

Ouachita Baptist University

## Scholarly Commons @ Ouachita

---

Honors Theses

Carl Goodson Honors Program

---

4-17-2024

### A Comparative Analysis of Japan and United States School Lunch Programs

Julie Phillips

Follow this and additional works at: [https://scholarlycommons.obu.edu/honors\\_theses](https://scholarlycommons.obu.edu/honors_theses)



Part of the [Dietetics and Clinical Nutrition Commons](#), [Educational Assessment, Evaluation, and Research Commons](#), and the [International and Comparative Education Commons](#)

---

A comparative analysis of Japan and United States school lunch programs

Julie A. Phillips

Ouachita Baptist University

### **Abstract**

**Question:** Are school lunch policies and programs in Japan beneficial and applicable to the United States?

**Main points:** Japan has a certification program that allows dietitians to teach nutrition. Japan also includes agricultural experiences as part of its academic curriculum to promote holistic development in students.

**Conclusion:** The School Lunch program in the United States would benefit from providing an avenue through which dietitians are able to teach students nutrition and from increasing the number of schools involved in Farm to School so that more students have experiences with nature.

Key Words: school lunch program, dietitian, Japan, United States

## Introduction

Food is life. It nourishes our bodies, supports brain development and provides an avenue through which to socially develop. The question this research is attempting to answer is whether the school lunch policies and meals in Japan would be beneficial in the United States, and if so whether or not they are applicable. But why is this topic important? This topic matters because adequate nutrition, or the lack thereof, affects academic performance. If students, especially at the elementary and middle school age, are not receiving adequate nutrition then they are less likely to progress at a developmentally appropriate pace. Studies have also posited that when students are worried about when they will next be able to eat, then they will not be focusing on schoolwork or their academic performance.<sup>1</sup> This means that having access to food is fundamentally essential to survival and thriving. This topic is also important as there are many diseases that may be nutritionally managed that are on the rise in the US in both adults and children. There is a continual rise in children diagnosed with T2DM and as more people have T2DM, more people become prone to it because it is genetically linked. Cardiovascular diseases are also the leading cause of death from preventable diseases—these are impacted by a person's nutritional intake and physical activity, the former of which is generally high in saturated and trans-fat and low in fruits and vegetables, and the latter of which is on the decline as technology and screens become more prevalent in our society and children spend less time doing activities that move their bodies.<sup>2</sup>

The lunch program in Japan was chosen as a comparison point because of its history of governmental policies regarding school lunches, the makeup of the meal itself, the role of dietitians and nutrition education within the program in schools, and the responsibility entrusted to the students as a part of the program.

## Japan

### The Lunch Meal

Japan has continually revised their meals for the good of their people. The program on the national level was originally stocked with foods imported from the United States and the United Nations International Children's Emergency Fund (UNICEF). These foods were often wheat products, such as pasta and bread, as the carbohydrate offered with the meal. As the country rebuilt after World War II, they were able to shift and adapt the foods to fit with goods that were locally sourced.<sup>3</sup> The benefits of transitioning to local foods are two-fold. This transition first allows for Japan, as a sovereign nation, to build its independence. The second benefit is that as the program uses local foods, the government is able to invest in its own people and economy to give both a boost and further help the country develop. A substantial crop in Japan is rice, and they now integrate this as the carbohydrate multiple times a week. The National Institute of Health and Nutrition (NIHN) has developed recommended daily allowances (RDA) which are the recommended amounts of nutrients that people should consume in a day and they are determined through analysis of the Dietary Reference Intakes for Japanese.<sup>4</sup> The standards for school lunches are developed from these guidelines. The standards differ on whether a vitamin or mineral is adequate in the cultural Japanese diet as well as the age and grade level of the students. The standard for most nutrients is one-third of the RDA, but due to low consumption in the diet, school lunches are to provide 40% instead for vitamin A, B1, and B2, as well as 50% for calcium.<sup>3</sup> In order to meet the requirements for the vitamins that rice is naturally deficient in, an enriched rice is mixed with the polished rice from local farmers. This allows the rice to be comparable to other starches made with enriched wheat (e.g., bread), and still use local foods as part of the meals.<sup>3</sup> The meal itself is very interesting.

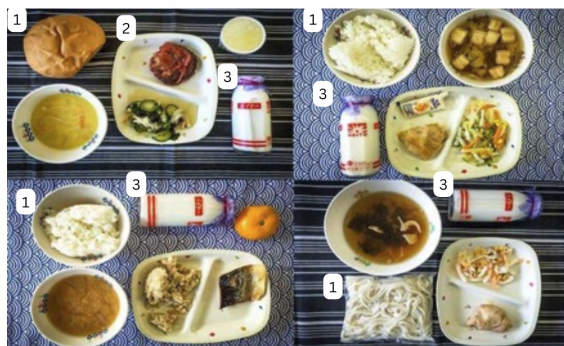


Figure 1: Meal example<sup>5</sup>

Table 1: Meal components

1	The item indicated by the number one (1) is the <i>shushoku</i> .
2	The items not indicated by a number are the <i>okazu</i> .
3	The bottle indicated by the number three (3) is the milk.

This figure portrays the three components of the school lunch—and when all are included it is called a complete school meal.<sup>5</sup> The first is *shushoku*, which is the starch of the meal and generally is rice, bread, or noodles. In the image it is designated by the one (1). The second is *okazu* which is the main meal and/or side (such as vegetables). The third is milk. The reason these are considered a complete school meal is that when either just milk, or just the *okazu* and milk are served they are called supplementary meals.<sup>3</sup> This is done in instances such as snack times.

