

ENVIRONMENTAL SANITATION FOR FOOD SAFETY

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ABSTRACT

Safety of food is gaining an increasing importance with advancements in time and improvements in technology. Food Poisoning refers to the group of illnesses caused due to unsafe and unhygienic foods due to the fact that the food prepared or stored in unsanitary conditions is comparable to poison. The major factors to be considered while maintaining food safety standards are, air, water, equipment and environment. The Codex Alimentations Commission has assigned several elements in the food supply chain. Bacterial contamination of food can result in serious food poisoning. The symptoms of food poisoning include abdominal cramps, nausea, vomiting, diarrhoea, and fever. Some of the main sources of contamination are *Escherichia coli*, *Salmonella*, *Campylobacter*, *Shigella*, *Listeria*, Viruses, Parasites. Regulatory bodies that monitor and control food manufacturing companies must make safety monitoring practices such as HACCP, GMP, GHP and ISO mandatory before heading or certifying such outlets. The FSSAI prescribes Standards under Food Safety and Standards for Food Product Standards and Food Additives, Packaging and Labelling, Contaminants, Toxins and Residues, Regulations, 2011. These standards comprise the latest developments that can bring about effective changes in food cultivation, harvest, processing, manufacturing and the various recent technological advancements to make them more safe and secure for the consumers. Since India is a signatory to the WTO-SPS Committee, Draft Standard is also notified in WTO. Such advancements can be later tested for their efficiency and taken up partially or completely by the government or by NGOs.

Keywords: Sanitation, Environment, HACCP

I. INTRODUCTION

Safety of food is gaining an increasing importance with advancements in time and improvements in technology. It can affect any person consuming the food. The term 'Food Poisoning' is assigned to the group of illnesses caused due to unsafe and unhygienic foods due to the fact that the food prepared or stored in unsanitary conditions is comparable to poison. This fact has given rise to numerous scientists, governmental and public health officials to present concern over the food safety and sanitation issues. Providing safe food is not a sole responsibility but a shared responsibility of producers, manufacturers, industrialists, experts, policy makers, and handlers. The food must be free from pathogenic organisms, pesticide residues, toxic substances as well as dirt and other substances that may harm the quality of the food. It is also essential that the food is of the right stage of consumption for the consumer. The WHO reveals hundreds of millions of people worldwide are getting sick from contaminated food. The total number of cases of 22 different food-borne diseases experienced in 2010 is 582 million and the number of associated deaths is 351,000. Facts have also been established that industrial and food production places are the most prone places of spreading infectious agents placing environmental sanitation at the top of the list of concern. The manufacturing unit has to undergo risk analysis, meaning a process consisting of three components, i.e. risk assessment, risk management and risk communication.

II. SCOPE OF THE STUDY

The study aims at providing clarity to the food safety procedures and information on the different criteria under the Codex Alimentarius Commission. The food safety laws and standards have now become the ultimatum in establishing entrepreneurship in any sector related with marketing of food and food related commodities. The knowledge regarding the different aspects of food safety is therefore essential for any aspiring entrepreneur or student related to food science and allied subjects. The study shall highlight these thrust areas and mandatory information related to commercialising and marketing of food.

III. FACTORS INFLUENCING THE SAFETY OF FOOD

The major factors to be considered while maintaining food safety standards are, air, water, equipment and environment. The Codex Alimentarius Commission has assigned several elements in the food supply chain to be considered³.

- Primary Production (environmental hygiene, hygienic production, handling storage & transport, cleaning, maintenance and personnel hygiene).
- Establishment – design and facilities (location, premises and rooms, equipment, facilities).
- Control of operation (food hazards, hygiene control systems, incoming materials, packaging, water, management & supervision, documentation & records, recall procedures).
- Establishment – maintenance and sanitation (maintenance & cleaning, cleaning programmes, pest control systems, waste management, monitoring effectiveness).
- Establishment – personal hygiene (health status, illness and injuries, personal cleanliness, personal behaviour, visitors).
- Transportation (general, requirements, use & maintenance).
- Product information and consumer awareness (lot identification, product information, food labelling, consumer education).

- Training (awareness & responsibilities, training programmes, instruction & supervision, refresher training).

IV. SOURCES OF CONTAMINATION OF FOOD

The major cause of food poisoning is the pathogenic microbes that may be present in the food. The symptoms of food poisoning include abdominal cramps, nausea, vomiting, diarrhoea, and fever. Food contamination is generally caused by microorganisms such as bacteria, viruses or parasites both by themselves as well as by the toxins released by them in the food. Some of the main sources of contamination are described below.

Escherichia coli - *Escherichia coli* or *E. coli* are found in the digestive systems of animals and humans. Most cases of *E. coli* food poisoning have been identified to have occurred after consuming foods cooked under unsafe conditions or through cross contamination. The incubation period for food poisoning caused by *E. coli* is one to eight days. The symptoms usually last for a few days or weeks.

Salmonella - *Salmonella* which falls under bacteria are often found in meat, raw eggs, milk, and other dairy products. Its incubation period is between 12 and 72 hours. The symptoms usually last from four to seven days.

Campylobacter - *Campylobacter* is usually found on raw meat, milk and untreated water. The incubation period of *campylobacter* poisoning is usually between two and five days. The symptoms usually last less than a week.

