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Research Paper on Food Safety Regulation in India
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Food Safety Regulation In India: Legislative Design, Implementation And Enforcement Under The Food Safety And Standards Act, 2006

1. Introduction

The safety of food is a responsibility for public health; it is an issue of consumer protection and provides the basis for consumers' trust in the food market at both national and international levels. Food that has been contaminated may cause immediate illnesses and future health problems. If food labeling and quality standards do not meet what consumers require, then there will be fewer options available to them, and competitive markets will suffer.Food travels through supply chains from large manufacturers and exporters to small producers, processors, caterers, street vendors. Regulations apply equally throughout the country, however their application differs significantly based on the jurisdiction and the size as well as type of business.

The food safety and standards act (FSSA) of 2006 represented an institutional shift. It combined many previous laws and orders into one more comprehensive statute that was based on scientific principles. Under the FSSA, FSSAI assumed the role of the national regulatory body that establishes and enforces standards for food products, and conducts other regulatory functions. Regulations under the Act address food products and standards for food products; licensing and registration; sanitation and hygiene; packaging and labeling; contaminants and additives; and other technical aspects.

Additionally, these regulations include requirements for preventive obligations placed upon food business operators; inspections; sampling; testing; adjudication; and prosecutions.

Although the establishment of a unified statutory framework has helped to reduce operational inefficiencies, it does not completely remove them. The effectiveness of the statutory framework

depends on several factors such as staffing levels; budget allocations; laboratory equipment availability; turn-around times for test results; effective case management strategies; and cooperative relationships among various regulatory agencies. These are not just administrative problems. They determine whether violations are identified; whether adequate evidence exists to pursue enforcement actions against operators; whether operators receive directives from regulatory bodies to implement corrective measures; and whether follow-up actions occur. Enforcement statistics offer only one small part of the overall picture of this system.

For example, according to government statistics, out of 170,535 samples tested in 2024-25, 34,388 (about 20.16%) were determined to be non-compliant. Similarly, approximately 19.83% of samples tested in 2023-24 were non-compliant and approximately 25.14% of samples tested in 2022-23 were non-compliant. While data merits examination, sample selection is a factor. Complaints, risk assessment, targeted campaigns and intelligence gathered prior to testing may all impact which samples are subjected to enforcement actions.

Non-compliance is also a continuum. Severity of violations varies, and not all violations indicate an immediate threat to consumer health. India's federal system adds another level of complexity. National standards are implemented via a federal statutory structure, however most day-to-day enforcement is conducted by state or union territory agencies. Therefore, the system relies upon national uniformity along with the local administrative capacity simultaneously.

Variation in reporting methodologies, laboratory access, follow-up procedures among agencies can lead to aggregate national statistics masking substantial differences in performance. Rigor of the law is not the sole consideration. Credible evaluations must assess whether responsibilities are clearly defined, whether agencies have resources to fulfil them, whether enforcement is proportional and evidence based or whether citizens can evaluate results. This paper analyses legislative design and implementation of food safety regulation in India, and surveys available evidence on enforcement, identifies recurring deficiencies and proposes a sequential reform agenda.

1.1 Research Questions

i. Does the fss act (2006) provide an adequate and comprehensive legal framework for food safety?

ii. How are regulatory responsibilities divided between FSSAI, Central government, State or Union Territory governments?
iii. What implementation failures exist in inspection, sampling, testing laboratories, adjudication and follow-up procedures?
iv. What do official enforcement data indicate regarding non-compliance and what limitations do those data possess?
v. How can enforcement become more risk-based, transparent and proportionate while maintaining minimum safety standards?
vi. Which institutional as well as compliance support reforms will best improve performance across all types of food businesses, including the small ones too?

1.2 Scope of the Study

This paper does not focus on one commodity or a specific foodborne illness. In contrast to the analysis of the regulatory framework for food safety as a whole; this paper examines the way in which the regulatory framework for food safety has been implemented and enforced at both state and federal levels by examining publicly available administrative data, audit reports etc. The main contribution of the paper is to link the design of the law to a measureable level of performance of regulation and to separate deficiencies in the statutory authority to regulate from deficiencies in the exercise of that authority.

