



---

Viewpoint

## Japanese food culture and human health – what we can learn from Japan

Klaus W. Lange<sup>1,2,3</sup> and Yukiko Nakamura<sup>1,2,3</sup>

<sup>1</sup>University of Regensburg, Regensburg, Bavaria, Germany; <sup>2</sup>Nara Institute of Science and Technology, Ikoma, Nara, Japan;

<sup>3</sup>Japan Society for Culture, Science and Technology, Germany

**Correspondence:** Klaus W. Lange, University of Regensburg, 93040 Regensburg, Germany. Email: Klaus.Lange@ur.de

**Received:** 11 November 2024; **Accepted:** 12 December 2024; **Published:** 17 December 2024

**Citation:** Lange, K.W., and Nakamura, Y. (2024). Japanese food culture and human health – what we can learn from Japan. *J. Dis. Prev. Health Promot.* 8, 9–12.

**DOI:** 10.5283/jdphp.50

---

### Abstract

Japan leads the world in life expectancy and the number of years people live in good health on average. Epidemiological studies have shown that the relatively high consumption of seafood, soy-based foods and green tea in Japan may have beneficial effects on health and longevity. In addition, low intake of red meat, milk and dairy products, sugar and sweeteners, and high intake of seafood, plant-based foods and sugar-free beverages are associated with relatively low mortality from cancer and ischaemic heart disease and a low prevalence of obesity. Avoiding obesity appears to be a key dietary factor in maintaining good health. The increasing use of highly processed foods in Japan is a cause for concern. Consumption of a wide variety of mainly fresh and unprocessed foods is inversely associated with all-cause mortality and may be a significant factor in public health.

### Japanische Esskultur und menschliche Gesundheit – was wir von Japan lernen können

Japan ist weltweit führend hinsichtlich der Lebenserwartung und der Anzahl der Jahre, die die Menschen im Durchschnitt bei guter Gesundheit leben. Epidemiologische Studien haben gezeigt, dass der vergleichsweise hohe Verzehr von Meeresfrüchten, Lebensmitteln auf Sojabasis und grünem Tee in Japan positive Auswirkungen auf die Gesundheit und Langlebigkeit haben kann. Darüber hinaus werden ein geringer Verzehr von rotem Fleisch, Milch und Milchprodukten, Zucker und Süßstoffen sowie ein hoher Verzehr von Meeresfrüchten, pflanzlichen Lebensmitteln und zuckerfreien Getränken mit einer relativ niedrigen Sterblichkeitsrate durch Krebs und ischämische Herzkrankheiten sowie einer geringen Prävalenz von Adipositas in Verbindung gebracht. Die Vermeidung von Adipositas scheint ein herausragender ernährungsbezogener Faktor für den Erhalt der Gesundheit zu sein. Die zunehmende Verwendung stark verarbeiteter Lebensmittel in Japan gibt Anlass zur Sorge. Der Verzehr eines breiten Spektrums hauptsächlich frischer und unverarbeiteter Lebensmittel steht in umgekehrtem Zusammenhang mit der Gesamtmortalität und kann ein wichtiger Faktor für die öffentliche Gesundheit sein.

### 日本の食文化と人間の健康 — 日本から学ぶもの

日本は平均寿命および平均的に健康で生きられる寿命において世界をリードしている。疫学的研究により、日本では海産物、大豆を基にした食品、緑茶の比較的多い消費が、健康と長寿に有益な影響を及ぼす可能性が示されている。さらに、赤身肉、牛乳や乳製品、砂糖や甘味料の摂取量を少なくし、海産物、植物性の食品、無糖飲料の摂取量が多くなると、がんや虚血性心疾患による死亡率が比較的低くなり、肥満の劇的な低下に相関する。肥満の回避は、健康を維持するうえで食事療法における重要な要因であるとみられる。しかし、日本の加工されすぎた食品の消費量の増加が懸念されてきている。主として新鮮で加工されていない多種多様な食品を消費することは、全死因死亡率と逆相関しており、公衆衛生上非常に大きな要因であると考えられる。

**Keywords:** Japan; Food; Diet; Obesity; Health; Life expectancy; Public health.

---

Japan has one of the longest life expectancies in the world and also leads the world in 'healthy life expectancy', which is the number of years people can expect to live in good health on average (Tokudome et al., 2016). Increased life expectancy at birth is the result of a complex interaction of several processes, of which improved nutrition is a very important but not necessarily dominant factor. However, when all relevant factors are taken into account, it can be argued that the increase in the average life expectancy of the Japanese population since the Second World War is significantly related to diet. Numerous scientific studies have focused on several unique aspects of the Japanese diet in relation to health, including the relatively high consumption of seafood, soy-based foods and green tea.