### Nutrition-mitigated health issues

Japan has a long history of providing school lunches dating back to 1889 in the Yamagata Prefecture when they were furnished at the local level for students in need.<sup>3</sup> Japan first developed a national program in 1932 as a way to help families in need of support to feed their children. This program was paused during World War II, and while support came after the war ended, it was in 1954, that a law was enacted—the School Lunch Law—as a way to combat the undernutrition that arose in the nation after World War II. Its goal was to develop the minds and

bodies of the children in school, and at that point its purpose was to increase the weight of the population and reverse the stunted growth that had been occurring as a result of malnourishment. This resulted in more intense in-school physicals than seen in the United States, as well as the presence of physicians in school.<sup>6</sup>

As Japan has rebuilt and continued developing after the war, the public health issues have also continued developing to represent the new society and have expanded to address more than a lack of food. The concerns about lack of nutrition have expanded to include excess consumption of empty calorie items and a diet high in fats. Similarly to the US, Japan is facing an increase in percentage of the population who are overweight and obese, while simultaneously struggling against the growth of eating disorders and disordered eating in adolescents.<sup>7</sup> This increase in overweight and obesity in the society as a whole, though not a specific cause, does lend to the increase in T2DM, cardiovascular disease (CVD), and hypertension seen in Japan today. In a study done by Miyawaki et al. on junior high students consuming the national school lunch, it was found that there was a significant decrease in obesity and weight in male junior high students.<sup>9</sup> However, this study observed no significant change in females with obesity or who were underweight. The purpose of the school lunch program with regards to the incidence rate of these kinds of illness is to decrease the rate in which they occur for the upcoming generation through health education and healthy habits beginning at a young age. Essentially, the hope is that as children progress through the school system, they will also learn to habits that help them to live healthier lifestyles in the future.

As students are required to eat school-provided lunch in public elementary schools, it is an ideal place to provide foods rich in nutrients that may be deficient in the local diet (interview with 002). Calcium is a nutrient that is not found in high quantities in a typical Japanese diet as

dairy is not often eaten. As such, Kohri, et al., studied the effects of the milk provided in the National School Lunch program on bone growth between students in schools that enforced the program and schools that did not. The authors concluded that there was a positive relationship between bone growth in students in schools that enforced the inclusion of milk with the school lunches.<sup>10</sup> In a different study, comparing the nutrient intake of students on non-school days versus school days, it was determined that inadequate intake of nutrients was significantly higher on non-school days.<sup>3</sup> This further emphasizes the importance of including milk and calcium-rich foods in the school meals as it is important for children to consume adequate amounts of calcium. Beyond contributing to bone health, calcium is also important throughout other systems in the body such as, “vascular contraction and vasodilation, muscle function, nerve transmission, intracellular signaling, and hormonal secretion”.<sup>2</sup> It is important to maintain enough serum calcium to perform these functions because if serum calcium drops then vitamin D signals for osteoclasts to break down some bone to retrieve calcium from there instead.<sup>2</sup>

### **Shokuiku**

These issues demonstrate, now more than ever, the importance of schools having nutrition education and not just the provision of food. This resulted in Japan’s enacting the Basic Law on Shokuiku in 2005. “Shokuiku,” translates to “food education,” but encompasses educating people of all ages how to make good dietary and lifestyle choices as well as actual nutrition information.<sup>11</sup> The transition in Japan to a different public health crisis is what brought about the creation of this law. The origin of school lunch programs in Japan is considered to have been back in 1889 when monks provided lunches for poor students in the Yamagata Prefecture. In 1932, there was the first implementation of a government-aided program, rather being privately run. After being temporarily stopped during WWII, the program renewed in 1946 with

updated guidelines—it was now for all children and not just those that were poor. It was not until the 1950s when program was implemented as providing a complete meal and began doing so with donations from various avenues (e.g., wheat flour from the US, and dehydrated skim milk from the UN), though these donations were stopped in 1951. In 1954, Japan implemented its first legislature regarding school lunches—The School lunch Act—which allowed it to formally introduce guidelines and expectations for and of the schools providing the lunches.<sup>12</sup> As the country recovered from the war and the people again began to thrive, there began to be an increase of obesity and metabolic syndrome (which is associated with nutrition-mediated diseases such as Type 2 Diabetes Mellitus) in children, and in particular, middle-aged men.<sup>2,13</sup> While the law was implemented it was placed under a variety of ministries (the United States equivalents of which would be federal departments) such as the Cabinet in collaboration with Ministry of Health, Labor, and Welfare; the Ministry of Education, Culture, Sports, Science and Technology, and the Ministry of Agriculture, Forestry, and Fisheries. This is important as it indicates the desire for far-reaching consequences as a result of the law. Though this law is federal, the implementation of it is based on basic plans drawn up by the different prefectures to better reflect the region (the closest equivalent in the United States would be the states and a focus on local culture and locally grown food.<sup>13</sup> While a large part of Shokuiku deals with nutrition in schools, it acknowledges that for behavior change to be significant, it is important that “eating education” be found in the home and in the community as well.<sup>4</sup>

The School Lunch Act underwent a revision in 2008 to change its focus away from improving dietary habits to the “promotion of Shokuiku”.<sup>6</sup> The purpose of this revision is to emphasize whole body and mental health, as well as three Shokuiku-based points—“nourish a right judgment on food; foster an understanding of traditional food culture; and cultivate an



attitude to respect life and nature through food.”<sup>6</sup> The scope of concepts involved in mental health is broad. Within these revisions it is made clear that while improving dietary habits is crucial, it is necessary to provide guidelines and a support structure within society to make the needed health changes actually accessible to people.

As such, students need to know how to fuel their bodies in a way that supports their growth. This demonstrates the importance of nutrition education from someone trained.

