

An Overview of Consumer Awareness and Right in Context of Present Food Safety Act, Rules and Regulations

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Abstract:

Food safety eco system in India ensures to provide safe, nutritious and wholesome food to a consumer in the entire food chain. Food should be safe from physical, chemical and biological contaminants. Consumer have a right to know as to whether food, they consume, is safe and is of desired and required quality as per their choice.

Food Safety and Standards Authority of India (FSSAI) was established on 5th September, 2008.

FSSAI is the Apex body for implementation of Food Safety Act, Rules and Regulations in India. FSSAI is responsible for protecting and promoting public health through the regulations and enforcement of food safety aspects. The objectives of FSS Act is to introduce unified food law in the country to simplify and facilitate the food Business Operators (FBO). Upon enactment of FSS Act 2006 with Rules 2011, different Regulations on different subjects were notified in 2011 and in subsequent years.

Prior to Food Safety and Standards Act, Prevention of Food Adulteration Act 1954 and its Rules 1955 were in existence. According to earlier Act and Rules, there were no clear-cut demarcation between misbranded / adulteration / sub – standard / unsafe food.

The common adulteration in food is described in this communication. Simple methods for detection of adulteration are available. These are basically for the consumer's knowledge and the methods prescribed are not confirmatory tests.

International food business has opened a new challenge for providing safe food. Hence, FSS Rules and Regulations have become dynamic to achieve goal of providing safe and nutritious food to consumers. Due to new products coming in to market especially with an exaggerated claim /misleading information, particularly fortified food, nutraceuticals/health claim /Ayurveda food/weight reducing, with very high cost.

Key Words: Food, Nutrition, Regulation, Safety, Consumer, Contaminant

1. Introduction:

Food safety eco system in any country ensures to provide safe, nutritious and wholesome food to a consumer. This should be applicable in the entire food chain right from farmer, manufacturer, storage, transportation, whole seller, distributor, retailer, consumer and other stake holder involved in the food chain till this is consumed by human beings. Besides maintaining quality of food in accordance with prescribed regulatory standards or in case of non-standardised food (proprietary food) as approved by regulatory authorities, food should be safe from physical, chemical and biological contaminants and should be within the regulatory permissible limit as prescribed for safe food. Human beings have a right to know and to ensure personally as to whether food, they consume, is safe and is of desired and required quality as per their choice.

Food Safety and Standards Authority of India (FSSAI) is an autonomous body established under the Ministry of Health and Family Welfare, Government of India (Figure 1). It has been established under the Food Safety and Standards Act, 2006, and is the sole agency responsible for implementation of food safety Act, Rules and Regulation in India. FSSAI is responsible for protecting and promoting public health through the regulations and supervision of food safety aspects. The objectives of FSS Act are to introduce unified food law in the country to simplify and facilitate the food Business Operators (FBO). Fig.1 represents the working of scientific activities

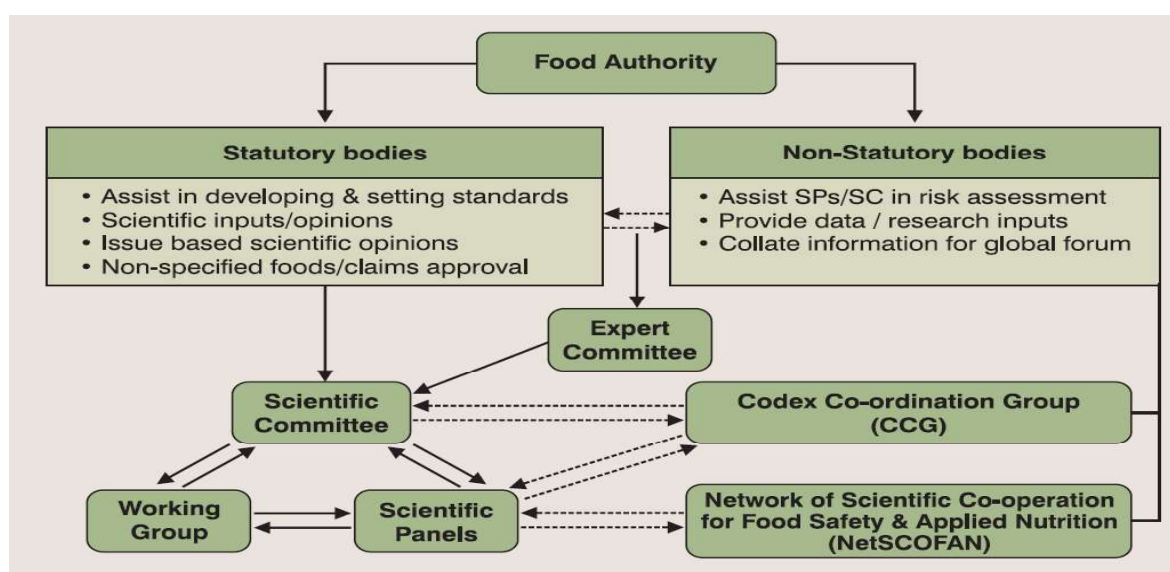


Fig.1 Working of scientific activities (Source- FSSAI annual report 2024-2024).

