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## FOOD SAFETY IN SCHOOL CANTEENS IN KILINCHCHI DISTRICT

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### **ABSTRACT**

Food safety is an increasingly important public health issue. Because of increasing number of food safety problems, governments all over the world and World Health Organisation are intensifying their efforts to improve the food safety. The aim of the study was to describe the level of food handling safety in school canteens in Kilinochchi district. It was an observational study. The schools in the Kilinochchi district were included in the study and 40 canteens (only 40 have canteens) were studied using a check list developed as part of the research. The structural cleanliness was satisfactory in 70.0% of canteens. Eighty percent of the canteens were free of Garbage/ food scraps in the surrounding with duct bins and safe water supply was available in all the canteens (100.0%). Regarding the practices 90.0% of food handlers did not wear apron or mask but 65% appeared clean with clipped nails. The overall food hygiene was satisfactory in 62.5 % of canteens. All the canteens were recorded with H - 800 checklists and regularly supervised by school administration. Conclusions: The food safety of majority of school canteens is satisfactory in Kilinochchi district.

Key words: school canteens, food safety, food hygiene

### **BACKGROUND**

Food is defined as any article manufactured, sold, or represented for use

for human consumption and includes any articles that enters into or is used in the composition or preparation of food or drink (Food act 1991). Nutritious food is essential for all living animals including humans to relief hunger, build the tissues, to provide energy, and to protect from the diseases. According to Food and Agricultural Organization (FAO 1997), access to safe and nutritious food is a human right. Food also contributes to enjoyment and is also important in many social events and celebrations. The diversity of food consumed by human beings depend on its availability, accessibility and affordability.

#### **Food hygiene /food safety**

The term 'food hygiene' has been defined as all conditions and measures that are necessary during production, processing, storage, distribution and preparation of food to ensure that it is safe, sound, wholesome and fit for human consumption (WHO 1984). Hazards attributed to food are a major problem faced by humans. The field of activities aimed to ensure that food supply to the community is hazard free it is referred to as 'food safety' (FAO 1997). Safe food means that it is prepared, cooked, transported and served in such a way as to retain nutrients, and to minimize bacterial contamination and growth.

Food safety is an increasingly important public health issue. Because of increasing number of food safety problems and the rising consumer concerns, governments all over the world are intensifying their efforts to improve the food safety (National Academy of Sciences 2009). Legal regulations and manufacturers' monitoring practices alone may not be enough to prevent contamination of national food supply of a country. To ensure the quality and safety of food, the monitoring has to be done from farm to table (National Academy of Sciences 2009). World Health Organisation (WHO) recommended the following five keys to ensure the food safety: keep clean, separate raw and cooked, cook thoroughly, keep food at safe temperatures and use safe water and raw materials (WHO 2009). A study on divisional levels in selected provinces in Sri Lanka demonstrated that majority of consumers and authorized officers were not satisfied with the level of enforcement of food safety rules and regulations (Herath 2004). The food is contaminated by micro organisms, mainly bovine spongiform, Campylobacter, Escherichia coli, Salmonella and Shigella, naturally occurring toxins such as mycotoxins, unconventional agents such as the agent causing bovine spongiform encephalopathy, organic pollutants such as dioxins and metals such as lead and mercury (WHO 2007).

A study on occurrence of enterotoxin producing Clostridium perfringens in meat and meat curries conducted in Sri Lanka demonstrated that more than one third of samples contained the organism (Ranasinghe 2004)

### **Food borne illnesses**

Food borne illnesses are defined as diseases, usually either infectious, or toxic in nature caused by agents that enter

the body through the ingestion of food. Every person is at risk of food borne illnesses (WHO 2007).