2. Literature review

The food regulatory literature of India can be classified into four primary areas: the consolidation and standardization of food laws; the institutional arrangements for governing food safety under federalism; the capacity and effectiveness of food safety regulators; the difficulties faced by small food businesses in meeting their regulatory obligations; and the use of data and risk-based methods to enhance compliance.

2.1 Food Safety Laws and Regulatory Structure

The FSS Act (2006) consolidated many food-related laws into a single piece of legislation, creating an authority responsible for food safety. This type of structure has several benefits.Centralized process permits uniform standards as well as technical regulations can be updated, As scientific knowledge develops, responsibilities can be allocated to different actors in supply chain based on their respective

roles in assuring safety. Act also acknowledges that safety cannot solely rely on testing finished products. Food business operators bear their own responsibility to abide by act's provisions and the regulatory authorities maintain oversight.

The consolidated regulatory framework can only be as effective as the subordinate regulations, guidance and administrative practices that support it.

Therefore, standards should be understandable by the diverse stakeholders including the business community, inspection teams, laboratories and other parties involved in the process. Regulatory requirements must be capable of being enforced and revisions to those requirements must allow regulated entities sufficient time to comply. Operators who are smaller-sized and confront technical rules which are either complicated or revised on an frequent basis will likely have trouble interpreting those rules even though the underlying objective of the rule is to protect public health.

2.2 Administrative Capacity

Food safety regulation in India has been established at several levels within the federal government. The FSSAI (Food Safety and Standards Authority of India) is responsible for regulating food safety at the national level. The FSSAI performs many tasks including setting standards, providing scientific advice and coordinating efforts between various government agencies, states and union territories.This dual arrangement permits national uniformity with local knowledge. Nevertheless results in varied administrative capacity. Sanction positions, vacant positions, training opportunities, laboratory access, budgetary allotments, organizational structures all shape state government's capacity to conduct inspections and respond to findings.

In 2017, Comptroller& Auditor General of India (CAG) conducted a performance audit of implementation of food safety legislation in multiple jurisdictions. CAG reported that 65 out of 72 state laboratories audited did not hold accreditation from national accreditation board for testing as well as calibration laboratories (NABL). NABL accreditation has subsequently become mandatory for all laboratories conducting food safety testing. However, cag audit finding remains pertinent. Any reputable regulatory regime relies upon technical competence and the reliability of laboratories. Regulatory credibility also relies on whether agencies hold formal authority to collect samples.

2.3 Inspection measurement, enforcement inspection.

Sampling are key elements of an enforcement strategy. But counting inspections alone does not measure regulatory performance. A large number of inspection may indicate increased regulatory activity, but does not reveal much about the inspectors focusing more on operators posing greatest risk, or sample collection was adequate or the laboratory results were delivered timely, or violations were remedied. Similarly, increased reported violations may indicate improved targeting by regulators and decrease in market safety. Meaningful outcome measurement must account for sampling design, risk categories, and laboratory performance.

Severity of violations or non-conformity rates require special consideration. The numerator is usually number of samples failing applicable standards and the denominator is number of samples analysed under relevant enforcement program. Neither of the two necessarily represents a random sample of all products available to consumers. Comparisons among states can be confounded by product mixes, targeting strategies and test volumes, reporting practices and enforcement priorities. Meaningful comparison requires common definitions for data elements and the clear explanation of sampling methodologies.

2.4 Small Businesses compliance costs

Micro and Small businesses comprise a substantial portion of India's food sector. These businesses have to handle several function in restricted spaces, with minimal capital investment in equipment and no formal record-keeping systems. They also have little access to technical expertise. As such compliance cost can have a much greater effect on smaller manufacturers compared to larger ones. To comply, a manufacturer will likely need to invest in new equipment and make changes to how they operate their business; such as, hygiene practices (facility for hand washing), pest management (preventative measures to keep out rodents), water quality (clean drinking water), temperature control (maintain proper temperature), packaging (use of appropriate material) and recordkeeping (purchasing records). All of these factors indicate that there should be an established regulatory system in place which defines the bare minimum standards so that the regulator can enforce these standards when necessary, and take action to correct small issues.