Prior to Food Safety and Standard Act, Prevention of Food Adulteration Act 1954 and its Rules 1955 were in existence. According to earlier Act and Rules, there were no clear demarcation between misbranded / adulteration / sub – standard / unsafe food. Any violation in these were subject to the criminal offense and the punishment prescribed under the then Act were different depending upon the nature of the offenses, etc. Consumers were also given the rights, under the then Act, Food Inspector for the purpose of taking the sample of any food deemed to be adulterated by them and the procedures were laid down for prosecution. These powers of the consumer were rarely used by them due to the complicated procedure and unwillingness of the consumer to enter to the litigation directly. However, the consumer had full right to inform the concern Food Authority of the states about nature of complaint and Food Authority had to take action for taking the sample and sending them for analysis to establish as to whether the sample was adulterated or not, to enable for further action in the matter. The consumer can also be present as a witness in the sample proceeding if he so wishes. The enforcement of the Act and Rules were totally by the state government. Central Government was involved only as policy maker and there was no enforcement at the level of the central government Authority. Licensing requirement were also very simple and lenient and several departments were involved depending upon the local Administration prevailing in that State/union Territories. There were several other government departments like BIS, Agmark, FPO etc. engaged in maintenance of food quality and safety in the country. However, PFA Act superseded other Act/Rules prevailing in the country.

Upon enactment of food safety and standards Act 2006 with Rules 2011, different Regulations on different subjects were notified in 2011 and subsequent years. Food Safety and Standards Authority of India was established on 5th September, 2008.

1.1 Food safety and standards Act, 2006 (Act No. 34 of 2006)¹

An act established by Food Safety and Standards Authority of India consolidate the laws relating to food and to establish science-based standards for articles of food and to regulate their manufacture, Storage, distribution, sale and import, to ensure availability of safe and wholesome food for human consumption and for matters connected therewith or incidental thereto.

This is central Act basically controlled by Government of India and enforced through central and state government bodies. In total, there are 101 sections for enactment and

applicable throughout the country uniformly. Now, this Act is under revision for presenting Bill in the Parliament.

1.2 Food Safety and Standard Rules 2011²

These Rules had been derived out of the Act for prescribing power, qualification of the various authority and procedure for sampling, seizure, analysis, adjudication, prosecution, penalty, punishment, appeal etc.

2. Food safety and standards Regulations

Various Regulations are made for smooth implementation of food safety in the country. Relevant Regulations are described in brief:

2.1 Food Safety and Standards (Licensing and Registration of Food Business) Regulations 2011³

The objective of this regulation is to ensure full control on food business to provide safe food to consumer by implementation through central and/or state govt. Authorities. This is, therefore, mandatory that all business operator including e-commerce should have a valid license issued by a competent Authority before commencement of business. License issued is commodity and nature of business specific. The Regulation has specified the requirements of hygienic and sanitary practices to be followed by all food business operator (FBO) before applying for license and has to maintain it during operation of Business. Provision of testing of raw materials and food ready for sale has been, inter-alia, mandated at specified interval to ensure that safe food is marketed.

2.2 Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011⁴

For ascertaining safe and quality food, this is necessary that regulatory standards are framed for ensuring the conformance of the food. Hence, under this Regulation many food products have been standardised for quality parameters and for safety parameters. According to objective of the Act, the standards of food have to be science based and efforts are made to harmonise the standards with that of internationally accepted standards like codex standards. FBO manufacturing these products must meet these regulatory standards before marketing for human consumption. There are scientific set of procedure for framing of new standards and revision of existing standards depending upon the requirement of the country / consumer.

2.3 Food Safety and Standards (Prohibition and Restriction on Sales) Regulations, 2011⁵.

Under these regulations sale of certain admixture of food has been prohibited, restriction on use of certain ingredients had been made beside prohibition and sale of certain food products has been imposed. These have been done with a view to ensure supply of safe food to a consumer and also for consumer welfare.

2.4 Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011⁶

This regulation is a part of safety standards which include a safe limit prescribed in different food in regard to metal contamination, restriction on use of pesticide, and other contaminants included micro toxins etc. The food must meet to these requirements.

2.5 Food Safety and Standards (Laboratory and Sampling Analysis) Regulations, 2011⁷

This regulation prescribes the regulatory testing part including the quantity of sample for analysis and competency of the laboratory with their notification for the area etc.

