

University near Suzhou, China.

“Traditionally, people think diet no longer matters when you’re old, but we show the opposite,” says Yan. She co-authored a study of 35,000 Chinese people aged 80 and over that shows sticking to a healthy diet is associated with a significant reduction in overall mortality⁷. “It’s never too late to pay attention to healthy eating,” Yan says.

Policy approaches

Facing the rapid increase in diet-related chronic diseases, the Chinese government has launched several strategic plans and policies in a bid to slow the trend. In *Healthy China 2030*, published in 2016, and the *National Nutrition Plan*, released in 2017, the central government pledged to cut Chinese residents’ salt intake by 20% by 2030, and “significantly slow the overweight and obesity growth rates”.

“The central government is paying unprecedented attention to residents’ health,” says Yan. But the policies have yet to be fully implemented by local governments and agencies.

The documents are generally advisory, says Jikun Huang, director of the Center for Chinese Agricultural Policy at Peking University in Beijing. “We made a nutrition plan advising people. But the guidelines aren’t that specific – they apply to women, men, children, rural and urban people. If you’re advising on the meat consumption and calorie count for everyone, you’re not going to get it right.”

Huang compares this advice to that offered by many countries in Europe, which he says suggests specific nutrition plans for individual age groups. “Without that detail, it’s much harder to advise people,” he says.

The government’s approach has been to focus on food security before worrying about good nutrition, he says. “It’s transformed gradually from grain economy and security. But I believe in the next ten years there will be more interest in public and government policy for health and nutrition.”

“We have a saying in China: you get enough to eat; then you eat better. It’s step by step.”

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Bean-curd-skin production at a processing plant in Tāizhōu.

RICH PICKINGS IN CHINESE FOODS

Studies reveal the benefits and risks of some Chinese dietary staples. **By Michael Eisenstein**

The richness and diversity of Chinese culinary culture is unsurprising given the country’s vast size and ancient history. But even though it would be reductionist to refer to a monolithic ‘Chinese cuisine’, there are some ingredients and foodstuffs that are particularly commonplace in the Chinese diet and whose roots stretch back across millennia, originating in the nation’s early history.

The modern Chinese diet has changed considerably, with a burgeoning middle class developing an ever-growing taste for Western menus. But traditional foods and ingredients continue to enjoy huge popularity at home as well as abroad, both for their flavour and for their nutritional benefits. Here is a summary of recent nutritional research into some of these traditional favourites.

For much of its early history, tea was brewed as a prescription rather than a refreshment. Legend has it that the Chinese emperor and herbalist Shennong – known as one of the fathers of traditional Chinese medicine – consumed the first cup of tea nearly 5,000 years ago, touting the drink’s detoxifying and invigorating effects.

Even today, the potential health benefits of regular tea consumption remain an active area of research. Although the magnitude and nature of those effects remain unclear, there is evidence that tea can confer protection against at least some chronic medical conditions.

In 2022, for example, Maki Inoue-Choi, an epidemiologist at the US National Cancer Institute in Bethesda, Maryland, and her colleagues published a study¹ monitoring how tea consumption affected mortality risk in almost



A soy-sauce bottling plant in Zhenjiang.

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500,000 middle-aged adults who participated in UK Biobank, a vast biomedical database. The researchers found that the overall risk of death was reduced by at least 9% in individuals consuming two or more cups daily relative to those who didn't drink tea, with a notably reduced likelihood of cardiovascular disease (CVD) mortality, which scaled with the amount of regular tea consumption.

Green tea – the most popular tea in China – is thought to be especially beneficial, because it contains high concentrations of a family of antioxidant molecules known as catechins. In 2022, Jung Eun Lee, a nutritional epidemiologist at Seoul National University, and colleagues, conducted a meta-analysis² of 12 prospective studies encompassing nearly 530,000 adults from across Asia. They found that green-tea consumption was associated with a reduction in overall mortality of around 9%.

Cell-culture and animal studies have suggested that catechins can positively influence cholesterol metabolism and vascular function, which could explain the apparent benefits of green tea in terms of protection against CVD. A 2023 analysis by Lian-Sheng Wang, a cardiologist at the First Affiliated Hospital of Nanjing Medical University in China, and colleagues, specifically probed this connection, evaluating five prospective studies involving nearly 650,000 participants. The researchers found that moderate green tea drinking (500–1000 millilitres per day) was associated with a 21–24% lower risk of stroke³.

Evidence for other health benefits is murkier. For example, there is currently little support for claims regarding tea's anti-cancer activity; neither the Inoue-Choi or Lee studies observed any reduction in cancer mortality. It also remains unclear whether tea protects against obesity and metabolic syndrome. Whereas some studies support this hypothesis, others have shown no protective effect. A 2023 prospective study of more than 2,000 Chinese adults at high risk of diabetes⁴, by Congrong Wang, an endocrinologist at Tongji University in Shanghai, China, and colleagues, suggested that regular tea consumption might amplify the risk by promoting insulin resistance.

Not so heavy on the soy sauce

An agricultural book dating to around AD 160, known as the *Simin yueling*, describes qing-jiang, a foodstuff derived from fermented soya bean paste and grain. This savoury condiment represents the earliest-known ancestor of soy sauce, a mainstay in kitchens across Asia – and indeed, much of the Western world.

The complex mixture of constituents produced during the fermentation process includes diverse antioxidant molecules such as melanoidins, which contribute to the sauce's distinctive deep-brown colour, as well as polysaccharides that arise from the degradation of the soya-bean cell walls by microbes. These molecules have exhibited potential anti-inflammatory properties in experimental settings. However, there is little evidence that

these compounds deliver meaningful health benefits to individuals who consume soy sauce.

