

Chapter 13



Is Japanese Food in Foreign
Countries Safe?

Is a lot of uncooked Japanese food in overseas countries safe? More than 80 % of Japanese-dishes-serving restaurants are kept by non-Japanese persons. Most of them are run by Asian people like Koreans, Chinese, Vietnamese, Filipinos and Indians and Latin American. Such a case as professional *sushi* cooks trained in Japan are working abroad is rare.

13.1 It takes much time to master making good *Sushi*

Japanese *sushi* cooks are usually trained in *sushi* restaurants more than 5 years under the *sushi* master. Although there are many varieties of *sushi*, the *sushi* mentioned here means *nigiri-zushi*. The *nigiri-zushi* is “hand-pressed *sushi*” that consists of an oblong mound of *sushi* rice (*shari*) that the chef presses into a small rectangular concaving between the palms of the hands, usually with a bit of *wasabi*, and a topping (the *neta*) draped over it. The *neta* is mostly fresh raw fish, so great care has to be taken to keep it fresh.

It takes *sushi* cooks much time to master making good *shari* in particular since the good *shari* depends on various fine conditions that are involved in species of Japanese rice like *koshi-hikari* and its steaming time and temperature. At the same time, thickness of rice vinegar, *komesu*, and the technique of mixing steamed rice with rice vinegar have to be noted, too.

13.2 Food sanitary education by *HACCP*

In the USA, cooks, waiters and waitresses must get food sanitary education. The law obliges every restaurant to employ at least one certified person of *HACCP*.

When I was once working for the Education and Research Center of Osaka University in San Francisco, which was established as an overseas base in the USA, a Japanese person visited me at the office. He said to me, “I have been working here in America as a cook and a restaurant manager for more than 30 years and I am teaching as a certified instructor of *HACCP*. I'd like to publish a book about *HACCP* in the Japanese language, but I'm not confident in translating scientific words of *HACCP* into the Japanese language. Would you introduce me a university professor who can manage to grant my request?” I answered immediately, “OK, I'll do it”. Soon, he published a book as to *HACCP* compiled under my supervision. Guidance of Japanese foods including *sashimi* and *sushi* are involved in this book^{*1}.

HACCP is the abbreviation of *Hazard Analysis Critical Control Point* under the Food and Drug Administration, USA (FDA). If we follow the guidance written in his book above-mentioned, we may not be stricken by food poisoning. The book shows us the standard of food sanitary knowledge, like ‘you should not touch rims of cups with hands when you serve customers’, ‘you'd better not dry your hands with the same towel’ or ‘you must pasteurize food under proper temperature and time and afterwards preserve it’. *HACCP* shows us the standard of food sanitation in detail so that every race of people can understand the importance of food sanitary knowledge.

By the way, *HACCP* was thought out from the plan of developing safe space foods by NASA.

13.3 You should take care when you take salad in developing countries

It will be all right in Europe and North America, but you should be careful in taking raw fish used in *sashimi* or *sushi* and fresh salad in developing countries even if they are served at the first-class restaurants. Water used for washing vegetables is hard to judge whether it is clean or not. Food materials are apt to be spoiled if they are left in warm surroundings. Overseas, there are few countries where people can drink tap water without anxiety, unlike Japan where people can drink it without any anxiety. In particular, we should take care in using ice. Most of it is made of tap water. As for me, I take care even when I brush teeth and use boiled water or water in a PET bottle during travels in developing countries. However, I don't worry about swimming in the swimming pools in the hotels or taking shower there. This is a contradiction, isn't it?

I will change the subject here. I sometimes go on a trek abroad. In those occasions like trekking on the *Pamir's* I touched in the first part of this book, or Himalayan plateau trekking I took part in five times, I had indigestions though I took much care. I guess that it is because I not only had infectious stomachache but also water there must have disagreed with me. I can suppose so because I also had stomachache in trekking on the heights of European Alps. I guess these symptoms are caused by water in the mountainous areas. Water streaming down from the glaciers is hard water which contains unusual minerals.

13.4 The key to safe transportation is the technique of preserving foods after sterilization

The most important point in circulating food is to preserve food as long as possible keeping its freshness and flavor after operations of sterilization. It takes a long time in exporting foods to foreign countries, so the technique of preservation is all the more important.

