8	93	123	22
Ei, KAGOSHIMA	Jul 63	1.47	256.5	72	383	213
Kokubu, KAGOSHIMA	〃	1.26	282.6	106	182	121
Akabane, AICHI	Aug 63	2.78	340.3	65.8	343	83
Sanage, AICHI	〃	1.56	183.1	73.7	95	23
(Turnip leaf)						
Tenno, AKITA	May 62	1.37	49	38	93	29
(Sweet potato leaf)						
Niiza, SAITAMA	Oct 61	1.11	44.9	35.0	47.4	29.3
〃 〃	Nov 61	1.19	80.0	62.6	49.6	13.8
[FLOWER VEGETABLE]						
(Cauliflower)						
Niiza, SAITAMA	Dec 61	1.26	66.8	36.4	52.2	16.7

HEAD VEGETABLE

Location	Month Harvested	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
(Cabbage)						
Akita AKITA	Dec 61	0.83	101	143	68.4	24.8
Seiro, NIIGATA	〃	0.58	50.2	114	89.1	29.9
Yoshiwara, SHIZUOKA	〃	0.97	176	107	100	45.3
Akashi, HYOGO	〃	0.87	14.5	13.8	38.0	13.9
Kabe, HIROSHIMA	〃	0.67	10.2	18.2	24.3	10.0

Table 11. ^{90}Sr and ^{137}Cs in Vegetables -Nov 61 to Oct 63- *(continued)*

Location	Month Harvested	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
Akita, AKITA	Jan 62	0.92	216	368	94.1	30.0
Seiro, NIIGATA	〃	0.52	61	143	64.0	39.0
Yoshiwara, SHIZUOKA	〃	0.93	320	231	102	46
Akashi, HYOGO	〃	0.70	10.5	21.1	20.7	7.9
Kabe, HIROSHIMA	〃	0.70	15.3	29.4	50.1	20.5
Akita, AKITA	Feb 62	1.00	160	487	43	18
Seiro, NIIGATA	〃	0.58	64	178	61	37
Yoshiwara, SHIZUOKA	〃	0.97	99	63	94	39
Akashi, HYOGO	〃	0.67	8	18	26	11
Kabe, HIROSHIMA	〃	0.68	13	23	24	10
Nagasaki, NAGASAKI	〃	1.06	73	36	64	26
Akita, AKITA	Mar 62	0.80	240	444	94	43
Yoshiwara, SHIZUOKA	〃	0.83	146	147	110	82
Akashi, HYOGO	〃	0.70	10	23	30	12
Nagasaki, NAGASAKI	〃	1.18	28	13	67	43
Sapporo, HOKKAIDO	Apr 62	0.53	23	59	33	23
〃 〃	〃	0.60	16	44	54	34
Akita, AKITA	〃	0.43	25	122	24	14
Yoshiwara, SHIZUOKA	〃	0.52	50	132	30	23
Fujieda, SHIZUOKA	〃	0.67	40	94	65	42