### **Agricultural Experience**

For the most part, Japan is an agricultural-based society and much of the culture was created on a foundation of collectivism and working as a community to survive and thrive. However, there is now an increasing trend of people moving from rural to urban areas for work. During this transition, it was observed that without intervention, as children grow up in urban areas, they lose their connection to nature. Consequent to the prior two points, elders increasingly make up a larger proportion of farmers. Based on these factors, it was thus decided that the exposure of students to agriculture and plant cultivation was essential, and these exposures are designated as “Agriculture Experiences (AEs)”.<sup>14</sup> The drive to incorporate agriculture-based learning in the school curriculum began in the late 1970s when policymakers began to explore the impact of AEs on learning. It was in 1998 that the Agricultural Policy Reform Guideline (APRG) was enacted in order to promote academic understanding through hands-on education. In 2002, a new policy was enacted to create curriculum in which AEs are central, more so than with the Agricultural Policy Reform Guidelines.<sup>14,15</sup> According to Wang and Yanai, there are differing benefits to having agricultural experiences based on if they occur in urban or rural areas.<sup>15</sup> School gardens within the school grounds, considered urban, allow for students to observe the development of plants on a daily basis. This close access also allows

students to perform experiments regarding the planting, growth, cultivation, and harvesting of the crops. While access to school farms, considered rural, can be limited due to a variety of factors, such as transportation and safety concerns, there are also benefits. The greater size available to school farms due to their rural nature, allows for students to work under the mentorship of experienced farmers and with larger crops such as cereals, like rice, which is important to Japanese society. Another benefit of school farms is that programs that use them tend to have greater integration with the community than those that just have school gardens.

Within the 2008 revision of the School Lunch Act, one of the points of *Shokuiku* that was emphasized was to “cultivate an attitude to respect life and nature through food.”<sup>6</sup> AEs emphasize teaching children the importance of being respectful to nature and how this in turn will impact each individual. We must care for nature to have a healthy environment in which to grow the food we use to sustain our bodies. Humans tend to mentally place themselves outside of the ecosystem in which they live, and so an aspect of AEs can be addressing the fact that humans are active parts of an ecosystem, and they can have positive or negative effects on it.

### **School Dietitians**

In Japan, a system was implemented in 2007 that licensed registered dietitians working in schools to teach, specifically about nutrition.<sup>3</sup> The intent of this program, called the Diet and Nutrition teacher system, was to increase the promotion of *Shokuiku* in educational settings.<sup>13</sup> The certification is called the Nutrition Teacher License and may be obtained after working for a minimum of three years as a school dietitian and taking 8-10 credits worth of classes. At this point, the dietitian essentially has two choices. He or she may be either a school dietitian or a nutrition teacher. The duties of the former include management of the school lunch program at the school, including planning the menus, managing the kitchen, and they also are involved in

the nutrition education of students indirectly through newsletters or supporting other teachers. With the latter, the duties encompass all that the school dietitians do but extend to directly teaching students in classroom settings and events, and also to utilize one-on-one meetings with students and families with the goal of addressing health problems that are nutrition-related.<sup>16</sup> According to Tanaka and Miyoshi, the employment of school dietitians by schools sees an improvement in children within those schools regarding building healthier dietary habits.<sup>6</sup>

### **Responsibility**

Culturally, Japanese people are expected to be responsible from a young age. They are also expected to learn to be hardworking and respectful. While there are many examples of this within the culture, with regard to the school, this is seen in two primary ways. The first way is that students eat in their homeroom, and in public elementary school are not allowed to bring homemade lunches but are expected to eat the school lunches. Throughout this process, on a rotation basis, students will pick up meals from the kitchen and serve their classmates. The second way is that students are also on a rotation basis for being in charge of cleaning their classroom and the hallway outside of it.

### **United States**

Within the US, there is a continual discussion regarding the nutritional value of school lunches, what they should include, and who should have access to them, as well as determining who is in control of deciding such standards, be it the state or federal governments.

The original intent of this research was to determine if the school lunches in Japan and their health-related aspects would be beneficial and applicable to the United States; however, it has become more of an assessment of the current policies and programs in place in the US.

### **The School Lunch**

Within the US, the standardizations of school lunches in the National School Lunch Program are determined based on the nutrients the students need based on the Dietary Guidelines for Americans and each meal needs to provide one-third of the dietary reference intakes (DRI) of each calories, protein, calcium, iron, vitamin A, and vitamin C through a variety of foods that can be offered based on the school meal pattern.<sup>17</sup> There are five components of the school lunches that are reimbursable—grains, vegetable, fruit, meat/meat alternative, milk. Of these five, students are required to choose three, and one of the three has to be a fruit or vegetable.

### **Nutrition-mitigated health issues**

There are a variety of health risks at play in the United States in which nutrition plays a role in prevention or at least in delaying the onset of them. According to a study done by Mayers-Davis et al. Type 2 diabetes mellitus (T2DM) in children has increased a statistically significant amount at an unadjusted incidence rate increasing 7.1% from 2002 to 2012.<sup>18</sup> While T2DM and obesity in children are of more immediate concern to deal with, the illnesses that affect adults are also relevant. This is because obesity and overweight in adults with malnutrition, T2DM, and CVD have better outcomes the earlier they are diagnosed and treated. However, if there is not information being provided regarding the reason that living a healthy lifestyle is important, then people may only be aware of the severity of an issue after diagnosis. To this point, a topic that needs to be addressed is that malnutrition is more than merely undernutrition. The term malnutrition, from the standpoint of public health, can also signify consumption in excess of caloric needs and the overconsumption of foods with little nutritional value. There is a difference between being full or fed and being well-nourished. It is important to emphasize that in order to function properly, the body needs to be well nourished and have access to enough of all the nutrients it needs. According to Raymond and Morrow, CVD remains

the number one cause of death within the United States. To demonstrate this point, they make the comparison that CVD causes more death than the number of deaths caused by “cancer, chronic lower respiratory diseases, and accidents combined.”<sup>2</sup>

According to the Center for Disease Control (CDC) report on nutrients in the diet of Americans, the highest occurring nutrient deficiencies that are relevant to this research are vitamin D and iron.<sup>19,20</sup> While iodine and folic acid are the other two top deficiencies, they primarily affect the in-utero development of babies during pregnancy. Vitamin D is important because its activated form is used to facilitate the absorption of calcium in the small intestine, which is needed to provide children with healthy bones. Beyond that vitamin D also plays essential roles in “neuromuscular and immune function, and reduction of inflammation,”<sup>2</sup> all which are important in keeping children healthy. The consumption of vitamin D is especially important now that children spend less time outside in the sun where their bodies can make vitamin D. Iron is important because, though in trace amounts, it is in every cell of our bodies, it is a necessary component of the hemoglobin in our red blood cells and myoglobin in our muscles.<sup>2</sup> Within this role it helps to carry oxygen, including to the brain. Therefore, it is imperative that people obtain enough iron in their diet.

