

Strengthening the Mauritius Food Control System for Enhanced Public Health and Life Protection

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SUMMARY

Reflections on future actions that could be used to promote effectiveness and sustainability of the national food control system in Mauritius are presented by drawing on professional experiences at the University of Mauritius and participation at the International Association for Food Protection 2023 European Symposium on Food Safety.

OVERVIEW

Strengthening national food control systems is strategic priority 1 of the World Health Organization global strategy for food safety (45). A food control system is defined as "... the integration of a mandatory regulatory approach with preventive and educational strategies to protect the whole food chain" (8). *Figure 1* presents a visual summary of the building blocks of a national food control system in accordance with Food and Agriculture Organization, World Health Organization international guidelines (8). Food laws and regulations provide the legal framework for implementation of food control activities to ensure food safety, food quality, food security, and economic growth as well as fair domestic, regional, and international trade.



Figure 1. Building blocks of a national food control system.

Mauritius is a small island located off the coast of East Africa with an upper-middle income economy (28). Recent milestones in the history of the country's primary food legislation include the adoption of the Food Act

2022, repealing the previous act of 1998, and the new Mauritius Food Standards Agency Act 2022 (10, 25). These legal texts will come into operation on a date to be fixed by proclamation (25). The objective of the Food Act 2022 explicitly addresses "safety and nutritional quality of food" (7), thereby steering the national food control system toward safe and nutritious food for all. Secondary legislation, namely the Food Regulations 1999, is currently being revised to update the requirements in line with international Codex standards and introduce mandatory hazard analysis [and] critical control point (HACCP) systems for specific food operations, namely, milk, meat, and fish processing, as well as water bottling (26). Codex activities in Mauritius are coordinated by the Codex Contact Point under the aegis of the Ministry of Agro-Industry and Food Security. Stakeholders participate in Codex standards setting through representatives on the National Codex Committee (27).

Food control management

Several authorities are involved in administration and enforcement of food and related laws in Mauritius. The Ministry of Health and Wellness has responsibility for enforcement of the Food Act and Food Regulations (1, 30). Previous research has reported the need for the development of a national food control agency (36) to overcome the gaps and overlaps of a multiple-agency system (8) as highlighted in *Figure 2*. Most recently, the adoption of the Mauritius Food Standards Agency Act 2022 demonstrates the government's commitment to improve effectiveness and efficiency of food control activities, thereby aiming to achieve a high degree of consumer confidence in the safety and nutritional quality of food (24). It provides for the establishment of a corporate body to direct and manage an integrated national food control system (*Figure 2*).

The Mauritius Food Standards Agency will play a leading role in food safety risk assessment, management, and communication. It will be required to provide scientific advice and technical support to the minister concerned in matters of policy and rules that affect food safety and nutrition (24). Policy setting involves articulation of a food control strategy that fosters an integrated approach to address interlinked food safety and nutrition priorities within the prevailing and emerging ecosystem (31, 37). Codex principles and guidelines provide practical guidance

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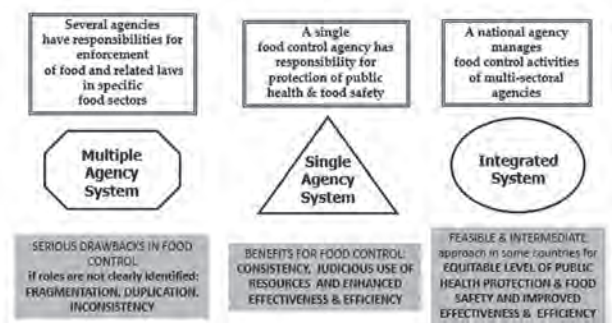


Figure 2. Organizational structures for national food control systems.

on a framework for the design and operation of the national control system that is schematized in Figure 3 (5). It is imperative that the forthcoming Mauritius Food Standards Agency applies principles of impartiality and integrity as well as risk, science, and evidence-based decision-making in the management of food control activities for positive public health outcomes. International initiatives on comprehensive food safety indicators and metrics provide valid insights (17) that could be adapted to the Mauritian context to continually track progress for sustained food control system success.

