



ISSN: 2395-7476

IJHS 2024; 10(2): 258-261

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www.homesciencejournal.com

Received: 20-07-2024

Accepted: 24-08-2024

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Navigating food safety and standards authority of India (FSSAI), take standards, guidelines and initiative for food safety and hygiene in food industries: A systematic review

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DOI: <https://doi.org/10.22271/23957476.2024.v10.i3d.1706>

Abstract

This study aims to understand the significance of food safety and navigate the Food Safety and Standards Authority of India (FSSAI), which establishes standards, guidelines, and initiatives to ensure food safety and hygiene in food industries. In the Indian context, a variety of food toxicants, contaminants and adulterants are responsible for several food-borne disease outbreaks in human health. Including, various physical, biological and chemical agents that are capable of making food unsafe for human consumption. This paper discusses various aspects of ensuring Food Safety, The Food Safety and Standard Authority of India (FSSAI) has issued numerous food and packaging laws and acts to maintain their manufacture, storage, distribution, sale, and import, also maintain standards, guidelines, and take initiatives such as Eat Right India, Safe and nutritious Food (SNF), Food Fortification, Javik Bharat, Safe water for healthy living, Milk quality survey, RUCO, Diet4 Life, Project Dhooop and Safe Food, Share Food, share Joy. FSSAI comes into existence under the Food Safety and Standers Act, 2006).

Keywords: FSS, FSSAI, guideline, standers, eat right India, SNF, food fortification, Javik Bharat, and milk quality survey

1. Introduction

Ensuring food safety to protect public health and promote economic development remains a significant challenge in both developing and developed countries. Food safety and hygiene play a crucial role in the food industry to ensure that the food is free of contamination and adulterations. Food Safety and Standers Act, (2006) [3] is an Act to consolidate the laws relating to food and to establish the Food Safety and Standards Authority of India for laying down science-based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import, to ensure the availability of safe and wholesome food for human consumption. (Food Safety and Standards Act, 2006) [3].

FSS is an umbrella terminology & eight different acts and orders that were handled by various ministries and departments related to food. The second schedule is section 97, (Reddy *et al.*, 2017) [19].

Food and Safety Standers ACT, 2006

- Prevention of Food adulteration Act, 1954
- Fruit Products Orders, 1955
- Meat Food products Order, 1973
- Vegetable Oil Products (Control) Order, 1947
- Edible Oil Packing (Regulation) Order, 1998
- Solvent Extracted Oil, De-oiled Meal, & Edible Flour (Control) Order 1967
- Milk & ilk Products Order, 1992
- Any Other Order under Essential Commodities Act, 1955 relating to food.

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Fig 1: Pre-existing acts and orders which came under the FSS Act, 2006, (Reddy *et al.*, 2017) [19]

2. Food Safety and Stranded Authority of India (FSSAI)

The FSSAI is an autonomous body established under the Ministry of Health & Family Welfare, Government of India. It is entrenched under the Food Safety and Standards Act of 2006. The FSSAI is conceived as science-based standards for food products and regulates the manufacture, storage, distribution, sale, and import of food products to ensure the availability of safe and nutritious food for consumption (www.fssai.gov.in).

The Act provides statutory powers to the FSSAI to function in the following areas.

- Framing of regulations, to lay down food safety standards
- Specify limits for addictive, Contamination, Pesticide, & veterinary Drug reduction and heavy metals Food
- Food labelling standards including claims on health and nutrition.

- Laying down guidelines for accreditation of laboratories for food testing
- Summarising and advice on relevant scientific & technical data provides the central government
- Contribute to creating information across the country to develop standards in Food
- To promote general information about food safety standards, providing training who are involved in the food business. (FSSAI, in Food Safety Enforcement in state food authority chp-2)

The FSSAI works under the aegis of the Ministry of Health and Family Welfare. Some key officials and institutions specified under the FSS Act, 2006 are as follows:



Fig 2: Food safety authorities in state /UTs (Food Safety Standards Act, 2006)

2.1 Food Safety and Standards Regulations, 2011

Under FSSAI six regulations were notified in the Gazette of India on 1st August 2011 and came into force on 5th August 2011. These regulations are:

- Food Safety and Standards (Licensing and Registration of Food Businesses) Regulation, 2011
- Food Safety and Standards (Food Products Standards and Food Additives) Regulation, 2011
- Food Safety and Standards (Prohibition and Restriction of Sales) Regulation, 2011
- Food Safety and Standards (Packaging and Labelling) Regulation, 2011
- Food Safety and Standards (Contaminants, Toxins, and Residues) Regulation, 2011
- Food Safety and Standards (Laboratory and Sampling Analysis) Regulation, 2011