3. Methodology

Research approach: Doctrinal or descriptive-analytical design. Thisstudy utilizes a descriptive-analytical design based solely on existing secondary sources or the doctrinal component analyses from statutory or regulatory frameworks lime the FSS act 2006, and related laws, regulations, enforcement statistics including audit findings. These analytical component helps to interpret both, in terms of institutional responsibilityimplementation capacity and policy options.

Data sources selection:

This study draws upon four sources:

a) FSS act and related subordinate regulations;
b) Official publications and press releases issued by FSSAI or ministry of health & family welfare;
c) CAG reports;
d) Published academic literature on food safety regulation, governance and compliance issues.

The official sources, statutory provisions, administrative figures and audit findings take precedence and the secondary literature provides context on institutional and implementation challenges. However, it does not replace primary legal and administrative evidence. Data analysis approach for the legal analysis identifies how authority on duty are allocated among government agencies, preventive responsibilities of food businesses and mechanisms for inspection , sampling, and testing. Enforcement and administrative analysis examines publicly available indicator data: samples analysed, samples reported as non-conforming and selected enforcement outcomes, reported annual totals are compared and a simple non-conformity rate is calculated as follows:

non-conformity rate (%) = (non-conforming samples ÷ samples analysed) * 100

Limitations

Rate is purely descriptive as enforcement samples are not drawn by probability sampling and as a result, the rate cannot estimate amount of unsafe food present in broader marketplace. Comparison between states indicate relative performance, but does not constitute definitive rankings. The study uses no interviews , surveys, laboratory experiments, field observation and cannot explain why particular authorities or businesses fail to comply. The research does not provide a basis for establishing causal relationships between enforcement actions and health outcomes due to differences in reporting methods over time and across different jurisdictions. The study identifies documented findings from interpretations and recommendations.

4. Data analysis and findings

National data shows that the number of non-compliant sample results from enforcement testings were a large portion of all enforcement testing in each of the three fiscal years reviewed. The percentage of non-compliant sample results was lower in 2023-24 than it had been in 2022-23; however, the percentage of non-compliant sample results was slightly higher in 2024-25 than it was in 2023-24.

Financial Year	Samples Analyzed	Non-Conforming Samples	Non-Conformity Rate
2022-23	177,511	44,626	25.14%
2023-24	170,513	33,808	19.83%
2024-25	170,535	34,388	20.16%

Source: ministry of health & family welfare, government of india, parliamentarypress release data; rates calculated from reported total; rounding may occur.

4.1 Interpretation of national trends in 2022-23

Roughly one-quarter of tested samples were non-conforming. This dropped to roughly one-fifth in 2023-24. The edged up slightly in 2024-25, when the absolute number of non-conforming samples increased from 33,808 to 34,388. During last two years, despite total number of samples analysed remaining relatively constant, the trend merits of ongoing examinationdoes not demonstrate that one-fifth of all food sold in India is unsafe.

Interpretation depends upon what and why was sampled. Authorities may intentionally test products generating complaints or that carry greater risk. This may be pushing observed rate higher than a representative market study would find. These targeted program can succeed even when its positive finding rate is high. The more relevant questions related to the processis testing based on risk. The important question is has the sample selection documented or do findings result in corrective action? The repeat violations should decline.

4.2 Differences between jurisdictions

The percentages of food samples that failed to comply with standards in different states are shown below based upon data from 2024-25. In terms of percentage failure rate: Rajasthan had the lowest at approximately 27.4%, Kerala was next at approximately 15.2%, followed by Madhya Pradesh at

approximately 11.7%. Uttar Pradesh had the highest percentage of failures at approximately 54.3%. It should be noted that these percentages reflect failures in compliance with standards in samples taken during this period and therefore cannot be used as an indicator of relative food safety or priorities for taking samples or types of products being sampled or the number of complaints received regarding food quality.

Differences in compliance failure rates across states may be attributed to a variety of factors. A valid comparison among states regarding compliance failure rates would require using common definitions, standardizing parameters such as sample characteristics, risk assessment profiles, completion rates for scheduled inspections, laboratory turnaround time, repeat violations and corrective action taken. Using a single percentage without standardizing these parameters will hide both successful actions taken by regulators to enforce food quality regulations and the reasons for non-compliance.