### **Magnitude of food borne illnesses worldwide**

Food borne diseases are a growing problem in both developed and developing countries. In developed countries, surveillance of food borne diseases is a fundamental component of food safety systems. Data from surveillance systems indicate a high disease burden of food borne diseases even though it shows the tip of the iceberg. It was reported in 2005 that 1.8 million people died from diarrhoeal diseases worldwide. In industrialised countries 30% percentage of people are suffering from diarrhoeal diseases. The prevalence of food borne diseases in developing countries is far higher and it is caused by a wide variety of organisms including parasites. The food borne diseases are sporadic in nature and food borne disease outbreaks take on massive proportions (WHO 2007). Food contamination creates a big socio economic burden on the health systems of countries. For example, in the USA, diseases caused by the major pathogens alone are estimated to cost up to 35 million US dollars a year (WHO 2007). Personal hygiene and environmental sanitation are key factors in transmission of food borne diseases (WHO 1998).

### **Magnitude of food borne illnesses in Sri Lanka**

Common food borne diseases in Sri Lanka are diarrhoeal diseases, enteric fevers, hepatitis A, dysentery and food poisoning. Diarrhoeal diseases are the leading cause of hospital admissions (670.7/100,000 population). But the burden has come down in recent years (Annual Health Bulletin 2005).

The Control of Diarrhoeal Diseases (CDD) programme had succeeded in decreasing mortality in recent years. But morbidity is still high. Incidence of bacterial dysentery is high in districts of Mannar, Nuwara Eliya, Vavuniya, Kalmunai, Ratnapura and Matara (Epidemiological Bulletin 2008).

### **Food handler**

According to Food Safety Association of New Zealand, a food handler is defined as anyone who works in a food business and who either handles food or surfaces that are likely to be in contact with food such as cutlery, plates and bowls. Food handlers have an overall responsibility for doing whatever is reasonable to make sure that they do not make food unsafe or unsuitable for people to eat. Food handlers also have specific responsibilities related to their health and hygiene (FSANZ 2009). The WHO has recognized the importance of education of food handlers and consumers for a number of years. In 1983, FAO/WHO Expert Committee on Food Safety which discussed the role of food safety in health and development (WHO 1983) identified public education and community participation as essential pillars of strategies for improving food safety and for intervening to prevent food borne disease. Lack of knowledge and negligence of food handler are identified as the major cause for the food borne illnesses (WHO 2000). WHO has identified ten golden rules to provide guidance to safe food in home circumstances which is applicable for all food preparation or service sites (WHO 2000).

### **National food safety programmes**

National food safety programmes are programmes implemented at national level that assure that food will not cause harm to the customer when it is prepared

and /or eaten according to its intended use.

### **National food safety programme of Sri Lanka**

In Sri Lanka, the food safety is governed by Food Act No 26 of 1980. The Act controls manufacture, importation, transport, sale, distribution, advertisement and labeling of food. Amendments to this Act were made in 1991(Food (Amendment) Act No. 20 1991). No person shall manufacture, import, sell or distribute any food injurious to health, unfit for human consumption, adulterated, or in contravention of the provisions of Act / Regulation. The food activities are controlled by the Ministry of Health. The Director General of Health Services (DGHS) is the Chief Food Authority and the Chairman of the Food Advisory Committee (FAC) which was established under the Food Act. Other members of FAC are as follows: Two members to represent commercial interest, Director (Environment & Occupational Health) of the Ministry of Health, Deputy Director General (Public Health Services) of the Ministry of Health, Asst. Director- Food Control Administration Unit (FCAU) of the Ministry of Health, nutritionist, food technologist, expert in food science, government analyst, city analyst, Director General of Customs, Director General of Sri Lanka Standards Institute, representatives of trade & commerce, and two members to represent the consumer.

The FCAU is in charge of general administration of regulations and training of food handlers.

At provincial level, Provincial Director of Health Services (PDHS) and at district level Regional Director of Health Services (RDHS) is responsible for food activities. Food and Drug Inspectors at

RDHS level are doing the activities. Informal and formal samples are taken by them and the divisional level Public Health Inspectors (PHI) to ensure the quality of food.

