

National Nutrition Survey in Japan

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National Nutrition Survey has been done every year since 1946. About seven thousand households in 300 randomly selected districts participated this survey. The food intake in each household by weight was recorded on three consecutive days in mid November. In 1989 survey, energy, protein and fat intake per day per capita were 2,061 Kcal, 80.2 g, and 42.4, respectively. All nutrient, except calcium exceeded Japanese R.D.A. The proportion of fat in energy was 25.7%. Sodium intake (presented as salt) per day per capita was 12.2 g. It showed regional difference. After the World War II, nutritional condition remarkably improved. Our recent problem is increasing fat intake, positive balance of energy and slow curve of decreasing salt intake. National Nutrition Survey has done its big role of monitoring Japanese nutrition and health condition.

National Nutrition Survey, Energy, Fat, Sodium, Calcium

PREFACE

The National Nutrition Survey has been carried out since 1946. It has greatly contributed to Japanese Food Supply Policy, Health and Nutrition Policy and health education. In this article, we introduce this unique and historical survey and our secular trend of nutrient and food intake.

Outline of the Survey

1) History

The Health Promotion and Nutrition Division in the Ministry of Health and Welfare of Japan has been conducting a National Nutrition Survey every year since 1946 to determine the health status and dietary intake of the Japanese. Historically, under the malnutritional conditions just after the World War II in 1946, General Head Quarters (GHQ) made a nutrition survey in order to get basic data necessary to acquire urgent food supplies from other

countries. At first, only residents in Tokyo were investigated. Gradually the area was expanded, and since 1948 a nation-wide survey has been performed. The National Nutrition Survey has been done under the law for improvement of nutrition established in 1952. The purpose of this survey has been shifting from the supply of food to the improvement of dietary habit and health promotion of the people. Since the 1960's, in sync with the rapid economic growth, malnutrition has become very rare and chronic diseases related to excess of intake have been increasing. Physical examination, physical activity tests and blood examinations have been added to the National Nutrition Survey.

The relationship between diseases and nutrition, and health and nutrition should be investigated epidemiologically and this survey is becoming much more important for that purpose.

2) Method

About 20,000 members from 7,000 households in 300 randomly selected districts were interviewed to obtain representative samples of the districts within Japan.

The survey included measurements of the food intake in each household by weight for the period of three consecutive days (excluding holidays) in mid-November. The names of ingredients, weights, cooking names and the leftover diets were recorded by subjects and checked every day by dietitians sent from the local health centers. Those being surveyed were also asked to undergo a physical examination (height, weight, skin folds, blood pressure, and blood examination) by doctors and public health nurses at specified locations in order to determine their physical conditions.

The individual data obtained by the annual survey were input and stored at the Statistics and Information Division, Ministry of Health and Welfare. The annual report was published 2 years after the survey.

Results of the survey from 1946 to 1989

1) Nutrient Intake in 1989

The calorie, protein, and fat intake per day per capita was 2,061 Kcal, 80.2 g, and 42.4 g, respectively. Though the intake of most nutrients exceed the Japanese Recommended Dietary Allowance (R.D.A.), average calcium intake was less than the R.D.A. (Fig. 1). 66.7% of the families took in calcium at less than the standard level. The average proportion of fat calories was 25.7%. The families which exceed by more than 120% the calorie and fat R.D.A. are 22.9% and 35.6%, respectively (Fig. 2). Japanese adult fat R.D.A. is 20–25% of total calories, so we assumed that fat R.D.A. is 22.5% of energy intake.

2) Secular Trend of Nutrient Intake

Calories, protein and fat: Average energy intake was 1900 Kcal in 1946, just after World War II. By reconstruction in 1950, it had recovered to a level of 2100 Kcal. The new economic policy started in 1960 made rapid improvements in living conditions, reflected in nutrient intake. Animal protein and fat intake was increased and carbohydrate intake was decreased. Calorie intake reached 2226 Kcal in 1975. One might say the diet was becoming westernized. But excess of some types of nutrient intake has been known as a risk factor for chronic diseases, especially obesity, hyperlipidemia, hypertension and so on. Recently calorie intake has declined but fat intake has not stopped increasing. In a 1989 survey, it reached 25.7% of energy intake (Fig. 3).

