

Food Fraud in Kenya: Public Health Implications, Regulatory Challenges and Emerging Food-Integrity Priorities

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Abstract

Food fraud is commonly treated as an economic or labelling offence, although an economically motivated act can create an unanticipated food-safety hazard. This Mini Review examines the emerging food-fraud evidence relevant to Kenya, the pathways through which fraud threatens health and traceability, and the implications of the Food and Feed Safety Control Co-ordination Act, 2026. Kenyan studies have documented milk dilution and inhibitory substances, as well as species substitution in the meat value chain. Additional vulnerabilities affect alcoholic beverages, honey, edible oils, spices, coffee, cereals, fortified foods and packaged products, but nationally representative prevalence data remain scarce. Three controversies shape the field: whether fraud should be governed principally as food safety or economic crime; whether informal markets are uniquely vulnerable or merely more visible; and whether digital traceability and artificial intelligence can prevent fraud without verified physical testing. Kenya's new coordination framework provides an institutional opportunity, but coordination alone will not deliver food authenticity. Priority gaps include the absence of a national incident database, limited denominator-based surveillance, uneven authenticity-testing capacity, weak integration of commercial intelligence with public-health data, and inadequate measurement of economic burden. Future development should combine vulnerability assessment, intelligence-led sampling, tiered analytical methods, interoperable traceability, protected reporting and transparent risk communication. Kenya should therefore govern food fraud as a food-integrity problem at the intersection of public health, consumer protection and economic crime.

Keywords: food fraud; food integrity; economically motivated adulteration; food safety; traceability; Kenya; public health; regulation

Introduction

Food fraud is the intentional deception of food, ingredients, packaging, provenance, processing or documentation for economic gain. It includes dilution, substitution, concealment, tampering, counterfeiting, misrepresentation, unauthorized enhancement and diversion (Spink and Moyer, 2011; Manning, 2016). Unlike accidental contamination, fraud involves intent; unlike food defence, its primary motive is financial rather than ideological harm. The categories are useful for governance but can be misleading in practice: an offender may intend profit, yet the chosen deception can expose

consumers to a hazard that neither the offender nor the regulator anticipated.

This intersection is important in Kenya, where modern processors and export chains coexist with extensive informal and semi-formal markets, cross-border trade, pooled commodities and fragmented documentation. These characteristics do not prove that informal food is fraudulent or that formal businesses are immune. They create different combinations of motivation, opportunity and control strength—the central determinants of fraud vulnerability (van Ruth et al., 2017; Barrere et al., 2020). Price shocks, scarcity, opaque brokerage, unrealistic procurement prices, weak supplier verification and low probability of detection increase opportunity throughout the chain.

Recent African reviews identify fraud as an under-recognized public-health and development concern, while emphasizing weak reporting and limited authenticity surveillance (Njiru et al., 2025; Shuping and Lebelo, 2026). Kenya has now enacted the Food and Feed Safety Control Co-ordination Act, 2026, creating a timely moment to examine whether institutional coordination can evolve into an operational food-integrity system. This Mini Review synthesizes recent evidence and emerging concepts, discusses current controversies, identifies research gaps and proposes priorities for the field. It is not a prevalence estimate: analytical studies are commodity- and location-specific, and media allegations are not treated as scientific evidence.

Food fraud as a hybrid food-safety threat

Food safety systems traditionally ask which biological, chemical or physical hazards can reasonably occur. Fraud prevention adds an adversarial question: who benefits if a product is changed or misrepresented, where could the act occur and how might controls be evaded? Hazard analysis and critical control point systems remain essential, but they were not designed to predict a rational actor who changes methods once controls become predictable. Food-fraud vulnerability assessment therefore considers economic motivation, opportunity and control effectiveness alongside conventional hazards (van Ruth et al., 2017; Barrere et al., 2020).

Fraud can generate health harm through several pathways. Toxic adulterants may be added deliberately, as with methanol in illicit alcohol or unauthorized preservatives. Substitution may introduce undeclared allergens, prohibited species or a different residue and pathogen profile. Concealment of spoilage, age or origin may keep unsafe food in commerce. False batch records, dates or supplier identities can obstruct recalls. Dilution or removal of valuable constituents can also produce nutritional harm when affected foods are consumed frequently by children or other vulnerable groups. Analysis of documented fraud cases outside Kenya indicates that a meaningful subset presents discernible food-safety hazards, particularly food laundering and fraud involving perishable products (Pustjens et al., 2025).

This leads to the review's central proposition: economic and health harms are not separate outcomes. The fraudulent act changes the product, information or custody history on which food-safety decisions depend. Even when the adulterant is not intrinsically toxic, deception can remove consumer choice, defeat allergen controls, invalidate process assumptions and prevent effective trace-back.

