A Shokuiku (Food Education) Program for Promoting Healthful Dietary Behavior in Elementary School Students through Increased Awareness of the Benefits of Kyoto’s Food Culture

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Poor dietary behavior among elementary school students in Japan has recently become a cause of concern. Kyoto’s traditional food culture is well known for its healthy, high quality, seasonal ingredients, and thus increased awareness among students may promote improvements in their dietary behavior. Therefore, we developed a shokuiku (food education) program consisting of a series of lectures and practical sessions based on Kyoto’s food culture. We then conducted the program on a total of 20 classes of sixth-grade students in a public elementary school in Kyoto to investigate whether increased awareness of the benefits of Kyoto’s food culture would improve their dietary behavior.

After the program, we assessed a number of factors related to dietary behavior. Among these factors, we found that the percentage of students who were able to savor meals using all 5 senses increased from 29.7% to 79.0%, and the percentage of students who paid more attention to table manners at mealtime increased from 10.9% to 40.3%. Furthermore, they came to view Kyoto’s food culture, which is representative of Japan, i.e., having a beautiful seasonal presentation, a spirit of treasuring the inherent color and flavor of the ingredients, and accompanied by a spirit of hospitality known as motenashi no kokoro, as beneficial. More than 90% of the students reported appreciating Kyoto’s food culture and feeling a sense of pride to be residents of the city. They also considered motenashi no kokoro to be its most important principle. In addition, a questionnaire conducted on the students’ parents (response rate, 66.2%) showed that over 50% observed an increase in their child’s interest in cooking and daily dietary habits at home. A separate questionnaire conducted on school teachers showed that the shokuiku program was suitable and effective for sixth-grade students, and that a visit to a restaurant specializing in Kyo-ryori, the cuisine of Kyoto, which was part of the program, allowed the students to reflect on what they had learned at school and to develop more interest in the benefits of Kyoto’s food culture. Moreover, they developed an awareness of healthy dietary behavior.

These results suggest that shokuiku programs can improve dietary behavior in elementary school students.

Key words: Shokuiku (food education) program, Kyoto’s food culture, Kyo-ryori, Motenashi no kokoro (a sense of hospitality)

1. Introduction

Washoku (traditional Japanese cuisine) was inscribed in the UNESCO Representative List of the Intangible Cultural Heritage of Humanity in December 2013. In addition, the Japanese Ministry of Agriculture, Forestry and Fisheries has cited the follow-
ing 4 characteristics of washoku: 1) uses an abundance of fresh foods from the sea, mountains, and countryside with cherished natural flavors; 2) provides a healthy and nutritionally well-balanced diet, 3) presented in a way that emphasizes the beauty of nature and the seasons; and 4) has a menu that corresponds to annual events such as New Year’s Day.

Although washoku has attracted worldwide attention as a healthy and well-balanced diet, Japan currently faces a number of dietary and lifestyle-related issues. For example, even though life expectancy among the Japanese is the highest in the world, gaps remain evident between total life expectancy (80.21 years in men, 86.61 years in women) and healthy life expectancy (71.19 years in men, 74.21 years in women). Moreover, death rates from chronic lifestyle-related diseases such as cancer and cardiovascular disease have increased, and Japan has the lowest level of food self-sufficiency among the developed countries.

In addition, social changes associated with the more independent modern lifestyle have led both to the expansion of the ready-made meal market and to the tendency for individuals to eat out more frequently; these changes provide children with fewer opportunities to learn about desirable dietary behavior, e.g., eating a nutritionally balanced diet, using seasonal ingredients, how to savor food, how to prepare food, etc., and Japanese food culture through daily dietary habits at home. Therefore, the traditional ways in which younger generations have inherited Japanese food culture have become problematic.

In 2005, to respond to these issues and promote lifelong healthy eating habits, the Cabinet Office of Japan passed a basic law to promote shokuiku (food education). The Shokuiku Promotion Basic Plan was implemented in 2006, and has led to the practice of various activities not only by the national government, but also by local government, schools, nurseries and the food industry.

