



The Ethiopian National Food Control System: status, challenges and recommendations

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RAISE-FS working paper #10

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The working paper highlights the significant challenges faced by the Ethiopian national food control management system. These challenges include the presence of multiple controlling ministries leading to overlapping mandates, inadequate alignment, and coordination among food safety actors, as well as insufficient provision and enforcement mechanisms. Addressing these challenges necessitates strong coordination and alignment among the multiple ministries involved in the food control system.

Keywords: Food safety, coordination, food control, Ethiopia

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Preface

Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE-FS) is a four-year program funded by the Dutch Embassy in Addis Ababa and hosted by Stichting Wageningen Research Ethiopia based in Addis Ababa, to bring about transformation in the Ethiopian food system. RAISE-FS will develop and implement a demand-driven and interdisciplinary approach to Research for Food System Transformation (R4FST) and as such contribute to the Government of Ethiopia's transformational agenda.

RAISE-FS adopts the food system approach as a Theory of Change (ToC), which helps in analysing the drivers and food system activities that contribute to the transformation of the food system by addressing leverage points, resulting in increased productivity, enhanced value chain performance, and improved human nutrition for food security while minimizing environmental impact and ensuring social inclusion.

The project aims to leverage transformation in Ethiopian food systems, covering the spectrum from food-insecure households and regions to better-off households that are food-secure and can realize production surpluses, towards commodity commercialization efforts that contribute to rural and urban consumption demands and export.

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List of abbreviations and acronyms

AF	Aflatoxin
APVDFQAC	Agricultural Authority, Animal Products, Veterinary Drug, and Feed Quality Assessment Centre
BCC	Behavioural Change Communication
EAA	Ethiopian Agricultural Authority
EABC	Ethiopia agricultural business cooperation
EAICD	Export Abattoir Inspection and Certification Directorate
EAS	Ethiopian accreditation service
ECAE	Ethiopian Conformity Assessment Enterprise
ECX	Ethiopia Commodity Exchange
EFDA	Ethiopian Food and Drug Authority
EIAR	Ethiopian Institute of Agricultural Research
EPHI	Ethiopian Public Health Institute
EU	European Union
FAO	Food and Agricultural Organizations of the United Nations
FBPIDI	Food, Beverage and Pharmaceutical Industry Development Institute
FDRE	Federal Democratic Republic of Ethiopia
FNP	Food and Nutrition Policy
GAIN	Global Alliance for Improved Nutrition
GAP	Good Agricultural Practice
GoE	Government of Ethiopia
GHP	Good Handling Practice
GMP	Good Manufacturing Practice
HACCP	Hazard Analysis Critical Control Point
IES	Institute of Ethiopian Standards
ISO	International Organization for Standardization
KII	Key Informant Interview
LMIC	Low and Middle-Income Country
ML	Maximum Level
MoA	Ministry of Agriculture
MoH	Ministry of Health
MoI	Ministry of Industry
MoTRI	Ministry of Trade and Regional Integration
PHPQD	Plant Health and Product Quality Directorate
RAISE-FS	Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems
SWRE	Stichting Wageningen Research Ethiopia
WHO	World Health Organization

Summary

An effective system for ensuring food safety is necessary to safeguard the general population from contaminated food and its harmful health impacts. It can also benefit a country's economy by increasing agricultural exports. This report presents the results of an assessment of the Ethiopian food safety system covering (i) the landscape of the Ethiopian national food control system and (ii) current challenges concerning food safety in selected sectors in the domestic and export markets. Based on key informant interviews complemented with literature and assessment of the relevant policies, this study identified the mandates of key national food safety actors as well as the challenges of the national food control management system. The five pillars, food laws and regulations, food inspection and certification, monitoring and surveillance systems (official food control laboratories), and information, education, communication and training for food control were assessed.

The main findings of this food control assessment are:

- Food Control Management in Ethiopia is characterized by a multi-ministry approach and a lack of coordination, fragmented institutional set-up and overlapping mandates. Food safety laws and regulations should be integrated into a farm-to-fork strategy. Incentives can be improved through a market-oriented production and controlling system, food safety incentives and engagement of the private sector. Awareness of food safety needs to improve throughout the food system.
- The Food & Nutrition Policy addresses the food safety challenges in the value chain. In addition, a comprehensive food safety law is required. Proclamations need updating and specific food safety standards need to be developed.
- For inspection and certification of food, there are overlapping mandates between the organizations responsible for animal as well as plant production and processed food. The number of inspectors and resources need to be increased and inspection of informal markets added to their mandate.
- The number of accredited laboratories with sufficient resources and with qualified personnel needs to be increased.
- Risk communication and awareness about food safety needs improving throughout the value chain. Food safety needs to be incorporated in the curricula starting at junior school up to university.
- The private sector needs to become proactively engaged in ensuring the safety of the food they trade, process and put on the market.