2.2 These regulations and standards are reviewed from time to time. The new regulations are below

1. Food Safety and Standards (Food or Health Supplements, Nutraceuticals, Foods for Special Dietary Uses, Foods for Special Medical Purposes, Functional Foods and Novel Food) Regulations, 2016
2. Food Safety and Standards (Food Recall Procedure) Regulation, 2017
3. Food Safety and Standards (Import) Regulation, 2017
4. Food Safety and Standards (Approval for Non-Specific Food and Food Ingredients) Regulation, 2017
5. Food Safety and Standards (Organic Food) Regulation, 2017

6. Food Safety and Standards (Alcoholic Beverages) Regulation, 2018
7. Food Safety and Standards (Fortification of Food) Regulation, 2018
8. Food Safety and Standards (Food Safety Auditing) Regulation, 2018
9. Food Safety and Standards (Recognition and Notification of Laboratories) Regulation, 2018
10. Food Safety and Standards (Advertising and Claims) Regulation, 2018
11. Food Safety and Standards (Packaging) Regulation, 2018
12. Food Safety and Standards (Recovery and Distribution of Surplus Food) Regulation, 2019
13. Food Safety and Standards (Safe Food and balanced diets for children in school) Regulations, 2020
14. Food Safety and Standards (Foods for Infant Nutrition) Regulations, 2020
15. Food Safety and Standards (Labelling and Display) Regulations, 2020
16. Food Safety and Standards (Ayurveda Aahara) Regulations, 2022
17. Food Safety and Standards (Ayurveda Aahara) Regulations, 2022 (fssai.gov.in)

3. Initiatives taken by FSSAI

FSSAI Commencing many initiatives to promote Food safety standards, in schools, colleges, households and public places like railway airports etc. these initiatives are having a great impact on the socio-economic condition of India.

3.1 Initiatives for the food business

Table 1: initiatives for the food business taken by FSSAI (T. Aswathy *et al.* 2024) ^[23]

Sr. No.	Initiatives for food business	Descriptions
1	Food Licencing/Registration System (FLRS)	FSSAI launched a Food Licencing & Registration System (FLRS) in 2012 for the issuance of pan-India FSSAI Licenses and Registration. FLRS is an online application that can be accessed via the Internet, Apply for a License/Registration Certificate, Track the application as well as send an SMS or Email to Complete the registration process. The latest version launched 3.0 in September 2014.
2	Food Safety Compliance System (FoSCoS)	The development of FoSCoS was needed to address the technical issues with the FLRS system. Integrating many of FSSAI's IT platforms, such as Food Safety Compliance through Regular Inspection and Sampling (FoSCoRIS), Food Safety Training and Certification (FoSTaC), Food Safety Mitra (FSM), Audit Management System (AMS), Indian Food Laboratory Network (InFoLNet) etc.
3	Food product identity verification system (FPIVS)	The FPIVS food safety standards with special and non-specified foods, such as proprietary foods or Nutraceuticals. It Auto-generation Product Identifiers on the approval by the authority. This would enable FBO to obtain a license from the appropriate licencing authority.
4	Food Import Clearance System (FICS)	The FICS is an online licencing Food import clearance system it is a web-based system for the process of licencing, registration and food import clearance. It also maintains the record of all food business operators (FBOs) FICS was launched on 28 December 2011.
5	Indian Food Laboratory Network (INFoLNET)	Indian Food Laboratories Network (INFoLNET), is a web-based online system developed by FSSAI. INFoLNET makes the process of food testing quick, easy, and convenient, tracking food sample testing and enabling FBO (Food Business Operators), FSO (Food Safety Officers) and AO (Authorized Officers to request Food laboratories collect samples or dispatch for testing through an online.
6	Food Safety Knowledge Assimilation Network (FSKAN)	The FSKN aims to Facilitate a scientific cooperation framework, coordination of activities, and the exchange of information development and implementation of joint projects.