2.6 Food Safety and Standards (Health Supplements, Nutraceuticals, Food for Special Dietary Use, Food for Special Medical Purpose, Functional Food and Novel Food) Regulations, 2016⁸

Under this regulation, special food has been included for specific purpose for a person having health deficiencies and for specific medical purpose included health benefit to the consumer. This is expected that as a consumer while using this food either on doctor prescription or himself directly for health benefit must ensure its uses and genuineness along with its need for complimenting the deficiency in mineral, vitamins etc. This may be stated that this food can't supersede the natural food being rich in mineral, and vitamins etc. depending upon the health and body requirement of the consumer. The consumer must be cautious from the false claim made on the label of the food inside that like reduction in weight, slimming, increasing height and weight etc. There is a need to have a constant check on quality and safety of these special food so that consumer is not cheated.

2.7 Food Safety and Standards (Food Recall Procedure) Regulations, 2017⁹

This regulation is a part of ensuring safety and quality of the food in case unsafe food has gone to the market for sale for human consumption. In such events, if noticed by the

Regulatory Authority or by the FBO, it is necessary to withdraw unsafe food available in the market to avoid further consumption by human. A prescribed procedure has been laid down by the Regulatory Authority.

2.8 Food Safety and Standards (Import) Regulations, 2017¹⁰

Due to WTO and TBT agreement to impart smooth flow of food internationally, the import / export of the food has increased manifold (Figure 2). This is, therefore, necessary that the food being imported in the country must be according to the standards prescribed by the country, so that consumer have a choice of taking the imported food which are safe. The import Regulation takes care of the food entering into Indian market either for direct consumption or as food ingredient are safe. The Regulator has to ensure also that an established and quick release of the food from entering port is done without any financial loss of the importer and to avoid damage to the perishable and fresh food kept at the port.

Fig.2 shows food import clearance system

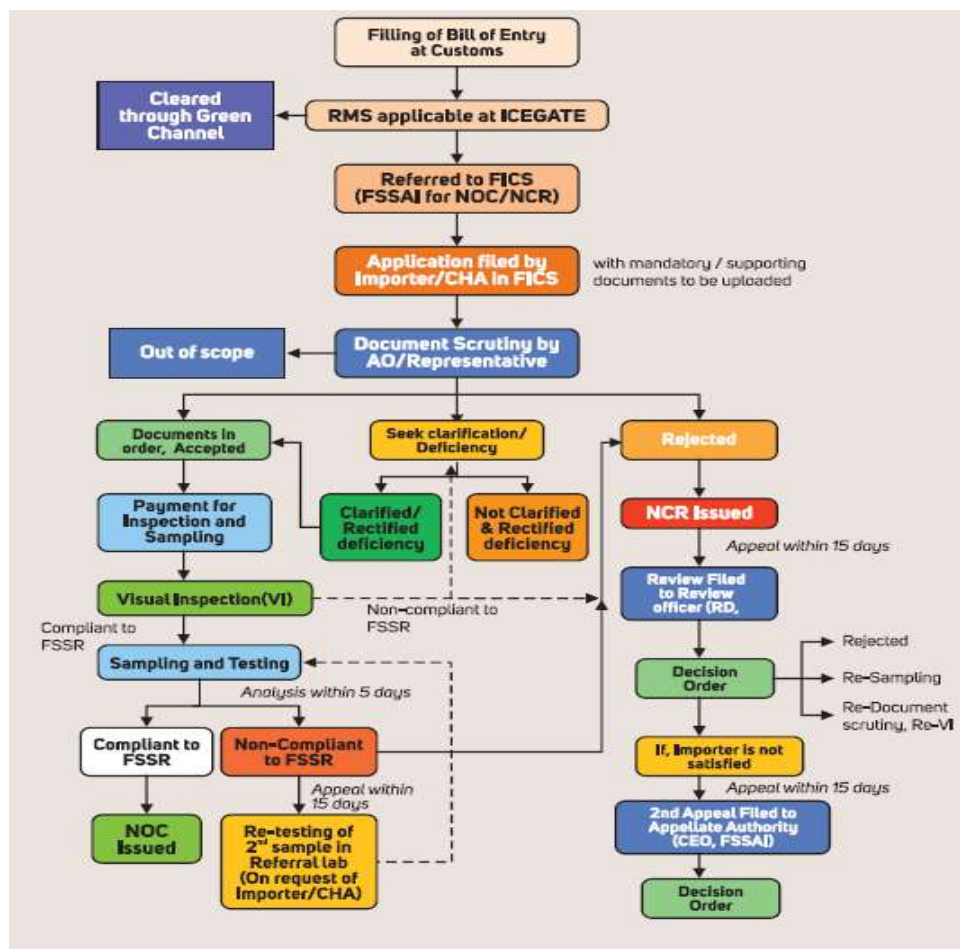


Fig.2. Food import clearance system. (Source- FSSAI Annual Report 23-24)

