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An Assessment of the Implementation of Guidelines in School Canteens

A Case Study from the Western Province of Sri Lanka

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SAMANTHI BANDARA
MUNSIF SANOON

A joint Publication by
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List of Abbreviations

CMC - Colombo Municipal Council
DCS - Department of Census and Statistics
KII - Key Informant Interview
PHI - Public Health Inspector
MOE - Ministry of Education
SMI - School Medical Inspection
UNICEF - United Nations Children's Fund

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Executive Summary

Sri Lanka is enjoying the benefits of free education policy for the last 70 years. Successive governments have introduced many incentives to the student population in the way of free text books, free school uniforms and free mid-day meals. Although the initiatives of providing text books and uniforms were sustained, the provision of free mid-day meals could not be sustained in the prescribed manner due to many issues. Efforts to transform the school canteen as a healthy setting is one of the initiatives undertaken. Over seven years have passed since introducing healthy canteen guidelines. This study was undertaken to assess the implementation of those guidelines in two districts.

A total of 71 school canteens were studied in the districts of Colombo and Gampaha in the Western Province. A check list and a data recording sheet were used to record the observations done in the school canteens. In addition, we conducted Key Informant Interviews with Principals of participating schools and persons operating the school canteens to obtain their perception of implementing the school canteen guidelines. The data collectors and the investigators also recorded their additional observations in field note books.

A majority of the schools (95 per cent) had a canteen in the school. Of them, 94 per cent had a permanent place to maintain the canteen. Even when the canteen is given a permanent place, the suitability of the location and the cleanliness of the outside environment were questionable in one fifth of the cases. Although most of the canteens (79 per cent) prepared some kind of food within the premises, space and facilities were grossly inadequate to maintain the standards of hygiene in food preparation and storage. It was found that canteens continued to sell unhealthy food items despite the restrictions. The demands for alternative healthy food items were extremely low among students. Affordability of most students using the canteens was below Rs. 25 per day. Hence, most of the food items were priced at or around Rs. 25. This lead to reduction of quality and quantity of the food offered. No major differences were observed in the implementation of guidelines among the three types of schools.

Food establishments outside the school were a major source of unhealthy foods for school children making the canteen guidelines less effective in changing food habits. Many barriers were identified that hinder the effective implementation of school canteen guidelines. Lack of support from the students, and parents, absence of alternative healthy food items, lack of resources in schools, inappropriateness of the present system of selecting canteen operators and prevailing trade and fiscal policies in the country negatively affect the implementation of canteen guidelines.

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ශ්‍රී ලංකාව පසුගිය වසර 70 තිස්සේ නිදහස් අධ්‍යාපනයේ ප්‍රතිලාභ ලබමින් සිටී. සෑම රජයක්ම ශිෂ්‍යයන්ට නොමිලයේ පාසල් පොත් ලබාදීම, නොමිලයේ නිල ඇඳුම් ලබා දීම හා නොමිලයේ දිවා ආහාර ලබා දීම වැනි දිරි ගැන්වීම් රාශියක් ලබා දී ඇත. පාසල් පොත් ලබා දීම හා නිල ඇඳුම් ලබා දීම වැනි මුලපිරීම් දිගටම පවත්වා ගෙන ආ නමුත් නොමිලයේ දිවා ආහාර ලබා දීම හේතු ගණනාවක් නිසා නියමිත ආකාරයෙන් පවත්වා ගැනීමට නොහැකි විය. පාසල් ආපන ශාලා සුව ආහාර සපයන ස්ථාන බවට පත් කිරීමේ උත්සාහය එවැනි මුල පිරුමකි. සුව ආහාර සපයන ආපන ශාලා පිළිබඳ මග පෙන්වීම් හඳුන්වාදී වසර හතක් ගත වී ඇත. මෙම අධ්‍යයනය කරන ලද්දේ දිස්ත්‍රික්ක දෙකක එම මගපෙන්වීම් ක්‍රියාත්මක කිරීම ඇගයීම සඳහාය. බස්නාහිර පළාතේ කොළඹ සහ ගම්පහ දිස්ත්‍රික්ක දෙකේ පාසල් 71 ක ආපන ශාලා අධ්‍යයනයට ලක් විය. පාසල් ආපන ශාලාවන්හි කරන ලද නිරීක්ෂණ වාර්තා කිරීමට පරීක්ෂණ ලැයිස්තුවක් (Check List) හා දත්ත වාර්තා කිරීමේ පත්‍රිකාවක් යොදා ගන්නා ලදී. ඊට අමතරව පාසල් ආපන ශාලා මගපෙන්වීම් ක්‍රියාත්මක කිරීම පිළිබඳව අදහස් ලබා ගැනීමට සමීක්ෂණයට සහභාගි වූ පාසල්වල විදුහල්පතිවරුන් සහ ආපන ශාලා පවත්වාගෙන එන්නන් සමග සම්මුඛ සාකච්ඡා ද පවත්වන ලදී. දත්ත රැස් කරන්නන් සහ සමීක්ෂකයන් තම ක්ෂේත්‍ර සටහන් පොත්වල අතිරේක නිරීක්ෂණ ද වාර්තා කරන ලදී.

පාසල් බහුතරයක (සියයට 95) ආපන ශාලා ඇත. ඉන් සියයට 94 ක ආපන ශාලාව පවත්වා ගෙන යෑමට ස්ථිර තැනක් පවතී. ස්ථිර ස්ථාන ඇති තැන්වලින් පහෙන් එකක ස්ථානයේ සුදුසුබව හා බාහිර පිරිසිදුතාවය ගැන ගැටළුවක් පවතී.

ආපන ශාලා බොහොමයක (සියයට 79) එම ස්ථානයේම සමහර ආහාර වර්ග සකස් කිරීම සිදු වුවද ඒවායේ ඉඩකඩ හා පහසුකම් ආහාර සකස් කිරීම සහ තබා ගැනීම පිළිබඳ සෞඛ්‍ය ප්‍රමිතීන් පවත්වා ගැනීම සඳහා කිසිසේත්ම ප්‍රමාණවත් නැත. සීමා පනවා තිබුණ ද මෙම ආපන ශාලාවල සෞඛ්‍ය තත්වයට නොගැලපෙන ආහාර විකිණීම දිගටම සිදුවන බව දක්නට ලැබිණ. සෞඛ්‍ය තත්වයෙන් උසස් ආහාර සඳහා ඇති ඉල්ලුම ශිෂ්‍යයන් අතර ඉතාමත් අඩුය. ආපනශාලා මගින් ආහාර ලබා ගන්නා සිසුන් ඒ සඳහා වියදම් කරන්නේ දිනකට රු. 25 ටත් අඩු ප්‍රමාණයක් වේ. ඒ නිසා බොහෝ ආහාර රු. 25 ක් හෝ ඊට ආසන්න මිළකට අලෙවි කරයි. ඒ නිසා ලබා දෙන ආහාරවල ගුණාත්මක භාවය සහ ප්‍රමාණය අඩුවීමට හේතුවේ. මෙම පාසල් වර්ග තුනේම (Type 1 AB, Type 1C, Type 2) ආපනශාලා මගපෙන්වීම් ක්‍රියාත්මක කිරීම පිළිබඳ වැදගත් වෙනස්කම් දක්නට නොතිබිණ.

පාසලෙන් පිටත ඇති ආහාර සපයන ස්ථාන සෞඛ්‍ය තත්වයෙන් පහත් ආහාර සැපයීමේ මූලාශ්‍ර වන අතර ඒවා ආහාර පුරුදු වෙනස් කිරීමේ ආපන ශාලා මග පෙන්වීම් සාර්ථක කිරීමට බාධාවකි. පාසල් ආපන ශාලා මග පෙන්වීම් සාර්ථකව ක්‍රියාත්මක කිරීමට ඇති බාධක රැසක් හඳුනා ගැනිණ. ශිෂ්‍යයන් හා දෙමාපියන් ගේ සහාය ප්‍රමාණවත් නොවීම, සෞඛ්‍ය තත්වයෙන් උසස් විකල්ප ආහාර නොමැතිවීම, පාසල්වල සම්පත් හිඟකම, ආපන ශාලාකරුවන් තෝරා ගැනීමේ පටිපාටියේ පවතින නොගැලපෙන බව, රටේ පවතින වෙළඳ සහ බදු ප්‍රතිපත්තිය ආපන ශාලා මගපෙන්වීම් ක්‍රියාත්මක කිරීමට නිෂේධාත්මකව බලපායි.

நிறைவேற்றுச் சுருக்கம்

கடந்த 70 வருடங்களாக இலங்கை இலவசக் கல்வியின் நன்மையினை அனுபவித்து வருகின்றது. இலவச சீருடை, இலவச பயிற்சிப் புத்தகங்கள் மற்றும் பகல் போசன உணவு என்ற வகையில் தொடர்ந்து வந்த அரசாங்கங்கள் மாணவர் சமுதாயத்திற்கு பல ஊக்க செயற்பாடுகளை அறிமுகம் செய்துள்ளன. இலவச பயிற்சிப் புத்தகங்கள் மற்றும் சீருடை வழங்கல் போன்ற ஊக்க செயற்பாடுகள் நிலையாக மேற்கொள்ளப்பட்டு வந்த போதும் பல தரப்பட்ட சிக்கல்களின் காரணமாக பகல் போசன உணவு வழங்கலானது அவ்வாறு நிலையாகவும் தொடர்ச்சியாகவும் மேற்கொள்வதற்கு முடியாமல் போய் உள்ளது. பாடசாலை சிற்றுண்டிச் சாலையினை ஆரோக்கியமான உணவு வழங்குகின்ற நிறுவனமாக மாற்றியமைப்பது தொடர்பான முயற்சியானது முன்னெடுக்கப்பட்டுள்ள விடயங்களில் ஒன்றாகும். ஆரோக்கியமான சிற்றுண்டிச் சாலை வழிகாட்டல்கள் அறிமுகம் செய்யப்பட்டு ஏழு வருடங்களுக்கு மேல் கடந்துவிட்டது. இவ் ஆய்வானது இரண்டு மாவட்டங்களில் அந்த வழிகாட்டல்களின் அமுல்படுத்தலை மதிப்பீடு செய்வதற்காக முன்னெடுக்கப்பட்டது.