1 Introduction

Food safety and quality are essential for food security, public health and economic development. Access to safe food is a basic human right. However, ensuring food safety globally remains a significant challenge. Multiple non-communicable diseases are caused by consumption of food contaminated with bacteria, viruses, parasites or chemical substances resulting in around 600 million people becoming ill, of whom 420,000 die every year (WHO, 2022). The economic burden of foodborne diseases in low- and middle-income countries (LMICs) is estimated to result in a productivity of US\$ 95.2 billion annually, costing US\$ 15 billion for treatment (Jaffee et al., 2018). An effective food safety system is vital to maintain consumer confidence in the food system and to provide a sound regulatory foundation for domestic and international trade in food, which supports economic development.

Food safety risks are exacerbated in LMICs through several factors, including growing urbanization, lack of infrastructure to support the delivery of safe foods, changes in agricultural production practices, expanding and complex food systems, and the predominance of informal food markets (GAIN, 2020). An efficient food safety system is, therefore, essential to protect the general public from contaminated food and the negative health effects that go along with it. Additionally, an efficient food safety system can help a nation's economy by boosting agricultural exports.

In line with this, one of the objectives of Ethiopia's food and nutrition policy is to "Ensure the safety and quality of foods from farm to table" (FDRE, 2018). Foods are generally considered safe provided that care is taken from farm-to-table. However, food handling at each stage of the supply chain influences the safety of the food. Foodborne hazards (microbial, chemical, or physical) can contaminate food, in the field, during transportation, storage, display, handling at the point of sale, preparation, and consumption (Grace, 2015). Chemical contamination can lead to acute poisoning or chronic diseases such as cancer.

In Ethiopia, high aflatoxin (AF) contamination was reported in peanuts and peanut cake collected from local markets (Mohammed et al., 2016). Similarly, samples of red pepper powder collected from markets in Addis Ababa contained levels of both aflatoxin B1 and total AF above the maximum level (ML) (Aberedew & Ayelign, 2023). A large number of these incidents are caused by improper handling of food. In Ethiopia, just under half of food handlers practice safe handling of food (Tamene et al., 2022), which increases the exposure of consumers to food-borne diseases. Also at the household level, microbial hazards often result in illness and sometimes, premature death especially among young children (Abbott, 2019).

The Government of Ethiopia (GoE) has declared that it is in the process of updating and modernizing the country's food safety, and animal and plant health systems. Recently, it has made modest but positive regulatory steps at the federal level to combat foodborne illnesses and unlawful food marketing practices (such as adulteration, counterfeiting, misbranding, etc.) that potentially have detrimental effects on both the economy and public health. In 2018, the GoE developed its Food and Nutrition Policy (FNP) consisting of seven objectives that designated food safety and nutrition as a matter of public concern. One of these objectives is to "Ensure the safety and quality of food along the value chain" (FDRE, 2018). This objective establishes an enabling legal framework for strategies, laws, and regulations about food safety throughout the entire food system.

The national food control system in Ethiopia experiences multiple challenges including a lack of appropriate food safety assurance systems, legal and policy framework, coordination of organizations involved in food safety management, and laboratory services for relevant food hazards; these problems have become obstacles to Ethiopia's economic development and public health safety (Ayalew et al., 2013; Fanta & Tesafa, 2018; Teferi, 2020). Responsibility for food safety regulations, compliance, and inspection in Ethiopia is fragmented and disjointed across different ministries and executive governing bodies (GAIN, 2022).

In general, the national food control system is framed covering its objectives, scope and principles. The set objectives of a national food control system are: (i) protecting public health by reducing the risk of foodborne illness; (ii) protecting consumers from unsanitary, unwholesome, mislabelled or adulterated food; and (iii) contributing to economic development by maintaining consumer confidence in the food system and providing a sound regulatory foundation for domestic and international trade in food (FAO/WHO, 2003).

In terms of the scope, the national food control system covers all foods produced, processed and marketed within the country, including imported foods. Such systems should have a statutory basis and be mandatory. Concerning principles of food control, the main issues for consideration are maximizing risk reduction by applying the principle of prevention as fully as possible throughout the food chain. Applying the principles of

prevention includes: addressing the farm-to-table continuum; establishing emergency procedures for dealing with particular hazards (e.g. recall of products); developing science-based food control strategies; establishing priorities based on risk analysis and efficacy in risk management; establishing holistic, integrated initiatives which target risks and impact on economic well-being; and recognizing that food control is a widely shared responsibility that requires positive interaction between all stakeholders (FAO/WHO, 2003).

This report presents the results of an assessment of the Ethiopian food safety system covering (i) the landscape of the Ethiopian national food control system and (ii) current challenges concerning food safety in selected sectors in the domestic and export markets. The commodity specific food safety issues for oil seeds, pulses, potatoes, spices and poultry will be published as separate briefs.

The report is structured into four main sections.

