

Nafdac Registration Fraud Exposes Food Fraud In Two Lagos Sme Cake Businesses

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Case Report

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NAFDAC REGISTRATION FRAUD EXPOSES FOOD FRAUD IN TWO LAGOS SME CAKE BUSINESSES

A NAPAMS-Confirmed Case Report of Two Lagos SME Bakery Businesses

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ABSTRACT

Background:

Food fraud — the deliberate misrepresentation of a food product for economic gain — and conventional food safety failures are conceptually distinct risk categories but are not mutually exclusive and may co-occur within a single product, compounding consumer risk. Small-to-medium enterprise (SME) bakery products represent a rapidly growing segment of informal food retail in Lagos, Nigeria, a sector in which formal hazard-control systems and regulatory registration are frequently bypassed. This case report documents the discovery of fraudulent National Agency for Food and Drug Administration and Control (NAFDAC) registration numbers — confirmed as regulatory certification fraud — on two independent Lagos SME cake businesses, co-occurring with a confirmed food safety incident involving recurrent pre-expiry fungal contamination.

Case Presentation:

A consumer purchased Ronmera Banana Bread carrying NAFDAC registration number A8-7600L with a stated expiry date of 14th June 2026. Visible mould was observed four days after purchase. Verification on the NAFDAC NAPAMS portal on 10th June 2026 confirmed the number belonged to an unrelated product (a herbal spirit drink) by a different manufacturer, with certification expired since February 2025. A second purchase of the same product, stored under refrigeration in accordance with the label instruction, again developed mould within four days at a substantially lower colony count. Two individuals who consumed the product reported transient gastrointestinal symptoms. In the same investigation, a second bakery brand (Elim's BakeHouse) was found to carry a different NAFDAC number registered to plantain chips by a different company — applied across seven distinct cake varieties on one label.

Methods:

Both NAFDAC registration numbers were verified on the NAPAMS portal with timestamped screenshots as primary evidence. Fungal culture was performed on Sabouraud Dextrose Agar (SDA) at 37 degrees Celsius using a four-quadrant streak technique on a shared plate for both Ronmera samples alongside a negative control. Colony morphology was assessed through sealed plates via reference chart at Days 2, 3, 5, and 7. A direct wet mount from the original mouldy cake was examined by light microscopy at 40x.

Results:

Both NAFDAC numbers were confirmed fraudulent. Sample A (ambient storage) yielded 12 colonies at Day 2, rising to 19 by Day 7, with surface colour progressing from greenish to very dark green and brownish-orange reverse pigmentation throughout. Sample B (refrigerated) showed markedly fewer colonies (3 at Day 2, 6 by Day 7) with identical colouration, indicating refrigeration suppressed but did not prevent growth. Wet mount microscopy confirmed septate hyphae consistent with *Aspergillus* species. Combined macroscopic and microscopic evidence supports a presumptive identification of *Aspergillus flavus*. The Control plate showed no growth throughout. No aflatoxin screening was performed.

Conclusion:

Two Lagos SME cake businesses were confirmed to be using fraudulent NAFDAC registration numbers. One also produced a product with fungal contamination, most consistent with *Aspergillus flavus*, occurring under both ambient and correctly refrigerated storage. The co-occurrence of regulatory fraud and a genuine food safety hazard in one product illustrates how these risk categories may compound one another in the absence of regulatory oversight. Formal regulatory complaints have been filed with NAFDAC, LASCOPA, the Lagos State Safety Commission, and the FCCPC.

Keywords:

Food fraud; NAFDAC registration fraud; NAPAMS; SME bakery; *Aspergillus flavus*; mould contamination; food safety; cold chain; consumer protection; Nigeria; Lagos; HACCP; food traceability; food authenticity; economically motivated adulteration.

1. INTRODUCTION

Food safety regulation in Nigeria is anchored by the National Agency for Food and Drug Administration and Control (NAFDAC), the federal agency responsible for the registration, inspection, and approval of food and drug products prior to market entry. Under the NAFDAC Act, Cap N1, Laws of the Federation of Nigeria 2004, no food product may be manufactured, imported, exported, advertised, sold, or distributed in Nigeria unless registered with the Agency [1,2]. Registration requires, among other prerequisites, a prior factory inspection and issuance of a Certificate of Recognition by the Agency's Establishment Inspection Directorate, aligned with the Hazard Analysis and Critical Control Points (HACCP) framework established under the Codex Alimentarius General Principles of Food Hygiene [3]. Standard processing timelines for registration range from 60 to 90 working days from acceptance of a complete application [2].

Within the food safety literature, Spink and Moyer (2011) established the foundational taxonomy distinguishing food fraud from food safety incidents and food defense. Food fraud is defined as the deliberate and intentional substitution, addition, tampering, or misrepresentation of food, food ingredients, or food packaging for economic gain [4]. Within this taxonomy, economically motivated adulteration (EMA) describes the fraudulent misrepresentation of a product to increase its apparent value or reduce production costs [4,5]. Moore, Spink, and Lipp (2012) confirmed that food fraud incidents frequently introduce unconventional hazards into the food supply, since standard quality assurance protocols are designed around known contaminants rather than the unpredictable substitutions characteristic of fraud [6].

The present case is classified as regulatory or certification fraud: the fraudulent use of a government food safety registration number constitutes a false statement about a product's regulatory status for economic gain, removing the product entirely from the oversight the number purports to represent. This distinguishes it from classical EMA ingredient substitution cases while falling within the broader food fraud definition [4,6].

Curto and Gaspar (2021) found that food safety traceability systems and HACCP-aligned frameworks present disproportionate implementation challenges for SMEs, who frequently perceive such systems as bureaucratic and economic burdens relative to their production scale [7]. This observation directly contextualises the registration fraud documented in this report. For micro-enterprise bakeries, the

multi-month, multi-step NAFDAC registration pathway creates a structural barrier to compliance that may incentivise circumvention rather than engagement.

This case report documents a citizen-initiated investigation triggered by the discovery of premature mould contamination in a commercially purchased banana bread product, which led to the identification of a fraudulent NAFDAC registration number via the NAPAMS portal. The investigation was extended the same day to a second, unrelated bakery brand exhibiting the same fraud pattern. Framed within the established food fraud and food safety systems literature, this report contributes to the limited published evidence on consumer-led detection of regulatory certification fraud in Sub-Saharan African food markets, and outlines the public health and policy implications of the findings.

2. LITERATURE REVIEW

2.1 Food Fraud — Classification and Framework

Spink and Moyer (2011) established that food fraud involves the deliberate misrepresentation of food, food ingredients, or food packaging for economic advantage, distinguishing it from food safety incidents (unintentional contamination) and food defense (intentional contamination intended to cause harm) [4]. A food fraud database compiled by Moore et al. (2012) across three decades confirmed that food fraud incidents consistently introduce hazards outside the scope of standard safety monitoring, because routine testing is designed around known and expected contaminants rather than deliberate and novel substitutions [6]. Soon et al. (2019) noted that vulnerability to food fraud is heightened in food supply chains with limited traceability and regulatory oversight [8]. The cases documented in this report fall within this framework as regulatory identity fraud — the fraudulent appropriation of another product's registration credentials to misrepresent compliance status.