மேல் மாகாணத்தின் கொழும்பு மற்றும் கம்பஹா மாவட்டங்களில் மொத்தமாக 71 பாடசாலைச் சிற்றுண்டிச் சாலைகள் ஆய்வு செய்யப்பட்டன. பாடசாலைச் சிற்றுண்டிச் சாலைகளின் ஆய்வு தொடர்பான அவதானிப்புக்களை பதிவுசெய்து கொள்வதற்காக செவ்வைப் பட்டியல் மற்றும் தரவுப் பதிவு பத்திரம் ஆகியன பயன்படுத்தப்பட்டன. மேலும், பாடசாலை சிற்றுண்டிச்சாலை வழிகாட்டல்களை அமுல்படுத்துவது தொடர்பான அவர்களுடைய மனோபாவத்தினை பெற்றுக் கொள்ளும் பொருட்டு பங்குபற்றுகின்ற சிற்றுண்டிச்சாலைகளைக் கொண்ட பாடசாலைகளின் அதிபர்கள் மற்றும் சிற்றுண்டிச் சாலைகளை செயற்படுத்துகின்றவர்களிடம் முக்கிய தகவலறியும் நேர்காணல்களை நாம் நடாத்தினோம். தரவு சேகரிப்பாளர்கள் மற்றும் ஆய்வாளர்கள் கள ஆய்வுப் புத்தகத்தில் தங்களது மேலதிக அவதானிப்புகளைப் பதிவு செய்துள்ளனர்.

பெரும்பான்மையான பாடசாலைகளில் (95 சதவீதம்) சிற்றுண்டிச்சாலைகள் காணப்படுகின்றன. அவற்றில், சிற்றுண்டிச் சாலைகளை நடாத்திச் செல்வதற்கு நிரந்தரமான இடத்தினை 94 சதவீதமான சிற்றுண்டிச் சாலைகள் கொண்டுள்ளன. சிற்றுண்டிச் சாலைகளுக்கு நிரந்தரமான இடம் வழங்கப்பட்டிருந்த போதும் கூட, ஐந்தில் ஒரு சிற்றுண்டிச் சாலைகளில் ஒதுக்கப்பட்டுள்ள இடத்தின் பொருத்தப்பாடு மற்றும் வெளிச் சூழலின் தூய்மை போன்றன கேள்விக்கு உட்பட்ட விடயமாகவே காணப்பட்டன.

பெரும்பாலான சிற்றுண்டிச் சாலைகள் (79 சதவீதம்) சில வகையான உணவுகளை சிற்றுண்டிச் சாலை வளாகத்திலேயே தயார்செய்த போதும் உணவுத் தயாரிப்பு மற்றும் களஞ்சியப்படுத்தல் தொடர்பில் தூய்மையின் நியமங்களைப் பேணுவதற்கு இடம் மற்றும் வசதிகள் பெருமளவிற்குப் பற்றாக்குறையாகக் காணப்பட்டன. கட்டுப்பாடுகளை கவனத்திற் கொள்ளாது ஆரோக்கியமற்ற உணவுகளை சிற்றுண்டிச் சாலைகள் தொடர்ச்சியாக விற்பனை செய்கின்றமை அவதானிக்கப்பட்டுள்ளது. தரமான மாற்று உணவுகளுக்கான கேள்வி மாணவர்களிடையே மிகமிகக் குறைவாகவே காணப்பட்டது. சிற்றுண்டிச் சாலைகளை பயன்படுத்துகின்ற அனேகமான மாணவர்களின் செலவு செய்யக் கூடிய தொகை நாளொன்றுக்கு 25 ரூபாவிலும் குறைவாகவே காணப்பட்டது. எனவே, அனேகமான உணவுப் பொருட்களின் விலைகள் ரூபா. 25 அல்லது அதற்கு அண்மித்ததாகவே காணப்பட்டன. இந்த நிலைமையானது வழங்கப்படுகின்ற உணவின் தரம் மற்றும் அளவில் குறைப்பினை மேற்கொள்வதற்கு வழிவகை செய்கின்றது. மூன்று வகையான பாடசாலைகளுக்கு மத்தியில் இந்த வழிகாட்டல்களின் அமுல்படுத்தல்களில் பாரிய வேறுபாடுகள் ஏதும் அவதானிக்கப்படவில்லை.

பாடசாலை மாணவர்களுக்கான ஆரோக்கியமற்ற உணவு வகைகளின் பாரியதொரு மூலமாக பாடசாலைக்கு வெளியில் உள்ள உணவகங்கள் காணப்பட்டதுடன் உணவுப் பழக்கவழக்கத்தில் மாற்றத்தை ஏற்படுத்துவதில் சிற்றுண்டிச்சாலை வழிகாட்டிகள் குறைந்த வினைத்திறனைக் கொண்டிருப்பதற்கும் காரணமாகின்றன. பாடசாலை சிற்றுண்டிச்சாலை வழிகாட்டலை வினைத்திறனாக அமுல்படுத்துவதில் மறைமுகமான பல தடைகள் அடையாளம் காணப்பட்டன. மாணவர்கள், பெற்றோர்களின் குறைவான ஒத்துழைப்பு, மாற்று ஆரோக்கியமான உணவு வகைகளின் கிடைக்காத தன்மை, பாடசாலையில் போதுமான வளங்கள் இன்மை, சிற்றுண்டிச் சாலை செயற்படுத்துனர்களை தெரிவு செய்யும் தற்போதய முறையின் பொருத்தமற்றதன்மை மற்றும் தற்போது அமுலில் உள்ள நாட்டின் வர்த்தக மற்றும் நிதிக் கொள்கைகள் ஆகியன சிற்றுண்டிச் சாலை வழிகாட்டல்களின் அமுல்படுத்தல்களில் எதிர்மறையான தாக்கத்தை ஏற்படுத்துகின்றன.

1. Introduction

1.1 Background

Sri Lanka is enjoying the benefits of free education policy for the last 70 years. It is estimated that there are over 4 million students enrolled in schools across the country. Successive governments have introduced many incentives to the student population in the way of free text books, free school uniforms and free mid-day meals. Although initiatives of providing text books and uniforms were sustained, the provision of free mid-day meals could not be sustained in the prescribed manner due to many issues. Different programmes were tested from time to time in the provision of mid-day meals. Within the last decade many circulars were issued by the Ministry of Education on school nutrition programmes ranging from the provision of mid-day meals to a glass of milk for primary school children. Acceptability of food items, sustainability of supply chains, financial difficulties and issues of accountability negatively influenced the mid-day meal programmes. However, the constant attempts to provide a meal at school highlighted the fact that nutrition of school children is a national priority (Ministry of Healthcare and Nutrition, 2010; National Nutrition Council, 2013).

Although there have been improvements in the overall nutritional status in the Sri Lankan population during the last three decades, there is enough room for improvement (National Nutrition Council, 2013). Nutrition of school children is a priority for both health as well as for the education sector. Apart from the issues related to protein calorie malnutrition, micronutrient deficiencies and childhood obesity are also becoming public health problems (Jayatissa, Gunathilaka, & Fernando, 2012). Discussions started on a school canteen policy is one initiative taken by the government in 2006 to combat malnutrition among school children through provision of nutritious, culturally acceptable food at affordable prices within the school premises. In addition, food hygiene, promoting healthy dietary habits, child friendly service provision and improving facilities of school canteens were expected through the policy. Based on the draft policy document, a circular was issued in 2007 (MOE circular 2007/2) to formalize the functioning of school canteens. A follow up circular was issued in 2011 (MOE circular 2011/3) to strengthen the school canteens. In addition, a direction was issued to schools (MOE circular 2007/21) to establish Health Promotion Committees that could engage in enhancing and monitoring of healthy activities in schools including nutrition of students.

The circular issued in 2007 focused on seven points that need to be considered in maintaining a school canteen. They were;

1. To maintain a canteen in all schools
2. To ascertain provision of hygienic food and maintaining utensils used to prepare food in a hygienic manner
3. To ascertain food safety and appropriate nutritional value
4. To improve opportunities to buy "healthy foods" in school canteen
5. To enhance "healthy food habits"
6. To prohibit "unhealthy food" in school canteen
7. To keep the indoor and outdoor environment of the canteen clean

The circular issued in 2011 added three more aspects to the directions. They were;

1. To maintain the indoor and outdoor environment of the canteen in a systematic manner and provision of safe drinking water
2. Proper storage of food items and maintaining of temperature in cooling devices
3. To ascertain use of approved preservatives and additives that does not cause allergy.

The directions sent to the school authorities did not specifically define the food categories as "healthy" and "unhealthy" or the details of maintaining different functions of the canteens. Broadly, it mentioned those food items with high fat, salt and sugar content and wheat based products to be restricted. Further,

the circulars stressed to make fruits, vegetables and cereal based food items available as far as possible. Examples of individual food items that should be prohibited/ restricted and those that need to be promoted were mentioned as an aid to school authorities. School authorities were instructed to solicit the help of Public Health Inspectors (PHIs) from the health department to maintain food safety.

Seven years have passed since the preparation of guidelines to strengthen school canteens. A systematic assessment of the implementation of the different elements in the proposed policy and the circular would provide valuable evidence for improvement of the status of school canteens. This study in two districts of the country is intended to at least partly fulfill this need.

1.2 Objectives of the Study

The main objective of the study was to evaluate selected aspects of implementation of the guidelines in strengthening school canteens in two districts. The proposed school canteen policy in 2006 and the circulars issued in 2007 and 2011 included several aspects of improving nutritional status among school children. This study concentrated on the following aspects of the guidelines that could help to assess the current level of implementation;

- To identify existing facilities in the schools to operate a canteen maintaining appropriate standards
- To identify food items sold in the school canteen
- To record prices of selected food items in school canteens
- To assess the availability of safe drinking water in school premises
- To describe the availability of selected food items in food stalls located in close proximity to the school
- To assess provider perspective of implementation of healthy school canteens.

2. Methodology

2.1 Study Setting

The study was conducted in the government controlled schools in Colombo and Gampaha districts in the Western Province of Sri Lanka. According to a recent report (Ministry of Education, Sri Lanka, 2012), there are 1337 government controlled functioning schools in the Western Province. Of those, 402 schools are in Colombo district, 531 are from Gampaha district and the rest are from Kalutara district. Approximately there are nine hundred and thirty eight thousand (938,340) students studying in government schools of the Western Province. Among those, 370,000 students are from Colombo district, 350,000 are from Gampaha district and the rest from Kalutara district.

The schools are categorized into 4 different types.

They are:

Type 1AB: Schools having Advanced Level Science stream classes

Type 1C: Schools having Advanced Level Arts and/or Commerce streams but no Science stream

Type 2: Schools having classes only up to Grade 11

Type 3: Schools having classes only up to Grade 08

This categorization of schools is used in the Ministry of Education as well as the Ministry of Educational Services for all administrative functions including resource allocation. Hence, data collection for applied research with a focus on improving the systems need to use this categorization to be meaningful for educational authorities.

In the sampling frame we included all the government schools in the two districts except for the Type 3 schools. Type 3 schools only have a primary section and with lesser number of students. As this is a pilot project to evaluate the implementation of School canteen

policy in two districts in the Western Province, sample size and the sampling method was devised considering the available resources, field logistics and the short time period available to complete the study. Multi-stage stratified sampling method was employed to achieve adequate representation of schools in the two districts.

In the first step of sampling, two educational zones of each district were selected by simple random sampling. Then, two educational divisions from each of the educational zones were selected using simple random sampling. Therefore, in total eight educational divisions from both districts was selected.