1. The first section presents the methodology employed for the assessment.
2. That is followed by the key findings that cover the status of
 - a. The food control management
 - b. Food laws and regulations
 - c. Food inspection and certification
 - d. Monitoring and surveillance systems, and
 - e. Information, education, communication, and training for food control.
3. The third section deals with the current status of the role of private actors in the food control system in the country. Included in the fourth section are the main challenges facing the food business operators.
4. The last section provides conclusions and recommendations.

2 Methodology

The assessment of this study was done based on the related literature, policy and proclamations review and through a qualitative study that involved carefully selected 17 key informant interviews (KIIs) with relevant experts from government and private institutions engaged in the national food safety system (for details see Annex 1). The assessment follows the FAO Strengthening National Food Control Systems: Guidelines to assess capacity building needs (Hopper & Boutrif, 2006). The assessment of essential components of government activity in a food control system is presented in the five pillars of the food control system (see Figure 1), which include: food control management, food laws and regulations, food inspection and certification, monitoring, and surveillance (official food control laboratories), and information, education, communication, and training.



Figure 1 The 5 pillars of the food control system

The information generated about the national food control system is narrated qualitatively under each pillar of the food system control system. The results of the assessment were validated in a one-day validation and consultative workshop by engaging professionals and experts from relevant public and private organizations engaged in the food control system.

3 Key Findings: The status and challenges of the Ethiopian national food control system

As indicated in the methodology section above, a successful national food control system is built on five pillars:

1. Food Control Management
2. Food Law and Regulations
3. Food Inspection & Certification
4. Official Food Control Laboratory Services, and
5. IEC and Training.

Accordingly, presented below is the assessment of the current status of the national food control system along with key challenges in light of these five pillars.

3.1 Food control management

Food Control Management in Ethiopia is characterized by a multiple ministries approach and a lack of coordination, fragmented institutional set-up and overlapping mandates. Food safety laws and regulations should be integrated to a farm-to-fork strategy. Incentives can be improved through a market-oriented production and controlling system, food safety incentives and engagement of the private sector. Awareness of food safety needs to improve throughout the food system.

"Effective food control systems require policy and operational coordination at the national level" (FAO/WHO, 2003). The details of such functions are determined by the national legislation and they include the establishment of a leadership function and administrative structures with clearly defined accountability for issues such as the development and implementation of an integrated national food control strategy; operation of a national food control program; securing funds and allocating resources; setting standards and regulations; participation in international food control related activities; developing emergency response procedures; and carrying out risk analysis. Core responsibilities include the establishment of regulatory measures, monitoring system performance, facilitating continuous improvement, and providing overall policy guidance.

The organization of food control management in Ethiopia is characterized by a multiple ministries approach in which food control is a shared responsibility among three ministries and respective accountable organizations found under each of these ministries.

- **Ministry of Agriculture (MoA):** Organizations within MoA that are in charge of food control are the Ethiopian Agricultural Authority (EAA), Plant Health and Product Quality Directorate (PHPQD), Export Abattoir Inspection and Certification Directorate (EAICD), Animal Products, Veterinary Drug, and Feed Quality Assessment Centre (APVDFQAC), and the Ethiopian Institute of Agricultural Research (EIAR);
- **Ministry of Health (MoH):** Within MoH, the two accountable organizations dealing with food control are the Ethiopian Food and Drug Authority (EFDA) and the Ethiopian Public Health Institute (EPHI);
- **Ministry of Trade & Regional Integration (MoTRI):** The three organizations within MoTRI dealing with food control issues are the Institute of Ethiopian Standards (IES); Ethiopian Conformity Assessment Enterprise (ECAE), and the Ethiopian Accreditation Service (EAS).

The key challenges identified concerning food control management among these ministries and accountable organizations along with explanatory examples are presented in Table 1. The challenges cover issues related to (i) coordination and alignment, (ii) incentives, (iii) laws, provisions, and enforcement mechanisms, and (iv) capacity, awareness and attention.