The theory of sterilization is to prevent microbes in the natural world from propagating in food. Therefore, we investigated growing characteristics of microbes and continued to make efforts to sterilize and take away bacteria by giving opposite circumstances. For instance, most microbes easily die if they are heated. They cannot survive under strong acid and alkaline circumstances. They cannot continue to exist in the surroundings including high concentration of salt or sugar. They die soon without water. They stop the growth under low temperature circumstances and cannot grow at all if they freeze. Since we realized these characteristics of microbes, we tried various methods of preserving food by knowledge obtained from experiences.

We now use sterilization by heat, ultraviolet rays and chemicals like chlorine, cationic soap, alcohol, ozone and hydrogen peroxide. We also prevent bacteria from increasing by producing dried goods, salted food and sugared food (Fig. 13.1) and by using low temperature sterilization. We also take away microbes by filtering, washing and using centrifugal machines. Pickled foods and *sushi* prevent bacteria from propagating owing to acetic acid and vinegar, but they cannot be sterilized.

However, these characteristics of microbes have subtle difference of strength and weakness according to the species. For example, *Bacillus*, *Streptomyces*,

Botulinus and molds which form spores in the cells cannot die even if they are heated at 100 °C (212 °F). This is because of their life conservation, that is to say, they are keeping their life for the future in shells called spores. Some scientists say, therefore, that the origin of life on our earth is the spores which came from far space. Nevertheless, these spores of microbes die if they are heated to about 120 °C (248 °F) under the certain pressure for 30 minutes. The machine devised by using this characteristic is autoclave, which is used for microbial experiments and sterilization of medical instruments.



Fig. 13.1 *Samples of preserved foods.*

Upper, dried foods; lower left, salted bacon; lower right, sugared fruits. Under these conditions microbes are hard to grow in foods.

Long-term preservation of food became possible by popularization of refrigerators and freezers and food poisoning has been decreasing. The method of transportation called cold-chain was born in the USA and it spread to many countries. Nowadays, refrigerator cars are carrying food keeping their freshness. It is natural that this method of transportation costs much in case of long distance.

13.5 New technique of sterilization for keeping freshness

Sterilization by heat, chemicals or ultraviolet irradiation is OK for sterilization of medical instruments. However, they are not good in case of food. They damage

flavors of food and destroy nutrient substances like vitamins. After all, we demand fresh foods which keep natural original flavor. In order to meet people's expectations, various methods of sterilization such as, the high pressure sterilization at room temperature, the low pressure sterilization with carbon dioxide at room temperature and the super critical extraction methods have been developed, and some of them were developed by Japanese researchers and engineers.



Fig. 13.2 *Sashimi and wasabi.*

Left, *fugu sashimi* (law globefish); right, raw fish *sashimi* with *wasabi* (Japanese horse-radish). *Wasabi* is essential for *sashimi* to enhance umami taste and mask their fishy smell.

For example, by using the high pressure sterilization method, a low salt soy sauce keeping good flavor is developed. The salt concentration is less than one tenth of the ordinary soy sauce. By this sterilization method *sashimi* of *fugu* (*Takifugu rubripes*) is exported to a California restaurant. The *fugu sashimi* has a very good taste, but people are afraid of *fugu* toxin, and thus only the certificated cooks can serve *fugu* dishes (Fig. 13.2). Instead of the ordinary chemical chloride sterilization, the method of using the low pressure with carbon dioxide sterilization started to be tried and some food companies began to send fresh Japanese vegetables to overseas consumers.

13.6 *Sashimi* is swimming in *Shoyu*, soy sauce

In Japanese food restaurants in Europe and America, much *wasabi*, ground horseradish and *shoyu* are brought before customers as condiments of *sashimi* (Fig. 13.2). I guess people in Europe and America like *wasabi* and *shoyu* as well as *sushi* and *sashimi*. I often notice them eating *sushi* and *sashimi* dipped deep in *shoyu*. Their way of taking *sushi* and *sashimi* like that is good in a sense, for *shoyu* has a masking effect of removing fishery smell and is effective as a way of sterilization.

13.7 Summary

HACCP shows us the standard of food sanitation in detail so that people dealing with foods can have enough knowledge of food sanitation by this guide.

The theory of sterilization is to prevent microbes from propagating in food. Most microbes die by heating and they cannot grow under strong acid, alkaline, high concentration of salt or sugar or without water or freezing conditions. They stop the growth under low temperature circumstances. The most important point in circulating food is to preserve food as long as possible keeping its freshness, flavors and nutrients after the sterilization. Strong sterilization methods cannot be used for foods, therefore recently several new technologies to keep food fresh have been developed.

*1 Yasuda, T., and Murooka, Y. 'Food Safety Management by HACCP (in Japanese)', Korin, Tokyo (2006).