Nagaoka, NIIGATA	May 62	1.30	50	31	59	19
Akashi, HYOGO	〃	0.70	13	40	25	13
Fukuyama, HIROSHIMA	〃	0.48	16	54	30	23
Nagasaki, NAGASAKI	〃	1.30	26	13	55	18
Tenno, AKITA	Jun 62	1.46	106	379	33	27
Setagaya, TOKYO	〃	0.52	84	138	20	12
Nagaoka, NIIGATA	〃	1.25	91	48	39	13
Sapporo, HOKKAIDO	Jul 62	0.67	33	55	31	11
Tenno, AKITA	〃	0.33	107	536	36	34
Setagaya, TOKYO	〃	0.56	56	154	13	7
Setagaya, TOKYO	〃	0.63	23	42	22	12
Akashi, HYOGO	〃	0.68	52	99	43	28
Sapporo, HOKKAIDO	Aug 62	0.60	16	40	47	26
〃 〃	〃	0.77	17	23	23	12
Tenno, AKITA	〃	0.73	111	210	26	24
Kabe, HIROSHIMA	〃	0.67	55	93	35	21
Sapporo, HOKKAIDO	Sep 62	0.65	16	35	26	11
〃 〃	〃	0.80	11	21	52	17
Tenno, AKITA	〃	0.51	61	154	38	22
Nagaoka, NIIGATA	〃	0.72	79	114	28	12
Akashi, HYOGO	〃	0.63	19	36	22	10
Kabe, HIROSHIMA	〃	0.55	27	52	20	11
Tenno, AKITA	Oct 62	0.55	136	368	59	31
Nagasaki NAGASAKI	〃	0.43	29	73	39	32
Tenno, AKITA	Nov 62	0.50	81	198	40	23
Nagaoka, NIIGATA	〃	0.49	123	394	38	22
Akashi, HYOGO	〃	0.61	9.4	23	16	75
Kabe, HIROSHIMA	〃	0.58	40	77	56	28
Fukuyama, HIROSHIMA	〃	0.57	36	85	32	19
Nagasaki, NAGASAKI	〃	0.52	109	289	49	27
Sapporo, HOKKAIDO	Dec 62	0.57	24.5	76	56	29
〃 〃	〃	0.66	24.1	46	47	23
Tenno, AKITA	〃	0.56	36.1	128	55	27
〃 〃	〃	0.66	26.7	110.7	56	20
Wakayama, WAKAYAMA	〃	0.80	14.0	25	29	14
Iwaide, WAKAYAMA	〃	0.58	23.1	54	33	24
Nagasaki, NAGASAKI	〃	0.54	7.2	23	10	66
Obihiro, HOKKAIDO	Jan 63	0.55	7.0	14.2	90	54
Asahikawa, HOKKAIDO	〃	0.54	21.6	190.9	55	41
Sapporo, HOKKAIDO	〃	0.42	14.3	69.1	50	44
〃 〃	〃	0.72	18.0	37.5	39	14
Tenno, AKITA	〃	0.51	29.7	74.4	63	34
Akashi, HYOGO	〃	0.68	6.4	19.5	32	12
Wakayama, WAKAYAMA	〃	0.79	38.0	139.9	32	15
Iwaide, WAKAYAMA	〃	0.44	7.4	32.8	26	23

