

Assessment of Food Quality and Food Safety in Everyday Life

Anita Singh¹ & Kamlesh Singh²

1. Principal, KMV Inter College, Sewapuri, Varanasi, UP

2. Associate Professor, Department of AH & Dairying, KAPG College, Prayagraj, UP

Introduction

Food is a major determinant of health, nutritional status and productivity of the population. It is, therefore, essential that the food we consume is wholesome and safe. Unsafe food can lead to a large number of foodborne diseases. You may have seen reports in the newspapers about health problems caused by contaminated or adulterated foods. Globally, food-borne illness is a major problem of public health concern. In India, the National Family Health Survey, 2015–2016 stated that more than 2 lakh children less than five years of age suffered from acute diarrhea. Food-borne illness can not only result in mortality but can damage trade and tourism, lead to loss of earnings, unemployment and litigation and thus can impede economic growth, and therefore food safety and quality have gained worldwide significance.

Significance

Food safety and quality are important at the home level, but are critical in large scale food production and processing, and also where food is freshly prepared and served. In the past, many foods were processed at home. Advancement in technology and processing, higher per capita incomes and better purchasing power as well as increased consumer demand have led to a variety of processed foods, food for health / functional foods being manufactured. Safety of such foods needs to be assessed. The quality of food stuff, raw as well as processed is of public health concern and must be addressed. In the past decade, safety challenges faced globally as well as in India have changed significantly and issues related to food quality and food safety have gained tremendous importance. A number of factors are responsible for this:

- With fast changing lifestyles and eating habits, more people are eating outside their homes. In commercial settings, foods are prepared in bulk handled by many persons, thus there are more chances of food getting contaminated. Further, food items are prepared many hours in advance, and may spoil if not stored appropriately.
- There are many processed and packaged foods. Safety of these foods is important.
- Spices and condiments, oilseeds were processed at home in former times and purity of these were not a concern. In today's world, prepackaged individual spices, condiments, spice powders and mixes are in demand, especially in cities and metros. Quality of even raw food stuff besides processed foods is of public health concern and must be addressed.
- Logistics governing transport of bulk food is complex and there is a long gap between processing and consumption. Thus risk assessment and safety management during mass production and mass distribution is critical.
- Microbial adaptations, antibiotic resistance, altered human susceptibility and international traveling have all contributed to increasing incidence of food-borne microbial

diseases. Nearly half of all known food-borne pathogens have been discovered during the past 25-30 years. There are still many food borne illnesses of unknown etiology. This is an issue of global public health concern and there is a need to detect, identify and recognize emerging pathogens and establish active surveillance networks, nationally and internationally.

- India is a signatory to the World Trade Organization (WTO) non-tariff agreement, which has provided greater access to world markets and opportunities to all countries to enter international trade. In this scenario, it has become essential for every country to protect the safety and quality of foods and also ensure that imported foods are of good quality and safe to eat. Effective food standards and control systems are required to protect food production within the country as well as to facilitate trade with other nations. All food manufacturers are required to meet the given standards of quality and safety, and need to have their products regularly tested.
- Pollution in atmosphere, soil and water, including use of pesticides in agriculture, bring their share of contaminants. Also use of additives such as preservatives, colorants, flavoring agents and other substances such as stabilizers makes the analysis of food for various components—both nutrients and contaminants—imperative.

Owing to the above factors, there is a growing concern for safe, wholesome and nutritious foods in a highly dynamic food business environment, which in turn has greatly expanded the scope and has increased career opportunities in this sector. Before learning about the various career options in this field, it will be worthwhile for us to understand the basic concepts regarding food quality, food safety, risk assessment, food standards and quality management systems.

Food Safety

Food safety means assurance that food is acceptable for human consumption according to its intended use. An understanding of food safety is improved by defining two other concepts — toxicity and hazard. Toxicity is the capacity of a substance to produce harm or injury of any kind under any conditions. Hazard is the relative probability that harm or injury will result when substance is not used in a prescribed manner and quantity. Hazards can be physical, chemical and biological causing harmful / adverse effects on the health of consumers. Among the various hazards, biological hazards are an important cause of food-borne illnesses. In spite of all the efforts in the area of food safety, microbial food-borne pathogens are still a serious concern and new pathogens continue to emerge.

Factors that are important in the emergence of pathogens include human host, animal hosts and their interactions with humans, the pathogen itself, and the environment including how food is produced, processed, handled and stored. For example, changes in host susceptibility due to malnutrition, age and other conditions can allow for the emergence of new infections in vulnerable populations. Genetic exchange or mutations in the organisms can create new strains with the potential to cause disease. Exposure to new pathogens through changes in eating habits, climate, mass production, food processing and increased globalization of the food supply can allow pathogens to emerge in new populations or new geographic areas. Examples are Norovirus, Rotavirus, hepatitis E contributing to about 70 per cent of cases. New

pathogens will continue to evolve and there is a need to develop methods to isolate them, control them and detect their presence in foods.

Food Quality:

The term food quality refers to attributes that influence a product's value to consumers. This includes both negative attributes such as spoilage, contamination, adulteration, food safety hazards as well as positive attributes such as color, flavor, and texture. It is therefore a holistic concept integrating factors such as nutritional traits, sensorial properties (color, texture, shape, appearance, taste, flavor, and odour), social considerations, safety. Safety is a preliminary attribute and precursor of quality. In order to ensure that foods are safe and of good quality, across the world various governments and international bodies have laid down food standards that manufacturers/suppliers are expected to adhere to.

Food Safety Management Systems

Over the years, issues related to food safety and quality have gone beyond just the avoidance of food-borne pathogens, chemical toxicants and other hazards. A food hazard can enter/come into the food at any stage of the food chain, therefore, adequate control throughout the food chain is essential. Food safety and quality can be ensured through:

- **Good Manufacturing Practices (GMP):** Good Manufacturing Practices (GMP) are a part of quality assurance to ensure that manufacturers/processors take proactive steps to ensure that their products are safe. It enables to minimize or eliminate contamination and false labelling, thereby protecting the consumer from being misled and helping in purchasing products that are not harmful. GMP is a good business tool that helps to refine compliance and performance by the manufacturers/producers.
- **Good Handling Practices (GHP):** Good Handling Practices indicate a comprehensive approach from the farm to the store or consumer, in order to identify potential sources of risk and indicates what steps and procedures are taken to minimize the risk of contamination. It ensures that all persons who handle food have good hygiene practices.
- **Hazard Analysis Critical Control Points (HACCP):** HACCP is a means of providing assurance about safety of food. HACCP is an approach to food manufacture and storage in which raw materials and each individual step in a specific process are considered in detail and evaluated for its potential to contribute to the development of pathogenic microorganisms or other food hazards. It involves identification of hazards, assessment of chances of occurrence of hazards during each step /stage in the food chain — raw material procurement, manufacturing, distribution, usage of food products and defining measures for hazard(s) control.

Why implement HACCP?

- It is a preventive approach to ensure food safety.
- End product inspection and testing, although important, is time consuming, expensive and detects the problems only after they occur. In contrast, HACCP enables us to detect hazards at any stage of processing or manufacture in order to ensure a good quality end product, by taking appropriate action at the stage where the problem occurs.

- It enables producers, processors, distributors and exporters to utilize resources efficiently and in a cost effective manner for assuring food safety.
- FSSA, 2006 places primary responsibility for safe food with producers and suppliers through HACCP, GMP, and GHP. This is important for consumer protection and international food trade.
- It assures consistently good quality products.

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