2.9 Food Safety and Standards (Approval for Non-Specified Food and Food Ingredients) Regulations, 2017¹¹

Due to continuous development in technology and research in food science, a number of products are coming up which have not yet been declared as food or is to be used as food ingredient. This is need of the hour that Regulatory authority do consider as to whether such food / food ingredients are safe and can be used in food preparation. Under this regulation, there is provision of approval of non-specified food and food ingredients, which are not traditional and are being made or otherwise prevalent in the market. To ensure safety of the non-specified food and food ingredients, a scientific procedure has been laid down for assessment of the safety of the food for permitting them to be used in manufacture of food or for direct consumption as such.

2.10 Food Safety and Standards (Organic Food) Regulations, 2017¹²

Earlier there was emphasis to increase production of the agriculture produce by the use of chemical, fertilizer, pesticide, and insecticide etc. Though a maximum residual limit has been prescribed to keep a control on excessive use of permissible pesticide / other contaminants etc. and not to use ban pesticides, but now the agriculture is tending towards production of organic food produced in accordance with the specified regulation for organic food production. This is basically limited to third party accredited certification system. However, to develop a confidence among the consumer, it may be necessary to have a quality and safety standards of organic food being produced under specified condition to avoid any type of cheating and false claim of organic food reaching to the consumer. As there is no doubt that organic is being sold at a much higher price as compared to equivalent normal food meeting the specified standards of quality and safety.

2.11 Food Safety and Standards (Alcoholic Beverages) Regulations, 2018¹³

During the regime of prevention of food adulteration Act, there were no standards and enforcement of alcoholic beverages and were not under food Act, presumably considering under Excise Department. However, presently the quality and safety Act, alcoholic beverages i.e. Indian and foreign liquor made are fully covered under definition of food and FSSAI is enforcing the Regulation.

2.12 Food Safety and Standards (Fortification of Foods) Regulations, 2018¹⁴

These Regulations have been made to permit addition of micro nutrients like mineral and vitamins in food with the objective of reducing the risk of deficiency in micro nutrients in the population, improving the health of consumer and improving the nutritional quality of the food. The fortified food should provide the 15 to 30% of Indian adult RDA of micro nutrient calculated on average calories in-take of 600 Kcal derived from processed foods (approximately 1/3rd of the daily energy requirement for an adult). For example edible salt must be fortified with iodine with a maximum limit of 300 ppm on dry weight basis before sale and consumption of human beings. There are other product fortified milk, fortified oil, fortified Atta & Maida and fortified rice, fortified cereals product, fortified bakery wares, fortified fruit juice available in the market.

2.13 Food Safety and Standards (Food Safety Auditing) Regulations, 2018¹⁵

These regulations include criteria for granting recognition to auditing agency, accredited bodies for the purpose of inspection / audit of food business on behalf of FSSAI. There are several million of FBO in the country and this is not possible by Regulatory Authorities to have an effective check on all. So, third party inspection /auditing system has been introduced by approving the accredited /certified agency have technical competency in their domain.

2.14 Food Safety and Standards (Recognition and Notification of Laboratories) Regulations, 2018¹⁶

Under these Regulations, private laboratories duly accredited under ISO 17025 have been approved and notified as primary food laboratory or as referral food laboratory for undertaking the analysis food sample which are duly recognised by FSSAI for different purposes including litigations. The objective of these regulations is to have a network of technically competent food laboratories in the country for testing of all parameters as described under standards and FSSAI can utilised their services on payment basis.

2.15 Food Safety and Standards (Advertising and Claims) Regulations, 2018¹⁷

These regulations keep a check on false and misleading advertisement and claims such as nutritional claim, health claim, and non-addition food additives claim like sugar, salt and non-addition of claim regarding food additives, claim regarding dietary guidelines. Different claims permitted with various foods have been given in schedule which can be utilized for the purpose of advertisement and claim and for label declaration. The list of prohibited claims has been given for guidelines. For reduction of disease risk claims which are not

defined, the food business operator has to seek prior approval. Prohibited claims have also been defined here.

2.16 Food Safety and Standards (Packaging) Regulations, 2018¹⁸

Earlier Packaging and labelling Regulations were clubbed together. Now this is individual dealing with different type of Packaging material suitable for use in Food. This is the choice of the FBO as to which type of Food grade packaging material he uses depending upon nature of food and shelf life of product packed in it.