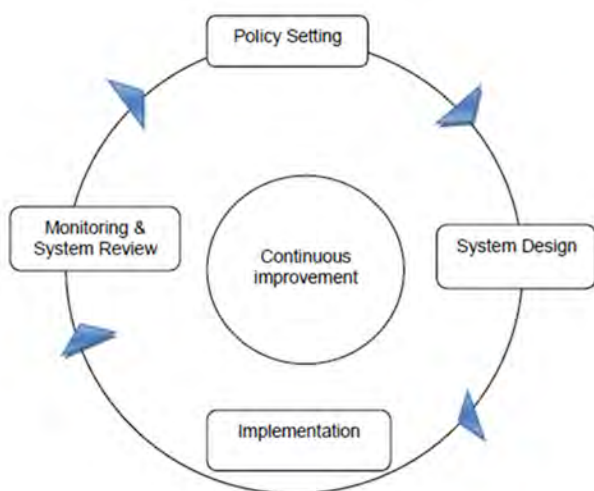


Figure 3. Framework for the development of a national food control system (5).

Inspection and laboratory services

The inspection service is a key function of the national food control system, whereas laboratory services fulfill food monitoring and epidemiological functions (8). In Mauritius, the health inspectorate, government analyst division, and central health laboratory of the Ministry of Health and Wellness are concerned with enforcement of the Food Act and Food Regulations (30). According to past research (36), proposed inspection and laboratory service improvements

from key informants' perspectives include the following: developing inspection manuals and enforcement codes of practice; strengthening laboratory facilities to ensure quality of data relating to the etiology of food incidents; and setting up of a foodborne disease surveillance, outbreak response, and investigation system that is fit for purpose. These recommendations are still relevant to the current food control landscape in Mauritius. Furthermore, it is important that the food control management body explores the feasibility of investing in whole genome sequencing as a powerful tool to diagnose, prevent, and manage foodborne disease outbreaks (15, 41).

The Mauritius Food Standards Agency Act 2022 provides for collection and analysis of data on food consumption, food safety hazards, food fraud, and incidence of foodborne disease to assess related risks (24). Food safety intelligence constitutes a factual basis for evaluation and continual improvement of national food control processes to enhance system performance. Hence, reliability, validity, and interoperability of food chain data are crucial to the effectiveness of risk control strategies in safeguarding consumer interests, trust, health, and life. According to a local news report, the mission of the Ministry of Health and Wellness includes transforming existing health services into a modern, high-performing quality health system. In this context, the government analyst division has recently achieved ISO/IEC 17025:2017 accreditation (20). However, there is a need for data sharing among competent laboratories, data curation, and comprehensive traceability solutions to establish efficient food fraud vulnerability plans, as well as foodborne disease prevention, tracking, and mitigation networks. Global partnerships are needed to apply tracing software tools in food recalls and solve complex foodborne crises (16, 19), paving a way toward the creation of a digital, responsive, and proactive food control system in Mauritius.

Monitoring of food law enforcement generates data that constitute an important input for national food control system review. In developing countries, human resources are often limited and enforcement officers may have multiple responsibilities, thereby impacting the adequacy of food control (8). Risk-based inspections contribute to prioritized enforcement activities and address resource challenges. International guidelines are available for use by regulatory bodies to determine frequency of food business inspections proportionate to food safety risks (9, 46). However, it has been argued that variability in risk assessment practices may have implications for the value of regulatory risk-based food safety inspections in the context of the European Union (EU) (3). Thus, enforcement officers must be adequately trained to ensure effective application of risk-based tools within their national political, economic, institutional, and cultural frameworks.

Information, communication, and education and training

Communication among the building blocks of a national food control system is vital to develop competence and shape culture toward success and sustainability in the global arena. Effective risk communication is imperative for food safety and may contribute to saving human lives in response to food incidents. Quality of scientific information in the public domain is critical to build consumer trust in food control. Debunking myths and misinformation is an evolving role of food scientists and is concerned with halting the negative consequences of infodemics on public health (33). It is increasingly important that scientists acquire communication and infodemic management skills to connect with nonscientific audiences, including policy makers, food businesses, and consumers to promote the societal impact of research. Credible scientific communication with policy organizations also contributes to ensure that food safety is a public health and socioeconomic priority.

