CHAPTER 1

Lifecycle stages for food safety of traditional foods

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1.1 Introduction

Food safety refers to the prevention of contamination and deterioration of food as well as to ensure quality food at the level of production, distribution, and consumption (Prabhakar et al., 2010). In today's world, food safety has become an important issue; yet, it is a very nascent stage of research and application. In view of population explosion in the South Asian population, if this issue is not considered in the right spirit, it may hinder achieving safe food delivery, especially of traditional foods.

South Asian countries such as Bangladesh, India, Nepal, Pakistan, and Sri Lanka have a variety of ethnic dishes that are nutrient dense. Pakistan shares common ethnic and traditional food similar to its neighbor countries such as India and Afghanistan. Indian traditional foods are relished with pungent spices such as cumin, turmeric, cardamom, pepper, and ginger. The traditional foods of India are globally accepted for their use of spices and herbs. The cooking style and authentic ingredients used in Indian traditional food vary from North to South or from East to West.

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Bangladesh, being a coastal region, has rice and fish as a staple food. The indigenous fishes such as *ilish* (Hilsa fish) and *shutki* (dried fish) are nutritious and widely consumed.

Ancient wisdom is nowadays supported and promoted by modern scientific research for its high degree of antioxidants, phytoestrogen, and vitamins. Nepal could be one of the best examples, as one of the indigenous communities from Nepal, named *Chepangs* or *Prajas*, has enormous knowledge about large numbers of plant species, which they have used for centuries (The Himalaya Times, 2018).

1.2 Food safety concerns

South Asia is renowned in the world for the legacy of the diversity of traditional foods; yet, with the increasing middle class, complex supply chain, and growing economies, this region is facing food safety challenges. In addition, after accepting the sustainable development goals to end hidden hunger, food safety must be the top priority of all South Asian countries with the treasure of traditional foods. South Asia contains almost half of the world population. Hence, developing a robust network for testing food safety is also complex. Hence, the investment done in food safety remains low due to the tropical weather conditions. Even the geographic and demographic complexities have made food safety complex in this region.

1.2.1 Food safety frameworks

Although regulations for food safety in most of the South Asian countries are getting tighter, coordination between government departments and agencies can often be time consuming and confusing and difficult for traceability and detection. Food safety does not just raise consumer safety but also raises a company or brand's reputation and revenues. Hence, elimination of food safety risks from farm to fork needs to be ensured. In addition, suppliers should manage the food safety cycle from the quality of raw materials to the export, transport, storage, packaging, and labeling.

1.3 Why food safety

An estimated three million people around the world, in developed and developing countries, die every year from food and water-borne disease, with millions more becoming sick (Food and Agriculture Organization of United States_EMPRES Food Safety). The occurrence of such diseases can easily escalate to a food safety emergency situation, which can adversely impact national economies and livelihoods through reduced availability of food. Although with the globalization of food supply people have become concerned about food safety, serious steps need to be taken to control and monitor food safety in South Asian countries.

1.3.1 Regulatory mechanisms

As every country moves from the nonregulatory phase to a regulatory phase, each has to establish its food policy and system comprehensively in tune with action points to implement and institutionalize it for better monitoring and controls.

Most of the countries such as Australia, China, India, Indonesia, Japan, Malaysia, and Thailand have developed food safety laws and programs. They also have started creating implementation agencies to enforce appropriate laws and regulations. Safety standards are defined on the basis of requirements and practices for food producers, manufacturers, handlers, processors, food supply outlets, and food consumers, especially of processed traditional foods.

This entire chain along with management of the lifecycle of food safety ensures that hygiene and health are maintained at every stage and the regulatory mechanism works through it regularly. Organic farming has been an offshoot of this process in many countries, and many countries are working on the same effectively with the ingredients being organic for the preparation of traditional foods.

Looking at the South Asian countries as an aggregate, the total food demand and the consumption right through the process of management of lifecycle stages, a nodal agency needs to be created to differentiate food safety regulatory systems for the harmonization of food safety in this region, very similar to the advisory body like CODEX especially for traditional foods.

1.3.2 Nonregulatory mechanism

Many social and even corporate houses that have a focus on food and food products can perhaps start the promotion of sustainable and safe production processes in their own capacity. Contract farming, which takes care of the entire food safety lifecycle, works out better for many corporates as a nonregulatory mechanism. Many aspects of sustainable production of safe food such as crop rotation, allowing the soil to regain fertility, controlling flooding, damage control procedures for draught, integrated pest management, promotional, and diversification of agroforestry can be a very important process of the nonregulatory mechanism. Besides infrastructure and food preservation practices, it can be training and skills development facilitated in the hospitality sectors such as hotels and catering institutions.