Table 11. ^{90}Sr and ^{137}Cs in Vegetables -Nov 61 to Oct 63- *(continued)*

Location	Month Harvested	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
Kabe, HIROSHIMA	〃	0.64	7.8	13.8	26	12
Sapporo, HOKKAIDO	Feb 63	0.56	12.2	53.0	36	18
〃 〃	〃	0.45	11.0	37.2	29	55
Sugito, SAITAMA	〃	0.68	12.5	27.5	41	52
Iwatsuki, SAITAMA	〃	0.58	7.0	19.2	27	42
Nagaoka, NIIGATA	〃	0.38	9.8	41.1	36	29
Yoshiwara, SHIZUOKA	〃	0.95	14.6	19.8	67	20
Fujieda, SHIZUOKA	〃	0.71	16.3	38.3	104	33
Akashi, HYOGO	〃	0.81	5.3	13.0	24	28
Kabe, HIROSHIMA	〃	0.56	5.8	12.3	13	7
Nagasaki, NAGASAKI	〃	0.72	5.1	13.9	39	48
Asahikawa, HOKKAIDO	Mar 63	0.63	14.1	17.5	53	23
Obihiro, HOKKAIDO	〃	0.58	5.0	11.3	33	16
Sapporo, HOKKAIDO	〃	0.46	9.4	33.5	45	25
〃 〃	〃	0.57	8.4	22.8	39	22
Nagaoka, NIIGATA	〃	0.74	27.1	63.0	66	22
Odawara, KANAGAWA	May 63	0.54	20.0	34	28	19
Miura, KANAGAWA	〃	0.52	6.0	9.2	32	27
Osaka, OSAKA	〃	0.60	13.2	48.1	25	10
〃 〃	〃	0.66	13.1	45.3	43	16
Sugito, SAITAMA	Jun 63	0.58	13.3	33	65	22
Niiza, SAITAMA	〃	0.57	16.1	36	38	14
Akabane, AICHI	〃	1.07	151.1	105	113	41
Sanage, AICHI	〃	0.62	33.1	72	69	30
Obihiro, HOKKAIDO	Aug 63	0.49	5.4	26.9	38	22
Sapporo, HOKKAIDO	Sep 63	0.55	24.5	80.2	27	13
(Chinese cabbage)						
Aomori, AOMORI	Dec 61	0.75	10.7	23.0	51.3	24.2
Niiza, SAITAMA	〃	0.56	14.1	25.8	26.6	17.5
Wakayama, WAKAYAMA	〃	1.09	23.1	30.3	64.5	33.5
Aomori, AOMORI	Jan 62	0.60	14	45	21	13
Niiza, SAITAMA	〃	0.44	11.2	29.1	20.8	17.1
〃 〃	Feb 62	0.52	11	32	11	8
Aomori, AOMORI	Mar 62	0.48	25	95	26	19
Seiro, NIIGATA	〃	0.50	73	240	34	24
Wakayama, WAKAYAMA	〃	0.58	23	48	26	17
Kabe, HIROSHIMA	〃	0.57	14	30	20	12
Setagaya, TOKYO	Apr 62	1.27	33	26	60	24
〃 〃	〃	1.27	41	33	71	25
〃 〃	May 62	1.20	36	25	33	16
〃 〃	〃	1.07	54	55	58	21
Tenno, AKITA	Jun 62	0.34	155	726	29	33
Nagasaki, NAGASAKI	〃	1.20	59	39	133	49
〃 〃	Aug 62	1.10	16	157	87	18
Niiza, SAITAMA	Oct 62	1.68	36	13.3	16	10
Tenno, AKITA	Nov 62	0.38	111	237	90	61
〃 〃	Dec 62	0.33	35.5	208	23	18
〃 〃	〃	0.34	61.8	202.7	35	27
Wakayama, WAKAYAMA	〃	0.52	15.6	45	36	24
Iwaide, WAKAYAMA	〃	0.60	20.3	56	30	17
Tenno, AKITA	Jan 63	0.33	34.2	170.1	42	33
Wakayama, WAKAYAMA	〃	0.74	28.1	46.0	147	65
Iwaide, WAKAYAMA	〃	0.75	48.1	100.5	97	41
Tenno, AKITA	Feb 63	0.33	32.2	16.5	34	27
Niiza, SAITAMA	〃	0.49	7.2	21.7	41	22
Tokorozawa, SAITAMA	〃	0.47	4.1	15.8	28	55
Obihiro, HOKKAIDO	Aug 63	0.48	13.0	32.1	47	28
Sapporo, HOKKAIDO	Sep 63	0.61	34.1	94.3	53	28
Obihiro, HOKKAIDO	Oct 63	0.70	11.7	28.1	64	35
Sanage, AICHI	〃	0.80	130.9	196.2	40	20
Akabane, AICHI	〃	1.71	139.0	106.0	67	14

