

## Rice Cooking in Japan

### The Development of the Rice Cooker and the Vagaries of Rice Consumption in Japan

*Le développement du cuiseur à riz et les aléas de la consommation de riz au Japon*

**Voltaire Cang**

---



**Electronic version**

URL: <https://journals.openedition.org/ephaistos/9820>

ISSN: 2552-0741

**Publisher**

IHMC - Institut d'histoire moderne et contemporaine (UMR 8066)

**Electronic reference**

Voltaire Cang, "Rice Cooking in Japan", *e-Phaïstos* [Online], X-1 | 2022, Online since 05 April 2022, connection on 06 April 2022. URL: <http://journals.openedition.org/ephaistos/9820>

---

This text was automatically generated on 6 April 2022.

Tous droits réservés

---

# Rice Cooking in Japan

The Development of the Rice Cooker and the Vagaries of Rice Consumption in Japan

*Le développement du cuiseur à riz et les aléas de la consommation de riz au Japon*

**Voltaire Cang**

---

- 1 In the global pandemic year of 2020, the average retail price for the rice cooker in Japan reached 39,500 Japanese yen, or slightly above 310 euros, in September. This was the highest sale price for the household appliance in the most recent decade, as announced by a Japanese consumer price tracking organization that utilises government statistics to obtain and compile retail prices of several hundred daily consumer goods and services nationwide (JP Market Conditions 2020).
- 2 The rice cooker's premium price but only reflects recent market trends, as its retail value has risen steadily in the past thirty years. Along with this steady rise in price has been a parallel, if not exponential, growth in its technical capabilities: From the rice cooker's beginnings as a simple rice-boiling machine, it has now evolved into a state-of-the-art, AI (artificial intelligence)-enabled kitchen equipment that, as one current model is described, is cognitive to the point that it judges consumer taste preferences while it "learns" from past cooking experiences and adjusts to the cooking "flow" to cook ideal rice' (Zojirushi 2020). Aside from cooking 'ideal' and 'perfect' white rice, this rice cooker and most of its counterparts from other manufacturers can also make hassle-free risotto, paella, porridge, biryani, and almost every other rice dish, in addition to soups, pasta, meat and vegetable dishes, breads, cakes, and many other foods and desserts. In short, it is now entirely possible to cook a full course banquet meal with the rice cooker doing most of the thinking and preparation.
- 3 This paper examines the cultural history of the rice cooker in Japan. In particular, it traces the major transformations undergone by the rice cooker from its rudimentary form in the early 20<sup>th</sup> century and post-war periods to its development today and correlates these transformations with shifts in the Japanese diet, especially with regard to rice consumption. While rice is considered as Japan's most important food

throughout its history, Japanese attitudes towards it have shifted along with dietary habits, especially in the last several decades; accordingly, the rice cooker has developed along with the vagaries of rice consumption.

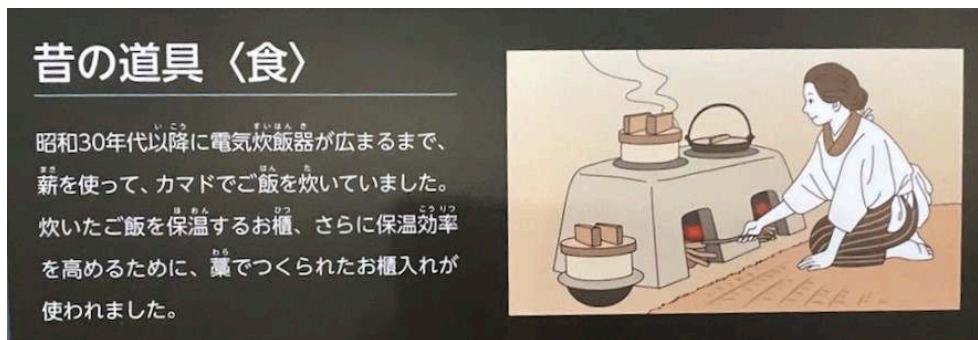
- 4 Since the period around the publication of Ohnuki-Tierney's seminal study on rice and Japanese identity, several studies have discussed rice's significance to Japan's social, political, economic, and cultural life (Ohnuki-Tierney 1994). However, only a small handful of scholarly works have linked the study of rice to technological issues, with majority of these works limited to technology in rice production and agriculture, understandably. As for technology's relationship to rice consumption, there is a dearth of research especially in the domestic arena. Indeed, very few works in English have explored the links between rice consumption and technology in the home, technology that is most conspicuously and singularly represented by the rice cooker. Among the notable and perhaps only studies in the English language that give the rice cooker pride of place are Yoshiko Nakano's book, *Where there are Asians, there are rice cookers* (2009), and Helen Macnaughtan's chapter article, 'Building up steam as consumers' (2012). However, both studies focus on the rice cooker as a consumer product, with Nakano singling out one company and detailing its product development and marketing processes mainly in Hong Kong, and Macnaughtan focusing on women's roles in the development and consumption of rice cookers as household goods in Japan. This present study supplements the literature with its historical outline of the rice cooker's technological development as it links such chronology to the history of rice consumption in the Japanese home, neither topic of which, much less both together, had been discussed in detail in previous studies.

