

## Comparison of students' foodservice satisfaction between Korea and US

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### Abstract

This study analyzes important factors of foodservice in school through comparison of students' satisfaction of using foodservice in Korea and US in order to meet students' expectations. The survey was composed of 4 categories including menu, service, hygiene, and facility and it was carried out in both countries to evaluate satisfaction. First, comparison of satisfaction between two countries was made using t-test. Secondly, multiple regression was performed to identify factors affecting satisfaction. As a result Korean students were more satisfied than American students in all aspects. However, regardless of nationality, the top three factors affecting the students' satisfaction were the same. The predictors were food taste (Korean 0.375 and American 0.350), menu variety (Korean 0.305 and American 0.278), and service line (Korean 0.226 and American 0.192). Despite the similarity of the predictors, it can be concluded that the difference in satisfaction level between the two nations can be explained by the approaches to create comfortable and acceptable changes in schools' foodservice. Korea has been increasing the foodservice quality based on their objectives to provide students comfortable and positive environment when eating nutritious meals. However, US have made their main objectives on making changes to decrease youth obesity. Foodservice improvements according to continuous evaluations and surveys are necessary in order to increase students' satisfaction.

**Key Words:** School foodservice, satisfaction, Korea, US

### Introduction

In US, school foodservice and nutrition programs were originally funded by the US Congress in 1946 and National School Lunch Act was conducted after the rein for cing process of nutrition status [1]. With its first starting as a relief foodservice system in 1953, the Korean school foodservice could develop by establishing the school foodservice law in 1981 and change its focus from quantity to the quality of the food. It has been found that 99.7% of the Korean schools and 97.7% students are using school foodservice [2-4]. Regardless of nations, school foodservice has its purpose on escalating the effects of forming students' proper eating behavior, maintaining health, developing community spirit and sociality, and educating sanitary factors [5,6]. The past school foodservice, with its heavy role in serving lunch to students, more gave its attention to providing one-third of daily calories for students' physical growth and daily activities. However, recent school foodservice is accepting 'quality' as a success factor, thus trying to create pleasant dining ambience and reflect students' menu preferences.

Over the years, many studies have investigated factors affecting students' participation or satisfaction in the foodservice [1,7-10]. One study identified that the meal pattern influencing students' attitudes toward the school foodservice [11]. Student choices are cannot be ignored, but offering various menu choices is not the total solution to make students choose healthy foods [1].

Improved taste and more menu choices were found as two main factors that led students to enjoy school foodservice according to Fogelman *et al.* [12]. On the other hand, Marples and Spillman [13] identified the quality and variety of menu were major factors affecting students' participation in the foodservice program. Meyer [1] also found that the provided number of choices influenced high school students' perception of the school foodservice both positively and negatively. Despite numerous research results on increasing students' satisfaction on school foodservice, most countries are suffering from the gap between the reality and students' expectation. Due to the easy access to school foodservice information, parents and students are reacting actively towards foodservice problems. Therefore, escalation of foodservice quality to meet their

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expectations is a necessary process for contemporary schools [4]. Various researches on Korean school foodservice satisfaction, mainly discuss about the increase of food quality and improvement of sanitation, quantity, dining and serving area, and improvement of serving speed [14-16]. In case of United States, however, most researches are mostly related to students' health problems, depicting serious issues such as educational efforts to prevent obesity, attempt to decrease vending machines and endeavor to provide vegetable- oriented menus [17-20]. Nonetheless, Hutchinson *et al.* [21] stated that lunch programs in schools did not satisfy students' wants. Therefore, the main goal of this study is to examine the Korean school foodservice environment and figure out whether they are appealing enough to school foodservice users.

## Subjects and Methods

### Subjects

A survey was conducted on middle and high school students of Korea and US in February 2010 to identify their perceived satisfaction degree on school foodservice. 250 students in Gyeonggi-do, Korea and 250 students in Boston and New York, US participated. A classroom setting was selected to increase the probability in order to allow students to take the survey resolutely [22]. The survey was completed by 206 Korean students and 243 US students (response rate: 82.4%, 97.2% respectively).