Evidence and vulnerabilities in Kenyan food chains

The strongest Kenyan evidence is concentrated in milk and meat. Wanjala et al. (2018) reported adulteration and inhibitory substances in raw and pasteurized milk marketed in the Nairobi region. Nyokabi et al. (2021) identified variation in composition, contamination and adulteration across dairy production systems and value chains in Laikipia, Nakuru and Nyandarua. Milk is vulnerable because it is liquid, perishable, frequently pooled and readily diluted. Water addition reduces nutritional value and may be followed by manipulation intended to restore apparent density or prolong shelf life. Fraud and safety can therefore coexist in the same sample rather than forming separate regulatory problems.

Njaramba et al. (2021) used high-resolution melting analysis of mitochondrial PCR products to detect species substitution in Kenya's meat value chain. Species substitution is more than pricing deception. It can violate religious and cultural expectations, introduce undeclared proteins and sever the link between the product and ante-mortem inspection, veterinary withdrawal periods and slaughter documentation. Visual identity is particularly weak in minced and processed products.

Other Kenyan value chains present credible but unevenly quantified vulnerabilities. Counterfeit or illicit alcoholic beverages can connect excise evasion and brand imitation to acute methanol poisoning. Premium claims in honey, edible oils, coffee and spices create incentives for dilution, cheaper substitution and false origin. In cereals, contamination itself is a food-safety failure; it becomes fraud when a person knowingly falsifies a certificate, launders or blends a non-compliant lot to evade limits, alters documentation or misrepresents intended use. Packaged products may be affected by counterfeit packaging, false labels, date-code tampering, underweight content or diversion through unauthorized channels. These are priorities for representative surveillance, not grounds for assuming national prevalence.

<i>Commodity</i>	<i>Principal mechanism</i>	<i>Evidence status</i>	<i>Food-safety relevance</i>	<i>Priority evidence need</i>
Milk and dairy	Dilution; inhibitory substances; unauthorized shelf-life manipulation	Analytical Kenyan studies	Reduced nutrients; chemical exposure; contamination may coexist	National denominator-based surveillance; supplier trend analysis
Meat and meat products	Species substitution; concealment; false origin	Species substitution analytically documented	Undeclared proteins; residue, pathogen and traceability concerns	Species surveillance in processed meats; custody-linked sampling
Alcoholic beverages	Counterfeiting; dilution; industrial-alcohol substitution	Serious regulatory vulnerability; fragmented incident data	Methanol poisoning, blindness or death	Integrated poisoning, chemical and enforcement database
Honey, oils, spices and coffee	Dilution; cheaper substitution; false purity, grade or origin	Internationally high vulnerability; limited Kenyan prevalence evidence	Possible allergens or contaminants; nutritional and economic deception	Representative market testing and Kenyan reference datasets
Cereals and fortified foods	Laundering contaminated lots; false certificates; fortification claims	Plausible high-impact vulnerability; intent must be established	Mycotoxin exposure or micronutrient deprivation	Link laboratory evidence with records, transactions and intent

Table 1: Documented evidence and priority food-fraud vulnerabilities relevant to Kenya.

Controversies shaping policy and research

The first controversy is institutional: should food fraud be governed mainly as food safety, consumer deception or economic crime? A food-safety lens prioritizes exposure and rapid control, whereas a criminal lens requires proof of intent, benefit and responsibility. Consumer and standards law can address false representation without establishing a health hazard. No single lens is sufficient. Treating fraud only as a labelling breach understates health risk; treating every non-compliance as fraud confuses negligence with deliberate deception. Effective investigation must link analytical results to lot identity, custody records, communications and financial transactions.

The second controversy concerns informality. Informal chains may have weaker documentation, limited cold-chain control and fewer verification resources, but they should not be presumed fraudulent. Formal systems can conceal sophisticated fraud behind certificates, approved suppliers and audit routines. Informal misconduct may simply be more visible, while formal fraud may be more scalable. Research should compare vulnerabilities and controls rather than stigmatize market categories.

The third controversy is technological. Digital traceability, blockchain and artificial intelligence are often presented as solutions. Digital records can improve visibility, but immutable systems preserve false input perfectly when initial identity is not verified. Artificial intelligence can identify anomalies in spectra, prices, trade flows, complaints and supplier behaviour; yet performance in curated studies does not establish prevention in real markets. A recent peer-reviewed systematic review highlights challenges involving explainability, reference-data quality and implementation across heterogeneous food systems (Fragkos et al., 2026). Technology must therefore complement sampling, laboratory confirmation, chain of custody and accountability rather than substitute for them.