## Beginnings in the 1920s and the traditional *kama*

- 5 The Japan Electrical Manufacturers' Association (JEMA) lists 1924 as the year when the 'electric [rice cooking] pot' was first produced and sold in Japan (JEMA 2020b). This prototype cooker was made by Mitsubishi Electric, an electrical equipment manufacturer founded in 1921 that is now a vast global manufacturing and services conglomerate. (JEMA mentions an 'electrical heating device' for heating rice, rather than cooking it, that appeared earlier in 1921, although other details are not supplied.) Mitsubishi Electric has one such rice cooker on display in its corporate headquarters today, although the date of manufacture is listed on the display plaque as 1923, one year earlier than the date broached by JEMA (&GP 2016). Although the manufacturing dates differ, both JEMA and Mitsubishi Electric proclaim this cooker to be the first kitchen equipment in Japan that used electricity to cook rice.
- 6 This early prototype rice cooker was made of anodised aluminum. It has the same size and appearance as the common aluminum cooking pot still used in many Japanese kitchens today, with similar handles on both sides of its body and on the lid. Its main difference with the aluminum pot, however, is the power plug affixed under one of the handles on its body that allows it to connect to a power source. A flat metal plate of the same anodised material is also fused to the bottom of the pot, which steadies it when placed on different flat surfaces, as it was initially designed for use in moving vehicles such as in ship kitchens as well as in field kitchens during wartime (&GP 2016).
- 7 These early prototype rice cookers, however, were not more than 'stoves and tubs to which heating coils were attached' with their only function to boil water for cooking

rice (Toshiba Science Museum 2020). They also required electricity, which was still a widely unavailable, unstable, and expensive energy source at the time (Kikkawa 2012). As such these early rice cookers could not replace the traditional *kama*, that is, the cauldrons which were used on *kamado*, or the wood-fired household stoves (Fig.1). Moreover, not only were the prototype cookers unusable on *kamado*, they also required different and more rigorous methods to clean, making them more labour-intensive than the *kama* (Macnaughtan 2012).

Fig.1. Illustration showing *kama* cauldrons on the ground and on the *kamado* stove



Titled 'Old utensils (Food)', the description notes that *kama* and wood-fired *kamado* were commonly used to cook rice before the diffusion of electric rice cookers in the mid-1950s in Japan.

Photo image by the author, from a display board at *Kyōdo-no-Mori Hakubutsukan* (museum) in Fuchu, Tokyo

- 8 The *kama* has an ancient provenance and is still used today. It is typically made from cast iron and shaped with a globular bottom, and usually has a flange (the 'wing' or *hane* in Japanese) around the middle of its body (Fig.2). This flange or wing enables the *kama* to fit securely into the hole in the *kamado*, so that only the bottom half of the pot is in direct contact with the fire; the wing also prevents overboiling liquids and ingredients from the pot to flow into the fire. The rounded bottom of the *kama* – the flanged version is specifically called *hagama*, literally 'winged cauldron' – results in better heat convection and even cooking and, consequently, better-tasting rice than if cooked in other pots. *Kama* are generally equipped with wooden lids, which can absorb excess water during cooking, and which are purposely thick and heavy to better seal in heat and prevent excess spillage.

Fig.2. *Kama* displayed at the *Kyōdo-no-Mori Hakubutsukan* (museum) in Fuchu, Tokyo



The *kama* is placed on a straw pot rest ; behind it is an old wooden refrigerator.  
Photo image by the author

- 9 Domestic and professional chefs in Japan today still consider the *kama* as the most ideal equipment for cooking rice, although it involves more work to clean and maintain so that most cooks today resort to using the rice cooker. More labour is also involved when cooking rice with the *kama*. Indeed, cooking rice, especially japonica white rice, into an 'ideal' state, that is, soft and moist but still chewy as favoured by most Japanese, is a laborious and complicated process, even as it is basic to Japanese cuisine. Cooking white rice entails constant attention and control over many aspects, such as temperature levels and boiling times, and also demands careful timing.
- 10 One of the most detailed and methodical instructions for boiling 'Japanese-style' white rice that was written in English is from Shizuo Tsuji, the late Japanese culinary expert and educator. Tsuji was originally a scholar of French cuisine and gastronomy who later established a chef training school in Osaka, the Tsuji Culinary Institute, that has become the largest school for professional chefs in Japan today. Tsuji wrote more than 30 books on cuisine in Japan but had only one work that was published in English, *Japanese Cooking: A Simple Art* (1980). This work, however, has retained its status as a quintessential and authoritative guide to Japanese cuisine more than 40 years since its publication, as underlined by a lavish 25th anniversary edition that was released in 2006 (Tsuji 2006). In his tome, Tsuji expressly declared that 'it takes 20 years to acquire enough experience to make truly perfect rice' (Tsuji 1980 : 273), adding that 'only experience and your own taste can be your ultimate guide' (274) to cooking rice in the Japanese way. Despite these words of caution, Tsuji did guide his reader through cooking 'perfect' rice and described the standard procedure as follows.

## The ideal and complex way to cook rice, and prewar rice consumption

- 11 Tsuji instructs the cook to wash the rice thoroughly before cooking and to change the water several times until it becomes clear ; this will help avoid ‘smelly’ cooked rice. The repeated washing also allows the rice to gradually absorb water and tenderise the grains. The rice is then drained and left to stand some 30 minutes to an hour before it is cooked. Tsuji mentions that some cooks will soak the rice for about one hour in the water it is to be cooked in, although he adds water just before cooking, as the rice would have already absorbed enough water while it was washed. (He also admits that he prefers the taste of rice cooked this way.) The rice, with the precise amount of water added, is then put in a tightly-covered pot and heated slowly until it reaches boiling point. Once the water boils, the heat is turned up ; at this point the rice will produce a starchy liquid that bubbles vigorously in the pot. When the bubbling stops, the heat is turned low to cook the rice until it absorbs all the liquid. The heat is finally turned off and the pot is left to stand for about 20 minutes for the rice to ‘settle’ and cook further using the steam and heat left inside the pot. The lid is never opened throughout the cooking process ; only after this final stage can the pot be finally uncovered and the rice fluffed just before it is served (Tsuji 1980).
- 12 This was, and still is, the standard process for cooking rice in Japan. It was the method followed when using the *kama* in *kamado* kitchens ; the advent of the first electric rice cooker did not, and could not, change it. Since this early cooker also involved even more work in the kitchen as it also required unstable but expensive energy, it never forayed into Japanese households. Most importantly, however, it was prohibitively overpriced. Mitsubishi Electric had lost most of its records for its first rice cooker in the Great Kantō earthquake and ensuing fires that devastated Tokyo and the surrounding prefectures in the same year of its release in 1923, but the manufacturer still has at least one surviving product pamphlet from the era that lists its selling price. Though undated, the pamphlet indicates a price of 3,980 yen (&GP 2016). If this pamphlet had been issued in the 1920s, it would mean that the cooker cost twice the price of the Ford automobile, which then sold for around 2,000 yen in Japan.
- 13 This early rice cooker was indeed a very expensive utensil, and for what was then still an expensive food item for most Japanese. The 1920s were particularly years of instability for rice, with Japan still reeling from the rice riots that raged in 1918. The riots had started small, sparked by complaints lodged by a fishing community in Toyama in northwestern Japan against the authorities concerning the inflated prices and inadequate supplies of rice, despite their region being one of the bigger rice producers in the country. The complaints precipitated similar protests in other regions, and grew to include labourers in other dissatisfied sectors such as the coal mining industry, which protested their work conditions along with the food situation. Many of the protests intensified into violent confrontations and spread nationwide, eventually culminating in the resignation of the ruling administration in September 1918, only two months from the first protest in Toyama.
- 14 Although some semblance of stability was established after the rice riots, rice production was still insufficient and, thus, rice remained an inaccessible food commodity. Japanese food scholar and historian Rath (2016) notes that in the 1920s very few among the general populace ate white rice on a regular basis, and especially in