### **Policies and Programs**

While the National School Lunch Program has been in existence since 1946 when President Truman signed it into law, the standards in effect today truly came about in 2010 when Congress passed the Healthy, Hunger-Free Kids (HHFK) Act into law.<sup>8</sup> When the NSLP was first signed into law, the focus was on creating a policy that provided continual yearly funding from the government so that a budget would not need to be passed every year to support school nutrition programs and there would be standards the meals needed to meet in order for the school

to get reimbursed.<sup>17</sup> These standards were increased and made more specific under the HHFKA Act. The current projects aimed at increasing the health of children through their meals at school are the HHFKA Act and the School Breakfast program, and the Farm-to-School initiative is also gaining traction and its benefits are being studied as well. Everyone is eligible to receive school meals, the differentiation occurs in the price for the individual students. The NSLP is an entitlement program. This means that if you meet eligibility criteria, you automatically can get the benefits, which in this case is a free or reduced price lunch.<sup>17</sup> Families that are enrolled in SNAP, have household income that is at or under a 130% percent of the federal poverty line and children that have the status of runaway, migrant, homeless, or foster child are eligible to receive a free lunch.<sup>21</sup> Reduced cost lunches are also provided to students on the basis of the income of their household, the range of which is between 130% and 185% of the federal poverty line. Schools are reimbursed “based on children’s free, reduced price, or paid eligibility status.”<sup>22</sup> Higher rates of reimbursement are given in two cases—areas where there is a documented higher cost of food (i.e., Alaska, Hawaii, Puerto Rico) and schools with higher percentages of students that are eligible for free lunches.

A detractor commonly brought up is that increasing the healthfulness of lunches served in schools is that the children will not eat it and there will therefore be an increase in food waste, but research has shown that this is not what happens. While food waste in school cafeterias is high, a study by Cohen, Richardson, et al. shows there is no significant difference in percentage of food waste before and after the implementation of the HHFKA standards.<sup>23</sup> The results of withdrawing sugar-sweetened milk (e.g., chocolate milk) from the milk options showed an interesting result. Upon the withdrawal, students at first began to consume less milk. However,

with time milk consumption increased back to normal intake levels that were previously seen prior to the withdrawal.<sup>24</sup>

The School Breakfast Program is also an entitlement program. This program was designed to supplement food for children, in order to ensure that children do not have to begin the school day on an empty stomach. The importance of schools providing breakfast is found in the academic engagement of the students. It has been shown that students who consume breakfast are more alert and ready to learn than those who do not.<sup>25</sup>

Farm to School is a program which schools are able to utilize in a variety of ways with the end goal of exposing students to nature, agriculture, and fresh produce. There are many benefits to living in urbanized areas, however an unintentional negative aspect is that children have limited access to the food system and, as a result, there is a disconnect in knowledge regarding what they eat and where it comes from. Research done on the impact of school gardens concluded that students in participating schools had an increase in knowledge regarding healthy eating, an increased consumption of fruits and vegetables, and improved academic performance.<sup>26</sup> It is important that this occurs at this age because this is when tastes and preferences are developing. Research has shown that while studying in a nutrition curriculum that promotes local foods, preschoolers “have a greater willingness to try and like healthy foods.”<sup>26</sup> Another important aspect of using local foods is that with regard to tribal schools, the Program is able to work with organizers and directors to incorporate traditional foods in the school meals. The fact that school gardens affect the fruit and vegetable consumption of students and their knowledge of being healthy is significant because it means that it has the potential to impact students who do not participate in the school lunch program and will not be impacted that way. There is also a wider economic benefit to these programs, as they invest in the local

economy when they incorporate local foods into the school lunches, breakfasts, and summer programs. The exact amount spent by school districts on local foods varies from year to year, but in the 2013-14 school year, the figure was almost \$790 million.<sup>26</sup> Another benefit of participation of schools in the Farm to School program is that lunches gained approval from parents and the community and as a result there was increased participation in the school lunch program.<sup>26</sup>

This is apposite as increase in participation in the National School Lunch Program (NSLP) is one of the nutrition objectives in the Healthy People 2030. The importance of increasing the participation of students in consuming school provided lunches is two-fold. The first is the desire for everyone who is eligible for free and reduced lunches to have it provided because research shows that students in these categories may have less access, and due to the number of hours spent at school, students may consume a significant portion of their calories of the day from meals at school.<sup>27</sup> The second reason increasing participation is important is that even among the students whose parents can afford to provide them with lunches, they may not be knowledgeable on what constitutes a healthy diet or consider it important to send their kids to school with fruits and/or vegetables.

### **School Dietitians**

Within the US, while dietitians are certainly qualified to be directors and managers of school nutrition programs. Registered Dietitian and Registered Dietitian Nutritionist are protected credentials that denote the person is an expert in food and nutrition.<sup>30</sup> This expertise comes from the education, graduation from an accredited dietetics programs and supervised practice, and the passing of a national examination required before obtaining the right to use those credentials. However, the positions in schools that dietitians are allowed to have do not require the personnel holding the position to be dietitians.<sup>31</sup> The personnel in these positions are



required to have either an associate's or bachelor's degree as well as a certain number of years working in a related field, which depends on both the pathway the person was hired under and the number of students in the school. Schools are placed in three categories—2,499 or less students enrolled, 2,500 to 9,999 students enrolled, and 10,000 or more students enrolled—and the fewer the students, the less advanced degree and experience the position-holder is required to have by the government.

