

## Food safety and quality during handling, storage and transportation in India

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**Abstract-** India is the largest producer of several crops, even after that the country faces, starvation and malnutrition. The major reasons behind these serious issues are food losses and food wastage. These kinds of losses mostly occur during pre-harvest practices, post harvest handling, storage and transportation of produce. Food safety and food quality are interdependent and they both depend on the practices during handling, storage, transportation, marketing and even also from consumer's end. To ensure the food safety and quality, cold chain management during post harvest

practices is a key point to restrict upon. There is an urgent urge to improvise the on farm mechanization and technologies, sincere record keeping and documentation at every level of handling, modern storage facilities, better roads, effective time management during transportation and utilization of fruits and vegetable waste at industrial level. By improving the system at every level we can assure the food safety and quality.

*Index terms-* food safety, food quality, handling, storage and transportation

## I. INTRODUCTION

Food is one of the basic needs of the human being. There are many sources of food from where we fulfil our daily requirements of food. India is the world's largest producer of milk, peas, and jute, and ranks second-largest producer of rice, wheat, sugar cane, groundnut, potatoes, fruit, and cotton. It is also a leading producer of spices, fish, poultry, livestock and crops [1]. India is also known for basket of spices, as variety of spices approximately 50 to 100 spices are grown in the country. Although country is the largest producer of various crops but losses and wastage is also very high. This is a matter of concern because it is somewhere responsible for hunger and malnutrition. Affordability of food by each and every person of the country is a challenge, due to poverty. Now here comes the term food security. All the aspects of food safety, quality and security are dependent on each other, they all are ultimately dependent upon on

farm practices, losses due to natural calamities and their management, way of handling the produce during storage, transportation, processing, marketing and most importantly at the consumer level.

## II. FOOD SAFETY AND QUALITY

Food safety and food quality both are principal terms to ensure safety of consumers, they both are related to each other because when safety is there then it is obvious to have quality. According to Food Safety and Standard Authority of India (FSSAI), food safety means the assurance that food is fit for human consumption as per its intended use. Food safety is a component of food production, which is demanded starting from farm to consumer i.e. during handling, storing, transportation, processing and marketing, and assures that food keeps enough nutrients to have a balanced diet [2]. Poor practices during production of crops food leads to huge amount of losses and wastage and also responsible for starvation and

malnutrition. Food losses and wastage are also contribute to green house gases so then global warming. Nowadays, there is a big demand for nutraceuticals and functional foods because consumers are more cognizant for healthy diet. So, here is opportunity for food producers and processors to utilize the food waste to convert it into valuable material. But there is lots of improvements have to be done by the Indian government to save the food by working in a diversified manner. FSSAI have done undoubtedly an upstanding job to maintain the food safety at the level of production and consumer. But there is a need for improvement at the farm, storage and logistics level. There are the following reasons for food losses as follows:

*A. Practices during handling*

There are lots of improvements needed to prevent the food losses at various levels. Figure 1 showing the bad practices which compromise the safety and quality of produce. Time to time

training of farmers, dairy men and maximum possible individuals involved in food handling should be conducted by the government.



Figure 1. Poor handling practices

They should be trained and educated regarding food losses and its ill effects on the nature; food borne illness, food security, so that we can save the food. Every year approximately 67 million tons of food is wasted in India, which has a value of more than 1045 crores Indian

Rupee [3]. Although one-third of all food produced worldwide is wasted annually produced for human consumption i.e. 1.3 billion tones and it supposed that this amount is sufficient to feed around 815 million hungry people in the world [4]. Government should provide helping hand and to support farmers to save on field losses of the produce.

#### *B. Storage condition*

Storage of surplus commodity is an unsettled issue in India. As a consequence of insufficient storage facilities, Indian farmers suffer loss of Rs 92,651 per year [5]. Horticultural crops and other perishable commodities are tends to spoil readily, even at storage facilities. According to recent statistics from the Ministry of Consumer Affairs, Agriculture & Public Distribution; rice is 2831.912 MT and wheat 1303.312 MT out of 4135.224 MT wasted food grains [6]. Now there is a call for food technologists to innovate ideas and methods, so that maximum perishable

produce can be converted into valuable ingredients or products. Some of the storage facilities are at worst condition, instead of protecting the commodity they contribute spoilage (Figure 2).



