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Microbial quality of food products sold by self help group women of informal sectors in Tamilnadu State, India

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Abstract

The healthy wellbeing of mankind depends mainly on the consumption of quality food. These days Self Help Groups (SHG) are implementing a large number of village cottage industries, especially food processing industries. To empower the SHG women physically and economically, the present report focused on the health conditions and prevailing food safety knowledge among the selected SHG members. The objectives of the study is to assess microbial quality of food items prepared by women who are involved in food processing trade in the unorganized sector with regard to various parameters like adopting food safety and hygienic methods, food safety laws for food production. In this regard, 200 SHG women who are involved in food processing trade in Dindigul District, Tamilnadu were selected for the study. The investigator met the respondents and collected their background information including socio economic details, knowledge about food safety practices. Microbial analysis, food adulteration test were done for food samples. Food safety and nutrition education was given to the respondents and the impact was assessed by using interview and observation method. Our investigation reveals that there is an urgency to infuse food safety and disease prevention methods in this sector. Also we recommend training programmes for SHGs to improve the methods of preparation, serving food hygienically and proper packing by giving training through NGOs or by Government itself.

Keywords: Food safety, Self Help Group, Hygienic Practices, Adulteration, Microbial Count.

Introduction

"We are what we eat" is an old proverb. Our nutritional status, health, physical and mental faculties depend on the food we eat and how we eat it. Access to good quality food has been man's main endeavour from the earliest days of human existence. Foods that are served to the consumers should be “clean and safe”. Food-borne diseases are a worldwide problem of great magnitude, both in terms of human suffering and economic costs. The task of accurate estimation of the occurrence of food-borne diseases globally is truly formidable as in most countries it is poorly recorded. It is estimated that almost 70% of the approximate 1.5 billion episodes of diarrhea that occur in the world annually are directly caused by biological or chemical contamination in foods (WHO, 1998). Even when such diseases are not fatal, they severely increase the effects of poor diet owing to reduced intake, nutrient losses and mal-absorption, which may lead to mental retardation and physical disabilities (FAO/WHO 1984). The healthy wellbeing of mankind depends solely on the consumption of quality food. These days Self Help Groups (SHG) are implementing a large number of village cottage industries, especially food processing industries. In the absence of quality control measures, poor quality packaging material, improper transport of foods, use of contaminated water, high turn-over of food handlers, lack of personnel hygiene and non judicious use of colorants and preservatives, these unit pose considerable food safety hazards (www.foodsafety.com). The popularity of these foods among consumers clearly reflects an urgent need for stringent food safety regulations for these food processing units. These systems not only provide new opportunities for the food industry but also put across challenges to save attractive and delicious food also ensure that food is wholesome and chemically and bacteriologically safe for human consumption (NFI, 2003). So 200 SHG Women who are involved in food processing Trade in Dindigul District were selected for the study. The investigator met the respondents and collected their background details. Microbial analysis, food adulteration test were done for food samples.

Objectives

To know the socio- economic background of the selected respondents; To assess the food hygienic practices of the women SHGS; To identify the microbial contamination of the selected food Items prepared by SHGS; To detect the adulterants present in the raw ingredients.

Methodology

To study the nutritional knowledge and food hygienic practices prevailing among the women. Self Help Group women 200 were selected by using purposive random sampling method in Dindigul district. The investigator met them and collected the details about socio-economic background, knowledge about food safety using interview and observation method. The study was conducted during February 2009 to February 2011. By using serial dilution test presence of microbial load such as bacteria, fungi in common street foods like Curry leaves, Papad, Sathumavu, Murukku, Athirasam, Green gram ball, Papad, Ragi puttu, Rusk, Vadai, Grape squash, Bhajji, Potato bonda, Mushroom soup, Amla Murappa, Chikki, Tomato jam, Murukku were tested. Raw materials used for the street foods were collected such as Dhal, Salt,

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Table1. Details regarding food hygiene and sanitation (N=200)

Items	Used		Not used		Appearance				Covered		Un overed	
					Clean		dirty					
	No	%	No	%	No	%	No	%	No	%	No	%
Serving Utensils	140	70	60	30	85	43	65	33	80	40	70	35
Vessels	200	100	-	-	146	73	54	27	140	70	60	30
Food basket containers	80	40	120	60	20	10	33	17	36	18	14	7
Whiping, drying Dishes	100	50	100	50	76	38	24	12	64	32	36	18
Push cart	150	75	50	25	106	53	44	22	78	39	72	36
Chilly powder	80	40	120	60	42	21	36	18	35	18	45	23

Asafetida, Sugar, Oil, Pepper, Turmeric, Chilly powder and Mustard seeds. They were analysed for food adulteration. Food safety education was imparted to them by using education modules like software packages, chart, posters, banner. The impact of education was assessed by using questionnaire.

Results and discussion

Background information of the selected subjects

Nearly 29 percent of the respondents belonged to the age range 20-30yrs, 25percent were in the age group of 41-50 yrs rest were above 50 yrs. Nearly 63 percent of the respondents were from nuclear family and the rest were from joint family. Based on classification (HUDCO, 2000) 30 percent were below poverty line, 40.1 percent belonged to low income group, 21 percent of women SHGs belonged to middle income group and only 9 percent of the respondents belonged to high income Group. Nearly 30 percent had their education up to secondary school level, followed by 20 percent had higher secondary level, 20 percent of the women SHGs had their education up to primary level and 11 percent were Graduates. About 19.5 percent were illiterates.