The health benefits of eating fish are generally attributed to its high levels of polyunsaturated omega-3 fatty acids. Fish consumption is associated with reduced mortality from ischaemic heart disease and stroke (Zhang et al., 1999) and appears to have a protective effect against prostate (Eshaghian et al., 2023) and colon cancer (Caini et al., 2022). Fish intake has also been linked to maintaining mental health, since the amount consumed is inversely correlated with the risk and prevalence of various mental disorders (Lange, 2020).

A wide variety of soy products are consumed in Japan, with the average consumption higher than in any other country in the world (Messina et al., 2006). Regular consumption of soy foods and the isoflavones they contain is associated with a lower mortality from stomach cancer (Nagata et al., 2002) and a lower risk of prostate cancer (Nagata et al., 2007). A high intake of isoflavones is associated with a lower risk of stroke and heart attack in Japanese women, particularly following the menopause (Kokubo et al., 2007).

The health benefits of green tea are mainly attributed to its polyphenolic flavonoids, with their antioxidant properties (Lange et al., 2022a, 2022b; Wang et al., 2022). Green tea consumption is inversely related to all-cause mortality (Kuriyama et al., 2006). There is also evidence of a protective effect of tea on cardiovascular health (Lange, 2022). However, the specific health benefits of regular tea consumption are unclear. In particular, the clinical evidence for the benefits of green tea in the prevention of most cancers is inconclusive (Clement, 2009). In addition, various fermented foods and beverages are produced and regularly consumed in Japan. The microorganisms that contribute to the fermentation process have been associated with many health benefits that require further investigation (Şanlıer et al., 2019).

It is important to note that most of the evidence linking health outcomes to Japanese food is based on epidemiological studies and provides quantifiable statistical associations but cannot establish causal relationships. This would require controlled intervention studies, which are not feasible. In addition, associations between the consumption of certain foods and positive health outcomes may be less meaningful than they appear at first glance. For example, green tea consumption in Japanese men is significantly associated with the consumption of ten other foods and four major nutrients (Tsubono et al.,

1997). Tea drinking may therefore only be a marker for a diet that can alter disease risk.

Given the complex and dynamic relationship between diet and health, it is probably more useful to attribute the effects of Japanese dietary habits on health and longevity to the diet as a whole, rather than continuing to single out individual components. This raises the question of what actually constitutes the Japanese diet, especially as eating habits in Japan have changed over time. The Japanese government emphasises the health benefits of *washoku*, a traditional Japanese cuisine that was recognised as an intangible cultural heritage by UNESCO in 2013. The main contributor to the healthiness of *washoku* is considered to be the "ichiju-sansai" dining style ("one soup, three dishes"). Usually consisting of one soup, one main dish and two side dishes (and a few pickles), with rice as the staple, this style of eating allows people to eat a variety of foods and thus absorb plentiful nutrients and micronutrients. However, there is no scientific definition of the Japanese diet that is based on the relationship between diet and health rather than food culture.

In summary, Japanese dietary habits, characterised by low intake of red meat, milk and dairy products, sugar and sweeteners, and high intake of fish, seafood, plant foods and sugar-free beverages, are associated with relatively low mortality from cancer and ischaemic heart disease and a low prevalence of obesity. However, these habits are changing over time. In particular, the increasing consumption of highly processed foods in both adults and children is a cause for concern (Shinozaki et al., 2023, 2024). Numerous studies show that highly processed foods are associated with a number of adverse health effects, such as cardiometabolic disease, cognitive impairment in old age and mental disorders, as well as increased all-cause mortality (Lane et al., 2024). In addition to dietary habits, the relatively low daily energy intake in Japan is likely to play a role in health. The effects of significantly reduced energy intake on increased longevity are well documented in many animal species. The reduced calorie intake in Okinawa ('hara hachi bu' = eat until 80% full), often for decades, is thought to contribute to a higher life expectancy with lower rates of disability in old age compared with the Japanese average (Gavrilova and Gavrilov, 2012). The lower prevalence of overweight and obesity in Japan compared to other G7 countries is also likely to reduce and delay the onset of age- and diet-related diseases (NCD Risk Factor Collaboration, 2017).

