

# A qualitative study on hygiene practices followed by personnel working in sweet shops in Chandigarh

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■ **ABSTRACT** : This study collected data on food workers' self-reported food safety practices and beliefs about factors that impacted their ability to prepare food safely. The workers (Manager, Head-cook, Assistant-cook, Waiters, dishwashers, Sweepers and people on counter) of 12 sweet shops were interviewed regarding cleaning and hygiene practices followed by them. Only in one sweet shop, one food handler had received formal training in food hygiene. All the workers washed their hands prior to handling the materials. In 17 per cent of sweet shops, plain water was used, 67 per cent of shops used soap and water and 17 per cent used polythene or plastic bags as hand gloves. Plain water, soap or detergent was used by all the workers for washing the cooking and serving utensils. Almost all the shop keepers used a disinfectant for cleaning purposes. For washing the floors, plain water and mop was used in 50 per cent of shops, surf and wet cloth was used in 50 per cent shops. Floor was cleaned once in 67 per cent of shops while twice and thrice a day in 17 per cent and 17 per cent of shops, respectively. Fly trappers were used in 42 per cent of shops. Wiping cloths were reused next day in all the shops after washing with soap and water in 83 per cent of shops and 17 per cent of shops used detergent. For the floor, disinfectants were used by all the workers once in 2-3 days. 83 per cent shops had deep freezers and 17 per cent did not have. 67 per cent of workers had knowledge regarding the freezer temperature for storage of sweets. Results suggest that food safety programs need to address the full range of factors that impact food preparation behaviours.

■ **KEY WORDS** : Food safety, Hygienic practices, Cleaning, Sanitation, Public health

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Safe food production in countries like India is based on the use of preventive measures such as the use of safe raw materials, application of good manufacturing practices, and application of Hazard analysis of critical control point (HACCP) procedures (Anonymous, 2011).

Epidemiological research has indicated that the majority of reported food borne illness outbreaks originate in food service establishments (Jones *et al.* 2004, Olsen *et al.*, 2000) and case control studies have shown that eating meals outside the home is a risk factor for obtaining a food borne illness (Friedman *et al.*, 2004; Kassenborg *et al.*, 2004 Sobel *et al.*, 2000). In addition, research on food borne illness risk factors has indicated that most outbreaks associated with food service establishments can be attributed

to food workers' improper food preparation practices (Bryan, 1988; Bansal and Kaul, 2004), and observation studies have revealed that food workers frequently engage in unsafe food preparation practices. (Clayton and Griffith, 2004; Howes *et al.*, 1996; Manning and Snider, 1993). These findings indicate that improvement of workers' food preparation practices is needed to reduce the incidence of food borne illness. Food worker intervention programs are needed to effect this improvement. However, health researchers have argued that an understanding of current practices and factors affecting those practices is necessary before behaviour change efforts can be successful (Ehiri and Morris, 1996; Foster and Kaferstein, 1985).

Sweets prepared from milk is an integral part of the

culinary habits of people all over India. Indian system is using a variety of sweets which have become an integral part of our festivals, marriages, parties, ceremonies and others functions (Soomro *et al.*, 2002). But these products are extremely vulnerable to contamination with spoilage and pathogenic organisms as well as toxic metabolites of microbial origin if subjected to advertent and inadvertent abuse during their production and processing (Benkerroum *et al.*, 2004, Maity *et al.*, 2010). More than 200 food borne illness are now recognized and most of them require specific laboratory diagnosis (Reddy *et al.*, 1983). The channels of contamination are immense; an insanitary environment is a major factor in the spread of diarrhoeal organisms, for example bacteria, viruses of parasites, the root of infection is either direct transfer from animals or human faeces or through water and food (Chukuezi, 2010; Varga, 2007). The problem of hygienic production of milk products is a very complex one of beset with great difficulties, more particularly in India, where the general public, milkers and vendors of milk are mostly illiterate and primitive in their knowledge of scientific matters (Randhawa and Chahal, 2008). Generally, catering staff are given little or no training in personal and kitchen hygiene.

Micro-organisms can enter the food through the personnel handling the equipment or as a result of processing techniques (Maillard, 2005). Even if all care has been taken for hygienic manufacture of the sweets, the boxes in which sweets are delivered can act as a source of micro-organisms.

Considering the public health importance of sweetmeat consumers, it is needless to say that the product should be prepared hygienically reducing the microbial load present in it. Therefore, an attempt was made to know the hygienic measures adopted by the food handlers and makers during sweets' preparation. In this study, data were collected from food workers on their food safety practices and beliefs about the factors that impact their ability to prepare food safely. Focus groups were used to collect the data because they supply descriptive, qualitative data that can be difficult to acquire through other research methods.

