

## Review

# The practices and needs of dietitian in school lunch program in Taiwan

Yueching Wong PhD, RD<sup>1,2</sup>, Yu-Jhen Chang MS, RD<sup>1</sup>,

<sup>1</sup>*School of Nutrition, Chung Shan Medical University, Taiwan, ROC*

<sup>2</sup>*Department of Nutrition, Chung Shan Medical Hospital, Taiwan, ROC*

Nutrition-related problems among school-age children nowadays become potentially serious. In order to prevent obesity and other nutritionally related diseases in the young generation, a school lunch program has been proposed and conducted in Taiwan. It is to ensure that students' nutritional intake meets the daily requirement and to help students develop correct eating habits and maintain a healthy lifestyle. A professional dietitian who has a clear concept regarding food material utilization, cooking methods and nutritional values thus becomes important. However, the majority of schools in Taiwan are unable to offer the post of dietitian due to budgetary constraints and lack of organization. The responsibility of a dietitian is usually held by teachers, school nurses and other administrative staff. This problem has hindered the nutritional education in schools and made school lunches less beneficial to the children's nutritional needs. For the current status of dietitians in schools, a large gap is found between the currently supplied school lunches and the nutritionally standardized school lunches. It also exists in relation to education and hygiene. One of the solutions requires an infrastructure to support plans and policy, reasonable adequate budget, well human affairs establishment and coordination of all aspects. While the needed infrastructure is being proposed, an access to the professionalism of the currently employed dietitians can be strategically explored by constructing an education system. Through the system, schools without on-campus dietitians will be able to utilize their expertise with which the improvement of school lunches can be expectedly accomplished.

**Key Words:** dietitian, school-age children, school lunch program, nutritional education, Taiwan

## INTRODUCTION

Nutrition-related problems among school-age children nowadays become potentially serious. In 2005, WHO experts proposed a new policy to address the problem of childhood obesity. This policy was implemented through the Nutrition Friendly Schools Initiative, NFSI in 2006 (Kobe, Japan, 20-24 June 2005). This policy intended to improve the nutritional status among the school-age children and teenagers, also to prevent obesity and other nutritionally related chronic diseases in the next generation. The school system has many opportunities to educate children and to promote healthy diet and exercise, which could also provide some important channels to communicate with and involve family members in the education and prevention of nutritional related problems (eg, deficiency of micronutrients, obesity, etc). This strategy would improve the children's diet, increase physical activities and assist them to have positive body image.

## THE SPECIFICATIONS AND THE FEATURES OF SCHOOL LUNCH PROGRAM IN TAIWAN

The purpose of the school lunch program is to "ensure students' nutritional intake meets the daily requirement, develop correct eating habits and maintain healthy lifestyle." At the same time, there are four essential points: 1) Teachers and students have their relationship enhanced by having lunch together and making school life more inter-

esting; 2) Students can learn to provide service and care when offering help in lunch preparation and the clean-up after lunchtime; 3) Students build up a correct understanding and level of awareness of diet and nutrition through the good model of food they eat at school lunch; and 4) Students acquire nutritional knowledge and recognize the importance of having good eating habits through their personal participation in school lunch. In addition, the student's lunch should possess "one key factor" and "two features", the key factor stands for the nutrition supply of the diet satisfying the physiological nutrition requirements for the growth and development of students at different ages; while the two features are that the food processing caters for the digestive system of students in different age groups and the cooking methods fit the taste preference of students of different ages. For further information and recommended nutritional facts for nutritional lunches in Taiwan, refer to Tables 1-3.

**Corresponding Author:** Dr Yueching Wong, Department of Nutrition, Chungshan Medical University, 110 Sec 1, Jien-Kuo North Road, Taichung City 402, Taiwan, ROC

Tel: 886-4-24730022#11706 ; Fax: 886-4-2472173

Email: wyc@csmu.edu.tw

Manuscript accepted December 12, 2011.