the rural areas, rice was often ‘diluted with other grains such as wheat, millet and barnyard millet and vegetables such as daikon [radish] in a portion of seven parts grain or vegetables to three parts rice’ (85), even among the wealthiest village families. The proportion was reversed for urban residents, who usually ate a mixture of three parts barley to seven parts rice. Several surveys conducted among Tokyo residents in the 1920s and into the 1930s showed that up to 75 percent used barley as ‘an important staple to augment the rice, in the familiar ratio of seven to three’ (87).

## Post-World War II and the revolution in the kitchen

- 15 World War II would exacerbate food insufficiency in Japan, and the nation could barely feed itself in the decade after its defeat in 1945. The supply of rice in 1945 ‘(at 80 kg/capita) was at a near-starvation level, and although it recovered to 120 kg in 1946, it remained precarious until the early 1950s’ (Smil & Kobayashi 2012: 16). The government, however, pursued aggressive agrarian policies, including nationwide land reform, the creation of irrigation systems, and the promotion of chemical fertilizer use. As a result, rice production significantly increased from 1955, and by the late 1960s, Japan finally became self-sufficient in rice (Harada 2005).
- 16 It was within this socio-economic context that the first automatic household electric rice cooker made its entrance. In late 1956, the manufacturer Toshiba released the first kitchen machine in the world that ensured a ‘fail-safe and easy way to cook rice with a mere flick of the switch’ that prompted a ‘revolution in the kitchen’ (JEMA 2020b). The circumstances surrounding the development of this revolutionary product bear some detailed discussion here.
- 17 In its official account and history of the first commercially successful rice cooker, Toshiba singles out and identifies only project leader Shogo Yamada by name (Toshiba Science Museum 2020). However, Macnaughtan (2012), referring to a documentary produced by public broadcaster NHK, gives majority of the credit to factory owner and engineer Yoshitada Minami and his family, especially his wife, Fumiko. Born in Ehime in the island of Shikoku in western Japan, Minami had moved to Tokyo where he ran a small factory that made parts for electric water heaters and ice machines; he also undertook subcontract work for big manufacturers, which included Toshiba. In 2019, the Ehime Prefectural Science Museum honoured Minami, which called him its ‘native son’, with a permanent exhibit named *Minami Yoshitada no hatsumei to gijutsu* (Yoshitada Minami’s inventions and technology). The museum categorically identifies him as the ‘inventor’ of the rice cooker, and displays Toshiba’s 1955 machine front and center at the exhibit (Asahi Shimbun Digital 2019).
- 18 As Macnaughtan (2012) relates, it was Fumiko who had performed most of the cooking tasks for the project. She conducted countless experiments using her own *kama* as well as other existing electric rice cookers, in the process laying the foundations for the successful development of the first rice cooker. Fumiko also experimented with prototype machines made from different materials that were produced in her husband’s factory. Many of the experiments were conducted in sometimes difficult weather conditions, as it was necessary to simulate the diverse climate of the Japanese archipelago. Indeed, Fumiko’s critical role cannot be overstated, as she also represented the end-consumer of the new product: the Japanese housewife who had to

cook rice for up to three times a day, which according to most housewives at the time was their ‘hardest chore’ (Macnaughtan 2012 : 82).

- 19 One of the major stumbling blocks of the project involved the development of technology to automatically turn off the heat at the proper time, so as to not scorch the rice or undercook it. By this time, the project members had already been able to produce a machine that cooked rice at a high temperature for 20 minutes, which was calculated to be the ideal cooking time, after which the heat needed to be turned off immediately. (Obviously, this function needed to be automatic, as manual operation would simply defeat the purpose.) The problem was eventually solved through a simple but creative method: An outer pot was formed around the inner cooking pot, which was to be filled with water that would evaporate in exactly 20 minutes. The evaporation would cause the outer pot’s temperature to rise over 100 degrees Centigrade, prompting a ‘bimetallic’ thermostat in the pot to bend and turn the switch off. This method, according to the manufacturer, was ‘simple and elegant, and uniquely Japanese’ (Toshiba Science Museum 2020). Once this issue was solved, Minami then devised a triple-layered iron exterior so that the machine could be used even in frigid conditions, solving one of the last hurdles in producing the first commercially viable and dependable rice cooker (Macnaughtan 2012).