Table 1 Key challenges of food control management

Categories	Key challenges	Examples
Coordination and alignment	Lack of coordination and transparency among stakeholders	Coordination among regulatory, private sector and other stakeholders is limited. As the national food control system is a multiple-agency system, all-inclusive coordinating forums would have created platforms for the identification and mitigation of problems as they appear. Such kind of limited coordination has created problems. For instance, spice exporters had experienced many challenges until they eventually got a government agency to support them fulfilling EU's regulation that imposed special conditions on Ethiopian spices.
	Fragmented arrangement of institutional setup and work activities	Both federal and regional institute arrangements create synergies as overlapping mandates.
	Institutional arrangement instability, weak operational system, high and frequent changes among officials (leadership) of the key actors.	Many government structures and higher officials frequently change for different reasons and that has affected the sustainability of the food safety system
	Overlap of mandates among institutions	<p>There are multiple agencies with common mandates, such as setting standards (IES, EFDA, Ethiopian Commodity Exchange (ECX)).</p> <p>There is a practice of standard setting and testing conformity by the same agency. ECX sets standards while at the same time, conducting laboratory tests. EFDA also sets standards and is planning to have its testing lab facility.</p> <p>There is no clear boundary between EFDA and EAA for the inspection of semi-processed products.</p>
Laws, provisions, and enforcement mechanisms	Inadequacy and lack of laws/regulations/standards	There is a lack of food safety laws in the country. The food security strategy of the country does not have food safety issues included in it. That is mainly because food availability has been more major concern than its safety. Food safety in general and aflatoxin control issues in particular are not well addressed at the policy level.
	Lack of traceability	Because commodities were purchased from various marketplaces, it is highly challenging to determine the source of a food safety problem that occurs.
	Lack of enforcement and acts	There is no inspection and enforcement for informal market and backyard slaughtering.
Incentive	Lack of market-oriented production and controlling system	The producers /manufacturers have limited knowledge about what to produce, how to produce, how to market and how to handle it. Nor do they have sufficient information/knowledge about national and international quality and safety requirements.

	Absence of food safety-based incentives	There is no clear purchasing price difference between products that meet or do not meet food safety requirements.
	Public-dominated system i.e. weak private engagement	There is limited private sector engagement in food safety control systems such as laboratory investment and capacity building activities.
Capacity, awareness, and attention	Lack of capacity including manpower and technologies	Staff of relevant agencies lack of needed awareness and/or competencies in food safety There is an imbalance between inspectors to industries and limited laboratory equipment.
	Limited awareness from top to bottom i.e. from government to community	Farmers fail to use GAPs, and good post-harvest handling practices, budget restrictions for safety issues.
	Lack of adequate attention to food safety problems by higher officials	Emphasis is on food security rather than food safety.
	Limited research on food safety	Scientific based evidence on food contamination such as mycotoxin, heavy metals, pesticide residual, adulteration, and microbial resistance is limited.

3.2 Food laws and regulations

The Food & Nutrition Policy attempts to address the food safety challenges in the value chain. In addition, a comprehensive food safety law is required. Proclamations need updating and specific standards need to be developed.

"The development of relevant and enforceable food laws and regulations is an essential component of a modern food control system" (FAO/WHO 2003). Currently, the Institute of Ethiopian Standards (IES) is responsible for developing standards and establishing a system that enables concerned bodies to check whether goods and services comply with the required standards. It is true that the Ethiopian Food and Nutrition Policy, food and nutrition strategies, many laws and regulations such as Food and Medicine Administration Proclamation No. 1112/2019; Meat Inspection Proclamation No. 81/1976; Veterinary Drug and Feed Administration and Control Proclamation No. 728/2011; Plant Quarantine Regulation No. 4/1992; and Pesticide Registration and Control Proclamation No. 674/2010 about food safety have been developed and are under the mandate of the various institutions for their enforcement. However, the key challenges linked with the food laws and regulations are presented concerning (i) the national food and Nutrition Policy, (ii) the enacted proclamations and (iii) the standards set in Table 2 below.

Table 2 Key challenges related to food law and regulations

Categories	Key challenges	Examples
The federal government of Ethiopia created a Food and Nutrition Policy (FNP) in 2018 that designated food safety and nutrition as a matter of public concern. "Ensure the safety and quality of food along the value chain"; is one of the key objectives of the FNP.	The food and nutrition policy does not clearly show a delineation of testing and certifying agents to avoid conflict of interest.	Food safety activities are spread across several institutions (e.g. MoA, MoH and MoTRI,) and not well coordinated at the federal level.
	Ethiopia does not have a national food safety law that manages legal matters involving food safety.	
	The food and nutrition policy lacks mechanisms of coordination among mandated actors.	

Proclamations	Most of the proclamations relevant to food safety are outdated.	For example, the Meat Inspection Proclamation (No. 81/1976) is 47 years old; the Plant Quarantine Regulation (No. 4/1992) is 31 years old.
	The Food Medicine Administration Proclamation No. 1112/2019 does not consider the informal market.	It provides the EFDA broad authority to inspect licensed establishments, but the regulators have no authority to inspect informal market areas.
	The Pesticide Registration and Control Proclamation No. 674/2010 pays little attention to the side effects of pesticides on human health and the environment in general.	Injudicious use of pesticides as well as the availability of banned and counterfeit pesticides on the market.
	The Plant Quarantine Regulation No. 4/1992 neglects food safety, with a scope limited only to plant health. Less attention is paid to domestic consumers and more attention is given to importing and exporting goods.	The regulation does not cover food safety risks that may have originated from plant origin foods.
	The scope of the Veterinary Drug and Feed Administration and Control Proclamation No. 728/2011 is limited, and it focuses only on animal health while neglecting human health concerns.	The proclamation only applies to commercially produced veterinary drugs and animal feeds.
	Meat Inspection Proclamation No. 81/1976	The scope of the proclamation only covers livestock meat; it neglects other animal source foods such as poultry. Neglecting informal markets, it only applies to formal markets.
Standards	Lack of mandatory food safety standards.	There are limited standards for spices and herbs that are produced in Ethiopia. The same is true for chicken meat and egg (mycotoxin standards for poultry feed, potato, spices and herbs are non-existent)

3.3 Food inspection and certification

For inspection and certification of food there are overlapping mandates between the organizations responsible for animal as well as plant production and processed food. The number of inspector and resources need to be increased and inspection of informal markets added to their mandate.