### **What can we learn from Japan?**

A key nutritional factor in maintaining good health is avoiding obesity. Japan's obesity rate is currently the lowest among high-income countries (NCD Risk Factor Collaboration, 2017). Lifelong calorie restriction may be unrealistic, but in addition to appropriate dietary advice, mandatory preventive measures are needed, such as the *Metabo Law* passed in Japan in 2008 (Onishi, 2008). This law requires the waist circumference of all Japanese adults aged 40–74 to be monitored as a part of annual health

checks by local authorities and employers. People with measurements above a certain level are referred for weight loss counselling to reduce the risks associated with a high body mass index. Companies are setting up weight-loss health plans with employees, and workplaces with overweight workforces can be fined. The Metabo ordinance ties in with the social determinants of health since it represents a widespread recognition in Japanese society that weight management is more than just an individual problem.

Although the regular consumption of various soy products can obviously have positive effects, it is difficult to see how it could become widespread in western countries, given the prevailing food culture. What is more conceivable is an increase in fish consumption and possibly a reduction in red meat consumption. Balancing fish and meat consumption could promote health and longevity. The stroke rate in Japan fell when the Japanese started eating a little more meat from 1970 onwards. Too much meat and dairy can be harmful because they contain saturated fat, which is linked to cardiovascular disease (Maki et al., 2021). Eating highly processed red meat has been linked to an increased risk of stroke (Yang et al., 2016), but too little can be unhealthy, as meat and milk provide cholesterol, which is needed for the walls of blood vessels. In a large British study, vegetarians were found to be unusually resistant to heart disease but prone to stroke (Tong et al., 2019). Similar associations have been found in Japan (Kinjo et al., 1999; Sauvaget et al., 2003, 2004; Takeya et al. 1984).

Green tea may have health benefits due to its bioactive constituents, but the fact that it is drunk unsweetened rather than in highly processed drinks with sweeteners, artificial flavours and preservatives is also likely to play a role. Ultra-processed foods are often high in saturated fat, salt and sugar, and their consumption may reduce the intake of more nutritious foods. It has also been suggested that the additives in these foods may be responsible for adverse health effects (Lane et al., 2024). Given the increasing prevalence of potentially harmful highly processed foods, policies aimed at targeting and reducing dietary exposure to these foods, such as mandatory labelling and increased taxation, may be considered.

Every Japanese school and kindergarten is required by law to employ a nutritionist who designs the school meals according to strict rules concerning fresh and healthy ingredients, supervises the preparation of the meals and uses them to educate children about nutrition. Providing school meals under the guidance of professionals can ensure that children receive a nutritious and balanced diet on a regular basis. A special Japanese bento (lunch box) containing a variety of functional (healthy) agricultural products high in fibre, micronutrients and other food bioactives such as carotenoids, polyphenols and amino acids can have potential health benefits (Ide et al., 2022). In the same vein, the Japanese government introduced a slogan in 1985 seeking to promote the daily consumption of 30 different foods from different categories to improve the nutrition of the population through balanced meals. Such dietary diversity has been found to be inversely associated with all-cause mortality (Kobayashi et

al., 2020), and consuming a wider variety of foods overall may have significant public health benefits.

Finally, it is important to remember that diet is only one of several lifestyle factors that are important for health (Nyberg et al., 2020). Another is regular physical activity (Lange, 2017, 2023 2024), which is generally higher in Japan than in many other countries (Inoue et al., 2020). Public transport and walking are popular ways of getting to work or school in Japan. Further research is therefore needed to explore how different lifestyle factors interact to improve health.

### Conflict of interest

The authors declared no conflict of interest.