Table 11. ^{90}Sr and ^{137}Cs in Vegetables–Nov 61 to Oct 63– *(continued)*

ROOT VEGETABLE

Location	Month Harvested	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
(Radish)						
Niiza, SAITAMA	Oct 61	0.46	6.5	28.8	22.6	14.2
〃 〃	Nov 61	0.49	7.8	23.9	16.1	11.8
Kawasaki, KANAGAWA	Jan 62	0.29	2.6	4.2	8	12
Niiza, SAITAMA	Feb 62	0.44	7	23	9	6
Kabe, HIROSHIMA	May 62	0.73	29	139	54	28
Fukuyama, HIROSHIMA	〃	0.75	17	77	27	27
Fujieda, SHIZUOKA	Jun 62	0.64	171	719	52	27
Yoshiwara, SHIZUOKA	〃	0.64	52	210	43	22
Shime, FUKUOKA	〃	0.81	33	135	157	59
〃 〃	〃	0.71	25	162	22	11
Tenno, AKITA	Jul 62	0.79	64	245	57	20
Shime, FUKUOKA	〃	0.59	45	123	42	28
〃 〃	〃	0.73	32	84	28	11
Tenno, AKITA	Aug 62	0.72	76	235	25	14
Fujieda, SHIZUOKA	〃	0.58	210	421	99	49
Yoshiwara, SHIZUOKA	〃	0.84	38	98	50	14
Shime, FUKUOKA	〃	0.84	25	34	29	11
〃 〃	〃	0.92	134	223	30	9
Tenno, AKITA	Sep 62	1.30	104	116	71	18
〃 〃	Oct 62	0.57	153	535	54	26
Kabe, HIROSHIMA	Nov 62	0.66	42	102	44	18
Shime, FUKUOKA	Jan 63	0.56	28.2	67.1	42	21
〃 〃	〃	0.59	22.1	71.4	37	14
〃 〃	Feb 63	0.52	28.3	60.6	33	26
〃 〃	〃	0.52	19.2	65.1	41	23
〃 〃	Mar 63	0.54	53.4	82.3	27	21
〃 〃	〃	0.52	64.6	110.6	66	61
Sugito, SAITAMA	Jun 63	0.81	21.1	79	70	20
Niiza SAITAMA	〃	0.64	32.5	114	54	19
Odawara, KANAGAWA	〃	0.88	11.5	26	74	42
Miura, KANAGAWA	〃	1.05	12.8	35	71	27
Akabane, AICHI	〃	0.86	44.8	152	88	26
Sanage, AICHI	〃	0.80	142.0	188	226	105
Nagaoka, NIIGATA	〃	0.77	47.7	172	98	51
Seiro, NIIGATA	〃	0.66	58.4	310	49	27
Fukuyama, HIROSHIMA	〃	0.93	38	138	71	23
Kabe, HIROSHIMA	〃	1.03	34	116	91	19
Akita, AKITA	Jul 63	0.68	50.8	228	63	31
Tenno, AKITA	〃	0.50	129.7	625	44	31
Kokubu, KAGOSHIMA	〃	0.62	61.6	108	59	29
Ei, KAGOSHIMA	〃	0.83	76.6	102	139	69
Obihiro, HOKKAIDO	Aug 63	0.68	15.4	42.8	32	12
Sanage, AICHI	〃	1.23	34.3	68.9	71	15
Akabane, AICHI	〃	0.93	55.9	102.1	37	11
Sapporo, HOKKAIDO	Sep 63	0.86	26.6	64.6	62	28
Obihiro, HOKKAIDO	Oct 63	0.60	5.6	17.8	30	20
(Turnip)						
Setagaya, TOKYO	Oct 62	0.78	18.8	74	39	14
〃 〃	〃	0.60	23.3	203	24	11
Fukuyama, HIROSHIMA	Nov 62	0.98	35	119	55	23
(Welsh onion)						
Kochi, KOCHI	May 62	0.61	142	181	37	29
〃 〃	Jul 62	0.62	147	375	24	13
〃 〃	Sep 62	0.39	169	359	24	23
〃 〃	Nov 62	0.74	100	83	107	54
〃 〃	Jan 63	0.52	48.5	83.2	21	15
〃 〃	May 63	0.91	29.1	26.2	155	49
(Potato)						
Sapporo, HOKKAIDO	Apr 62	0.98	3.1	58	48	12
(Sweet potato)						
Niiza, SAITAMA	Nov 61	0.54	8.4	28.0	22.5	11.9
Kawasaki, KANAGAWA	Jan 62	0.73	2.6	8	32	17

Strotium-90 and Cesium-137 in Soybean and its Products

(National Institute of Radiological Sciences)

The soybean and its products have been widely used in the Japanese diet. During the period 1961 to 1963, the strontium-90 and cesium-137 content in the soybean and its products were analyzed at the National Institute of Radiological Sciences.

Results obtained are shown in Tables 12 and 13.