## ■ RESEARCH METHODS

Twelve sweets' shops were surveyed to determine the hygiene standards maintained in their shops. The workers (Manager, Head-cook, Assistant-cook, Waiters, dishwashers, Sweepers and people on counter) of all the sweet shops were interviewed regarding cleaning and hygiene practices followed by them. To obtain participants, sweet shops were randomly selected from list of sweet shops of Chandigarh. To be eligible for participation, workers had to have worked in a sweet shop for at least three months. Because of initial difficulty in commuting large distances, recruitment was limited to those areas with relatively high proportion of

sweet shops.

In total, 10 managers and 60 workers participated in the interview schedule. A questionnaire was framed for this purpose. Workers were asked regarding the hygiene practices followed by them under which washing methods and cleaning schedule for washing was determined. Under washing methods, workers were questioned regarding the technique of washing they were adhered to. Under schedule for washing, they were asked about the duration and the time gap between subsequent washings. Responses were collected regarding cleaning and storage practices followed by the personnel.

Some interviews were conducted through telephone conference calls, as they have been found to be effective in collecting information from participants who are difficult to recruit or who are scattered geographically, as the participants of this study were. Evidence suggests that, compared with face-to-face interviews, telephonic questionnaire generate as much information and provide more anonymity for participants.

Focus groups from each sweet shop consisted of 4-5 workers who responded to the questions posed on them. Participants discussed various sweets preparation practices like hand washing, prevention of cross contamination, use of detergent, training in food hygiene, use of fly trapper and deep freezers, knowledge of storage freezing temperature and the shelf-life of sweets prepared. These practices were chosen for discussion because their improper implementation has been associated with food borne illness in food service establishments. (Bryan, 1988; FDA, 2001)

Participants first discussed their current implementation of these practices and then discussed the factors that influenced their ability to engage in these practices according to recommendations. For example, participants were asked to describe when they washed their hands while at work. After this discussion, the moderator read the recommendations concerning hand-washing, and participants were then asked to discuss what made it easier or more difficult for them to wash their hands according to the recommendations.

## ■ RESEARCH FINDINGS AND DISCUSSION

The findings tabulated in Table 1 reveal that in only 17 per cent of sweet shops, workers washed their hands with plain water alone; in 67 per cent of the shops, soap and water was used by food handlers. In 17 per cent of shops, polythene or plastic bags were worn in hands by the food handlers. 42 per cent of the food handlers working in the various sweet shops washed their hands prior to handling sweets, where as 50 per cent washed them before and after handling these sweets.

For cleaning the work surface area, 17 per cent of shops made use of plain water; 42 per cent made use of soap and

water while again 42 per cent used wet cloth. The work surface was washed with plain water or soap and then water dried with cloth. 17 per cent of workers cleaned the work surface thrice a day, 8 per cent cleaned the work surface just once a day and 75 per cent cleaned it whenever they found it dirty.

None of the workers discarded the wiping cloths at the end of the day. Instead, they used the same cloths the next day after washing it. In 83 per cent of shops, soap and water was used for washing wiping cloths and in remaining 17 per cent of shops, hot water and detergent was used. Out of 12 shops, in 83 per cent shops, workers washed wiping cloths once a day while only in 17 per cent shops, it was washed six times a day. None of the workers used a disinfectant while washing the wiping cloths.

It was also observed that for washing the utensils, hot water and detergent was used in all the shops. In 42 per cent of sweet shops, utensils were washed whenever they were found empty after use. Utensils were cleaned once, twice or thrice a day in 33 per cent, 8 per cent and 17 per cent of shops, respectively.

For washing the floors, plain water and mop was used in 50 per cent of the shops while in other 50 per cent of shops, surf and wet cloth was used. However, all the workers used a disinfectant (Phenyl or Domex or Novan) for cleaning purposes. The floor was cleaned once in 67 per cent of sweet shops while twice and thrice a day in 17 per cent and 17 per cent of shops, respectively.

The findings tabulated in Table 2 reveal that the food handlers had undergone formal training in food hygiene only in one shop and they did not follow any written cleaning

schedule.

The answers received for the other queries put to the personnel revealed that in 83 per cent of sweet-shops, refrigerators / deep freezers were used to store Khoa, Cottage cheese and milk. Only 67 per cent of shopkeepers had knowledge regarding freezer temperature for storage. 42 per cent shops made use of fly trapper where as 58 per cent shops did not have the provision of fly trappers.

**Consistencies in factors impacting practices :**

There are a number of consistencies in the factors participants identified as impacting their safe food preparation practices. These factors are discussed below:

*Time pressure/high volume of business/staffing :*

The issue of time pressure was mentioned in the discussions of all sweets' preparation practices. Participants said time pressure caused by high volumes of business and/or inadequate staffing made it difficult for them to wash their hands, change their gloves, clean their cutting boards, check the temperatures of sweets, and cool them properly.