### Questionnaires

A written questionnaire was developed based on previously published findings [1,23,24] as well as the opinions of researchers. Satisfaction of school lunch which composed with four territories including menu, service, hygiene and facility were investigated. 5-point Likert-scale was used (1 = very dissatisfied and 5 = very satisfied). The questionnaire was validated before starting study by two dietitians and two food and nutrition major professors. The pilot test was performed by five Korean students and five US students to clarify language and response options.

### Statistical analysis

Surveys from students who responded in sincerely were excluded from the statistical analysis. Descriptive statistics, such as means, standard deviations, frequency distributions, and percentages were used. Comparison analysis was done by using the *t*-test. All of the tests were conducted by computerized statistical package, SPSS 12.0. A 5% probability level was designated as the level of significance, but higher levels of significance ( $P < 0.01$  and  $P < 0.001$ ) were also indicated.

## Results

### General characteristics of the respondents

General characteristics of the groups "Korean students" and "American students" are shown in Table 1. First grade of middle school through third grade of high school (Grade 7 through Grade 12 in the US), representing students aging from 13 to 19, were sampled. Family size of three scored the highest frequency (56.8%) and dual income family dominated in both groups (57.3% in Korea, 59.7% in US). Considering the nutrition education, 14.3% of Korean students and 34.0% of US students answered having nutrition education from school. The main source of the education was television or the Internet (47.3% of Korean students, 48.7% of US students). 34.6% of total respondents answered that the nutrition education from school is necessary or above (Table 2).

### Satisfaction of the school foodservice menu

Table 3 shows the students' satisfaction of school foodservice and the differences between two nationality groups. In the menu categories, because of the meal pattern, rice and *banchan* (Korean style side dishes) of Korean lunch were not matched with the dishes in Western style meal, therefore rice and *banchan* of Korean were matched with carbohydrate menu and side dishes

**Table 1.** General characteristics of the respondents

Variables	Korea (n = %)	US (n = %)	Total (n = %)
Grade			
M 1 (7 <sup>th</sup> ) <sup>1)</sup>	35 (17.0)	34 (14.0)	69 (15.4)
M 2 (8 <sup>th</sup> )	36 (17.5)	42 (17.3)	78 (17.4)
M 3 (9 <sup>th</sup> )	30 (14.6)	38 (15.6)	68 (15.1)
H 1 (10 <sup>th</sup> )	42 (20.4)	43 (17.7)	85 (18.9)
H 2 (11 <sup>th</sup> )	39 (18.9)	51 (21.0)	90 (20.0)
H 3 (12 <sup>th</sup> )	24 (11.7)	35 (14.4)	59 (13.1)
Gender			
Male	96 (46.6)	120 (49.4)	216 (48.1)
Female	110 (53.4)	123 (50.6)	223 (49.7)
No. of family			
≤ 3	17 (8.3)	46 (18.9)	63 (14.0)
4	139 (67.5)	116 (47.7)	255 (56.8)
≥ 5	50 (24.3)	81 (33.3)	131 (29.2)
Income status			
Dual income	118 (57.3)	145 (59.7)	263 (58.6)
Single income	88 (42.7)	98 (40.3)	186 (41.4)
No. of going out for meal			
1-2/day	2 (1.0)	60 (24.7)	62 (13.8)
3-4/week	5 (2.4)	79 (32.5)	84 (18.7)
1-2/week	91 (44.2)	50 (20.6)	141 (31.4)
rarely	108 (52.4)	54 (22.2)	162 (36.1)
total	206 (100.0)	243 (100.0)	449 (100.0)

<sup>1)</sup> M: middle school in Korea, H: high school in Korea, ( ): secondary school grade in US

**Table 2.** Students' responses about nutrition education

Variables	Korea	US	Total	$\chi^2$
Nutrition education experience from school				
Yes	29 (14.3)	82 (34.0)	111 (69.7)	22.90***
No	174 (85.7)	159 (66.0)	333 (30.3)	
Subtotal	203 (100)	241 (100)	444 (100.0)	
Main channel of nutrition information				
Parents	29 (14.3)	44 (18.5)	73 (16.5)	39.53***
TV or internet	96 (47.3)	116 (48.7)	212 (48.1)	
School class	11 (5.4)	36 (15.1)	47 (10.7)	
School newsletter	38 (18.7)	7 (2.9)	45 (10.2)	
Bulletin board	22 (10.8)	22 (9.2)	44 (10.0)	
Newspaper or magazine	7 (3.4)	13 (5.5)	20 (4.5)	
Subtotal	203 (100)	238 (100)	441 (100)	
Necessity of nutrition education				
Very necessary	4 (2.0)	39 (16.4)	43 (9.7)	51.94***
Necessary	43 (21.1)	67 (28.2)	110 (24.9)	
Moderate	96 (47.1)	105 (44.1)	201 (45.5)	
Unnecessary	48 (23.5)	13 (5.5)	61 (13.8)	
Totally unnecessary	13 (6.4)	14 (5.9)	27 (6.1)	
Subtotal	204 (100)	238 (100)	442 (100)	