Table 12. ^{90}Sr and ^{137}Cs in Soybean

By R. Ichikawa, M. Abe, N. Takada and M. Etō
(National Institute of Radiological Sciences)

Harvested Time and Area			Strontium-90		Cesium-137		Sr/Ca
			μμc/kg	μμc/gCa	μμc/kg	μμc/gK	$\times 10^{-3}$
Autumn	1960	Chiba	46	17	77	-	-
Autumn	1961	Sapporo	132	51	100	61	3.6
		Chiba	51	18	60	-	-
		Niigata	494	297	793	473	1.6
		Gifu	117	56	46	-	-
		Shimane	73	37	247	-	-
Autumn	1962	Sapporo	118	70	583	324	1.4
		Kucchan	388	168	505	275	2.9
		Chiba	109	41	745	444	2.1
		Tottori	289	162	945	649	2.2
		Okayama	82	48	75	46	1.7

Table 13. ^{90}Sr and ^{137}Cs in Soybean Products

By R. Ichikawa, M. Abe, N. Takada and M. Etō

(National Institute of Radiological Sciences)

Description		Strontium-90 ($\mu\mu$c/kg)	Strontium-90 ($\mu\mu$c/gCa)	Cesium-137 ($\mu\mu$c/kg)	Cesium-137 ($\mu\mu$c/gK)	Sr/Ca $\times 10^{-3}$
Bean Paste (Miso)						
Feb 62	Sendai Miso	45	16	34	-	-
〃	Echigo Miso	35	42	54	-	-
〃	Ishikawa Miso	33	37	54	-	-
〃	Shinshu Miso	30	22	43	-	-
〃	Nagoya Miso	76	55	75	-	-
Mar 63	Sendai Miso	32	22	81	21	1.8
〃	Chiba Miso	49	75	82	21	4.6
〃	Echigo Miso	38	79	140	34	4.8
〃	Shinshu Miso	38	30	132	34	1.9
〃	Nagoya Miso	37	27	137	14	4.0
Bean-curd (Tofu)						
Feb 62	Saitama	7.2	6.7	3.6	-	-
〃	Chiba	7.0	6.3	4.6	-	-
〃	Tokyo	12	9.4	5.6	-	-
Apr 63	Saitama	19	7.2	28	20	0.49
〃	Funabashi	5.9	5.1	28	20	0.61
〃	Tokyo	7.5	4.8	26	33	0.20
May 63	Chiba	7.7	7.4	21	34	0.92
Bean-juice (Tonyu)						
Sep 62	Chiba	27	185	86	44	1.8
Apr 63	Saitama	3.2	32	10	13	0.86
〃	Funabashi	4.1	26	33	21	0.93
〃	Tokyo	4.5	20	31	20	0.66
May 63	Chiba	6.6	35	15	10	1.4
Bean-curd Refuse (Okara)						
Sep 62	Chiba	53	136	73	49	4.7
Apr 63	Saitama	17	11	18	11	1.8
〃	Funabashi	25	33	33	21	3.6
〃	Tokyo	15	21	22	18	2.4
May 63	Chiba	33	98	12	14	6.7
Fermented-bean (Natto)						
Feb 62	Saitama	53	61	44	-	-
〃	Chiba	47	40	49	-	-
〃	Tokyo	25	30	24	-	-

Strontium-90 and Cesium-137 in Fruit

(Japan Analytical Chemistry Research Institute)

Since July 1962, the Japan Analytical Chemistry Research Institute has analyzed the strontium -90 and cesium-137 content of fruits.

Fruit samples were purchased on the open market in Tokyo. Three kg of the edible portions of the fresh fruit sample was washed with water, then ashed under 450°C. For the analysis of strontium-90 and cesium-137 content, the method recommended by the Science and Technology Agency was used.

Results obtained are shown in Table 14.

Figure 6. Producting Districts
- Fruits -

Table 14. ^{90}Sr and ^{137}Cs in Fruits and Fruit-type Vegetables - 1962 to 1963 -

By T. Asari, M. Chiba and M. Kuroda

(Japan Analytical Chemistry Research Institute)