Salt: High sodium intake has been a big problem for the Japanese, due to the risk of cerebrovascular disease or gastric cancer. Due to a nationwide campaign, education and the spread of the refrigerator, sodium intake has remarkably decreased. In 1989 sodium intake, in the form of salt, reached 12.2g per day per capita (Fig. 4). About two-thirds of all households took more than the sodium intake, goal of 10 g/day (Fig. 5). In every region, sodium intake has decreased, though still far from the goal. Kinki I (Osaka metropolitan area) showed minimum intake and Tohoku was the maximum (Fig. 6). We need a more powerful program for accomplishing the goal.

Calcium: Average calcium intake was 253 mg per day per capita in 1946 and increased to 540mg in 1989 (Fig. 7). Pulses and vegetables, fish, and milk and dairy products provided 33.5%, 13.1% and 26.0% of total calcium intake, respectively. Milk and dairy products has the possibility of increasing Japanese calcium intake (Fig. 8).

Vitamins: Vitamin levels were sufficient, neglecting cooking loss (Fig. 1). During World War II, people could not get enough food and ate pumpkins, potatoes, pulses and sweet potatoes to make up calories. After 1950, the intake of potatoes and vegetables decreased and that of fish, meat, and milk increased (Fig. 8). The intake of vitamins A, B₁ and C decreased, though it was still sufficient. Recently the intake of vitamins has stabilized and we now rarely observe vitamin deficient patients in Japan.

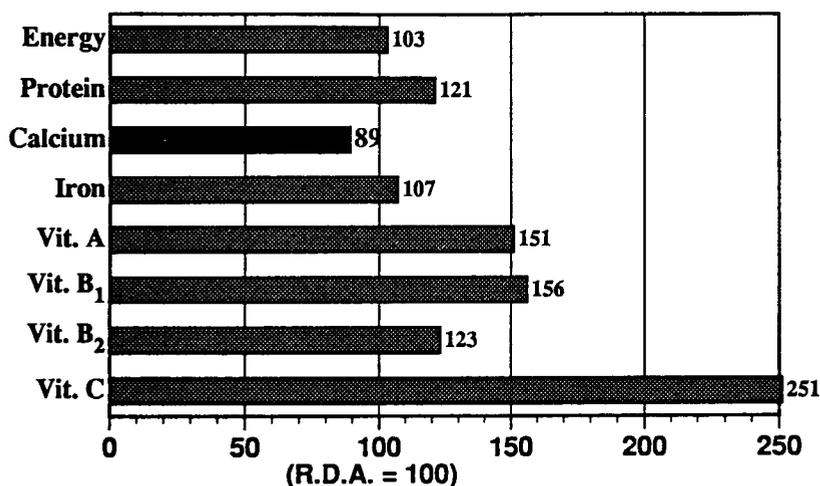


Figure 1 Average intake of some nutrients expressed as a mean percentage of the Japanese R.D.A. (1989)