The basic Japanese-style meal comprises the following combination of dishes: a staple food (rice) accompanied by 1 soup and 3 kinds of dishes (1 main dish and 2 side dishes): this is known as 一汁三菜 (Ichi jyuu sann sai). The Japanese diet celebrates 5 tastes (sweet, salty, sour, bitter, and umami), known as 五味 (gomi), 5 colors (red/orange, white, yellow, blue/green, and black/brown/purple), known as 五色 (goshi), and 5 food preparation methods (raw [cut], steam, boil, bake, and deep fry), known as 五法 (gohou), all of which use seasonal ingredients and are meant to be savory by all 5 senses (smell, sight, taste, touch, and sound). This Japanese dietary style promotes healthy eating habits; however, among all shokuiku activities conducted between 2006 and 2008 in Hyogo Prefecture, Japan, only 24% included information related to Japanese food culture.

Kyo-ryori, the cuisine of Kyoto, which is representative of Japanese food culture, attempts to address these problems. In order to teach the benefits of Kyo-ryori, Kyo-ryori chefs offered to participate in a shokuiku program for elementary school children; however, due to a limited workforce, a systematic program was unable to be implemented. In the shokuiku program, it was thus decided that the primary teaching method concerning the concept of Kyoto’s food culture would be to allow students to savor foods at a Kyo-ryori restaurant after participating in preliminary studies at school. After the restaurant visit, the students were to be given follow-up information at school. However, to the best of our knowledge, no shokuiku programs were implemented that included savoring meals at a Kyo-ryori restaurant. Therefore, in order to teach the benefits of Kyoto’s traditional food culture, we conducted a 20-class shokuiku program among sixth-grade public elementary school students in Kyoto that included savoring foods at a Kyo-ryori restaurant. In this paper, we discuss the effectiveness of our shokuiku program.

2. Methods

Subjects

The study cohort comprised 68 sixth-grade students from S public elementary school in Kyoto, Japan. To teach the importance of the environment and the seasons in Japanese food culture during the preparation and presentation of meals, students had been given related lessons on the subject while they were in the fifth-grade.
Between July and November 2005, with the cooperation of a food and nutrition teacher, homeroom teachers, skilled persons from the community, and a master chef of Kyo-ryori, a *shokuiku* program was implemented based on the concept of Kyoto’s food culture. The program consisted of 20 classes that included lectures and practical experience, as shown in Table 1.

The purpose of the first series of lectures (2 classes) was to allow students to understand the roles of the 5 senses when savoring dishes. After gaining awareness of their 5 senses in relation to savoring food, students were asked to taste 6 kinds of *dashi* (Japanese stock), including 1 made from *konbu* (dried giant kelp) and *katuso-bushi* (dried bonito), and 1 made from an instant powder with either *yuzu* (Chinese lemon) as a stimulus for the sense of smell and/or *namafu* (wheat gluten) in the shape of cherry blossoms as a stimulus for the sense of smell and/or taste.

### Table 1 Framework of the *shokuiku* program based on the concept of Kyoto’s food culture

<table>
<thead>
<tr>
<th>Lecture series</th>
<th>Theme</th>
<th>Lesson and Experience</th>
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| 1              | Let’s savor dishes using all 5 senses (2 classes) | Lecture: learning about the roles of the 5 senses  
Practice: comparing the tastes of 6 kinds of *dashi*  
: serving the same ingredients in 2 different-colored bowls |
| 2              | Food culture in the world and in Kyoto, Japan (3 classes) | Lecture: learning how food culture evolves based on the social and geographical environments  
Practice: comparing 3 types of water (soft water from Kyoto, hard bottled water from France, and tap water from the school) to understand the importance of water quality for Kyoto’s food culture |
| 3              | Let’s become professionals at savoring dishes (2 classes) | Lecture: learning the aesthetics of Kyoto’s food culture  
Practice: learning the importance and significance of proper table manners for dining at a Kyo-ryori restaurant  
: experiencing the aesthetics of Kyoto’s food culture through participation in a simulated tea ceremony and a game in which *wagashi* are freely given names |
| 4              | Let’s savor Kyo-ryori, the cuisine of Kyoto, at a restaurant (3 classes) | Practice: watching a demonstration of knife skills and experiencing the beauty of both Kyo-machiya, a traditional Kyoto townhouse, and *shitsurae*, interior design that represents the season  
: savoring *tenshin* (a light meal) using all 5 senses |
| 5              | Let’s deepen our understanding of Kyoto’s food culture (10 classes) | Practice: deepening understanding of Kyo-ryori through investigational studies, group debates, and presentations |

