Monitoring and Evaluation Systems for the School Lunch Program in Japan: Organizing Items with Reference to Acts and Surveys

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ABSTRACT

Objective: To compile rules concerning monitoring and evaluation systems related to implementation of the school lunch program in Japan based on the Plan-Do-Check-Act (PDCA) cycle.

Methods: Using surveys conducted by MEXT and related organizations, we compiled data on monitoring and evaluation and then extracted and organized monitoring/evaluation items, document titles, subjects, implementation time, and frequency.

Results: Monitoring and evaluation systems were divided into two categories: “Healthy development of children” and “Operation of school lunch programs.” Both should be conducted in conjunction with each other. For “healthy development of children,” it is necessary to evaluate school children’s dietary habits, attitudes, QOL, and health status. Concerning “operation of school lunch programs,” an understanding is required of nutrition/dietary controls, menu controls, receiving, storage and inventory control of foodstuffs, financial management, food safety and hygiene management, and quality control. “Nutritional Standards” corresponding to nutrition and dietary control, and the implementation status of school lunch programs are reported annually. As a result, an increase in children’s height and body weight has been observed in line with improvements in school lunches and the overall quality of meals.

Conclusion: School lunch programs in Japan play an important educational role. To be successful, it requires coordinated monitoring and evaluation of school children’s status and the operation of the program.

Key words: school lunch program, monitoring, evaluation

I. Introduction

School lunch programs play an important role in the growth and development of Japanese school children. To clarify the role of the school lunch program, it is necessary to monitor and evaluate it in a consistent and well-defined manner. In accordance with the “Nutritional Standards” that have been employed in preparing the school lunch menu, basic practice in the operation of school lunch programs demands that their evaluation must be conducted based on the Plan-Do-Check-Act (PDCA) cycle. The PDCA cycle is a method for ensuring the smooth management of tasks such as quality control. By repeating the four phases of the PDCA cycle, tasks can be continuously improved. In the Dietary Reference Intakes for Japanese (2015 edition), the PDCA cycle is used to evaluate the effectiveness of dietary improvement programs. For the school lunch program, the nutritional status of school children is assessed and school lunch menus are planned according to the “Nutritional Standards” during the Plan phase, while in the Do phase, controls of school lunch program and dietary guidance are implemented. The Check phase encompasses evaluation, in which the status of elements such as nutrition controls and school children’s dietary habits are evaluated. The Act phase involves monitoring, with the school lunch program being further developed based on the results of the evaluation.

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The school lunch program in Japan is implemented based on the “School Lunch Act”\(^5\). The main order is known as the “Order for Enforcement of School Lunch Act”\(^6\) while the enforcement regulations are contained in the “School Lunch Act Enforcement Regulations”\(^7\) and its public notices (Direction of Bureau Notice) “Criteria for Provision of School Lunches”\(^1\) and “The Standards of Hygiene Control of School Lunches”\(^8\). The revision of the Act in 2008 stated that the school lunch program plays an important role in education by cultivating in school children a correct understanding of food and the ability to make appropriate food choices\(^5\). Diet and Nutrition Teachers should teach relationship between the food and the improvement of health, and provide individual support through school lunches. The “Nutritional Standards”\(^1\) found in the “Criteria for Provision of School Lunches”\(^1\), describes the recommended intake per meal per person as set based on the Dietary Reference Intakes for Japanese (2010 edition)\(^9\) by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). These standards are used in the planning and evaluation of school lunch menus. Furthermore, improvements in the school lunch program are overseen by MEXT.

In evaluating the status of school children, MEXT conducts surveys such as the “School Health Statistics”\(^10\), and the “Survey of Physical Strength/Sporting Ability”\(^11\). The “National Assessment of Academic Ability”\(^12\) is administered by the National Institute for Educational Policy Research, the “Survey of School Children’s Dietary Habits”\(^13\) by the Japan Sport Council, and the “Surveillance of School Children’s Health Status”\(^14\) by the Japan Society of School Health under the authority of MEXT. In evaluating the operation of school lunch programs, MEXT conducts surveys such as the “Nutrition Report of School Lunches”\(^15\), and the “School Lunch Implementation Survey”\(^16\).