### References

- Caini, S., Chioccioli, S., Pastore, E., Fontana, M., Tortora, K., Caderni, G., and Masala, G. (2022). Fish consumption and colorectal cancer risk: meta-analysis of prospective epidemiological studies and review of evidence from animal studies. *Cancers (Basel)* 14, 640.
- Clement, Y. (2009). Can green tea do that? A literature review of the clinical evidence. *Prev. Med.* 49, 83–87.
- Eshaghian, N., Heidarzadeh-Esfahani, N., Akbari, H., Askari, G., and Sadeghi, O. (2023). Fish consumption and risk of prostate cancer or its mortality: an updated systematic review and dose-response meta-analysis of prospective cohort studies. *Front. Nutr.* 10, 1221029.
- Gavrilova, N.S., and Gavrilov, L.A. (2012). Comments on dietary restriction, Okinawa diet and longevity. *Gerontology* 58, 221–223.
- Ide, H., Tsukada, S., Asakura, H., Hattori, A., Sakamaki, K., Lu, Y., Okada, H., Maeda-Yamamoto, M., and Horie, S. (2022). A Japanese box lunch bento comprising functional foods reduce oxidative stress in men: a pilot study. *Am. J. Mens Health* 16, 15579883221075498.
- Inoue, S., Kikuchi, H., and Amagasa, S. (2020). Physical activity, sport, and health in Japan. In: Brunner, E., Cable, N., and Iso, H. (eds.). *Health in Japan: social epidemiology of Japan since the 1964 Tokyo Olympics*, pp. 201–216. Oxford: Oxford University Press.
- Kinjo, Y., Beral, V., Akiba, S., Key, T., Mizuno, S., Appleby, P., Yamaguchi, N., Watanabe, S., and Doll, R. (1999). Possible protective effect of milk, meat and fish for cerebrovascular disease mortality in Japan. *J. Epidemiol.* 9, 268–274.
- Kobayashi, M., Sasazuki, S., Shimazu, T., Sawada, N., Yamaji, T., Iwasaki, M., Mizoue, T., and Tsugane, S. (2020). Association of dietary diversity with total mortality and major causes of mortality in the Japanese population: JPHC study. *Eur. J. Clin. Nutr.* 74, 54–66.
- Kokubo, Y., Iso, H., Ishihara, J., Okada, K., Inoue, M., and Tsugane, S. (2007). Association of dietary intake of soy, beans, and isoflavones with risk of cerebral and myocardial infarctions in Japanese populations: the Japan Public Health Center-based (JPHC) study cohort I. *Circulation* 116, 2553–2562.
- Kuriyama, S., Shimazu, T., Ohmori, K., Kikuchi, N., Nakaya, N., Nishino, Y., Tsubono, Y., and Tsuji, I. (2006). Green tea consumption and mortality due to cardiovascular disease, cancer, and all causes in Japan: the Ohsaki study. *JAMA* 296, 1255–1265.
- Lane, M.M., Gamage, E., Du, S., Ashtree, D.N., McGuinness, A.J., Gauci, S., Baker, P., Lawrence, M., Rebholz, C.M., Srour, B., Touvier, M., Jacka, F.N., O'Neil, A., Segasby, T., and Marx, W. (2024). Ultra-processed food exposure and adverse health outcomes: umbrella review of epidemiological meta-analyses. *BMJ* 384, e077310.
- Lange, K.W. (2017). Movement and nutrition in health and disease. *Mov. Nutr. Health Dis.* 1, 1–2.
- Lange, K.W. (2020). Omega-3 fatty acids and mental health. *Glob. Health J.* 4, 18–30.
- Lange, K.W. (2022). Tea in cardiovascular health and disease: a critical appraisal of the evidence. *Food Sci. Hum. Wellness* 11, 445–454.
- Lange, K.W. (2023). Sport for health: a call for action. *J. Dis. Prev. Health Promot.* 7, 1–5.
- Lange, K.W. (2024). Jeremy Morris as a pioneer of behavioural epidemiology, social