*Shokuiku program*

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of sight. The students compared the delectability of the dashis and were capable of noticing changes in palatability. In addition, to understand the importance of tableware in food presentation, they were asked to serve identical wanmori dishes (a dish served in a wooden bowl during Japanese tea ceremonies) in 2 separate black- and red-colored bowls, as shown in Fig. 1A. They then described the differences in their personal perceptions of each dish.

The purpose of the second series of lectures (3 classes) was to increase student awareness of variations in food culture not only within Japan, such as differences between Kyoto’s food culture and the rest of the country, but also around the world. Students were taught that the food culture of each area evolved according to its own specific social and geographical environment. For example, Kyoto was the capital of Japan for over 1000 years (794~1868 AD).
and during that time, a variety of food cultures, such as that of the ancient court nobility (Yusoku-ryori), that of the samurai (Honzen-ryori), that of the Buddhist priests (Syojin-ryori), and that of the tea ceremony (Kaiseki-ryori), were prominent. The benefits of each of these individual food cultures were incorporated into the development of Kyoto’s present-day food culture. Moreover, Kyoto’s geographical features were also of importance. For example, Kyoto is surrounded by mountains and traversed by four different rivers; this type of geography results in high-quality groundwater, which in turn provides fertile soil and enables the production of high-quality vegetables referred to as Kyo-yasai (Kyoto vegetables).

Kyo-ryori was therefore developed with a dependence on high-quality water, which is necessary for making key components of the cuisine, such as a good dashi (stock). To increase student awareness of the importance of water quality, we had students compare the tastes of the following 3 types of water: (1) somei no mizu (soft water from a famous well in Kyoto); (2) hard bottled water (Contrex; Nestlé, Vittel, France); and (3) tap water from the school.

The purpose of the third series of lectures (2 classes) was to teach students the art of savoring food dishes. Students learned about the aesthetics of Kyoto’s food culture, particularly about the importance of the sense of season and motenashi no kokoro (a sense of hospitality). As part of this series, experienced individuals from the local community were asked to introduce the ritual of the Japanese tea ceremony to the students (Fig. 1B). In a simulated ritual, the students learned the essence of the tea ceremony and its 4 key principles: (1) wa (和; harmony); (2) kei (敬; respect); (3) sei (清; purity); and (4) jaku (寂; tranquility).

Before the simulation, in order to teach them how to taste wagashi (a traditional Japanese confectionery) before drinking tea, students were asked to freely name a wagashi called ama no gawa (the Milky Way) (Fig. 2), which was manufactured by a famous traditional Japanese confectioner (Toraya, Tokyo, Japan), based on its appearance.

In addition, students were taught both the importance and the significance of table manners. In relation to Kyoto’s food culture, students were taught the proper way to use chopsticks and soup bowls when dining at a Kyo-ryori restaurant (Fig. 1C).

The fourth series of lectures (3 classes) centered on savoring Kyo-ryori at a restaurant. After learning about Kyoto’s food culture at school, students were provided the opportunity to appreciate its peculiarities at a restaurant specializing in Kyo-ryori. The owner of the restaurant explained serving etiquette and the different types of Japanese cooking knives, accompanied by a demonstration of knife skills. Students were then able to experience the beauty of Kyo-machiya, a traditional Kyoto townhouse, and shitsurae, interior design that represents the season. After these experiences, students were given the opportunity to savor tenshin (a light meal), not only through the appreciation of the spirit of hospitality and aesthetic value of Kyoto’s food culture, but also through use of their 5 senses (Fig. 1D).

The purpose of the fifth series of lectures (10 classes) was to deepen the students’ understanding of Kyoto’s food culture through investigational studies and group debates related to the unique aspects of Kyo-ryori. Finally, students presented their findings in the form of a school report.

