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FOOD SAFETY MANAGEMENT SYSTEMS IMPLEMENTATION IN SMALL BAKERY MANUFACTURE'S IN INDIA: A CASE STUDY



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Abstract: Food safety is a global concern. Several measures exist to ensure that food safety is not compromised at any stage from field to fork. These measures that prevent from any food safety hazard can broadly be categorized as food safety management systems. In certain countries, complying with food safety standards is a legal requirement. However, in developing countries like India where the concept of food safety is on a rise, the awareness about food safety management systems still lacks specially among small and medium size manufacturers. In smaller cities and towns in India, hardly food manufacturers are aware of the food safety management concept. This research paper intends to portray the current scenario of food safety and its management in Moradabad, a small city in Uttar Pradesh, India. In Moradabad, local retailers dominate the sweets, savory and bakery market. Majority of these retailers don't follow any food safety policy and are not even aware of it. Over constant exploration of the market, one retailer was identified who knew briefly about the concept of food safety and intended to implement it on one of its production site. This research is presented in a case study format to explain the current scenario of its production site and the challenges they face on daily basis to implement food safety. On visiting the site and interviewing the personnel, multiple factors were identified as the reason for poor food safety demonstration. The primary factors included poor infrastructure, lack of education amongst the staff, lack of food safety and personal hygiene understanding, no awareness of food safety management systems. During the visits, certain suggestions of how to handle these limitations were also provided to help them in improving their production site standard.

Keywords: Food safety, Food safety management systems in India, HACCP, ISO 22000

HIGHLIGHTS:

The importance of food safety was explained.

The meaning and importance of HACCP and ISO 22000 was understood.

The hurdles in successful food safety management systems implementation were identified.

Lack of proper infrastructure, enthusiasm and knowledge of the subject were identified as the main barriers.

INTRODUCTION

Food safety as per BS EN ISO 22000, 2005 is defined as food that will not be injurious to customer's health after consumption when it is prepared and eaten as per its intended use. Food safety has now become a big concern in food manufacturing companies, nationally and also internationally. Globalization in trade of food and various food processes over the last decade, food safety crises like heavy metal contamination, microbiological contamination, GM foods etc. have increased. According to World Health Organization, millions of people die every year because of unsafe food consumption. "Globally, diarrheal diseases kill an estimated 1.8 million children annually. Even in developed countries, up to one-third of the population gets sick from food every year. In addition, there is a very significant disease burden caused by chemical substances in

food". "In India, Nearly 8% of eggs and 7% of egg-storing trays from retail markets in Coimbatore were found to be contaminated with *Salmonella* sp (mainly *Salmonella enteritidis*) in 2006. *Listeria monocytogenes* was isolated from 105 (5%) milk samples collected from 52 farms in Maharashtra in 2007. Enterotoxigenic *Bacillus cereus* was isolated from 29% of fish (finfish, prawns and clams) samples in a study from Cochin in 2009". This is a clear indication that a stringent food safety management system has to be implemented at all phases to overcome the crisis of food safety hazards. Though at an international level, policies has been created and government has modified laws to create more transparency and stringency in applying these systems but still these systems application at an internal structure is very weak.

It is also important to note that FSMS(s) should focus on the complete food production chain in order to prevent recall situations and food borne diseases. The business should recognize and establish that food safety hazards prevention measures might be different at different levels. A food safety program might be suitable at farm level and cater to the problems associated with it but not at manufacturing or retail level and vice versa. The presence and successful implementation of Food safety management system(s) at different levels in the food production chain in

food sector demonstrates a business capability and ability to produce food which is safe for human consumption.

Research Hypothesis: Implementation of FSMS in small food manufacturers in India and the challenges faced whilst applying them.

In view of this, this research was conducted in bakery retailer sector in Moradabad, Uttar Pradesh, India to understand how they understand the concept of food safety and what measures they have taken to control food safety hazards.