The type of school was considered as the "stratum' for the third step of sampling. From each stratum three schools were selected. Hence, the final sample consisted of 72 schools (Table 2.1). Same weightage was given to all the types of schools in the analysis as the school canteen is expected to have the same standards in all schools. In schools with more than one canteen, the canteen used by the most number of students was selected for the assessment.

In addition to the observations done in the school canteens, in-depth interviews were conducted with Key informants on the implementation of guidelines to strengthen school canteens. Participants were Principals or a teacher in charge of school canteens and the person operating the school canteens. Six Principals and 6 canteen operators were selected for the interviews considering the type of school, number of students, medium of instruction and the educational division. From a given school, either the Principal or the canteen operator was selected.

2.2 Data Collecting Methods

A check list and a data recording sheet were used to record the observations done in the school canteens. The check list consisted of four sections. (1) Physical facilities of the canteen premises (2) Section on available food items (3) Availability of safe drinking water (4) Information on food stalls close to the school.

Section 1 of the observation list was based on information provided in the canteen circular issued on 2011 and the Food Act of 1980. Section 2 was based on the information provided in the canteen circular issued on 2011 and the preliminary observations done in the school canteens. The canteen circular contained information on the manner the Ministry of Education classified "healthy" versus "unhealthy" food items sold in canteens. The circular or the background documents in the Ministry of Education did not refer to nutrition profiling of food items before this classification. Further, no widely accepted classification based on nutrition profiling is available for Sri Lankan food. Hence, this assessment was solely based on the directions provided in the canteen circular of 2011.

Interview guide

A brief interview guide was used to conduct Key Informant Interviews (KII) with Principals of participating schools and owner/ in charge person of the school canteen to obtain perception of

Table 2.1
Selection of Schools

District	No: Educational Zone	No: Educational Division	Type of School	Number of Schools
Colombo	2	4	1AB	12
			1C	12
			Type 2	12
Gampaha	2	4	1AB	12
			1C	12
			Type 2	12
Total				**72**

implementing the school canteen guidelines.

In addition, the data collectors and the investigators recorded their additional observations in field note books.

Four teams of field investigators were trained for data collection. Data collection in one educational division was completed within a week. Key informant interviews were done during the same week by the principal investigator and co- investigators.

Data analysis was done considering the selected elements of the proposed school canteen policy and the Ministry of Education circular dated 2011/01/ 18 as the standard. Key informant interviews were recorded and transcribed. Thematic analysis was performed to elicit important messages to strengthen school canteens in the future.

This study did not intend to assess or report performance of individual schools, educational divisions or educational zones. The results are aggregated data for all the schools. Important deviations and findings are presented without identifying the source. Ethics review committee of the Faculty of Medicine, Colombo approved the research protocol.

3. Results

Totally, 71 school canteens were studied in two districts in the Western Province. The results are presented according to
(i) availability of canteens,
(ii) quality of maintaining the premises of canteens,
(iii) availability of food items,
(iv) prices of food items,
(v) availability of water supply,
(vi) availability of food stalls, and
(vii) kind of food items sold in those food establishments close to the school.

All selected schools were included in the study. In Homagama division, there were only 2 IAB schools. Only 63 schools had health promotion committees (see Annexure I).

Out of 71 schools, 68 (95.8 per cent) schools had a place to buy food for school children during school hours. Among those, 64 (94.1 per cent) schools were maintaining their canteen in a permanent place (Table 3.2).

The 68 schools had 73 canteens. All of them maintained an ordinary canteen in which main meals along with other food products were sold. In addition, three schools had an extra canteen, and two schools had a milk bar. The four schools that did not have a permanent place for a canteen was selling food in road side outlet, vehicle outlet, under staircase and by a food vender.

Table 3.1
Distribution of Schools According to District, Zone and Type of School (n = 71)

Location & Type	Frequency	Per cent (%)
District		
Colombo	35	49.3
Gampaha	36	50.7
Zone		
Colombo	18	25.4
Homagama	17	23.9
Kelaniya	18	25.4
Negombo	18	25.4
Type of School		
Type 1AB	23	32.4
Type 1C	24	33.8
Type 2	24	33.8

Table 3.2
Availability of a Canteen in the School (n = 71)

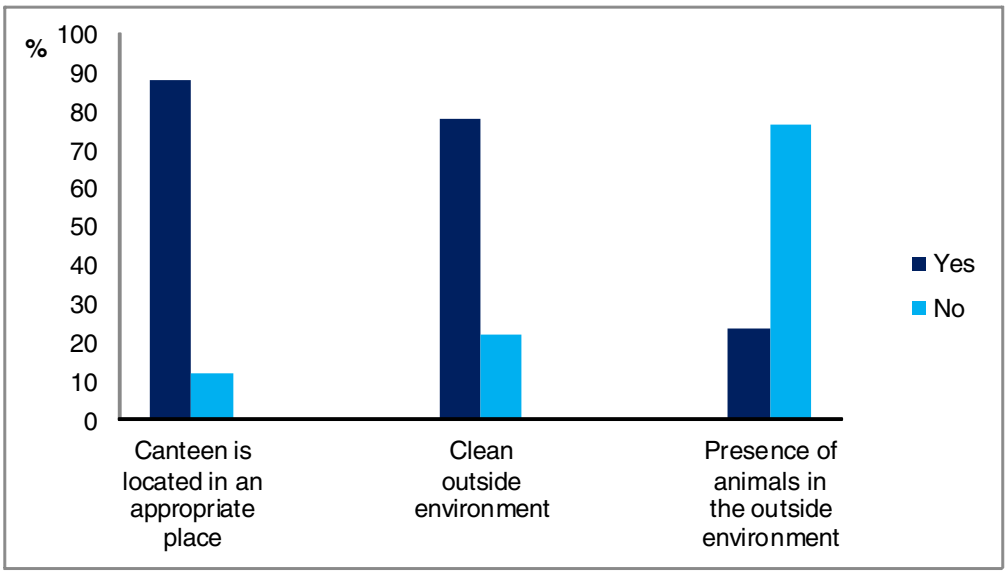
Canteen Status	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
A place is available to buy food	68	95.8	3	4.2
More than one canteen is available†	5	7.4	63	92.6
Permanent place is available to maintain a canteen†**(n = 68)**	64	94.1	4	5.9

Note: † Only 68 schools had canteens.

3.1 Main Canteen

Only the information on the main canteen is presented here onwards.

Figure 3.1
Cleanliness of the Outside Environment of the Canteen (n = 68)



Of the canteens, 88.2 per cent were located in suitable places away from toilets, garbage pits or other unhygienic surroundings. Fifty three (77.9 per cent) canteens had a clean outside environment (Figure 3.1).

Majority of the canteens **(**79.4 per cent) prepare some kind of food in the canteen itself. Other canteens (20.6 per cent) solely depend on food prepared outside. Only 50 per cent of the canteens had a dining area for school children in the canteen (Figure 3.2). There was no difference according to the type of school (see Annexure II).

Among the canteens which prepare food within canteen premises, 26 (48.1 per cent) prepare all type of food products such as main meals, short eats and some drink items. 16 (29.6 per cent) canteens prepare short- eats with drinks and the rest of the canteens (22.2 per cent) prepare only drink items (Figure 3.3). There was no difference according to the type of school (see Annexure II).

Figure 3.2
Food Preparation and Facilities for Dining in the Canteen (n = 68)

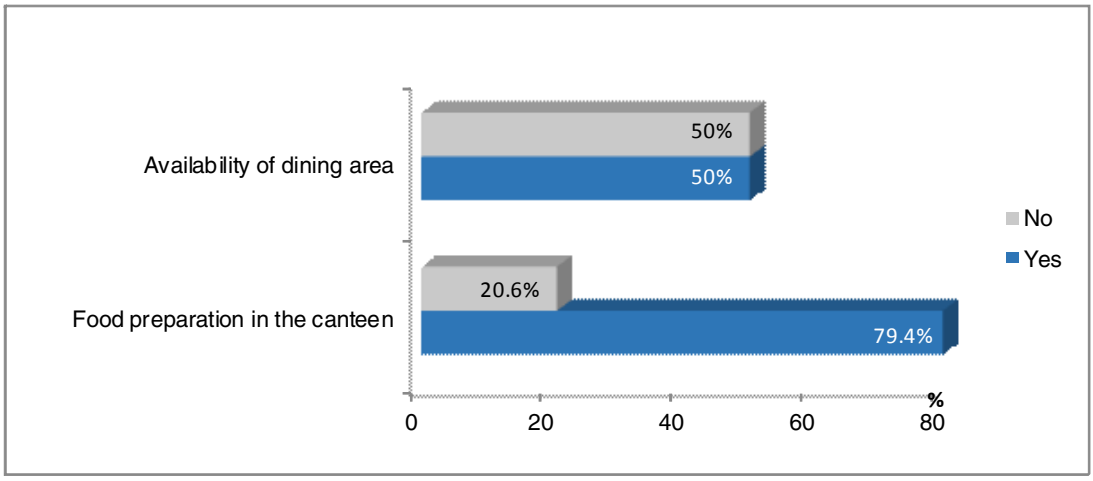


Figure 3.3
Type of Food Items Prepared in the Canteen Premises (n = 54)

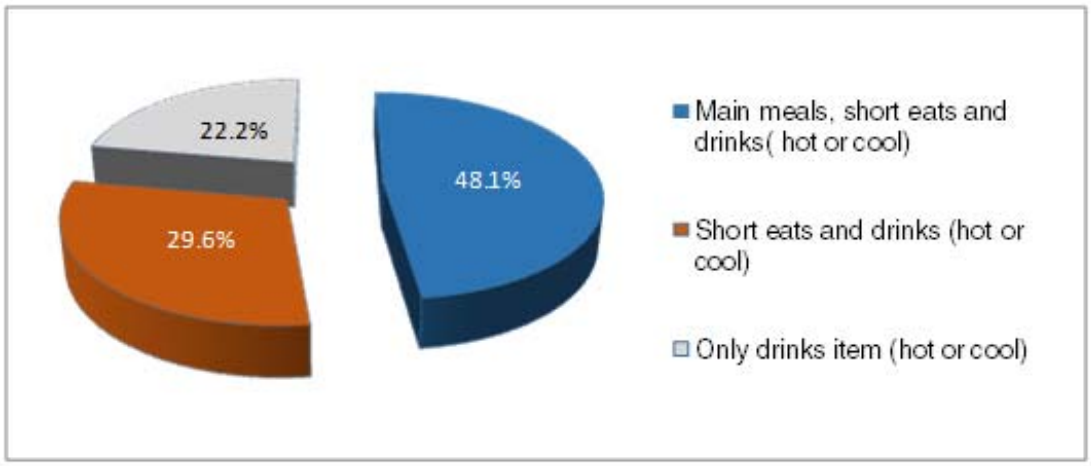


Table 3.3
Characteristics of Housing in the Food Preparation Area (n = 54)

Housing Characteristic	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Adequate **space** available for food preparation	21	38.9	33	61.1
Presence of **ceiling** in food preparation area	12	22.2	42	77.8
Clean **wall** in food preparation area	38	70.4	16	29.6
Adequate **ventilation**	36	66.7	18	33.3
Adequate **lighting**	40	74.1	14	25.9
Type of floor in food preparation area - Cemented	49	90.7	-	-
- Tiled	5	9.3	-	-
Clean floor in food preparation area	30	55.6	24	44.4

Table 3.4
Facilities for Proper Disposal of Waste in the Food Preparation Area (n = 54)

Facility	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Availability of drains for waste water drainage	44	81.5	10	18.5
Availability of bins for waste disposal	**48†**	88.9	6	11.1
Bins are kept closed **(n=48)†**	11	22.9	37	77.1
Bins are kept away from food preparation area **(n = 48)†**	30	62.5	18	37.5

Note: † Only 48 canteens had bins in food preparation area.

