

# Influence of Sea-water on the Iodine Contents of Rice, Rice-bran and Wheat.

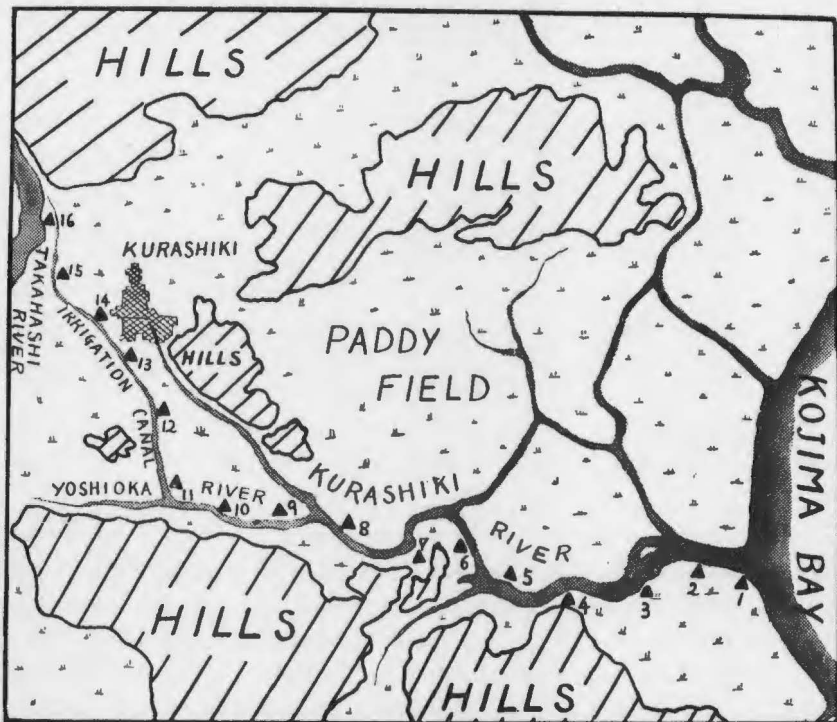
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Previously the chlorine<sup>1)</sup> contents in soils from various points along the irrigation canal which runs from the Takahashi river to Kojima Bay in this prefecture were determined, and later the iodine<sup>2)</sup> contents were examined in the similar soil samples. In both cases, it was found that the amount decreases as the distance from the sea increases although much more chlorine was found than iodine in all the cases. In this investigation, the iodine contents of rice and wheat grown in the similar localities where the soil samples were taken in the previous investigations, were determined. Especially in case of rice, the distribution of iodine in the polished rice and rice-bran was investigated.

Figure 1.



Note: ▲ indicates the places where the samples were taken; the numerals correspond to those noted in the table.

### Experimental.

#### *Samples Collected :*

Sixteen samples of each rice and wheat were collected from different farmers along the irrigation canal extending about sixteen kilometers long, as shown in Fig. 1. Ten grams of samples were taken for the analysis in both cases, rice and wheat, and the rice-bran corresponding to ten grams of whole rice were used. The samples were subjected to combustion without any pre-treatment.

#### *Results :*

The results are presented in Table 1.

Table 1.

No. of locality.	Whole rice.		Wheat.	
	Iodine in 10 g.	Moisture.	Iodine in 10 g.	Moisture.
1	( $\gamma$ ) 4.13	(%) 13.86	( $\gamma$ ) 1.70	(%) 14.70
2	3.41	14.01	1.48	12.70
3	3.07	13.90	1.14	12.80
4	2.67	13.71	1.25	13.95
5	2.21	13.80	1.36	12.95
6	1.15	13.77	1.25	13.10
7	1.70	14.11	1.25	13.10
8	1.93	13.29	1.25	11.75
9	1.82	13.81	1.14	13.55
10	1.48	13.45	1.32	12.40
11	1.82	13.71	1.14	12.20
12	1.14	14.05	1.25	12.90
13	1.48	13.89	1.25	13.10
14	1.59	13.59	1.36	12.65
15	1.14	13.91	1.36	13.10
16	—	—	1.14	12.60

As Table 1 indicates, the rice grown near the bay contains iodine more than three times of those harvested farther away where the influence of sea-water is hardly felt. On the other hand, not much difference is found among the wheat samples except the one came from locality No. 1 which is adjacent to the bay.

Next the distribution of iodine in whole rice was investigated by taking 10 g. of whole rice and the bran so that the iodine contents in the polished rice could be estimated by the difference. The results are presented in Table 2.

Table 2.

No. of locality.	Whole rice.	Rice-bran.	Polished rice.
	Iodine in 10 g.	Corresponding to 10 g. whole-rice.	Iodine in 10 g.
1	( $\gamma$ ) 4.13	( $\gamma$ ) 2.50	( $\gamma$ ) 1.63
2	3.41	2.04	1.37

As shown in Table 2, a large portion of iodine in the whole rice is found in the bran which amounts to more than 65 per cent of the total iodine.

### Discussions.

It is well known that the lack of iodine in the human body is one of the important factors to produce goiter, and the safest as well as most economical source of supply of the proper amount of iodine to maintain our normal health is through our daily food. In turn, the iodine contents in our food vary by the localities where the food is produced since the iodine contents in the soils govern the amount of iodine as shown by various investigators. FELLEBERG<sup>5)</sup>, SHORE and ANDREWS<sup>6)</sup>, McCLENDON<sup>7)</sup> and others investigated the distribution of goiter and that of iodine, and reported that the number of goiter patients is in inverse ratio of the iodine contents of soils in a respective district. Recently TAKAMORI and his co-workers found the same condition in Manchuria where the goiter is prevalent in a certain province.

In this vicinity, the case of goiter is scarcely found but this investigation was undertaken to find the influence of sea-water on the iodine contents of rice and wheat and also the distribution of iodine in the rice which is the chief diet of the Japanese people.

### Summary.

In this investigation, the influence of sea-water on the iodine contents in the whole rice, rice-bran and wheat grown along the irrigation canal which runs from the Takahashi river into Kojima Bay in this prefecture was investigated and the results are summarized as follows:

- 1.) The rice grown near the bay contained iodine more than three times of those some harvested farther away.
- 2.) The iodine contents of rice were found to be in parallel with those found in the soils.
- 3.) More than 65 per cent of iodine in the whole rice was found in the rice-bran which is an important factor considering it from the standpoint of iodine diet.

- 4.) The wheat on an average contained less iodine than the rice.
- 5.) With the wheat not much difference was found among the samples except No. 1 which contained more iodine than the rest coming from the adjacent place to the bay.

### Literature.

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  - 6.) SHORE, R. A., *Bulletins Dep't of Sci. and Ind. Research and Dep't Health, New Zealand*, 1929 and 1934.
  - 7.) McCLENDON, T. F., *Münchener Medizinischen Wochensch.*, 25: 1002, 1936.
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