4.3 Enforcement outcomes

Civil case decisions imposing penalties increased from 29,586 in 2023-24 to 30,142 in 2024-25. The criminal convictions increased from 1,161 to 1,265 over same period. Numbers demonstrate enforcement activity, but do not reveal how long cases take to resolve, severity of violations, the penalty amounts, the compliance after orders or the share of cases overturned on appeal. A mature performance evaluation system would track sequence from identification of violation to verification of corrective action.

4.4 institutional Capacity

CAG audit of 2017 documents prior deficiencies in institutional capacity. Its finding that sixty-five of seventy-two state laboratories reviewed lacked NABL accreditation illustrates what occurs when enforcement authority is not accompanied by adequate technical infrastructure. Audit does not provide current national laboratory counts. The laboratory by laboratory data remain necessary on accreditation status, test scopes, staffing levels, equipment availability, repair, maintenance, replacement, timeframes, sample rejection rates and testing turnaround times

4.5 Evidence supporting conclusions

Three conclusions can be drawn with reservation. First non-conformity in enforcement testing continues. This warrants further study.

Second, differences between jurisdictions warrant standardized data collection for meaningful interpretation alongside contextual readings.

Third, counts of inspections, samples or penalties must be supplemented by measures of quality, timeliness, repeated violations and the public health consequences. The existing data can facilitate inquiry, or the activity monitoring, but cannot estimate prevalence across markets or attribute causality to reforms.

5. Recommendations for policy reform and discussion

5.1 Enforcement Gap

Evidence suggests an implementation problem that legislation alone cannot rectify. The FSS act establishes legal basis but its efficacy relies upon competent officials and well defined processes, supported by reliable testing, prompt action, Where positions remain unfilled or the laboratories are unavailable, the chain of enforcement may break before sufficient evidence exists to justify a legally defensible determination. In cases where notices are issued but corrective action cannot be demonstrated to mitigate risk, the system logs activity without demonstrating corrective action. The reform should commence with vigorous enforcement of existing law. The legislation may be necessary to fill gaps in authority. But nothing can replace due process or adequate funding for well-managed follow-through.

5.2 Clarifying Union-State responsibilities

FSSAI should continue leading on national standards and provide technical guideline, common data definitions, The State or the union territory governments should continue to assume responsibility for local enforcement, by providing staffing, inspection schedules, sample collection, enforcement of regulations and corrective action. A formal compact between Union government and each State or Union Territory could define minimum reporting requirements, annual capacity plans, the escalation procedures for persistent deficiencies, The reports published by Union Government should illustrate national progress as well as limitations faced by individual jurisdictions.

5.3 Proportionate Enforcement Based On Risk-Based Inspections

Frequency of inspection should be dictated by risk. For this the relevant factors include potential magnitude, probability of harm from product, type of product, size, complexity of operation, prior compliance history. Credible complaints lodged with authorities, repeated offenders and high-risk

establishments should receive closer scrutiny, whereas the low-risk establishments with track record of compliance may receive fewer routine inspections. Although complaint-driven or the targeted inspections remain viable, standardized checklists, written justifications for assigned risk levels, supervisory review would decrease inconsistency among inspectors. The enforcement should be graduated as well. Severe hazards, intentional adulteration or repeated non-compliance including procedural deficiencies that can be readily remedied warrant different responses. The proportionate responses increase legitimacy but it must not compromise minimum safety requirements. The authorities should document every corrective action directed toward establishment, the deadlines for completion, the verification visits, proof of completion, and the final outcome. Any repeat violations should trigger structured escalation.

5.4 laboratory and scientific capabilities

Enforcement is only as reliable as laboratories supporting it. Each state government should publish a current listing of food testing laboratories functioning within its borders, providing accreditation status, personnel numbers, equipment availability, geographical area served, and typical turnaround times for each laboratory. A mechanism of referral or collaboration among laboratories can assist jurisdictions lacking specialized testing capacity provided sample integrity and the chain of custody are maintained. Accreditation alone is insufficient, it must be supported by proficiency testing, quality assurance, timely disclosure of delays and invalid test results

5.5 Assisting Small Food Businesses

Small food business owners require assistance in complying. For this useful measures includingsimple guides, vernacular language training, standard hygiene templates, technical guidance on water quality control, food storage, pest control, temperature management, cleaning methods should be provided. The training should be evaluated based on subsequent compliance rather than attendance figures. Cases where deficiencies are correctable or do not present immediate threat to public health, authorities may permit owners to remedy deficiencies within a specified time frame. However, the serious or deliberate violations require immediate action regardless of size of business.

