

Review

Present status and issues of school nutrition programs in Korea

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School nutrition programs are essential for children's long-term nutrition and health promotion. The last decade has been the most dramatic years in the history of school nutrition programs in Korea. The percentage of schools serving school lunches reached almost 100% in 2003. In 2006, *School Meals Act* was significantly revised after serial outbreaks of food-borne illness among students having eaten school lunches. The safety and nutritional quality of school meals had remained as the biggest issue until the middle of 2000s, and then eco-friendly and universal free school lunches have become the main issues related to school meal service and are still under debate. Implementation of the Nutrition Teacher System in 2006 was the turning point of school-based nutrition education in Korea. In addition, two new laws, *Special Act on Children's Dietary Life Safety Management* of 2008 and *Dietary Life Education Support Act* of 2009, started to make meaningful changes in school nutrition environment and practices. The next decade is expected to be very critical in the development of school nutrition programs in Korea as the new systems and laws are to be settled. Significant effort is needed from both the academia and the field to make the related issues to be debated and answered to progressive direction for the school nutrition programs in Korea.

Key Words: school nutrition, school lunch, school meals, nutrition education, nutrition teacher

INTRODUCTION

Schools have been considered as the excellent places of community nutrition services for school-aged children in many countries. It was not an exception in Korea, and Korea could be ranked as one of the top countries having actively utilized school settings as such. For the last decade, especially, significant legislative changes were made in relation to school nutrition in Korea. Policies and programs based on the new legislations are under implementation with great expectation from both the related field and the academia.

The compulsory education in Korea is nine years including six years of elementary schools and three years of middle schools. In addition, over 99% of Korean children attend high schools although high school education is not compulsory. Children are encouraged to choose healthy foods and learn good dietary habits through school meals and nutrition education. The school nutrition programs in Korea, therefore, refer to school meal service and nutrition education practiced in elementary, middle, and high schools.

This article overviewed school meal service and then school-based nutrition education in Korea, focusing on the meaningful changes and related issues during the last decade. At the end of this article, two important persons in the development of school nutrition programs in Korea were briefly introduced.

Current status of school meal service

School meals have played a vital role in the nutrition and health of the school-aged children in Korea. School lunch service was first introduced to Korea in 1953 right after the Korean War with the aid of United Nations Children's Fund (UNICEF). *School Meals Act* was enacted in 1981, and has been revised to meet the needs of the time and public expectation since then.

The percentage of elementary, middle, high, and special schools serving school lunches has reached almost 100% in 2003, from only 13.3% in 1991. As of 2010, 99.9% of 11,396 schools provided lunches for students (Figure 1). Among about 7,263,000 students nationwide, 98.8% students ate school lunches each school day.¹ Although school lunches are available in most of the schools, school breakfasts are served by only a few of boarding schools.

Contract management companies were allowed to operate school lunch service as *School Meals Act* was amended in 1996. Participation of contract management companies in school lunch service made significant contribution to the rapid expansion of school lunch service

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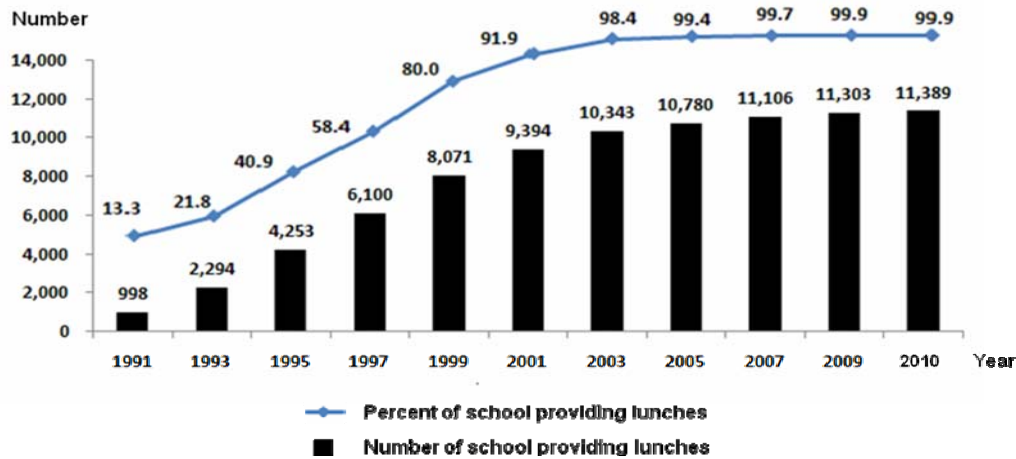


Figure 1. Expansion of school lunch service in Korea



Figure 2. Examples of lunch trays with and without foods in Korea

despite insufficient government budget, especially in middle and high schools.