*Structural environment, equipment and resources :*

Issues associated with the structural environment of the sweet shop' kitchen, equipment, and resources arose in the discussions of all handling practices. Participants said accessible sinks and adequate resources, such as soap and gloves, facilitated handwashing and glove use and separate work areas for different types of sweets helped prevent cross contamination; and multiple thermometers, well-maintained equipment, and certain kinds of equipment (e.g., blast chillers

**Table 1: Hygiene practices followed by personnel working in sweet shops**

	Washing method						Cleaning schedule for washing					
	Plain water	Hot water	Hot water + detergent	Soap and water	Disinfectant	Any other	Once	Thrice	Three	Before and after use	Any other	
Food handlers	2(17)	-	-	8(67)	-	2(17)	5(42)	--	--	6(50)	1(8)	
Work surfaces	2(17)	--	--	5(42)	--	Plastic bags	1(8)	--	2(17)	--	Plastic bags	
						Wet cloth					9(75)	
Wiping clothes	--	--	2(17)	10(83)	--	--	10(83)	--	--	--	2(17) six times	
Utensils	--	--	12(100)	--	--	--	4(33)	1(8)	2(17)	--	5(42)	
Floor of the whole shop	6(50) plain water + mop	--	6(50) surf and wet cloth	--	12(100) Phenyl, Domex etc.	1(8)	8(67)	2(17)	2(17)	--	--	

Values given in ( ) are the percentages

**Table 2: Cleaning and storage practice followed by personnel working in sweet shops**

Any training in food hygiene		Follow any written cleaning schedule		Use of fly trapper		Deep freezer is available		Knowledge of storage freezer temperature		How to store milk product			Unconsumed sweets in days		
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Deep freezer	Any other (specify)	One day	Two days	Three days	Any other
1 (8)	11 (92)	--	12 (100)	5 (42)	7 (58)	10 (83)	2 (17)	8 (67)	4 (33)	10(83)	2 (17)	1(8)	6(50)	2(17)	3 (25)

Values given in ( ) are the percentages

and infrared thermometers) facilitated temperature control. Not having enough workspace, however, made cooling and holding sweets at proper temperatures difficult.

#### *Management/co-worker emphasis :*

Management and co-worker emphasis on safe food preparation practices was discussed in relation to only a few practices. Participants said having managers and co-workers who emphasized safe food preparation and who paid attention to others' food preparation practices facilitated food safety.

#### *Worker characteristics :*

Participants identified several characteristics of food workers that positively impacted five practices. These included experience, motivation, age, preferences for clean hands, concerns about appearing sanitary to customers, and expectations of reciprocal treatment from other food workers. A few said allergies to glove materials negatively impacted glove use practices.

#### *Negative consequences :*

In discussions of four practices, participants said workers were more likely to engage in safe practices when they knew there would be negative consequences if they did not. These negative consequences could be for workers, for the restaurants, or for the restaurants' customers.

#### *Education and training :*

Participants indicated in the discussions of four practices that they thought food safety education and training was important to safe food preparation. Several participants emphasized that workers should be taught why engaging in safe food preparation practices was important, not just how to engage in those practices.

#### *Sweet shop procedures :*

In discussions of three practices, participants' comments suggested that some sweet shop procedures facilitated safe food preparation. For example, some shops required workers to record hand washing activities and food temperatures in logs.

#### *Gloves and sanitizers :*

Some participants believed that gloves and sanitizers facilitated food safety because their use helped to prevent cross contamination and keep hands clean. However, comments indicated that use of these sanitary supplements may sometimes have a negative impact on food safety. For example, some participants said they sanitized their cutting boards without first cleaning them and used sanitizer instead of washing their hands and some participants expressed concern that glove use actually lowered hand washing rates because some workers used gloves incorrectly.

#### **Conclusion :**

The findings reported here suggest that management plays a significant role in the extent to which food workers engage in safe food preparation practices (WHO, 2002). The findings also support FDA's contention that active managerial control - implementation and supervision of food safety practices by the person-in-charge - is important to food safety (FDA, 2001) and suggest that future food safety initiatives should ensure a significant focus on management and active managerial control.

Although the findings presented here suggest that a variety of factors impact safe food preparation practices, many of the current efforts in food safety are focused primarily on one factor-education. The findings from this study and others (Cotterchio, 1998) indicate that education is important for food safety. However, our results also suggest that providing food safety education to food workers is not enough to ensure that they will handle food safely, as a number of factors may impact their ability to implement that education. Several studies have found that even when food workers demonstrate knowledge of safe food preparation practices, they do not always engage in those practices (Howes *et al.*, 1996, Manning and Snider, 1993). In order to be successful, food safety intervention programs must do more than provide food safety training; they must also address the full range of factors that impact food preparation behaviours.

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