The Mauritius Food Standards Agency Act 2022 provides for food safety and nutritional knowledge transfer to the public as well as training of food business employees (24). Food handlers and consumers need to nurture self-protection consciousness and adopt good food hygiene practices at all times to prevent foodborne disease. Continuing consumer education and food handlers' training are essential for the sustainability of food safety assurance efforts implemented throughout the food chain. The setting up of a food hygiene and safety academy could be the way forward to deliver stakeholders with lifelong education and training, while engaging with local and international partners to upskill enforcement officers, food handlers, and consumers in Mauritius.

It is acknowledged that embedding a strong and positive food safety culture within corporate culture reinforces food safety management systems in protecting consumer health and life (18, 34). Hazard and risk awareness is one of the five dimensions of food safety culture (18). HACCP knowledge and proficiency is required to effectively apply Codex HACCP principles and advance a culture of food safety within an organization (23, 32, 43). In Mauritius, HACCP is implemented in food businesses including manufacturing, hospitality, catering, and fast food industries. However, research on food safety management systems (35) and food safety culture in micro-, small-, and medium-sized enterprises (4) is in its infancy. No studies have been undertaken on HACCP team proficiency and food safety culture in large food manufacturing and hospitality settings.

Food safety culture assessment of food businesses contributes to risk-based regulatory inspections, a preventive approach to food law enforcement and compliance with EU regulations (13, 14, 21). According to a U.S. Food and Drug Administration systematic food safety culture literature review (42), areas that require further research include the

following: validity of food safety culture assessment tools for different organizational and national contexts; application of food safety culture to regulatory agencies; and the relationship between food safety culture and public health outcomes. In the Mauritian context, there is potential for development and use of food safety culture assessment methods by industry, enforcement bodies, and research institutions to enhance food control system performance.

Consumer knowledge, beliefs, myths, and attitude influence food handling practices in household kitchens that are considered as the last line of defense against food safety hazards (29, 38). Behavior change models can be applied to develop educational interventions and improve consumer food safety habits. The health belief model and dimensions of wellness have been used in research on factors that affect food safety practices among older adults who are vulnerable to food poisoning (6). Mauritius is faced with the challenges of an aging population. One of the goals of the health sector strategic plan 2020–2024 is to "... enhance the health and wellbeing of the elderly" (40). However, there is a lack of knowledge on food safety behavior among senior citizens and care givers. It is important to address this research gap and formulate evidence-based policies aimed at minimizing risk of foodborne illness, life-threatening complications, and fostering quality of life at an older age.

Quality and trusted peer-reviewed research papers communicate valid evidence that fulfills user needs (48). International collaboration creates opportunities for capacity building, quality research and customized interventions that address food safety issues relevant to low- and middle-income countries (2). With this in mind, the University of Central Lancashire (UCLan) in the United Kingdom has collaborated with the University of Mauritius to undertake a research project funded by Research England Quality-Related Global Challenges Research Fund grant at UCLan. The findings on consumer food safety with reference to COVID-19 hygiene barriers and lockdown measures in Mauritius have been disseminated at the International Association of Food Protection (IAFP) Annual Meeting in 2022 (44). The identified knowledge, attitude, and self-reported practice gaps will be useful for future investigations, policies, and actions. However, determinants of self-protection behavior, consumer food safety culture traits, and the use of nudge-based interventions (22, 47) have not been explored in Mauritius. There is a need for further research to inform education and training of food handlers as well as consumers to achieve habitual and systemic good food hygiene practices in everyday life.

Food control system success and sustainability

Everyone has responsibility for food safety. Leadership and engagement of all stakeholders in implementing sustained food safety actions is fundamental to the success of the national food control system in public health and

life protection. The forthcoming Mauritius Food Standards Agency will need to measure success against food safety indicators with reference to a national food control strategy and global food safety strategies (17, 45). It will have to play a pivotal role in raising food hygiene standards in all types of food establishments in the country to align policies, national food safety infrastructure, and interventions for positive impact. The future of national food control activities lies in applying a foresight approach (11), making augmented use of digital technology and collaborating with global partners to integrate food safety, nutrition, food security, and One Health initiatives toward the 2030 agenda for sustainable development (12, 39).

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