### **School Health programme in Sri Lanka**

The school population in Sri Lanka consists of 3.9 million children. It is 20% of the population. The school health programme was commenced in 1918 with one medical officer and was integrated with the national health system in 1926. Incorporation into Family Health Programme took place in 1980. Health promoting schools were established in 2007. One of the programme objectives is to improve the nutritional status of school children by continuous monitoring and appropriate intervention (School health Programme 2007). As a component of the school health programme, School Canteen Policy was introduced in 2006. The broad aim of the School Canteen Policy is to optimize the educational programme among school children by improving their nutritional status. The School Canteen Policy aims to control the food hygiene in school canteens, to control the prices of food items sold, to recommend healthy traditional food items and to prohibit unhealthy food items (Ministry of Education 2006).

### **JUSTIFICATION**

Food safety is a current concern as a public health issue all over the world as food borne disorders is increasing. Even in a developed country like Japan, more than 1000 food poisoning cases are reported each year from school canteens (Morioka et. al 2006). In Sri Lanka, so many food borne disease outbreaks and food poisoning outbreaks occur each year. An outbreak of viral hepatitis A occurred in 2007 in Gampola Medical

Officer of Health area (Epidemiological Bulletin 2007). Annually, bacterial dysentery occurs at a rate of 5.05 cases/100,000 population in Sri Lanka (Epidemiological Bulletin 2008).

One component of the School Canteen Policy initiated by the Ministry of Education is to ensure the food safety in school canteens (Ministry of Education 2006). Ensuring the food safety in school canteens is essential to ensure the uninterrupted educational programme. In Sri Lanka, as diarrheal diseases are the leading causes of hospital admissions, strict implementation of food safety is necessary. A study on food safety activities at divisional levels in selected provinces in Sri Lanka (Herath 2004) demonstrated that inspection performance ranged from 1.22-34.79 (mean-11.7) inspections per PHI per month and was dependent only on characteristics of PHI and PHI range.

According to a study on food hygiene in the public eating houses and food outlets in the Colombo Central Electorate of city of Colombo (Weerasuriya 1990), the food hygiene was poor. This study demonstrated that the knowledge of food handlers was good but the attitudes and practices were poor regarding food hygiene. There are not enough studies in Sri Lanka on food hygiene or food handlers especially in school canteens. So far no statistics or records are available regarding the implementation of the School Canteen Policy. Therefore, a study on food hygiene in school canteens and regarding knowledge, attitudes and practices of food handlers in school canteens will reflect the food safety in school canteens which is a component of School Canteen Policy

(2006).

### **Justification**



In Sri Lanka the school health programme was commenced in 1918 with one medical officer and integrated with health system in 1926 and then incorporated into Family Health Programme in 1980. As a component of school health programme School Canteen Policy was introduced in 2006 which aims to control the food hygiene in school canteens (School Canteen Policy 2006). In Sri Lanka as diarrhoeal diseases are the leading causes of hospital admissions, strict implementation of food safety is necessary. The bacterial dysentery and enteric fever were reported to epidemiology unit in higher numbers from Kilinochchi district (Epidemiological Bulletin 2012). A study on food hygiene in the public eating houses and food outlets in the Colombo Central Electorate of city of Colombo (Weerasuriya 1990) and another study on 'Safety of street vended food and the effectiveness of an intervention to improve hygienic practices among street food vendors in the district of Kandy' (Wicrematilake 2007) demonstrated that the food hygiene was poor. In a study by Subaskaran (2009) the level of food hygiene was satisfactory only in 45.5% of canteens. The environmental sanitation is the sub component which is very unsatisfactory in most of the canteens.

There are not enough studies in Sri Lanka on food hygiene or food handlers, especially in school canteens mainly in North and East part of the island. A study on food hygiene in school canteens will reflect the food safety in school canteens which is a component of School Canteen Policy (School Canteen Policy 2006). Therefore this research is a timely need which can pave way to improve the food safety.

## **Objectives**

General objective:

To describe the level of food safety in school canteens in Kilinochchi district

Specific objectives:

1. To describe the level of food safety in school canteens
2. To describe the associated factors for food safety in school canteens

## **METHODOLOGY**

### **Study design**

This was a descriptive cross sectional study.