“Food inspection is the examination of a product or service for the control of food, raw materials, processing and distribution, including in-process and finished product testing, to verify that they conform to requirements” (FAO/WHO 2003). The EFDA, EAICD, and PHPQD are the key governmental organizations that perform inspections and give certifications. The administration and implementation of food laws require a

qualified, trained, efficient and honest food inspection service. In general, the mandates given to each of these organizations are presented in Table 3.

Table 3 Key inspection and certification bodies

Institute	Mandates
Ethiopian Food and Drug Authority (EFDA)	Inspection and certification of semi-processed and processed food items EFDA is capacitating regional regulatory bodies in terms of manpower and structure. For instance, offices are present in regional towns such as Bahir Dar, Kombolcha, Hawassa, Jimma, Dire Dawa, and Mekelle.
Ethiopian Agriculture Authority, Export Abattoir Inspection and Certification Directorate (EAICD)	Inspection and certification of abattoirs EAICD does not regulate or enforce backyard slaughtering--a practice that often leads to microbial contamination. Backyard slaughtering is not governed or enforced by any rules or systems.
Ethiopian Agriculture Authority (Plant Health and Product Quality Directorate (PHPQD)	Inspection and issuance of phytosanitary certifications for oil seeds, pulses and spices PHPQD has the legal basis to quarantine all imported and export plants and other products potentially infected with pests listed as quarantine pests. PHPQD is focusing on the export market and less attention is given to the local market

A close assessment of the inspection processes reveals the challenges for the regulatory body for national food inspection and certification processes. Those challenges are presented below in Table 4. under two categories: (i)mandate overlap of the different responsible organizations and (ii) the system related to inspection and regulations.

Table 4 Key challenges related to inspection and certification

Category	Key challenge	Example
Mandate overlap	Regulatory mandates on inspection overlap between inspection bodies	There is an overlap of mandates between food safety actors for inspection of semi-processed food, for example in the case of food of animal origin between processed meat and milk.
	Inadequate institutional arrangements and limited coordination between the mandated food safety inspection institutions	Food safety activities are spread across several institutions (e.g., EFDA, EAA and MoTRI) and their activities are not well coordinated at the federal level.
Inspection and regulation system	Regulators have no authority to inspect informal or traditional food markets	A high proportion of the local market system does not fall under the jurisdiction of EFDA. For example, red pepper powder (<i>berbere</i>) is mostly processed at the household level. However, producers are required to have licenses and that makes enforcement of regulations quite challenging.
	No regulation and law enforcement for backyard slaughtering	Informal backyard and marketplace poultry slaughtering especially during Ethiopian holidays—a traditional practice that often leads to microbial contamination. Such practice is not governed or enforced by any rules or systems.
	No strong inspection and regulation system for specific food value chains	The source of food contamination can start at any stage of the value chain; however, there is no system in place to do inspection and enforcement across the chain. There is also limited evidence on the prevalence of contamination at the different stages.

	Limited number of inspectors	Despite the growth of food industries, the number of food inspectors is not proportional to this growth. As a result, the limited number of inspectors are unable to discharge their responsibilities appropriately.
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3.4 Monitoring and surveillance (official food control laboratories)

The number of accredited laboratories with sufficient resources and qualified personnel needs to be increased.

"Laboratories are responsible for analysing food samples to detect, identify and quantify +50 contaminants such as pesticide residues, mycotoxins or heavy metals, and for analysing specimens from humans and foods implicated in food-borne illness outbreaks to identify the causes and sources" (FAO/WHO 2003).

Equally, assentation is the monitoring of contamination at relevant stages in the food chain and the timely surveillance of foodborne disease is essential. The establishment of laboratories requires considerable capital investment, and they are expensive to maintain and operate. EPHI, ECAE and APVDFQAC are the main food control laboratories in the country. All food analysis laboratories are not under the control of one agency or ministry. The main mandates of the stated organizations are summarized in Table 5 below.