The number of schools contracting their lunch service with management companies has dramatically increased; in 2004, about 17% of schools contracted their lunch service with management companies.² But a large scale of food poisoning in contract-managed school lunch service in 2006 prompted *School Meals Act* to be renewed, thus many schools adopting contract-management switched their lunch service to self-operation based on the requirement of the law. In 2010, only about 5% of schools contracted their lunch service with management companies.¹

The average lunch price was 1,900 KRW (1.76 USD) for elementary school students, and 2,700 KRW (2.5 USD) for middle and high school students in 2010. According to the statistics in 2011, 79% of the schools served meals at cafeterias and 16% did so at classrooms; the rest 5% served meals at both the cafeterias and classrooms as the capacity of cafeterias was not enough to accommodate all the students.³

Menus and nutritional standard of school lunches

Generally, school lunches in Korea comprise of steamed rice, soup or stew, protein-rich side dish, extra side dish(es), Kimchi, and dessert. Whole milks are provided

with school lunches or a few hours before school lunch service.

School lunches are served on trays made of stainless steel, which usually have five or six compartments. Staples and soup or stew are served in two big compartments of the lower part of a tray and side dishes and Kimchi are served in small compartments of the upper part of the tray (Figure 2).

Table 1 shows the nutritional standard of school lunches in Korea.⁴ This new nutritional standard, revised 10 years after the previous standard of 1997, was specified in the *Enforcement Rules of School Meals Act* renewed in January, 2007 following the comprehensive amendment of *School Meals Act* in 2006. The new standard included required amounts of energy and such nutrients as protein, vitamin A, B₁, B₂, C, calcium and iron per meal by age and gender groups.

The nutritional standard was established based on one-third of Dietary Reference Intakes for Koreans.⁵ Actual energy provided by school lunches should be within $\pm 10\%$ of the nutritional standard. Energy from carbohydrate, protein, and fat should be 55~70%, 7~20%, and 15~30%, respectively. In addition to the quantitative nutritional standard, the following are stated to be considered in the process of menu planning of school meals; first, succession and development of traditional dietary

Table 1. Nutritional standard of school lunches in Korea

Gender	Grade	Energy (kcal)	Protein (g)	Vitamin A (RE [†])		Vitamin B ₁ (mg)		Vitamin B ₂ (mg)		Vitamin C (mg)		Calcium (mg)		Iron (mg)	
				EAR [‡]	RI [§]	EAR	RI	EAR	RI	EAR	RI	EAR	RI	EAR	RI
Male	Primary school 1 st ~3 rd students	534	8.4	97	134	0.20	0.24	0.24	0.30	13.4	20.0	184	234	2.4	3.0
	Primary school 4 th ~6 th students	634	11.7	127	184	0.27	0.30	0.30	0.37	18.4	23.4	184	267	3.0	4.0
	Middle school students	800	16.7	167	234	0.34	0.40	0.44	0.50	25.0	33.4	267	334	3.0	4.0
	High school students	900	20.0	200	284	0.37	0.47	0.50	0.60	28.4	36.7	267	334	4.0	5.4
Female	Primary school 1 st ~3 rd students	500	8.4	90	134	0.17	0.20	0.20	0.24	13.4	20.0	184	234	2.4	3.0
	Primary school 4 th ~6 th students	567	11.7	117	167	0.24	0.27	0.27	0.30	18.4	23.4	184	267	3.0	4.0
	Middle school students	667	15.0	154	217	0.27	0.34	0.34	0.40	23.4	30.0	250	300	3.0	4.0
	High school students	667	15.0	167	234	0.27	0.34	0.34	0.40	25.0	33.4	250	300	4.0	5.4

[†] RE: Retinol Equivalent

[‡] EAR: Estimated Average Requirement

[§] RI: Recommended Intake

1. The nutritional standard of school lunches is presented for a meal; It may be flexibly applied according to the growth and health condition, level of physical activity, and regional situation.
2. The average nutrition provision per student is to be evaluated for five consecutive days by season; following are the compliance ranges.
 - 1) The energy should be $\pm 10\%$ of nutritional standard for school lunch and the energy ratio of carbohydrate, protein, fat should be 55~70%, 7~20%, 15~30% respectively.
 - 2) In case of protein, more than required amount in the nutritional standard should be provided, but energy from protein should not exceed 20% of total energy.
 - 3) In case of vitamin A, vitamin B-1, vitamin B-2, vitamin C, calcium, and iron, more than respective Recommended Intakes in principle and Estimated Average Requirements at least should be provided.