The space for food preparation in the canteen was inadequate in 61.1 per cent of canteens according to the type of food items prepared. 77.8 per cent of canteens had no proper ceiling but a majority of canteens had adequate ventilation (66.7 per cent), adequate lighting (74.1 per cent) and clean wall (70.4 per cent). 90.7 per cent of canteens had a floor paved with cement and only 55.6 per cent of canteens had a clean floor (Table 3.3).

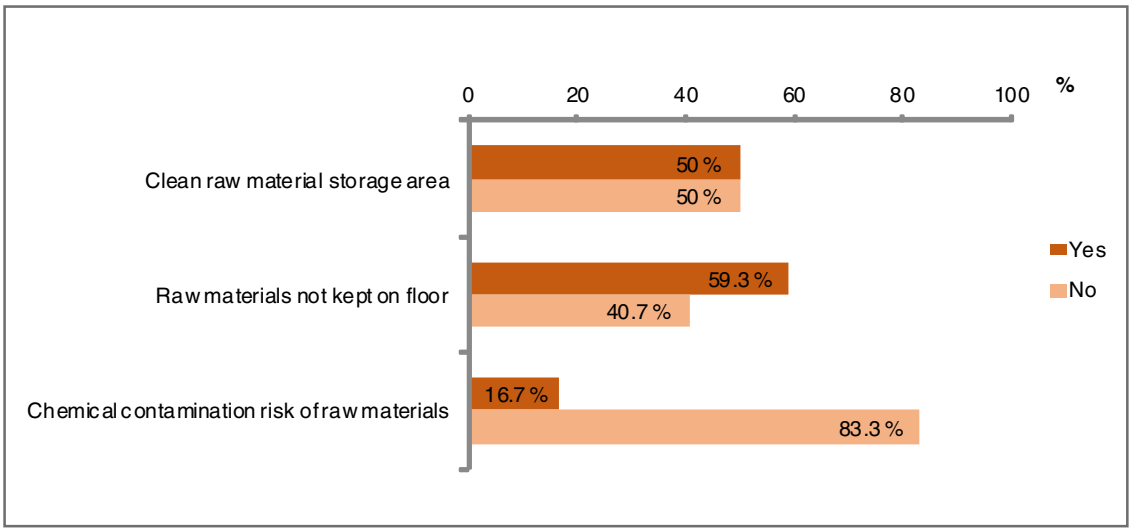
Although 48 canteens (88.9 per cent) had bins in food preparation area, bins were not kept closed in 37 canteens (77.1 per cent). 81.5 per cent of canteens had a drain to waste water drainage (Table 3.4).

Utensils for food preparation were in usable condition in 66.7 per cent of canteens and were clean only in 53.7 per cent. Majority of canteens (94.4 per cent) had water supply in the food preparation area. Although hand washing facilities were available in 81.5 per cent of canteens, facilities to properly clean the utensils were available only in 48.1 per cent. Toilet was located away from the kitchen in a majority of schools (94.4 per cent) (Table 3.5).

Table 3.5
Facilities for Maintaining Food Safety in the Food Preparation Area (n = 54)

Safety Measures	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Utensils in usable condition	36	66.7	18	33.3
Clean utensils	29	53.7	25	46.3
Working surface in good condition	27	50.0	27	50.0
Facilities to disinfect utensils	26	48.1	28	51.9
Hand washing facility in food preparation area	44	81.5	10	18.5
Water supply availability at food preparation area	51	94.4	3	5.6
Detergents are kept away from food handling area	41	75.9	13	24.1
Light bulbs placement over food handling area	14	25.9	40	74.1
Toilet is away from food handling area	51	94.4	3	5.6
Presence of animals inside food preparation area	12	22.2	42	77.8

Figure 3.4
Status of the Food Storage Area in the Canteen (n = 54)



50 per cent of canteens had stored the raw materials in an unclean area and 40.7 per cent of canteens kept some of their raw materials on the floor (Figure 3.4).

Majority of canteens (92.3 per cent) had clean cooling equipment without any decomposed food items inside them. Out of 26 canteens, 18 (69.2 per cent) canteens stored meat and dairy products separately and 20 (76.9 per cent) canteens stored cooked food and raw materials separately (Table 3.6).

In 20 (29.4 per cent) canteens, food was not covered properly to prevent from contamination. Only 30.9 per cent had separate spoons to serve different food items. Materials used for wrapping and packing of food items were not clean in 47.1 per cent of the canteens. Price list of food items were also displayed in only 42.6 per cent of the canteens (Table 3.7).

Food handlers in 94.1per cent and 97.1 per cent of the canteens were not using aprons to cover the body or gloves to cover the hands, respectively. In 57.4 per cent of canteens, bare hands were used for serving food (Figure 3.5).

Table 3.6
Availability of Refrigeration Facilities and Proper Maintenance (n = 54)

Facility	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Availability of Freezer	9	16.7	45	83.3
Availability of Refrigerator	26	48.1	28	51.9
Clean cooling Equipment (**n=26**)†	24	92.3	2	7.7
Separate storage of meat and dairy products (**n=26**) †	18	69.2	8	30.8
Separate storage of cooked food & raw material (**n=26**) †	20	76.9	6	23.1

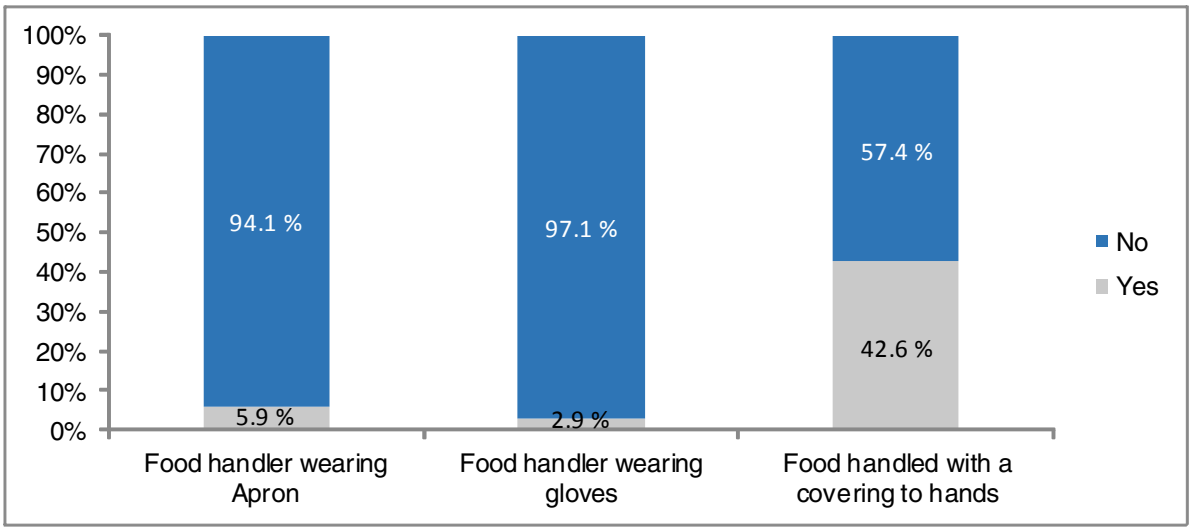
Note: † Only 26 canteens had a cooling facility.

Table 3.7
Facilities Available in the Food Serving Area in the Canteen (n = 68)

Facility	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Prepared food kept covered	48	70.6	20	29.4
Separate spoons for different foods	21	30.9	47	69.1
Availability of reusable dishware and cutlery	38	55.9	30	44.1
Clean reusable dishware[†] **(n= 38)**	33	86.8	5	13.2
Availability of non-reusable dishware	26	38.2	42	61.8
Price list display	29	42.6	39	57.4
Clean food packing materials	36	52.9	32	47.1

Note: [†] Only 38 canteens used reusable dishware for the purpose of serving food.

Figure 3.5
Practices of the Food Handler in the Canteen (n = 68)

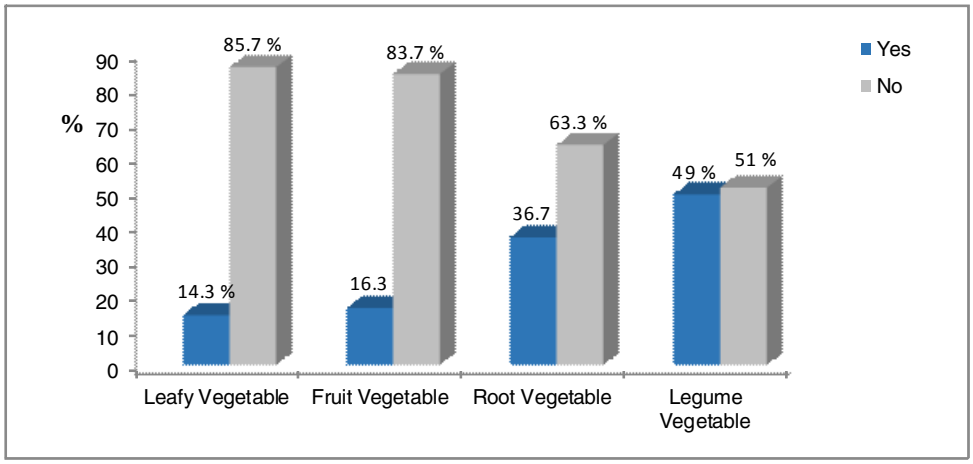


Among the 68 canteens, rice and kiribath were available in 77.9 per cent and 30.9 per cent of the canteens, respectively. The pulses were available in less than 50 per cent of the canteens. Although string hoppers prepared from rice flour were available in 63.2 per cent of canteens, food items prepared from wheat flour were also available in over 50 per cent of canteens (Table 3.8). No major differences were seen in the availability of food items according to type of school (see Annexure II).

