NIRS-RSD-32

# RADIOACTIVITY SURVEY DATA in Japan

NUMBER 32
AUG. 1971

National Institute of Radiological Sciences
Chiba, Japan

# Radioactivity Survey Data in Japan

## Number 32

**Aug. 1971**

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**Contents**



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**National Institute of Radiological Sciences, Chiba Japan**
**Science and Technology Agency, Japan**

# Meteorological Data

## Strontium-90 and Cesium-137 in Air-borne Dust

*(Japan Analytical Chemistry Research Institute)*

Since April 1969, Japan Analytical Chemistry Research Institute Started the analyses of strontium-90, cesium-137 and cerium-144 content in air-borne dust.

Samples are collected by 10 prefectural public health laboratories, using a Cottrell type dust collector (1,200 liters per hour).

Figure 1 shows the sampling locations. Results obtained during the period from April 1970 to March 1971, are shown in Table 1.

Table 1. $^{90}Sr$ and $^{137}Cs$ in Air-Borne Dust
– Apr. 1970 to Mar. 1971 –
by T. Asari, M. Chiba and M. Kuroda
*(Japan Analytical Chemistry Research Institute)*

(Continued from Table 1, Issue No. 27 of this Publication)

| Location | Duration (days) | Air Inhaled ($m^2$) | Efficiency Cottrell (%) | $^{90}Sr$ ($10^{-3}$ pCi/$m^3$) | $^{137}Cs$ ($10^{-3}$ pCi/$m^3$) |
|---|---|---|---|---|---|
| Apr. 1970 | | | | | |
| Namie FUKUSHIMA | 2 | 3684 | 79 | 1.6 | 2.4 |
| Niigata NIIGATA | 15 | 1478 | 96 | 0.9 | 1.4 |
| Mito IBARAKI | 22 | 20610 | 70 | 0.7 | 0.7 |
| Shizuoka SHIZUOKA | 29 | 3240 | 90 | 6.9 | 13.5 |
| Nagoya AICHI | 4 | 1260 | 95 | 3.2 | 4.5 |
| Fukui FUKUI | 17 | 4320 | 96 | 3.9 | 5.4 |
| Osaka OSAKA | 22 | 7586 | 90 | 3.3 | 4.8 |
| Tottori TOTTORI | 21 | 561 | 90 | 7.8 | 8.3 |
| Hiroshima HIROSHIMA | 16 | 7750 | 80 | 0.4 | 1.5 |
| Nagasaki NAGASAKI | 22 | 1800 | 90 | 3.9 | 8.1 |
| May 1970 | | | | | |
| Namie FUKUSHIMA | 9 | 978 | 97 | 6.1 | 8.2 |
| Niigata NIIGATA | 20 | 2555 | 96 | 1.7 | 3.0 |
| Mito IBARAKI | 23 | 25920 | 70 | 1.6 | 3.0 |
| Shizuoka SHIZUOKA | 23 | 3240 | 90 | 2.7 | 5.3 |
| Nagoya AICHI | 7 | 1260 | 95 | 5.9 | 8.2 |
| Fukui FUKUI | 26 | 8640 | 96 | 3.8 | 5.1 |
| Osaka OSAKA | 15 | 5360 | 90 | 4.1 | 7.0 |
| Tottori TOTTORI | 22 | 553 | 90 | 6.0 | 7.2 |
| Hiroshima HIROSHIMA | 18 | 7300 | 80 | 0.9 | 3.8 |
| Nagasaki NAGASAKI | 16 | 1500 | 90 | 4.6 | 11.5 |

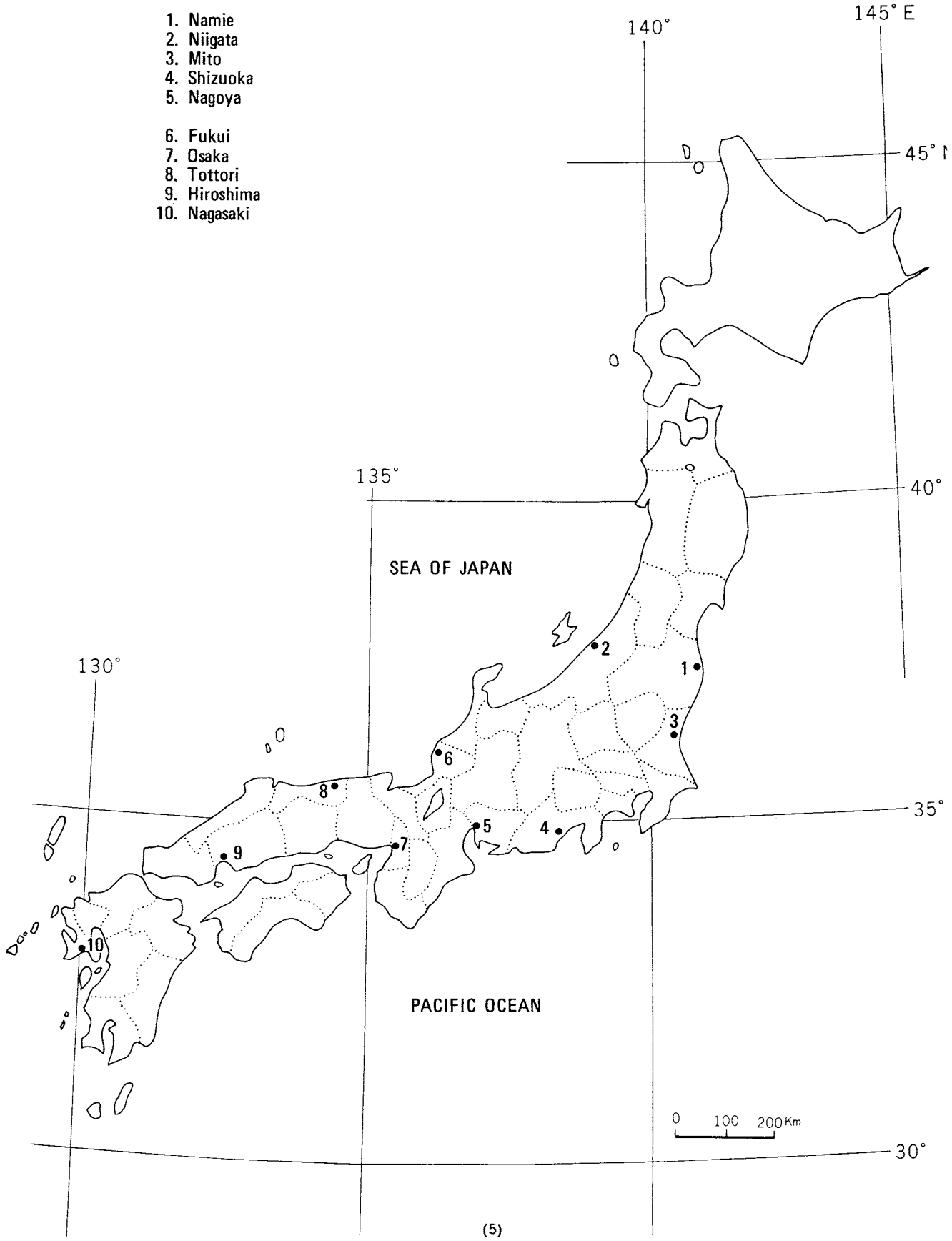
| Location | Duration (days) | Air Inhaled ($m^2$) | Efficiency Cottrell (%) | $^{90}Sr$ ($10^{-3}$pCi/$m^3$) | $^{137}Cs$ ($10^{-3}$pCi/$m^3$) |
|---|---|---|---|---|---|
| June 1970 | | | | | |
| Namie FUKUSHIMA | 14 | 1037 | 97 | 3.8 | 7.2 |
| Niigata NIIGATA | 29 | 5009 | 96 | 1.6 | 3.0 |
| Mito IBARAKI | 29 | 34560 | 70 | 1.5 | 1.8 |
| Shizuoka SHIZUOKA | 14 | 3240 | 90 | 3.4 | 10.1 |
| Nagoya AICHI | 7 | 1152 | 95 | 2.6 | 4.4 |
| Fukui FUKUI | 27 | 3600 | 96 | 6.6 | 9.2 |
| Osaka OSAKA | 23 | 2174 | 90 | 1.9 | 2.6 |
| Tottori TOTTORI | 25 | 1059 | 90 | 5.1 | 8.9 |
| Hiroshima HIROSHIMA | 24 | 7000 | 80 | 2.2 | 4.6 |
| Nagasaki NAGASAKI | 15 | 1500 | 90 | 4.9 | 10.2 |
| July 1970 | | | | | |
| Namie FUKUSHIMA | 14 | 1135 | 97 | 3.9 | 6.8 |
| Niigata NIIGATA | 15 | 3005 | 96 | 0.9 | 1.7 |
| Mito IBARAKI | 29 | 38880 | 70 | 0.6 | 1.1 |
| Shizuoka SHIZUOKA | 2 | 2160 | 90 | 1.0 | 9.7 |
| Nagoya AICHI | 7 | 1440 | 95 | 2.3 | 3.8 |
| Fukui FUKUI | 20 | 2880 | 96 | 1.2 | 1.8 |
| Osaka OSAKA | 25 | 2592 | 90 | 2.4 | 2.8 |
| " | 19 | 2751 | 90 | 1.7 | 3.2 |
| Tottori TOTTORI | 26 | 1041 | 90 | 2.9 | 4.8 |
| Hiroshima HIROSHIMA | 27 | 6649 | 80 | 0.9 | 2.4 |
| Nagasaki NAGASAKI | 15 | 2000 | 90 | 1.2 | 1.5 |
| Aug. 1970 | | | | | |
| Namie FUKUSHIMA | 9 | 729 | 97 | 4.4 | 7.6 |
| Niigata NIIGATA | 26 | 5109 | 96 | 0.4 | 1.1 |
| Mito IBARAKI | 29 | 38880 | 70 | 0.8 | 1.3 |
| Nagoya AICHI | 4 | 1530 | 95 | 1.3 | 2.0 |
| Fukui FUKUI | 22 | 2880 | 96 | 1.4 | 2.7 |
| Tottori TOTTORI | 24 | 1021 | 90 | 1.8 | 5.2 |
| Hiroshima HIROSHIMA | 23 | 6800 | 80 | 0.9 | 2.0 |
| Nagasaki NAGASAKI | 21 | 2000 | 90 | 1.0 | 2.4 |
| Sept. 1970 | | | | | |
| Namie FUKUSHIMA | 18 | 1179 | 97 | 2.5 | 3.9 |
| Niigata NIIGATA | 7 | 2004 | 96 | 0.5 | 1.2 |
| Mito IBARAKI | 26 | 30024 | 70 | 0.6 | 1.0 |
| Nagoya AICHI | 8 | 1440 | 95 | 1.2 | 3.4 |
| Fukui FUKUI | 21 | 2160 | 96 | 0.8 | 1.3 |
| Osaka OSAKA | 25 | 2603 | 90 | 1.6 | 3.0 |
| Tottori TOTTORI | 27 | 878 | 90 | 2.2 | 3.6 |
| Hiroshima HIROSHIMA | 25 | 6900 | 80 | 1.1 | 2.3 |
| Nagasaki NAGASAKI | 18 | 2000 | 90 | 2.0 | 2.6 |
| Oct. 1970 | | | | | |
| Namie FUKUSHIMA | 18 | 1047 | 97 | 2.5 | 3.4 |
| Niigata NIIGATA | 22 | 5093 | 96 | LTD | LTD |
| Mito IBARAKI | 30 | 77130 | 70 | 0.2 | 0.3 |
| Shizuoka SHIZUOKA | 8 | 3240 | 90 | 3.1 | 4.4 |
| " | 3 | 3240 | 90 | 1.4 | 3.7 |
| Nagoya AICHI | 14 | 3690 | 95 | 1.1 | 1.8 |
| Fukui FUKUI | 22 | 11016 | 96 | 0.8 | 1.5 |