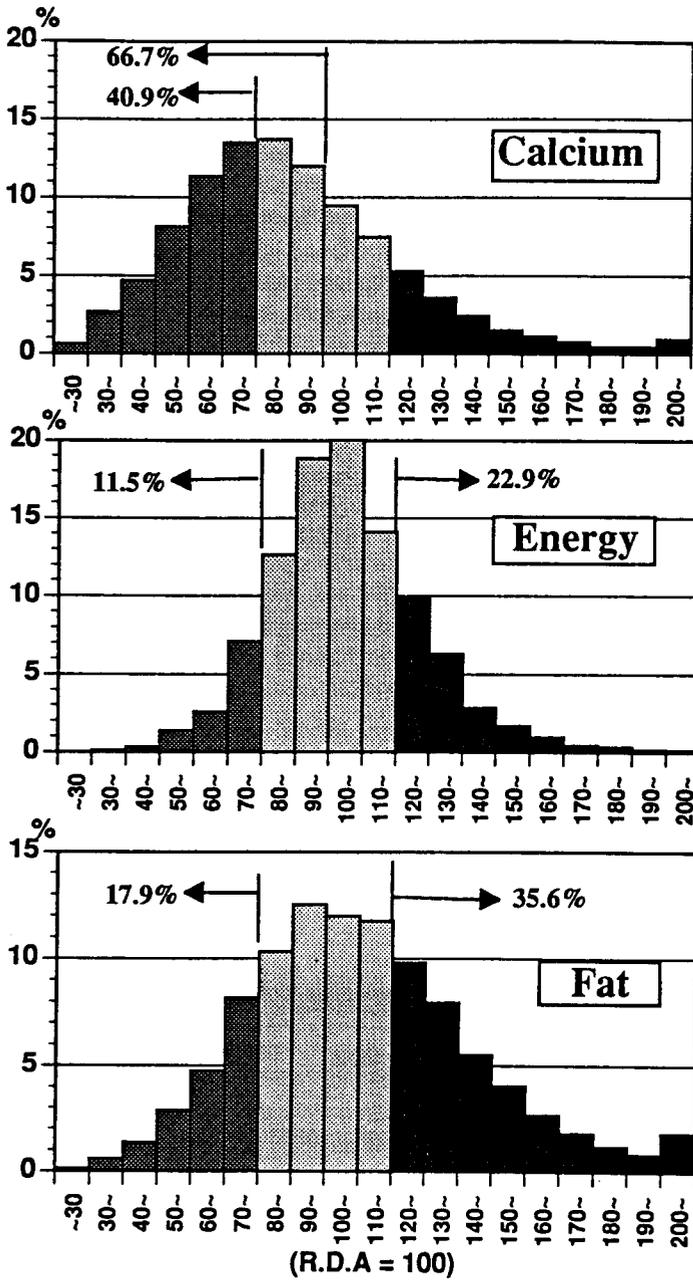


Figure 2 Distribution of calcium, energy & fat intake of households expressed as a percentage of Japanese R.D.A. (1989)

