Appendix 7: What works to prevent food fraud - codebook for the interviews

Alternative sectors

Name	Importance: Level 1	Importance: Level 2	Importance: Level 3
-	cyber crime	-	-
drugs	Drugs	doping in sport	-
fashion	clothing; handbag	-	-
finance	accounts; accounting software; banks; digital fraud; software; tax evasion	backup protocols; credit rating; cutoff test	-
one health	public health; pharmaceutical	pharmacovigilance	-
tobacco	illicit tobacco; smuggling tobacco	-	-

Challenges

Name	Importance: Level 1	Importance: Level 2	Importance: Level 3
external drivers	BREXIT; cheap food; cost of living crisis; COVID; currency variations; impact of austerity; natural disaster - for example,: floods; political stability; price stability; supply shock/shortage; trade deals; war/conflict	-	-
lack of agility	lack of flexibility with rituals; lack of interconnectivity; lack of operationalisation	challenging status quo; contractual inflexibility; inspection myopia; normalisation; over-complex; ways of working	Checklist; ticking a box
lack of awareness/understanding	lack of communication; lack of familiarity; lack of guidance; lack of interoperability; lack of knowledge; lack of understanding	disclosure; ignorance of law; jargon	-
lack of information	lack of benchmark; lack of definition; lack of real time information	lessons	-
lack of resources	consolidation of laboratory services; cost of designing of predictive systems; cost of implementing predictive systems; lack of capacity; lack of equipment; lack of food experience; lack of food qualified officers; lack of funding/budget; lack of surveillance tools; lack of training	commercial decision; maintaining existing competencies; poor use of resource; poor response time for sampling reduction; informal sampling; sampling gaps; staff turnover	too busy with the day job
lack of structure/standards	lack of statutory driver; lack of stringency	poor level of enforcement	-
lack of trust	building trust; failure of trust	Trust	trustworthy

Recommendations

Importance: Level 1	Importance: Level 2	Importance: Level 3

connecting the dots	better external communication National Food Crime Unit (NFCU); additionality in data sharing; ecosystem for verification; good supplier relationships; international harmonisation of definitions; invest in communication; invest in technology; invest in testing; invest in training; invest in transparency; invest in trust; mapping the landscape; raise the bar to entering the food system; raise the bar to stay in business; real-time information for businesses; real-time information for environmental health officers (EHOs); ring fencing funding	adapted solutions; foreign supplier verification programme; payment for food like feed enforcement. Minimum training standards; minimum capability of controls

Elements of a Food Control Management System

Name	Importance: Level 1	Importance: Level 2	Importance: Level 3
Appropriate technologies/tools	analogue tools	paperwork; pen and paper; records	-
Appropriate technologies/tools	analytical techniques	authentication techniques; bioinformatics; chromatography; DNA testing; fatty acid profile; forensics; genetically modified organization (GMO) testing; isotope analysis; next generation sequencing; nuclear magnetic resonance (NMR); spectrometry (mass spectroscopy); x-rays	-
Appropriate technologies/tools	automation mechanisation, digital systems and IoT	apps; blockchain; data mining; digital platform; digital tools; digital traceability; drones; early warning systems; handheld devices; holograms; QR codes; tagging; tamper evident packaging; tamper proof seals	human technology interface; interoperability; signal
Culture	company culture; food fraud culture; food safety culture; mission; quality culture; shared values	audit rituals; human factors; positive culture; work environment	altruistic; aspiration; brand identity; ethics
Culture	economic culture	cost benefit analysis; economic climate; financial constraints; market dominance	financial records; margins; profit
Evidence, data, intelligence information	Data; databases; information; intelligence; incidents	commercially sensitive information; complaints (product recalls, scandals); credible sources of information; industry intelligence; information flow; information nodes; information sharing; intelligence filtering; intelligence gathering; intelligence led; procurement intelligence; Rapid Alert System for Food and Feed (RASFF) database	-
Evidence gathering	Auditing; observation; monitoring; surveillance; sampling; testing; triangulation; validation	audit depth; audit process; audit scope; audit standard; auditing standards; independence of audits; systems auditing unannounced audits; formal sampling; purposive sampling; random sampling; risk based sampling; suspect sample; surveillance programme; first, second, third party audits; traceability	audit reports; company check; in house surveillance; markers; metrics; objective evidence; routine checks; screening; scoring; snapshots; social media; spot checks; supplier reality check; trigger; whistleblowing; tracking tracing;
food crime	black economy; black markets; bribery; corruption; forgery; grey markets (grey imports); human (child labour, modern slavery, trafficking); illegal butchery; racketeering; theft (cash/stock); trademark infringements	illicit food system	the fake factory
food defence	bioterrorism; cyber crime (for example, ransomware); malicious contamination; malicious tampering	-	-
Food fraud	fraud detection	food fraud detection strategies; sampling strategy	Reactive; targeted (DNA speciation, chemical testing); untargeted
food fraud	food fraud diamond	competition; consequences; deterrence; ease of committing fraud; economic gain; getting away with it; motivation; opportunities; power/powerless; pressure (social pressure); rationalisation; situation	food fraud awareness; definition of fraud; intentional vs unintentional (mistake); value of ingredient/added value;
food fraud	food fraud management	food fraud mitigation; food fraud strategy	external fraud; internal fraud; generic fraud protocols; site level fraud protocols; specific fraud protocols;
food fraud	food fraud prevention		
food fraud	illicit food system	the fake factory	liability, litigation, fines sentencing
food fraud	perpetrators	criminal; fraudster; insiders; mafia (organised crime groups); offender	disgruntled employee; lorry drivers; occasional; occupational