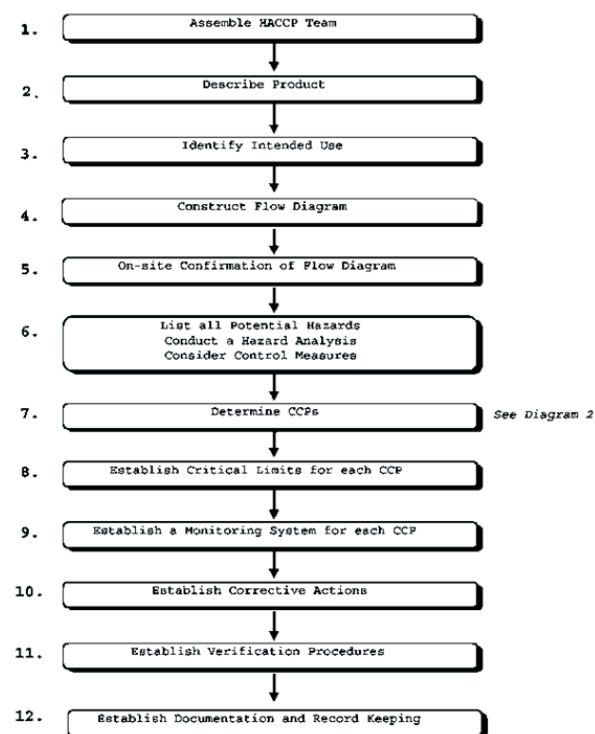
Understanding Food Safety Management Systems(s)

Globally, there are various Food Safety Management Systems available that cater to various business needs. In India, HACCP and ISO 22000 are the most common types of food safety management systems that are implemented by major food manufacturers.

HACCP : Hazard Analysis and Critical Control Point (HACCP) is one of the oldest form of food safety management systems that can be implemented to control food safety hazards. It is a science based systematic system that identifies hazards and control measures to assure food safety. HACCP is a hazard analyzing and establishing control systems tool whose main aim is to prevent any food safety hazard. Its effectiveness is not dependent on final product testing and it can easily accommodate any change in the manufacturing process like equipment change, development changes or process change. HACCP is easily compatible with any other food safety management system and it can easily be complemented with other systems such as ISO 9001 series, ISO 22000 etc. It is important to understand that HACCP requires a cross departmental approach such as engineering, process, development, food microbiology etc. for its successful implementation. HACCP consists of 7 principles in identifying hazards and ways of controlling them.

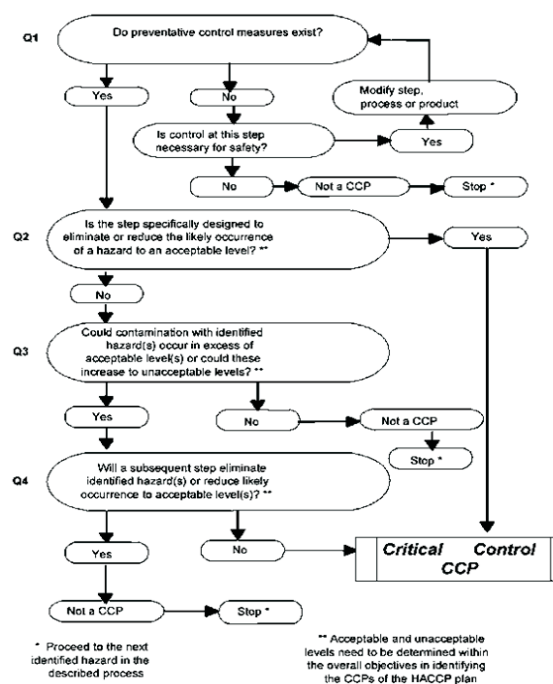
1. Conduct a hazard analysis
2. Determine the Critical Control Points (CCP's)
3. Establish critical limits
4. Establish a system to monitor control of the CCP
5. Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control
6. Establish procedures for verification to confirm that the HACCP system is working effectively
7. Establish documentation concerning all procedures and records appropriate to these principles and their application

The application of HACCP has the following steps:



For Step 7, CCPs are determined using a HACCP decision tree. It is used to individually evaluate each and every hazard identified in the HACCP plan. Using a decision tree, a flexible approach is required as per the nature of food business i.e. storage, processing, distribution etc. Also, all the questions in the decision tree should be answered in sequence.