| Location | Duration (days) | Air Inhaled ($m^2$) | Efficiency Cottrell (%) | $^{90}Sr$ ($10^{-3}$ pCi/$m^3$) | $^{137}Cs$ ($10^{-3}$ pCi/$m^3$) |
|---|---|---|---|---|---|
| Osaka OSAKA | 17 | 3600 | 90 | 1.4 | 2.9 |
| Tottori TOTTORI | 25 | 1092 | 90 | 3.1 | 5.5 |
| Hiroshima HIROSHIMA | 28 | 7800 | 80 | 1.6 | 2.2 |
| Nagasaki NAGASAKI | 15 | 1800 | 90 | 1.9 | 3.1 |
| Nov. 1970 | | | | | |
| Namie FUKUSHIMA | 9 | 1067 | 97 | 1.0 | 1.6 |
| Niigata NIIGATA | 29 | 5082 | 96 | 0.4 | LTD |
| Mito IBARAKI | 27 | 38880 | 70 | 0.2 | 0.3 |
| Shizuoka SHIZUOKA | 7 | 3240 | 90 | 2.2 | 3.2 |
| " | 8 | 4320 | 90 | 1.0 | 2.0 |
| Nagoya AICHI | 21 | 1440 | 95 | 1.0 | 1.6 |
| Fukui FUKUI | 29 | 3600 | 96 | 1.1 | 0.9 |
| Osaka OSAKA | 25 | 2880 | 90 | 1.1 | 1.9 |
| Tottori TOTTORI | 20 | 946 | 90 | 1.2 | 1.6 |
| Hiroshima HIROSHIMA | 15 | 8600 | 80 | 1.6 | 2.5 |
| Nagasaki NAGASAKI | 22 | 1800 | 90 | 2.2 | 2.7 |
| Dec. 1970 | | | | | |
| Namie FUKUSHIMA | 9 | 1067 | 97 | 1.0 | 1.4 |
| Niigata NIIGATA | 15 | 3067 | 96 | LTD | 1.2 |
| Mito IBARAKI | 19 | 25920 | 70 | 0.1 | 0.1 |
| Shizuoka SHIZUOKA | 9 | 3240 | 90 | 0.6 | 0.9 |
| Nagoya AICHI | 14 | 1530 | 95 | 0.6 | 1.0 |
| Fukui FUKUI | 15 | 2160 | 96 | 0.6 | 0.9 |
| Osaka OSAKA | 13 | 2880 | 90 | 1.3 | 2.1 |
| Tottori TOTTORI | 19 | 1135 | 90 | 2.2 | 3.7 |
| Hiroshima HIROSHIMA | 22 | 7100 | 80 | 2.5 | 3.7 |
| Nagasaki NAGASAKI | 17 | 1800 | 90 | 2.6 | 4.3 |
| Jan. 1971 | | | | | |
| Niigata NIIGATA | 21 | 4007 | 96 | 0.5 | 1.0 |
| Mito IBARAKI | 24 | 32040 | 70 | 0.1 | 0.1 |
| Shizuoka SHIZUOKA | 17 | 3240 | 90 | 0.8 | 3.0 |
| Nagoya AICHI | 5 | 1530 | 95 | LTD | 1.2 |
| Fukui FUKUI | 14 | 2160 | 96 | 0.7 | 1.0 |
| Osaka OSAKA | 21 | 2592 | 90 | 0.8 | 1.6 |
| Tottori TOTTORI | 23 | 1143 | 90 | 1.7 | 2.8 |
| Hiroshima HIROSHIMA | 22 | 6600 | 80 | 1.4 | 2.9 |
| Nagasaki NAGASAKI | 9 | 1200 | 90 | 2.1 | 3.6 |
| Feb. 1971 | | | | | |
| Niigata NIIGATA | 21 | 4007 | 96 | LTD | 0.4 |
| Mito IBARAKI | 25 | 26460 | 70 | 0.1 | 0.1 |
| Shizuoka SHIZUOKA | 9 | 3240 | 90 | 2.5 | 4.3 |
| Nagoya AICHI | 26 | 1260 | 95 | 0.9 | LTD |
| Fukui FUKUI | 26 | 1488 | 96 | 0.8 | LTD |
| Osaka OSAKA | 20 | 2619 | 90 | 0.9 | 1.3 |
| Tottori TOTTORI | 24 | 1119 | 90 | 2.1 | 3.9 |
| Hiroshima HIROSHIMA | 25 | 7300 | 80 | 2.2 | 4.2 |
| Nagasaki NAGASAKI | 4 | 1200 | 90 | 0.8 | LTD |
| Mar. 1971 | | | | | |
| Niigata NIIGATA | 30 | 5009 | 96 | 2.0 | 2.3 |
| Mito IBARAKI | 29 | 33840 | 70 | 0.2 | 0.3 |