While this works as the positions in question require nutrition knowledge and attention to detail in terms of what the USDA requires of school lunches nutritionally, it does mean that the staff who are directors and managers may not be qualified to provide nutrition advice or education as would be beneficial to the students in terms of making lifestyle changes and building better habits. This indicates that there is a gap in the system as is, and there is a potential for nutrition education provided to students in school.

This gap has the potential to be mitigated by the employment of dietitians within a school or school district. There are two main ways that school dietitians could provide benefits that are unique to their professions. The first is that dietitians have a wealth of knowledge regarding health and the impact of nutrition and physical activity on it that could be utilized with the students. This could be through giving presentations with books during library time or talking with physical education and health classes. Another way this knowledge could be utilized is by being a resource for the student athletes. Given the plethora of disreputable sources of information available to students, it is important that they have access to person qualified to give advice and guide them to resources that are reputable, this is especially true is an athlete is serious about his or her sport.

The second is that given the consent from parents, when students have a physical exam with the school nurse, dietitians would be able to perform nutrition-focused physical exams. A benefit of this is that the dietitian may catch potential deficiencies or issues that can be addressed with parents. Another benefit is that this exam would be able to provide the school with records that may bring to light trends or categories of issues that the school, or the nutrition education from the dietitian could focus on.

In the United States, dietitians are already utilized as managers and directors of food systems within the school or school districts by which they are employed. An important benefit of having dietitians in schools and involved in the care of students' nutritional knowledge, is that they are professionals who are trained in dealing with eating disorders and disordered eating, which statistically have a high occurrence in adolescents. While having a foundation of healthy habits is the gold standard for living a healthy life, life does not always turn out according to the gold standard and as such having dietitians available to help people make decisions within their options is important.

### **Inequities**

Due to the nature of this research, it is important to recognize and evaluate the potential effects of inequities on school lunches, though it is equally important to keep in mind it is difficult to determine causation due to potential unknown factors. A systemic review performed by Rashawn Ray et al. evaluated the question of whether environmental equities (e.g., school gardens) would provide a significant effect on the achievement gap.<sup>30</sup> They established that the majority of schools with gardens in Washington D.C. had a majority population of white students and that those without gardens were mostly those with majority Black and, to a lesser extent, Hispanic students. When the data of academic improvement after the implementation of a school

garden was controlled for the race and class composition, higher test scores were shown for both reading and science, though not for math. This shows that the academic benefits of school gardens extend beyond socioeconomic level and ethnicity and therefore, an effort should be made to provide students with opportunities to engage with nature and have experiences with agriculture, such as in school gardens.

While research has discovered that children on free and reduced lunches continue consuming a higher percentage of fruits and vegetables than their counterparts, it is important to recognize that it may also be due the increased chance that they do not have food at home. This issue is compounded when considering that under the revision of the School Lunch Act of Japan in 2008, the parents are responsible for providing part of the cost of ingredients, which amounts to about 4000 yen (or around 26.58 USD) a month. Even though lunches in Japan are well-balanced and healthy, this aspect of the policy would prove to be a barrier to the very people school lunches are aimed at helping, due to the financial burden placed on participating families. Thus, it would not be feasible for the US to move away from the current paradigm of free and reduced lunches based on socioeconomic status. As such, it is good that in a study done by Bardin et al., no significant difference in nutritional quality was found in schools with more students from low-income backgrounds than those with more students from high-income backgrounds. A further

### **Discussion**

As seen in Table 2, the Japanese and US school lunch programs had differing motivators behind their original formation. The Japanese school lunch program is shaped by its purpose of formation, which was to intervene in the malnutrition prevalent in Japanese school children after WWII due to lack of food. This original purpose allowed its core characteristics to develop. The

program is thus characterized by its effort to provide students not only with food during the school day, but also with the knowledge and resources to make good choices throughout their lifetime. The purpose that shaped the formation of the US school lunch program was to provide nutrition for students who were otherwise at risk for malnutrition as a high percentage of men were rejected by the draft and the reason was traced back to childhood malnutrition.<sup>17</sup> As a result, the US program is characterized by its focus on the provision of food itself and its nutritional content, and not necessarily ability of the general population to live a healthy lifestyle.

Beyond their characterizations, the programs have further differences. One of these differences, demonstrated in Table 2, is the cost-burden of the program on the students and their families. Within Japan's program, while the municipalities are required to bear the burden of cost for labor and time, parents are held responsible for part of the cost of the food itself. However, with the program in the US, the cost is calculated based on the income category the student is in. The first category is comprised of students who pay full price for the meal. The second category of students are those that able to pay a reduced price for the meal, which may be no more than \$0.40. The third and final category is comprised of students who are eligible to receive the school lunch for free. In this aspect, the program in the US seems to be more equitable than the Japanese program. When considering difference in cost, it is also necessary to look at enrollment policies, which in this case, are also different between the programs, as seen in Table 2. In Japan, two aspects of the program's characteristics are evident in this policy. The first is that its main purpose of combating malnutrition is evident in the compulsory nature of the program in participating elementary schools as a way to ensure students are receiving proper nutrition. Though not compulsory, it is encouraged in junior high and high school as well. The compulsion also demonstrates the second aspect which is the more authoritarian nature the government in

Japan has, as compared with the US. In contrast, the program in the US is completely voluntary and trying to increase enrollment numbers due to the increase nutrition-mitigated diseases in children previously mentioned.

Another difference lies in the programs that contribute to and are considered school meals. In Japan, the only meal served is lunch, though snacks may be served as well. From the perspective of the US, this paper explored the effects of the School Breakfast Program, the School Lunch Program, and the Farm to School program.