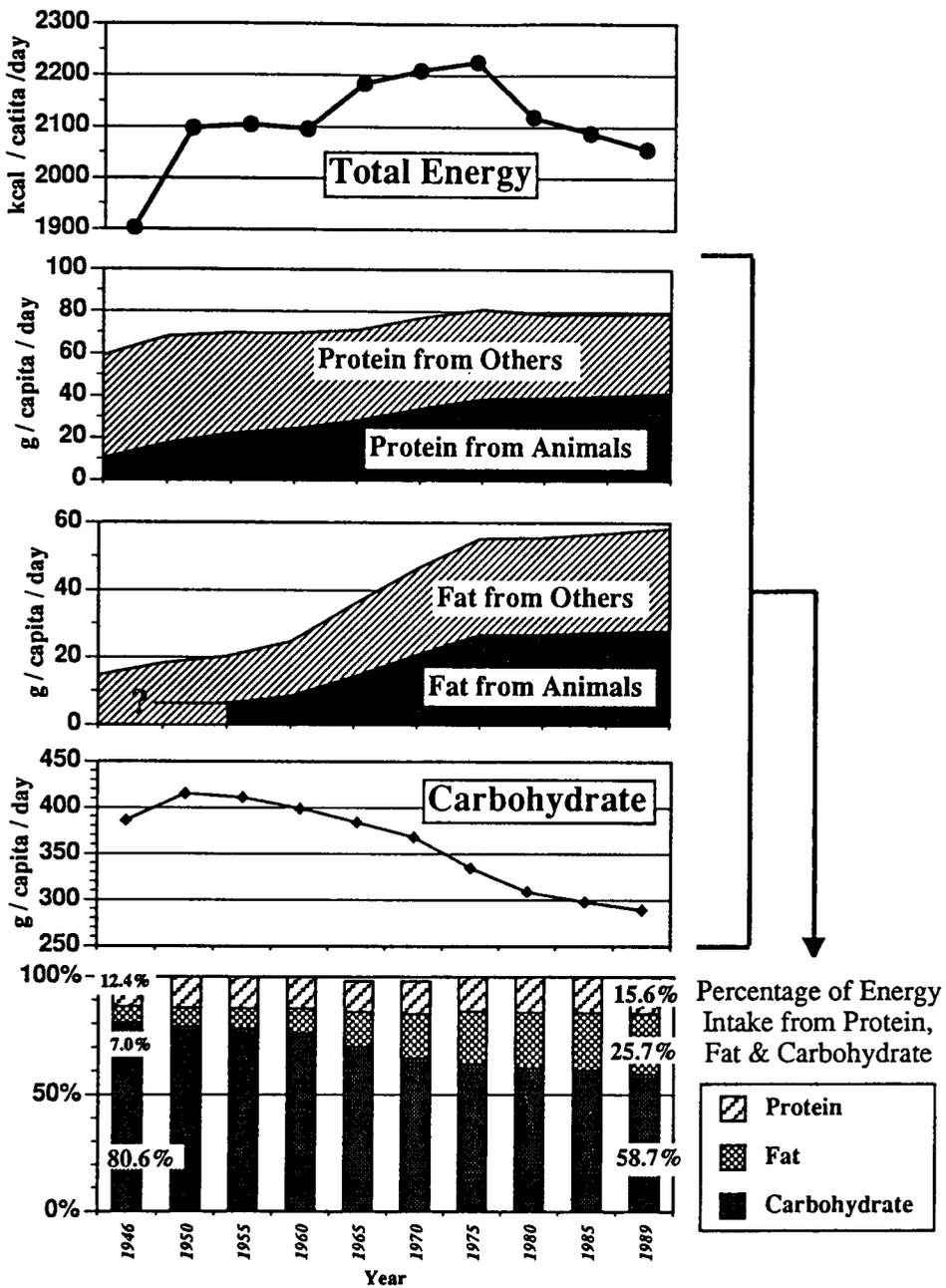


Figure 3 Yearly changes in average intake of nutrients

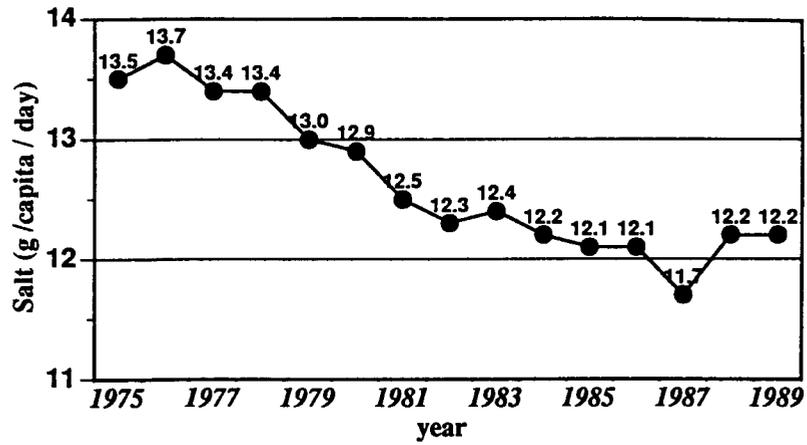


Figure 4 Yearly change in average intake of salt

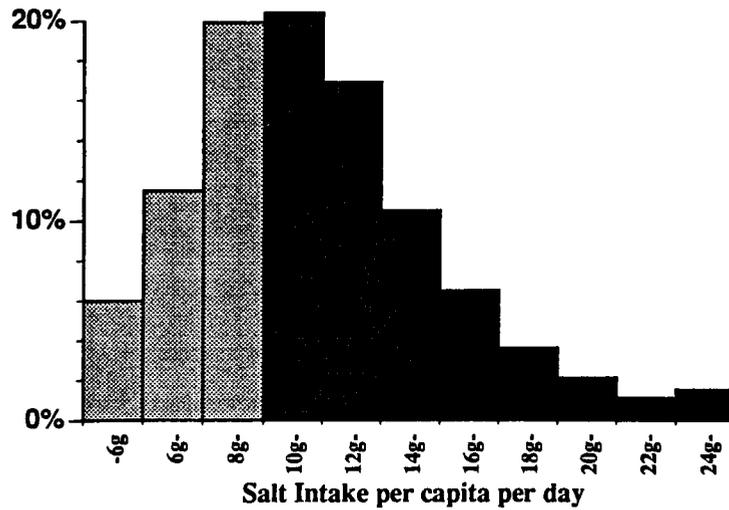


Figure 5 Distribution of salt intake of households (1987)