HACCP decision tree:



(FAO Corporate document repository,2011)

ISO 22000:ISO 22000:2005 meets the basics of food safety management system. The requirements of this standard help the business to produce food which is safe for human consumption and can also be used in conjunction with any other food safety system. It is a certificated standard that food business of any size can imply and get annually certified. It is believed that this standard was developed to cover all the sections of the food chain, from food manufacturers to retailers to food service providers that are directly or in-directly associated with food safety. “The standard combines the key elements to enable management of food safety along the food chain including: integrating the principles of HACCP and application sequence developed by Codex Alimentarius Commission; system management; control of food safety hazards through pre-requisite programs and HACCP plans; interactive communication with suppliers, customers, regulators and consumers and, continual improvement and updating of the management system.”

The benefits of ISO 22000 are as follows:

- 1.To produce safe food as per its intended use by planning, implementing, operating, maintaining and regularly updating a food safety system.
- 2.Its implementation ensures that the business is complying with the requirements of the standard.
- 3.It increases customer satisfaction.
- 4.It aims at successfully communicating any food safety related issues to their customers, suppliers or anyone else who is directly or indirectly associated with the business.
- 5.It is a method of ensuring that the business is also complying with its food safety agenda.
- 6.Seekig certification of the standard boosts the confidence of the business and also helps them in assuring their intention of food safety to respective clients.

RESEARCH METHODOLOGY

The research was conducted in Moradabad, Uttar Pradesh, India in a local bakery, sweets and savory retailer. Due to confidentiality reasons, the name of the business cannot be disclosed. The business has many flagship stores in Moradabad and few stores outside Moradabad as well. They have two operational sites; one is annotated only for savory manufacturing and the other one is for sweets and bakery manufacturing. Savory manufacturing site was newly constructed keeping in mind of following HACCP and ISO 22000. The site follows all the basic principles of these food safety management systems. The owner of the business intends to get the other site HACCP, ISO 22000 certified as well. This site has almost 15-20 employees altogether. Since 8 months they are working hard to get their site complied with the mandatory food safety requirements, however they are facing challenges in doing so.

CHALLENGES OBSERVED

Over few site visits and random questioning from the staff, the major challenges that came to notice are as follows:

- 1.There is no senior management commitment and no authorized personnel appointed to take care of technical and quality assurance.
- 2.The understanding of what is HACCP or ISO 22000 and what can it do to the business is missing.
- 3.The site is more than 10 years old and their construction layouts have a lot of flaws like no proper ventilation, no drainage facility, no pest control measures etc.
- 4.The staff recruited is almost 10 years old. All of the staff is from village with no primary school education. They also lack basic food handling, personal hygiene and food safety education.
- 5.There is no separate allocation of washing utensils. The utensils are washed in the same area where bakery products produced and packed. Also, they don't have proper dustbins in place. The garage is binned in the utensil washing area in the bakery production section. This practice attracts a lot of insects and flies.
- 6.The staff resides in the manufacturing site and their clothes are dried in the production area only.
- 7.The staff does not wear any protective clothing, gloves, hair net, and boots while working.
- 8.The site also encounters rat issues. They contacted a pest control company for rat control and the company gave them an idea of using their glue which will kill the rat and one of their personnel will visit their site every week and take away the rats. However, using that glue for rat prevention also means that a dead rat will be in the premises for almost a week which will be dangerous to human health. They are still struggling to get some better rat control measures. Because the site does not have any proper drainage facility, they are facing this problem.
- 9.The floor is always wet in the bakery production unit. This is because of no drainage facility and no staff allocation for constantly drying the floor.
- 10.The site has no sickness policy in place.
- 11.The site has no proper raw ingredients storage facility. They have one room allotted for keeping all the raw materials. The business uses allergens like nuts, milk, eggs etc. but they are not stored separately from the rest of the raw materials. There is no separate annotation in the room for storing allergens.
- 12.The toilets and bathroom are between the bakery and sweets production unit. The door of the toilets and bathroom are always open and there is a fetid smell coming while passing from one production section to the other.
- 13.They don't have a hand washing procedure in place. They even lack a hand sanitizer and don't understand the importance of using it.
- 14.There is no documentation of recipes, raw materials intake, and raw material specifications.
- 15.There is no temperature control/monitoring. There are no temperature probes to daily check the fridge temperatures.
- 16.The windows has glass shield which is strictly against food safety.
- 17.Pre-requisites and CCP's are missing.
- 18.No customer complaint procedure. Flies and insects are sometimes noticed in their finished product. Sometimes, the cream on the pastries has a discreditable taste.