Fig.3. Advertisement for Toshiba’s rice cooker, priced at 3200 yen, from 1956



Image from Wikimedia Commons

- 20 All in all, the development process for Toshiba’s rice cooker took at least five years, from its planning in 1951 to commercial release in 1956. The first units were sold for 3,200 yen, at a time when the civil servant’s starting monthly salary was 10,000 yen. But the rice cooker had arrived at an opportune moment: Not only was Japan close to achieving self-sufficiency in rice production – there was going to be enough rice to



cook – its economy was also taking off at the same time, with more people with more money to spend. With the economic prosperity also came more opportunities for work, resulting in an increasing percentage of women – the domestic cooks – joining the labour force. In the years immediately following World War II, the labour participation rate for women in Japan was only slightly above 30 percent, but it rapidly grew to 50 percent in 1950, peaking at 56 percent in 1955, before hovering around the 50 percent mark in the ensuing decades (Osawa 1988 & Rani 2006). As cooks in the home who worked outside during the day, women needed as much help as they could get in the kitchen, which was ready to be supplied by Toshiba's rice cooker. It sold very well, that in the year following its release Toshiba was producing 200,000 units per month. Five years later, in 1960, half of all Japanese households were reported to own a rice cooker (Macnaughtan 2012) (Fig.3).

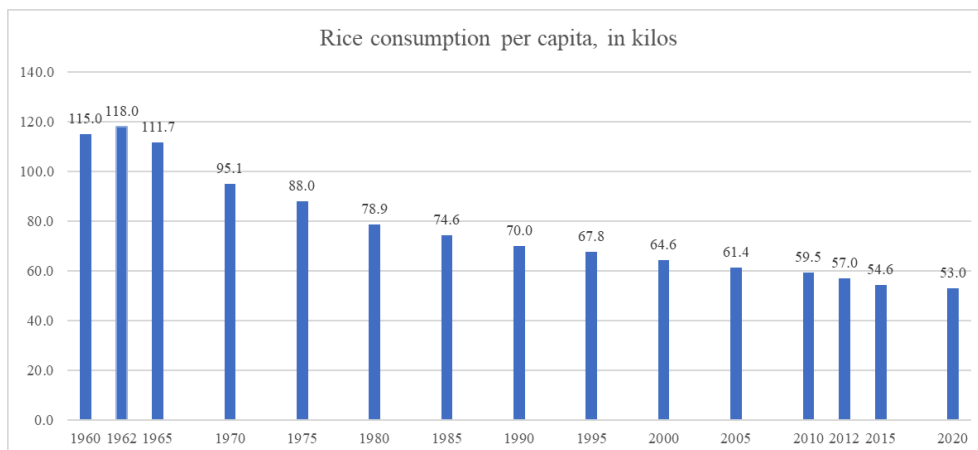
## Radical shifts in family eating habits and rice consumption

- 21 Toshiba continued to improve on its product, adding functions like a timer that would allow the working wife to set it in the morning before leaving for her job and coming home to the rice already cooked in time for dinner. Other manufacturers would also begin production of their own rice cookers to rival Toshiba's, such as Matsushita Electric (under its brand, National, now Panasonic), which released its first electric cooker in 1959 (Nakano 2009). The manufacturers also sold warming pots, to which freshly cooked rice would be transferred and kept warm when rice was served at different times.
- 22 The warming pot was an important accessory for the rice cooker, as white rice is never eaten cold in Japan, except perhaps when it is served as sushi. (Even then, the rice in hand-pressed sushi – *nigiri* – is still slightly warm when served, at least in the more traditional sushi restaurants. Sushi rice is also a different rice dish altogether, being vinegared and sweetened.) Rice served cold carries negative connotations: A common Japanese phrase, *hiyameshi wo kuu*, literally, 'to eat cold rice', is used when referring to a person who is neglected or ignored, that is, 'given the cold shoulder'. The phrase originally referred to the practice in traditional households of caring for the first son, the family heir, better than his other siblings. The practice was evident especially at mealtimes, when he was served first and ate before other family members, who had no choice but to eat rice that had already gone cold.
- 23 Warming pots, however, would lose much of its sales after 1972, when Mitsubishi Electric developed a rice cooker that continued to keep the rice warm after cooking. The additional warming function is considered to be the first major development in the rice cooker's evolution after its commercial release in 1956 (Hirata 2002). Although households in Japan today use microwave ovens to reheat – and cook – food, including white rice, these were still expensive and mostly used in the restaurant industry until the late 1970s, when reasonably-priced ovens began to be sold for domestic use.
- 24 The rice warming pots and, later, the rice cooker's newly developed warming function had become vital in the context of changing Japanese family dining habits during this period. Many authors on Japanese food culture refer to the 1960s and into the early 1970s as the time when a drastic change in family dining habits occurred in Japan:

Fathers especially – the so-called economic warriors – often came home late from work, sometimes when the children had already gone to bed, so that members of the same household were now taking their meals separately; this would remain to be the case until the present (e.g. Kumakura 1993 & Watanabe 2005). Despite the different mealtimes, the new rice cookers ensured that everyone in the family was still able to eat warm rice.

- 25 In this same period in the 1960s to the early 1970s, rice was still a major part of the Japanese diet. The peak of rice consumption in Japan had been reached in 1962, when an average of 118 kilograms was consumed per capita in one year (Japan Times 2015), and annual rice consumption averaged at about 110 kilograms per person throughout the 1960s. Rice was also a major source of calories, accounting for nearly half during the same period: In 1965, for example, 44 percent of food calories came from rice, with wheat amounting to 12 percent, and vegetables, meat, fish, oils and other food items making up 8 percent or less each.
- 26 However, economic prosperity would not only change how Japanese families ate; more importantly, it would change what they ate. '[B]eginning in the 1960s...[a]ll at once, Western foods, which had gradually found their way into the Japanese diet since the Meiji Period (1868–1912), seemed to take over the Japanese diet' (Watanabe 2005: 2). Rice would be the most prominent food to be affected by this 'take over': By the beginning of the 1970s, annual consumption would fall below 100 kilograms per person per year, sharply declining to less than 80 kilograms by 1980, and 70 kilos at the start of the 1990s. In 2012, rice consumption went down to 57 kilograms per person, less than half the amount exactly 50 years earlier in 1962 when it was at its peak (Japan Times 2016).