Table 2: Program overview

<b>Program Overview</b>					
<b>Country</b>	<b>Program instigator</b>	<b>Eligibility</b>	<b>Cost</b>	<b>Enrollment Policies</b>	<b>Responsibility of children</b>
Japan	Malnutrition after WWII	Everyone is eligible to receive a school lunch	Parents pay part of the cost of the food, otherwise free.	All students in participating elementary schools are required to eat the school provided lunch.	Students are responsible for serving their peers and cleaning their classroom after the meal
United States	Exceeding number of draft rejections, due to malnutrition during the Great Depression		Three categories: Free, reduced, full price	Any student is allowed to participate, but it is not required.	Students have no responsibilities related to the meal

Another difference is in the meal and meal service itself. As seen in Table 2 and mentioned previously, students in Japanese schools are expected to hold a fair amount of responsibility. As part of the daily and weekly leadership rotation schedule, students are assigned to retrieve the food from the kitchen, serve it to their peers, and clean up the classroom before returning the dishes to the kitchen. Within the US, this is currently not the expectation or policy of the majority of schools. Within the US, students go to a cafeteria where they choose at least

three of the five components to eat and they eat in that room. The components of the meal itself are different between the two programs. As seen in Table 3, Japan’s program has three basic components, while the program in the US has 5. However, the main difference is not the number of components, but what is the meal as a whole and the lack of fruit as a component in the program in Japan, though they may sometimes have it offered as well.

*Table 3: Meal components*

<b>Meal Components</b>	
<b>Japan’s School Lunch Components</b>	<b>US School Lunch Components</b>
Starch	Grains
Main dish and vegetables	Vegetable
Milk	Fruit
	Meat/Meat alternative
	Milk

The difference in the laws themselves also carry over into the programs. Tables 4 and 5 demonstrate this point. Table 4 lays out the laws in both Japan and the US—the laws that govern the Japanese program cover what is to be taught to the children along with providing nutritional regulations and the US laws focus primarily on providing proper nourishment to the bodies of the students.

This difference lies in the end goal of the laws. Table 5 delineates the goals and purposes of the programs in the two countries. The goals in Japan’s program clearly emphasize that while good nutrition is essential to proper development and good health, the importance of a more holistic approach is not to be underestimated. The program places great importance on intentionally building healthy habits and cultivating respect towards others and the environment around the students. In the US-based program, the goals revolve around increasing participants, in order to ensure more students are receiving some amount of nutritious food, and working with states to ensure continual funding of the programs in schools.

*Table 4: Law difference*

<b>Laws differences</b>
-------------------------

Categories	Japan	United States
<b>Laws</b>	School Lunch Act (1954, 2008)	National School lunch Act (1946)
	Diet and Teacher (2007)	Child Nutrition Act (1966): expansion and reinforcement of NSL ACT
		Healthy, Hunger-Free Kids Act (2010) <ul style="list-style-type: none"> <li>- New nutritional requirements for reimbursable school meals.</li> </ul>
<b>Implementation regulations</b>	Centralized government: Started after federal government realized a need.	More power to the states: States began having them and eventually federal government made a law to make it national and provide consistent annual support
<b>Nutrition requirements</b>	Based on 1/3 of RDA of DRI for Japanese people, in general; however, greater than 1/3 for nutrients that tend to be lacking in intake. <ul style="list-style-type: none"> <li>- 40% of RDA for vitamins A, B1 (thiamin, hx of beriberi in Japan), B2, and 50% of RDA for calcium.</li> <li>- Food standards categorized by grade level</li> <li>- Met by School lunches</li> </ul>	1/3 of DRI of calories, protein, calcium, iron, vitamin A, and vitamin C for age group, and the Lunch and Breakfast programs must adhere to a meal pattern that designates amounts necessary of a food item (vegetables, fruit, whole grains, meat/meat alternative) daily and weekly.

Table 5: Goals of the programs

Goals	
Japan (School Lunch Act)	US goals of the NSLP
Main goals: (2008) <ul style="list-style-type: none"> <li>- Develop a proper understanding of diets and healthy eating habits in daily life</li> <li>- Enrich school life and nurture sociability</li> </ul>	Purpose: (1946) <ul style="list-style-type: none"> <li>- safeguard the health and well-being of the Nation's children</li> <li>- encourage the domestic consumption of nutritious agricultural</li> </ul>

<ul style="list-style-type: none"> <li>- aim at rationalization of diets, nutritional improvement and health promotion</li> <li>- enhance a sound understanding on food production, distribution and consumption</li> </ul> <p>Shokuiku-based goals</p> <ul style="list-style-type: none"> <li>- Nourish a right judgment on food</li> <li>- Foster an understanding of traditional food culture</li> <li>- cultivate an attitude to respect life and nature through food</li> </ul>	<p>commodities and other food</p> <ul style="list-style-type: none"> <li>- Assist states in providing adequate supply of food and other facilities for the establishment, maintenance, operation, and expansion of nonprofit school lunch programs.</li> </ul> <p>HHFKA</p> <ul style="list-style-type: none"> <li>- Increase enrollment in school lunches</li> </ul>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

The final and most considerable difference between the programs is the roles that dietitians can have in the school setting, which are laid out in Table 6. It is important to continue to perform physicals in the school system, but it may be beneficial to incorporate dietitians into the current process as they are trained to perform nutrition-focused physical exams and may make connections that the school nurse is not trained to make. The most significant role that the dietitian is able to have in Japan but not in the US, is that of an educator. The option to teach nutrition for dietitians who undergo additional education as well as have experience as a school dietitian, in a management capacity, is one that is not available to dietitians in the US.

Table 6: Dietitian utilization

<b>Difference in utilization of dietitians</b>	
<b>Japan</b>	<b>United States</b>
Directors and managers of school lunch program	Directors and managers of school meal programs
Educators in their own right	



There are similarities between the programs. In both countries, school meals are designed to meet the nutritional standards set up to meet the nutritional needs of the students in each country. As such, meals provided are likely to be superior in nutritional quality to the food brought from home (why the dietary goals of 2030 include increasing enrollment).<sup>3</sup> Another similarity between the programs is the inclusion of a nature-based focus. In the Japanese program, having agricultural experiences are included as a part of the school curriculum, while implemented as a separate program, the Farm to School program provides similar experiences for students in the US programs.

