



Penetrance of FSSA amongst Food Safety officers (FSOs), milk vendors and consumers of Vadodara district

KEYWORDS

Food borne illnesses, Food Safety Officer, Food Safety and Standards Act, Food Safety Education Intervention

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ABSTRACT Due to rise in food borne illnesses, governments all over the world are making efforts to enforce various food safety acts. In India, Food Safety and Standards Act (FSSA) was implemented for strengthening the food safety system. The penetrance of some of the aspects of this act was studied among 12 Food safety officers (FSO), 30 milk vendors and 90 consumers of Vadodara district. The results revealed poor mean knowledge scores of FSOs and milk vendors (5-18%) regarding physical, chemical and microbial contaminants. Food Safety Education (FSE) brought 64.4 % rise in the mean knowledge scores of FSOs regarding physical, chemical, microbial contaminants and names of insecticides and heavy metals, 55 % and 56 % rise was seen in the mean knowledge scores of milk vendors about physical and chemical contaminants and about the FSS Act respectively.

Background:

Foodborne diseases are widespread and growing public health problem, both in developed and developing countries. The global incidence of food borne diseases is difficult to estimate, but it has been reported that in 2005 alone 1.8 million people died from diarrhoeal diseases (WHO, 2007).

Various foods are associated with different food borne illnesses such as cereals, milk, nuts and oilseeds etc. Among them safety of milk is of utmost importance because it is perishable commodity and likely to get contaminated very easily through variety of means during the various stages of processing.

Chemical contaminants in milk encompass chemical hazards that may get introduced in milk during its production, processing or packaging, such as veterinary drugs, heavy metals, radionuclides, mycotoxins (especially aflatoxin) and pesticides (Khaniki J R, 2007). Also contamination due to detergents, neutralizers, water, urea, hydrogen peroxide, glucose in the milk has been reported by FSSAI in 2011. A high incidence of AFM1 poisoning in both raw and pasteurized milk samples have been reported by Tajik H et al. in 2007.

Such contaminants can raise serious public health concerns; hence governments all over the world are intensifying their efforts to improve food safety. In response to this, government in many countries have taken measures by enforcement of different Food Safety Acts.

In India, The Food Safety and Standards Authority of India (FSSAI) was established under Food Safety and Standards Act in 2006 which consolidates various acts and orders that have previously handled food related issues in various ministries and departments. FSSAI has been created for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption.

However little effort has been made to monitor the penetrance of this act amongst various stakeholders such as FSOs, milk vendors and consumers and data on the knowledge regarding the contaminants present in milk was also lacking. Hence, in the present study efforts were made to compile this information.

Methodology:

Location of study and sample selection

The study is based on purposive convenient sampling method. Of the total 12 FSOs in Vadodara district, one ward was selected, out of nine wards of urban Vadodara from that 30 milk vendors were selected (n=30), who gave consent to carry out the study and 90 consumers were selected (3 consumers from each outlet).

Tools used for the survey:

A semi-structured pre-coded, pre-tested questionnaire was used to gather information by interview method on two aspects from FSOs, milk vendors and consumers.

- Knowledge about the act
- Knowledge regarding physical, chemical and microbial contaminants

IEC material was developed in the form of leaflet to impart education to the food safety officers and milk vendors and assess the effect of intervention on the knowledge and practices of FSOs and milk vendors.

In the intervention programme all the FSOs and milk vendors were distributed leaflets and explained about the content individually and post data was collected to see the impact of FSE imparted. In order to assess the quality of milk in terms of aflatoxin contamination, hazard analysis of milk was carried out by Ridascreen® Fast Aflatoxin Elisa kit.

Data Analysis:

Data were compiled and subjected to statistical analysis to

evaluate the impact of food safety education using paired 't' test on knowledge and practices of FSOs and milk vendors. Chi square was used to study the impact of FSE on knowledge of milk vendors before and after intervention.

Results and Discussion:

Feedback of FSOs regarding various aspects of FSS Act-2006:

All the FSOs were aware about FSSA and about 83.3 % of FSOs were aware about the licenced/ registered outlets. Almost 50% of FSOs received training in FSSA-2006 wherein various aspects were covered such as hierarchy of food safety authorities, sanitation and hygiene, adulteration and additives, food laboratory techniques etc. and only 25 % of FSOs were satisfied with their training. These findings are supported by a paper submitted by Dr.Anitha Thippah in an India Urban Conference held in Mysore (2011), where in the focus was on training and education of food inspectors, particularly in the context of professional development.

Knowledge of Food safety officers, milk vendors and consumers with respect to FSSA and contaminants present in milk before intervention:

Table 1 represents mean knowledge scores obtained by the food safety officers, regarding various aspects like physical, chemical and microbial contaminants and names of insecticides and heavy metals, prior to intervention FSOs had very poor knowledge (9.6%), (14.5%) and (8.3%) about physical, chemical and microbial contaminants present in milk respectively. None of the FSOs could name any insecticides and heavy metals that can be present in milk.

Table 1 Mean knowledge scores obtained by food safety officers about physical, chemical and microbial contaminants and names of insecticides and heavy metals present in milk before intervention

Sr no.	Aspects	Maximum scores	Mean±SD (n=12)
1	Physical contaminants	6	0.58±0.51 (9.6 %)
2	Chemical contaminants	4	0.58±0.79 (14.5 %)
3	Microbial contaminants	3	0.25±0.45 (8.3%)
4	Names of insecticides and heavy Metals	6	0

Note: No. in Parenthesis indicates mean Per cent scores

As can be seen in table 2, milk vendors had very poor knowledge about physical contaminants present in milk (18.33%); they had hardly said two names about physical contaminants such as water and dust, their mean percent scores for knowledge on chemical contaminants was 5.5% wherein they reported about the presence of urea and detergent, and they had average knowledge about the fat and SNF content of milk was up to (34 %) before intervention.