**Table 1.** The reference of the nutrition facts for school lunch

	Elementary School		Junior High School	Senior High School	
	grade 1-3	grade 4-6		Male	Female
Calories(kcal)	650	750	850	950	750
Standard value of calories intake: the mean of calories suggested to be in the range of 1/3~2/5 of DRI					
Protein (g)	20~23	23~26	25~30	28~33	23~26
Standard value of proteins intake: 12~14% of total calories					
Fats (g)	22	26	28	32	25
Standard value of fats intake: ≤30% of total calories					
Calcium (mg)	280	350	420	420	420
Standard value of calcium intake: the value of calcium suggested to be in the range of 1/3~2/5 of DRI					

Sources: Taiwan Ministry of Education, Dept. of Physical Education<sup>8</sup>

**Table 2.** The contents of school lunch for Elementary School

Food Group	Grade 1-3	Grade 4-6
	3.5 servings per day	4.5 servings per day
Grains (Rice, noodles, and others)	1. The alternatives to the grains should not be more than 3 servings per week 2. Rice or noodles at least 2.5 servings for grade 1-3 students 3. Rice or noodles at least 3.5 servings for grade 4.5 students	
Dairy	2 servings per week	2 servings per week
Fishes, eggs, beans and meats	2 servings per day (The alternatives of fish should not more than 0.5 serving per day)	2 servings per day
Vegetables	1 serving per day (2/3 serving of dark green vegetables per day)	1.5 servings per day (1 serving of dark green vegetables per day)
Fruits	1 serving per day	1 serving per day
Fats and oils	2.5 servings per day	3 servings per day

Sources: Taiwan Ministry of Education, Dept. of Physical Education<sup>8</sup>

With the changing of time, the ratio of career women in Taiwan has increased proportionally to the ratio of dining out. Therefore, the school lunch has become the major balanced diet source of the day for the children.<sup>1</sup>

The school lunch provided by schools not only saves their parents time, but also meets the requirements of the nutritional intake for their daily life. Furthermore, it provides a safe and healthy eating environment with proper nutritional education for the children to build up a correct understanding and level of awareness of diet according to their own needs as they develop healthy eating habits. For the disadvantaged families, school lunch is the only access for the children to obtain essential nutrition. Hence, the school and the government draw up the school lunch to carry out the consistent method, so that school lunches may make a better contribution to the children's nutritional needs.

#### OVERVIEW OF THE SCHOOL LUNCH AND THE STATUS OF DIETITIAN ORGANIZATION IN TAIWAN

The method of providing lunches in Taiwan's schools currently can be divided into three major categories and eight sub-types (Table 4). According to the statistics reported by The Ministry of Education of Taiwan in 2006, there are around 3280 schools providing lunch for children, approximately 58.5% of 1<sup>st</sup> category, 20.5% of 2<sup>nd</sup>

category and 21% of third category. Even though there are lots of schools providing lunches, but there are not many schools hiring full-time position of registered dietitians to design the meal. Therefore the implementation of nutritional education in schools was hindered.

The Schools' Hygiene Law was enacted by the Legislative Yuan of Taiwan on 6 February 2002. The law is enacted with the goal of boosting students, faculty and staff health, and laying the foundation for national health and enhancing life quality. The essential points are that schools should improve the level of hygiene and provide professional training for the staffs. Besides that, at least one dietitian should be placed in elementary and high school which the number of classes is more than forty, while several dietitians should be placed in every county and city's competent authority.<sup>2</sup> Nevertheless, the survey of the Taiwan Cancer Foundation in year 2007 found that nearly 96% of students have participated in the school lunch program, but there are about 81% of schools do not have any dietitian in this program. On the other hand, for the schools that are able to have dietitian in this program, more than 91% of these schools are able to provide only one dietitian regardless number of classes.<sup>1</sup> There are average 3907 students in elementary school in Taiwan, but considering there is just one dietitian in each school, it is actually not enough.<sup>1</sup> At present, some school dietitians are provided by the supplier of the school lunch and this

**Table 3.** The contents of nutritional lunch for High School

Food Group	Junior High School	Senior High School (Male)	Senior High School (Female)
Grains (Rice, noodles, and others)	6 servings per day (The alternatives of grains should not be more than 3 serving per week)	6.5 servings per day	4.5 servings per day
Rice and noodles	At least 5 servings per day	At least 5.5 servings per day	At least 3.5 servings per day
Dairy	2 servings per week	2 servings per week	2 servings per week
Fishes, eggs, beans and meats	2 servings per day (The alternatives of fish should not be more than 0.5 serving per day)	2 servings per day	2 servings per day
Vegetables	2 servings per day (The supply of dark green vegetables must be more than 1 serving per day)	2 servings per day	2 servings per day
Fruit	1 serving per day	1 serving per day	1 serving per day
Fats and oils	3 servings per day	3.5 servings per day	3 servings per day