| Location | Duration (days) | Air Inhaled ($m^2$) | Efficiency Cottrell (%) | $^{90}Sr$ ($10^{-3}$ pCi/$m^3$) | $^{137}Cs$ ($10^{-3}$ pCi/$m^3$) |
|---|---|---|---|---|---|
| Shizuoka SHIZUOKA | 8 | 3240 | 90 | 3.0 | 8.2 |
| Nagoya AICHI | 26 | 1260 | 95 | 1.3 | 2.1 |
| Fukui FUKUI | 19 | 1440 | 96 | 1.6 | 2.7 |
| Osaka OSAKA | 20 | 2592 | 90 | 2.1 | 3.0 |
| Tottori TOTTORI | 22 | 1148 | 90 | 2.3 | 5.5 |
| Hiroshima HIROSHIMA | 27 | 9700 | 80 | 2.3 | 2.0 |
| Nagasaki NAGASAKI | 16 | 1500 | 90 | 0.7 | 1.5 |

Figure 1: Air-Borne Dust Sampling Location

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



# Geographical Data

## Strontium-90 and Cesium-137 in Soil

*(Japan Analytical Chemistry Research Institute)*

Japan Analytical Chemistry Research Institute has analyzed surface soil samples collected from 18 prefectures, to determine the total deposits of fallout.

Sampling locations are indicated in Figure 2.

Soil samples were collected at depths of 0~5 and 0~20 cm on grassland or bare surface at each sampling location. The samples were analyzed using the method recommended by Science and Technology Agency.

Results obtained during the period from July to December, 1970 are shown in Table 2.

Table 2. $^{90}Sr$ and $^{137}Cs$ in Soil
–July to November, 1970–
by T. Asari, M. Chiba and M. Kuroda
*(Japan Analytical Chemistry Research Institute)*

(Continued from Table 2, Issue No. 27, of this Publication)

| Location | Sampling Depth (cm) | Dry Soil | | $^{90}Sr$ | | | $^{137}Cs$ | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Ca(%) | K(%) | (pCi/kg) | (mCi/km$^2$) | (mCi/gCa) | (pCi/kg) | (mCi/km$^2$) | (mCi/gK) |
| July 1970 | | | | | | | | | |
| Murata MIYAGI | 0~ 5 | 0.52 | 0.14 | 745 | 29.7 | 143 | 1256 | 50.0 | 897 |
| ,, | 0~20 | 0.42 | 0.15 | 261 | 29.7 | 62 | 266 | 27.1 | 177 |
| Kanamachi TOKYO | 0~ 5 | 1.08 | 0.14 | 62 | 2.6 | 57 | 312 | 13.0 | 223 |
| ,, | 0~20 | 0.01 | 0.14 | 83 | 17.7 | 830 | 86 | 18.1 | 61 |
| Omiya SAITAMA | 0~ 5 | 0.90 | 0.13 | 1144 | 28.9 | 127 | 725 | 18.3 | 558 |
| ,, | 0~20 | 0.51 | 0.15 | 452 | 54.0 | 89 | 193 | 23.1 | 129 |
| Hamamatsu SHIZUOKA | 0~ 5 | 0.01 | 0.19 | 271 | 14.0 | 2710 | 1340 | 69.0 | 705 |
| ,, | 0~20 | 0.01 | 0.25 | 135 | 33.1 | 1350 | 689 | 169.0 | 276 |
| Miyazu KYOTO | 0~ 5 | 0.01 | 0.14 | 293 | 13.1 | 2930 | 401 | 17.9 | 286 |
| ,, | 0~20 | 0.01 | 0.13 | 164 | 60.1 | 1640 | 141 | 52.1 | 108 |
| Tsuyama OKAYAMA | 0~ 5 | 0.52 | 0.22 | 923 | 37.5 | 178 | 1024 | 41.6 | 466 |
| ,, | 0~20 | 0.31 | 0.22 | 627 | 105.0 | 202 | 163 | 27.3 | 74 |
| Toyosaka HIROSHIMA | 0~ 5 | 0.18 | 0.21 | 337 | 14.7 | 187 | 272 | 11.8 | 130 |
| ,, | 0~20 | 0.26 | 0.21 | 233 | 69.5 | 90 | 360 | 107.0 | 171 |
| Oda SHIMANE | 0~ 5 | 0.16 | 0.06 | 831 | 27.3 | 519 | 543 | 17.9 | 905 |
| ,, | 0~20 | 0.15 | 0.06 | 1064 | 103.0 | 709 | 72 | 7.0 | 120 |
| Yamaguchi YAMAGUCHI | 0~ 5 | 0.20 | 0.15 | 149 | 7.6 | 75 | 321 | 26.3 | 214 |
| ,, | 0~20 | 0.17 | 0.12 | 145 | 34.8 | 85 | 545 | 130.0 | 454 |
| Hagi HAMAGUCHI | 0~ 5 | 0.14 | 0.15 | 149 | 7.8 | 106 | 417 | 21.6 | 278 |
| ,, | 0~20 | 0.17 | 0.13 | 175 | 46.4 | 103 | 995 | 263.0 | 765 |
| Aug. 1970 | | | | | | | | | |
| Sapporo HOKKAIDO | 0~ 5 | 0.84 | 0.16 | 609 | 29.3 | 73 | 754 | 36.2 | 471 |
| ,, | 0~20 | 4.01 | 0.18 | 315 | 63.2 | 8 | 437 | 87.3 | 243 |
| Aomori AOMORI | 0~ 5 | 0.44 | 0.18 | 514 | 21.4 | 117 | 507 | 21.1 | 282 |
| ,, | 0~20 | 0.31 | 0.11 | 381 | 73.1 | 123 | 512 | 98.2 | 465 |
| Nakakanbara NIIGATA | 0~ 5 | 0.25 | 0.15 | 899 | 108 | 360 | 585 | 70.4 | 390 |
| ,, | 0~20 | 0.31 | 0.15 | 420 | 110 | 135 | 335 | 88.0 | 223 |