Shigella - *Shigella* bacteria are present in contaminated water. Symptoms typically develop within seven days and last for up to a week. The infection is known as bacillary dysentery or shigellosis.

Listeria - *Listeria* bacteria may be found in ready-to-eat foods, some varieties of cheese when they are consumed beyond their expiry dates. The incubation period is between a few days to several weeks. The symptoms last for three days.

Virus - Viruses are a larger group of organisms that are common cause for food borne illnesses Such as vomiting, diarrhoea and stomach pains. These are easily transmitted through personal contact and via food and water. Sea foods are very commonly contaminated by these viruses. The incubation period of these organisms varies from 24 to 48 hours.

Parasites - Parasitic infections that can be spread in contaminated food include Giardiasis, Cryptosporidiosis and Ameobiasis. Giardiasis is an infection caused by a parasite called *Giardia intestinalis*. Cryptosporidiosis is caused by a parasite called *Cryptosporidium*. Ameobiasis dysentery is caused by ameoba which is a single-cell parasite called *Entamoeba histolytica*.

V. SANITATION REGULATIONS

The Food Safety and Standards Act⁴, 2006 is an act to consolidate the laws relating to food and to establish the Food Safety and Standards Authority of India for laying down standard levels and protocols for food commodities and their monitoring at various levels to ensure safety of foods. It has defined food safety as the assurance that food is acceptable for human consumption according to its intended use. Further, the Act also describes various levels of safety management and highlights the system of adopting GMP and GHP in different levels of food management and commercialization.

The FSSAI has made it mandatory for any food production unit to assess its risk in production and at various levels of processing to keep the health of the consumers safe and to eliminate the possibility of food hazard. The process makes it mandatory to check at each level of production rather than at the end of the manufacturing process. The manufacturing unit has to undergo risk analysis, meaning a process consisting of three components, i.e. risk assessment, risk management and risk communication.

'Risk assessment' means a scientifically based process consisting of the following steps: (i) hazard identification, (ii) hazard characterisation; (iii) exposure assessment, and (iv) risk characterisation. The term risk communication is used to collect information at various levels and update through risk analysis, perceptions, assessment, management. It is necessary to generate awareness among producers, processors, handlers and consumers in this regard. The academic community and other interested parties, including the explanation of risk assessment findings and the basis of risk management decisions; 'Risk management' means the process, distinct from risk assessment, of evaluating different alternatives in the existing policy system, and consulting the various personnel and associates to assess the risk factors relevant to risk strategies. Different preventive and remedial measures need to be scrutinised and implemented.

The FSSAI is controlled by the Ministry of Health and Family Welfare. The main aim of FSSAI is to lay down science-based standards for articles of food; regulate manufacture, storage, distribution, sale and import of food; facilitate food safety.

The FSS Act comprises into it 8 older laws, rules and regulations for food safety into one umbrella.

- Prevention of Food Adulteration Act, 1954
- Fruit Products Order, 1955
- Meat Food Products Order, 1973
- Vegetable Oil Products (Control) Order, 1947
- Edible Oils Packaging (Regulation) Order 1988
- Solvent Extracted Oil, De-Oiled Meal and Edible Flour (Control) Order, 1967
- Milk and Milk Products Order, 1992.

The FSSAI prescribes Standards under Food Safety and Standards (Food Product Standards and Food Additives) Regulation, 2011, Food Safety and Standards (Packaging and Labelling) Regulation, 2011 and Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011. These standards comprise the latest developments in different fields related to the produce and marketing of food and food commodities. The various advancements, inventions and regulatory aspects can be categorised into various categories. These have been classified under the following heads.

- Cereal and cereal products
- Fruits and vegetable products
- Dairy products and analogues
- Fats, oils and fat emulsions
- Meat and meat products
- Fish and fish products
- Sweets & confectionery
- Sweetening agents including honey
- Salt, spices, condiments and related products
- Beverages, (other than dairy and fruits & vegetables based)
- Proprietary food
- Irradiation of food
- Other food product and ingredients

In order to formulate standards for a food commodity under Food Safety and Standards Act, the product has to undergo several standards. These factors are assessed by the Food Authority and is drafted and published. Invites are posted for comments and recommendations from different stakeholders and also notified under the WTO. Thereafter, taking into account the comments received from the stake-holders, the Standard is finalized and notified in Gazette of India, and implemented.

VI. BIBLIOGRAPHY

1. "Food Safety." World of Microbiology and Immunology. . *Encyclopedia.com*. (March 2, 2017). <http://www.encyclopedia.com/science/encyclopedias-almanacs-transcripts-and-maps/food-safety>.
2. World Health Organization, WHO Estimates of the Global Burden of Foodborne Diseases, Executive Summary, World Health Organization [2015] WHO/FOS/15.02.
3. The Global Food Safety Resource, Food Sanitation and Hygiene, Toronto, Canada. <http://globalfoodsafetyresource.com>.
4. The Food Safety and Standards Act, 2006, General Principles of Food Safety, <http://lawmin.nic.in/ld/P-ACT/2006/The%20Food%20Safety%20and%20Standards%20Act,%202006.pdf>.
5. Food Safety and Standards Authority of India, https://en.wikipedia.org/wiki/Food_Safety_and_Standards_Authority_of_India.