From the above, there is a need to promote use of the PDCA cycle for the development of the school lunch program in Japan. This report describes the rules that have been enforced by the central government and its related organizations in the monitoring and evaluation systems related to the planning and evaluation of the implementation of school lunch programs based on the PDCA cycle.

II. Method

This report compiles the rules that have been enforced by the central government and related organizations regarding the monitoring and evaluation of school lunch programs. Using the MEXT website on the development of school lunch programs\(^17\), the authors chose surveys related to school lunch programs conducted by MEXT, along with other surveys mentioned in the website and conducted by related organizations in March, 2017. Using these surveys, we compiled data relating to monitoring and evaluation. In researching the evaluation of facilities for the development of healthy school children and school lunch programs, we extracted and organized monitoring/evaluation items, document titles, subjects, implementation time, and frequency from surveys by MEXT, the Japan Sport Council, the Japan Society of School Health, the National Institute for Educational Policy Research, the Ministry of Health, Labour and Welfare, the Organization for Economic Co-operation and Development (OECD), and the International Association for the Evaluation of Educational Achievement (IEA). The monitoring/evaluation system of school lunch program is divided into two sections, namely, “Healthy development of children” and “Operation of school lunch programs.” For “healthy development of children,” a framework proposed by Akamatsu et al.\(^18,19\) for the evaluation of *Shokuiku* (Food and Nutrition Education) based on the PRECEDE-PROCEED Model\(^20\) at school was used.

III. Results

1. Overall picture of monitoring/evaluation system of school lunch programs in Japan

The monitoring/evaluation system of school lunch programs is divided into “healthy development of children” and “operation of school lunch programs” (Figure 1). For “healthy development of children,” a framework proposed by Akamatsu et al.\(^18,19\) was modified. In accordance with evaluation of school children’s dietary habits and knowledge as well as skills and attitudes, an evaluation of school children’s quality of life (QOL) and health status must be made. In terms of the evaluation results, a comprehensive judgment for assessing and evaluating school children is to be given.
Concerning the “operation of school lunch programs,” nutrition and dietary control are to be planned based on the result of “healthy development of children.” Then, based on the plan for nutrition/dietary controls, menu controls, receiving storage and inventory control of foodstuffs, financial management, food safety and hygiene management, and quality control is to be executed. After planning and implementing these administrative tasks, each of them is to be evaluated. With a comprehensive judgment based on the evaluation results, the “operation of school lunch programs” is to be carried out.

As described above, the evaluation on “healthy development of children” and “operation of school lunch programs” should be conducted in conjunction with each other.

2. Healthy development of children (Table 1)

1) Survey for monitoring/evaluating “healthy development of children”

The surveys for monitoring/evaluating “healthy development of children” are implemented by MEXT, the Japan Sport Council, and the Japan Society of School Health, among others. The “School Health Statistics” that are compiled by MEXT show the results by age groups, prefecture, gender, and so on, thus enabling the examination of annual changes and regional differences. The statistics have a long history, being in existence since 1900 (Figure 2-1, 2-2). For the method of investigation, each prefecture is expected to extract survey schools and to confirm the data obtained at the investigated schools, and then to submit the data to MEXT. Every year MEXT compiles the data, and prepares and publishes the report. The survey implemented by the Japan Sport Council is not carried out on a regular basis but has set up the items by which school children’s dietary conditions can be comprehended in detail.