2.2 HACCP, Traceability, and the SME Gap

The General Principles of Food Hygiene under Codex Alimentarius CXC 1-1969, incorporating HACCP, provide the internationally recognised framework for identifying and controlling food safety hazards across production processes [3]. Curto and Gaspar (2021) systematically reviewed food supply chain traceability and found that SME food producers face disproportionate barriers to implementing formal food safety management systems, frequently viewing regulatory compliance as a cost and administrative burden rather than a value-adding process [7]. This gap between regulatory intent and SME capacity is structurally important: it generates an environment in which registration fraud may represent a workaround to a system that is perceived as inaccessible, rather than purely criminal opportunism.

2.3 Cold Chain Failure and Bakery Product Spoilage

Ndraha et al. (2018) identified time-temperature abuse across the food cold chain as a well-documented driver of microbial spoilage, distinguishing cold chain failure as a discrete risk category requiring dedicated control measures [9]. Filamentous fungi are the dominant cause of post-baking spoilage in bread and bakery products worldwide. Since baking temperatures typically destroy vegetative fungal cells and most spores, post-bake contamination — during cooling, slicing, wrapping, or storage — is the primary spoilage pathway rather than survival through the baking process [10,11]. Packaging of baked goods before adequate cooling creates condensation within the wrapper that strongly favours fungal growth [10]. The genera most consistently isolated from spoiled bakery products include

Aspergillus, *Penicillium*, *Rhizopus*, *Mucor*, and *Fusarium* [10,11,12]. A Nigerian study of bread spoilage in Niger State similarly isolated *Aspergillus* as the most frequent genus, attributing contamination primarily to post-production handling and poor hygiene rather than baking failure [12].

2.4 *Aspergillus flavus* and Aflatoxin Toxicology

Aspergillus flavus is the primary producer of aflatoxin B1 (AFB1), the most carcinogenic naturally occurring compound known, classified as a Group 1 carcinogen by the International Agency for Research on Cancer [13,14]. The toxicological literature describes a dose- and duration-dependent spectrum of health effects. Acute, high-dose aflatoxin exposure — termed aflatoxicosis — presents with fever, vomiting, abdominal pain, and in severe cases progresses to jaundice, hepatic failure, and multi-organ involvement, with reported outbreak mortality rates ranging from 16% to 76% [14,15]. At the other end of the exposure spectrum, chronic low-dose dietary aflatoxin exposure is a well-established risk factor for hepatocellular carcinoma, with risk substantially amplified by concurrent hepatitis B or C infection, and is additionally associated with immunosuppression and growth impairment in vulnerable populations [13,14].

Biomarker studies using the aflatoxin-albumin adduct have demonstrated that chronic, low-dose exposure is widespread across West African populations, frequently detectable in the majority of individuals sampled even outside known outbreak periods [16,17,18]. A dietary risk assessment of households in North-Central Nigeria calculated chronic aflatoxin exposure at levels projected to generate up to 247 additional liver cancer cases per year per 100,000 population for the highest-risk food category, with children identified as the most exposed subgroup and household awareness of mycotoxin contamination found to be generally low [19]. A separate Nigerian biomonitoring study similarly noted that individual-level mycotoxin exposure data remain sparse despite documented dietary contamination [20].

2.5 Self-Medication and Healthcare-Seeking Delay in Nigeria

A body of literature documents that self-medication and delayed formal healthcare-seeking are prevalent responses to common symptoms across Nigerian populations, with important implications for the under-recognition of food-related illness. Reported self-medication prevalence ranges from 29.5% among patients with gastrointestinal presentations at a rural Niger Delta clinic [21] to over 80% in studies of artisan and semi-urban populations [22,25]. A nationally representative survey found that delayed treatment-seeking for childhood fever occurred in 62.1% of reported cases, more pronounced

in lower-income and less-educated households [26]. The practical implication for food safety surveillance is that mild or moderate symptoms potentially attributable to mycotoxin exposure are systematically unlikely to reach formal diagnostic pathways, rendering the true population burden of chronic dietary exposure substantially invisible in health system data.

3. CASE PRESENTATION

This report presents two independent cases of NAFDAC registration fraud, discovered on the same day involving unrelated Lagos SME cake businesses. The cases are maintained strictly separate throughout. Case One (Ronmera Banana Bread) involves registration fraud co-occurring with confirmed fungal contamination and reported gastrointestinal symptoms, with full laboratory investigation. Case Two (Elim's BakeHouse) involves registration fraud only — no contamination was observed, no sample was collected, and no laboratory work of any kind applies to it. No finding from one case is attributed to the other.

3.1 Case One — Ronmera Banana Bread: Index Purchase (Sample A)

Product	Banana Bread
Brand / Producer	Ronmera Cakes (produced by Costley's for Ronmera Cakes)
NAFDAC No. on Label	A8-7600L
Stated Net Weight	140g
Ingredients on Label	Banana, Flour, Eggs, Sugar — no preservatives declared
Date of Purchase	6th June 2026
Point of Purchase	[Name and address of supermarket], Lagos
Storage Instruction on Label	“Keep Refrigerated”
Actual Storage at Retail Point	Open, unrefrigerated counter shelf
Domestic Storage	Sealed in original packaging; domestic cupboard at ambient temperature
Stated Expiry Date	14th June 2026
Mould First Observed	10th June 2026 — 4 days after purchase; 4 days before stated expiry
Mould Colour Progression	White on initial observation → Black within 48–72 hours, consistent with active sporulation

The product remained in its original sealed packaging throughout the observation period. No tampering, puncturing, or external contamination pathway was identified. The absence of declared preservatives is noted, as banana is a high-moisture substrate (approximately 75% water content) well documented in the mycological literature to support fungal proliferation [10].



Figure 1a. Ronmera Banana Bread in original packaging at the time of the index purchase (6th June 2026), showing the circular label bearing NAFDAC Reg No. A8-7600L and expiry date 14/06/2026.

3.2 Case One — Repeat Purchase Under Refrigeration (Sample B): The Pivotal Comparator

To assess whether retail or domestic storage mishandling alone could explain the contamination observed in the index purchase, a second unit of the identical Ronmera product was purchased and stored under active refrigeration from the time of purchase, consistent with the stated label instruction. This second purchase constitutes Sample B of the laboratory investigation described in Section 4; the index purchase is referred to as Sample A throughout.

Storage Condition	Refrigerated from time of purchase — label-compliant cold chain maintained
Mould Observed	Day 4 post-purchase — visible mould growth, identical in appearance to Sample A
Significance	Contamination recurred under correct cold-chain storage conditions, substantially weakening retail or consumer storage error as the sole causal explanation. A manufacturing-stage contamination source is the leading hypothesis, supported by laboratory data in Section 5 showing contamination present in both purchases at markedly different growth rates.



Figure 1b. Ronmera Banana Bread from the second (refrigerated) purchase, showing visible mould growth despite label-compliant cold-chain storage maintained from time of purchase. This is the pivotal comparator finding supporting a manufacturing-stage contamination hypothesis.

The refrigerated purchase showed substantially fewer colonies than the ambient-stored purchase at every observation point. This quantitative difference is discussed in Section 6.1: refrigeration slowed but did not prevent contamination, consistent with an organism present from the point of manufacture.