Table 3.8
Availability of Different Food Items in the Canteen (n = 68)

Food Item	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Cereals				
Rice	53	77.9	15	22.1
Kiribath	21	30.9	47	69.1
Pulses				
Chickpea	31	45.6	37	54.4
Cowpea	10	14.7	58	85.3
Mung bean	4	5.9	64	94.1
Tubers				
Manioc	7	10.3	61	89.7
Sweet potato	1	1.5	67	98.5
Wheat flour				
Bread	35	51.5	33	48.5
Roti	36	52.9	32	47.1
String hoppers	9	13.2	59	86.8
Pittu	3	4.4	65	95.6
Rice flour				
String hoppers	43	63.2	25	36.8
Pittu	3	4.4	65	95.6
Hoppers	23	33.8	45	66.2
Ulundu Flour				
Idly	10	14.7	58	85.3
Dosai	32	47.1	36	52.9
Other				
Noodles	34	50.0	34	50.0
Pasta	6	8.8	62	91.2

Figure 3.6
Availability of Different Kinds of Vegetables for Rice and Curry Menu (n = 49)†



Note: †Although 53 schools were selling rice and curry, it was possible to observe these food items only in 49 schools to confirm the menu.

Legume vegetable was available in 49 per cent of canteens which is a higher per cent compared to other types of vegetables such as leafy vegetables and fruit vegetables (Figure 3.6).

Egg was available in 64 per cent of canteens while fish and dried fish were available in 27.5 per cent and 19.6 per cent of canteens as the source of protein (Table 3.9).

Fresh milk, fresh fruit juice and kola kanda were available in 8.8 per cent, 13.2 per cent and 7.4 per cent of school canteens, respectively. However, pasteurized milk, carbonated drink, commercial fruit juice and malted drinks were available in 30.9 per cent, 25.0 per cent, 16.2 per cent and 14.7 per cent of canteens (Table 3.10). Pasteurized Milk was available in a significantly higher number of schools in 1AB type compared to other types of schools (see Annexure II).

Chocolate was available in 20.6 per cent of canteens. Other food products with high sugar content were available in a few canteens only (Table 3.11). No major differences were seen in the availability of food items according to type of school (see Annexure II).

Table 3.9
Availability of Different Kinds of Protein Source for Rice and Curry Menu (n = 51)*

Food Item	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Fish	14	27.5	37	72.5
Dried fish	10	19.6	41	80.4
Meat (i.e. Chicken) (n = 50)	3	6.0	47	94.0
Egg (n = 50)	32	64.0	18	36.0

Note: *Though 53 schools were selling rice, it was possible to observe these food items only in 51 schools to confirm the menu. Availability of meat and egg was checked in 50 canteens only.

Table 3.10
Availability of Beverages in the Canteen (n = 68)

Food Item	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Milk				
Fresh milk	6	8.8	62	91.2
Pasteurized milk	21	30.9	47	69.1
Fruit Juices				
Fresh fruit juice	9	13.2	59	86.8
Commercial fruit juice	11	16.2	57	83.8
Kola kanda	5	7.4	63	92.6
Carbonated drinks	17	25.0	51	75.0
Malted drinks	10	14.7	58	85.3

Table 3.11
Availability of Food Products with High Sugar Content (n = 68)

Food Item	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Chocolates	14	20.6	54	79.4
Cake	4	5.9	64	94.1
Doughnuts	3	4.4	65	95.6
Ice cream	4	5.9	64	94.1
Watalappam	3	4.4	65	95.6

Table 3.12
Availability of Food Products with Fatty Content (n = 68)

Food Item	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Pastry	39	57.4	29	42.6
Biscuits	32	47.1	36	52.9
Deep fried short eats	55	80.9	13	19.1

Deep fried short eats were available in most of the canteens (80.9 per cent). Similarly, other food products with high fatty content are also available in most of the canteens (Table 3.12). No major differences were seen in the availability of food items according to type of school (see Annexure II).

The junk food items such as toffees, sweet deserts and chips items were available in 57.4 per cent, 30.9 per cent, and 48.5 per cent of canteens, respectively (Table 3.13). No major differences were seen in the availability of food items according to type of school (see Annexure II).

All the schools had drinking water supply of which 88.7 per cent are from the Water Board and the rest (11.3 per cent) from well water. 83.1 per cent of schools store the water in a water tank and 97.2 per cent of the schools distribute the water via taps (Table 3.14).

Out of 34 canteens, the dining area for schoolchildren was not adequate in 18 (52.9 per cent) of the canteens. 70.6 per cent of canteens had no proper ceiling in the dining area but the majority of canteens had adequate ventilation (73.5 per cent), adequate lighting (79.4 per cent) and a clean wall (70.6 per cent). 75.5 per cent of canteens had the floor paved with cement in the dining area. Only 52.9 per cent of canteens had a clean floor (Table 3.15).

Table 3.13
Availability of Other Junk Foods (n = 68)

Food Item	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Toffees	39	57.4	29	42.6
Sweet desserts (i.e. jelly)	21	30.9	47	69.1
Any chips item	33	48.5	35	51.5

Table 3.14
Availability of Safe Drinking Water

Drinking Water	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Availability of drinking water	71	100.0	0	0.0
Source				
Pre-treated water supply	63	88.7	8	11.3
Well Water	8	11.3	63	88.7
Water stored in water tank	59	83.1	12	16.9
Water dispensed via tap	69	97.2	2	2.8

Table 3.15
Characteristics of Housing in the Dining Area (n = 34)

Housing Characteristic	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Adequate **space** in dining area compared to crowd	16	47.1	18	52.9
Presence of **ceiling** in dining area	10	29.4	24	70.6
Clean wall in dining area	24	70.6	10	29.4
Adequate **ventilation**	25	73.5	9	26.5
Adequate **lighting**	27	79.4	7	20.6
Clean floor in dining area	18	52.9	16	47.1

Furniture in the dining area for schoolchildren was not adequate in 55.9 per cent of the schools. Although 91.2 per cent of canteens had facilities for hand washing in the dining area, hand washing solution or soap was available only in 55.9 per cent of canteens (Table 3.16).

Rice and curry (fish) was available in 14 canteens with the mean price of Rs. 52.50 and the mode was Rs. 50.00. The mean

Table 3.16
Facilities for Maintaining Food Safety and Other Needs in the Dining Area (n = 34)

Safety Measures	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Availability of waste disposal bins	29	85.3	5	14.7
Presence of animals inside dining area	8	23.5	26	76.5
Adequate furniture in dining area	15	44.1	19	55.9
Clean furniture	14	41.2	20	58.8
Availability of hand washing area in dining area	31	91.2	3	8.8
Availability of hand washing solution or soap	19	55.9	15	44.1

Table 3.17
Prices of Selected Food Items (In SL Rupees)

Food Item	Mean	Median	Mode	SD	Min. Price	Max. Price	Frequency #(n)
Price of one dish of rice & curry (Fish)	52.50	50.00	50.00	20.91	25.00	110.00	14
Price of one dish of fried rice (Egg)	46.34	40.00	30.00	20.85	25.00	110.00	26
Price of one dish of cowpea	29.00	27.50	20.00	8.432	20.00	40.00	10
Price of one dish of chickpea	25.00	25.00	30.00	6.582	10.00	35.00	31
Price of one dish of string hoppers with curry and sambol	28.58	27.50	25.00	4.906	20.00	40.00	46
Price of one egg roll	25.71	25.00	30.00	5.020	10.00	35.00	35
Price of one fish roll	24.25	25.00	20.00	4.744	15.00	35.00	27
Price of one fish pastry	28.26	30.00	30.00	5.956	10.00	40.00	23
Price of one chicken pastry	40.00	40.00	35.00	7.071	35.00	45.00	2
Price of one glass of fresh fruit juice	17.22	10.00	10.00	10.92	10.00	40.00	9
Price of one glass of fresh milk	30.00	30.00	30.00	0.000	30.00	30.00	5
Price of one bottle of small size carbonated drink	34.43	34.00	35.00	4.162	30.00	45.00	16
Price of one fish bun	25.54	25.00	25.00	4.272	10.00	30.00	50
Price of one kimbula bun	22.71	25.00	25.00	3.502	10.00	30.00	35
Price of one plain bun	22.27	20.00	20.00	3.768	10.00	30.00	33
Price of one sausage bun	30.71	30.00	30.00	6.753	10.00	40.00	14

Note: #Number of canteens where food item is available.

price of one dish of egg fried rice was Rs. 46.34 among 26 canteens with the mode being Rs. 30.00. Among the pulses, chick pea was the most available of the pulses compared to other pulses with the mean price of Rs.25.00. One parcel of string hoppers with curry and sambol was sold in 46 canteens with the mean price of Rs. 28.58. Egg roll was sold in 35 canteens with the mean price of Rs. 25.71. The mean prices of fish bun, kimbula bun and plain bun were Rs. 25.54, Rs. 22.71, and Rs. 22.27, respectively. The mean price of one glass fresh fruit juice was Rs. 17.22 and the mode was Rs. 10.00. Fresh milk was available only in 5 canteens and its mean price and mode was Rs. 30.00. The mean price of one small bottle of carbonated drink was Rs. 34.44 (Table 3.17).

3.2 Unhealthy Advertisements

Advertisements of unhealthy food products were displayed in 6 canteens (17.6 per cent).

Within the 200m perimeter of a school, 36.6 per cent of schools had billboards or poster advertisements of unhealthy commercial food products. Sixty two (87.3 per cent) schools had local food stalls outside their schools. Only 16.9 per cent schools had branches of well-established local food chains within 200m. Among those food stalls, availability of fast foods and carbonated drinks were 84.1 per cent and 82.5 per cent, respectively (Table 3.18).

3.3 Availability of H800 Form for Ranking of Food Establishments (n = 68)

Among 68 school canteens, only 3 (5.9 per cent) canteens had H 800 form issued for ranking of food establishments by a PHI. Although the PHI had visited many school canteens, food rating form was not maintained.

Table 3.18
Information on Food Stalls and Food Advertisements in the School Perimeter of 200m

Food Stalls & Items	Availability			
	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Presence of international food chain outlets	1	1.4	70	98.6
Presence of local food chain outlets	12	16.9	59	83.1
Presence of other local food stalls	62	87.3	9	12.7
Presence of unhealthy advertisements outside school	26	36.6	45	63.4
Availability of food items on food stalls outside (n = 63)*				
Fresh fruit juices	25	39.7	38	60.3
Kola kanda	10	15.9	53	84.1
Fresh milk	18	28.6	45	71.4
Fast foods (burger, submarine, short eats)	53	84.1	10	15.9
Carbonated drinks	52	82.5	11	17.5

Note: * Only the schools which have at least a single food stall within 200m.

4. Perceptions on Implementation of School Canteen Guideline

In-depth interviews were conducted with Principals of schools and canteen operators to elicit their perceptions on the present status of school canteens in respect to guidelines. Six interviews were done with Principals and a similar number of interviews were done with the canteen operators. The 12 schools for the interviews were selected depending on the type of school, medium of instruction, location of the school and also status of the canteen as observed by the investigators during the preliminary visit.