Variety	District grown	Date of purchase	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
Tomato	CHIBA	Jul 62	0.56	8	79	37	28
Peach	YAMANASHI	〃	0.56	17	345	25	20
Damson Plum	〃	〃	0.52	10	432	40	36
Cucumber	TOKYO	Aug 62	0.56	27	106	38	40
〃	〃	〃	0.47	22	132	17	14
〃	〃	Sep 62	0.40	10.8	71	8	4.5
〃	〃	〃	0.31	11.6	84	11	9
Grape	YAMANASHI	〃	1.24	3.9	14	67	19
〃	〃	〃	0.80	7.9	38	45	21
Avacado	CHIBA	〃	0.47	43	674	36	24
〃	YAMANASHI	〃	0.47	15	307	35	28
New Melon	SAITAMA	〃	0.38	29	762	24	14
Apple	AOMORI	〃	0.39	7.6	181	26	27
〃	NAGANO	〃	0.41	49	263	40	26
〃	AOMORI	Feb 63	0.47	2.7	106.4	35	25
〃	AKITA	〃	0.32	3.9	56.4	88	49
〃	YAMAGATA	〃	0.40	7.0	121.8	79	53
Mandarin Orange	SHIZUOKA	〃	0.39	6·4	34.3	63	48
〃	WAKAYAMA	〃	0.48	12.2	36.1	40	24
〃	HIROSHIMA	〃	0.42	6.3	23.9	33	34
〃	YAMAGUCHI	〃	0.43	10.5	61.1	30	19
〃	SAGA	〃	0.41	12.9	59.4	34	38
〃	KUMAMOTO	〃	0.43	8.3	33.9	60	37
〃	OITA	〃	0.49	17.4	66.0	84.3	54
Summer Orange	EHIME	〃	0.58	17.5	60.6	38	21
Dried Persimmon	FUKUSHIMA	〃	1.73	11.2	69.4	365	76
〃	TOYAMA	〃	1.64	5.1	19.4	257	54
〃	YAMANASHI	〃	1.62	18.6	71.8	514	67
〃	NAGANO	〃	1.89	10.3	30.0	132	15
Banana	(TAIWAN)	Feb 63	0.87	2.2	31.1	20	13
〃	〃	〃	0.86	2.3	36.3	25	6

Strontium-90 and Cesium-137 in Meat and Eggs

(Japan Analytical Chemistry Research Institute)

The Japan Analytical Chemishry Research Institute has analyzed the strontium-90 and cesium-137 content in meat and eggs since April 1962.

The samples were purchased on the open market in Tokyo. For the analysis of strontium-90 and cesium-137 content, the method recommended by the Science and Technology Agency was used. The inedible portions were removed in advance.

Results obtained are shown in Tables 15 and 16.

Figure 7. Producting Districts
—Meat and Eggs—

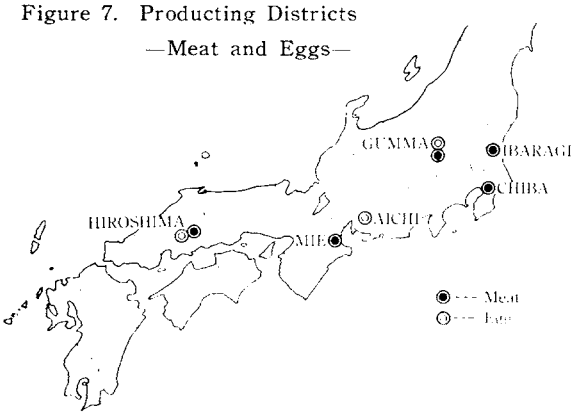


Table 15. ^{90}Sr and ^{137}Cs in Meat —Apr 62 to Feb 63—

By T. Asari, M. Chiba and M. Kuroda
(Japan Analytical Chemistry Research Institute)

Producing District	Variety	Date of Purchase	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
MIE (Matsuzaka)	Cattle	Apr 62	1.15	0.96	6.7	94	107
〃 〃	〃	Jul 62	0.90	3.1	11.3	335	126
GUMMA	〃	Feb 63	0.73	1.8	34.3	67	40
HIROSHIMA	〃	〃	0.70	1.6	23.9	176	179
IBARAGI	Pig	〃	0.76	0.19	3.3	48	22
CHIBA	〃	〃	0.70	0.4	3.0	91	45
ANTARCTIC OCEAN	Whale	Feb 63	1.00	0.7	13.3	27	10

Table 16. ^{90}Sr and ^{137}Cs in Eggs —Apr 62 to Feb 63—

By T. Asari, M. Chiba and M. Kuroda
(Japan Analytical Chemistry Research Institute)