culture should be considered. Second, various kinds of foods such as grains and starches, vegetables and fruits, fish, meat and beans, milk and dairy products should be used. Third, salt, oils and fats, simple sugar or food additives should not be overused. Fourth, natural and seasonal foods should be used as much as possible. Last, a variety of cooking methods should be utilized.⁴

Issues regarding school lunch service

For the last decade, several issues related to school lunch service have been raised in Korea. These issues have been around quality aspects of school nutrition programs as quantitative expansion of school lunch service was completed by 2003. Among the issues, following are the most critical ones still under debate: safety of school lunches, universal free school lunch service and eco-friendly school lunch service. How to resolve these issues shall be the keys for the development of the school lunch service in Korea for the next decade.

In the early and middle of 2000s, safety issues have risen in school lunches as a series of outbreaks of food-borne illness in schools of which the foodservice was operated by management companies. Therefore, students' and their parents' trust on school lunches bottomed out and recovering trust on school lunches has been the biggest issue during the period.

Several local governments have enacted ordinances regarding use of eco-friendly food products in school

lunches since 2003. Parents' needs for eco-friendly school lunches has become bigger as the incidence of atopic disease increased in school-aged children although the relationship between atopic disease and diet is not scientifically established. Nationwide interest in well-being and LOHAS also enlarged the demands for eco-friendly school meals. The percentage of the schools using eco-friendly foods in their lunch service is increasing but most of the schools partially utilize eco-friendly foods and still use ordinary foods as well mainly due to the relatively high price and limited supply of eco-friendly foods.

The School Meal Services Support Centers, with functions of central procurement and pre-process of food products for school lunches, started to be founded by local governments based on the amended *Schools Meals Act* of 2006. These centers are expected to contribute to providing schools with eco-friendly and high quality foods with lower prices. As of 2010, the School Meal Services Support Centers are being operated in 11 regions nationwide.⁶ However, this movement of the respective local government needs to be examined for its efficiency from the perspective of the whole nation.

More recently, universal free school lunch service has become another big issue related to school lunch service. In the June 2nd local election in 2010, many politicians pledging to implement 'universal free school lunch' won. About 20% of the students eating school lunches had the benefit of free meal at that time; they were the children

from low-income families or rural areas. If universal free school lunch service is implemented nationwide, the remaining 80% of students are also expected to benefit from free school lunches. This unprecedented policy in school lunch service is still under debate for its practicality and priority in budget allocation.

SCHOOL-BASED NUTRITION EDUCATION IN KOREA

The Nutrition Teacher System

Compared to school meal service, relatively low attention had been given to school-based nutrition education in Korea until the Nutrition Teacher System was initiated. The Nutrition Teacher System was implemented in Korea in 2006, three years after *Elementary and Secondary Education Act* and *School Meals Act* were partially amended to adopt the Nutrition Teacher System in 2003. Two laws stated nutrition teachers as teaching staff and having initiatives in school nutrition services, respectively.⁷

Nutrition teachers are to play roles of teachers and counselors on nutrition in addition to managers of food-service operations in schools. Accordingly, nutrition teachers are expected to make synergic effects on school nutrition programs by providing meal service together with nutrition education.

Nutrition teachers have replaced the position of school dietitians, and 4,531 nutrition teachers were employed by schools as of 2010.¹ But the numbers are still less than 60% of the total number of the schools required to hire nutrition teachers. The number of nutrition teachers is expected to increase very slowly for a while mainly due to the limited quota of government employees.

Because a nutrition teacher should be qualified with teacher license as well as dietitian license, many universities opened special graduate programs to educate and train nutrition teachers. The accredited graduate programs admit licensed dietitians and provide education programs to be qualified for the teacher licensing exam.

In the present, the standards for nutrition education in schools, such as minimum hours of classroom education or curriculum, are not established yet. However, various creative approaches are being tried by nutrition teachers using special class hours, discretionary or club activities, before-school class or lunch hours: experiential learning such as cooking class and farm visit and multifaceted media use such as bulletin board, intra TV, and web-based learning, etc.

School Meals Act prescribes nutrition education as a role of school nutrition teachers but there is any obligation of nutrition education in school curricula. Therefore, the current school-based nutrition education in Korea mainly depends on the intention of principals and nutrition teachers. In addition, job duties of nutrition teachers focused more on meal service yet than nutrition education or counseling. Therefore, much homework remained to make the Nutrition Teacher System work right to the purpose.