2) Outcome evaluation: Children’s QOL and evaluation of health/nutritional status

Children’s QOL is divided into enjoyment, sense of belonging to a school, academic ability, and physical strength. For enjoyment, three items such as “I experience enjoyment in going to school” were executed in the “National Assessment of Academic Ability” (PISA). Additionally, the items related to experiencing enjoyment in eating described in the “Survey of School Children’s Dietary Habits” were investigated. For the evaluation of sense of belonging to a school, six items such as “feeling like a stranger (or an outcast) at school” in the “Programme for International Student Assessment” (PISA), were surveyed. Next, for the evaluation of academic ability, academic abilities including Japanese language, arithmetic,
## Table 1: The monitoring/evaluation items and references related to "healthy development of children"

| Major items                                                                 | Minor items                                 | Monitoring/evaluation items | Refereces                                                                                               | Subjects                                                                 | Implementation |
|------------------------------------------------------------------------------|---------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------|
| QOL Enjoyment                   |                                             |                             | National Assessment of Academic Ability (National Institute for Educational Policy Research) 12)         | Fifth-grade elementary and second-grade junior high-school children and their parents, about 10,000 | Every April                  |
| Sense of belonging to a school                                             |                                             |                             | Programme for International Student Assessment (PISA) 21)                                             | First-grade senior high-school students, 198 schools across the country | Every three years          |
| Academic ability (Japanese arithmetic, mathematical literacy, scientific literacy) |                                             |                             | Programme for International Student Assessment (PISA) 21)                                             | Described before Described before | Described before Described before |
| Health/nutritional status                                                   |                                             |                             | Survey of Physical Strength/Sporting Ability (MEXT) 11)                                               | Elementary and junior high-school children, complete survey            | Every April |
| Physical strength                                                           |                                             |                             | Survey of Physical Strength/Sporting Ability (MEXT) 11)                                               | Number of samples 13,536 elementary school children, 8,460 junior high-school children (fiscal year 2015) | From May to July every year in elementary and junior high schools |
| Health status                                                                |                                             |                             | Surveillance of School Children's Health Status (Japan Society of School Health) 14)                  | From the first grade of elementary school to the third grade of junior high school | From December to February every two years |
| Academic ability (Japanese arithmetic, mathematical literacy, scientific literacy) |                                             |                             | Trends in International Mathematics and Science Study (TIMSS) 22)                                       | 4,400 fourth-grade elementary school children, 4,700 second-grade junior high-school children (2015) | Every four years |
| Academic ability (Japanese mathematics, science)                            |                                             |                             |                                                                                                         |                                                                                                                                      |
| Health/nutritional status                                                   |                                             |                             |                                                                                                         |                                                                                                                                      |
| Health status                                                                |                                             |                             |                                                                                                         |                                                                                                                                      |
| Feeling hungry or not before school lunch                                    |                                             |                             |                                                                                                         |                                                                                                                                      |
| Unidentified complaint (6 items)                                            |                                             |                             |                                                                                                         |                                                                                                                                      |
| Major items | Minor items | Monitoring/evaluation items                                                                 | References                                                                                      | Subjects                                                                 | Implementation time/frequency |
|------------|-------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------|
| Dietary habits | Meal intakes | Nutrient intake by food groups (one day)                                                   | National Health and Nutrition Survey (Ministry of Health, Labour and Welfare)24)                  | 7 to 14 years old 7 to 14 years old                                         | Every November                |
|            |             | Nutrient intake by food groups (each one weekdays and holidays)                           | Survey of School Children's Dietary Habits (Japan Sport Council)13)                               | Third-grade and fifth-grade elementary school and second-grade junior high-school children | In 2002, 2007, and 2010       |
|            |             | Comparison between days with school lunch and days without it                             |                                                                                                 | About 5,700 children                                                      |                               |
| Eating behavior | Breakfast   | Breakfast intake, snack intake, help in cooking, Greetings at meal, Food that school children dislike | Survey of School Children's Dietary Habits (Japan Sport Council)13)                               | Fifth-grade elementary and second-grade junior high-school children       | In 2000, 2005, 2007, 2010     |
|            |            | Frequency of eating breakfast, eating breakfast alone, eating dinner alone, eating late-evening snacks, having leftovers and eating too much confectionery, and the kind of the dishes eaten for breakfast or dinner |                                                                                                 | About 10,000 children                                                    |                               |
| Knowledge/skill/attitude | Dietary attitude/skill | Dietary perception and preferences * Favorite and least favorite food at school lunch * Matters that require attention in dietary life (12 items) * Cooking skill * Way of holding chopsticks * Favorite and least favorite menu | Survey of School Children's Dietary Habits (Japan Sport Council)13)                               | Fifth-grade elementary and second-grade junior high-school children and their parents, about 10,000 | In 2002, 2007, and 2010       |
|            | Food knowledge | * Three-color Classification System for Food Groups                                            |                                                                                                 |                                                                            |                               |
| Food environment | Food environment | Items pointed out for caution by family (6 items) * Washing hands before eating meals; greeting at meals; way of holding chopsticks; way of putting utensils on the table; not eating with elbows on the table; not being picky about eating |                                                                                                 |                                                                            |                               |
mathematics, and science in the "National Assessment of Academic Ability"\textsuperscript{12), PISA\textsuperscript{21)}, and the "Trends in International Mathematics and Science Study" (TIMSS)\textsuperscript{22)} were mentioned. For the evaluation of physical strength, eight items in the "Survey of Physical Strength/Sporting Ability"\textsuperscript{11)} were examined. In the "National Survey of Physical Strength/Sporting Ability, and Exercise Habits"\textsuperscript{23)}, which was analyzed using the same research items, more detailed analysis results of the relationships between lifestyle and physical strength and among aspects such as TV, games, use of mobile phones, and physical strength were shown.