Producing District	Date of Purchase	Ash (%)	Strontium-90 (μμc/kg)	Strontium-90 (μμc/gCa)	Cesium-137 (μμc/kg)	Cesium-137 (μμc/gK)
GUMMA	Apr 62	0.903	2.8	4.9	52	57
AICHI	Jul 62	1.14	1.6	3.8	39	32
〃	Feb 63	1.15	1.1	2·0	11	9
HIROSHIMA	〃	0.94	2.2	4.0	26	34

Strontium-90 and Cesium-137 in Milk Powder

(National Institute of Hygienic Sciences)

At the National Institute of Hygienic Sciences, whole milk powder collected from 7 plants of dairy products located in various parts of Japan was analyzed for strontium-90 and cesium-137 content.

For analysis of strontium-90, the method recommended by the Science and Technology Agency was used. Cesium was separated by cation exchange resin, ammonium phosphomolybdate and di-picrylamine.

Results obtained are shown in Table 17.

Table 17. ^{90}Sr and ^{137}Cs in Milk Powder -Apr 62 to Mar 63-

By. K. Nagasawa, G. Urakubo and K. Kametani

(National Institute of Hygienic Sciences)

District Produced	Date Produced	^{90}Sr ($\mu\mu$c/kg)	^{137}Cs ($\mu\mu$c/kg)
Engaru	4 Aug 62	122	110
Fukushima	7 Sep 62	79	493
Matsumoto	11 Apr 62	35	146
Tokyo	17 Apr 62	41	164
〃	21 May 62	56	454
〃	9 Sep 62	51	390
〃	14 Oct 62	80	553
〃	Nov 62	61	460
〃	22 Dec 62	72	450
〃	21 Jan 63	64	460
〃	21 Feb 63	90	453
Hiratsuka	5 Jul 62	51	433
〃	23 Feb 63	54	306
〃	Mar 63	52	380
Tokushima	15 Apr 62	40	128
〃	16 May 62	49	214
〃	3 Jul 62	65	356
〃	12 Oct 62	77	450
〃	12 Jan 63	43	245
Kagoshima	16 May 62	142	782
〃	9 Dec 62	79	510

Strontium-90 and Cesium-137 in Tea

Part I *(National Institute of Hygienic Sciences)*

Green and black tea samples harvested and processed in 1962 were analyzed for strontium-90 and cesium-137 content at the National Institute of Hygienic Sciences.

A 30 g dry sample was ashed at 550°C. After the strontium fraction was separated from the cesium fraction by cation exchange resin, the method recommended by the Science and Technology Agency was used for analysis of strontium -90 and cesium-137.

On the other hand, "extracted-tea" samples were prepared as follows. One and half *l* of boiling water was poured over a 30 g of "processed-tea" and boiled for 1 minute. After 10 minutes, 1 *l* of the "extracted-tea" sample was taken. After being evaporated and ashed, the sample was analyzed for strontium-90 and cesium-137 content by the above-mentioned method.

Strontium-90 and cesium-137 content in "processed tea" and "fresh tea-leaf" are shown in Table 18. The values of tea-leaf are reported $\mu\mu$c per 1 kg of dry tea-leaf. Table 19 shows the resultes of "extracted-tea" $\mu\mu$c per 1kg of "processed-tea". The ratio of "processed-tea" and "extracted-tea" is shown in this Table.

Table 18. ^{90}Sr and ^{137}Cs in Tea -1962-

By K. Nagasawa, G. Urakubo and K. Kametani

(National Institute of Hygienic Sciences)