| Location | Sampling Depth (cm) | Dry Soil | | $^{90}Sr$ | | | $^{137}Cs$ | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Ca(%) | K(%) | (pCi/kg) | ($mCi/km^2$) | (mCi/gCa) | (pCi/kg) | ($mCi/km^2$) | (mCi/gK) |
| Yokohama KANAGAWA | 0~ 5 | 1.26 | 0.04 | 621 | 20.9 | 49 | 302 | 10.2 | 755 |
| " | 0~20 | 0.62 | 0.02 | 314 | 48.2 | 51 | 335 | 51.4 | 1675 |
| Hamaoka SHIZUOKA | 0~ 5 | 2.38 | 0.20 | 425 | 17.3 | 18 | 776 | 31.4 | 388 |
| " | 0~20 | 0.82 | 0.21 | 279 | 35.3 | 34 | 418 | 53.0 | 199 |
| Kanazawa ISHIKAWA | 0~ 5 | 0.38 | 0.18 | 203 | 9.3 | 53 | 595 | 27.5 | 331 |
| " | 0~20 | 0.17 | 0.11 | 76 | 16.0 | 45 | 102 | 21.6 | 93 |
| Akabane AICHI | 0~ 5 | 0.21 | 0.09 | 272 | 16.4 | 130 | 661 | 39.9 | 734 |
| " | 0~20 | 0.13 | 0.16 | 192 | 63.0 | 15 | 382 | 126.0 | 239 |
| Hirakata OSAKA | 0~ 5 | 0.22 | 0.16 | 398 | 14.1 | 181 | 814 | 28.8 | 479 |
| " | 0~20 | 0.25 | 0.25 | 239 | 52.7 | 96 | 270 | 59.1 | 108 |
| Akashi HYOGO | 0~ 5 | 0.01 | 0.11 | 295 | 13.9 | 2950 | 228 | 10.7 | 207 |
| " | 0~20 | 0.01 | 0.09 | 180 | 26.8 | 1800 | 734 | 109.0 | 815 |
| Tottori TOTTORI | 0~ 5 | 0.44 | 0.09 | 211 | 12.4 | 48 | 938 | 55.5 | 1042 |
| " | 0~20 | 0.54 | 0.12 | 302 | 60.0 | 56 | 484 | 96.3 | 403 |
| Kochi KOCHI | 0~ 5 | 0.66 | 0.18 | 803 | 29.8 | 122 | 1731 | 64.1 | 962 |
| " | 0~20 | 3.57 | 0.16 | 404 | 86.1 | 11 | 1075 | 229 | 672 |
| Sawara FUKUOKA | 0~ 5 | 0.21 | 0.19 | 670 | 31.0 | 319 | 705 | 32.7 | 371 |
| " | 0~20 | 0.16 | 0.19 | 315 | 70.5 | 197 | 623 | 140 | 328 |
| Nagasaki NAGASAKI | 0~ 5 | 0.13 | 0.11 | 393 | 19.6 | 302 | 452 | 22.6 | 410 |
| " | 0~20 | 0.12 | 0.11 | 238 | 59.8 | 198 | 200 | 50.0 | 182 |
| Sept. 1970 | | | | | | | | | |
| Kariba NIIGATA | 0~ 5 | 0.05 | 0.16 | 1551 | 158 | 3102 | 2521 | 256 | 1576 |
| " | 0~20 | 0.11 | 0.20 | 639 | 122 | 581 | 520 | 99.3 | 260 |
| Kariba NIIGATA | 0~ 5 | 0.35 | 0.22 | 454 | 28.0 | 130 | 1051 | 65.0 | 478 |
| " | 0~20 | 0.29 | 0.29 | 441 | 76.6 | 152 | 636 | 110 | 219 |
| Wakayama WAKAYAMA | 0~ 5 | 1.11 | 0.17 | 53 | 3.9 | 48 | 725 | 53.4 | 426 |
| " | 0~20 | 1.21 | 0.12 | 38 | 7.9 | 31 | 49 | 10.2 | 41 |
| Kaimon KAGOSHIMA | 0~ 5 | 3.55 | 0.04 | 329 | 15.3 | 9 | 1146 | 53.2 | 2865 |
| " | 0~20 | 7.26 | 0.03 | 501 | 118 | 7 | 710 | 168 | 2367 |
| Nov. 1970 | | | | | | | | | |
| Kashima SHIMANE | 0~ 5 | 0.53 | 0.25 | 1049 | 26.8 | 198 | 2962 | 75.5 | 1185 |
| " | 0~20 | 0.42 | 0.21 | 821 | 84.8 | 195 | 1542 | 159 | 734 |
| Matsue SHIMANE | 0~ 5 | 0.03 | 0.17 | 713 | 21.3 | 2377 | 1042 | 31.1 | 613 |
| " | 0~20 | 0.01 | 0.14 | 257 | 28.1 | 2570 | 241 | 26.4 | 172 |

Figure 2: Soil Sampling Location

1. Sapporo
2. Aomori
3. Murata
4. Nishikanbara
5. Kariba

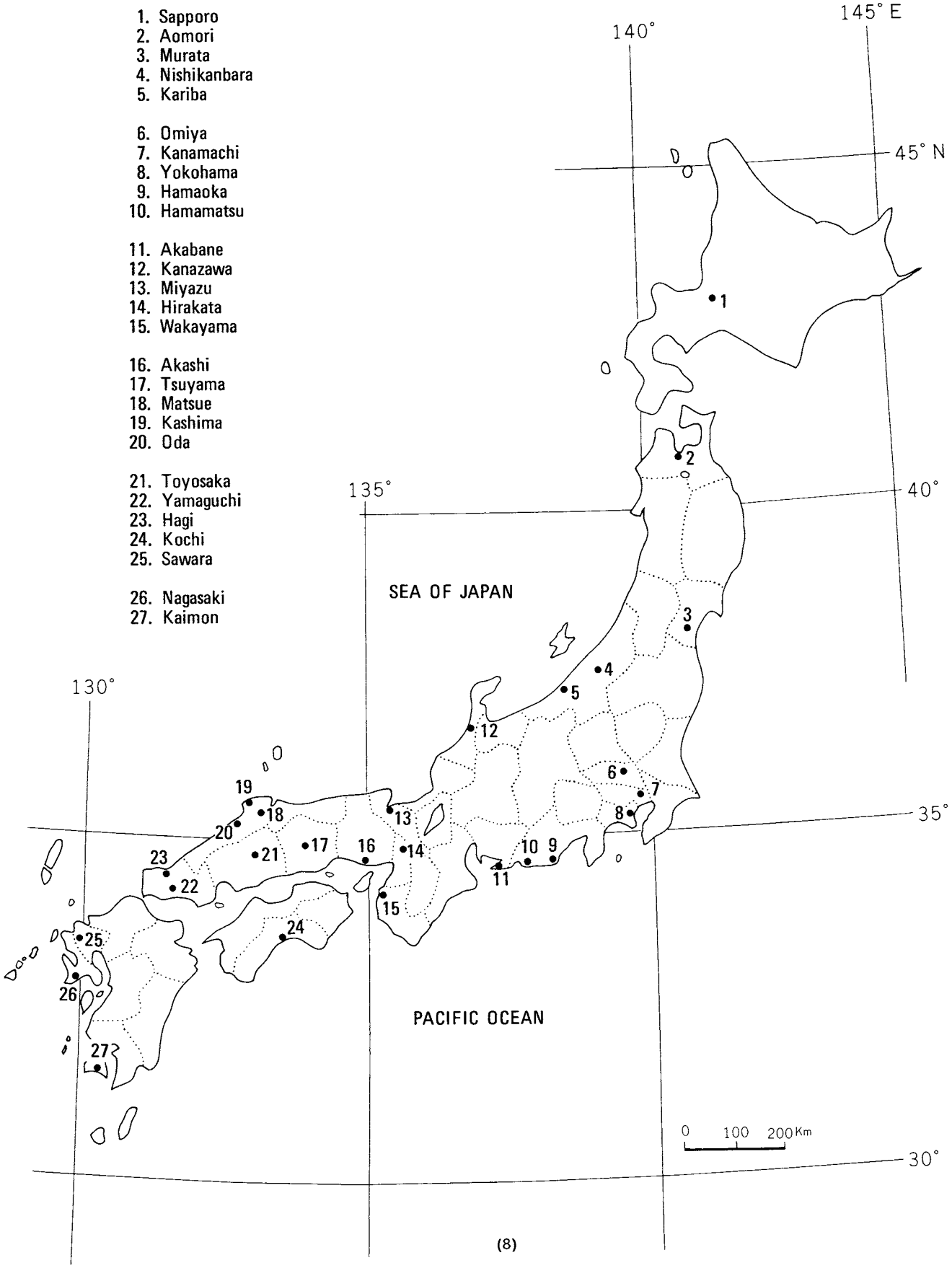
6. Omiya
7. Kanamachi
8. Yokohama
9. Hamaoka
10. Hamamatsu

11. Akabane
12. Kanazawa
13. Miyazu
14. Hirakata
15. Wakayama

16. Akashi
17. Tsuyama
18. Matsue
19. Kashima
20. Oda

21. Toyosaka
22. Yamaguchi
23. Hagi
24. Kochi
25. Sawara

26. Nagasaki
27. Kaimon



## Strontium-90 and Cesium-137 in Soil

*(National Institute of Radiological Sciences)*

The purpose of this survey is to investigate the amount of ground deposite and leaching rates of radionuclides from soil to river.