Number of students in the twelve schools ranged from over 3,000 to just over 400 students. Students belonged to different ethnic and religious background. In some schools, canteens were located in permanent housing. In a few schools, food was sold in makeshift arrangements. Students in all the schools belong to socio-economic strata of middle income to lower income households.

4.1 Nutritional Status of Students and Education

Across all the interviews, both Principals and the canteen operators recognized the importance of proper nutrition as a key factor for successful attainment in education. However, there were differences in the understanding of proper nutrition in respect to intake of food items. The differences of understanding were not only between Principals and canteen operators but also within those two groups. Principals were looking at both the quantity and quality of food in their judgment while most canteen operators were mainly relating the quantity and the affordability.

There were clear differences among Principals when they commented on choice of food in relation to healthy and unhealthy. Most Principals were comfortable in categorizing traditional foods as healthy in a blanket manner without evaluating the nutritional value of those. The canteen operators were more concerned about the value of the food that can be sold for an affordable price to students. Their perception on difference of healthy versus unhealthy was almost limited to rice flour based products to wheat flour based products and sweets.

Several schools provide 10 minutes at the beginning of the school for students to have breakfast. Principals find that a substantial number of students come to school skipping the breakfast and it affects learning. They have noticed less issues of sick reporting in the morning session after providing a small break in the morning to have breakfast. Principals admit that some students do not bring food or buy them from the canteen due to economic issues.

Canteen operators also find many students buying food items for breakfast from the canteen. They observe that students coming from a distance as well as who reside close to school, purchase food in the morning for breakfast. Hence, they have some amount of sale in the morning before starting school. Both Principals and the canteen operators attribute the habit of skipping breakfast, to issues at home. They felt that parents should make it a habit to provide breakfast to children before leaving home if this behaviour is to be changed.

4.2 Guidelines on Bringing Food to Schools by Students

According to the instructions given by the Education Ministry, many schools have issued guidelines for bringing food from home. These are implemented in the primary sections but not in the middle or upper schools. Many children in the primary classes adhere to the instructions. However, Principals feel that teachers are in an embarrassing position when they are to implement the guidelines. In particular, implementing the guidelines is very difficult in some schools, where large numbers of children come from the lower socio- economic strata. Although the teachers have to physically check the food items brought by

the students, it is difficult to implement it fully due to the sensitive nature of the issue. Teachers do not want to embarrass students if they have not brought any food from home due to economic difficulties or due to ignorance of the parents. Although teachers do spot checks, it is difficult to enforce the guidelines as stipulated.

On the other hand, teachers also sometimes experience situations where students would bring the stipulated food items for the day as a formality, still they do not consume those food items and stay hungry till they return home. This has resulted in low compliance from parents and sometime creating unpleasant situations to the Principal, teachers and parents. Principals admit it is not practical to enforce those guidelines to students in the middle or upper school where most of the students do not bring food from home.

4.3 Awareness on School Canteen Guidelines

Majority of the Principles (4/6) have seen the circular sent on canteen guidelines. Others have heard but not seen the circular. Although Principals had a general understanding of the content of the circular, most of them were not aware on the specific issues addressed. All of them knew that school canteens should not have soft drinks and refrain from selling sweets. They also knew that wheat based food items needed to be restricted and rice and rice flour based food should be encouraged. Only a few Principals admitted that they have given the printed guidelines to the canteen operator. They assumed that the Zonal Education Office would have done it as part of the tender procedure. Canteen operators are aware of the instructions given by education authorities. They mainly recollect the instructions imposed on restricted food items but little on the promotive aspects.

Principals were not familiar with some technical issues addressed in the circular namely, food storage, proper maintenance of equipment, maintenance of utensils in the canteen and compliance with the Food Act. Unawareness on those issues had some bearing on their understanding on the guidelines and monitoring of school canteens. This was evident from the observations done on food preparation, storage and serving in school canteens.

4.4 Food Habits and Guidelines

Food habits of the students was seen by Principals as the main barrier to implement a healthy canteen policy as well as to have a better nourished student population. They attribute this to the up-bringing of children at home, food culture at home, affordability and attitudes of parents on the food habits of students. In addition, the media is also influencing food habits greatly. All the Principals pointed out that the school cannot change the existing food habits of students in isolation. A student stays only 6 hours in the school and has all three main meals at home. They emphasize that the home environment should take the lead in changing it. The school can only support the change.

Majority of the students like the food items categorized as oily, sugary or unhealthy in broad terms. In canteens, the main demand is for pastries, fried items, and sweets. Although soft drinks are not available now in most school canteens, it was one of the frequently sold items previously. The least demand is for pulses which are recommended in the guidelines as alternative food items. Principals and canteen operators both insisted that, it is extremely difficult to convince students to have them. Serving rice and curry is promoted in the guidelines as a suitable food item. According to Principals most of the canteens serve it as a main food item. However, according to the canteen operators and our observations, the demand is for 'fried rice' and not for rice and curry. Hence, rice as a food item is sold more often as fried rice with a minute amount of fried vegetables (carrot and cabbage) and chili paste. Apart from fried rice, some canteens also offer rice and curry packets.

Apart from the food items listed in the tender documents, many other items are sold in canteens. Canteen operators reveal that those items have more demand than those in the list given by the Education Department. Also, they earn more from those items. According to the canteen operators and on our own observations, most students bring Rs. 10-20 to buy food from the canteen. Students in higher classes may bring 30-50 rupees. However, most students cannot afford food items beyond

Rs. 20-25. Hence, students are compelled to buy food items that are affordable to them. In turn, the canteen has to provide food items within their reach. Rice and curry or fried rice is generally priced on or above Rs. 30. Same is for "kotthu roti" which has a high demand from older school children. Main food items that are within the reach of students are, fried items like vade, bakery items as fish bun, pol roti, hoppers, dosai, bite packets (manioc, murukku), biscuits and sweets. Students can buy only one piece of those items for the amount of money they possess. It is also seen that several students pool money to buy food items and share it to increase the affordability. Hence, food items are sold in the canteens to cater for the demand and affordability of students. Food items considered as healthy such as pulses, kola kanda and red rice is generally consumed by teachers. Hence, such food items are brought to the canteen in small amounts.

Most of the canteen owners revealed that they use "soup cubes" when preparing fried rice and Kotthu. When they have not added "soup cubes", students complain that the food is not tasty. They admit that students like that taste and they are compelled to use it. Further, none of the canteen operators knew the harmful effects of those additives. It was also found that most of the food items labelled as "rice based" is actually prepared by a mix of wheat flour and rice flour. They find it is difficult to prepare pure rice flour food items in large-scale. Canteen operators affirm that students like the taste and the texture of mixed preparation rather than the pure rice flour made food items.

4.5 Feasibility of Operating School Canteen According to the Guidelines

All the Principals admitted that the space provided to the canteen is not adequate. They also agreed that the facilities in the canteens are not adequate to maintain them according to the stipulated guidelines. Most of the schools do not have housing that is made for the purpose of a canteen. Either they use an old class room or a room that is not been used for any other purpose. Some of the class rooms have been later transformed into a canteen by supplying water and a waste water line. However, the canteens do not have dedicated areas planned for preparation of food, storage and dining. They admitted that there is no space to provide dining area for students inside the canteens. In most canteens, teachers are provided one or two tables and few chairs to have their meals. Students are not allowed to use that facility.

Most canteens prepare some items of food within the canteen premises. The canteen operators also express the inadequacy of space to do their work properly. Within the available space, they try to accommodate a table and a few chairs for teachers. They find it is an obligation to provide a dining area for teachers. However, they continue to allow students to have their meals in the open, outside the canteen. They admit that provision of dining area for students is beyond their capacity and it should be looked into by the school authorities. The Principals state that they are unable to expand the space and facilities of the canteen due to inadequate funds from the education authorities to do so. Further, three Principals stated that the building of the existing canteen is provided by the support of parents and well-wishers. Principals find it difficult to solicit support from parents on a continuous basis to improve the canteen as they have to approach parents for many activities of the school. Parents coming from middle to low income communities find it difficult to finance school development activities in a long-term basis.

All Principals stated that they have either appointed a committee or an in-charge teacher to supervise the canteen activities. Principals themselves monitor the activities from time to time. However, they admitted that it is not easy to comply with the canteen guidelines fully due to various reasons.

One of the key issues identified by both Principals and the canteen operators is shops, bakeries and eating houses close to the school. All the food items banned or restricted in the school are available in those places. Therefore, students have easy access to those food items on their way to school and also after school. In some schools, students in the higher classes patronize those shops during the interval too. Many parents buy food from those shops in the morning for the students in the lower grades when they request. School authorities do not have any jurisdiction over the activities happening beyond the school premises. Hence, the implementation of the guidelines in the school canteens is effectively negated.

4.6 Present System of Selecting Canteen Operators

Principals are not contacted or not involved in the selection of the canteen operator. Only a Principal of a national school admitted that they had the opportunity to go through the credentials of the competitors before awarding of the tender. Awarding of the canteen tender is totally handled by the Zonal Education Office. Most Principals revealed that they are not even informed when tenders are called. They only get to know when the canteen operator is appointed. Minimum amount for the tender is decided by the zonal office. Principals understand that competitors indicate a higher quota to win the tender irrespective of the ground reality. At present, tender prices are decided on the basis of a per capita rate for a day for a student in the school. Hence, the total amount payable to the school per day would be per-capita rate into total number of students in the school at the beginning of the year. The fluctuation in the student numbers during the year, their absenteeism or their actual use of the canteen is not considered. The selling prices of food items agreed at the beginning of the year cannot be changed. Possible price changes of raw materials and fuel during the year is also not considered when setting maximum prices for food items. The canteen operator should pay the school this amount on a daily basis. The Principals admit that only a proportion of students use the canteen on a regular basis. The selected canteen operator only realizes the ground situation when they find it difficult to achieve the sales to accommodate the costs when adhering to tender specifications on food items.

The Principals find this situation difficult to handle. The canteen operator at this stage either will abandon the agreement and leave or they will sort to other means of increasing their income. If the canteen operator leaves, the Principal has to close the canteen till a new person been appointed by the zonal office. However, this circle would continue. If the school wants to continue the canteen, the Principle has to overlook some of the deviations from the agreement. Hence, all Principals expressed that it is not possible to adhere to the stipulated guidelines fully if the current tender procedure is continued. Principals observe that canteen operators who have been in the business for some time, know how to manipulate the situation to evade restrictions and gain profits.

In addition, new restrictions have been imposed in several schools due to the dengue epidemic. Many schools have banned selling yogurt and milk packets in the canteens as the empty containers are said to be breeding sites for mosquitoes. Principals fear prosecution by public health authorities. These are products that have a high demand from the students and also provide an earning to the canteen. In addition, use of lunch sheets has been banned citing the same reason. Canteen operators used to wrap food items like pulses, string hoppers, and rice using lunch sheets. Students have been advised to bring lunch boxes to buy those food items. The canteen operators find it difficult to supply other types of disposable wrapping material or reusable dishes to serve food for a large number of students within a small time period. If they purchase reusable dishes they have to spend a substantial amount that cannot be recovered. This has also reduced the sale of food items in the canteens.