\*\*\* $P < 0.001$ **Table 3.** Students' satisfaction on school foodservice

Variables	Korea	US	t-value
About menu			
Food taste			
Carbohydrate menu	3.77 ± 0.86 <sup>1)</sup>	3.28 ± 1.05	5.36***
Side dishes	3.32 ± 0.86	3.12 ± 0.91	2.42*
Dessert	3.20 ± 1.03	3.05 ± 0.96	1.68
Overallsatisfaction	3.43 ± 0.92	3.15 ± 0.97	4.17***
Menu quality			
Food appearance	3.41 ± 0.83	3.06 ± 0.99	4.05***
Nutrition value	3.50 ± 0.79	3.07 ± 0.96	5.15***
Food temperature	3.22 ± 0.92	3.14 ± 1.01	0.83
Overallsatisfaction	3.38 ± 0.84	3.09 ± 0.99	3.27*
Menu variety	3.05 ± 1.12	3.04 ± 2.18	0.09
About service			
Service line			
Staff courteousness	3.44 ± 1.12	3.44 ± 0.98	0.01
Service time	3.56 ± 1.00	3.45 ± 0.88	1.29
Overall satisfaction	3.50 ± 1.06	3.45 ± 0.90	0.08
Complaint handling			
Complaint adjustment	3.01 ± 0.99	2.94 ± 0.88	0.80
Student opinion acceptance	3.08 ± 0.99	3.06 ± 1.03	0.24
Overall satisfaction	3.05 ± 0.96	3.03 ± 0.96	0.22
About sanitation			
Food sanitation	3.58 ± 0.82	3.40 ± 0.85	2.30*
Plate and utensil cleanness	3.59 ± 0.75	3.35 ± 0.93	2.90**
Staff's neat clothes	3.91 ± 0.76	3.50 ± 0.89	5.07***
Overall satisfaction	3.69 ± 0.78	3.42 ± 0.89	3.37**
About dining ambience			
Convenient facility layout	3.60 ± 0.90	3.37 ± 0.83	2.81**
Cafeteria atmosphere	3.43 ± 0.84	3.19 ± 0.94	2.83**
Overall satisfaction	3.52 ± 0.87	3.28 ± 0.89	3.17**

<sup>1)</sup> Descriptor: 1 (very unsatisfied) ~ 5 (very satisfied)

of American respectively for comparison. Satisfaction of all the menus including carbohydrate menu, side dishes and dessert were higher by Korean students than American students. A significant difference in carbohydrate menu ( $P < 0.001$ ) and side dishes ( $P < 0.05$ ) was found between the groups. In terms of overall satisfaction, Korean students (3.43) were more satisfied in school lunch menu than American students (3.15) ( $P < 0.001$ ).

In menu quality, a significant difference was found between Korean students and American students on the question associated with food appearance (3.41, 3.06 respectively) and nutrition value (3.50, 3.07 respectively). Korean students were more satisfied with these two aspects ( $P < 0.001$ ). Two groups showed that there was no significant difference in food temperature satisfaction. Overall satisfaction of menu quality was higher by Korean students (3.38) than by American students (3.09) ( $P < 0.05$ ). Students' satisfaction in menu variety had no evident difference between two countries.

In terms of service, a significant difference was not found between the groups, however, all of the service aspects tend to be higher for Korean students rather than Americans.

In sanitation and dining ambience aspects, Korean students were more satisfied with foodservice than American students. In detail, Korean youths were more satisfied with food sanitation ( $P < 0.05$ ) and plate and utensil cleanness (3.58, 3.59 respectively) ( $P < 0.01$ ) than American youths (3.40, 3.35 respectively). In addition, staffs' neat clothes were also evaluated higher by Korean youth (3.91) than by American youth (3.50) ( $P < 0.001$ ). In terms of dining ambience including convenient facility layout and cafeteria atmosphere, Korean students were more satisfied with both aspects (3.60, 3.43 respectively) than American students (3.19, 3.28 respectively) ( $P < 0.01$ ).