Table 5 Key Food Control Laboratories in Ethiopia

Institute	Mandate
<p>Ethiopian Public Health Institute (EPHI)</p> <p>Established under regulation No. 301/2013 as an autonomous federal government office it is accountable to the Ministry of Health.</p>	<p>Research: Involved in examining priority health and nutrition problems, EPHI generates, absorbs and disseminates scientific and technological knowledge to improve the health of the general public;</p> <p>Surveillance: Engaged in early identification and detection of public health risks, it prevents public health emergencies through adequate preparedness; it alerts, warns and dispatches timely information during public health emergencies; it responds to public health emergencies effectively and timely; and ensures rapid recovery of the affected population from the impact of the public health emergency;</p> <p>Laboratories: Strengthens its laboratories with trained manpower and technology to undertake problem solving research; provides an effective response to public health emergencies; carries out referral diagnostic and analytical tests; and supports the capacity building of health and food science laboratories at the national level.</p>
<p>Ethiopian Conformity Assessment Enterprise (ECAE) is a state-owned enterprise managed by the Ministry of Trade and Regional Integration (MoTRI). It was founded in 2011. Its primary facilities are found in Addis Ababa, and it also has nine branch offices across the country.</p>	<p>Testing: ` bio-chemical and electro-mechanical tests for both food & beverages and other products such as electrical, mechanical, textile, leather, packaging materials, etc.</p> <p>Inspection</p> <p>Certification services to the industry and the public: Product certifications, system certification, cleaning plants and the certification of companies.</p> <p>ECAE is good at microbiological tests from various food matrixes, ECAE is ISO 17025 accredited to provide a wide range of chemical and microbiological tests. The enterprise has applied for accreditation for aflatoxin analysis.</p>
<p>Animal Products, Veterinary Drug, and Feed Quality Assessment Centre (APVDFQAC)</p>	<p>Testing</p> <ul style="list-style-type: none"> • Microbial safety and veterinary drug residue from animal products. • Pesticide residue from honey. • Feed safety and quality analysis. <p>Only lab that has been testing chicken meat (both imported and local) for veterinary drug residues.</p>

With the diverse roles and responsibilities, the key challenges facing the food laboratories covering issues are related to accreditation and availability of required lab equipment and consumables. The main challenges are presented in Table 6 along with some explanatory examples linked with the challenges identified.

Table 6 Key challenges related to food control laboratories

Category	Key challenge	Example
Accreditation of food control labs	A limited number of accredited laboratories	ECAE and Bless Agri Food Laboratory Services PLC are the only accredited laboratories ISO17025 for specific parameters. There are limited accredited laboratories for mycotoxin analysis.
	Lack of collaboration to access and use laboratory facilities	There is no system in place to access and use laboratory facilities. As a result, equipment of many laboratories malfunctions due to a shortage of reagents, chemicals, and spare parts
	Limited knowledge of biomedical engineers to maintain the laboratory equipment	Limited skilled personnel needed to maintain machinery like HPLC, LC-MS/MS, GC, etc.
Access to required lab equipment and consumables	Lack of availability of laboratory consumables, reagents, chemicals and spare parts	The laboratory analysis results are slow in performing the test analysis, results are often overdue.
	Limited access to exact specifications to purchase laboratory equipment	Due to lack of exact access to laboratory equipment specification purchasing dalliance, limited list of required accessories, guidance of installation and training are the key challenges.

3.5 Information, education, communication, and training

Risk communication and awareness about food safety needs improving. Food safety needs to be incorporated into the curricula starting at junior school up to university.

"Information, education and communication is the process of developing, packaging and disseminating appropriate messages to specific audiences to increase their knowledge, skills and motivation to make decisions that enhance food safety and quality" (FAO/WHO,2003) An increasingly important role for food control systems is the delivery of information, education and advice to stakeholders across the farm-to-table continuum. The EPHI, EIAR, Food, Beverage and Pharmaceutical Industry Development Institute (FBPIDI), Universities, and non-governmental organizations are involved in the national food safety IEC system. They all disseminate research outputs through publications, policy briefs and social behavioural communication approaches. The main mandates of the major relevant organizations in terms of IEC are presented in Table 7.

Table 7 Relevant key stakeholders and their mandates

Stakeholder	Mandate
Ethiopian Public Health Institute (EPHI)	Research and dissemination of research outputs through publication, policy brief and issue brief. Coordination of national programs (like the National Food and Nutrition Monitoring Evaluation and Research Steering Committee; scales up nutrition academia network, etc.) Awareness creation and informed measures to protect the consumer from unsafe, low-quality, adulterated, misbranded or contaminated foods Behavioural change communication.
Ethiopian Institute of Agricultural Research (EIAR)	Research and dissemination of research outputs.

Food, Beverage and Pharmaceutical Industry Development Institute (FBPIDI)	Research Capacity building for the food, beverage and pharmaceutical industry through training, Consulting services.
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There are two key challenges relevant organizations are facing concerning IEC: food safety awareness and education. They are summarized in Table 8 with explanatory examples.