5.6 Improving data collection and Public Accountability

Centralized national dashboard should report:

- Inspection activities conducted by regulatory authorities;

- Sampling strategies utilized by authorities;
- Sample analysis results classified according to severity and type of analysis conducted;
- Laboratory turnaround times for those analyses;
- Enforcement actions taken, penalties imposed or convictions obtained for violations of laws enforced by authorities;
- Appeals filed against enforcement actions;
- Corrective actions taken by establishments completed and verified by authorities

Data definitions should remain consistent over time. Any modifications made to reported data should be documented. Cases where underlying records permit, dashboard should also permit stakeholders to differentiate legitimate food safety hazards from other types of regulatory non-compliance. A greater transparency will improve public understanding of regulatory performance and facilitate comparative analysis across jurisdictions.

5.7 Prevention, Traceability Recalls

Regulatory policy should place greater emphasis on preventing hazards prior to products reaching consumers. The establishments can contribute through various mechanisms:

- Food safety management systems such as HACCP;
- Supplier controls such as audits;
- Hygiene practices such as handwashing;
- Storage practices such as maintaining refrigerated products at correct temperatures;
- Temperature management during cooking;
- Traceability systems that record product origin;
- Recall procedures such as rapid notification

Digital tools can expedite recordkeeping and improve recordkeeping quality. It must be proportional to size of each establishment and supported by practical implementation guidelines

Also, the information sharing also needs to improve. The regulators or the public health agencies should share data on illness outbreaks. This requires signal identifications by public health agencies, sharing investigation findings and regulatory findings

The roadmap below outlines a series of reforms with measurable objectives and publicly reported performance measures and independent evaluations. Both FSSAI & State or Union Territory Governments share responsibility in achieving these objectives: FSSAI is responsible for creating and coordinating national standards and reporting; State or Union Territory Governments are responsible for implementing operational changes and publishing results of implementation.

Timeline	Priority	Lead Responsibility	Measurable Deliverable
0-6 Months	Establish National Baseline	FSSAI With State, UT Authorities	Publish Comparable Baseline Data on Staffing, Laboratories, Inspections, Samples, Case Outcomes, Turnaround Times; Document Data Definitions & Gaps.
0-12 Months	Address Critical Capacity Gaps	State or UT Governments; FSSAI Support	Each State Publishes Corrective Action Plan for Critical Vacancies, Laboratory Access and Training Needs.
6-18 Months	Adopt Risk Based Inspection Protocols	State or UT Food Safety Commissioners	All States Implement Documented Risk Criteria, Standard Checklists and Supervisory Review; Publish Inspection Coverage by Risk Category.
6-24 Months	Track Corrective Action & Case Disposal	State or UT Authorities & Adjudicatory Bodies	Record Deadlines, Follow-Up, Repeat Violations, Case Age, Final Outcome; Report Unresolved Serious Cases.
Within 24 Months	Launch Common Public Dashboard	FSSAI & State or UT Authorities	Quarterly Reporting of Samples and Non-Conformity Categories, Laboratory Turnaround, Enforcement Outcomes Using Common Definitions.
Within 24 Months	Expand Small Business Compliance Support	State or UT Authorities; Local Bodies & Industry Associations	Report Businesses Trained & Proportion Meeting Specified Hygiene Requirements at Follow-Up.
Within 36 Months	Improve Traceability & Recall Readiness	FSSAI or State Authorities and Food Businesses	Conduct Documented Recall, Traceability Exercises for Selected High Risk Categories and Publish Aggregated Findings.
Within 36 Months	Independent Performance Evaluation	Independent Evaluators Commissioned By Government	Assess Inspection Quality, Repeat Violations, Case Timeliness, Laboratory Performance, Data Comparability.
3-5 Years	Review Statutory & Regulatory Gaps	FSSAI, Union GovernmentStates	Publish Review Distinguishing Gaps In Legal Authority From Failures Of Implementation; Propose Targeted Amendments Only Where Justified.