Table 2 Mean knowledge scores obtained by milk vendors about physical, chemical contaminants and normal levels of fat and SNF present in milk before intervention

Serial no.	Aspects	Maximum scores	Mean±SD n=30
1	Physical contaminants	6	1.1±1.37 (18.33%)
2	Chemical contaminants	6	0.33±0.71 (5.5 %)
3	Normal levels of fat and SNF	4	1.36±1.69 (34%)

Note: No. in Parenthesis indicates mean Per cent scores

When consumers were asked about the act and contaminants present in milk, only 13.31 % reported to have knowledge about new FSSA and 28.17 % consumers knew about

contaminants/adulterants present in milk.

Impact of Food Safety Education (FSE) on knowledge and practices of food safety officers and milk vendors:

Table 3 reveals effect of FSE on mean knowledge scores obtained by food safety officers, after intervention. The knowledge scores of FSOs increased by 58.4 %, 45.7% and 58.3% for physical, chemical and microbial contaminants respectively. Maximum increase (86 %) in knowledge scores was observed regarding names of insecticides and heavy metals (p<0.001). Table 4 depicts the impact of FSE on mean knowledge scores obtained by milk vendors after intervention. The knowledge scores of milk vendors increased by 46% and 57.1% for physical and chemical contaminants respectively, 65 % increase was seen in their knowledge on fat and SNF (p< 0.001).

Table 3 Mean knowledge scores obtained by food safety officers before and after intervention

Sr. no	Aspects	Maximum scores	Mean±SD n=12		% increase in knowledge	Paired 't' test
			Pre	Post		
1	Physical contaminants	6	0.58±0.51 (9.6 %)	4.08±1.24 (68%)	58.4	9.75***
2	Chemical contaminants	4	0.58±0.79 (14.5 %)	2.41±1.08 (60.25%)	45.75	4.74***
3	Microbial contaminants	3	0.25±0.45 (8.3%)	2.0±1.04 (66.6%)	58.3	4.98***
4	Names of insecticides and heavy metals	6	0	5.16±1.85 (86%)	86	9.67***
	Total	19	1.41±1.75 (7.4%)	13.65±5.21 (71.84%)	64.44	3.78*

***Significant p< 0.05, ** Significant p< 0.01 and ***Significant at p<0.001**

Note: The figures in parenthesis denote the mean per cent scores.

Table 4 Mean knowledge scores obtained by milk vendors before and after intervention

Sr. no	Aspects	Maximum scores	Mean±SD n=30		% increase in knowledge	Paired 't' test
			Pre	Post		
1	Physical contaminants	6	1.1±1.37 (18.33%)	3.86±1.10 (64.33%)	46	12.68***
2	Chemical contaminants	6	0.33±0.71 (5.5%)	3.76±1.30 (62.6%)	57.1	15.03***
3	Normal levels of fat and SNF	4	1.36±1.69 (34%)	3.96±0.18 (99%)	65	8.42***
	Total	16	2.79±3.77 (17.43%)	11.58±2.58 (72.37%)	55	11.52**

**** Significant p< 0.01 and ***Significant at p<0.001**

Note: The figures in parenthesis denote the mean Per cent scores.

From the above results, it can be concluded that there was positive impact of food safety education imparted to food safety officers and milk vendors on their knowledge and practices. Thus it can be said that FSE is influential tool for improving the knowledge of both the groups.

Conclusion:

It can be concluded that knowledge about the act was good amongst FSOs, but they lacked knowledge about contaminants and adulterants, while milk vendors had average knowledge about the act and poor knowledge on contami-

nants and adulterants present in milk. Consumers lacked in knowledge about both the act as well as contaminants, however they had good knowledge about adulteration.

REFERENCE

1. Dr. Thippaiah, A. (2011). Food Safety along with food and nutritional security-the need of the hour. Mysore: India Urban Conference. Retrieved from: [iuc2011.in/sites/default/files/white-papers/Food Safety along with Food and Nutritional Security _ the Need of the Hour_Dr. Anitha.pdf](http://iuc2011.in/sites/default/files/white-papers/Food%20Safety%20along%20with%20Food%20and%20Nutritional%20Security%20_the%20Need%20of%20the%20Hour_Dr.%20Anitha.pdf). | 2. Food Safety and Standards Authority of India. (2011). Executive Summary on National Survey on Milk Adulteration. Retrieved from: [http://www.fssai.gov.in/Portals/0/Pdf/sample_analysed \(02-01-2012\).pdf](http://www.fssai.gov.in/Portals/0/Pdf/sample_analysed%20(02-01-2012).pdf). | 3. Khaniki, Gh, R. J. (2007). Chemical Contaminants in Milk and Public Health Concerns: A Review. International Journal of Dairy Science, 2, pp.104-115 | 4. Tajik, H., Seyed, M., R.R. & Moradi, M. (2007). Detection of Aflatoxin M1 in Raw and Commercial Pasteurized Milk in Urmia, Iran. Pakistan Journal of Biological Sciences, 10, pp. 4103-4107. | 5. World Health Organization (WHO). (2007). Food Safety and Food Borne Diseases. Retrieved from: <http://www.who.int/mediacentre/factsheets/fs237/en/>.