3.3 Case One — NAPAMS Verification: NAFDAC No. A8-7600L

On 10th June 2026 at 11:57am, NAFDAC registration number A8-7600L was independently verified using the official NAPAMS portal (registration.nafdac.gov.ng). The timestamped screenshot below constitutes the central evidentiary exhibit of Case One: it is the regulator's own database returning its own verdict on the product in question.

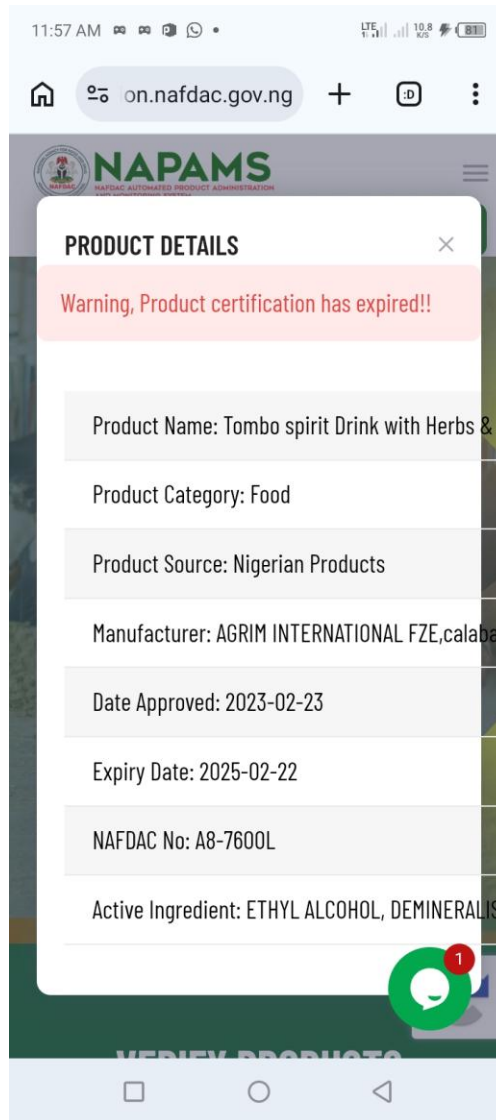


Figure 2. NAPAMS verification result for NAFDAC No. A8-7600L, captured 10th June 2026 at 11:57am. The portal's own red 'Warning, Product certification has expired!!' banner confirms the number is registered to a wholly unrelated product with an expired certification.

Number Queried	A8-7600L
Product Returned by NAPAMS	Tombo Spirit Drink with Herbs
Manufacturer	AGRIM INTERNATIONAL FZE, Calabar
Date Approved	23rd February 2023
Expiry Date	22nd February 2025 — certification expired 16 months before date of verification
Active Ingredient	Ethyl Alcohol, Demineralised Water

Verification Outcome	Number belongs to an unrelated alcoholic herbal beverage. Ronmera Banana Bread has never been independently registered, inspected, or assessed by NAFDAC.
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3.4 Case Two — Elim's BakeHouse: Regulatory Fraud Only

SCOPE NOTE: Case Two (Elim's BakeHouse) is a registration fraud case only. No mould, contamination, spoilage, or gastrointestinal symptoms were observed or reported for this product. No sample was collected. No laboratory work in Sections 4 or 5 applies to Elim's BakeHouse in any way. This case rests entirely on the NAPAMS verification evidence presented below.

Brand	Elim's BakeHouse
Address on Label	Plot H157 Cooperative Villas, Badore Road, Ajah, Lagos
Contact on Label	@elims.bakehouse +2349090003261
NAFDAC No. on Label	A8-107992L
Net Weight	130g
Batch No. / PD / BB	All blank on printed label. Ink stamp on outer packaging reads PRD: [partially obscured] 2020 and EXP: 12/05/2026 — the product's own stated expiry had already passed by 29 days at the time of examination (10th June 2026). A production date of 2020 would indicate the product was approximately 6 years old at the time of discovery.
Refrigeration Instruction	None stated on label
Products Listed Under This Number	Yummiest Red Velvet Cake, Creamy Strawberry Cake, Butterdream Chocolate Cake, Creamy Vanilla Cake, Chocolate Marble Cake, Creamy Coconut Cake, Banana Bread — seven distinct varieties on one label



Figure 3a. Elim's BakeHouse label, clearly showing NAFDAC Reg No. A8-107992L and the complete list of seven product varieties printed on a single label, all carrying one registration number. Note blank Batch Number, PD (Production Date), and BB (Best Before) fields.



Figure 3b. Elim's BakeHouse product from a different angle, showing the production date (PRD) and expiry date (EXP) stamp visible on the packaging above the label, alongside the NAFDAC number and full product variety list.

SCALE OF FRAUD: A single misappropriated NAFDAC number (A8-107992L) was applied across seven distinct cake varieties on one label. This is not a one-off labelling error but a systematic and ongoing practice: one stolen registration number covering an entire product line, none of which has ever been independently registered with NAFDAC.

A further and independently significant finding is visible on the physical packaging of the Elim's BakeHouse product: an ink stamp on the outer packaging, partially obscured, reads PRD (production date) in 2020 and EXP (expiry date) 12/05/2026. At the time of examination on 10th June 2026, the product's own stated expiry date had already passed by 29 days. If the 2020 production date is accurate, the product was approximately six years old at the time of discovery — a finding consistent with the complete absence of any regulatory oversight of its manufacture, storage history, or labelling integrity, since no NAFDAC registration or inspection of this business has ever taken place.

On 10th June 2026 at 12:25pm — 28 minutes after the Ronmera verification — NAFDAC number A8-107992L was independently verified on the same NAPAMS portal.

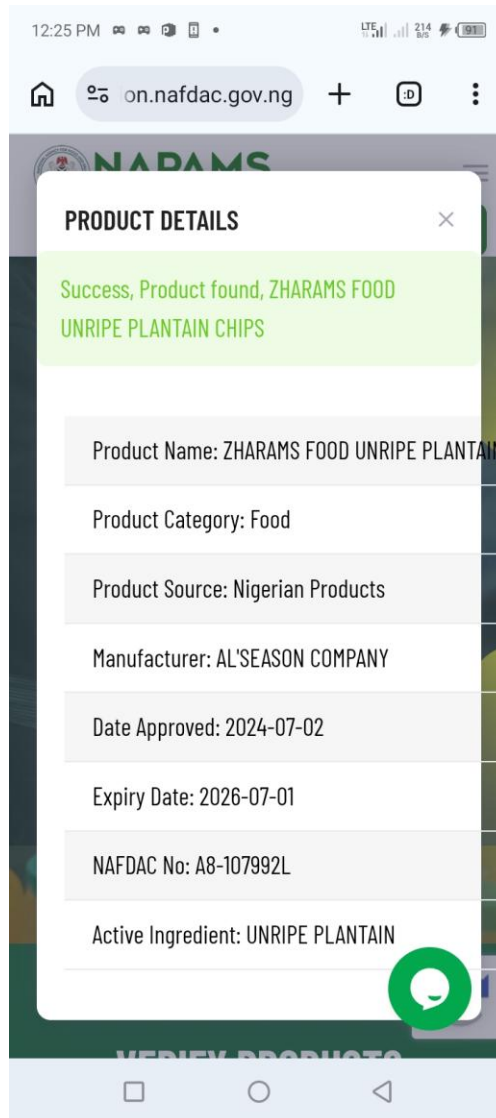


Figure 4. NAPAMS verification result for NAFDAC No. A8-107992L, captured 10th June 2026 at 12:25pm. The green 'Success, Product found' banner confirms the number is currently valid — but registered to Zharams Food Unripe Plantain Chips by AL'SEASON COMPANY, not to any cake product.