New laws impacting school-based nutrition education

Recently, from a legislative perspective, there was prominent progress in the era of school-based nutrition education: enactment of two acts, *Special Act on Children's*

Dietary Life Safety Management and Dietary Life Education Support Act.

Special Act on Children's Dietary Life Safety Management was enacted in March, 2008 as a result of the national strategic plans for improving food safety and nutrition focusing on children by Korea Food and Drug Administration (KFDA).⁸ The act prescribes that KFDA and local governments are responsible for education and promotion of food safety and nutrition for children. Principals of elementary and middle schools are required to provide safety and nutrition education necessary for children's healthy dietary life by the law. To implement the law, larger budget has been allocated than ever before to the research for improving children's diet and therefore significant numbers of research and projects have been conducted on school-based nutrition education for the last three years.

Based on the law, Green Food Zones were designated around schools where junk foods were not allowed to be sold. In addition, school-based healthy food stores have been piloted at a local government level since 2008. The Seoul Metropolitan Government has supported middle and high schools to launch the 'healthy tuck shop' and has provided fresh fruits to the stores at low price.

Dietary Life Education Support Act was established in May, 2009. The implementation of this law has been driven by the Ministry for Food, Agriculture, Forestry and Fisheries, which presented a master plan for the first five years after the activation of the law in April, 2010.⁹ Local governments are supposed to adopt and implement a local policy to support education of dietary life according to the master plan. Advocating the value of environment, health, and consideration, the plan targets a dietary life to contribute to environment preservation, to minimize the social and economical costs due to the increased rate of chronic diseases, and to consider the efforts of farmers and natural environment.

The plan outlined the following policy components: 1) construction of infrastructure to support nutrition education; 2) development of environment friendly dietary life; 3) promotion of Korean traditional meal and nutrition education through family, school, community involvement; 4) extension of experiential learning opportunities. Comprehensive nutrition education and promotion policy and programs such as development of dietary guidelines for green dietary life, empowerment program for food and nutrition practitioners, and development of nutrition education standards and materials are being planned by both of the local government and non-governmental institution.

WHO'S WHO IN SCHOOL NUTRITION PROGRAMS IN KOREA

The history and development of school nutrition programs in Korea cannot be mentioned without crediting two important persons: Dr. Il-sun Yang and Ms. Hye-yeong Cho.

Dr. Il-sun Yang, current vice president and professor of the Department of Food and Nutrition, Yonsei University, produced significant amount of quality research on school meal service in Korea, contributing the improvement of school meals for the last 30 years. While Dr. Yang was serving as the president of the Korean Dietetic

Association from the year of 2002 to 2005, she played the key role in establishing the School Nutrition Teacher System.

Ms. Hyeyeong Cho, current director of the Department of Welfares, Seoul National University, was at the center of history of school meal service in Korea. Ms. Cho had been in charge of the policy and programs of school meal service as a deputy director and a director of the Department of School, Health, and Physical Education, Ministry of Education in Korea from 1996 to 2007. During the period, the percentage of schools serving school lunches increased dramatically, reaching almost 100% of elementary, high, and middle schools in the year of 1997, 1999, and 2003, respectively. As an educational administrator as well as a licensed dietitian, she have led and coordinated the solid settlement of school meal service nationwide in Korea; she established the food safety management system in school meal service adapting HACCP, initiated the modernization of school kitchens, and prepared legal foundation to improve the quality of school meals.

AUTHOR DISCLOSURES

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韓國學校營養系統的目前狀況和議題

學校營養系統對兒童長期營養及健康促進是必要的。過去十年韓國的學校營養系統歷史有劇烈的變化。在 2003 年，提供午餐的學校幾乎達到 100%。但是 2006 年，在食用學校午餐的學童間連續爆發食物中毒後，學餐法案被大幅度修訂。迄 2000 年代中期，學餐的安全性及營養品質仍然是最大的議題；之後生態友好和全面性免費學校午餐變成學校供餐相關的主要議題，且仍在爭議中。韓國於 2006 年執行營養教師系統，這是以學校為基礎的營養教育之轉捩點。此外，兩項新的法案，2008 年的兒童飲食生活安全管理特別法案和 2009 年的飲食生活教育支持法案，開始讓學校營養環境及實踐有明顯的改變。韓國在學校營養系統的發展，預期下一個 10 年將是非常關鍵的，因為這些新的系統及法律將被實施並檢驗。需要學術理論和實際執行雙方面的努力，提出相關的議題，加以討論並解答韓國學校營養系統的進步方針。

關鍵字：學校營養、學校午餐、學餐、營養教育、營養教師