

Study of nutrition education utilizing school lunches
- Using food classification based on the nutrient contribution rates of foods
in school lunches –
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Introduction

In nutrition education utilizing school lunches, the Three-Color Classification System for food groups is useful for children because it is simple and easy to understand. However, the Three-Color Classification System does not have a standard for food classification and application guide. The objectives of this study were to suggest a standard for food classification based on the nutrient contribution rates of foods in school lunches and the Three-Color Classification System, and to develop a nutrition education program. The study consisted of three sub-studies.

Study 1 Study of food classification using the nutrient contribution rates of foods and the Three-Color Classification System for Food Groups in Japan

This study investigated food classification based on the nutrient contribution rates of foods and the Three-Color Classification System for Food Groups in school lunches. Twelve school lunch menus were collected from 16 elementary schools in Tokyo, Japan. From 192 school lunch menus, a total of 214 types of foods were analyzed, totaling 4,811 food items. As a result, the food sources of each nutrient, considering the offer amounts and the frequency of appearance in school lunches, were determined. Using the 90th percentile of the contribution rates of foods and the Three-Color Classification System, food items were divided into eight categories. In the food classification based on the nutrient contribution rates of foods, very few food items classified in a single group belonged to one group of the Three-Color Classification System. Many food items contributed to the functions of several food groups. Additionally, in some instances, food item classification considering the offer amounts and the frequency of appearance in school lunches were different from the classification in the existing teaching material of the Three-Color Classification System.

Study 2 The current status of nutrition education using the Three-Color Classification System in elementary schools

For the development of the material and nutrition education program using the Three-Color Classification System in elementary schools, this study investigated the current status of nutrition education using the Three-Color Classification System in elementary schools through two perspectives, the educational approach and the environmental approach. From August 2014 to January 2015, self-report questionnaires were handed out to 327 school dietitians who worked in elementary schools in Tokyo and Chiba, Japan. In the educational approach, approximately 70% of dietitians provided nutrition education about the Three-Color Classification System during school lunch time, and they mostly educated fifth-grade children. During class time, they mostly educated fifth and sixth-grade children. Therefore, it was suggested that it was beneficial to develop a nutrition education program for the upper grades of elementary school. In the environmental approach in the majority of schools, tables denoting the Three-Color Classification System were inserted in school lunch letters. The teaching materials were posted to the school. This indicated the need to post development materials to schools to assist in the utilization of the program.

Study 3 The development and feasibility of the nutrition education program “Let’s study the function of nutrients and the relationship between nutrients and food”

Based on studies 1 and 2, the objectives of this study were to develop the nutrition education program including the standard of food classification based on the Three-Color Classification System, and to determine the program’s feasibility. In addition, the program was revised based on the evaluation of the results. The program was targeted toward fifth grade children and it consisted a teaching plan of five minutes per day for five days, the Three-Color Classification System picture, the food item cards that accompany the food group picture, and the instruction manual for teachers. The characteristics of this program was to learn that food classification considered the offer amounts and frequency of appearance in school lunches, that food included multiple nutrients, and that some foods could not be classified into one group of the Three-Color Classification System.

To determine the feasibility of this program, the participants included 129 fifth grade children

and 2 school dietitians from elementary schools in Tokyo, Japan. The schoolchildren were divided into an intervention group and a control group, and the program was carried out with the intervention group. The pre- and post-survey by self-reported questionnaires were conducted for both groups and the questionnaires for the evaluation of this program were given to the school dietitians. The results of the questionnaire for children indicated an increase in correct answer rates for three questions about the relationship between nutrients and food. This suggested that the program could be used to learn that food has multiple nutrients and has several nutritional functions. However, in the question about the amount of nutrients included in each food item, the rate of correct answers did not change. This suggested that although the teaching material showed the contribution rates of each food visually, it was difficult for schoolchildren to understand. Therefore, it is necessary to re-examine the teaching technique for the concept of nutrient amounts, such as food classification by the function of nutrients included in the provided amounts of typical meals.

Conclusions

These studies revealed two aspects of food classification: First, food includes multiple nutrients and some foods cannot be classified into one group of the Three-Color Classification System. Second, food classification reflecting the provided amounts and the frequency of appearance in school lunches differed from the existing teaching material on the Three-Color Classification System. Additionally, a nutrition education program on three nutritional functions and the relationship between food and nutrients was developed and its feasibility was determined. The researcher proposes that it is necessary for the quantitative concept to be considered in nutrition education, and for educators to recognize this point of view. It is also necessary to re-examine the education method to enhance understanding of the quantitative concept.