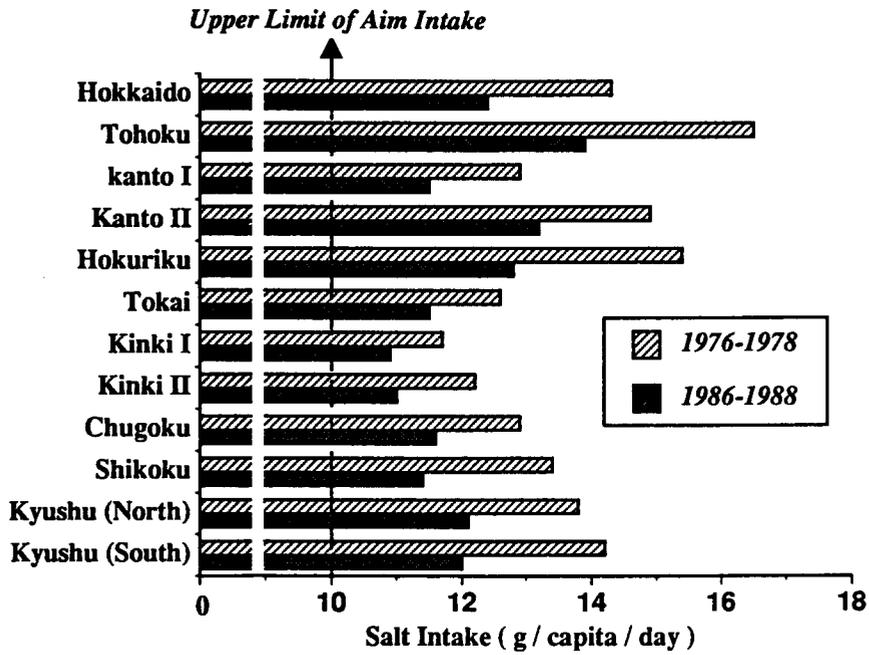


Figure 6 Regional differences in the average intake of salt

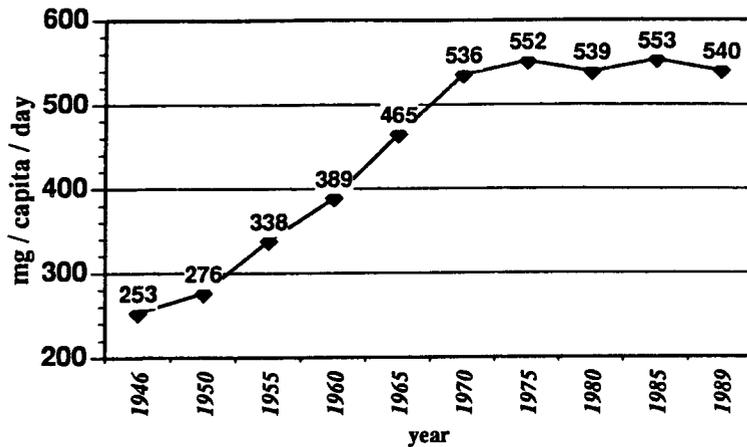


Figure 7 Yearly change in average intake of calcium

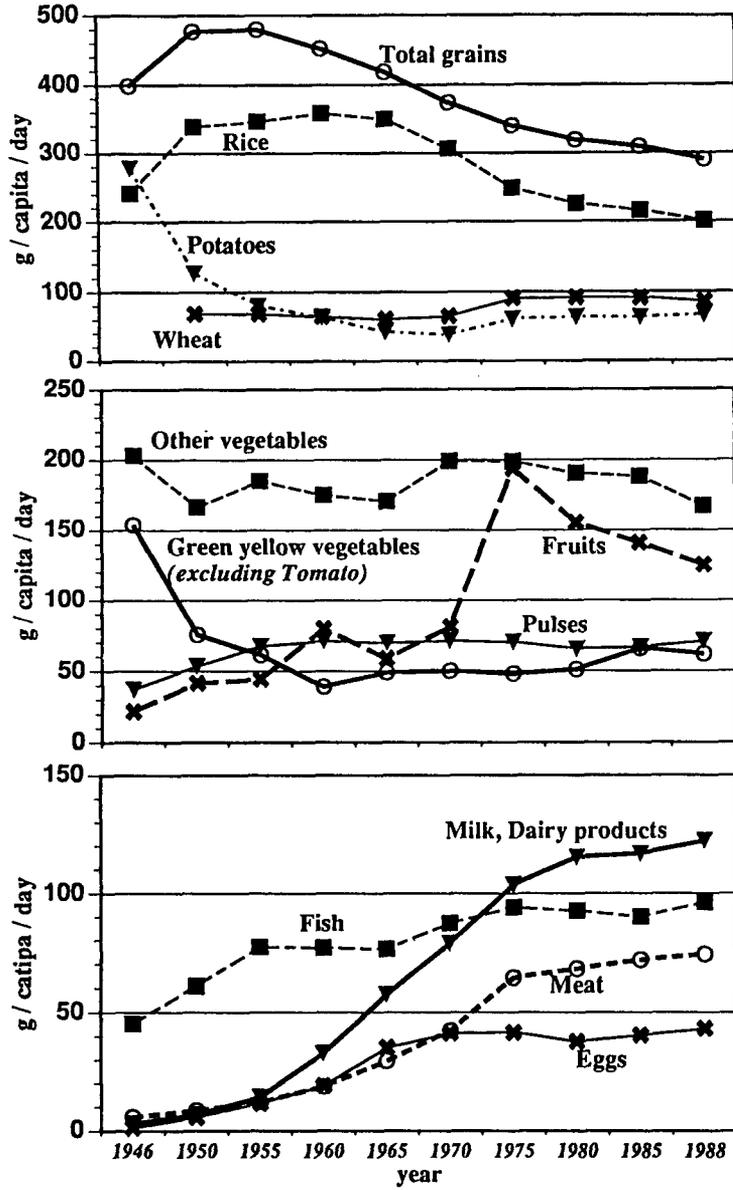


Figure 8 Yearly changes in the average intake from various food groups

3) Blood Examination

Blood examination was started only in 1989. The examination checks for hemoglobin, iron, GOT, GPT, γ -GPT, cholesterol, HDL cholesterol, triglyceride, protein, uric acid and glucose. One laboratory surveyed all items by a standardized method. Male and female mean serum cholesterol is 200.7 mg/dl and 205.7 mg/dl, respectively. Under 50 years old, the male level was higher than the female. Over 50, female cholesterol level exceeded male (Table 1). HDL cholesterol showed male's is always less than female's (Table 2).

Table 1 Serum Cholesterol

AGE \ mg/dl	male			female		
	n	mean	S.D.	n	mean	S.D.
30-39	506	201.3	36.1	893	184.5	32.4
40-49	637	203.6	39.1	1021	198.8	38.0
50-59	652	202.5	37.1	896	218.5	38.0
60-69	568	199.4	36.8	748	220.8	38.6
70-	347	193.3	42.8	506	212.0	43.7
total	2710	200.7	38.3	4064	205.7	40.2

Table 2 Serum HDL Cholesterol

AGE \ mg/dl	male			female		
	n	mean	S.D.	n	mean	S.D.
30-39	506	51.5	14.5	893	58.8	15.4
40-49	637	50.3	14.5	1021	57.2	15.1
50-59	652	49.6	14.8	896	55.5	15.4
60-69	568	49.5	14.4	748	53.7	15.2
70-	347	52.0	17.0	506	52.7	16.3
total	2710	50.4	14.9	4064	56.0	15.3

CONCLUSION

Nutrient intake reflects Japanese social and economic conditions. We have reached sufficient levels and it has become very rare to see malnutritional people in Japan. But excess of nutrient intake and less physical activity has brought us other problems. To avoid new problems, we should find new public health activities for diet improvement. The National Nutrition Survey itself should develop into a good monitor for evaluating health promotion and diet improvement activity.

REFERENCES

- Annual Report of National Nutrition Survey 1947-1991
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