Regulatory transition in Kenya

Kenya already has legal entry points through the Food, Drugs and Chemical Substances Act, Standards Act, Consumer Protection Act, Competition Act, Anti-Counterfeit Act, Alcoholic Drinks Control Act and commodity-specific laws. County governments also exercise public-health, licensing and market functions. The historical weakness has been less the absence of prohibitions than the dispersion of mandates, data and enforcement pathways.

The Food and Feed Safety Control Co-ordination Act, 2026 establishes a national coordination framework and the Office of the Food and Feed Safety Controller. This is a significant institutional advance, but an organizational map is not automatically a fraud-control system. Implementation must explicitly incorporate food authenticity, economic intelligence and public-health surveillance. Without shared incident definitions, referral rules, data infrastructure, budgets, laboratory pathways and outcome indicators, agencies may coordinate conventional safety activities while adaptive fraud remains between mandates.

South Africa offers a useful regional comparison. Similar concerns include fragmented control, limited laboratory and inspector capacity, complex labelling enforcement, informal-market exposure and emerging e-commerce risk (Shuping and Lebelo, 2026). Kenya's newer statutory platform creates an opportunity to move faster, but comparative success should be judged by measurable detection, response, prosecution, recurrence and health outcomes—not by the appearance of legislation alone.

Research gaps and future developments

Five gaps constrain evidence-based action. First, Kenya lacks a consolidated, publicly accessible food-fraud incident and authenticity-testing database. Second, most published evidence is commodity- and location-specific, preventing national prevalence estimates. Third, authenticity capability is uneven across laboratories, particularly for validated reference databases, non-targeted screening, proficiency testing and legally defensible sampling. Fourth, commercial signals—abnormal prices, impossible yields, supplier capacity and trade discontinuities—are rarely integrated with public-health complaints and laboratory findings. Fifth, Kenya has no robust estimate of direct and indirect economic burden. International cost estimates cannot simply be transferred because market structure, reporting and enforcement differ (Shepherd et al., 2026).

Future development should use a tiered analytical architecture. Rapid field or receiving tests can broaden screening; high-throughput laboratory methods can identify suspect samples; and accredited confirmatory methods can support enforcement. Relevant tools include spectroscopy, chromatography, mass spectrometry, stable-isotope analysis, DNA-based methods, immunoassays and omics platforms (Ellis et al., 2016). Methods must be validated for Kenyan matrices, varieties, processing conditions and expected adulterants.

A national research agenda should establish representative surveillance in milk, meat species, alcoholic beverages, honey, edible oils, spices, coffee, cereals and fortified foods. Studies should report sampling frames and denominators, distinguish fraud from unintentional non-compliance, and assess both hazard severity and economic drivers. Industry research should test whether vulnerability assessment, supplier due diligence, mass-balance reconciliation, confidential reporting and procurement reform reduce incidents rather than merely improve documentation.

Discussion

Kenya should govern food fraud as a food-integrity problem at the intersection of public health, consumer protection and economic crime. Evidence from milk and meat demonstrates that authenticity failures are not hypothetical, but the wider national burden remains unknown. The immediate priority is therefore not to claim an epidemic; it is to build the surveillance needed to determine its nature and scale. The distinction between documented evidence, reported allegations and plausible vulnerability must remain explicit to avoid both complacency and public panic.

The 2026 coordination framework can support this transition if it creates operational capability. A national food-integrity network should connect the Food and Feed Safety Controller, health authorities, standards and commodity regulators, counties, customs, tax authorities, law enforcement, prosecutors, laboratories, academia and industry. Its core functions should include shared case definitions, protected reporting, an interoperable incident platform, commodity risk registers, intelligence-led sampling, confirmatory referral pathways and transparent public alerts. Outcome measures should include time to triage, samples screened and confirmed, traceability completeness, recalls, prosecutions, illicit gains recovered and repeat offending.

Food businesses should complement food-safety culture with food-integrity culture. Boards should ask whether supplier prices are commercially plausible, whether yields and inventories reconcile, whether label claims are analytically verifiable and whether employees can report concerns safely. Procurement that rewards the lowest price without authenticity controls can make honest operators uncompetitive and fraud economically rational.

The emerging field must resist two easy answers. Hygiene inspection alone will not detect adaptive deception, and advanced technology alone will not create trustworthy food. Kenya requires both the old disciplines—competent inspection, sampling, documentation and enforcement—and newer tools for vulnerability analysis, digital intelligence and non-targeted detection. Food may appear clean and still be deliberately false. The regulatory task is to control both the hazard and the deception on which it travels.

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PNN: Conceptualization, literature review, interpretation, writing—original draft, and writing—review and editing.

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