### **Study setting**

This study was conducted in Kilinochchi district. Sri Lanka is divided into 9 provinces, 25 administrative districts, and 256 Divisional Secretariat areas. The Kilinochchi district is situated in Northern Province.

### **The Study Population**

School canteens in Kilinochchi district were the study population.

### **Study Duration**

The study was carried out from February 2014 to August 2014.

### **Sampling**

As the whole study population was studied there was no sampling. All 106 schools were included and 40 canteens were studied, as only 40 schools had canteens.

### **Data collection instrument**

An observational check list (annexure I) was used for the data collection. The check list was prepared by PI, with the guidance of experts in relevant fields in a way that can describe the level of food safety. For the initial draft, the PI selected the Guidelines and Golden Rules recommended by World Health Organization (WHO 2009) on Food Safety and detailed version of H-800

check list used by RDHS division of Puttalam district (2008). PI has also referred to the instruments used by the following researchers: Wicremathilake (2002, 2007), Weerasuriya (1990). The PI decided the following components to be included in the check list:

- Environmental sanitation
- Water supply and hand washing facilities
- Personal hygiene of food handlers
- Display of food items
- Unhygienic habits of food handlers

After the initial draft the expert opinion was obtained, necessary changes were made and the final draft was prepared. Final draft was shown to the experts and then finalized and pre tested.

This instrument was drafted in English language and used as it was, because it was marked only by the data collectors.

The judgmental validity was assessed by expert opinion by means of face validity, Content and consensual validity.

### **Data collection team**

Data collection team consisted of two trained data collectors who were Tamil speaking pre intern doctors. Pre intern doctors were selected because they had background knowledge about the subject and they were not familiar with the study population.

Both data collectors were given adequate training and guidelines to minimize observation variability and to increase the quality of data.

The study instrument was pretested in few schools in Jaffna district.

The data were collected from schools after getting consent from the school principal and the canteen owner.

### **DATA ENTRY AND ANALYSIS**

Data entry and analysis was done by PI using SPSS 15.0. The data were described in proportions and percentages. Chi square test were applied for the comparisons in the statistical analysis.

### **Ethical and administrative considerations**

Ethical clearance for the study was obtained from a university of Jaffna. Permission to conduct the study was obtained from the Provincial Director of Education and Health of Northern Province.

The confidentiality of the information was maintained by PI and the name of the school was not included in the check list.

A copy of that written permission was given to each data collector. First, the purpose of the visit was informed to the school principal and informed written consent was obtained.

With the permission, the data collectors visited the canteen and introduced them to the in-charge of the canteen. The data collector then got the written consent from the canteen in charge. After getting consent the data collector observed the practices of all the food handlers of the canteen for 10-15 minutes and filled out the check list. Even if one food handler is found with an unhygienic activity or habit that item was considered as unhygienic practice and marked accordingly.

On completion of data collection, the data collectors thanked the food handler as well as the school principal and left the school.

The confidentiality of the information was maintained by PI and the name of the school was not included in the check list.

### **RESULTS**

Forty canteens from 106 schools included in the study since not all the

schools had canteens. No temporary food sellers were allowed to sell food in the school premises to ensure food safety and monitoring. Results from the study are summarised in tables below

### Environmental sanitation of the canteens

Environmental sanitation of the canteen was measured by means of insects/animals presence in canteen, garbage management, tidiness walls and floors

Parameter	Number (n=40)	%
Flies	38	95.0
Garbage in surrounding	8	20.0
Stray animals	7	17.5
Dust bin	36	90.0
Closed dust bin	11	27.5
Tidy floors & walls	26	65.0

There were flies in 95.0% of canteens and only 20% of canteens had garbage in surrounding. Most of the canteens (90%) had dust bins but among them only 27.5% are closed.

### Water supply and hand washing facilities of canteens

Parameter	Number (n=40)	%
Water supply	40	100.0
Soap beside sink/water supply	22	55.0

Water supply was available in 100% of canteens and soap was available beside the sink/ water supply in 55.0% of canteens.