The business outsourced a certified food auditor to do a gap analysis of their site and came up with the same points as mentioned above along with few more points that the business had already implemented or were in a process of implementing like getting monthly staff medical checkups, change of unfiltered water to filtered etc.

SUGGESTIONS

Firstly, for any business intending to comply with any food safety system, it is important to understand what will be its benefits, challenges and motivations. A research in 2011 was conducted in United Kingdom on food safety management system implementations. That research aimed at understanding what are the key benefits, motivational factors and challenges that a food business faces in implementing food safety systems. On the basis of 463 responses from food manufacturers, the research showed that 81% of the food enterprises were implementing food safety standards to improve food and product safety. The major benefits of complying with any food safety system were increase in customer satisfaction and improved product quality. The challenges faced by any business in implementing these systems are: lack of technical knowledge, infrastructure involved and employee resistance to change. Hence, it is very important for any business to understand their reasons for implementing any food safety standard and what challenges they will face whilst applying them. Once this ideology was explained to them, the next step was to gradually work on the loopholes in their current system. During the visits, few suggestions were given to the owner of the company to simplify their work like

1. Discussing with staff what food safety management systems are and why the business wants it to be implemented on the site.
2. Training staff on food safety and food hygiene and their after constant monitoring of how well they are taking care of food safety and hygiene.
3. No drying of clothes in the production unit. A separate allocation of place outside the production unit for drying.
4. Proper cleaning of bathroom and shutting the door after it is used.
5. Proper stainless steel covered dustbins to be used so that they don't break easily and the garbage is also covered. Use of bin liners in the dustbin will help to keep the dustbins clean and garbage manageable.
6. Use of hair nets by all staff and gloves for those handling raw materials and packaging the finished product.
7. Installation of an electronic fly trapper to reduce flies and other insects on the site.
8. Training of proper hand washing procedure and installation of a hand wash and sanitizer pump near hand basin.
9. Advise on modifying their drainage system so that rat and water logging issues can be resolved.
10. Use of electronic thermometers to measure temperature of product and accuracy of the fridge.
11. Separation of raw materials. Allergens to be kept separately from other raw materials.
12. Explaining the concept of pre-requisites and advising him

to identify them.

13. Making of a HACCP plan to identify their CCP's.

LACK OF INFRASTRUCTURE

It is essential to have proper infrastructure in place. If the site has no proper allocation of space, the food safety will be at risk. Proper drainage system, getting electrical appliances replaced or fixed etc. are a part of infrastructure only. The water present on the production floor all the time is because of no drainage on the site. Working on wet floor all the time is a health and safety hazard. Anyone can slip on the floor and hurt himself. This is because there is no drainage on the production site. Proper drainage will also help in controlling pest issues.

The staff has no area to hang their wet clothes and hence they dry them in production unit only. It is a very unhygienic practice. A separate space outside the production area needs to be allotted to stop this practice.

RESISTANCE TO CHANGE

The staff has always followed the above mentioned practices. They are habitual to them and do not intend to change. An additional problem is that they are not educated. They belong to rural areas where primary education was also not available. Hence, they are now resistant to all these things. They don't want to cooperate with this change. They don't want to participate to make their production site a better place to work. They are not even ready to wear hair nets, protective clothing etc. This resistance is because no one ever tried to educate them about food safety and personal hygiene. Because this concept of food safety is now getting importance, it is getting difficult for manufacturers to train their older staff. The staff does not understand what happens if dirty hands are used in preparation of food or what a microbial outbreak is, how it happens, how they contribute in microbial outbreak and how they can control it.

CONCLUSION

Due to several microbial outbreaks and constant awareness of food safety in public, working without a food safety management system will not go a long way. It is important to start educating manufacturers of all size and their staff about the importance of food safety and how it can be managed by different food safety standards. Consumer safety should now be the paramount importance for all food manufacturers. Consumers are also getting aware of food safety and they expect that whatever they buy from market should be hygienic and safe for consumption. If the practice of food safety is not implemented, the business will start losing their customer base which will not benefit them in any shape or form. FSSAI is making all the possible efforts to spread the knowledge of food safety. However, it is still vital to identify all the manufacturers directly or indirectly associated with the food chain and educate them. This is one possible method of spreading the roots of safer food production from small towns and cities to metro cities in India.

'Food Safety Management Systems Implementation In Sma.....

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