2.17 Food Safety and Standards (Recovery and Distribution of Surplus food) Regulations, 2019¹⁹

There is a huge loss of prepared food at commercial level especially in marriage party or other ceremonies and these are thrown as waste due to excessive preparation of different varieties. Whereas, on the other hand millions of people go hungry and die of hungriness due to poverty. These regulations have taken care to specify the role and responsibility of food donor and voluntary organisation engaged in surplus distribution of food to needy organisation/person free of cost. This has to be ensured by distributing organisation that food is wholesome and fit and safe for human consumption and has been transported under proper sanitary and hygienic condition.

2.18 Food Safety and Standards (Safe food and balanced diets for children in school) Regulations, 2020²⁰

Under these Regulations, a control has been made on the sale of midday meal and other food being manufactured and sold in the school premises. Obesity amongst school children and supply of the balanced diet and nutritive food through school canteen is one of the major issues which is causing health problem towards the school children. These Regulations ensure the responsibility of the school Authority for ensuring safe food and balanced diet in the school premises, sale of food licensee vendor, promotion of safe food and balanced diet in and around school campus, restriction of marketing and sale of food products high in saturated fat or trans-fat or added sugar or sodium, promotion of food which is not high in saturated fat or trans-fat or added sugar or sodium, encourage balanced diet.

2.19 Food Safety and Standards (Foods for Infant Nutrition) Regulations, 2020²¹

Food for infant needs special attention keeping in view their health and growth. These regulations describe such foods for consumption of infant taking care of optimum use of nutrients and restriction on use of food additives. These foods are; (1) food for infants based on traditional food ingredients known to be prepared traditionally at home for feeding infants, for use after six months up to twenty-four months age; (2) Food for special medical purpose intended for infants, a substitute for human milk or formula specially manufactured to meet the special nutritional requirement of infants from birth to twenty-four months; (3) Follow-up formula for infants for use after six months to twenty-four months as a complimentary diet; (4) Infants formula breast milk substitute product with other ingredients suitable of infant feeding to meet nutritional requirement of infants for six months; (5) Milk cereal based complimentary food for use for infants from six months to twenty-four months having a ingredients like milk ,cereals etc.; (6) Processed cereal based complimentary food for use amongst infants after six months up to twenty-four months with main ingredients as cereal and pulses etc.

2.20 Food Safety and Standards (Labelling and Display) Regulations, 2020²²

These Regulations are most important regulation from consumer view- point and their knowledge. This describes about the nature of the food, fancy name of the food, detailed ingredients, manufacturer or packer, packing date and expiry date, batch number for identification, vegetarian or non-vegetarian food, nutritional information like energy, sugar, fat, protein, salt etc. detail of the allergens present in the food ingredients, health claim and other claims made by the manufacturer, country of origin, instruction and storage of the food. Declaration if article of food is injurious to health. There is lot of misnomer on label, hence consumer must look into technical name of food before purchase along with ingredients, nutritional value like fat, protein, sugar and energy and should not be misguided by brand /fancy name.

2.21 Food Safety and Standards (Ayurveda Aahara) Regulations, 2022²³

These Regulations describes about food prepared according to recipes or ingredients or processes through method described in authoritative books of Ayurveda. This does not include Ayurveda drugs, medicine etc. This food is basically for promoting health or to meet specific physiological needs etc. The quality of Ayurveda aahara and its characteristics should be in proximity with as mentioned in the Ayurveda book. Any packed food for daily

use for dietary purpose such as pulses, rice, flour, vegetables etc. is not covered under this regulation unless these meet the provision of the Regulations on additives, contaminants, packaging, restriction on sale etc. No claim for treating human disease should be made as per regulations requirement. Ayurveda aahara is not applicable for infants up to twenty-four months. No external addition of vitamins, mineral and amino acid are allowed. This should contain an advisory warning that it is only for dietary use and not a substitute for varied diet.

2.22 Food Safety and Standards (Vegan Foods) Regulations, 2022²⁴

Vegan food is the food or food ingredient, including additives, flavourings, enzymes and carriers, or processing aids, which are not products of animal origin and in which, at no stage of production and processing, ingredients, including additives, flavourings, enzymes and carriers, or processing aids that are of animal origin has been used. The food products to be called vegan, shall not involve animal testing for any purpose including safety evaluation, unless provided by any Regulatory Authority. FBO is required to obtain approval from FSSAI for use of vegan logo.