Table 8 Key challenges related to information, education, communication, and training

Categories	Key challenges	Examples
Food safety awareness	There is limited food safety awareness at all stages throughout the value chain.	There is limited implementation of good agricultural practices (GAP), good handling practices (GHP), and good manufacturing practices (GMP).
	Lack of risk communication platform at EPHI, EIAR and FBPIDI	Limited communication strategies for the communities about food safety hazards and their health impacts.
	Limited media coverage of food safety	Media coverage plays an important role in raising consumer awareness and reducing the risk of exposure. However, there is limited coverage of food safety issues for national mass media.
Education	Limited food safety curriculum both for short- and long-term training	Food safety receives limited attention at universities, particularly at the undergraduate level

4 The role of private sector in food control system

The private sector needs to become proactively engaged in ensuring the safety of the food they trade, process and put on the market.

Given the complexity of the food control system to ensure safety across the food value chain, experiences in other countries indicate the need for a co-regulatory approach, which emphasizes a synergistic combination of self-regulation and legislative action that engages both the public and private actors (Chen et al., 2015). The growing public concern about food safety is putting increasing pressure on government agencies to be more prescriptive and proactive in their regulation of the food industry. However, given the scarcity of public sector resources, concerns about the impact of regulation on competitiveness and the scale of the task at hand, there is growing interest in co-regulation, with public and private sectors working hand-in-hand to deliver safer food at lower regulatory cost (Martinez et al., 2007). In this regard, the role of the private sector in the food control system is linked to two main aspects. While the first aspect has to do with participation in providing regulatory services to ensure safety, the second is related to ensuring self-regulatory measures as food producers per food safety standards set by the public sector. In this section, the status of the engagement of the two private actors in the Ethiopian context is presented.

4.1 Private Service providers

The participation of private service providers in the food control system in Ethiopia is very limited though there is huge demand for the service. Under Ethiopian law, in addition to having a business license, there is also a need to be accredited as per the ISO/IEC 17025:2017¹. In this regard, there is only one private food control laboratory known as Bless Agri Food Laboratory Services PLC. As an ISO/IEC 17025:2017 accredited laboratory, this private laboratory is engaged in providing food safety tests. The laboratory tests for which the company is accredited include testing the presence of:

- Heavy metals (Hg, Cd, Pb, and As) from chicken meat, oil seeds, pulses and spices;
- Microbial hazards (*Salmonella*, *E. coli*, coliform, aerobic count, etc.) from chicken meat, oil seeds, pulses and spices;
- Mycotoxins (particularly aflatoxins) in oil seeds, pulses and spices and pesticide residue in oil seeds and pulses.

However, there are several challenges this company is facing including machine maintenance problems (when its machines do not work, it takes a long time to maintain due to a lack of skilled personnel in the country); shortage of inputs such as spare parts, chemicals, certified reference materials (as most of the inputs are imported, the cost of proficiency testing procedure is very high); and lack of attention from the government in obtaining foreign currency to purchase consumables and chemicals.

4.2 Food business operators

One of the main actors in the food control system is the food business operators who need to abide by the country's food safety laws and regulations. To ensure food safety standards, operators also need to access the required services. The assessment indicates that these food business operators face diverse challenges in ensuring food safety while doing business. The main challenges identified include:

- The food control laboratories take too long to conduct food safety analyses, which in turn delays and results in pricing variations. There is a system of premium prices for short analysis time, but the reality is different;
- The high price of the food safety analysis (aflatoxin) from the food control laboratories;
- Lack of veterinary drugs;
- Lack of availability of safe poultry feeds in the market;
- Lack of modern transportation facilities to transport products from farms and abattoirs to shops; and
- The certification procedure takes a long time when a certificate, phytosanitary and non-genetically modified organisms, are required for export.

¹ <https://www.iso.org/standard/66912.html>

5 Conclusions and recommendations

The results presented indicate that presently Ethiopian food control management is characterized by a multiple agency approach and multifaceted problems. There is no well-integrated coordination mechanism. Some of the directives are outdated and as a result, it has been attempted to devise and put in place proclamations and laws that are important to increase the safety of food. There is a weak regulatory framework that may ignore the domestic market in favour of the export market. Food control laboratories provide ineffective laboratory services, and the lack of knowledge among stakeholders in the value chain of the aforementioned sectors suggests a lack of adequate information, education, communication, and training. The key recommendations to address these challenges are presented below under each food control pillar and the ministries in charge of discharging those responsibilities are given in parentheses along each of the recommendations.

5.1 Food control management

In connection with food control, ministries concerned are advised to:

- Promote collaboration among mandated institutions working on food safety to enhance national and regional mechanisms that coordinate the national food control system pillars to ensure food safety (MoH, MoA, MoTRI);
- Promote change of informal markets into formal markets as food items in the informal markets are more susceptible to contamination or devise a system to regulate the informal market (MoTRI);
- Provide special attention to food safety issues and allocate budget accordingly (MoH, MoA, MoTRI);
- Protect consumers based on scientifically based risk analysis (risk assessment, risk management, risk communication) (MoH, MoA, MoTRI);
- Enhance food safety along the supply chain MoA, MoTRI);
- Establish clear division of mandates for inspection of semi-process products (MoH, MoA, MoTRI);
- Promote professionalization of required food control management services at all mandated institutions (MoH, MoA, MoTRI); and
- Promote a co-regulatory approach for a synergistic combination of self-regulation and legislative action that engages both the public and private actors.