The school children’s health status/nutritional status were divided into growth status and health/nutritional status. Growth status is surveyed in the regular school physical examinations implemented by MEXT, in which height and body weight are checked. For health/nutritional status, items such as those on nutritional status, diagnosis of eye sight, hearing ability, and eye diseases are surveyed every year in the school physical examinations. This regular health check is conducted at all schools in Japan every year. All the compiled results extracted from this data constitute the "School Health Statistics"\textsuperscript{10). In the "Surveillance of School Children’s Health Status"\textsuperscript{14)}, eighteen items relating to physical health such as blood pressure and lipids in blood and mental health such as physical dullness and feeling hungry or not before school lunch are surveyed for the evaluation of health status. This survey is carried out every two years.

3) Impact evaluation: Evaluation of children’s dietary habits

Children’s dietary habits were divided into meal intakes and eating behavior. For the evaluation of meal intakes, the survey on nutrient intake and intake by food groups in
the “Survey of School Children’s Dietary Habits”\(^{13}\) and other factors was conducted on weekdays when school lunches are served and during holidays when school lunches are not provided. The most recent results were obtained in 2010. In the “National Health and Nutrition Survey”\(^{20}\) as well, the nutrient intake and the intake by food are surveyed every year.

For eating behavior, the items such as breakfast intake, snack intake, help in cooking, greetings at meals, and food that school children dislike were surveyed in the “Survey of School Children’s Dietary Habits”\(^{13}\), as well as the “Surveillance of School Children’s Health Status”\(^{14}\). The survey on breakfast intake has also been carried out in the “National Assessment of Academic Ability”\(^{12}\) and the “Survey of Physical Strength/Sporting Ability”\(^{11}\) and the relationship between breakfast intake status and academic ability/sporting ability was reported.

4) Impact evaluation: Evaluation of knowledge/skill/attitude

For the evaluation of dietary attitude/skill, items such as favorite food at school lunch and matters that require attention in dietary life regarding dietary perception and preferences were surveyed in the “Survey of School Children’s Dietary Habits”\(^{13}\).

For knowledge, the item on food knowledge (the Three-color Classification System for Food Groups) has been checked in the “Survey of School Children’s Dietary Habits”\(^{13}\).

5) Impact evaluation: Evaluation of food environment

For the food environment, six items on eating manner, which point out the need for caution by a family, were surveyed in the “Survey of school children’s dietary habits”\(^{13}\).

### 3. Operation of school lunch programs (Table 2)

1) Survey for monitoring/evaluating the operation of school lunch programs

Most of the surveys for monitoring/evaluating the operation of school lunch programs have been executed by MEXT. The “Nutrition Report of School Lunches”\(^{15}\) and the “School Lunch Implementation Survey”\(^{16}\) are compiled by the board of education of each prefecture, and are reported to MEXT. The distribution and collection of the questionnaires are carried out online.