3. Other Regulations

There are other Regulations dealing with administrative and financial matter for smooth running of the FSSAI these are:- Food Safety and Standards Authority of India (Transaction of Business at its Meetings) Regulations, 2010; Food Safety and Standards Authority of India (Procedure for Transaction of Business of the Central Advisory Committee) Regulations, 2010; Food Safety and Standards Authority of India (Salary, Allowances and Other Conditions of Service of Officers and Employees) Regulations, 2013; Food Safety and Standards Authority of India (Transaction of Business and Procedure for the Scientific Committee and Scientific Panel) Regulations, 2016; Food Safety and Standards Authority of India (Recruitment and Appointment) Regulations, 2018; Food Safety and Standards Authority of India (Financial) Regulations, 2023.

4. Enforcements

The main focus of the FSSAI is on Licensing of all food business operators (FBO) in the country, introduction of self-compliance of food safety requirements by FBO including sanitary and hygienic conditions, strengthening of food safety laboratories for testing of quality and safety parameters, a concept of notification and approval of private laboratories in the regulatory compliances, enhancing the technical competency of the testing laboratories by virtue of mandatory certification of ISO 17025 beside approval by FSSAI and specifying the scope of testing along with the different food commodities, introduction

the system of approval of third party certification through private certifying bodies, inspection of the food premises besides introduction of training to the food operators by the certifying bodies. Above these, the FSSAI at central level has involved themselves in implementation of the Act and Rules and Regulation through issue of the licenses to major FBO, propriety and nutraceutical food and certification for vegan food, dealing in the enforcement of imported food etc. Therefore, basically all the control at present lies with the FSSAI save with issue of the license and inspection etc. by State government food official for particular segment of FBO's. Licensing system had been introduced for all the FBO in the food chain except farmer. Animal feed is also being covered under definition of food, thus empowering the FSSAI to take due care for safe animal feed being manufactured by the animal feed manufacturers. The objective of this is to ensure that animal feed which is consumed by the animals or by the mulching animal like cow, buffalo etc. from whom the milk is extracted and consumed by human being in different form as milk and milk product are specially free from toxicant like antibiotic, drug residue, and other micro toxin, pesticides etc. The same analogy lies with the animal and birds which are used as food. For example egg, chicken, goat and sheep meat and buffalo meat etc. The limitation and scope of the State Government food officials have been clearly defined through Rules, Regulations and Advisories. FSSAI is also involved in capacity building for Food officials and FBO, awareness programme by way of organising seminar, conferences, Mela, general public programme, utilization of mobile food laboratories for detecting, adulteration in food.

Under the Food Safety Act, adulteration has been categorized as sub- standard and/or unsafe food only beside misbranding and non-compliance of the labelling requirements. Whereas, in case of sub- standard and misbranded food, the action is initiated through adjudication and there is provision for fine only and no imprisonment. This is unlike the earlier Act under PFA, thus facilitating the FBO for early disposal of the cases. Only in case of unsafe food there is provision of criminal offense and proper legal procedure has been laid down for legal proceedings with fine and imprisonment depending on the nature of the unsafe food (Table 1).

Table1 shows details of enforcement samples, outcome for the year 2023-2024. (Source – FSSAI Annual report 23-24).

Table1. Details of enforcement samples, outcome for the year 2023-2024. (Source – FSSAI Annual report 23-24).

Details of enforcement samples analyzed, found non-conforming and penal action taken during the year 2023-24															
S. No.	State/UT	No. of Samples lifted	No. of Samples Analysed	No. of samples found Non-Conforming during the year	Non-Conforming Samples			Details of Civil Cases				Details of Criminal Cases			
					unsafe	Sub Standard	Labelling defects/ Misleading claims/ others	No. of Cases Launched	No. of Cases decided		No. of pending cases	No. of Cases Launched	No. of Cases decided		No. of Pending Cases
									Convicted with penalty	Penalties Realised (₹)			Convicted with Fine and Imprisonment	Penalties Realised (₹)	
1	Andaman And Nicobar Islands	0	0	0	0	0	0	0	0	0	2	0	0	0	0
2	Andhra Pradesh	6443	6439	472	133	331	8	312	646	4177500	639	80	8	760000	562
3	Arunachal Pradesh	328	501	11	3	7	1	7	2	20000	9	5	0	0	5
4	Assam	1146	1139	125	38	64	23	30	0	160000	171	4	0	0	38
5	Bihar	3491	2806	126	34	73	19	65	79	800000	552	25	0	0	174
6	Chandigarh	333	311	49	8	36	5	128	87	1706000	99	31	52	1850000	87
7	Chhattisgarh	1457	1373	167	9	137	21	109	86	1571000	280	23	2	10000	226
8	Dadra and Nagar Haveli & Daman & Diu	185	185	0	0	0	0	0	0	0	0	0	0	0	1
9	Delhi	3412	3412	150	92	51	7	113	36	1974500	609	67	12	380500	222
10	Goa	599	599	16	3	8	5	28	17	0	16	6	0	0	12
11	Gujarat	10875	15841	910	64	797	49	847	1701	18198400	4372	31	65	2788000	515
12	Haryana	3445	3485	856	113	690	53	818	593	7424900	1522	117	47	497000	545
13	Himachal Pradesh	1769	1618	401	17	84	300	489	376	5093500	538	7	2	7000	74
14	Jammu & Kashmir	9046	9057	750	34	616	100	1467	1612	14360300	3128	30	22	662500	169