4.7 Future of School Canteens

Principals feel there should be a uniform plan for building canteens in all schools which provides adequate space for different activities carried out in the canteen. They take the newly built Mahindodaya science laboratories across the country using a common template as an example. Using a common template and similar facilities will help to establish better infrastructure to maintain a healthy school canteen.

Main concern was the existing method of selecting the canteen operator based on tender procedure. Most Principals believe that an alternative method needs to be developed. However, they were reluctant to take up the responsibility at school level due to the fear of possible allegation on financial handling. One of the suggestions to improve the current system was to carry out a simple study on the utilization of the canteen by students before preparation of tender documents for each school. This can be done by the school itself. It should include the number of students generally using the canteen, facilities available to operate the canteen, affordability of students and pattern of sale of food items in the canteen. This could provide

insights to decide the minimum fees to be charged from the canteen operator. Canteen operators should be educated on the actual business opportunities they will have when adhering to guidelines. This will prevent competitors citing higher bids that cannot be earned through a healthy canteen.

Many Principals believe that provision of compulsory breakfast, sponsored by the government could solve the nutrition issues of students to some extent. If this can be undertaken, the canteen will not be a serious need for the school. They propose that such a system should be based on the participation of parents. However, Principals could not come up with a practical mechanism for a sustainable programme of this kind. It was clear that Principals do not want to be a part of financial handling in school meal programmes.

Canteen operators were reserved in suggesting new ways of operating school canteens. They feel that the tender procedure was appropriate provided that the payment is adjusted according to the utilization of the canteen and not depending on the total number of students in the school. They also feel there should be flexibility to change the price of a food item according to the fluctuation of food prices in the market.
Both Principals and the canteen operators believed that food habits of students can be changed only through a nation wide approach on healthy food. When unhealthy food is widely available and intensively promoted, they find that school canteen can play only a marginal role in changing food habits.

5. Discussion and Conclusions

This study was undertaken to assess the implementation of selected aspects of guidelines in strengthening school canteens in two districts. The proposed school canteen policy in 2006 and the circulars issued in 2007 and 2011 included several directions to improve nutritional status among school children. The study concentrated on a few aspects of the guidelines that could help to assess the current level of implementation.

A total of 71 school canteens were studied in two districts in the Western Province. A check list and a data recording sheet were used to record the observations done in the school canteens. In addition, we conducted Key Informant Interviews with Principals of participating schools and persons operating the school canteen to obtain perception of implementing the school canteen policy/circular. The data collectors and the investigators recorded their additional observations in log books. The data obtained through qualitative inquiry supplemented the quantitative findings.

5.1 Directive for Healthy Canteen

The environment can exert a strong influence on people's food decisions. If schools food environment can be made healthy, it can influence students to make healthy food choices and develop healthy eating habits. Hence, it is important that the school food programme is healthy (Mensink, Schwinghammer, & Smeets, 2012). Many initiatives have been taken on this approach by several countries during the last decade and a half. Healthy "Food and Drink Policy" of the Western Australian Department of Education and Training in an effort to improve the food environment within the government schools in 2007, a legislative enactment in a state in Brazil in 2001 to lay down criteria for provision of snacks/ drink services in educational institutions and healthy school canteen programme in the Netherlands are a few examples (Pettigrew, Pescud & Dovonan, 2012; Menisk, Scwinghammer & Smeets, 2012; Gabriel, Vasconcelos, Andrade & Schmitz, 2009). The World Health Organization resolution WHA 57.17 in 2004 provided an impetus for initiatives on healthy diet throughout the world (World Health Organization, 2004). Initiation of a dialogue on a healthy canteen policy in Sri Lanka during 2006/2007 period and subsequent directives on maintaining a school canteen that promote healthy nutrition among school children could be

considered as a part of the global push towards healthy diet.

The most comprehensive approach on healthy school canteen could be seen from the programme initiated by the Australian government. The directives from the National Healthy School Canteens Project provided clear guidelines for food selection, food safety, food handlers, training modules, information system, monitoring and evaluation of the programme (Department of Health, Australian government, 2013). This provided sufficient guidance and technical support to the school authorities. Guidelines from the Ministry of Education in Sri Lanka to the school authorities were almost restricted to the two circulars and the attachment. A detail resource on maintaining a healthy canteen for the school authorities and the canteen operator would have been helpful.

5.2 Facilities in the Schools to Operate a Canteen

Majority of the schools (95%) had a canteen in the school. This is a positive finding. Students of the three schools that did not have a canteen had to rely on outside sources such as roadside food venders and shops. Despite having a canteen, four schools could not provide a permanent place for it to function. When the school could not provide a permanent place, the canteen was located in a road side outlet, vehicle or a make shift location for the day. Even when the canteen is given a permanent place, suitability of the location and the cleanliness of the outside environment were questionable in one fifth of the cases.

Most canteens were preparing some kind of food within the canteen premises itself (79%). However, majority of the canteens did not have separate areas or adequate facilities to prepare food. As the majority of the school canteens are housed in old class rooms or in inappropriate buildings to maintain a food establishment, the canteen operator is using the limited space available to perform all the tasks of a canteen. Hence, the ability to maintain appropriate standards of hygiene and good practice is compromised. Unavailability of proper storage space to keep both raw materials and cooked food was observed in most canteens. At present, the school is able to provide only some old furniture. All the utensils for food preparation, storage and serving food are brought by the canteen operator. Usage of unsuitable, unclean utensils for food preparation and storage of cooked food and raw materials contravening the provisions of the Food Act of 1980 in some schools could be attributed at least partly for not providing adequate facilities. The findings raise two key issues on the guidelines, provision of facilities for food inside the canteen and food safety. As the circulars have not explicitly provided the standards of maintaining the canteen and directions for establishing purpose made premises for the canteen, school authorities have to depend on their own knowledge and experiences. Establishment, maintenance of food establishments and all regulatory procedures in relation to food is controlled by the Food Act (Parliament of Democratic Socialist Republic of Sri Lanka, 1980). This Act empowers the Director General of Health and specified subordinates as authorized officers. Ministry of Education needs the support and coordination of the Ministry of Health to exercise food safety within the school premises as it is not reasonable to expect school authorities to be conversant on operational details of the Food Act. The circular provides this link through mentioning the importance of obtaining assistance from the PHI in maintaining the canteen healthy. However, it has not established adequate tools to strengthen the coordination with the health authorities. Although the school health programme, a joint activity between the Ministry of Health and the Ministry of Education, is expected to deal with nutritional aspects in school children, the main thrust of the programme at present is medical examination of school children. Currently, the information system of school health is restricted to medical returns and thus, does not support monitoring of healthy food habits or facilities in that respect.

Behaviour and practices of food handlers in school canteens need to be improved in a substantial manner to maintain the hygiene standards. Particularly, not wearing an apron and handling food with bare hands was seen as a major issue that can lead to contamination of cooked food. In one-third of schools, food items were not kept properly covered until served. Although most canteens provide bins for waste disposal, no effort was taken to keep them closed. These can be corrected with simple interventions and proper supervision. Training of canteen operators and use of a

pre-qualification mechanism in the selection of canteen operators can improve food hygiene in a major way. Pre-qualification of canteen operators can be done through an assessment test based on basic knowledge and skills of food safety and hygiene (Department of Health, Australian government, 2013). Successful completion of training and a qualifying test of canteen operators and his staff could be a prerequisite for registration as a canteen operator in the Ministry of Education. Brazilian experience has shown that training of operators of canteens, school authorities as well as regular inspection is necessary to improve the compliance with the guidelines (Gabriel , Vasconcelos, Andrade , & Schmitz , 2009).

Majority of the canteens do not provide a dining area for students. Even when there is a space, it is partly covered without adequate seating arrangements. Dining area is provided only for teachers in most school canteens as it is considered an obligation by the canteen operators as well as the school. In all schools, water supply was available for drinking and hand washing within the canteen premises or close to the canteen. Also, half of the canteens supplied soap for hand washing. Toilets were located away from the canteens in the majority of the schools. Those are positive measures taken to uphold hygienic practices in schools.

5.3 Food Items and Food Behaviour

One of the key elements of the guidelines is to provide healthy food in school canteens and to promote desirable food habits of students to improve the nutritional status of the student population. As evidence suggests that provision of unhealthy foods in canteens leads to the belief that such products are appropriate for regular consumption, it is a useful strategy to use schools as a model for healthy diet (Bell & Swinburn, 2005). The findings of this study present a selective implementation of the food guidelines in relation to the items available in school canteens. School authorities have tried to implement the guidelines to make a canteen a healthy setting by imposing certain restrictions on food items while promoting alternatives. However, it was found that practical realities at ground level make it difficult to completely adhere to the guidelines. Most of the major obstacles to institute a healthy canteen are beyond the schools and the education authorities.

A key message is to promote rice and rice based food in school canteens and to do away with wheat flour based and fried items. The efforts made to promote rice as a main food item in the canteens has been derailed due to introduction of “fried rice” in the canteens as a major demand item. In addition, use of taste inducers for preparing food items (monosodium glutamate) was found as a major issue in food safety. The guidelines clearly mention to avoid harmful preservatives and food additives. The school authorities were unaware of the use of monosodium glutamate by the canteen operators in a major way to induce demand on food. On the other hand, the food regulations also do not prohibit use of monosodium glutamate in general. Although introduction of pulses intended to keep students away from wheat based pastries, it has not been successful due to the extremely low demand. Pastries and deep fried items have the highest demand among the students. It is well established that children will prefer fatty sugary snack foods to more nutritious food and also, the preference of parents for convene foods that can be easily carried to school (Bell and Swinburn, 2004). In school it is likely that students prefer those foods partly due to convenience to have those food items in a short period of time during the interval and the taste it holds. Further, when there are more alternatives, there is likelihood of children resorting to less optimal choices in regard to nutritive value. Also, the demand induces the supply of “unhealthy” food unless suitable alternatives are provided. In this study it was found at present that “healthy” alternatives offered to students in the canteen has failed to create enthusiasm on healthy food habits.

Owing to restrictions on selling milk packets and yogurt in schools due to dengue prevention, students in several schools have lost access to one of the main protein sources. Despite the ban on carbonated drinks, it was found that one fourth of canteens still sell them. Ratnayake and Ekanayake (2012) reported that all except one (n=65) in their sample of Colombo schools sold soft drinks in the canteen. They further

reported that 82 per cent of adolescents consumed sugar sweetened soft drinks one or more times in a week. This provides evidence for the existing demand for carbonated beverage in school going children. In comparison, Kolakanda and fresh juice were sold in only a small number of canteens and with poor demand from students.