By contrast, several studies have highlighted concerns that soy-sauce consumption could be contributing to an ongoing health challenge in China. A high-sodium diet greatly heightens the risk of CVD, and a 2019 analysis by the Global Burden of Disease initiative, a consortium of more than 9,000 researchers in 162 countries and territories, found that this represents the leading dietary cause of mortality in China⁵. It is estimated to account for up to half of the world's salt-associated cardiovascular deaths that year. To better understand the roots of this problem, researchers led by Wenwen Du, a nutritionist at the Chinese Center for Disease Control and Prevention in Beijing, analysed top-selling dishes from 182 Chinese restaurants and determined that nearly 9.4% of the sodium in these dishes was associated with the use of soy sauce⁶. Similarly, a 2020 study by nutritionist Yuna He and colleagues, also at the centre, analysed data from a nationwide survey of nearly 54,000 Chinese adults, and found that soy sauce accounts for 8.2% of dietary sodium – second only to table salt⁷.

But researchers are also looking to leverage the love of soy sauce as an opportunity to deliver dietary micronutrients. Selenium is an essential cofactor for proteins involved in cellular functions, including DNA repair and metabolism of thyroid hormones. And there is a sizeable belt of territory across central China wherein selenium deficiency in people

is a serious problem, owing to low levels of the element in its soil. Researchers led by Xianli Gao, a food scientist at Jiangsu University in Zhenjiang, China, have been exploring the potential of producing selenium-enriched soy sauce as a means to supplement this element in those communities⁸.

Noting that soy sauce offers an excellent biochemical medium for delivering selenium with high bioavailability, Gao and colleagues developed a preparation using a selenium-enriched hybrid soya bean variant that increased the amount of selenium delivered per serving ten-fold.

Sesame opens up healthier cooking

In many cuisines, sesame makes only an occasional guest appearance, but this aromatic legume and the products derived from it are commonplace in China's kitchens and fields – the country is among the world's top-five sesame producers.

Sesame oil is highly enriched with unsaturated fatty acids – which are generally linked with improved cardiovascular health relative to their saturated counterparts – including several essential lipids that cannot otherwise be produced in the human body, such as linoleic acid.

A large longitudinal study published in 2020 by Jingjing Zhao at Nanjing Medical University and Yu Zhang at Zhejiang University suggested that sesame oil is a healthier cooking oil compared with alternatives⁹. After monitoring health data and dietary surveys from around 15,000 Chinese adults over the course of 14 years, the two nutritionists and their colleagues found that heavy consumers of lard, peanut oil or blended plant oils had a 31–42% greater risk of developing type 2 diabetes, whereas the risk was essentially unchanged for the heaviest users of sesame oil.

Research into the putative medical benefits of sesame has focused largely on a family of molecules known as lignans, which include compounds such as sesamol and sesamin. So far, there is limited evidence for a clinical benefit from the consumption of sesame-derived lignans, either in foods or in purified extracts. However, cell and animal studies have revealed potentially interesting properties for these molecules.

For example, studies from a team led by Hong Qin, a nutritionist at the Xiangya School of Public Health in Changsha, China, have shown that treatment with sesamol is associated with reduced body weight and improved glucose and lipid metabolism in mice fed a high-fat diet¹⁰. Another study suggested that this compound promotes conversion of energy-storing white adipose tissue



Harvesting tea in Youyang Tujia and Miao Autonomous County.

into energy-burning brown adipose tissue¹¹. Although these results have yet to be replicated in human tissues, they hint at the potential clinical utility of sesame-derived biomolecules.

Tofu: a nutritional powerhouse

Historians think that tofu, a foodstuff derived from curdled soya milk, was first produced nearly 2,000 years ago. Over time, tofu would become a popular substitute for meat. Some studies have estimated that Chinese individuals consume anywhere from 10–40 grams of tofu per day on average, depending on the region¹².

Best known as a protein- and vitamin-rich source of nutrition, tofu is also laden with molecules called isoflavones, which have been tentatively linked to a range of health benefits, including a protective effect against CVD. Laboratory studies have assigned antioxidant and anti-inflammatory properties to these molecules, and indicated that they might also mitigate the vascular build-up of platelets and cholesterol as a prelude to heart disease.

Researchers led by Qi Sun, a nutritionist at the Harvard T.H. Chan School of Public Health in Cambridge, Massachusetts, analysed data from three cohorts comprising more than 200,000 men and women in the United States¹³. Their study showed that the consumption of at least one serving of tofu per week was associated with a modest but statistically significant 18% reduction in risk of coronary heart disease, with the benefits most notable in premenopausal women or postmenopausal women who were not receiving hormone therapy.

Isoflavones belong to a larger category of molecules known as phytoestrogens, which share structural features with the female sex hormone oestrogen, and a handful of studies and case reports have raised concerns that these soya-derived molecules could perturb

sexual development or even heighten the risk of breast cancer. However, a 2022 review of 417 published studies by Mark Messina, a nutritionist at the University of Loma Linda in California and his colleagues, found little cause for concern¹⁴. The researchers found no clear negative physiological effects of routine soya consumption, beyond the potential for slightly longer menstrual cycles.

Indeed, the literature offers evidence that soya-based foods such as tofu might instead confer some defence against breast cancer. For example, Qianghui Wang's team of nutritionists at the No. 906 Hospital of the Chinese People's Liberation Army Joint Logistic Support Force in Ningbo, conducted a meta-analysis¹⁵ of 14 cohort and case-control studies in 2020 and found that high tofu consumption was linked with a 22% reduction in breast-cancer risk. However, the authors note that more robust prospective studies will be needed to firmly establish a meaningful anti-cancer effect.

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