Observation method

Table 1 gives the information regarding food hygiene and sanitary condition of the food selling unit of the respondents. Majority 70 percent of the respondents used serving utensils. 40 percent of the respondents' vessels found to be clean and the food item were covered properly. Only fifty percent of the respondents either wiped or dried their vessels after cleaning the vessels. Among the selected respondents 70 percent of the respondents kept their vessels in cleaned condition and kept in a covered condition. Majority (75%) of the respondents used push cart, 53 percent of the respondents cart found to be clean and only 39 percent of the respondents covered their pushcart either by using jute bag or cloth to protect from dirt and other insects and flies.

Table 2. Microbial analysis of food products prepared by the respondents.

Food products	Bacteria ($*10^{-6}$cfu/g)	Fungi ($*10^{-4}$ cfu/g)
Curryleaves papad	3	1
Sathumavu	4	1
Murukku	3	2
Athirasam	5	1
Green gram ball	4	2
Papad	3	1
Ragi puttu	3	1
Rusk	3	1
vadai	4	2
Grape squash	3	2
bhajji	4	1
Potato bonda	5	2
Mushroom soup	4	1
Amla murappa	4	2
chikki	3	1
Tomato jam	3	2
Murukku	3	1

Thus, it is evident (Table 1) that the hygienic condition of the working unit should be improved. This shows the need for nutrition and health education to the respondents. Educational efforts should also be focused on high risk groups as well as those preparing food (Brun,1997). Table 2 reveals the details about microbial analysis of food products prepared by the respondents. Five grams of the food product weighed aseptically and dried. By using serial dilution method the total bacterial and fungi count was taken. The bacteria count in curry leaves Papad, Chikki, tomato jam, Murukku, papad, Ragi puttu, Rusk, potato bonda, grape squash are 3×10^{-6}cfu/g. Sathumavu, Green gram ball, Mushroom soup, Amla murappa, Vadai, Bajji are $4x10^{-6}$cfu. Athirasam 5×10^{-6}cfu/g. The fungi count in curry leaves papad, Athirasam, pappad, Ragi puttu ,Rusk, Sathumavu ,Bajji, Murukku, Chikki, Pappad are 1×10^{-4}cfu/g and Tomato jam, Amla Murappa, Green gram ball, Vadai, Grape squash are 2×10^{-4}cfu/g .The bacteria count is high compare to fungi in selected food products. The International Microbiological Standard recommended limit of bacteria contaminants for food of less than 106 cfu/g (Anon, 1974); whereas Rombouts & Nouts (1995) revealed that bacterial counts obtained in plant food were in the order of 12×10^7 to 10^8 cfu/g. Low bacteria counts were obtained as a result of high standard of personal hygiene and quality maintenance of good manufacturing practices observed during the food formulation process. The above Table 3 clearly depicts the adulterants present in the selected raw ingredients. Among the item chilly powder and salt found to highly adulterated with brick powder and chalk

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Table 3. Food adulterants present in food stuffs

Food stuffs	Adulterated		Not adulterated	
Turmeric powder	Number of food items (N=50)	%	Number of food items (N=50)	%
	19	38	31	62
Chili powder	39	78	11	22
Pepper	7	14	43	86
Sugar	12	24	38	76
Mustard seeds	7	14	43	86
Salt	36	72	14	28
Asafoetida	3	6	47	94
Oil	11	22	39	78
Dhal	3	6	47	94
Milk	14	28	36	72

powder respectively. Among the 50 items selected for the test none of the item found to be pure.

Impact of education

The prevalence of food borne illness begins with the knowledge of where contaminants come from and how they get into food. If the employees in food industry do not know correct food handling procedure the programme will fail (NFI, 2003).The importance of training employees for food industry is heightened because of the global nature of our food supply, control of growth, harvest and shipping is not always possible when food is produced in so many different parts of the world. Also an error in time, temperature management, cross contamination or personal health and hygiene of food handlers can cost a life among our vulnerable citizens, As we have learned storage, preparation, holding and service procedure are critical in the prevention of food borne illness. Employees do not come to the job knowing this information. They have to be trained (NIN, 2006) so taking these aspect in mind food safety education was given to the self Help group members using education modules like software packages, chart, posters, banners. The impact of education was also assessed. Table 4 shows the details about impact of education on knowledge of food safety and sanitary practices. From the Table 4 it is clear that the mean and standard deviation value increases from 450±98 to 450±102. So the increased values obtained in standard deviation revealed that there was statistically significant difference in the knowledge about food safety and hygienic practices among the respondents with different levels of education.

Table 4. Knowledge about food safety and hygienic practices (N=200)

Parameters	Before one month of education	After one month education
Elements of safe food a)Hand washing b)Temperature and time C)Heat and cold d)wash, rinse and sanitize e)all of the above	40 - 21 14 -	13 - - 4 58
Gloves are needed while preparing a)yes b)No	15 60	66 9
Knowledge about HACCP HACCP means a)Critical control point b)Hazard accumulation control point c)Heat analysis control point D)Hazard analysis critical control point	 20 11 34 10	 11 4 5 55
Awareness about cross contamination a)Aware b))Unaware	 10 65	 55 20
Safe temperature for food items a)potentially hazards food 5' c (or)below,60'c(or)above b)7.2'c(or) below c)above 8.2'c d)None of the above	 10 - 20 45	 46 10 10 9
Mean ±SD	450±98	450±102

Conclusion

The Self Help Group women were poor in hygienic practices in food preparation, handling, serving and storage. They were also poor in their nutritional knowledge. It can be concluded that as there is an urgent need for food safety and disease prevention. Measures are suggested to improve the dwindling standards of the street food units. The findings of the study may help to pave the way for the policy makers to implement training programmes to improve the methods of preparation, serving food hygienically and proper packing by giving training to these Self Help Group women either through unorganized sectors or government sector since, street foods are inexpensive, locally available, preparing traditional foods with adequate nutrients may help to provide food for all at cheapest rate motivation to buy such foods by people would be one of the means to reduce the malnutrition and hunger in the community.

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