Sample (area)	Strontium-90 $\mu\mu$c/kg (62) Apr	May	Jun	Jul	Aug	Cesium-137 $\mu\mu$c/kg (62) Apr	May	Jun	Jul	Aug
(Shizuoka)										
Green tea-leaf (dry)	-	1500	-	1650	1090	-	2360	-	3930	2190
Black tea-leaf (dry)	-	980	-	1490	730	-	2350	-	3760	2200
Green tea product	-	760	-	1480	850	-	1010	-	2040	1420
Black tea product	-	1060	-	1200	970	-	1330	-	2720	1870
(Makurazaki)										
Black tea leaf (dry)	1150	-	1190	-	750	3000	-	3420	-	2540
Black tea product	1160	-	1200	-	790	2880	-	3190	-	2820
(Kagoshima)										
Green tea-leaf (dry)	-	-	-	610	1170	-	-	-	2260	3230
Green tea-leaf (dry)	-	-	-	540	1210	-	-	-	2530	3000
Green tea product	-	-	-	1330	1110	-	-	-	3280	2510

Table 19. ^{90}Sr and ^{137}Cs in Extracted-Tea -1962-

By K. Nagasawa, G. Urakubo and K. Kametani

(National Institute of Hygienic Sciences)

Sample	Date	^{90}Sr ($\mu\mu$c/kg)	Effluence (%)	^{137}Cs ($\mu\mu$c/kg)	Effluence (%)
Shizuoka Green Tea	Jul 62	112	7.6	1470	71
Shizuoka Black Tea	〃	117	9.7	2645	97
Makurazaki Black Tea	Jun 62	101	8.4	3036	95
Kagoshima Green Tea	Aug 62	198	17.8	2080	83

Part II *(Japan Analytical Chemistry Research Institute)*

Since 1963, the Japan Analytical Chemistry Research Institute, on commission by the Science and Technology Agency, has also analyzed, the strontium-90 and cesium-137 content in processed-tea.

Tea samples were sent by the prefectural public health laboratories of Saitama, Shizuoka and Kyoto. Samples were ashed between 400 to 500°C, and analyzed by the method recommended by the Science and Technology Agency.

Results obtained during 1963 are shown in Table 20.

Figure 8. Production Location of Sample. -Tea Part I and II

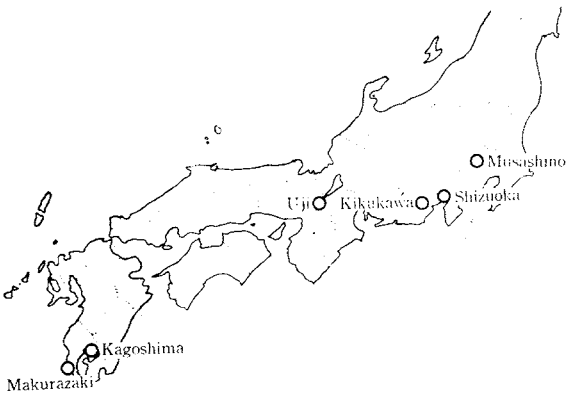


Table 20. ^{90}Sr and ^{137}Cs in Processed Tea -1963-

By T. Asari, M. Chiba and M. Kuroda
(Japan Analytical Chemistry Research Institute)

Area Harvested	Pick	Date	Ash (%)	^{90}Sr $\mu\mu c/kg$	^{90}Sr $\mu\mu c/gCa$	^{137}Cs $\mu\mu c/kg$	^{137}Cs $\mu\mu c/gK$
Musashino, SAITAMA	1 st	Jun 63	5.00	1860	480	3217	181
〃	2nd	Jul 63	5.32	2125	498	3789	205
Uji, KYOTO	1 st	Jun 63	5.15	1399	502	2831	147
〃	2nd	Jul 63	5.15	1173	283	2501	147
Kikukawa, SHIZUOKA	1 st	May 63	4.42	4106	2155	5809	338
〃	2nd	Jun 63	4.84	3513	1322	6611	376

Contributor

The analytical results quoted in this issue was contributed from the following institutes.

Institute, and Address	Item
National Institute of Radiological Sciences 250, Kurosuna-cho, Chiba-shi Japan	City water, Well water, Vegetables, Soybean,
National Institute of Hygienic Sciences 203, Tamagawayoga-machi-2-chome, Setagaya-ku, Tokyo, Japan	Milk powder, Tea
Japan Analytical Chemistry Research Institute 17, Kikukawa-cho-2-chome, Sumida-ku, Tokyo, Japan	Fallout, Vegetables, Fruits, Meat and Eggs, Tea