Number Queried	A8-107992L
Product Returned by NAPAMS	Zharams Food Unripe Plantain Chips
Manufacturer	AL'SEASON COMPANY
Date Approved	2nd July 2024
Expiry Date	1st July 2026 — currently valid, but for an entirely different product
Verification Outcome	Number is valid but registered to an unrelated food product. Seven Elim's BakeHouse cake varieties are being marketed under this single misappropriated number, none independently registered with NAFDAC.

The two cases, verified within 28 minutes on the same day, illustrate two distinct failure modes of the same underlying fraud: an expired registration belonging to a different product category in Case One, and a currently valid registration belonging to a different food product applied across multiple varieties in Case Two. Neither manufacturer had, at the time of verification, ever been independently registered, inspected, or assessed by NAFDAC.

3.5 Reported Adverse Effects Following Consumption — Case One (Ronmera) Only

Two individuals consumed portions of the Ronmera product following the index purchase and reported the onset of gastrointestinal symptoms. These are documented as self-reported, mild, and self-limiting observations only.

Individual	Symptoms Reported	Onset	Resolution
Individual 1	Abdominal bloating, general abdominal discomfort	Within hours of consumption	Self-limiting; no medical consultation sought
Individual 2	Abdominal discomfort, loose stool	Within hours of consumption	Self-limiting; no medical consultation sought

These symptoms are reported strictly as an observed self-reported association, not as confirmed causal outcomes of mould or mycotoxin exposure. No clinical assessment, stool analysis, or biomarker testing was conducted. The symptoms are consistent with multiple possible causes and fall at the mild end of the gastrointestinal symptom spectrum described in the aflatoxin exposure literature [13,14]. No causal link to a specific toxin or organism is established or claimed by this report.

4. METHODS

All methods described in this section apply to Case One (Ronmera Banana Bread) only. No laboratory work was conducted on the Elim's BakeHouse product.

4.1 Sample Handling and Preservation

Two units of the Ronmera Banana Bread product were designated as test samples. Sample A was from the index purchase of 6th June 2026, stored at ambient domestic cupboard temperature. Sample B was from the repeat purchase, stored under active refrigeration from the time of purchase. Both samples remained sealed in their original packaging until laboratory preparation. A plain Sabouraud Dextrose Agar (SDA) plate, uninoculated, served as the negative Control and was incubated under identical conditions alongside the test samples.

4.2 NAPAMS Regulatory Verification

NAFDAC registration numbers were verified using the National Agency for Food and Drug Administration and Control's NAPAMS portal at registration.nafdac.gov.ng. Each number was entered into the public search interface and the returned product details — product name, manufacturer, approval date, expiry date, and active ingredient — were recorded via timestamped screenshot on 10th June 2026 (Figures 2 and 4, Section 3).

4.3 Fungal Culture on Sabouraud Dextrose Agar

Sample preparation involved suspending a portion of each sample in 1ml sterile saline, vortexing for 30 seconds, and allowing debris to settle. Each prepared suspension was inoculated by four-quadrant streak technique near an open flame onto a shared SDA plate, with Sample A and Sample B streaked onto opposite halves of a single dish, labelled and divided by hand. A separate plain SDA plate served as the negative Control. All plates were sealed at the edges with parafilm and incubated at 37 degrees Celsius. Plates were read at scheduled intervals: Days 2, 3, 5, and 7. At each read, colony count, surface colour, reverse-side pigmentation, and texture were recorded.

BIOSAFETY NOTE: Due to the biosafety containment level of the Lagos State Veterinary Diagnostic Laboratory, Agege, Lagos, sealed plates showing active mould growth were not physically opened at any read point. All colony counts and morphological observations were made through the sealed plate using a standard mycological reference comparison chart, in accordance with the biosafety precaution that sporulating mould colonies produce aerosolised spores requiring N95 respiratory protection and containment.

SCOPE NOTE: Laboratory analysis was limited to organism identification and colony enumeration. No aflatoxin or mycotoxin screening assay of any type was performed. Toxin presence and concentration remain untested, and are neither confirmed nor excluded by this investigation.

4.4 Direct Wet Mount Microscopy

A direct wet mount was prepared from visible mould growth scraped from the surface of the original mouldy cake sample using a sterile loop. The scraping was emulsified in one drop of sterile saline on a clean glass slide, a coverslip was applied with gentle pressure to minimise air bubbles, and the preparation was examined by light microscopy at 40x magnification (dry objective). The mount was unstained, as Lactophenol Cotton Blue stain was not available at the Lagos State Veterinary Diagnostic Laboratory. Two photographic fields were captured through the eyepiece using a smartphone camera held over the objective lens.

4.5 Biosafety Precautions

All laboratory personnel wore N95 respiratory protection, gloves, lab coat, and eye protection throughout sample handling, in recognition that sporulating mould colonies present an aerosolised spore hazard. All growth plates are scheduled for autoclave disposal at 121 degrees Celsius for 30 minutes on completion of the observation period. Bench decontamination was performed with 10% bleach solution following each working session.

4.6 Limitations of Method

- Single sample-pair design with no biological replicates.
- Colony morphology was assessed through sealed plates via reference chart rather than by direct microscopy of cultured colonies, due to the absence of a Class II biosafety cabinet at the Lagos State Veterinary Diagnostic Laboratory. Species-level differentiation from cultured colonies was therefore not achievable.
- Wet mount microscopy was performed without staining (no LPCB), reducing colour contrast and limiting the clarity of fine structural features such as vesicle surface coverage needed for species-level differentiation.
- No aflatoxin or mycotoxin screening was performed. Toxin presence in this sample cannot be confirmed or excluded from the data available.
- No clinical or biochemical testing was performed on either individual who reported gastrointestinal symptoms.
- Species-level identification is presumptive, based on combined macroscopic progression and unstained wet mount structural observation. Definitive confirmation by LPCB-stained microscopy or ITS molecular sequencing is recommended as a follow-on step.

5. RESULTS

All results in this section relate to Case One (Ronmera Banana Bread) only.

5.1 Laboratory Activity — Process Documentation

The following photographs document the laboratory procedures described in Section 4, confirming that culture was performed as stated.



Figure 5a. Laboratory bench setup: Sabouraud Dextrose Agar (SDA) stock, Petri dishes, test tube rack, inoculation loops, and materials prior to plating.