Effectiveness of the shokuiku program through questionnaire surveys

The effectiveness of the shokuiku program was assessed by questionnaire surveys conducted on students, parents, a food and nutrition teacher, and homeroom teachers. Statistical analyses were performed using Microsoft Excel Statistics 2010 for Windows (SSRI Co., Ltd., Tokyo, Japan).

3. Results and Discussion

A total of 20 classes comprising 68 sixth-grade students (40 boys, 28 girls) in S public elementary school were subjected a series of lectures and practical sessions on Kyoto’s food culture.

We performed content analysis on student reports from the lessons and then compared responses to questionnaire surveys conducted both before and after the shokuiku program.

Following the first series of lectures, the students reported gaining a good understanding of not only the roles of the 5 senses, but also their importance in savoring food. In the dashi comparisons, students could distinguish changes in palatability upon the
addition of the yuzu and namafu stimuli. They also noticed differences in their impressions of identical dishes served in different-colored bowls.

Following the second series of lectures, the students reported becoming aware of the relationship between food culture and the environment. After comparing the tastes of the 3 different varieties of water, they came to understand the connection between Kyo-ryori and the quality of Kyoto’s water.

Following the third series of lectures, the students reported that they had learned the importance of the season. This was aided through the task in which they were asked to name wagashi based on its appearance, depending on the season. In Japanese culture, when guests of a tea ceremony are presented with wagashi, they should create an imaginary scene inspired by its name and appearance before eating. In the wagashi task, student descriptions of wagashi included komorebi (the play of the sunlight filtering down through the leaves), ryusei (shooting star), and kazewataru (wind passing through a meadow). After the tea ceremony simulation, students reported more appreciation of this ritual.

Table manners were necessary not only for creating a pleasant atmosphere at mealtime, but also for showing gratitude towards the cooks, the servers, and all those involved in the preparation of the meal. Through participation in the tea ceremony simulation and the lesson on table manners, the students came to understand their significance in savoring meals.

Following the fourth series of lectures, the students reported an appreciation the beauty of Kyo-machiya and shitsurae. They also reported that the
tenshin they savored at the Kyo-ryori restaurant, which comprised dishes designed using 5 types of tastes, colors, and preparation methods (五味・五色・五法) (Fig. 1D), was a practical reminder of what they had studied in school.

Following the fifth series of lectures, the students reported being having a deeper understanding of Kyoto’s food culture as a result of the investigational studies, group debates, and presentations related to its unique aspects.

Finally, they reported that motenashi no kokoro was the most important principle of Kyoto’s food culture.

Based on responses from the questionnaire surveys conducted both before and after program, we were able to verify the following effects of the shokuiku program.

The answers to the question “How do you savor your daily meals at home?” are shown in Fig. 3. The percentage of students who answered “using all 5 senses” increased from 29.7% before to 79.0% after the program.

Similarly, answers to the question “What do you think is the most important contributing factor to
comfortable eating at mealtime?” are shown in Fig. 4. Over half (53.1%) of the students emphasized the importance of the “dining environment” before the program, which might be explained by their lessons from the previous year. Nevertheless, this percentage increased to 59.7% after the program. Furthermore, the percentage of students who answered “table manners” increased from 10.9% to 40.3%. As shown in Fig. 5, many students responded that table manners were necessary “for enjoying mealtime with others”, “for savoring meals”, “for eating comfortably”, “for showing respect to others” and so on. These results suggested that the students deepened their understanding of the importance of the dining environment not only as a result of the lecture, but also as a result of their experience of savoring dishes at the Kyo-ryori restaurant.

As shown in Fig. 6, the most common answer to the question “What do you remember the most about what you learned at the Kyo-ryori restaurant?” was “table manners”, followed by “savoring a meal using all 5 senses”. After their practical experience at the Kyo-ryori restaurant, we asked students, “What contributes to the benefits of Kyoto’s food culture?”. Over 30% of students answered “beautiful presentation” and “treasuring the inherent color and
flavor of the ingredients”, and 23.3% answered “a sense of hospitality (motenashi no kokoro)”, as shown in Fig. 7. The practical experience at the Kyo-ryori restaurant was thus considered to be extremely effective for allowing students to reinforce what they had learned at school.

