

## FOCAL POINT ON FOOD SCIENCE IN JAPAN

# THE FUTURE OF FOOD SCIENCE IN JAPAN

Since its traditional way of preparing food was heritage-listed by UNESCO, Japan has used this profile—both in-country, and across the world—to generate interest in the nation's food, but also in how its **CUISINE CAN ADDRESS SOME KEY SOCIETAL GOALS.**

As Japanese food science looks to the future, there are fresh twists for an age-old cuisine. The ancient ways of preparing Japanese food, known as *washoku*, was listed in 2013 by United Nations Educational, Scientific, and Cultural Organization (UNESCO) on the Representative List of the Intangible Cultural Heritage of Humanity. This acknowledgement put the spotlight on this traditional Japanese cuisine and its emphasis on community cohesion, natural and seasonal ingredients and respect for nature through sustainable use of natural resources.

## FOOD FOR A LONG AND HEALTHY LIFE

When it comes to the health benefits of a traditional Japanese diet, it seems the proof is in the pudding — or the lack of it. Japan's low obesity rates, as measured by the OECD in 2017, are a success story. "The obesity rate and fat intake rate of Japanese people are low compared with other countries around the world," says Eriko Komiya, Director of Food Cultures Office, of the Overseas Market and Food Cultures Division in the Ministry of Agriculture Forestry and Fisheries. "These low rates relate to Japanese food culture and diet, for example, eating a nutritionally balanced meal using a variety of food materials and using soup stock, rather than oil, for cooking and flavoring."

Japan also consistently maintains the longest life spans globally for both men and women, according to a 2019 World Health Organization report,



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The impacts of both food preferences and of **DIFFERENT FOODS ON QUALITY OF LIFE** are particularly important for an aging society like Japan, says Professor Keiko Abe, whose research focus lies in the molecular logic of desirable tastes.



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**FOOD ATTRIBUTES**, according to Abe, are primarily nutrition, physiological function and personal preferences.



with diet an important contributor. The flip side of longevity, however, is a large aging population.

"With its high number of elderly people, Japan is particularly interested in next-generation science of functional foods that aim to improve both quality of life as well as a healthy, long span of life," explains Keiko Abe, Professor of Applied Biological Chemistry at the University of Tokyo.

Abe notes that the term 'functional food' was coined in Japan in *Nature* (1993) with the headline 'Japan explores the boundary between food and medicine' and the nation has a long history, underpinned by science, in developing, commercializing and regulating foods that promote health.

## EATING TO A HEALTHY HUNDRED

"Traditional foods in Japan are mostly of plant origin and they are already high in health-promoting elements such as polyphenols and microbial enzymes involved in fermentation of lactic acid, amino acids, oligopeptides and oligosaccharides," explains Abe. "These Japanese foods are being investigated for their efficacy in supporting good health, especially those that help slow mental or physical aging."

One example is the use of a common food additive, trehalose, a naturally occurring sugar that improves shelf life of food and pharmaceuticals. Japanese researchers from Hayashibara Co., Ltd. are also investigating its health applications given that trehalose induces autophagy, the body's natural process for removing damaged cells.

Fermented foods are well known for their health benefits and are characteristic of *washoku* as well as other cuisines, says Komiya. "Since the coronavirus pandemic in 2020, there is new attention on the relationship between fermented food in the Japanese diet and improved immunity," Komiya says.

## REACHING FOR THE STARS

The future of food is certainly about respecting the past while moving forward, explains Komiya. "We give priority to preserving and handing

down *washoku* to future generations," she says, "but also to creating new value through novel ways of utilizing food both in Japan and abroad, based on the international attention our food culture has gained."

Like the other heritage-listed cuisines — such as the Mediterranean diet — Japanese eating practices need research to better understand what underpins their benefits. This is a key current challenge for food science in Japan, says Komiya. "We need to increase the evidence base of the impact of the whole Japanese dietary lifestyle on health as well as having specific studies on the functionality and health benefits of individual food items."

The heritage listing of *washoku* is about more than just food: it also emphasizes a balance with nature and food sustainability. Support for food that sustains a healthy life and healthy planet requires commitment from the top, through government initiatives. For example, the Japanese government in 2019 announced an ambitious Moonshot Research and Development Program "with one of its goals being to balance healthy diets with sustainable food production by 2050," says Komiya.

Improved environmental benefits will also come from local actions such as reducing food waste along the chain from production to consumption. One such initiative is Fuji Oil's use of okara, a byproduct created during production of tofu and soy milks that, rather than being discarded, is now converted into a novel food additive thus halving the processing waste.

Sustainable and seasonal sourcing of produce is another element of *washoku* and increasingly diners are putting food sustainability issues on the menu. Similarly, Japanese chefs are progressively adopting initiatives such as Chefs for the Blue, with a focus on sustainable seafood. A similarly oriented partnership between the Japanese Culinary Association and Ryukoku University is scoping ideas to make Japanese cuisine a model for food sustainability in the world.

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Keiko Abe is a professor of Applied Biological Chemistry at the **UNIVERSITY OF TOKYO.**

**"Japan has the potential to become a global leader in providing scientific evidence on the impacts of specific foods in supporting a long and healthy life."**