It was found that completely removing oily and sugary items from the canteens is practically difficult. The proposed alternatives for pastries, fried food and sugary items in the school canteens have not been able to satisfy the demand. According to Bell and Swinburn (2004), the driving forces behind school canteen sales are also non-nutritive. School canteens exist for profit and fast foods are considered to be the most profitable items. Thus, to sustain the canteen economically viable, canteen operators have drifted from the guidelines to some extent. The Principals also had to ignore some deviations for the same. From the parents' side, the school canteen is treated as an opportunity to "reward" the children, hence, are not bothered on healthy choices (Bell & Swinburn, 2004).

5.4 Prices of Selected Food Items

Only 40 per cent of canteens display a price list that help students to choose the food item according to their affordability. Most students can afford only Rs. 25 or less to buy food items. Observation on the median prices of selected food items sold in school canteens is around Rs. 25. It also shows that a student can afford to buy only one piece of a particular food item for the amount they spend. The canteen operator need to price a food item considering the actual cost of preparing it, the amount that has to be paid for the school and the intended profit. When the canteen operators try to price the food items within the limits of affordability while retaining a profit, they invariably compromise the quantity and quality. The Western Australian experience suggest a canteen should be primarily a resource for ensuring access to appropriate food to sustain the children during the schooldays rather than a source of revenue for the school. Hence, the financial target should be a break-even and not profits (Pettigrew, Pescud, & Donovan, 2012). Affordability of students can certainly be increased in the Sri Lankan set-up if the share of the school could be removed from the pricing equation of food items.

In this study, the quantity of food offered at a given price was not considered due to practical difficulties. It should be also noted that guidelines issued from the Ministry of Education also was not based on the nutrition profile of specific food items and the pricing method. As the school canteen is used within a broader strategy to combat childhood malnutrition (National Nutrition Council, 2013), an approach encompassing nutrition profile need to be considered in selection of food items. However, considering the affordability of students and pricing of food items at present, possibility of supplying a nutritious food with adequate caloric value in a school canteen is doubtful.

5.5 Food Stalls Located in Close Proximity to the School

One of the key obstacles expressed by Principals and canteen operators for operating a healthy canteen was the presence of food stalls close to the school that sell unhealthy food. It was found that a majority of the schools have food establishments in the vicinity including outlets of corporate food establishments. Majority of these offer fast food and carbonated drinks which are restricted in the school canteen guidelines. However, it was found that some of the food stalls also offer healthy foods namely, kola kanda, fresh fruit juices and fresh milk. Food establishments are governed by the trade policies and regulation outside the jurisdiction of school authorities. Display of unhealthy food advertisements were also seen close to one third of schools. Hence, school children retain the access to unhealthy food items and are influenced by advertising on their way to school. As Ratnayake & Ekanayake, (2012) noted, carbonated drinks are available even in most remote places in Sri Lanka and aggressively advertised particularly by multinational companies. All these factors effectively reduce the efforts of healthy canteen guidelines to some extent.

5.6 Suggestions

Unawareness of canteen operators, employees on healthy and unhealthy food and unfavourable attitudes and wrong practices can be corrected through training and prequalification mechanisms. A pool of competent canteen operators needs to be developed than open award of tenders. This need to be coupled with regular monitoring of canteens using standard tools and trained personnel. An information system cross-cutting Ministry of Education and the Ministry of Health would help to monitor the strengths and weaknesses of the system to take appropriate decisions at the correct time. Evaluation mechanism tested in National school canteen project in Australia could be used as a base to develop a tool for Sri Lanka (Department of Health, Australian Government, 2013).

Unavailability of a purpose built canteen premises was found to be a major issue in maintaining a healthy canteen. Less attention has been paid for the structural arrangement of the canteen in almost all schools. A common ground plan with appropriate space and facilities will help to function a canteen in a hygienic manner catering to the needs of the students. Although this will be a capital intensive initiative from the government side, it is worth attempting it in a pilot scale. It could generate interest in potential sponsors among alumni and the private sector to take it forward. A basic ground plan developed by the authors is attached (see Annexure III).

Although the discussion on healthy food has caught attention in health as well as food science forums for over a decade in Sri Lanka, scientists and health authorities have failed to deliver economically viable, culturally acceptable and appealing healthy alternatives to unhealthy food. The available healthy alternatives within the budget of the majority are not appealing to the younger population. Hence, a consorted effort is needed to develop healthy recipes appealing and affordable to the school children if we are to change the current food habits. As learnt in the Brazilin effort, prohibiting caloric foods and restricting their advertising per se will not resolve the issue. A combined effort of parents, teachers, professionals, canteen operators, legislators and advertising agencies among others are necessary to promote strategies that enable healthy eating habits among students (Gabriel, Vasconcelos, Andrade, & Schmitz, 2009).

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Annexure

Annexure I
Information on School Health Promotion Committee and School Medical Inspection (SMI)

a. Availability of School Health Promotion Committee and School Medical Inspection (SMI)

Status	Yes		No	
	Frequency	Per cent (%)	Frequency	Per cent (%)
Availability of School Health Promotion Committee	63	88.7	8	11.3
School Medical Inspection (SMI) is conducted	61	85.9	10	14.1

b. School Health Promotion Committee and School Medical Inspection According to Type of the School

Status	Variable categories	Type 1AB	Type 1C	Type 2	Total
Availability of School Health Promotion Committee	Yes	21	21	21	63
	No	2	3	3	8
School Medical Inspection (SMI)	1. All the grades are covered by SMI	3	2	4	9
	2. Only Grade 1, 4, 7 and 10 are covered by SMI	15	19	18	52
	3. SMI is not conducted	5	3	2	10

Annexure II
Analysis of Some Selected Factors and Food Items Available in the Canteen According to Type of the School

a. Food preparation and facilities for dining in the canteen according to type of school (n = 68)

Facility		Type of School			Total	x^2	*p*
		Type 1AB	Type 1C	Type 2			
Food preparation in the canteen	Yes	19	18	17	54	0.998	0.607
	No	3	6	5	14		
Availability of dining area	Yes	12	14	8	34	2.485	0.289
	No	10	10	14	34		

b. Type of food items prepared in the canteen premises according to type of the school

Food Types	Type of School			Total
	Type 1AB	Type 1C	Type 2	
Main meals, short eats and drinks (hot or cool)	12	9	5	26
Short eats and drinks (hot or cool)	5	3	8	16
Only drinks item (hot or cool)	2	6	4	12
Total	19	18	17	54

x^2 – 7.158 *p* – 0.128 df - 4

c. Availability of different food items in the canteen according to type of the school (n = 68)

Food Item		Type of School			Total	x^2	p
		Type 1AB	Type 1C	Type 2			
Cereals							
Rice	Yes	20	18	15	53	3.491	0.175
	No	2	6	7	15		
Kiribath	Yes	7	7	7	21	0.051	0.975
	No	15	17	15	47		
Pulses							
Chickpea	Yes	11	12	8	31	1.116	0.572
	No	11	12	14	37		
Cowpea	Yes	3	5	2	10	1.291	0.524
	No	19	19	20	58		
Mung bean	Yes	1	1	2	4	0.608	0.738
	No	21	23	20	64		
Tubers							
Manioc	Yes	2	3	2	7	0.195	0.907
	No	20	21	20	61		
Sweet potato	Yes	0	0	1	1	2.122	0.346
	No	22	24	21	67		
Wheat flour							
Bread	Yes	13	13	9	35	1.564	0.458
	No	9	11	13	33		
Roti	Yes	13	13	10	36	0.843	0.656
	No	9	11	12	32		
String Hoppers	Yes	2	4	3	9	0.578	0.749
	No	20	20	19	59		
Pittu	Yes	0	1	2	3	2.161	0.339
	No	22	23	20	65		
Rice flour							
String hoppers	Yes	19	13	11	43	7.569	0.023
	No	3	11	11	25		
Pittu	Yes	1	1	1	3	0.005	0.997
	No	21	23	21	65		
Hoppers	Yes	7	8	8	23	0.106	0.949
	No	15	16	14	45		
Ulundu Flour							
Idly	Yes	3	4	3	10	0.114	0.945
	No	19	20	19	58		
Dosai	Yes	14	10	8	32	3.717	0.156
	No	8	14	14	36		
Other							
Noodles	Yes	11	11	12	34	0.348	0.840
	No	11	13	10	34		
Pasta	Yes	5	1	0	6	8.062	0.018
	No	17	23	22	62		

d. Availability of beverages in the canteen according to type of the school (n = 68)

Food Item		Type of School			Total	x^2	*p*
		Type 1AB	Type 1C	Type 2			
Milk							
Fresh Milk	Yes	4	2	0	6	4.531	0.104
	No	18	22	22	62		
Pasteurized Milk	Yes	12	6	3	21	9.226	0.010
	No	10	18	19	47		
Fruit Juices							
Fresh fruit juice	Yes	3	3	3	9	0.017	0.991
	No	19	21	19	59		
Commercial fruit juice	Yes	7	3	1	11	6.404	0.041
	No	15	21	21	57		
Kola Kanda	Yes	1	1	3	5	1.887	0.389
	No	21	23	19	63		
Carbonated Drinks	Yes	9	5	3	17	4.707	0.095
	No	13	19	19	51		
Malted Drinks	Yes	6	1	3	10	4.915	0.086
	No	16	23	19	58		

e. Availability of food products with high sugar content according to type of the school (n = 68)

Food Item		Type of School			Total	x^2	*p*
		Type 1AB	Type 1C	Type 2			
Chocolates	Yes	4	6	4	14	0.442	0.802
	No	18	18	18	54		
Cake	Yes	1	2	1	4	0.402	0.818
	No	21	22	21	64		
Doughnuts	Yes	2	0	1	3	2.251	0.325
	No	20	24	21	65		
Ice cream	Yes	1	2	1	4	0.402	0.818
	No	21	22	21	64		
Watalappam	Yes	2	0	1	3	2.251	0.325
	No	20	24	21	65		

f. Availability of food products with fatty content according to type of the school (n = 68)

Food Item		Type of School			Total	x^2	*p*
		Type 1AB	Type 1C	Type 2			
Pastry	Yes	12	11	16	39	3.499	0.174
	No	10	13	6	29		
Biscuits	Yes	12	14	6	32	5.177	0.075
	No	10	10	16	36		
Deep fried short eats	Yes	18	17	20	55	3.010	0.222
	No	4	7	2	13		

g. Availability of other junk foods according to type of the school (n = 68)

Food Item		Type of School			Total	x^2	*p*
		Type 1AB	Type 1C	Type 2			
Toffees	Yes	16	14	9	39	4.568	0.102
	No	6	10	13	29		
Sweet desserts (i.e. jelly)	Yes	11	5	5	21	5.588	0.061
	No	11	19	17	47		
Any chips Item	Yes	13	9	11	33	2.170	0.338
	No	9	15	11	35		

Annexure III
A Sample Floor Plan for a School Canteen