#### Multiple regressions with dependent variable overall satisfaction

In order to identify factors affecting the degree of satisfaction, multiple regression was performed with 7 categories including food taste, menu quality, menu variety, service line, complaint handling, sanitation, and dining ambience (Table 4 and 5). Satisfaction with the school foodservice for the Korean students was significantly correlated with food taste, menu variety, sanitation, service line, dining ambience, menu quality, and complaint handling ( $P < 0.001$ ). Satisfaction with the school foodservice for the American students was also significantly

**Table 4.** The mean of overall satisfaction degree of 7 categories

Classification	Korea	US
Food taste	3.43	3.15
Menu quality	3.38	3.09
Menu variety	3.05	3.04
Service line	3.50	3.45
Complaint handling	3.05	3.03
Sanitation	3.69	3.42
Dining ambience	3.52	3.28

**Table 5.** Regression results with 7 dependent variables on school foodservice satisfaction

Korea	$\beta$ -value	US	$\beta$ -value
1. Food taste	0.375	1. Food taste	0.350
2. Menu variety	0.305	2. Menu variety	0.278
3. Service line	0.226	3. Service line	0.192
4. Dining ambience	0.167	4. Sanitation	0.108
5. Meal quality	0.067	5. Meal quality	0.068
6. Sanitation	0.044	6. Dining ambience	0.057
7. Complaint handling	0.038	7. Complaint handling	0.020
$R^2 = 0.324, F = 10.946, P < 0.001$		$R^2 = 0.248, F = 7.252, P < 0.001$	

correlated with all of the above aspects ( $P < 0.001$ ). The food taste was the best predictor of students' satisfaction in both groups. Variety of food offered and Service line were thesecond and third best predictors regardless of nationality. The next best predictor was dining ambience for Korean students and sanitation for American students.

## Discussion

In the foodservice industry, it is important to consider customer preferences and choices into foodservice operating decisions, because customers evaluate foodservice experienced through more than one criterion [23,25]. The regression model developed in this study validated these opinions. Results showed that variety of menu offered and service speed highly influenced school foodservice satisfaction regardless of country.

The data showed that the taste of food was the best predictor for foodservice satisfaction. The result is not astonishing because people usually evaluate food and foodservice operations mainly on the basis of sensory factors including taste, smell, and visual appeal [23].

The variety of food offered was also an important variable for foodservice satisfaction of both groups. Over the years, many studies have founded that the more menu choices affected students' satisfaction and participation. Fogelman *et al.* [12] found that more menu choices led students to eat school lunch more frequently. Marples and Spillman [13] also identified the variety of food offered was significant factor affecting students' participation in the lunch program. In a study about middle school students' request on school lunch program, Oh *et al.* [8] analyzed that the variety of menu including 'various side dish', 'serving various western and eastern foods; and 'various recipe', were requested by students.

Impression of foodservice line including speed of service and employees' attitude is very important for students' satisfaction. In many studies, long queue time was found as one of the students'dissatisfaction factors [8,26,27]. Harper *et al.* [28] found that 'steady distribution' was correlated with overall satisfaction of school foodservice in Korea. In other studies, many researchers have also proven that the amount of time being served and eating

in the school foodservice had been affected on students' participation [12,13,29]. That is, improving speed of queue time could make student happier. Another issue at foodservice line is employee attitudes toward students. Lee and Park [2] pointed out the importance of employees' courteous manner for school foodservice satisfaction. In the study of middle school students' school foodservice satisfaction by Kim *et al.* [6], it was also identified that employees' kindness exerted influence on the foodservice satisfaction. As showing in this research result, service line management including physical aspects such as a smooth queue management and human resource management is important for increasing students' satisfaction.