Table 1. Annual rice consumption rates in Japan



Based on data from MAFF 2020.

- 27 Diminishing consumption does not mean that the Japanese had grown tired of rice, however. It was still an important part of the diet, but it was now competing for a place at the dining table with many other food items coming in from elsewhere. That is, Japanese simply ate lesser amounts of rice to make room for other foods, especially bread. While Japan gradually increased its rice production level to finally achieve self-sufficiency, Japanese households have also augmented their diet with more and different kinds of bread, to the point that from 2008, they have been spending more

money on bread than rice, as reflected in the annual survey results of household spending by Japan's Statistics Bureau (Statistics Japan 2020). Rice has continued to occupy a central if sometimes symbolic role in the diet, nevertheless, and rice cooker manufacturers have carried on manufacturing and improving their products. The next major development in the rice cooker's evolution would come in 1979 when computerised – or microprocessor-equipped – rice cookers appeared in the market.

## The revolution of computerised rice cookers

28 Microprocessors brought a plethora of new functions to the rice cooker, chief of which was the ability to control the temperature in incremental and precise levels. As outlined above, the recommended method for cooking white rice in Japan involves several cooking temperature adjustments throughout the process. This was not possible with earlier rice cookers: Although automatic, they could only cook rice at fixed temperatures and cooking times. Through microprocessors, the new cookers could now cook within a wider range of temperatures and time settings, which resulted in more precisely-cooked and, thus, better-tasting rice. In addition, computers allowed the user to also cook different amounts since, obviously, varying rice amounts entail varying heat levels and cooking times.

29 With their computerised systems, these new machines produced rice that was close to the ideal for most Japanese. In other words, they now resembled the closely-monitored cooking process using the traditional *kama*. In general, the computerised cookers cooked rice in four main stages, a process that is still followed in today's cookers. This process is summarised as follows, with reference to Hirata (2002).

### 1/ Soaking and pre-boiling rice stage

As mentioned earlier, rice is often soaked in the water it is to be cooked in to allow its starch granules to soften and swell. Soaking usually takes at least 30 minutes in summer or in warm weather, and one hour or more in wintertime. (Absorption is faster with warm water.) Only after sufficient soaking could the actual cooking process begin, but the computerised rice cookers freed the cook from this preliminary preparation step: She only needed to put in the right amount of water with the rice into the cooker, which would calculate and raise the water temperature to the appropriate level to allow maximum water absorption, after which it would start cooking the rice.

### 2/ Boiling stage

Once the rice has absorbed enough water, the temperature rises automatically to boiling point so as to cook the rice rapidly without breaking up the grains.

### 3/ Maintaining boiling point

The cooker maintains boiling temperature until the rice has absorbed all the liquid in the pot.

### 4/ Steaming

The rice cooker then lowers the temperature when all the liquid is gone, and continues to cook the rice with the steam in the pot as well as from the heat of the pot itself. This process results in further gelatinisation of the rice down to its core, at the same time removing extra moisture from the surface of the grains, thereby preserving the stickiness of the rice but not making it mushy, as preferred by many in Japan. The rice cooker then turns itself off, or shifts to the warming mode, when it deems this final process to be done.

30 All in all, microprocessors made cooking rice even less of a burden especially for the wife or whoever else cooked for the family. She could also cook different amounts

depending on how many members of the family would be home for dinner. And if she were so inclined, she could also make other kinds of rice dishes, such as porridge, boiled unhusked rice (*genmai*), or rice mixed with vegetables and other ingredients (*takikomi gohan*), among others, with microprocessors taking care of many of the calculations.

## Emergence of induction heating (IH) technology and a reassessment of rice

- 31 Another major development was in the offing less than a decade after the appearance of computerised cookers: In 1988, Panasonic released the first rice cookers that incorporated induction heating (IH) technology. With IH, the heat source would no longer come from outside the pot, but from the pot itself which generated the heat through coils embedded in its body. IH technology also made it possible to raise the temperature rapidly and evenly inside the pot, further mimicking the better qualities of the traditional *kama*. Consequently, IH technology resulted in more evenly-cooked rice and also allowed it to remain warm for longer periods. The use of IH would mark the last significant development in the evolution of the rice cooker: Today, at least 4 in every 5 units manufactured in Japan incorporate the technology (JEMA 2020a).
- 32 By the time IH rice cookers appeared in the late 1980s, however, rice was already a much-diminished presence in the Japanese diet. While Japan had achieved rice self-sufficiency more than two decades earlier – when the population also ate the most rice – overproduction was now fast becoming a problem. Eventually, the government was forced to buy and store surplus rice from its farmers, who were important politically and were thus coddled. In the late 1980s and into the early 1990s, the government also devised programs to increase rice intake in school lunches and even encouraged more sake drinking to elevate consumption levels (Ohnuki-Tierney 1994). A rice crisis in the early 1990s, however, would prompt Japan to reassess the role of rice in its diet, as well as in society and culture as a whole.
- 33 The eruption of Mount Pinatubo in the Philippines in 1991 had disrupted global weather patterns; its effects on climatic conditions in Japan were keenly felt in 1993, bringing an inordinately long rainy season and low temperatures from spring all through summer. Critically, the cold and wet conditions prevented rice stalks that had been planted in spring from maturation, and majority of the rice-growing regions failed to harvest enough rice to fulfill the government food quota and adequately supply the local market. Prices of domestic rice shot up as a result, sometimes going up to 18,000 yen for a 10-kilo bag, about six times the regular retail price at the time (Reid 1993). The crop failure and accompanying price rise prompted hoarding among suppliers and panic-buying among consumers, with a black market also sprouting to cash in on the crisis. To alleviate the situation, the government resorted to rice importation, a policy that it had resisted for the past three decades when the country had achieved rice self-sufficiency. Among the first batches of rice to arrive in the country was jasmine rice from Thailand, which is perhaps the most polar opposite variety to japonica rice in Japan: While the former is a long-grain and non-sticky variety that emits a pandan-like aroma, the latter is short-grain and sticks together when cooked, with its own distinct fragrance.