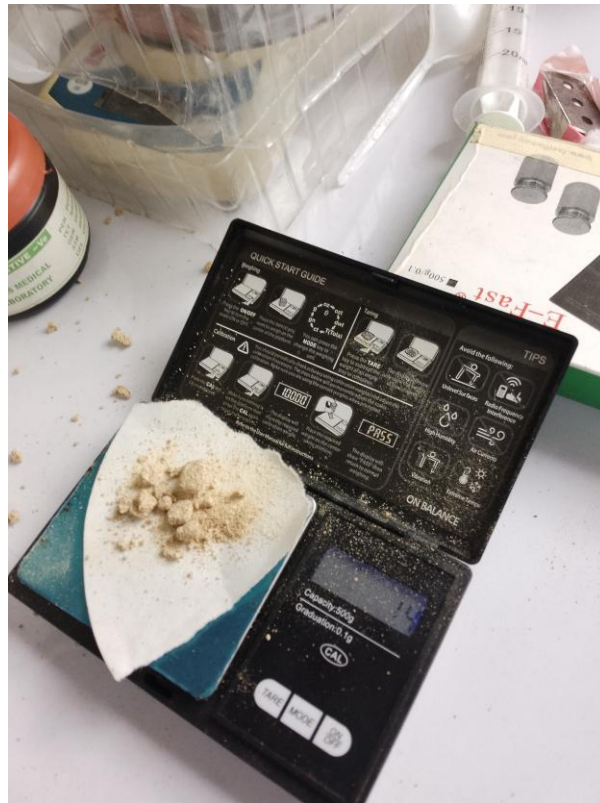


Figure 5b. Sample preparation: weighing on a calibrated digital scale (0.1g graduation, 500g capacity) prior to suspension in sterile saline.



Figure 5c. Sterilisation step using autoclave as part of aseptic technique prior to plating.



Figure 5d. Direct swab sampling from Ronmera Banana Bread in its original packaging, prior to inoculation onto SDA plates.

5.2 Culture Growth Results

Both Sample A and Sample B showed quantifiable colony growth across the observation period. The Control plate showed no colony development at any read, confirming the medium itself was not a source of contamination and that observed growth represents genuine biological contamination from the test samples.

Day	Sample Colonies A	Surface Colour A	Reverse Colour	Sample Colonies B	Surface Colour B	Texture (Both)
Day 2	12	Greenish	Brown	3	Greenish	Granular, powdery
Day 3	18	Darkish green	Brownish-orange	4	Darkish green	Granular, powdery
Day 5	18	Dark greenish	Deepening orange-brown	4	Dark greenish	Granular, powdery
Day 7	19	Very green dark	Brownish-orange	6	Very green dark	Granular, powdery
Control	0 — no growth	N/A	N/A	N/A	N/A	N/A

Sample A (ambient storage) showed approximately 4 to 5 times the colony count of Sample B (refrigerated storage) at every observation point, despite both samples originating from the same product with identical surface and reverse colouration. This quantitative difference is discussed in Section 6.1 and is interpreted as evidence that refrigeration substantially suppressed fungal growth rate without eliminating an organism plausibly present in both purchased units from the point of manufacture.

5.3 Culture Plate Photography — Chronological Progression

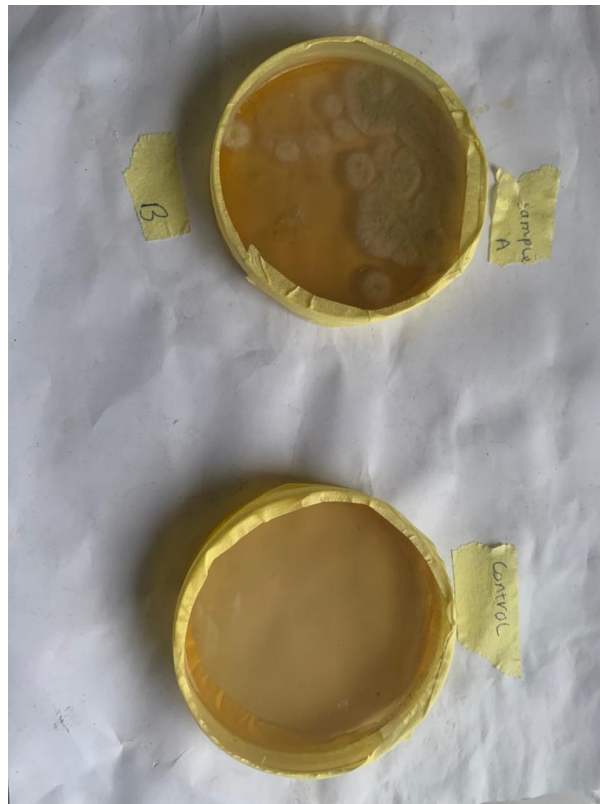


Figure 6a. Day 2. Top: shared SDA plate, Sample A (labelled 'sample A') and Sample B (labelled 'B') on opposite halves, early-stage colony growth visible. Bottom: Control plate, clean, no growth.

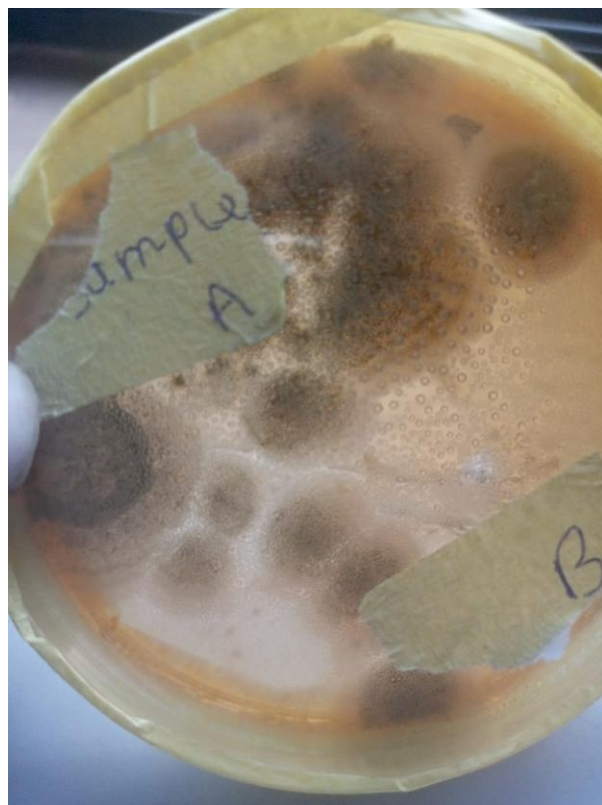


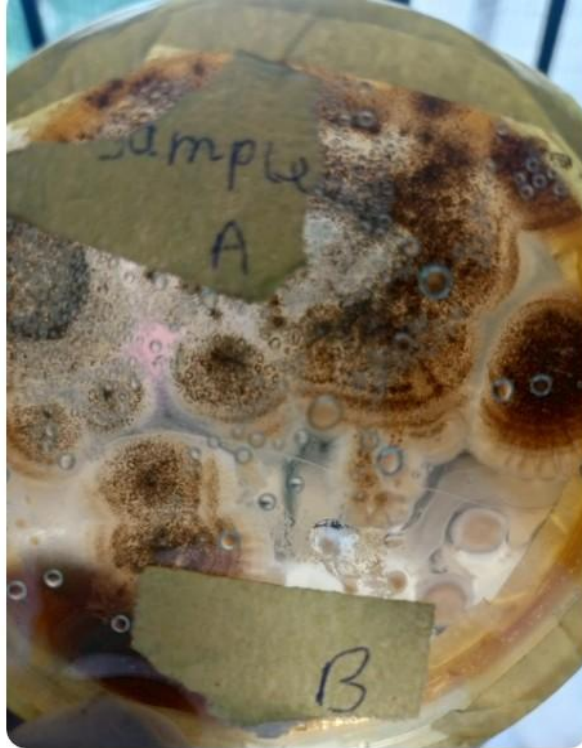
Figure 6b. Day 3 surface view. Colony count and pigmentation visibly increased on Sample A side. Dark-centred circular colonies with lighter halos are present on both halves of the shared plate.