2) Evaluation items of nutrition/dietary control

For intake in the evaluation of nutrition/dietary control, intake of nutrients and intake by food group of school lunches are reported in the “Nutrition Report of School Lunches”\(^{15}\). This nutrition report, which is compiled once a year from the data collected twice a year from one out of 50 schools, is submitted to MEXT.

3) Evaluation items of menu controls

For school lunches with rice as a staple food in evaluation of menu controls, the frequency of serving a rice meal per week has been reported in the “School Lunch Implementation Survey”\(^{16}\). MEXT shows its policy on menu preparation in the “Criteria for Provision of School Lunches”\(^{1}\), but the survey results of the implementation status are not available.

4) Evaluation items of financial management

Evaluation of financial management has been performed for school lunch fees, cost of foodstuffs, and ingredients in foodstuffs. For school lunch fees, the cost of foodstuffs to be borne by guardians was reported in the “School Lunch Implementation Survey”\(^{16}\). The operation expenses and personnel expenses necessary for implementation of school lunches are to be borne by the central government and the local government who have established the facilities for providing meals, but the amounts were not published. For cost of foodstuffs, the average cost per meal was reported in the “Nutrition Report of School Lunches”\(^{15}\). For ingredients in foodstuffs, the utilization rate of local products and that of domestic products were reported. The numerical values for these evaluation items are shown as the objectives of “The 3rd Shokuiku Promotion Basic Plan”\(^{25}\), and MEXT surveys their trends every year.

5) Evaluation items of production control

For evaluation of production control, food safety and hygiene management are carried out in accordance with the “Standards of Hygiene Control of School Lunches”\(^{8}\) that were stipulated by MEXT. Monitoring and evaluation is conducted by using the following eight kinds of food hygiene inspection from the 1st to 8th card. Respective frequency of each card is fixed to be once a year for the 1st, 4th, and 7th cards; thrice a year for the 2nd, 3rd, and 5th cards; twice a month for the 6th card; and daily for the 8th card. For implementation of hygiene inspections using the cards, the person responsible for hygiene management such as a Diet and Nutrition Teacher performs the inspection, receives the seal of a school master, and keeps
Table 2 The monitoring/evaluation items and references related to “operation of school lunch program”