### **Conclusion**

The United States is on an upward trajectory of helping students learn to take care of their bodies and make healthy choices, and improvements have been made to the nutritional quality of the foods provided in school lunches. The NSLP, the School Breakfast program, and the Farm-to-School program are all school nutrition initiatives that have greatly impacted the health and academic performance of students.

With regard to the question of this research, do the policies represented in Japan demonstrate benefits that can be introduced into the US? This research lends credence to the thought that yes, some of the policies may be beneficial to the programs within the US. The major benefit is that of the additional role that dietitians play in schools in Japan. The role of the school dietitian in Japan is one area where the US can learn from and formulate programs to allow students the benefit of learning from someone trained in both nutrition and teaching. While there is monetary compensation and standards for schools regarding the school lunch itself, there is little standardization or certification regarding the nutrition education provided to students. Increasing the roles that dietitians can perform in schools is an implementation that is feasible.

This feasibility is due to precedence set by other programs. Some states already have licensures for education in specific fields in place of getting a degree in education (e.g., New York has a licensure for teaching TESOL [Teaching English to Speakers of Other Languages] in grades K-12 that requires some classes, training, and observation). Another option is to follow the precedent put forth in extra certifications such as becoming a Certified Diabetes Care and Education Specialist (CDCES). Being certified in this manner would be comparable to being a Nutrition Teacher within the Japanese system. Using the CDCES system as a foundation, school dietitians could be required to work as a school dietitian for a certain number of hours or years and take specific classes or continuing education units (CEUs) that focus on education and teach dietitians how to teach and care for the children in a classroom setting. There is also already a Practice Group involving RDs in education that this certification would fall under and which would be a great resource in developing a certification program. In using one of these methods, dietitians may have a heavier workload, but they will also have a greater impact on helping students make healthy choices for their bodies, so they are able to prevent or delay the onset of nutrition-mitigated illness in their future. As we have seen, prevention is the best medicine. It may also be possible for a dietitian to work as a nutrition teacher, perhaps per diem, and not work with the lunch program as a dietitian if there are no jobs in that area available, or if a dietitian would be needed at multiple schools within a system.

There are also areas in which Japan is potentially able to improve its program. One area was acknowledged in a study done by Takeda et al. regarding the perceptions of food education and literacy among people living in urban areas is that some, particularly men, tended to separate nutrition education from actual daily living.<sup>31</sup> This demonstrates that education needs to have an application or meaning for students to associate with so that they will incorporate it into their

lives. This is the benefit that programs like Farm to School and AEs can bring to the classroom. Students are able to have experiential learning opportunities regarding where food comes from, how it is grown, and the work that goes into farming and bringing fruits and vegetables onto the table.

To further a previous point, this disconnect in knowledge ties in with the idea within the Basic Law that Shokuiku needs to happen at home and in the community to truly be effective. This can look like workshops in gyms to demonstrate the connection between nutrition and physical activity, and community centers to demonstrate how nutrition can affect the daily lives of everyday people.<sup>13,31</sup> This is an aspect that would be beneficial to include in both school programs as well. While nutrition education for the students is essential, it is also important to note that during this time in the students' lives, their parents, not them are making decisions regarding grocery shopping and what is being served for meals at home. This means that when considering how to positively influence the nutrition of a student, the knowledge of the parent must be considered. It is important to find ways to educate parents on healthy habits and how to positively affect one's health through nutrition so that students have further experiential connection to what they are learning about nutrition.

There are many aspects of Japan's school lunch program that would not be acceptable in the US or would be difficult to implement. Japan has a certain expectation of uniformity and responsibility above one's own free will, while in the US free will is considered more important. This means that aspects like forcing children to finish all the food on their plate is not applicable to the US. However, there are benefits to building children up through responsibility. According to the revised version of the School Lunch Act in 2008, the parents are expected to pay for the ingredients of the school lunches, while the government (prefectural or municipal) pays for the

staff, the preparation, and the facilities. In theory this would create a situation where parents are more involved, and the purchase of better food is encouraged. However, in reality it could lead to a situation where inequality may run rampant as areas of lower income families would be further impacted economically by being required to contribute funds to pay for required school lunches. Ray et al. brings up a point in his article that is significant in this instance from the US side. He states that in the US the segregation and redlining of the past have created current problems as the schools that need help the most tend to have fewer funds since the part received from property taxes increases the disparity between areas with high property values and those with low property values. Though this is not the purpose of this research, it is tangentially related and is important to note that finding ways to increase academic achievement that does not come down to more classroom instruction is possible as seen previously in this paper in the research regarding school gardens.

More research needs to be done on several aspects covered by this paper. One such aspect is whether schools are adhering to nutrient requirement standards. Another aspect that would be useful to research is how families are financially affected by compulsory school lunches at the elementary school level due to the monetary expectations placed on them.