Figure 6c. Day 3 reverse-side view. Brownish-orange pigment diffusing into the agar beneath the colonies on both Sample A and Sample B.

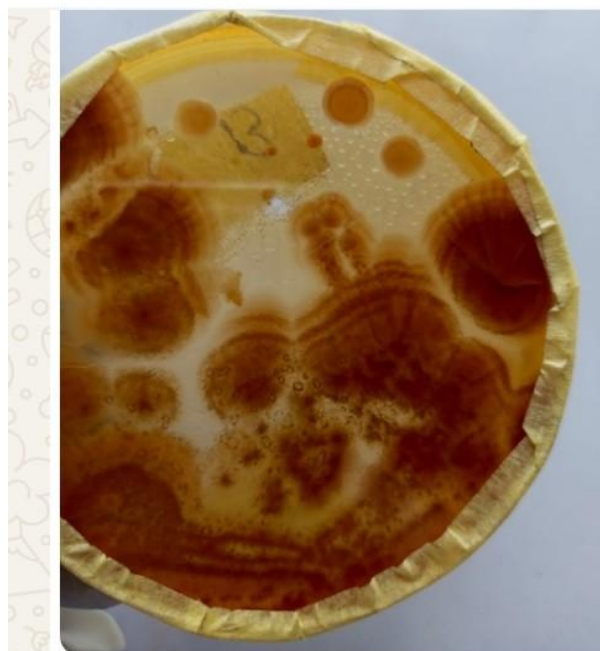


Figure 6d. Day 5 surface view. Dark greenish colouration confirmed; colony count stable at 18 (Sample A) and 4 (Sample B).



Day 7
Surface color colony and
count: very Dark- green; 19.

Figure 6e. Day 7 surface view. Colonies very dark green; count 19 (Sample A) and 6 (Sample B). Progressive surface darkening across Days 2–7 is a key macroscopic identification feature.



Day 7
Reverse color colony plate
and count: Brownish -Orange ;
Sample A : 19.
Sample B: 6

12:37 PM

Figure 6f. Day 7 reverse-side view. Brownish-orange reverse pigmentation deepened and spreading; colony count confirmed Sample A: 19, Sample B: 6.



Figure 6g. Control plate at Day 3: clean, uniform SDA, no colony growth throughout the entire observation period, confirming negative control integrity.

5.4 Organism Identification — Macroscopic Reference Chart Assessment

Colony characteristics assessed through the sealed plate via mycological reference chart across Days 2 to 7 revealed a consistent and progressive macroscopic pattern: surface colour progressing from greenish → darkish green → dark greenish → very dark green; reverse pigmentation progressing from brown to brownish-orange; granular and powdery texture throughout, consistent with active sporulation. Three organisms were identified as consistent with the observed morphological progression:

Candidate	Macroscopic Basis for Inclusion	Key Distinguishing Feature	Public Health Significance
<i>Aspergillus flavus</i>	Yellow-green to dark green surface progressing over Days 2–7; brown to orange-brown reverse; granular/powdery texture; growth at 37°C	Large globose vesicle; conidia covering entire surface (biseriate); yellow-green in early growth	Primary producer of aflatoxin B1; most toxicologically significant possible finding for a food sample [13,14,19]
<i>Aspergillus fumigatus</i>	Thermotolerant (grows at 37°C); greenish surface;	Flask-shaped vesicle; conidia covering upper half	Primary opportunistic pathogen; most dangerous to immunocompromised

	powdery texture; compact colony growth	only (uniseriate); typically more compact colony	individuals; causes invasive aspergillosis
Penicillium spp.	Blue-green to greenish surface; powdery texture; overlapping early-stage macroscopic appearance with Aspergillus	Branching conidiophore (penicillus) with no vesicle — definitive distinguishing feature at microscopy	Common bakery spoilage organism; some species produce ochratoxin A and patulin [27]

5.5 Organism Identification — Wet Mount Microscopy

A direct wet mount prepared from mould growth on the surface of the original cake sample was examined by light microscopy at 40x magnification. Two photographic fields were captured through the eyepiece.

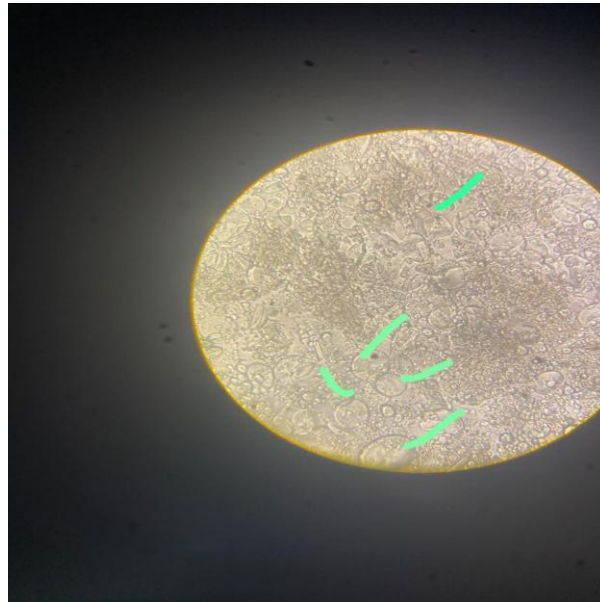


Figure 7a. Wet mount microscopy at 40x, Field 1. Green markers indicate septate hyphal fragments consistent with a filamentous fungus. Granular debris consistent with conidia visible throughout the field.

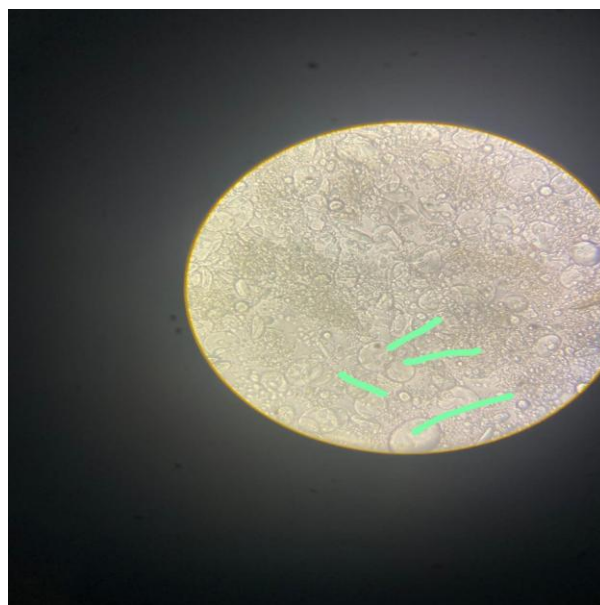


Figure 7b. Wet mount microscopy at 40x, Field 2. Additional septate hyphal structures marked. The overall architecture is consistent with Aspergillus species.