| Major items                          | Minor items      | Monitoring/evaluation items                                                                 | References                                                                 | Subjects                                                                 | Implementation time/frequency                                      |
|--------------------------------------|------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|
| Nutrition/dietary control           | Intake           | Nutrient intake in school lunches                                                           | Nutrition Report of School Lunches (MEXT)15)                               | Public elementary and junior high schools, including the first half of secondary schools, and evening part-time high schools where full meal school lunches, cooked in a lunch preparation center, are offered | For 5 days, every May and November                                   |
|                                      |                  | Energy, protein, animal protein, lipid, animal lipids, calcium, iron, vitamin A, vitamin B1, vitamin B2, vitamin C, dietary fiber, salt, magnesium, zinc |                                                                           | (One out of 50 schools)                                                  |                                                                     |
|                                      |                  | Intake by food group                                                                      | Nutrition Report of School Lunches (MEXT)15)                               |                                                                           |                                                                     |
|                                      |                  | Flour, rice, enriched rice, milk (for drinking), potato and starch, sugars, pulses, nuts and seeds, green and yellow vegetables, other vegetables, fruits, kinds of mushrooms, marine algae, fish and seafood, meat, eggs, dairy, fat, dried wheat gluten snack, beverages, seasoning and spices, cooked and processed food |                                                                           |                                                                           |                                                                     |
| Menu control                         | School lunches   | Frequency of school lunch with rice as staple food (per week)                               | School Lunch Implementation Survey (MEXT)16)                               | National, public, and private elementary and junior high schools (including the first half of secondary schools), special-support schools, and evening part-time schools | May 1, every year                                                   |
| of rice as a staple food             |                  |                                               |                                                                           | Complete survey                                                          |                                                                     |
|                                      |                  |                                               |                                                                           |                                                                           |                                                                     |
|                                      |                  |                                               |                                                                           |                                                                           |                                                                     |
|                                      |                  |                                               |                                                                           |                                                                           |                                                                     |
| Receiving, storage, and inventory   | School lunch fee | Monthly school lunch fee                                                                    | School Lunch Implementation Survey (MEXT)16)                               | Described before                                                         | Described before                                                   |
| control of foodstuffs/Financial       |                  |                                               |                                                                           |                                                                           |                                                                     |
| management                           |                  |                                               |                                                                           |                                                                           |                                                                     |
|                                      |                  |                                               |                                                                           |                                                                           |                                                                     |
| Production control                   |                  | Card 1: Periodic inspection card for school lunch equipment                                 | Standards of Hygiene Control of School Lunches (MEXT)16)                  | All facilities of serving school lunches                                  | Inspection once a year                                             |
| Hygiene management                   |                  | Card 2: Periodic inspection card for hygiene control of school lunch facilities            |                                                                           |                                                                           | Inspection three times a year                                       |
|                                      |                  | Card 3: Periodic inspection card for receiving and storing of foods for school lunches     |                                                                           |                                                                           | Inspection three times a year                                       |
|                                      |                  | Card 4: Periodic inspection card for the cooking process                                   |                                                                           |                                                                           | Inspection once a year                                              |
|                                      |                  | Card 5: Periodic inspection card for hygiene and health conditions of personnel engaged in school lunches |                                                                           |                                                                           | Inspection three times a year                                       |
|                                      |                  | Card 6: Processing card for periodic fecal examination                                       |                                                                           |                                                                           | Inspection twice a month                                            |
|                                      |                  | Card 7: Periodic inspection card for hygiene controls in school lunch service              |                                                                           |                                                                           | Inspection once a year                                              |
|                                      |                  | Card 8: Routine inspection card for school lunches                                          |                                                                           |                                                                           | Inspection every day                                                |
| Personnel management                 | Posts of school lunch staff                                                                        | Commissioning cooking of school lunches to the private sector Number of Diet and Nutrition Teachers/school dietitians and the number of cooks for school lunches (full and part-time employment) | School Lunch Implementation Survey (MEXT)16)                               | Described before                                                    | Described before                                                   |

15) Nutrition Report of School Lunches (MEXT)
16) School Lunch Implementation Survey (MEXT)
the records. For the 8th card that requires daily inspection, the following items should be recorded in a separate paper for monitoring. The monitoring items are (a) a record of the amount of free residual chlorine used in the water, (b) a record of the temperature and time when cooking with heat, (c) a record of the temperature and time of the food that was cooled after heat processing, (d) a record of the temperature and time at the end of the cooking procedure such as after cooling of dressed foods and salads, (e) a record of the temperature and time of free residual chlorine in water used at the time of cooling the food, (f) a record of free residual chlorine at the end of the cooking procedure, (g) a sample of reserved food and date of disposal, (h) a record of the time of meal delivery, (i) a record of the health conditions of outsiders who entered in the cooking room, (j) a record of the carry-in time to school from the lunch preparation center, (k) a record of delivery to school by cooker and by lot as well as carrying in/out time, and (l) a record of the results of food inspection.

For production control, besides hygiene management, there are quality control and work practice management, but there no control has been executed by the government.

6) Evaluation items of personnel management

For allocating posts of school lunch staff, the number of Diet and Nutrition Teachers/school dietitians and the number of cooks for school lunches (full and part-time employment) are surveyed by MEXT every year.

IV. Discussion

The results of this study revealed the following features and the significance of monitoring and evaluation of the school lunch program in Japan.