Undisturbed and uncultivated soil up to the depth of 5 cm and 20 cm were collected at the same site.

Sampling Locations site are shown in Figure 3.

The amounts of radionuclides deposited on ground are shown in Table 3.

Table 3. $^{90}Sr$ and $^{137}Cs$ in Soil
– July to August 1970 –
by M. Saiki and H. Kamada
*(National Institute of Radiological Sciences)*

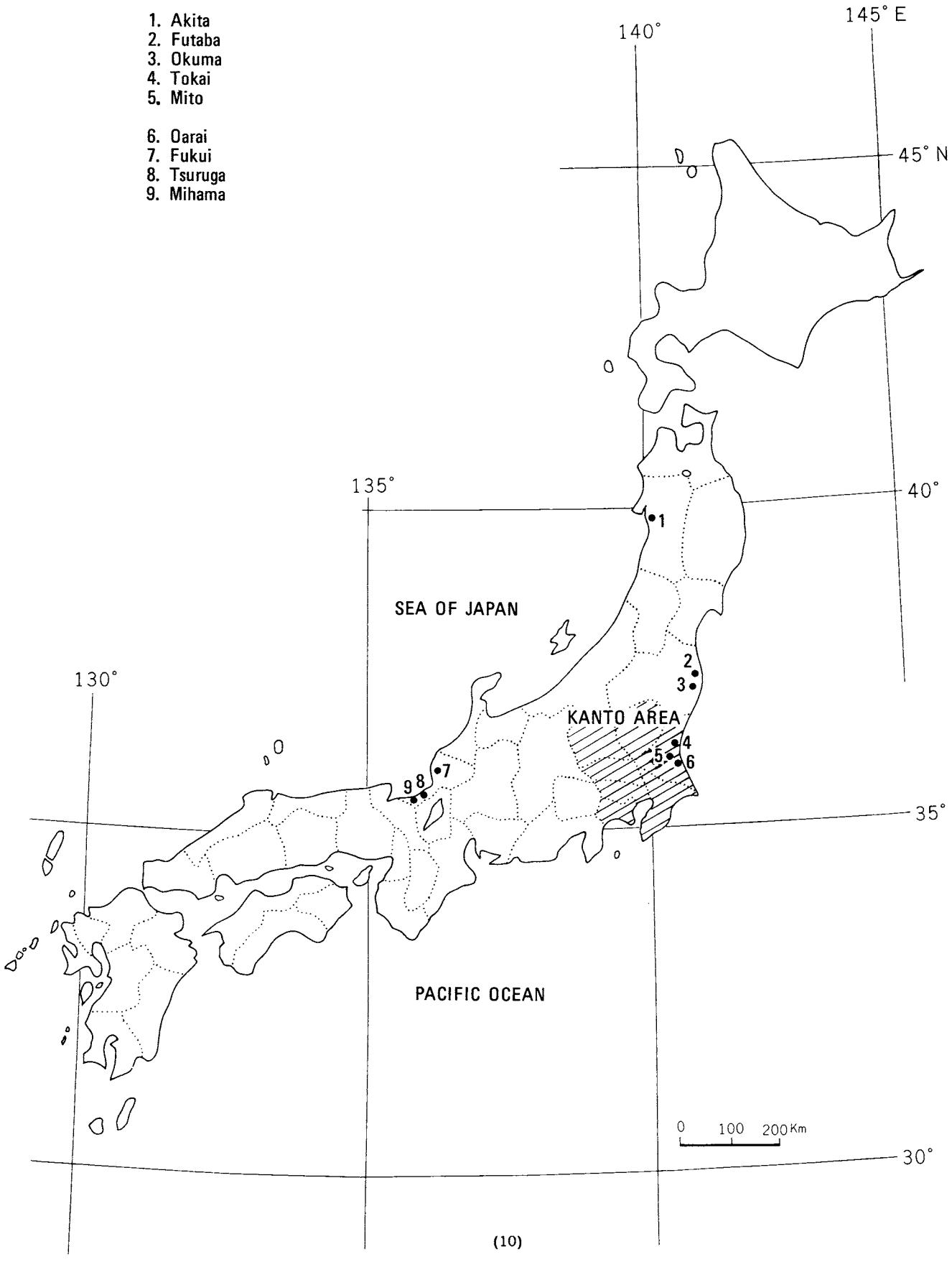
(Continued from Table 2, Issue Number 27 of this Publication)

| Location | Sampling Depth (cm) | Natural Weight (kg) | Dried out Weight (kg) | $^{90}Sr$ (mCi/km$^2$) | $^{137}Cs$ (mCi/km$^2$) | The nature of the Soil |
|---|---|---|---|---|---|---|
| July 1970 | | | | | | |
| Tokai IBARAKI | 0~ 5 | 4.18 | 4.07 | 2 | 44 | sanday |
| " " | 0~20 | 5.64 | 5.53 | 5 | 49 | " |
| Mito | 0~ 5 | 3.65 | 2.66 | 11 | 33 | Kanto Loam |
| " " | 0~20 | 3.85 | 2.48 | 18 | 53 | " |
| Oarai " | 0~ 5 | 3.59 | 2.79 | 18 | 21 | " |
| " " | 0~20 | 3.68 | 2.69 | 24 | 25 | " |
| August 1970 | | | | | | |
| Akita AKITA | 0~ 5 | 4.7 | 2.28 | 19 | 57 | |
| " " | 0~20 | 3.79 | 2.93 | 80 | 155 | |
| Futaba FUKUSHIMA | 0~ 5 | 8.85 | 4.65 | 12 | 8 | clayey soil |
| " " | 0~20 | 5.85 | 4.87 | 87 | 17 | " |
| Okuma " | 0~ 5 | 8.15 | 3.58 | 12 | 14 | " |
| " " | 0~20 | 5.25 | 3.98 | 18 | 21 | " |
| " " | 0~ 5 | 8.45 | 4.64 | 23 | 109 | soft soil |
| " " | 0~20 | 4.55 | 3.74 | 48 | 174 | " |
| Fukui FUKUI | 0~ 5 | 4.1 | 3.28 | 11 | 34 | hard soil |
| " " | 0~20 | 4.0 | 2.99 | 35 | 83 | " |
| Tsuruga | 0~ 5 | 3.1 | | | | sandy |
| " " | 0~20 | 4.4 | | | | " |
| Mihama " | 0~ 5 | 3.0 | | | | " |
| " " | 0~20 | 4.7 | | | | " |

Figure 3: Soil Sampling Location

1. Akita
2. Futaba
3. Okuma
4. Tokai
5. Mito

6. Oarai
7. Fukui
8. Tsuruga
9. Mihama



## Strontium-90 and Cesium-137 in River Sediments

*(National Institute of Radiological Sciences)*

Measurments of the quantity of radionuclides that precipitated or deposited in River Sediments was carried out for two kind of nuclides Strontium-90 and Cesium-137.

That results are shown in Table 4, also sampling locations are shown in Figure 3.

Table 4. $^{90}Sr$ and $^{137}Cs$ in River Sediments – Jul. –
by M. Saiki, H. Kamada and M. Mita
*(National Institute of Radiological Sciences)*

| Location | Sampling Date | $^{90}Sr$ (nCi/Kg) | | | | $^{137}Cs$ (nCi/Kg) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | L.S. | C. | R.S. | M. | L.S. | C. | R.S. | M. |
| Oh-hira River (AKITA) | Jul. 1970 | 0.015 | 0.099 | — | 0.051 | 0.338 | 0.372 | — | 0.355 |
| Asahi River (AKITA) | Jul. 1970 | — | 0.29 | 0.253 | 0.141 | — | 0.120 | 0.150 | 0.135 |
| Kuma River (FUKUSHIMA) | Jul. 1970 | — | 0.044 | 0.034 | 0.039 | — | 0.046 | 0.074 | 0.060 |
| Maeda River (FUKUSHIMA) | Jul. 1970 | 0.087 | 0.084 | — | 0.086 | 0.082 | 0.116 | — | 0.099 |
| Ottozawa River (FUKUSHIMA) | Jul. 1970 | — | 0.035 | 0.051 | 0.034 | — | 0.065 | 0.103 | 0.084 |

Note; L.S., R.S. and M. indicate the left side, center, right side and mean values, respectively, in the sampling river.