- 34 Most Japanese consumers considered Thai rice ‘strange-tasting’ and ‘inferior’ to Japanese rice and was resisted even by professional chefs (Sanger 1994). (The paper’s author, who was living in Kyoto in 1993, remembers the rice crisis very well. He witnessed piles of Thai rice, sometimes priced as low as 100 yen per one-kilo pack, lying unsold in many supermarkets and rice shops as these were ignored by customers in lieu of domestic rice, which were frequently out of stock.) Japanese consumers’ unfamiliarity with foreign rice and their corresponding rejection of it exacerbated the crisis. To them, white rice had to be prepared and eaten in a certain way, that is, soft and sticky, moist, and yet still chewy. It was how rice cookers cooked it, even as it was also why they had evolved, were developed, and were now programmed to cook rice, preferably locally-grown japonica rice. (Later, rice would also be imported from California, which had been producing the same variety of japonica rice. Being ‘foreign’, however, it also did not sell well. Culinary nationalism, that is, the assertion of singularity and superiority of one’s food over another nation’s, also came into play during this time, although space reasons prevent lengthy discussion in this present paper.)
- 35 The rice crisis was short-lived, though, as the domestic rice crop revived to normal levels the next year, in 1994. In hindsight, one could say that there was no crisis per se. After all, the Japanese could have had enough rice to their hearts’ content, except that much of it did not come from their own fields. However, crisis or not, the rice crop failure of 1993 was a time of reckoning for most Japanese with regard to their relationship to rice, confirming as it did the central place of rice in Japan’s culinary psyche despite their diminishing consumption of it. And the rice was not to be any other kind but Japan’s own japonica, which is eaten best in the form of ‘perfectly steamed rice’, meaning ‘rice, usually a domestic variety, that is pearly, moist, and yet fluffy – each grain of rice distinct from the others’ (Nakano 2009 : 154). Manufacturers had always been aware of this specific rice taste preference of the Japanese. Looking at the history of the rice cooker up to this point and continuing onto the very present, it was this goal, that is, the production of ‘perfectly steamed rice’, for which all the technologies had actually been invented and developed.

## Rice cookers today

- 36 Although microprocessors and IH technology vastly improved the rice cooker, they also resulted in greatly increasing its price. IH especially was an expensive innovation. According to a Matsushita Electric (Panasonic) director, ‘With the introduction of IH (induction heating) [in 1988], the average price for rice cookers increased dramatically. It went up again in 2003, when our company introduced [high-temperature] steam models. Then, one of our competitors introduced a \100,000 model, raising the average price even further’ (Nakano 2009 : 155).
- 37 Today in 2020, prices for the rice cooker continue to rise as manufacturers constantly pursue further technological innovation. The relentless pursuit of technological prowess in the rice cooker was the main subject of an article from an industry publication released recently in October 2020, a short summary of which is provided here. In the introductory comment, the article emphasised that the global pandemic has only strengthened the resolve of the manufacturers to improve their rice cookers

even more, especially in light of higher numbers of people now cooking and eating more frequently at home (Dempa Digital 2020).

- 38 The article singled out three manufacturers that recently released high-end rice cookers, indicating their products to be representative of the state of the technology, and the state of affairs, of rice cookers in Japan today. Detailed descriptions of the technology in the said representative products would probably be in order, but it is not within the scope of this present paper, so a brief summary of their most touted innovations should suffice, as below. (The direct quotes of the descriptions are from the article, unless otherwise indicated.)

1/ The model from Panasonic is equipped with an « adjustable pressure IH » pot that is able to maintain high heat during the cooking process, which results in more 'supple' and 'shinier' rice. Its pressure system is programmed with a 'freshness sensing' function to calculate the level of the rice's freshness and, thus, cook it at the most appropriate temperature.

2/ Toshiba's latest model incorporates IH technology that can be adjusted from very low to very high temperature levels ; it can generate up to 1,420 watts of heat, resulting in rice that is « 17 % sweeter than usual ». Among its other functions, the cooker can also be programmed to cook the rice at different textures, such as « al dente », « chewy », or « recommended [by the machine] », all following user preferences.

3/ The manufacturer Zojirushi created a 'technologically advanced' IH pot called '*kamado kama*' for its rice cookers (Zojirushi 2020). The pot is thick and consists of different layers of iron, stainless steel, and aluminum, with an overall platinum-coated surface. Its system is programmed to cook rice in as many as 121 different configurations, in a wide-ranging variety of textures, chewiness, and softness.

- 39 The same article pointed out the two main areas that rice cooker manufacturers today continue to emphasise in terms of technological innovation, namely : 1. « improvement of the IH system and the inner pot », and 2. « development of the most appropriate programming system for cooking rice' so as to properly cook the rice 'grain by grain » no matter « which brand of rice from Japan it may be » (Digital Dempa 2020). In other words, IH technology and computerisation continue to be the main technological areas of focus for the manufacturers. It can also be deduced from these statements that even if today's cookers can be used to make all kinds of rice dishes and other meals, they are still best for making steamed white rice, preferably Japanese-grown.
- 40 The article established its conclusion at the outset, saying that manufacturers in Japan today appear to have one common goal in their pursuit of technological advancement for their rice cookers : « to mimic the *kamado* cooking » method as closely as possible' (Dempa Digital 2020). That is, indeed, true for rice cooker manufacturers in Japan ever since the machine first appeared in the mid-1950s. If one takes even only a quick and cursory look at the representative models mentioned in the article as well those from other manufacturers today, one will find that the rice cooker more and more faithfully mimics and incorporates most of the best qualities of the traditional *kama*. Through, and despite, technological innovation, the rice cooker has now come full circle.