Microscopic examination of the direct cake sample wet mount confirmed the presence of septate hyphae consistent with a filamentous mould of the genus *Aspergillus*. Structural features visible at 40x in an unstained wet mount confirmed filamentous, septate growth architecture consistent with the *Aspergillus* genus differential. When combined with the complete macroscopic colony progression documented in Sections 5.2 and 5.4, the most consistent presumptive identification is *Aspergillus flavus*.

CLASSIFICATION: This is a **PRESUMPTIVE** identification based on combined macroscopic reference chart assessment (Days 2–7) and unstained direct wet mount microscopy from the original food sample. Species-level confirmation by LPCB-stained microscopy or ITS molecular sequencing is recommended as a follow-on step. The regulatory fraud findings (Section 3) are independently confirmed on NAPAMS and are not contingent on this microbiological identification.

5.6 Summary of All Findings

Parameter	Finding
NAFDAC No. A8-7600L (Ronmera)	Confirmed fraudulent — NAPAMS: belongs to Tombo Spirit Drink (AGRIM INTERNATIONAL FZE); certification expired 22/02/2025
NAFDAC No. A8-107992L (Elim's)	Confirmed fraudulent — NAPAMS: belongs to Zharams Food Plantain Chips (AL'SEASON COMPANY); valid but wrong product; applied across 7 cake varieties

Culture growth vs Control	Confirmed — growth on Sample A and Sample B; zero growth on Control at all read points
Sample A colony count (ambient)	Day 2: 12 Day 3: 18 Day 5: 18 Day 7: 19
Sample B colony count (refrigerated)	Day 2: 3 Day 3: 4 Day 5: 4 Day 7: 6
Surface colour progression	Greenish → darkish green → dark greenish → very dark green (Days 2–7)
Reverse colour progression	Brown (Day 2) → brownish-orange (Days 3–7)
Texture	Granular, powdery throughout — consistent with sporulation
Wet mount microscopy	Septate hyphae confirmed, consistent with <i>Aspergillus</i> spp.
Presumptive identification	<i>Aspergillus flavus</i> — combined macroscopic + microscopic evidence (Section 5.4–5.5)
Aflatoxin/mycotoxin screening	Not performed — outside current laboratory scope; toxin presence neither confirmed nor excluded
Reported GI symptoms (Ronmera only)	2 individuals; mild transient bloating and abdominal discomfort; self-limiting; no causal link to organism or toxin established

6. DISCUSSION

6.1 Evidence for a Manufacturing-Stage Contamination Source

The recurrence of mould contamination in Sample B — stored under refrigeration from the time of purchase, fully consistent with the manufacturer's label instruction — is the most significant finding of this case with respect to contamination origin. Had the index purchase been an isolated event under ambient storage, retail or consumer mishandling would have remained a plausible explanation. The repeat finding under correct cold-chain conditions substantially weakens that explanation and points instead toward a manufacturing-stage origin, consistent with the established literature on post-baking contamination pathways: insufficient cooling before packaging, contaminated raw ingredients (banana is a high-moisture substrate particularly susceptible to fungal colonisation), or contaminated food-contact surfaces and packaging materials are the most plausible mechanisms [10,11].

The quantitative colony count difference between Sample A and Sample B — approximately four to five times the colony count in the ambient-stored sample at every read point — is an independently informative result. It confirms that refrigeration was not irrelevant: it substantially suppressed growth rate, consistent with the known temperature sensitivity of *Aspergillus* species [10]. However, it did not prevent contamination, consistent with an organism already present in both purchased units from the production stage and proliferating more slowly under cold conditions. This pattern is consistent with what Ndraha et al. (2018) characterise as time-temperature abuse compounding a pre-existing contamination risk [9].

6.2 Regulatory Identity Fraud — Implications and Structural Context

The confirmed absence of valid product-specific NAFDAC registration for both implicated products has unambiguous implications: no NAFDAC inspector has ever visited either facility; no laboratory analysis of their ingredients, processes, or finished products has ever been conducted under regulatory supervision; and the expiry dates printed on both products were entirely self-assigned with no scientific or regulatory basis. This is precisely the category of unconventional hazard that Moore et al. (2012) identified as characteristic of food fraud: a risk entirely outside the scope of standard quality assurance monitoring because the monitoring never occurred [6].

The Elim's BakeHouse case is instructive in terms of systemic scale: one misappropriated number applied across seven product varieties indicates a deliberate, ongoing practice rather than a one-off

labelling error. Every consumer of any of those seven products has been purchasing under a false regulatory identity. In Case One, the expired registration of the appropriated number adds a second layer of invalidity: even the original registrant's certification had lapsed over 16 months before the date of verification.

Contextually, as Curto and Gaspar (2021) noted, SME food producers face genuine structural barriers to formal registration [7]. The multi-month, multi-step NAFDAC pathway may, for a micro-enterprise operating at artisanal scale, feel genuinely inaccessible rather than merely inconvenient. This does not excuse the fraud — consumers bear all the risk regardless of the manufacturer's motivation — but it does point toward the policy recommendation in Section 7: enforcement alone is insufficient if the formal compliance pathway remains structurally inaccessible to the producers most likely to bypass it.

6.3 Presumptive Identification of *Aspergillus flavus* — Significance and Limits

The combined macroscopic progression observed across Days 2 to 7 — progressive surface darkening to very dark green, brownish-orange reverse pigmentation, granular/powdery sporulating texture, growth at 37 degrees Celsius — combined with wet mount microscopy confirming septate hyphae, collectively support a presumptive identification of *Aspergillus flavus* as the most consistent organism from the three-candidate differential. The reverse pigmentation pattern in particular — brown progressing to brownish-orange across the observation period — is more characteristic of *Aspergillus flavus* than of *Aspergillus fumigatus*, which typically produces pale to colourless reverse pigmentation, or *Penicillium*, which typically shows yellower and lighter reverse pigmentation.

If this presumptive identification is ultimately confirmed, the public health implications extend substantially beyond the immediate spoilage concern. *Aspergillus flavus* is the primary producer of aflatoxin B1, the most carcinogenic naturally occurring substance known, linked to hepatocellular carcinoma with chronic exposure and to acute hepatotoxic presentations at high doses [13,14]. A dietary risk assessment in North-Central Nigeria projected up to 247 additional liver cancer cases per year per 100,000 population from chronic aflatoxin exposure through high-risk food categories, with low household awareness of mycotoxin contamination [19]. Biomarker studies across West African populations have demonstrated that chronic low-dose exposure is widespread even outside known outbreak periods [16,17,18], suggesting that the population-level risk from unregistered, uninspected baked goods contaminated with a potential aflatoxin producer may be substantially underestimated.

Two caveats must be stated clearly. First, this is a presumptive rather than confirmed species identification: the absence of LPCB staining and cultured-colony microscopy means the vesicle morphology required to definitively separate *A. flavus* from *A. fumigatus* was not clearly resolved. Second, even if *A. flavus* is confirmed, no aflatoxin screening was performed in this investigation. Toxin production in this specific sample cannot be confirmed or excluded. The gastrointestinal symptoms reported by the two individuals who consumed the product are documented as a self-reported associative observation consistent with the mild end of the GI symptom spectrum described in the aflatoxin literature [13,14], not as evidence of aflatoxin poisoning. No causal link between the reported symptoms and any specific toxin is claimed by this report.