# Water Data

## Strontium-90 and Cesium-137 in Source Water and Treated Water

*(National Institute of Radiological Sciences)*

Since December 1961, the concentration of Radionuclides in city water in Japan have been determined, in co-operation with 24 prefectural Public Health Laboratries.

From April 1963, sampling points have been selected in Tokyo, Niigata and Osaka prefectures.

From June 1970, the sampling points were carried out in Akita, Fukushima, Ibaraki and Fukui prefectures. Sampling locations are shown in Figure 4 .

The results obtained from June 1970 to March 1971 are shown in Table 5 .

Table 5. $^{90}Sr$ and $^{137}Cs$ in Source Water and Treated Water
– Jun. 1970 to Mar. 1971 –
by M. Saiki, H. Kamada, M. Mita

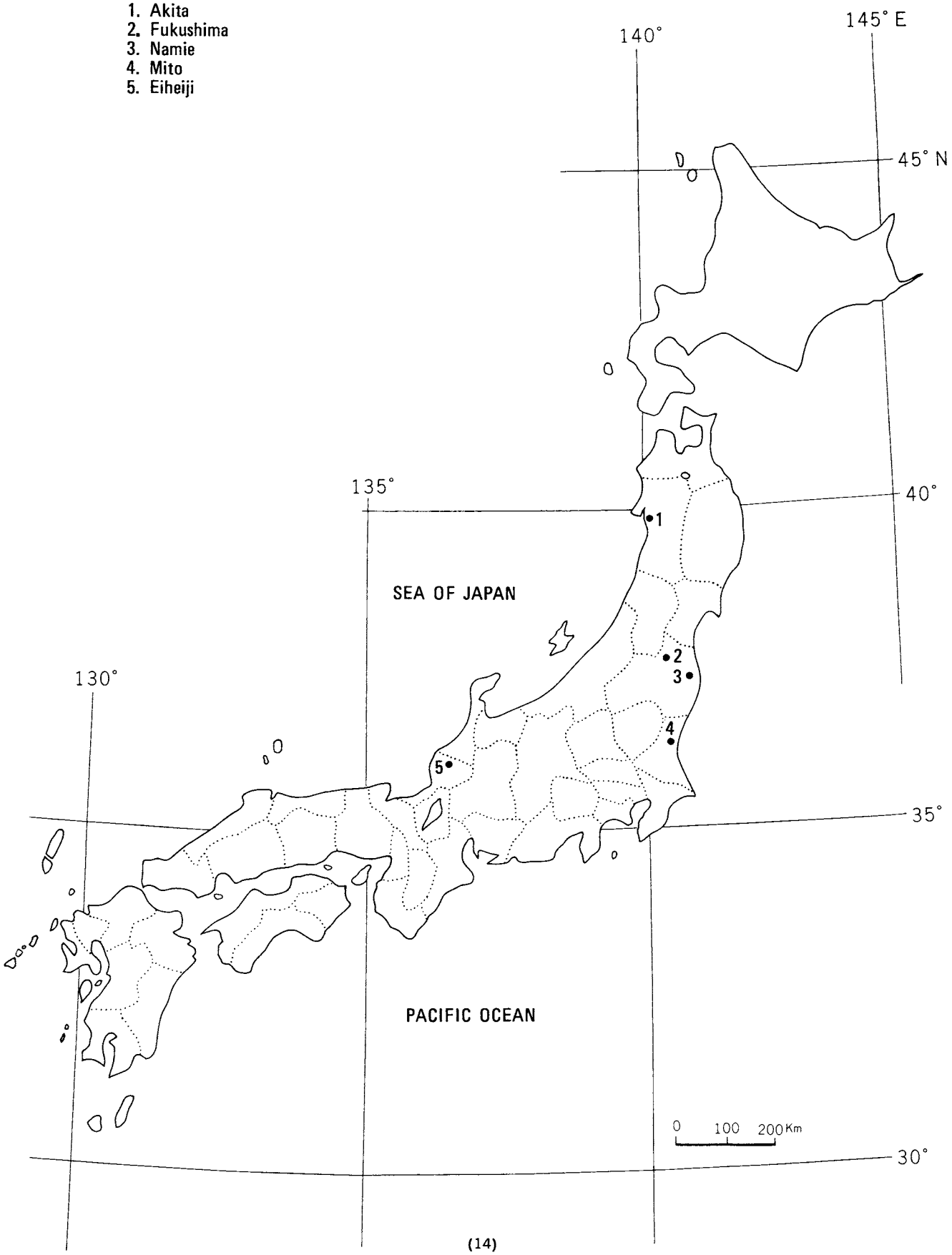
| Location | Type | Date | $^{90}Sr$ | $^{137}Cs$ |
|---|---|---|---|---|
| | | | pCi/l | |
| Akita (AKITA) | SW | Jun. 1970 | 0.46 | <0.05 |
| | TW | | 0.35 | <0.05 |
| | SW | Sept. 1970 | 0.32 | 0.08 |
| | TW | | 0.17 | 0.08 |
| | SW | Dec. 1970 | 0.31 | 0.06 |
| | TW | | 0.22 | <0.03 |
| | SW | Mar. 1971 | 0.16 | <0.02 |
| | TW | | 0.12 | <0.02 |
| Iizaka (FUKUSHIMA) | SW | Jun. 1970 | 0.18 | <0.05 |
| | TW | | 0.07 | <0.05 |
| | SW | Sept. 1970 | 0.30 | <0.04 |
| | TW | | 0.17 | <0.03 |
| | SW | Dec. 1970 | 0.27 | <0.02 |
| | TW | | 0.10 | <0.02 |
| | SW | Mar. 1971 | 0.07 | <0.03 |
| | TW | | 0.04 | <0.02 |
| Namie (FUKUSHIMA) | SW | Jun. 1970 | 0.28 | <0.05 |
| | TW | | 0.05 | <0.05 |
| | SW | Sept. 1970 | 0.10 | <0.04 |
| | TW | | 0.08 | <0.03 |

| Location | Type | Date | $^{90}Sr$ | $^{137}Cs$ |
|---|---|---|---|---|
| | | | pCi/l | |
| Namie (FUKUSHIMA) | SW | Dec. 1970 | 0.03 | <0.02 |
| | TW | | 0.02 | <0.02 |
| | SW | Mar. 1971 | 0.08 | <0.02 |
| | TW | | 0.05 | <0.02 |
| Mito (IBARAKI) | SW | Jun. 1970 | 0.21 | <0.05 |
| | TW | | 0.11 | <0.05 |
| | SW | Sept. 1970 | 0.15 | 0.08 |
| | TW | | 0.15 | <0.05 |
| | SW | Dec. 1970 | 0.06 | <0.02 |
| | TW | | 0.05 | <0.02 |
| | SW | Mar. 1971 | 0.03 | <0.03 |
| | TW | | 0.03 | <0.02 |
| Eiheiji (FUKUI) | SW | Jun. 1970 | 0.12 | <0.05 |
| | TW | | 0.10 | <0.05 |
| | SW | Sept. 1970 | 0.10 | <0.05 |
| | TW | | 0.09 | <0.05 |
| | SW | Dec. 1970 | 0.08 | <0.03 |
| | TW | | 0.07 | <0.02 |
| | SW | Mar. 1971 | 0.05 | <0.02 |
| | TW | | 0.04 | <0.02 |

Note; SW and TW indicate Source and Treated Water respectively.

Figure 4: City Water Sampling Location

1. Akita
2. Fukushima
3. Namie
4. Mito
5. Eiheiji



# Dietary Data

## 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 7 prefectures. Sampling locations are shown in Figure 5.

One city and one village in each prefecture were chosen as reprensentative 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 7 families were ashed together and analyzed.