Figure 2. Bad storage condition

In food industries first in first out (FIFO) has been followed under the guidelines of FSSAI, in similar fashion storage house should follow this. If there is no monitoring device in the store rooms then, regular monitoring of the stored produce should be done to track the status of the commodity. Now it's a time to flow in the winds of change, to use modern technologies in every storage

facilities like, controlled atmosphere storage, modified atmosphere storage, sensors, indicators (gas indicators, freshness indicators, time temperature indicator), smart packaging and further lots of scope is there to improve. Food commodity is a organic matter in which life process continues, regular breakdown takes place simultaneously. Recording keeping and documentation plays a key role to sustain the commodity's safety. Regular cleaning, sanitation and renovation are principal rules for maintaining the security and safety of the food products and commodity.

### *C. Transportation*

Transportation is a source of loss and wastage of any commodity, if it is not done accurately. Millions of tons of food lost their originality and integrity while transition from source to destination. To transport the produce from farm to market is not the end point solution. In Indian context there are many issues. Do

our farmers have sufficient infrastructure? Are we ensuring adoption of proper methods? Lack of cold chain management is a root cause of tons of early stage losses and wastage. Especially in the rural areas, there is dearth of cold chain infrastructure, which is the main source of food (Figure 3). This is accountable for losses in various terms as, economic loss, fuel loss, labor loss, resources used to grow the crop will also become useless. To keep away from these losses it is necessary to do inspection of vehicle, cleanliness, sanitation, hygiene and facilities on vehicle to maintain the required temperature and moisture by the produce to be transported. Vehicle overloading also sometimes contributes to losses during transit. Food safety and food quality are also the duty of food transporters to maintain priorities it at highest. Record maintenance, communication during transportation is equally important. Any break in between

the transition can cause failure of overall system.

Nowadays, new techniques have been used to save these losses. GPS tracking system and RFID tags are proved to be a milestone, to maintain the transparency during transportation of food from source to destination, because sometimes truck drivers keep the vehicle shutdown for sometimes and sleep without taking care of the produce. Cold chain management, HACCP, sanitation, transparency and maintenance are critical points to execute every time to retain the commodity.



Figure 3. Bad transportation practices

### III. CONCLUSION

After going through many literatures and news readings here it can be concluded that it is responsibility of each and every single person to assure the food safety and quality from farm to consumer. Food engineers should develop low cost machinery for farmers. Food technologists come forward to innovate new methods and procedure to utilize the waste into valuable products. It's an era of functional foods, super foods, nutraceuticals, and bioactive compounds that provide pharmaceutical companies to convert waste into money. Because increasing food waste on earth is a problem for environment and increasing food loss is responsible for starvation of millions of people on earth. So it's an appeal to save food, save life and save earth.

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#### REFERENCES

- [1]FAO. (2020). India at a glance. [Online]. Available: <http://www.fao.org/india/fao-in-india/india-at-a%20glance>, (Accessed on 02.07.2020).
- [2] FAO. (2020). Food safety and quality. <http://www.fao.org/food-safety>, (Accessed on 03.07.2020).
- [3] Z. Haq. (2016). Food India wastes can feed all of Bihar for a year, shows govt. study. Hindustan Times, September 15.
- [4] FAO. (2020). Technical Platform on the Measurement and Reduction of Food Loss and Waste. [Online]. Available: <http://www.fao.org/platform-food-loss-waste>, (Accessed on 03.07.2020).
- [5] K. Pandey. (2018). Poor post-harvest storage, transportation facilities to cost farmers dearly. Down to earth. [Online]. Available:<https://www.downtoearth.org.in/news/agriculture/poor-post-harvest-storage-transportation-facilities-to-cost-farmers-dearly-61047>, (Accessed on 04.07.2020)
- [6] H. S. Bedi. (2019). Here is India's food grain storage report card, One India, [Online]. Available: <https://www.oneindia.com/india/here-is-india-s-food-grain-storage-report-card-2850974.html>, (Accessed on 04.07.2020)