Details of enforcement samples analyzed, found non-conforming and penal action taken during the year 2023-24															
15	Jharkhand	877	384	292	39	168	85	240	59	328000	478	43	0	0	154
16	Karnataka	5492	5492	286	211	62	13	75	75	1198500	361	191	16	210000	254
17	Kerala	10466	10792	1304	994	297	13	2464	854	4658500	1610	2347	134	3086500	2213
18	Ladakh	651	638	11	0	10	1	28	19	147500	12	0	0	0	0
19	Lakshadweep	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	Madhya Pradesh	14939	13998	2022	108	1486	428	2114	1938	29634248	3811	47	46	188003	976
21	Maharashtra	9186	5087	1174	358	499	317	418	154	3823100	5101	191	0	0	2069
22	Manipur	264	168	3	1	1	1	0	0	0	0	0	0	0	0
23	Meghalaya	413	123	7	1	6	0	0	0	0	0	0	0	0	0
24	Mizoram	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	Nagaland	192	138	3	0	1	2	4	3	125000	14	0	0	0	0
26	Orissa	2003	2003	252	80	155	17	52	0	30000	139	80	0	0	228
27	Puducherry	31	31	0	0	0	0	0	0	0	0	0	0	0	0
28	Punjab	6041	6041	929	111	569	249	1577	1204	19874200	1019	76	102	1145000	421
29	Rajasthan	18536	18536	3493	526	2535	432	3580	2181	38372580	6550	83	12	177200	1356
30	Sikkim	231	231	0	0	0	0	0	0	0	0	0	0	0	0
31	Tamil Nadu	17090	18146	2237	1184	594	459	2091	2195	5593000	2533	944	478	12768000	2692
32	Telangana	6156	6156	973	123	850	0	457	425	5587900	590	0	0	0	177
33	Tripura	87	87	0	0	0	0	0	0	0	0	0	0	0	2
34	Uttar Pradesh	28144	27750	16183	2369	12126	1688	15621	14627	571786500	33541	1928	163	2261900	13939
35	Uttarakhand	1946	1998	192	41	143	8	355	332	95000	990	16	0	0	96
36	West Bengal	11043	5948	414	88	207	119	365	285	4513600	440	5	0	0	13
	Total	176317	170513	33808	6782	22603	4423	33854	29586	741253728	69206	6377	1161	26791603	27220

5. Common adulteration of different food^{25,26}

The common adulteration in food is enumerated and given as below. Simple methods for detection of adulteration are available (Table 2). These are basically for the consumer's knowledge and the methods prescribed are not confirmatory tests, hence adulterations have to be confirmed in a laboratory only by official methods as prescribed in the approved manuals for tests by FSSAI. Here, common adulterants in food are given:

5.1 Milk and milk products

Addition of water in milk is very common. Detergent in milk, starch in milk and milk product (like khoya, paneer), mashed potatoes, sweet potatoes and other starches in Khoya, fat deficiency in Khoya and paneer, Hydrogenated vegetable Oils, palm oil, animal fats etc. in ghee.

5.2 Oils and fats

Other cheaper oil in costly oils of similar nature, TOCP (Tri-Ortho-Cresyl-Phosphate) in oils and fats, Contamination of argemone oil, mineral oil in other oils.

5.3 Sugar and confectionery

Addition of sugar solution, inverted syrup, commercial liquid glucose in honey, chalk powder in sugar / powdered sugar, aluminium leaves in silver leaves.

5.4 Food Grains and Its Products

Excessive presence of extraneous matter (dust, pebble, stone, straw, weed seeds, damaged grain, weevilled grain, insects, rodent hair and excreta) in food grains; Dhatura in food grains; excess bran in wheat flour; khesari dal in dal whole and split; added colour in food grains; turmeric in Sella rice; rhodamine B in ragi; sand, soil, insects, webs, lumps, rodent hair and excreta in Atta, Maida, Suji (Rawa).