Sources: Ministry of Education, Dept. of Physical Education<sup>8</sup>

**Table 4.** School lunch systems in Taiwan

Type of systems	Types	Explanation
Public-Owned and Public-Managed	a. Public-Owned and Public-Managed school that do not supply to other school	The school sets up a kitchen and hires a chef and food service workers preparing lunch for its students.
	b. Public-Owned and Public-Managed school that provide supply to other school	The school sets up a kitchen and hires chef and food service workers preparing lunch to its students and other schools' students.
	c. Public-Owned and Public-Managed school that getting supply from other school	The school does not set up a kitchen and hires a chef and food service workers preparing lunch for its students or entrusts catering staff from an outside agency to take charge of lunch service. The lunches for the students provided by other nearby Public-Owned and Public-Managed schools.
	d. Public-Owned and Public-Managed school's central supply kitchen	The school sets up a central supply kitchen and hires a chef and food service workers preparing lunch for more than one school.
Private Management of Public School	e. Private Management of Public School that do not provide supply to other school	The school builds a kitchen and entrusts catering staff from an outside agency to take charge of lunch service; but the lunches are only provided for its students.
	f. Private Management of Public School that provide supply to other school	The school builds up a kitchen and entrusts catering staff from an outside agency to take charge of lunch service; and the lunches prepared are also provided to other schools.
	g. Private Management of Public School that getting supply from other school	The school does not set up a kitchen and hires a chef and food service workers preparing lunch for its students or entrusts catering staff from outside agency to take charge of lunch service. The lunches for the students are provided by other nearby Private Management of Public School.
Packed Lunches	h. Entrusts catering staff from an outside agency to take charge of lunch service	The school does not have a kitchen and order lunch boxes from a food service company outside after the assessment and planning of the school. The school is playing a role as a supervisor to ensure the quality of the lunches provided by the food company.

Sources: The study of the difference between the nutritional lunch provided by Private Management of Public School and Public-Owned and Public-Management School.<sup>9</sup>

is therefore a conflict of interest which may not be in the interests of providing the best nutrition possible.<sup>3</sup>

#### THE REQUIREMENT AND THE SIGNIFICANCE OF DIETITIAN FOR SCHOOL LUNCH

In 2007, Tong Foundations in Taiwan did a survey of 66 primary and secondary schools. The result of this survey showed that the majority of schools were unable to set up

the post of the dietitian in their schools because of budgetary constraints and lack of organization.<sup>4</sup> The responsibility of a dietitian in most schools is held by teachers, school nurses and other administrative staff who are called "School Lunch Secretaries". However, the "School Lunch Secretary" has no clear concept regarding food material utilization, cooking methods and nutritional value concepts. As a result, school lunches have more

chance include processed foods, fried foods and food high in sugar. And the method of cooking often does not comply with the cooking method stated on the suggested menu particularly exceeds the amount of oil to be used.<sup>4</sup> Therefore, Tong Foundation suggested every school should employ a professional dietitian. The dietitians will provide specialist expertise in the aspect of quality, hygiene and safety of the foods in the management of school lunches. The dietitians may also become Nutrition Teacher in the school to enhance the school lunch.<sup>4</sup>

Furthermore, Tong Foundation had also done a survey in 2007 about the school lunches provided by 212 schools and the supply of the vegetables, fruits, dairy and grains. The results of the survey found that the supply of fruits and dairy products as part of school lunch did not reach the standard of the reference.<sup>5</sup> The survey of Taiwan Cancer foundation also found that there are nearly 70% of schools providing fruit for 1-2 days per week. There are less than 10% of schools that provide fruits as part of the meal everyday for lunch. There are only 50% of schools' nutritional lunches prepared according the reference value of calorie which are within the range of 650–750 kcal.<sup>1</sup> More than 60% of the teachers think that the school lunch contains high fat calories. Seventy five percent of teachers hope that schools would engage a dietitian to take over food service and nutrition works.<sup>1</sup> Indeed, this survey also found that the amount of vegetables and fruit provided is higher in those schools with full-time dietitians compared to those schools without the service of a dietitian. The amount of vegetables and fruits provided in those school with dietitian were 0.63 and 0.85 serving respectively, while the amount of vegetables and fruits were only 0.56 and 0.43 serving for those school without a dietitian.<sup>1</sup> From this survey, the employment of a dietitian is very important for the management of the nutritional lunch for a school.

According to the survey by Chen in central Taiwan, the executive management of those schools without dietitians felt overworked.<sup>6</sup> They also felt that the lunch inspection brings them serious burden and they are worried that their insufficient experience and ability in purchasing the food will indirectly impede the benefits to the students.<sup>7</sup> The survey by Lo and Lin disclosed that the children's guardians were not satisfied with certain aspects of this project which included insufficient supply of dairy products per week, the amount of dairy products that supply per time, the taste of the lunch, the temperature of the food etc.<sup>3</sup> The major factors that caused these dissatisfaction was inadequate budget. Besides, and that the menu of the school lunch was not drawn up by professional dietitians.