3.2 Initiation for citizen

Table 2: Initiatives for citizens taken by FSSAI (Mishra A, *et al.*, (2020) ^[14]

Sr. No.	Initiatives for citizen	Descriptions
1	Eat Right India	FSSAI launched "The Eat Right Movement" on July 10, 2018, with three major pillars: Eat Safe, Eat Health and Eat Sustainably, to improve public health in India. It is aligned with Ayushman Bharat, POSHAN Abhiyaan, Swachh Bharat Mission and Anemia Mukta Bharat. Besides these, a campaign named 'Aaj Se Thoda Kam' has been launched to help people reduce the consumption of foods high in fat, sugar, and salt,
2	Safe and Nutritious Food (SNF)	The strategy of SNF is to awareness and engagement in social and behavioural change among citizens around Food safety and hygiene. The various initiatives under SNF are: SNF@Home, SNF@School, SNF@Workplace, SNF@Hospital, SNF@Religious Places, SNF@Eatout, Safe Food on Track, Serve Safe, and Clean Street Food as well as awareness material such as 'The Pink Book' for home kitchens, 'The Yellow Book' for school children, 'The Orange Book' for workplaces, etc., FSSAI has developed Food Safety Display Boards, Rating Systems, across the country.
3	Food fortification	Food fortification is providing nutrients that may or may not have been originally present in the food before processing or may have been lost during processing. It is done through staple foods to increase minerals and vitamins like iodine, iron, zinc, Vit-A & D, etc. The fortifying staples namely Wheat Flour and Rice (with Iron, Vitamin B12 and Folic Acid), Milk and Edible Oil (with Vitamins A and D) and Double Fortified Salt (with Iodine and Iron) to reduce the high burden of micronutrient malnutrition in India. The '+F' logo has been notified to identify fortified foods.
4	Save food, share food, share joy.	FSSAI launched "Save Food, Share Food, Share Joy" on 13 December 2017 to promote the donation of food, curb food wastage, and reduce food loss in the country. The objectives of this initiative are To provide policy, regulations, and strategy, promote food donation (pre-packaged, fresh, cooked food) and awareness about food loss and food waste among citizens.
5	Safe water for healthy living	FSSAI has launched "The Project Clean Drinking Water". The goal of this project is to enable the consumer to make an informed choice on the quality of water being consumed. The project aims to purchase safe and high-quality water. By using the Safe Water portal, the water should be verified for physical, chemical & microbiological safety.
6	Jaivik Bharat	Jaivik Bharat initiative is a part of the Food Safety and Standards (Organic Foods) Regulations 2017 which was launched on 9th November 2017. The Regulation ensures the food is organic- labelled and It covers the labelling, transport, storage and distribution. The Indian Organic Integrity (IOI) database is considered the heart of Javik Bharat. It was jointly developed by FSSAI, APEDA, and PGS-India.
7	Milk quality survey	India is the largest producer & consumer of milk and milk products. Therefore, it should be clean, contamination and adulteration-free. The objectives of the Milk Quality survey are, To create awareness, build a network and evaluate the status of current Milk quality in India.
8	Diet4Life	Diet4Life for babies & parents to find timely medical support and treatment. This initiative sensitises people about metabolic disorders. Because in India, many babies suffer from life-threatening conditions of IEM.
9	Project Dhoop	Project Droop's strategy for Vitamin D deficiency can be reduced in teenagers by using sunlight from 11 to 1

		p.m. and adding fortified foods with vitamin D.
10	RUCO	The repurpose of used cooking Oil (RUCO), initiatives used Education, Enforcement, and Ecosystem (EEE), the main focus of the cooking oil for repeated frying which causes several diseases such as hypertension, atherosclerosis, Alzheimer's disease, and liver diseases.
11	Microplastic Contamination Detection	The FSSAI launched the Micro-and Nano plastics Emerging Food Contamination in Food on August 18, 2024, in New Delhi. These initiatives aim to detect Micro and Nano-plastic in various food products and assess their prevalence & exposure level in India. As well as developed protocols for Nano-plastic analysis, conducting intra- and inter-laboratory comparisons and generating critical data on microplastic exposure levels among consumers.

4. Conclusion

In conclusion, this study has demonstrated an overview of the FSSAI regulations, standards, initiatives, and guidelines, which are crucial for the success of food service and food businesses in India. Ensuring product Safety, Quality, Packaging, Labelling, Food legality, and Consumer confidence. Despite challenges like limited Knowledge, Complexity, and financial constraints, solutions such as training, Collaboration, technology adoption, and infrastructure improvement can help overcome these hurdles. By addressing these challenges, businesses can navigate FSSAI effectively, ensuring both their success and Public Health.

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