As shown in Fig. 8, more than 90% of the students answered that they wished to share Kyoto’s food culture with others and that they felt proud to live in Kyoto.

The results of the student questionnaire surveys suggested that the shokuiku program could, through increasing their awareness of the benefits of Kyoto’s food culture, play an important role in allowing students to achieve healthy dietary behavior.

In addition, in order to investigate for changes in the students’ dietary behavior at home and at school as a result of the shokuiku program, we conducted questionnaire surveys on the student’s parents, home-room teachers, and food and nutrition teacher.

**Verification of the present program by their parents**

Results from the questionnaires conducted on parents after the program (response rate : 66.2%)
were as follows. Concerning the question, “How did the home dietary behavior of your child change after the shokuiku program?”, over 50% of the parents answered that their child demonstrated more interest in cooking and in the ingredients of the meal (Fig. 9).

Concerning whether they thought that a shokuiku program at school was important and whether they thought it should continue, more than 90% of the parents answered “very much” or “yes” (Fig. 10).

In the present program, the owner of the Kyo-ryori restaurant invited students to have lunch for free. However, in order to expand these practices in Kyoto city, some additional funding money may be necessary. The owner of the restaurant noted that it would be possible to give students the chance to have practical lessons at the Kyo-ryori restaurant for 1,500 yen per student per year. Therefore, we asked parents “How much would you agree to pay for shokuiku programs such as these?”. As shown in Fig. 11, about 42% of the parents answered that they would pay between 1,001-2,000 yen, and about 16% answered that they would pay more than 2,000 yen.

These results suggest that parents recognized the effectiveness of the present shokuiku program.

Verification of the present program by teachers

Finally, after the program, we asked a food and nutrition teacher and 2 homeroom teachers from the elementary school if our program was appropriate for sixth-grade students based on a 5-point scale (1 : Inappropriate, 2 : Not very appropriate, 3 : Appropriate, 4 : Very appropriate, and 5 : Extremely appropriate). The results are shown in Fig. 12. The mean evaluation concerning student understanding of each aspect of the program was about 4.0 points. This suggests the appropriateness of our program for sixth-grade students.

In the present program, the eagerness of students to have a meal at the Kyo-ryori restaurant gradually increased through a priori learning, and they were able to relate that knowledge to their experience at the Kyo-ryori restaurant. Through subsequent investigations, they found that the most important principle of Kyoto’s food culture was motenashi no kokoro.
Based on these results, a shokuiku program based on Kyoto’s food culture might promote healthy dietary behavior in students by increasing their awareness of the benefits of their local food culture.

References

2) Ministry of Health, Labour and Welfare : The progress of each target item in Healthy Japan 21 (the second term). http://www.mhlw.go.jp/file/05-
Foodservice Industry Statistics 2013: toward the safety and security of food, (Public Interest Incorporated Foundation of Foodservice Industry Research Institute, Tokyo, Japan), 9-17, 147-163 (2013)


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京都の食文化に活きる精神を活用した食育プログラムの実践
―小学6年生の健康な食行動育成を目指して―

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京都市立S小学校6年生68名を対象に、健康的な食行動の育成を目指して、地元の京都の食文化を活かした講義と体験からなる全20時間の食育プログラムを実践し、その効果を検証した。その結果、五感を使って食事を味わう児童（29.7％から79.0％に）、食事時のマナーを大切にする児童（10.9％から40.3％に）が増加した。また、季節感や食材本来の色や香りを大切にする精神、もてなしの心などに気付き、90％以上の児童が、京都の食文化に誇りを持ち、これからも伝えていきたいと答えた。保護者へのアンケート結果から、家庭における児童の食行動の変化として、調理方法や食材に興味を持つようになったことが示された。加えて、担任教諭や栄養教諭からは、学校での学びが京料理店での食事体験と一体化することで、より一層、学びを行動に移す良い機会となったことが示された。以上のことから、本食育プログラムは、子どもたちの健康的な食行動形成に一定の効果があったと考えられた。