1. Features of monitoring/evaluation of school lunch programs in Japan

“Nutritional Standards”1) corresponding to nutrition and dietary controls of school lunch programs provide the recommended nutritional intake based on national average values. These standards were fixed based on the concept of “Dietary Reference Intakes for Japanese (2010 edition)”10), according to assessments such as the “Survey of School Children’s Dietary Habits”13). However, flexible application of these values is required, and therefore, each school must determine the actual status of its school children and then establish their dietary intake accordingly, considering factors such as the gender ratio, local food culture, and dietary habits. However, evidence-based data are insufficient for implementation of standards related to the actual status of individual school children2). Current nutritional standards are based on the Dietary Reference Intakes for Japanese (2010 edition)10); however, since the Dietary Reference Intakes for Japanese were revised in 201513), no changes have yet been made. The data are therefore lacking for accurate assessment of both “Nutritional Standards”1) and standards established by each school. Based on preceding studies, Kitade et al.26) examined a method for calculating the standard intake of energy from assessments of height/body weight with the aim of establishing “Nutritional Standards”1) based on the PDCA cycle.

The “School Lunch Implementation Survey”16) is reported annually as a nutritional report on school lunches. Sampling surveys are also conducted at a rate of one in every 50 schools twice annually. In this survey, the average intake of nutrients and the classified average intake by each food group are clarified. Because the resulting intake results represent average values, evaluation based on “Nutritional Standards”1) is not possible, a problem that needs to be addressed. To establish “Nutritional Standards”1), distribution analysis is therefore required. In addition, improvement of menu evaluation during the operation of school lunch programs is also necessary. In the menu evaluation, the frequency of rice meals is available, but this is only one of many evaluation items. In “The 3rd Shokuiku Promotion Basic Plan”25), the aim is to increase the rate of use of local products and domestic foodstuffs in school lunches. However, this forms only one part of foodstuff control in the “Nutrition Report of School Lunches”15), and has yet to be utilized in menu evaluation. Moreover, school lunches also play an educational role, so evaluation of, for example, the inclusion of local products in the menu in consideration of the social studies curriculum should also be implemented.

2. Significance of monitoring/evaluation of school lunch programs in Japan

1) Monitoring/evaluation of children’s growth status

In monitoring of school children, “School Health Statistics”10) have been collected annually since 1900. Analysis
of annual changes in height and body weight revealed increases correlated with improvements in school lunches (Figure 2-1, 2-2).

2) Contribution of school lunches to school children’s intake of nutrients

According to surveys by the Japan Sport Council, the intake of vitamins, minerals, and dietary fiber is high on days with school lunches, while the intake of salt is high on days without school lunches. Furthermore, Nozue et al. found that, by comparing the nutrient intake and intake by food group on days when school lunch was served and days when it was not, intake of calcium, vitamin B₁, vegetables, and milk were high, and intake of salt was low on days with school lunches. Furthermore, a study by Asakura et al. showed that school lunches contribute to overall diet quality, especially in terms of vitamin and mineral intake. Moreover, in a study by Arai et al., the contribution of school lunches by household income was higher in low income groups than in other groups. Murayama et al. further showed that school children’s food and nutrient consumption were not significantly related to household income on days with school lunches, despite being significant on days without school lunches. These findings suggest that school lunches are extremely valuable in terms of overall nutritional status.

However, evaluation of the “healthy development of children” must also be fulfilled. As the school lunch program aims to improve and maintain the health of school children, assessment of school children during implementation of the evaluation is indispensable. However, there are many cases in which the assessment results of dietary habits, health, and nutritional status have not been given as feedback, thereby affecting the flow of the PDCA cycle. Based on evaluation results, such as the acquisition status of knowledge of food, eating habits, lifestyle status, and obesity status, there have been calls to establish indicators in accordance with the actual status of individual schools. Moreover, in terms of setting up indicators in accordance with actual statuses, a detailed framework for evaluation, including disclosure of the results of assessments, is also required.

Furthermore, the diversification of individual support for conditions such as food allergies should also be incorporated. A survey of food allergies was conducted in 2013; however, no longitudinal study has yet been conducted (Table 3). Although there are limitations in equipment and personnel in determining to what extent individual support should be provided, it may be necessary to carry out monitoring/evaluation of individual tendencies in the future.

Despite the problems mentioned above, the school lunch program in Japan plays an important educational role, and the provision of nutritionally balanced meals to school children has been clearly established. Working to solve the above problems will therefore contribute to further development of the school lunch program.

Conflict of Interest

There exist no items constituting a conflict of interest.

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