5.2 Food laws and regulations

Concerning food laws and regulations, ministries in charge are recommended to:

- Improve regulatory framework for both domestic and export markets (MoA and MoH with EFDA as lead);
- Update regulations and proclamations on food safety (MoH, with MoA as lead);
- Align all relevant policies & regulations with clear mandates for each organization;
- Voluntary standards of the major commodities should be considered to be made mandatory; and
- Develop food safety standards for those sectors that do not have one yet.

5.3 Food inspection and certification

Regards food inspection and certification, concerned bodies are advised to:

- Improve the regulatory and enforcement systems;
- Draft a food safety monitoring plan along with its implementation for the specific commodities;
- Establish an effective food safety risk communication platform; and
- Improve the regulatory framework for both domestic and export markets.

5.4 Monitoring and surveillance (official food control laboratories)

Regarding monitoring and surveillance, concerned bodies are advised to:

- Improve the national laboratory facility and capacity to undertake food safety analysis (MoTRI with ECAE in the lead,)
- Strengthen analytical laboratories, including accreditation along with the establishment of a clear division of mandates;
- Build capacity to maintain lab equipment needed for food safety analysis;
- Provide government support to import consumables (chemicals, reagents, standards, etc.) used in food safety analysis; and
- Encourage the private sector to participate in the laboratory services for food safety analysis.

5.5 Information, education, communication, and training

In connection with information, education, communication and training, concerned bodies are advised to:

- Establish a public-private food safety task force for effective IEC activities;
- Strengthen (establish) food safety risk analysis (risk assessment, risk management and communications) platforms.
- Create awareness and introduce behavioural change communication among stakeholders about food safety from farm-to-table for the specific sectors;
- Engage in food safety advocacy for decision-makers and food handlers;
- Enhance media coverage for food safety practices such as production, processing, transportation, storage and general food safety issues; and
- Organize farm-to-fork short- and medium-term food safety courses.

5.6 The private sector and the food control system

The private sector, through new initiatives as well as a coordinated approach, can contribute to food safety, specifically:

- To become proactively engaged in ensuring the safety of the food they trade, process and put on the market;
- Take the opportunity to establish services that support the food control system such as private laboratories, certification etc.; and
- To ensure self-regulatory measures as food producers following food safety standards set by the public sector.

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Annex I List of key informants interviewees

Organization	Function of key informant	Roles and responsibilities of the organization related to food safety
Debre Zeit Agricultural Research Centre, National Poultry Research Program	Researcher Researcher and program head	Doing research on poultry production and safety
Agriculture Authority, MoA	Export Abattoir Inspection and Certification Directorate Director	Inspection and certification of abattoirs
Holeta Agricultural Research Centre	Researcher	Doing research on potato breeding and postharvest handling
Food, Beverage and Pharmaceutical Industry Development Institute	Director oil seed directorate Spice and herbs Expert	Training, capacity building, research and development
Plant Health and Product Quality Directorate, MoA	Inspector	Regulation and giving phyto-sanitary certificate
Institute of Ethiopian Standards	Team leader	Developing food safety standards
Ethiopian Conformity Assessment Enterprise	Lab analyst (vice lab head)	Food safety analysis laboratory
Bless Agri Food Laboratory Services PLC	Laboratory head	Food safety analysis laboratory
Ethiopian Public Health Institute	Food safety research case team leader, Food Science and Nutrition Research Directorate	Research, awareness creation, BCC and communication
Ethiopian Food and Drug Authority	Food inspection directorate director	Food safety regulation
Animal Products, Veterinary Drug, and Feed Quality Assessment Centre	Laboratory analyst	Food and feed safety analysis laboratory
Ethiopian Institute of Agricultural Research	Food Science and Nutrition Research Directorate Director	Research
Quarit Agro Industry PLC	Expert	Export of oil seeds (sesame, soya bean, and peanut) and pulses (chickpea, haricot bean)
Belayneh Kindie Import and Export	Expert	Export sesame seed and soya bean
Warka Trading House PLC	Deputy manager	Export sesame seed and green mung bean
Fasica Spice and Baltina	Manager and company owner	Produce Berbere, Shiro and spice such as korerima, turmeric and black cumin (tikur azmud) for domestic and export market
Elfora Agro Industry PLC	Quality manager	Produce chicken meat and eggs for the domestic market



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implement a demand-driven and interdisciplinary
approach to Research for Food System Transformation
(R4FST) and as such contribute to the Government of
Ethiopia's transformational agenda.