## CONCLUSION

At present, there is a large gap between the currently supplied school lunches and the expectation of a truly nutritional standard of school lunch. This gap also exists in relation to education and hygiene. The main reason is because the executive role of this project in most schools is held by the teachers and not a professional dietitian. Implementation of a standard mechanism to facilitate the nutritional lunch in schools continues to be one of the Taiwan Education Ministry's objectives. Impetus of the

full-time campus dietitian requires the infrastructure to support plans and policy, reasonable adequate budget, well human affairs establishment and coordination of all aspects. In the meantime, we need to explore strategies to effectively use the resource of currently employed dietitians. If we are able to increase access to dietitians already employed in the education system, by allowing those schools without dietitians to utilize their expertise, then improvement to school lunches can occur a across-board while we are awaiting needed infrastructure to increase the number of dietitians employed at every school. Consequently, how to implement the above goals is worthy of future research.

## AUTHOR DISCLOSURES

There is no conflict of interest in this study.

## REFERENCES

1. Lai JM. The report of survey on elementary school lunch in Taiwan. Formosa cancer foundation. 2007.
2. Ministry of education. School hygiene law. Laws & Regulations Database of The Republic of China. 2002.
3. Lo YJ, Lin HS. Effect of parents cognition and attitude on the elementary school lunch program in Taipei shilin area. *Hwa Kang Journal of Agriculture*. 2008;21:39-50.
4. Tong Foundation. Survey on status and quality of school lunch in Taiwan. [Cited 2007]; Available from: <http://nutri.jtf.org.tw/index.php?id=10&aid=2&bid=34&cid=1049>
5. Tong Foundation. Survey on status and quality of school lunch in Taiwan. [Cited 2007]; Available from: <http://nutri.jtf.org.tw/index.php?id=10&aid=2&bid=34&cid=1048>
6. Chen SM. A study on the different running model of elementary school lunch in central Taiwan. Master Thesis, National Taichung University of Education, Department of Education. 2007.
7. Txai HL. A Study of Relationship on the Boundary Roles of Stress and the Job Satisfaction for the Directors of Lunch in Elementary Schools -Changhua County, Yunlin County, Chiayi County Elementary School as an example. Master Thesis, National Yunlin University of Science and Technology, Information Management. 2008.
8. Ministry of Education Dept. of Physical Education. School Lunch. [Cited 2003]; Available from: <http://140.122.72.62/history/index?id=0f6d6f53d6290527a869b79081883d034812c646e8b26>
9. Tsu JZ. The study of the difference between the nutritional lunch provided by Private Management of Public School and Public-Owned and Public-Management School. *School Administration Bimonthly Magazine*. 2005;35:170-88. (in Chinese)

## Review

## The practices and needs of dietitian in school lunch program in Taiwan

Yueching Wong PhD, RD<sup>1,2</sup>, Yu-Jhen Chang MS, RD<sup>1</sup>

<sup>1</sup>*School of Nutrition, Chung Shan Medical University, Taiwan, ROC*

<sup>2</sup>*Department of Nutrition, Chung Shan Medical Hospital, Taiwan, ROC*

### 營養師於台灣學校營養午餐計畫中的業務及需求

現今營養相關問題在全世界學齡兒童間日益嚴重。為了預防年輕世代的肥胖及其他營養相關疾病的發生，因此在台灣，大部分學校均有開辦營養午餐計畫，以確保學生的飲食攝取有符合營養需求量，且可幫助學生發展正確的飲食習慣及維持健康的生活型態。專業營養師對於食材選用、烹調方法及營養價值具有完整的概念。然而在台灣因為預算不足及缺乏整體組織規劃，大部分的學校並沒有聘用專職營養師，營養師的工作通常由老師、校護或行政人員兼任。這個現象不僅不利學校的營養教育，且影響學生的營養素需求。由於缺乏營養師的狀況，目前台灣學童營養午餐實際攝取量與衛生署所建議的攝取量有相當大落差，且存在有教育及衛生方面的問題。解決這些問題的方法，除了需要建立基本設施來支持這些計畫及政策外，更需要有合理足夠的預算、良好的人事聘用制度及加強各單位的協調。然而在這些制度尚未完全落實之前，建議應該建立一個資源共享平台，將目前已聘任的營養師，透過研討會上課的方式將其專業傳遞出去，使沒有聘任專職營養師的學校，可以透過這個分享系統，改善學校營養午餐的品質。

**關鍵字：**營養師、學齡兒童、學校營養午餐、營養教育、台灣