6.4 Self-Medication, Under-Recognition, and the Wider Exposure Burden

The self-limiting resolution of gastrointestinal symptoms in the two affected individuals, without formal medical consultation, is consistent with the documented national pattern of self-medication in Nigeria. Studies across multiple Nigerian populations report self-medication prevalence from 29.5% among patients with gastrointestinal presentations at a rural Niger Delta clinic [21] to over 80% in other population groups [22,25]. A nationally representative survey found delayed treatment-seeking for childhood fever in 62.1% of cases [26]. The practical consequence for food safety surveillance is that mild GI symptoms potentially attributable to low-level mycotoxin exposure are systematically unlikely to reach formal diagnostic pathways, making the true population burden of chronic dietary exposure from unregistered food products largely invisible in health system data. Consumer-facing verification tools are therefore an important demand-side complement to supply-side regulatory enforcement.

6.5 Systemic and Policy Implications

This case illustrates a structural failure operating simultaneously at three levels: a manufacturing sector in which formal registration is perceived as inaccessible for SME producers; a retail sector under no practical obligation to verify the registration status of products it stocks; and a consumer base largely unaware that a public verification tool (NAPAMS) exists. Each failure point compounds the others. The NAPAMS portal is a functioning, publicly accessible tool that produced decisive results in both cases documented here within a single morning. What is absent is not the technology but the awareness, the enforcement, and the regulatory incentive structure to use it.

Formal complaints arising from this investigation have been submitted to NAFDAC, LASCOPA, the Lagos State Safety Commission, and the Federal Competition and Consumer Protection Commission under the Federal Competition and Consumer Protection Act 2018 [28].

7. CONCLUSION

This report has documented two independent and confirmed cases of NAFDAC registration fraud in two Lagos SME cake businesses, verified on the regulator's own NAPAMS portal within a single investigation. Case One (Ronmera Banana Bread) presents a compound finding: regulatory identity fraud co-occurring with confirmed pre-expiry fungal contamination, most consistent on combined macroscopic and microscopic evidence with *Aspergillus flavus*, in a product sold on an unrefrigerated shelf despite a clear label instruction to refrigerate. The recurrence of contamination under correctly refrigerated storage in the repeat purchase points toward a manufacturing-stage origin rather than storage mishandling alone, a finding with direct implications for production hygiene and post-baking handling practices at unregistered SME bakeries.

Case Two (Elim's BakeHouse) presents a systematic fraud finding: a single misappropriated NAFDAC number applied across seven distinct cake product varieties, none of which have ever been independently registered, inspected, or assessed. The scale of this fraud — one stolen number covering an entire product line — illustrates how a single act of regulatory identity fraud can multiply its consumer impact.

Together, the two cases demonstrate that NAFDAC registration fraud is not an isolated incident but a pattern with both individual and systemic dimensions among Lagos SME food businesses. They further demonstrate that consumer-led detection of food fraud using the publicly available NAPAMS portal is both feasible and evidentially productive. Both cases were identified within a single morning by a single consumer using only a smartphone.

The microbiological findings, while presumptive at species level due to biosafety and resource constraints at the Lagos State Veterinary Diagnostic Laboratory, provide documented laboratory corroboration of the contamination reported. The four to five-fold difference in colony count between the ambient and refrigerated purchases is an independently significant quantitative result: it establishes that refrigeration suppressed but did not prevent contamination in both purchased units, a finding inconsistent with storage error as the sole causal explanation.

The public health implications of unregistered, uninspected SME food products carrying presumptively aflatoxigenic contamination, sold in a context of documented widespread chronic low-dose mycotoxin

exposure in Nigerian populations [16,17,18,19] and prevalent self-medication rather than formal diagnostic response to gastrointestinal symptoms [21,22,25,26], point toward a substantially underestimated population-level food safety risk. Regulatory enforcement, consumer awareness, and accessible compliance pathways for SME producers are not alternative solutions — all three are necessary simultaneously.

8. RECOMMENDATIONS

1. NAFDAC should develop and publish an accessible, subsidised, and expedited registration pathway specifically for small and micro food producers, with simplified documentation requirements and fees proportionate to production scale. Removing the structural barrier to registration addresses the primary incentive for regulatory fraud at source.
2. NAFDAC should develop a dedicated public consumer awareness campaign promoting the NAPAMS verification portal to Lagos consumers, targeting retail markets with high SME and artisanal food activity. Both fraud cases in this report were identified by a single consumer in under 30 minutes using only a smartphone.
3. Retail outlets should be required, under a strengthened regulatory framework, to verify and document the NAFDAC registration status of SME and artisanal food products before stocking. The retailer in this case was distributing two fraudulently labelled products from its shelves; this is a due diligence failure that existing regulations should address more explicitly.
4. NAFDAC and LASCOPA should consider a structured pilot partnership with citizen-led consumer protection initiatives, enabling consumer-generated NAPAMS verification findings to feed systematically into enforcement intelligence, with formal acknowledgement of the reporting contribution.
5. Aflatoxin and mycotoxin screening of SME baked goods produced without declared preservatives and without NAFDAC registration should be incorporated as a targeted public health surveillance priority, given documented background aflatoxin exposure levels in Nigerian populations [16,17,18,19] and the identification in this report of a probable aflatoxin-producing organism in an unregistered, commercially sold food product.
6. Definitive species confirmation of the organism identified in this case, by LPCB-stained microscopy or ITS molecular sequencing at a better-equipped facility, is recommended as a follow-on investigation to strengthen the microbiological evidence chain for both regulatory purposes and journal peer review.

9. DECLARATIONS

9.1 Author Contributions

Dr. Henrietta Bolanle Ojuri: conceptualisation, investigation (consumer purchase, NAPAMS verification, regulatory complaints), data curation, writing — original draft, writing — review and editing, corresponding author.

Dr. Billy Quadri Omoniyi: laboratory methodology, culture analysis, microscopy interpretation, writing — review and editing.

Oluwabukola Ojuri: laboratory procedures, monitoring and data recording.

9.2 Ethical Considerations

This report concerns the corresponding author's own consumer experience and that of two consenting individuals known to the authors, who have given informed consent for the inclusion of their anonymised symptom data. No identifying personal information beyond general symptom description is disclosed. The investigation used commercially purchased food products available to any member of the public, and public regulatory verification tools. No formal ethics committee approval was required for this consumer investigation and case report.

9.3 Conflicts of Interest

The authors declare no financial or commercial conflict of interest with any party named in this report, including the implicated manufacturers, the retail outlet, or any regulatory body.

9.4 Funding

This investigation was conducted independently and at the authors' own cost. No external funding was received.

9.5 Regulatory Reporting

Formal complaints arising from the findings of this investigation have been submitted to: the National Agency for Food and Drug Administration and Control (NAFDAC); the Lagos State Consumer Protection Agency (LASCOPA); the Lagos State Safety Commission; and the Federal Competition and Consumer Protection Commission (FCCPC).

9.6 Laboratory

All fungal culture and microscopic examination described in this report was conducted at the Lagos State Veterinary Diagnostic Laboratory, Agege, Lagos, Nigeria.

9.7 Acknowledgements

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