6.1 Proposed Performance Measures

- **Staffing:** Percentage of Authorized Food Safety Positions Filled With Separate Reporting on Critical Vacancies.
- **Laboratories:** Percentage of Routine Samples Processed Within Prescribed National Turnaround Time; Accreditation Status & Scope Of Accredited Tests.

- **Quality of Inspections:** Percentage of Planned Risk Based Inspections Completed & Percentage of Planned Risk Based Inspections Requiring Corrective Action Where Necessary.
- **Corrective Action:** Percentage of Directives Issued Completed By Respective Deadlines After Verification; Number & Proportion Of Repeat Violations.
- **Case Management:** Median Time From Discovery To Final Disposition; Backlog Of Cases Awaiting Disposition; Outcomes By Civil Vs Criminal Proceedings.
- **Small Business Compliance:** Proportion Of Assisted Businesses Meeting Minimum Hygiene Standards At Follow-Up Inspections.
- **Traceability:** Completion Of Recall, Traceability Exercises For Selected High Risk Sectors & Findings Thereof.
- **Data Quality:** Completeness, Timeliness and Consistency Of Data Submitted By States To National Dashboard

7. Conclusion

The Food Safety and Standards Act (2006), which has created a statutory foundation for food safety regulation in India, was found to have a number of shortcomings in the area of legislative implementation. As indicated by the findings of this study, although there are sufficient laws and regulations in place to ensure food safety, they are not being consistently enforced or translated into measurable improvements in consumer protection. There is consistent noncompliance among tested food samples and institutional deficiencies have been identified in official audit reports.

Therefore, it appears that the ability of regulatory agencies to effectively monitor and control food safety is largely dependent upon having qualified personnel, access to appropriate laboratory services and prompt corrective action. A quantifiable reform program should begin with clearly defined baseline data and assigned institutional responsibility. Within six months, both FSSAI and state food safety authorities should develop a standard national assessment covering staffing vacancies, laboratory capacity, inspection activity, sample processing times and enforcement results. Each state should report comparable data using common definitions and then provide a public report each year. Within 12

months, every state should have an approved corrective action plan for critical staffing and laboratory deficiencies. Within 18 months, all states should implement documented risk based inspection protocols with inspection frequency determined based on the type of food being inspected, past violations and the potential for severe harm. Agencies should also develop systems to track corrective actions taken, repeat violations and resolution of enforcement cases. By the end of 24 months, FSSAI and state agencies should develop a common enforcement dashboard showing the total number of samples collected and analysed, the percentage of samples that were noncompliant, laboratory turnaround times, cases closed and repeat violations. A minimum of 90 percent of routine samples should be processed within a nationally established turnaround time and all exceptions and reasons for those exceptions should be reported transparently. Within 36 months, an independent evaluation should determine if the reforms have resulted in improved inspection quality, fewer repeat violations and greater compliance with existing food safety regulations considering changes in sample size and composition.

In addition to enforcement, compliance assistance should also be included as part of the same program. Within two years, state agencies should create targeted training and advisory programs for small food businesses. State agencies should report on the number of businesses trained and the percentage of businesses meeting specific hygiene standards during subsequent inspections. It is important to note that attending training alone should not be considered proof of improved compliance. Enforcement should be proportional to the violation. Serious or repeated violations should result in timely sanctions while deficiencies that can be corrected should be addressed through documented corrective actions and follow-up verifications. Legislative changes should only be considered when a comprehensive review indicates that the current administrative options do not adequately address existing deficiencies. The proposed targets must be established based on verified baseline data and existing resources. The study is limited due to its reliance on secondary evidence and due to the non-representative nature of enforcement sampling.

Therefore, it is impossible to infer from this study that noncompliance is representative of unsafe food throughout the marketplace. Additional research should investigate differences among states, risks associated with particular commodities and the relationship between enforcement actions and public health outcomes.

Ultimately, success should be evaluated by demonstrating improvements in regulatory responsiveness, sustained business compliance and preventing avoidable foodborne illnesses rather than by counting regulations issued or inspections conducted. India's statutory framework provides a strong base. Whether that base functions effectively in practice will ultimately depend on whether measurable responsibilities are assigned to individuals within institutions, sufficient institutional capacity exists and performance is reviewed regularly.

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