## References

1. Kauchak D. *Introduction to Teaching: Becoming a Professional*. PRENTICE HALL; 2020.
2. Raymond JL, Morrow K. *Krause and Mahan's Food and the Nutrition Care Process*. 16th ed. Elsevier; 2023.
3. Ishida H. Role of school meal service in nutrition. *J Nutr Sci Vitaminol*. 2015;61(supplement):S20-S22. doi:10.3177/jnsv.61.s20
4. Melby MK, Utsugi M, Miyoski M, Watanabe S. Overview of nutrition reference and dietary recommendations in Japan: application to nutrition policy in Asian countries. *Asia Pac. J. Clin. Nutr*. 2008;17(S2):394-8.
5. National School Lunch Program (Japan). Sustainability. Accessed February 24, 2024. <https://icdasustainability.org/case-study/national-school-lunch-program/>.
6. Tanaka N, Miyoshi M. School lunch program for health promotion among children in Japan. *Asia Pac J Clin Nutr*. 2012;21(1):155-158.
7. Section 3. measures against lifestyle-related diseases ... Ministry of Health, Labour, and Welfare. Accessed February 2, 2024. <https://www.mhlw.go.jp/english/wp/wp-hw2/part2/p2c1s3.pdf>.
8. Asakura K, Sasaki S. School lunches in Japan: Their contribution to healthier nutrient intake among elementary-school and junior high-school children. *Public Health Nutr*. 2017;20(9):1523-1533. doi: 10.1017/S1368980017000374
9. Miyawaki A, Lee JS, Kobayashi Y. Impact of the school lunch program in overweight and obesity among junior high school students: a nationwide study in Japan. *J. Public Health*. 2019;41(2):362-370. doi: 10.1093/pubmed/fdy095
10. Kohri T, Kaba N, Itoh T, Sasaki S. Effects of the National School Lunch Program on bone growth in Japanese elementary school children, *J Nutr Sci Vitamin*. 2016;62(5):303-309. doi: 10.3177/jnsv.62.303
11. Background to enactment of the Basic Law on Shokuiku. What is Shokuiku (Food Education)? Accessed February 20, 2024. <https://www.maff.go.jp/e/pdf/shokuiku.pdf>.
12. Ishida H. The history, current status, and future directions of the school lunch program in Japan. *Japn. J. Nutr. Diet*. 2018;76(supplement):S2-S11. doi: 10.5264/eiyogakuzashi.76.S2
13. Miyoshi M, Tsuboyama-Kasaoka N, Nishi N. School-based "Shokuiku: program in Japan: application to nutrition education in Asian countries. *Asia Pac. J. Clin. Nutr*. 2012;21(1):159-162.

14. Wang R, Yanai S. Characteristics and Roles of School Gardens in Urban Areas of Japan: Perspective of School Managers. *Land*. 2023; 12(3):565. doi: 10.3390/land12030565
15. Yamada, I. The Effects of agricultural experience on the emotion and interest of children. *J. Rural Problem*. 2008;44(2):326-336. doi: 10.7310/arfe1965.44.326
16. Nutrition Teacher School Dietitian at Japanese School Lunch A Perspective from Vietnamese Dietitians. Accessed March 20, 2024. <http://jnl.calorie-smile.jp/>.
17. Boyle MA. *Community Nutrition in Action*. 8th ed. Cengage; 2022.
18. Mayer-Davis EJ, Lawrence JM, Dabelea D, et al. Incidence Trends of Type 1 and Type 2 Diabetes among Youths, 2002-2012. *N Engl J Med*. 2017;376(15):1419-1429. doi:10.1056/NEJMoa1610187
19. 2012 nutrition report infographic. Centers for Disease Control and Prevention. March 27, 2012. Accessed February 24, 2024. <https://www.cdc.gov/nutritionreport/infographic.html>.
20. CDC's Second Nutrition Report. Accessed February 24, 2024. [https://www.cdc.gov/nutritionreport/pdf/4page\\_2nd\\_nutrition\\_report\\_508\\_032912.pdf](https://www.cdc.gov/nutritionreport/pdf/4page_2nd_nutrition_report_508_032912.pdf).
21. National School Lunch Program Infographic. Accessed February 11, 2024. <https://fns-prod.azureedge.us/sites/default/files/resource-files/NSLPFactSheet.pdf>.
22. School Breakfast Program Infographic. United States Department of Agriculture. Accessed February 11, 2024. <https://fns-prod.azureedge.us/sites/default/files/resource-files/SBPfactsheet.pdf>.
23. Cohen JFW, Richardson S, Parker E, Catalano PJ, Rimm EB. Impact of new U.S. department of agriculture school meal standards on food selection, consumption, and waste. *Am. J. Prev. Med*. 2014;46(4):388-394. doi: 10.1016/j.amepre.2013.11.013
24. Cohen JFW, Smit LA, Parker E, Austin SB, Frazier AL, Economos CD, Rimm EB. Long-term impact of a chef on school lunch consumption: Findings from a 2-year pilot study in Boston middle schools. *J Acad Nutr Diet*. 2012;112(6):927-933. doi: 10.1016/j.jand.2012.01.015
25. Make breakfast first class. Food and Nutrition Service U.S. Department of Agriculture. Accessed February 24, 2024. <https://www.fns.usda.gov/sbp/make-breakfast-first-class>.
26. Research shows farm to school works. Food and Nutrition Service U.S. Department of Agriculture. Accessed February 24, 2024. <https://www.fns.usda.gov/f2s/research-shows-farm-school-works>.
27. Bardin S, Washburn L, Gearan E. Disparities in the healthfulness of school food environments and the nutritional quality of school lunches. *Nutr*. 2020;12(8):2375. doi: 10.3390/nu12082375

28. About RDNs and NDTRs. Academy of Nutrition and Dietetics: [eatright.org](https://www.eatright.org/about-rdns-and-ndtrs). Accessed April 15, 2024. <https://www.eatright.org/about-rdns-and-ndtrs>.
29. The Federal Register. Federal Register: Professional Standards for State and Local School Nutrition Programs Personnel as Required by the Healthy, Hunger-Free Kids Act of 2010. Accessed April 6, 2024. <https://www.federalregister.gov/documents/2015/03/02/2015-04234/professional-standards-for-state-and-local-school-nutrition-programs-personnel-as-required-by-the>.
30. Ray R, Fisher Dr, Fisher-Maltese C. School gardens in the city: Does environmental equity help close the achievement gap? 2016;13(2):379-395. doi: 10.1017/sx742058X16000229
31. Healthy, Hunger-Free Kids Act of 2010. PUBLIC LAW 111–296—DEC. 13, 2010. Accessed April 9, 2024. <https://www.govinfo.gov/content/pkg/PLAW-111publ296/pdf/PLAW-111publ296.pdf>.
32. Takeda W, Melby MK, Ishikawa Y. Food education for whom?: Perceptions of food education and literacy among dietitians and laypeople in urban Japan. *Food Stud.* 2017;7(4):49-66. doi: 10.18848/2160-1933/CGP/v07i04/49-66