- medicine and public health. *Scand. J. Publ. Health* 52, 1026–1027.
- Lange, K.W., Lange, K.M., and Nakamura, Y. (2022a). Green tea, epigallocatechin gallate and the prevention of Alzheimer's disease: clinical evidence. *Food Sci. Hum. Wellness* 11, 765–770.
- Lange, K.W., Nakamura, Y., Lange, K.M., and Zhao, H. (2022b). Tea and depression. *Food Sci. Hum. Wellness* 11, 476–482.
- Maki, K.C., Dicklin, M.R., and Kirkpatrick, C.F. (2021). Saturated fats and cardiovascular health: current evidence and controversies. *J. Clin. Lipidol.* 15, 765–772.
- Messina, M., Nagata, C., and Wu, A.H. (2006). Estimated Asian adult soy protein and isoflavone intakes. *Nutr. Cancer* 55, 1–12.
- Nagata, C., Takatsuka, N., Kawakami, N., and Shimizu, H. (2002). A prospective cohort study of soy product intake and stomach cancer death. *Br. J. Cancer* 87, 31–36.
- Nagata, Y., Sonoda, T., Mori, M., Miyayama, N., Okumura, K., Goto, K., Naito, S., Fujimoto, K., Hirao, Y., Takahashi, A., Tsukamoto, T., and Akaza, H. (2007). Dietary isoflavones may protect against prostate cancer in Japanese men. *J. Nutr.* 137, 1974–1979.
- NCD Risk Factor Collaboration (2017). Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents, and adults. *Lancet* 390, 2627–2642.
- Nyberg, S.T., Singh-Manoux, A., Pentti, J., Madsen, I.E.H., Sabia, S., Alfredsson, L., Bjorner, J.B., Borritz, M., Burr, H., Goldberg, M., Heikkilä, K., Jokela, M., Knutsson, A., Lallukka, T., Lindbohm, J.V., Nielsen, M.L., Nordin, M., Oksanen, T., Pejtersen, J.H., et al. (2020). Association of healthy lifestyle with years lived without major chronic diseases. *JAMA Intern. Med.* 180, 760–768.
- Onishi, N. (2008). Japan, seeking trim waists, measures millions. Available: <https://www.nytimes.com/2008/06/13/world/asia/13fat.html>. Accessed November 1, 2024.
- Şanlıer, N., Gökçen, B.B., and Sezgin, A.C. (2019). Health benefits of fermented foods. *Crit. Rev. Food Sci. Nutr.* 59, 506–527.
- Sauvaget, C., Nagano, J., Allen, N., Grant, E.J., and Beral, V. (2003). Intake of animal products and stroke mortality in the Hiroshima/Nagasaki Life Span Study. *Int. J. Epidemiol.* 32, 536–543.
- Sauvaget, C., Nagano, J., Hayashi, M., and Yamada, M. (2004). Animal protein, animal fat, and cholesterol intakes and risk of cerebral infarction mortality in the adult health study. *Stroke* 35, 1531–1537.
- Shinozaki, N., Murakami, K., Asakura, K., Masayasu, S., and Sasaki, S. (2023). Consumption of highly processed foods in relation to overall diet quality among Japanese adults: a nationwide study. *Publ. Health Nutr.* 26, 1784–1797.
- Shinozaki, N., Murakami, K., Kimoto, N., Masayasu, S., and Sasaki, S. (2024). Highly processed food consumption and its association with overall diet quality in a nationwide sample of 1,318 Japanese children and adolescents: a cross-sectional analysis based on 8-day weighed dietary records. *J. Acad. Nutr. Diet.* doi: 10.1016/j.jand.2024.06.001.
- Takeya, Y., Popper, J.S., Shimizu, Y., Kato, H., Rhoads, G.G., and Kagan, A. (1984). Epidemiologic studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii and California: incidence of stroke in Japan and Hawaii. *Stroke* 15, 15–23.
- Tokudome, S., Hashimoto, S., and Igata, A. (2016). Life expectancy and healthy life expectancy of Japan: the fastest graying society in the world. *BMC Res. Notes* 9, 482.
- Tong, T.Y.N., Appleby, P.N., Bradbury, K.E., Perez-Cornago, A., Travis, R.C., Clarke, R., and Key, T.J. (2019). Risks of ischaemic heart disease and stroke in meat eaters, fish eaters, and vegetarians over 18 years of follow-up: results from the prospective EPIC-Oxford study. *BMJ* 366, l4897.
- Tsubono, Y., Takahashi, T., Iwase, Y., Itoi, Y., Akabane, M., and Tsugane, S. (1997). Dietary differences with green tea intake among middle-aged Japanese men and women. *Prev. Med.* 26, 704–710.
- Wang, L., Brennan, M., Li, S., Zhao, H., Lange, K.W., and Brennan, C. (2022). How does the tea L-theanine buffer stress and anxiety. *Food Sci. Hum. Wellness* 11, 467–475.
- Yang, C., Pan, L., Sun, C., Xi, Y., Wang, L., and Li, D. (2016). Red meat consumption and the risk of stroke: a dose-response meta-analysis of prospective cohort studies. *J. Stroke Cerebrovasc. Dis.* 25, 1177–1186.
- Zhang, J., Sasaki, S., Amano, K., and Kesteloot, H. (1999). Fish consumption and mortality from all causes, ischemic heart disease, and stroke: an ecological study. *Prev. Med.* 28, 520–529.