5.5 Salt, Spices and Condiments

addition of foreign resin in asafoetida (hing); papaya seeds in black pepper; light black berries in black peppers; soap stone or other earthy matter in asafoetida (hing); artificial / oil soluble synthetic colours in chilli powder; dust in chilli powder; starch in asafoetida; exhausted cloves in cloves; black pepper / cloves coated with mineral oils; cassia bark in cinnamon; coriander powder, salt powder or talc powder added in chilli powder; Argemone seeds in mustard seeds; lead chromate in turmeric whole; artificial colour in

turmeric powder; dust and powdered bran in powdered spices; coloured dried tendrils of maize cob in saffron; Volatile oil extracted from cloves and cardamom.

5.6 Fruits and Vegetables

Addition of malachite green in green vegetables like bitter gourd, green chilli and others, artificial colour on green peas; rhodamine B in sweet potato.

5.7 Beverages

Detection of clay in coffee powder; chicory powder in coffee powder without declaration; exhausted tea in tea leaves; iron filings in tea leaves through processing. Table 2 shows Simple Test for adulterant detection in common food

Table 2. Simple Test for adulterant detection in common food

S. No.	Food Commodities	Adulterant	Test
1	Milk	Water	- Put a drop of milk on a polished slanting surface. - Pure milk flows slowly leaving a white trail behind. - Milk with added water will flow fast.
2	Milk	Detergent	- Take sample with an equal amount of water, shake thoroughly. - Milk adulterated with detergent, forms dense lather.
3	Milk and Milk product	Starch, Maida	- Boil sample with same quantity of water if in solid form. - Cool and add few drops of iodine solution. - Blue colour shows the presence of starch.
4	Sugar and jaggery, salt	Chalk powder	Add a little quantity of sample in a water kept in transparent glass, shake well. In presence of chalk it will settle down at bottom and will not dissolve.
5	Food grain	Detection of sand, soil, stone, insect, damaged grain etc.	All types of whole grain must be thoroughly checked and the foreign matter could be seen.
6	Dal	Khesari dal	- Examine dal with naked eyes. Khesari dal has wedged (phawda) type shape. - Chana dal will have natural appearance with rough surface.
7	Black pepper	Papaya seeds	- Add some black pepper to a glass of water. - Black pepper settles at the bottom. - Papaya seeds float on the surface of water.
8	Spice powder	Saw dust	- Add the sample to water. - The saw dust will float at the surface of water, while spice powder will settle down.
9	Fruits and vegetables	Artificial colour	- Rub the water-soaked cotton with the fruits and vegetables. - Artificial colour will appear in the cotton.
10	Tea	Iron filing	Rotate a magnet over tea, magnet will attract iron filing

Conclusions

1. FSS Regulations are Dynamic and there are continuous improvements to achieve goal of providing safe and nutritious food to consumers in the present scenario of food safety eco system. This has resulted that not only FBO has to update his knowledge for compliances, but consumers have to be very cautious while purchasing a food for his utility.
2. Due to new products coming in to market especially with an exaggerated claim /misleading information, particularly fortified food, nutraceuticals/health claim /Ayurveda food/weight reducing, with very high cost, consumer must take extra precautions while purchasing those foods. Though regulations have been made to inform consumers through label declarations, but these are hardly read by consumers. Consumers should not be misguided by the brand name of food. Mostly brand name does not depict clear nature of food most particularly for proprietary food. But he should look for actual name of food, its ingredients details.
3. In the era of online procurements of food particularly prepared Food, Consumers should be careful to ensure freshness of the food, its food grade packing materials/boxes, before consumption. While placing orders, ingredients and cooking medium must be checked. Perishable veg. and non-veg food should be physically examined before use.
4. Menu for prepared food in eating place must display calories and presence of allergens. Sweet shop must display use by date for each item. Personnel and premises hygiene must be watched by the consumer at eating places as to whether the place is suitable for eating.
5. Fresh cut fruits/ vegetables, chilled and frozen foods being sold in street food markets may be contaminated. Water for washing food and drink is the biggest source of contamination. Proper storage temperatures are often not maintained. These causes food poisoning, stomach upset, dysentery etc.
6. In many food, artificial sweeteners are allowed. As a consumer, he must ensure to avoid continuous and excessive use of such foods, as these are chemicals and prolonged use can cause health problems.
7. Consumer is a part of safe food chain; hence he has to ensure himself not only at home but outside also while purchasing or consuming any food that he devotes adequate time and attention for having safe food. In case any unsafe/ misbranded food comes to his knowledge at any point of time, it is his duty to inform concerned food safety Authority and he should

not simply ignore them. Safe food purchase should be the only criterion of a consumer and not the price. But this should be kept in mind that it is not necessary that costly foods are safe and cheap food are not safe. He himself should judge the safety of the food first and then price reasonability. In this process, use by date is very important and quantity of food purchases should be dependent on consumption pattern and use by date to avoid wastage of food.

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Author's contribution

This review paper is solely written by author.

Conflict of interest

There is no conflict of interest

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