### Personal hygiene of food handlers in canteens

Parameter	Number (n=40)	%
Clean appearance	34	85.0
Clean dress	32	80.0
Clipped nails	26	65.0
With apron/uniform	04	10.0
With mask	00	00
Unwrapped Skin lesions	00	00
Handling of food by bare hand	25	62.5

Majority of canteens had food handlers with clean appearance (85%) clean dress (80%) and clipped nails (65%). Very few canteens had food handlers with apron/uniform (10%) and no canteens had a food handler with mask or with unwrapped skin lesions. Majority of the food handlers (62.5%) were serving food with bare hands.

### Display of food items in canteens

Parameter	Number (n=40)	%
Correct expiry dates	40	100
Proper covering of un wrapped foods	27	67.5
Clean utensils	33	82.5
Raw materials storage	36.0	90

All the canteens consisted of packed foods with correct expiry dates. In canteens of government schools, unwrapped food items were correctly covered in only 67.5%. Utensils in majority (82.5%) of canteens were clean. Majority (90%) of canteens stored the raw materials hygienically

### Unfavorable habits of food handlers

Parameter	Number (n=40)	%
Smoking	02	5.0
Betel chewing	8	20.0
Putting the fingers into mouth/nose	4	10.0

Minority of canteens (<20%) had food handlers with smoking and betel chewing habits during work.

### Level of personal hygiene of the food handlers in canteens

This level was described using a composite scoring system (Annexure III).

Parameter	Number (n=40)	%
Satisfactory	25	62.5
Un satisfactory	15	37.5

The level of overall personal hygiene is satisfactory in majority of canteens (67.5%)

## Supervision

All the canteens were recorded by H 800 and school administration supervises the food hygiene regularly.

## DISCUSSION

The aim of the study is to describe the level of food hygiene in school canteens in Kilinochchi district. Forty canteens were studied for this purpose.

The level of food hygiene in school canteens

The level of food hygiene was satisfactory in 67.5% of canteens. Water supply was available in 100% of canteens. More than half of the canteens had food handlers with good personal hygiene. In more than 80% of canteens the foods were displayed in good manner. Majority of canteens have food handlers without unhygienic habits during the work.

There were flies in the vicinity of 95.0% of canteens. Weerasuriya (1990) in his study demonstrated that 78.9% of eating houses with flies which resembles that of canteens. But the study by Wicrematilake (2002) demonstrated that 64.1%. But the study by Wicrematilake (2007) demonstrated that 25.6% of street vending places were with flies which are well below that of canteens in this study.



There were garbage in the surrounding only in 20.0% of canteens. Two studies by Wicrematilake (2007) and Weerasuriya (1990) demonstrated that around 45% of places were with garbage in the surrounding.

There were dust bins with lids in 27.5% of canteens. The studies by Wicrematilake (2007, 2002) and Weerasuriya (1990) demonstrated that more than one-thirds were without dust bins and very few with dust bins with lids.

Food handlers in more than two-thirds of the canteens serve food with bare hands. But in the studies by Wicrematilake (2007) and Weerasuriya (1990), this was less than 50%.

More than 80% of the canteens had the food handlers with clean dress. The study by Weerasuriya (1990) where 90% of food outlets were with food handlers with clean dress resembles this findings approximately.

## **CONCLUSIONS AND RECOMMENDATIONS**

1. The level of food hygiene was satisfactory in 67.5% of canteens. The environmental sanitation is the sub component which is not satisfactory in most of the canteens.

2. The knowledge of more half of the food handlers were satisfactory regarding food hygiene.

3. The practices of two-thirds of food handlers were satisfactory.

4. The frequency of supervisions by PHII is adequate. All canteens had H-800 forms.

## **RECOMMENDATIONS**

1. There should be a registration system for food handlers. This would facilitate the introduction of educational

programmes, training and certification system for them.

2. Similar studies should be conducted island wide.

3. School authorities should take steps to educate not only the canteen management but the food handlers too regarding the School Canteen Policy.

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