Hence, food safety has plenty of lifecycle stages in the chain of food production, transportation, consumption, and disposal as well as changing hands by various food handlers making it difficult to reach the target population of any area or region.

1.4 Lifecycle of food safety

As shown in Lifecycle stages of food safety (Fig. 1.1) a the production level, food safety issues emerge owing to residual aspects of contaminants. Due to inadequate

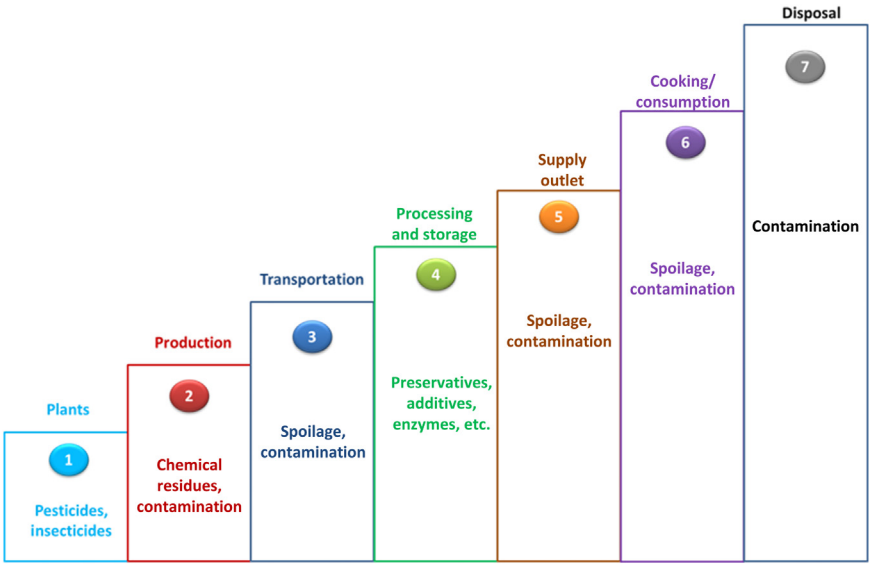

Figure 1.1 Lifecycle stages of food safety.

storage facilities and unhygienic handling of food while transportation affect the entire food safety lifecycle by the time it reaches to consumer. As a result, a single approach may not be sufficient to integrate the different stages of the lifecycle and ensure food safety. Due to this precise reason, the lifecycle approach is crucial whereby issues concerned at different stages are handled differently and yet they are integrated from one stage to another so that, in the end, food safety is the priority (Prabhakar et al., 2010).

1.5 Building stakeholder capacities

Precautions, policies, and prioritization have to be well coordinated to ensure that food safety concerns of traditional foods in the South Asian region are addressed adequately.

1.5.1 Institutional capacity

Relevant governments should create an institutional capacity among themselves to monitor and enforce safety standards in the food supply. Each country is capable of deriving safety standards on the basis of issues related to the lifecycle stages of food safety. An IT-enabled and lifecycle-based approach would provide ease to monitor and control if there is any adulteration as well as show clarity at the level of all these stages by enforcing appropriate safety standards. Trained and competent food inspectors are very vital for the execution of this entire institutionalization process.

1.5.2 Producer capacity

To get mileage and strengthen existing food producers to develop the capacity to properly handle food and manage risks that are vital to food, appropriate intervention is necessary. It has been observed that the World Bank has helped developing countries in establishing and implementing various International agreements aimed at food safety. New and modern technologies, as well as practices, would enhance good hygienic, agricultural, and manufacturing practices at small-scale food producers as well as food vendors' levels, especially for traditional foods.

1.5.3 Consumer capacity

As traditional forms of food are slowly disappearing, it is often difficult for a consumer to be aware of food safety while consuming the same in the processed form. All South Asian countries will have to start sharing information, awareness, and education among all stakeholders based on the lifecycle stages of food safety. As a result of this awareness, there will be a good holistic and integrated understanding of food safety inclusive of food labeling to improve the consumption of safe food. Food is sold at retail markets combining institutional capacity with consumer capacity. Adequate food safety that will resolve many problems of food safety starting from the stage of procurement can be ensured.

1.6 Robust approach to food safety

Each country needs to assess all lifecycle stages of food safety to identify and prioritize what needs to be done at each stage of the lifecycle. This is crucial for traditional foods too.

During the production stage, promoting sustainable production issues at higher food safety, inclusive of manure, insecticides, pesticide, and fertilizer management is needed. The next stages are basically focused on logistics and farm to fork dimensions that can be taken care by three major aspects of capacity building such as institution, producer, and consumer capacity. This will be a robust approach for the lifecycle management of food safety of traditional foods by an integrated approach for each sector.

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