


Salt intake



Salt

- 
- Salt is an ionic compound with the chemical formula **NaCl**, representing a 1:1 ratio of sodium (**Na**) and chloride (**Cl**) ions.

$$\text{salt (g)} = \text{sodium (g)} \times 58.5/23 = \text{sodium (g)} \times 2.54$$

- Sodium is **an essential mineral** and is available as sodium chloride, sodium bicarbonate, and sodium phosphate in body fluids.
- An adult has approximately 100 g of sodium in the body: 50% in extracellular fluid, 40% in bone, and 10% in intracellular fluid*.


*Including blood, lymph, and digestive fluid (e.g., gastric fluid).

Function of sodium



- Sodium is a major cation (Na^+) in the extracellular fluid and **maintains the volume**.
- It also plays an important role in **the control of osmotic pressure and acid-base balance of body fluid**.
- It is a component of bile, pancreatic juice, and intestinal fluid.
- Although sodium is an essential mineral, sodium deficiency does not occur in a normal Japanese diet.


Association of salt intake with hypertension

- 
- The INTERSALT study has reported that **1 g/d higher sodium intake results in 6 mmHg/10 years elevated blood pressure.**
 - A number of Western intervention trials including the DASH study have demonstrated **the blood pressure-lowering effect of salt reduction.**
 - The results of large Western clinical trials suggest that **salt reduction of at least 6 g/d is required to obtain a significant blood pressure-lowering effect.** Hence, the major guidelines for hypertension treatment set less than 6 g/d of salt as the goal of salt reduction.

Reference

- Intersalt Cooperative Research Group. Intersalt: an international study of electrolyte excretion and blood pressure. Results for 24 hour urinary sodium and potassium excretion. BMJ. 1988; 297: 319 28.
- Sacks FM, Svetkey LP, Vollmer WM, et al. ; DASH Sodium Collaborative Research Group. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. N Engl J Med. 2001; 344: 3 10.

Global goal of salt intake

- 
- Recently, Western countries have set stricter goal of salt reduction. The American Heart Association have stated that **general adults should consume no more than 2,300 mg/d of sodium (5.8 g/d salt equivalent) and adults with high risk (i.e., all persons with hypertension, all middle-aged and older adults, and all blacks) should not consume more than 1,500 mg/d (3.8 g/d salt equivalent).**
 - 2018 Guidelines of the European Society of Cardiology and the European Society of Hypertension as well as 2012 WHO Guidelines for general population strongly recommend that **adults should consume no more than 5 g/d of salt.**

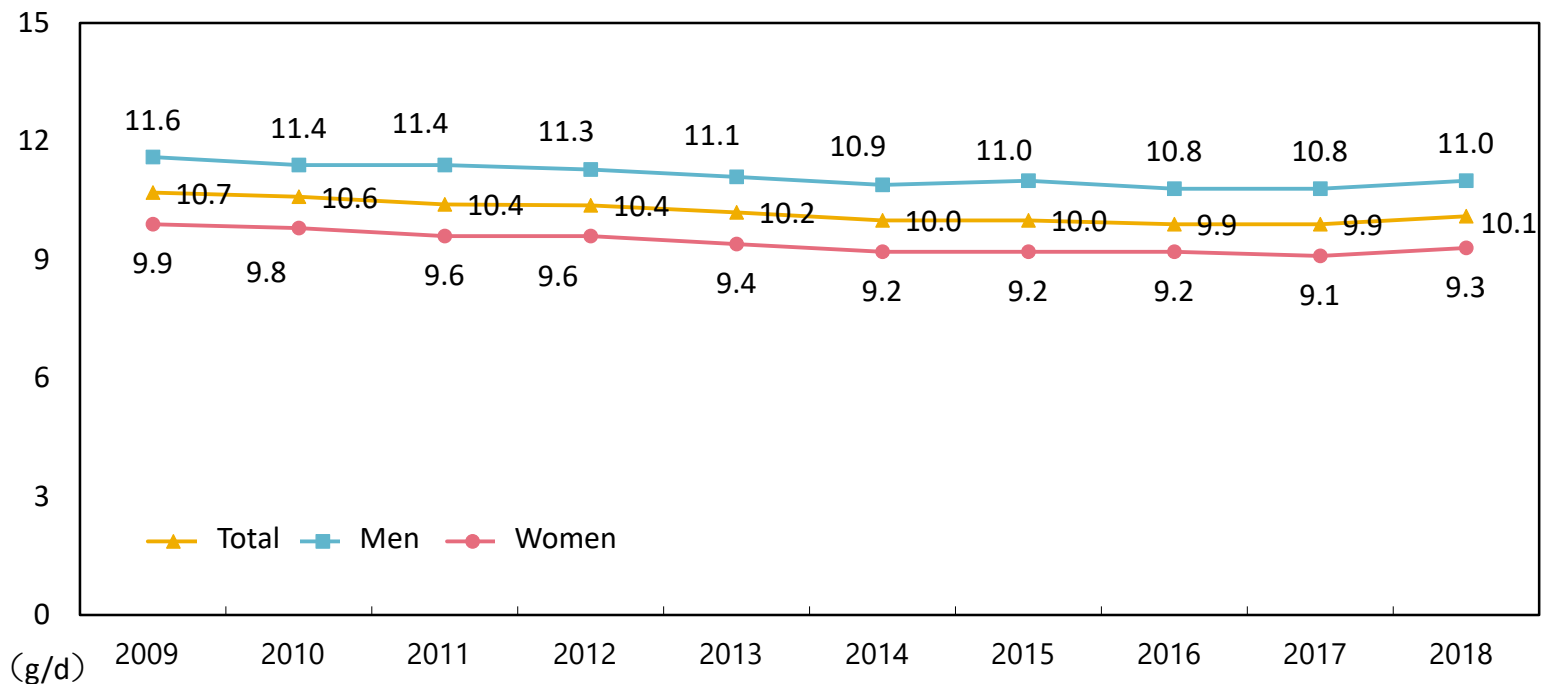
Reference

- Ministry of Health, Labour and Welfare, Japan. Dietary Reference Intakes for Japanese, 2020. 2019.
- WHO. Guideline: Sodium intake for adults and children. Geneva, World Health Organization(WHO). 2012.

Salt intake in Japan

- The 2018 National Health and Nutrition Survey (NHNS) reports that the mean salt intake is **11.0 g/d** for men and **9.3 g/d** for women and the intakes in both sexes have reduced for 10 years.

Annual change in mean salt intake in Japanese adults (aged 20 years and above) from 2009 to 2018



Reference

- Ministry of Health, Labour and Welfare, Japan. The 2018 National Health and Nutrition Survey. 2019

Japan's goal for salt intake



- In the Dietary Reference Intakes for Japanese, 2020, the dietary goal of salt intake was set at the median of the WHO guidelines (5 g/d) and the current intake in Japan (the median intake in the 2016 NHNS); **less than 7.5 g/d for men and less than 6.5 g/d for women.**
- In the 2014 Guidelines for the Management of Hypertension, **less than 6 g/d of salt intake** was set as a goal.

Reference

- Ministry of Health, Labour and Welfare, Japan. Dietary Reference Intakes for Japanese, 2020. 2019
- The Japanese Society of Hypertension. Guidelines for the Management of Hypertension 2014. 2014