Results obtained during May to June and November to December are shown in Table 6.

Table 6. $^{90}Sr$ and $^{137}Cs$ in Total Diet
– May to June and Nov. to Dec., 1970 –
by M. Saiki, T. Ueda, Y. Suzuki, R. Nakamura and E. Kase
*(National Institute of Radiological Sciences)*

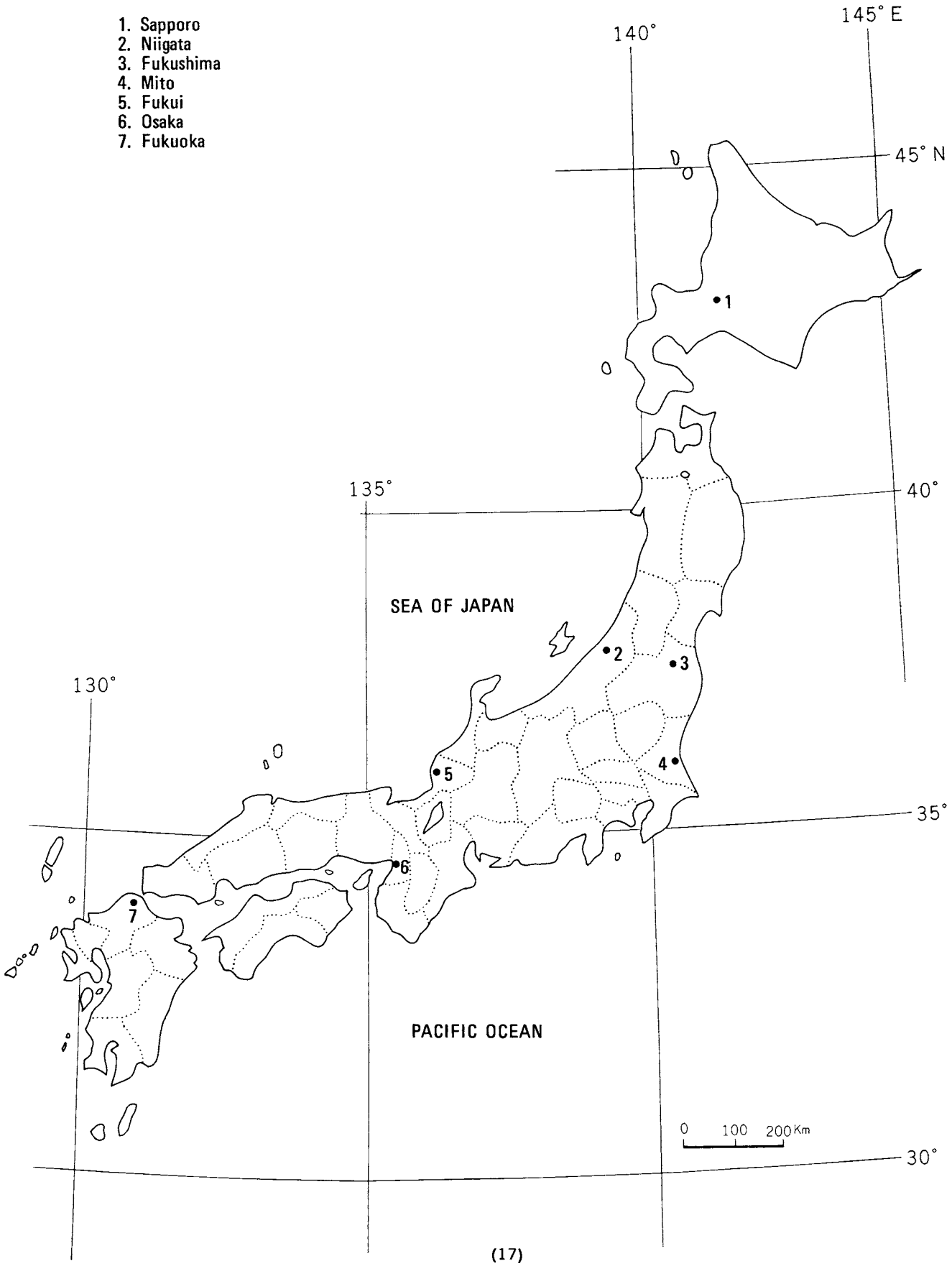
(Continued from Table 7, Issue Number 28 of this Publication)

| Location | Daily Intake | | | | $^{90}Sr$ | $^{137}Cs$ |
|---|---|---|---|---|---|---|
| | Ca (mg) | K (mg) | $^{90}Sr$ (pCi) | $^{137}Cs$ (pCi) | (pCi/gCa) | (pCi/gK) |
| | | | URBAN ADULT DIET | | | |
| May to June, 1970 | | | | | | |
| Sapporo HOKKAIDO | 346 | 1408 | 6.7 | 10.7 | 19.4 | 7.6 |
| Niigata NIIGATA | 366 | 1623 | 6.2 | 9.9 | 16.9 | 6.1 |
| Fukushima FUKUSHIMA | 305 | 1387 | 3.2 | 8.0 | 11.0 | 5.8 |
| Mito IBARAKI | 292 | 1379 | 4.6 | 9.1 | 10.7 | 6.6 |
| Fukui FUKUI | 430 | 1293 | 3.6 | 7.5 | 11.8 | 5.8 |
| Osaka OSAKA | 311 | 1606 | 3.3 | 11.3 | 10.6 | 5.7 |
| Fukuoka FUKUOKA | 316 | 1355 | 6.0 | 8.4 | 19.0 | 6.2 |
| | | | RURAL ADULT DIET | | | |
| Sapporo HOKKAIDO | 385 | 2013 | 10.1 | 16.1 | 26.2 | 8.0 |
| Niigata NIIGATA | 404 | 2728 | 10.9 | 15.1 | 27.0 | 5.5 |
| Fukushima FUKUSHIMA | 453 | 2338 | 10.8 | 17.3 | 23.8 | 7.4 |
| Mito IBARAKI | 511 | 1938 | 11.6 | 15.7 | 22.7 | 8.1 |
| Fukui FUKUI | 257 | 1150 | 2.8 | 6.1 | 10.9 | 5.3 |
| Osaka OSAKA | 246 | 1857 | 3.4 | 10.5 | 13.8 | 5.7 |
| Fukuoka FUKUOKA | 644 | 1836 | 10.1 | 11.2 | 15.7 | 6.1 |
| | | | URBAN ADULT DIET | | | |
| Nov. to Dec., 1970 | | | | | | |
| Sapporo HOKKAIDO | 686 | 3775 | 11.7 | 23.7 | 17.1 | 6.3 |
| Niigata NIIGATA | 594 | 2879 | 13.7 | 18.5 | 25.0 | 6.4 |

| Location | Daily Intake | | | | $^{90}Sr$ | $^{137}Cs$ |
|---|---|---|---|---|---|---|
| | Ca(mg) | K(mg) | $^{90}Sr$(pCi) | $^{137}Cs$(pCi) | (pCi/gCa) | (pCi/gK) |
| Fukushima FUKUSHIMA | 543 | 1519 | 3.1 | 9.4 | 5.7 | 6.2 |
| Mito IBRAKI | 732 | 2299 | 7.9 | 15.8 | 10.8 | 6.9 |
| Fukui FUKUI | 473 | 1892 | 7.3 | 11.0 | 15.4 | 5.8 |
| Osaka OSAKA | 612 | 1727 | 6.2 | 12.3 | 10.1 | 7.1 |
| Fukuoka FUKUOKA | 653 | 1914 | 5.7 | 12.8 | 8.7 | 6.7 |
| | | RURAL ADULT DIET | | | | |
| Sapporo HOKKAIDO | 725 | 3564 | 17.7 | 27.2 | 24.4 | 7.6 |
| Niigata NIIGATA | 758 | 3146 | 19.0 | 29.7 | 25.1 | 9.4 |
| Fukushima FUKUSHIMA | 1145 | 2158 | 7.6 | 12.3 | 6.6 | 5.7 |
| Mito IBARAKI | 537 | 2112 | 8.3 | 17.0 | 15.5 | 8.0 |
| Fukui FUKUI | 324 | 1588 | 11.3 | 10.5 | 34.9 | 6.6 |
| Osaka OSAKA | 487 | 1947 | 9.7 | 12.4 | 19.9 | 6.4 |
| Fukuoka FUKUOKA | 470 | 1842 | 3.5 | 10.9 | 7.4 | 5.9 |

Figure 5: Total Diet Sampling Location

1. Sapporo
2. Niigata
3. Fukushima
4. Mito
5. Fukui
6. Osaka
7. Fukuoka



## 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 3 prefectures (Hokkaido, Niigata and Kagoshima). The sampling locations are shown in Figure 6.