## Concluding thoughts

- 41 In the early years of Japan's postwar economic development, increasingly affluent households coveted what were then called the 'three sacred treasures' of the domestic sphere : the television, the washing machine, and the refrigerator. These three



household appliances had become potent symbols of a prosperous and modern lifestyle, as they were also the stars of the firmament that was the Japanese postwar manufacturing industry at a time when Japan was fast becoming a quality manufacturer that rivalled and was poised to surpass American or European (i.e. « Western ») firms.

- 42 The items in the list of ‘sacred treasures’ have since changed in the succeeding eras, from the three Cs (car, cooler/air-conditioner, colour television) in the early 1970s and to the 4K/8K television, refrigerator, and robot vacuum cleaner today (PR Times 2020). Surprisingly, the rice cooker has never been included among the ‘sacred treasures’ at any time throughout the past decades.
- 43 However, the manufacturing industry in Japan has radically shifted, with so-called household « sacred treasures » of the past and present now largely produced not in Japan but abroad. At the same time, Japan-made household appliances are also losing popularity and marketability due to cheaper but quality-made products from other countries. Within this widely transformed manufacturing landscape, however, the rice cooker has remained a steadfast ‘made in Japan’ bestseller. Official statistics show that in the decade leading to 2020, factories in Japan produced an annual average of 5.5 million units of rice cookers, representing more than half of all rice cookers made by Japanese manufacturers both in their factories in and outside Japan. For comparison, more than 90 percent of washing machines and microwave ovens, and above 80 percent of refrigerators from Japanese manufacturers are now made in factories abroad. In contrast, majority of the rice cookers from Japanese manufacturers are sold in the domestic market, with the rest exported mostly to newly developed economies in Asia (JEMA 2020a).
- 44 Indeed, the sustained marketability of the rice cooker and its constant technological development attest to its lasting importance in the domestic sphere in Japan. The rice cooker may never have been a ‘sacred treasure’, but it had perhaps always been a ‘hidden treasure’. From its commercial release in 1956 and throughout the ensuing decades, the rice cooker has supported the Japanese diet, witnessed and adapted to its changes and vagaries, and remains a most significant player in the life of the nation.

---

## BIBLIOGRAPHY

&GP (And GoodsPress), « Product history. *suihanki* (rice cooker) », 20 November 2016, <https://www.goodspress.jp/columns/67395/2/>, accessed 15 November 2020

ASAHI SHIMBUN DIGITAL, *Denki suihanki hatsumei shita Minami Yoshitada no jōsetsu tenji kaisetsu* (Electric rice cooker inventor Yoshitada Minami permanent exhibit opens), 7 November 2019, <https://www.asahi.com/articles/ASMBJ4FP0MBJPFIB00K.html>, accessed 15 December 2020

DEMPA DIGITAL, « *Suihanki tokushū. Shuyō kakusha takikata ni kodawaru* (Rice cooker special feature. Major companies focus on cooking methods) », 2 October 2020, <https://dempa-digital.com/article/118036>, accessed 15 December 2020

- HARADA Nobuo, *Washoku to nihon bunka (Japanese food and Japanese culture)*, Tokyo, Shogakukan, 2005
- HIRATA Yumiko, « The recent trend about the electric rice cooker », *Journal for the Integrated Study of Dietary Habits*, 13, 3, December 2002, p. 147-155, DOI : 10.2740/jisdh.13.147
- « Rice remains Japanese staple, despite popularity waning », *Japan Times*, 8 January 2016
- JEMA (The Japan Electrical Manufacturers Association), « (Report) 2020 nendo denki kiki no mitōshi (Electrical devices outlook for fiscal year 2020) », <https://www.jema-net.or.jp/Japanese/data/mitoshi/index.html>, accessed 15 November 2020
- JEMA (The Japan Electrical Manufacturers Association), « *Suihanki no rekishi* (History of the rice cooker) », <https://www.jema-net.or.jp/Japanese/ha/suihanki/history.html>, accessed 15 November 2020
- JP Market Conditions, « *Kouri bukka tōkei chōsa* (Retail price statistics survey) », <https://jpmarket-conditions.com/>, accessed 15 December 2020
- KIKKAWA Taeko, The history of Japan's electric power industry before World War II, *Hitotsubashi Journal of Commerce and Management*, 46, 1, October 2012, p. 1-16, DOI : 10.15057/25372
- KUMAKURA Isao, « *Kindai shokutaku wo meguru bunka* (Modern dining culture) », *Journal of Cookery Science of Japan*, 26, 2, 1993, p. 149-154, DOI :10.11402/cookeryscience1968.26.2\_149
- MAFF (Ministry of Agriculture, Forestry and Fisheries), « (Report) *Shokuryō jukyū hyō. Reiwa gannenndo* (Food demand and supply chart. Fiscal year 2020) », 2020, <https://www.maff.go.jp/j/tokei/kouhyou/zyukyu/attach/pdf/index-9.pdf>
- MACNAUGHTAN Helen, « Building up steam as consumers. Women, rice cookers and the consumption of everyday household goods in Japan » dans FRANCKS Penelope and HUNTER Janet, (eds.), *The historical consumer. Consumption and everyday life in Japan 1850-2000*, Palgrave Macmillan, 2012, p. 79-104
- NAKANO Yoshiko, *Where there are Asians, there are rice cookers. How "National" went global via Hong Kong*, Hong Kong, Hong Kong University Press, 2009
- OHNUKI-TIERNEY Emiko, *Rice as self: Japanese identities through time*, Princeton, Princeton University Press, 1994
- OSAWA Machiko, « Working mothers. Changing patterns of employment and fertility in Japan », *Economic Development and Cultural Change*, 36, 4, July 1988, p. 623-650, DOI : 10.1086/451690
- PR Times, « *Reiwa no kaden sanshu no jingi kettei* ("Three sacred treasures" of the Reiwa era chosen) », <https://prtimes.jp/main/html/rd/p/000000001.000052850.html>, accessed 15 January 2021
- RANI Uma, « Economic growth, labour markets and gender in Japan », *Economic and Political Weekly*, 41, 41, October 2006, p. 4369-4377, DOI :10.2307/4418813
- RATH Eric, *Japan's cuisines. Food, place and identity*, London, Reaktion Books, 2016
- REID T R, « Japan rice crisis may mean import ban ends », *Washington Post*, 5 October 1993
- SANGER David, « Osaka journal ; Japan's big rice scare (Let them eat Californian) », *New York Times*, 14 March 1994