Except food taste, menu variety and service line, the order of important variables were different country by country. Dining ambience including facility layout and cafeteria atmosphere was the 4<sup>th</sup> predictor in Korean student group, rather 6<sup>th</sup> predictor in American students. In the study of quality attributes of school foodservice, Korean students and teachers evaluated a pleasant foodservice environment as the lowest satisfaction aspect [4]. The reason of sensitivity about foodservice environment might be caused by poor condition of eating place. Since the school foodservice improvement and modernization project was started in 2006, many school foodservice facilities and environments have been improved, however some school foodservice are still operating and offering service in coarse environment. In several studies, poor foodservice environment was pointed out as the dissatisfaction factor for school foodservice [15,16,30]. Park *et al.* [4] emphasized that the pleasant foodservice environment is related to the students' satisfaction of school foodservice which supports the present research outcome relating the importance of foodservice environment and atmosphere. In service management area, it is emphasized that customer satisfaction can be stronger according as how to treat dissatisfaction [9]. Foodservice ambience is not a major predictor of Korean students' satisfaction degree, however it is assumed that continuous improvement and management of this physical aspects necessary for increasing overall satisfaction.

From this research, we tried to identify the differences of perception about school foodservice between Korean youth and American youth. When comparing school foodservice administration systems between two countries, Korean systems obtain lower level in financial, management, and human resource support from local and federal government than American [30]. However for many children in US, the federally sponsored school meal programs National School Lunch Program (NSLP) and School Breakfast Program (SBP)-are major sources of food. Almost all US public schools participate in the NSLP, and > 80% of schools with NSLP also participate in SBP [31]. On an average school day in 2006-2007, > 30 million children ate school lunch, and > 10 million ate a school breakfast [32,33]. The programs are federally funded in cash and in-kind food every year to support local school lunch programs. They are administered by state child nutrition agencies and local school food authorities, which are

part of school districts or groups of districts.

In spite of this inferiority, the result of the study showed satisfaction of the Korean students was generally higher than the Americans. This can be interpreted as the Koreans' effort to improve the quality of its foodservice system. Especially, Korean foodservice is pursuing an important objective to allow students to consume nutritious food within a comfortable atmosphere. In order to meet this desire, continuous trials should be made through exhaustive examination and improvement.

Another issue drawn from the study is that there is a common and essential expectation regardless of different food cultures. The quality of the food itself and the speed of the service are the foremost factors in school foodservice. The accomplishment of the menu, a core product of the foodservice system, should be well planned through nutritiously balanced menu reflecting a nation's food culture: students' preferences and cooking methods based on taste. Moreover, it is mandatory to consider the unique features of school foodservice; it needs to serve many students at a short period of time. Also, concerning these features, various strategic methods should be taken into account such as controlling traffic, building effective layouts, and adopting adequate methods to minimize queuing time.

Schools are increasingly contracting out their foodservices to foodservice management companies in US. Schools participating in the National School Lunch Program (NSLP) are facing problems of rising food and labor costs, competition from commercial restaurants, tough nutrition regulations, uncertainty of future federal funding, reduction in food commodities, and declining student participation [34]. Noncommercial foodservice sales in 2005 are estimated to be about \$71 billion [35], which is 19% of total US foodservice sales [36]. Educational markets are the largest segments of noncommercial market accounting for about \$25 billion in sales. In terms of number of places, noncommercial foodservice operations represent 34% of total foodservice and drinking places. However, the number of middle and high schools in Korea with food service are 5,257 schools (99.7%), and 4,049 schools (77.0%) are self-operated and 1,208 schools (23.0%) are managed by contract [37].

In both Korea and US, the school foodservice environment including school foodservice regulation and social perspective is constantly changing. Moreover, adolescents are involved in various physiologic and emotional changes that might be leading to new ways of thinking and behavioral patterns in the purchase of food [1]. Studies on American school foodservice are likely to show spotlight on eliminating competitive food, decreasing the number of snack bars and vending machines, and increasing vegetable and fruit-oriented menus in order to prevent obesity and promote students' health. It is critical, however, to recognize that these attempts of governments and related organizations are worthwhile when the final consumers, or students, accept the aforementioned process comfortably. Therefore, it is important for dietitians or child nutrition professionals to have better understandings in regards to adolescents' need of having a

comfortable foodservice environment that provides foods students like, quality food choices, and foods that taste good. In addition, school foodservice professionals must be open-minded to learn student wants and needs. Ultimate action should be applied from the question of how these wants and needs can be met. By learning and applying, school foodservice professionals will have to ensure that the better foodservice environment is offered and finally result in high rate of student satisfaction in school foodservice.

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