Individual foodstaffs producted in each prefecture were collected separately according to 9 categories: cereals, beans, potatos, milk, eggs, meat, fish and shellfish, leafy vegetables and root vegetables.

The standard diet, taken in this stady, 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: 30, meat: 30g, fish and shellfish: 75g leafy vegetables: 144g, root vegetables: 96g.

Collected foodstuffs were ashed and analyzed separately.

Results obtained during the period from May to December 1970 are shown in Table 7.

Table 7. $^{90}Sr$ and $^{137}Cs$ in Standard Diet
– May and December, 1970 –
by M. Saiki, T. Ueda, Y. Suzuki, R. Nakamura and E. Kase
*(National Institute of Radiological Sciences)*

(Continued from Table 6, Issue Number 29 of this Publication)

| Foodstaff Samples | Daily Intake/Person | | | | | |
|---|---|---|---|---|---|---|
| | $^{90}Sr$ (pCi) | Ca (mg) | $^{90}Sr$ (pCi/gCa) | $^{137}Cs$ (pCi) | K (mg) | $^{137}Cs$ (pCi/gK) |
| | | | HOKKAIDO – May 1970 – | | | |
| Cereals | 0.62 | 40 | 15.5 | 5.5 | 316 | 17.7 |
| Beans | 0.38 | 17 | 22.4 | 1 | 117 | 8.5 |
| Potatos | 0.91 | 13 | 70 | 2.6 | 343 | 7.6 |
| Milk | 1.75 | 178 | 9.8 | 3.3 | 270 | 12.2 |
| Eggs | 0.01 | 12 | 0.8 | 0.2 | 43 | 4.7 |
| Meat | 0.01 | 2 | 5 | 0.5 | 72 | 6.9 |
| Fish and Shellfish | 0.02 | 30 | 0.7 | 0.8 | 190 | 4.2 |
| Leafy Vegetables | 0.74 | 34 | 21.8 | 1.8 | 354 | 5.1 |
| Root Vegetables | 1.33 | 10 | 17.2 | 1.1 | 212 | 5.2 |
| | | | HOKKAIDO – Dec. 1970 – | | | |
| Cereals | 0.75 | 41 | 18.3 | 6.2 | 370 | 16.8 |
| Beans | 0.43 | 25 | 17.2 | 0.4 | 128 | 3.1 |
| Potatos | 0.26 | 10 | 26 | 1 | 312 | 3.2 |
| Milk | 0.78 | 211 | 3.7 | 5.9 | 268 | 22 |
| Eggs | 0.01 | 17 | 0.6 | 0.1 | 46 | 2.2 |
| Meat | 0.004 | 1 | 4 | 0.5 | 69 | 7.2 |
| Fish and Shellfish | 0.01 | 77 | 0.1 | 1.9 | 350 | 5.4 |
| Leafy Vegetables | 1.74 | 48 | 37 | 1 | 409 | 2.4 |
| Root Vegetables | 0.68 | 19 | 35.8 | 0.5 | 114 | 4.4 |

| Foodstaff Samples | Daily Intake/Person | | | | | |
|---|---|---|---|---|---|---|
| | $^{90}$Sr (pCi) | Ca (mg) | $^{90}$Sr (pCi/gCa) | $^{137}$Cs (pCi) | K (mg) | $^{137}$Cs (pCi/gK) |
| | | | NIIGATA – May 1970 – | | | |
| Cereals | 0.87 | 35 | 24.9 | 3.4 | 348 | 9.8 |
| Beans | 0.45 | 10 | 45 | 0.7 | 127 | 5.5 |
| Potatos | 0.53 | 15 | 35.3 | 1.1 | 320 | 3.4 |
| Milk | 0.76 | 170 | 4.5 | 3.2 | 270 | 11.9 |
| Eggs | 0.02 | 9 | 2.2 | 0.1 | 44 | 2.3 |
| Meat | 0.01 | 22 | 0.5 | 0.4 | 70 | 5.7 |
| Fish and Shellfish | 0.02 | 113 | 0.2 | 0.9 | 215 | 4.2 |
| Leafy Vegetables | 0.6 | 61 | 9.8 | 0.8 | 331 | 2.4 |
| Root Vegetables | 1.11 | 20 | 9.6 | 1.1 | 247 | 4.5 |
| | | | NIIGATA – Nov. 1970 – | | | |
| Cereals | 1.02 | 33 | 30.9 | 3.3 | 283 | 11.7 |
| Beans | 0.71 | 17 | 41.8 | 0.6 | 155 | 3.7 |
| Potatos | 0.64 | 18 | 35.6 | 1.3 | 356 | 3.7 |
| Milk | 0.4 | 163 | 2.5 | 3.6 | 247 | 14.4 |
| Eggs | 0.04 | 16 | 2.5 | 0.1 | 29 | 3.4 |
| Meat | 0.01 | 2 | 4.8 | 0.2 | 77 | 2.5 |
| Fish and Shellfish | 0.02 | 108 | 0.2 | 1.3 | 223 | 6.0 |
| Leafy Vegetables | 1.14 | 43 | 26.5 | 0.6 | 329 | 1.9 |
| Root Vegetables | 0.8 | 18 | 11.4 | 1.2 | 288 | 4.3 |
| | | | KAGOSHIMA – June 1970 – | | | |
| Cereals | 0.84 | 34 | 24.7 | 5.2 | 350 | 14.9 |
| Beans | 0.44 | 31 | 14.2 | 2.3 | 113 | 20.4 |
| Potatos | 0.3 | 10 | 30 | 2.9 | 301 | 9.6 |
| Milk | 0.92 | 160 | 5.8 | 4.1 | 303 | 13.5 |
| Eggs | 0.03 | 17 | 1.8 | 0.3 | 50 | 6.0 |
| Meat | 0.01 | 1 | 6 | 0.9 | 64 | 14.1 |
| Fish and Shellfish | 0.04 | 21 | 1.9 | 1 | 222 | 4.5 |
| Leafy Vegetables | 0.96 | 38 | 25.3 | 0.8 | 367 | 2.2 |
| Root Vegetables | 1.42 | 19 | 74.7 | 1.2 | 204 | 5.9 |
| | | | KAGOSHIMA – Dec. 1970 – | | | |
| Cereals | 0.76 | 42 | 18.1 | 7.3 | 356 | 20.5 |
| Beans | 0.33 | 30 | 11 | 3.1 | 120 | 25.7 |
| Potatos | 0.24 | 5 | 47.8 | 3.1 | 290 | 10.7 |
| Milk | 0.61 | 101 | 3.3 | 3.1 | 280 | 11.2 |
| Eggs | 0.25 | 17 | 14.7 | 0.3 | 47 | 6.4 |
| Meat | 0.01 | 1 | 5.2 | 0.7 | 70 | 9.8 |
| Fish and Shellfish | 0.04 | 23 | 1.7 | 0.9 | 216 | 4.2 |
| Leafy Vegetables | 1.36 | 56 | 24.3 | 2.1 | 343 | 6 |
| Root Vegetables | 0.52 | 27 | 19.3 | 1.3 | 217 | 6 |

Figure 6: Standard Diet Sampling Location

1. Hokkaido
2. Niigata
3. Kagoshima