TOSHIBA SCIENCE MUSEUM, « Toshiba firsts of their kind. Automatic electric rice-cooker », <https://toshiba-mirai-kagakukan.jp/en/learn/history/ichigoki/index.htm>, accessed 15 November 2020

TSUJI Shizuo, *Japanese cooking. A simple art*, Tokyo, Kodansha, 1980

SMIL Vaclav & KOBAYASHI Kazuhiko, *Japan's dietary transition and its impacts*, Cambridge (MA), 2012

Statistics Japan (Ministry of Internal Affairs and Communications), « Kakei chōsa (Survey of household budgets) », <https://www.stat.go.jp/data/kakei/2.htm>, accessed 15 June 2021

WATANABE Zenjiro, « The development and expansion of the Japanese diet », *Food Culture*, 10, 2005, [https://www.kikkoman.co.jp/kiifc/foodculture/pdf\\_10/e\\_002\\_007.pdf](https://www.kikkoman.co.jp/kiifc/foodculture/pdf_10/e_002_007.pdf), accessed 20 January 2021

ZOJIRUSHI, « Pressure Induction Heating Rice Cooker & Warmer NP-NWC10/18 », <https://www.zojirushi.com/app/product/npnwc>, accessed 15 January 2021

## ABSTRACTS

The rice cooker is one of the most globally successful products to have emerged from Japan's postwar manufacturing sector. It remains popular today, with exports especially to Asian countries continuously expanding in recent decades, even as production and sales in Japan have remained stable during the same period. From the first commercially viable and simple rice-boiling machine in 1956, the rice cooker today has evolved into a state-of-the-art, AI (artificial intelligence)-enabled kitchen equipment with a host of cognitive and technological functions. Not only can current rice cookers cook 'perfect' white rice as favoured by the Japanese, they can also make almost every other rice dish as well as soups, meat and vegetable dishes, pasta, breads, cakes, and many others. This paper traces the evolution and major transformations of the rice cooker from its invention in the pre-war period to its development today, and correlates these transformations with shifts in the Japanese diet, especially with regard to rice consumption. While rice is historically considered its most important food, Japan's attitudes towards it have changed significantly in the past century. Rice consumption rates especially have shifted, as it is now less than half compared to peak levels in the 1960s. Throughout these changes in rice consumption and the Japanese diet, the rice cooker's functions and roles have diversified accordingly, even as it has developed into a most technically-advanced and inordinately expensive household equipment that continues to be a significant player in Japanese food culture.

Le cuiseur de riz est l'un des produits manufacturés japonais de l'après-guerre à avoir eu le plus de succès dans le monde. Il reste encore aujourd'hui très populaire. Les exportations, notamment vers les pays asiatiques, n'ont d'ailleurs cessé de croître au cours des dernières décennies, alors même que la production et les ventes au Japon sont restées stables pendant la même période. Depuis la première machine simple à bouillir le riz commercialisé en 1956, le cuiseur de riz est aujourd'hui devenu un équipement de cuisine de pointe, doté d'une IA (intelligence artificielle) ainsi que d'une multitude de fonctions intelligentes et technologiques. Ainsi les cuiseurs à riz actuels peuvent-ils non seulement cuire du riz blanc « parfait », comme l'apprécient les Japonais, mais ils peuvent aussi préparer presque tous les autres plats à base de riz, des soupes, des plats de viande et de légumes, des pâtes, du pain, des gâteaux et bien d'autres mets encore. Cet article retrace l'évolution et les principales transformations du cuiseur à riz depuis son invention dans la période d'avant-guerre jusqu'à son développement actuel. Il établit aussi une corrélation entre

ses transformations et des changements dans le régime alimentaire japonais, notamment en ce qui concerne la consommation de riz. Bien que le riz soit historiquement considéré comme l'aliment le plus important au Japon, l'attitude de ce pays à son égard a considérablement changé au cours du siècle dernier. Les taux de consommation du riz ont particulièrement évolué. Ils sont aujourd'hui inférieurs de moitié aux niveaux records des années 1960. Tout au long de ces changements dans la consommation de riz et le régime alimentaire japonais, les fonctions et les rôles du cuiseur à riz se sont diversifiés. Bien qu'il soit devenu un équipement ménager très avancé sur le plan technique et, ce faisant, excessivement coûteux, il continue à jouer un rôle majeur dans la culture alimentaire japonaise.

## INDEX

**Mots-clés:** histoire des techniques, riz, cuisine, arts ménagers

**Keywords:** history of technology, rice, cooking, kitchen, household appliances

## AUTHOR

### VOLTAIRE CANG

Voltaire Cang, PhD, is a specialist researcher for the Research Center for Ethniculture Studies, RINRI Institute of Ethics, in Tokyo, Japan. He earned degrees from Kyoto, Waseda, and Rikkyo (St Paul's) Universities through his main research in heritage studies, particularly intangible heritage in Japan. He is a member of and has presented his work in many academic societies, mainly on Japanese heritage and food studies, and has also published his work in several books and journals inside and outside Japan. He published "Unmaking Japanese Food : Washoku and Intangible Heritage Designation," in *Food Studies : An Interdisciplinary Journal* in late 2015 ; "Policing washoku :the performance of culinary nationalism in Japan, *Food and Foodways. Explorations in the History and Culture of Human Nourishment*, vol. 27, 2019 ; "Sushi Leaves Home. Japanese Food and Identity Abroad, in Raúl Matta, Charles-Edouard de Suremain, Chantal Crenn ed., *Food Identites at Home and on the Move. Explorations at the Intersections of Food, Belonging and Dwelling*, Routledge, London, 2020.