Name	Importance: Level 1	Importance: Level 2	Importance: Level 3
threat agent	colours; insecticide; horsemeat; melamine; methanol; medication	carotenoid; copper sulphate; Sudan dyes; ethylene oxide; fipronil; nitrofuran	-
threat characterisation	addition (for example, water); adulteration; authenticity; composition; counterfeiting; deception; dilution; extortion; hacktivism; mislabelled; misrepresentation; negligence; smuggling; substitution; replacement; tampering; terrorism	adaption; accessing illegal waters; cheating; claims fraud; deliberate; desiccation; dishonesty; economically motivated adulteration (EMA); excess packaging; fake product; infractions; misdemeaneours; misdescribing; misleading; misuse; overrun; passing off; provenance (country of origin; geographic origin; protected geographic indication (PGI)); reboxing; replication; ripped off; similarity; swapping out; too good to be true	-
threat target	alcohol	Alcohol by volume (ABV); champagne, gin spirits, vodka, whiskey, wine	-
threat target	fish and shellfish		
threat target	Honey	Manuka honey	-
threat target	Meat	Aberdeen Angus beef, Welsh beef, Chicken; composite meat; condemned meat; ham; kebabs; poultry; Scottish beef; Scottish lamb; Welsh lamb; Stornaway black pudding; turkey ham	-
threat target	miscellaneous: animal feed and pet food; baby food CBD, chocolate, cocoa, coconut milk, eggs, food supplements, fruit juice, gluten, salt, Sicilian lemon, veterinary medicines	-	-
threat target	Nuts	cashews, ground almond, pistachios	-
threat target	Oil	olive oil, sunflower oil	-
threat target	Rice	basmati rice, risotto rice	-
threat target	Spices	cinnamon, cumin, madagascan vanilla, paprika, saffron, turmeric	-
food integrity	data integrity	aggregated data; anonymised data; data access; data analysis; data characteristics; data collection; data consolidation; data driven; data ethics; data governance; data platforms; data sharing; data trusts; data versus metadata; databases; digitalisation; granularity; managing data; non-targeted data; people data; personal data, unstructured data	Data
food integrity	people integrity	Equity; honest; walks the walk; decision making; mindset	emergent thinking; old thinking
food integrity	process integrity	animal welfare; environmental; food waste; GMP; good practice; standards; procedures; standard operating procedure; opacity;	halal; religious standards; retailer standards
food integrity	product integrity	product analysis; product fingerprinting; product sampling; product scanning; product testing; product quality; product inspection;	-
Food quality	Failure prevention versus detection	failure detection; quality failure; failure prevention; prevention gap; quality control; raw material quality assessment; specification; statistical process control	-
Food safety	food safety management	allergen controls; cadmium; conditions; due diligence; E coli; food hygiene; food poisoning; Clostridium botulinum; forever plastics; glass; mineral oils; palm oil; reasonable precautions; hygiene controls;	-

Name	Importance: Level 1	Importance: Level 2	Importance: Level 3
Guardians	supply chain guardians	abattoir; auditor; board of directors; brokers; butchers; buyers; caterers; co-packer; consolidators; consumer; consumer services; distributors; engineers; factory manager; farmer; fast food; food business operator (FBO); food manufacturers; food service; food technologist; maintenance team; management team; manager; managing director; micro, small and medium sized enterprises (MSMEs); official veterinarians; procurement staff; production staff; quality control staff; quality manager; restaurants; retailer; shop floor; takeaways; technical manager; technical staff; wholesalers	-
Guardians	Stakeholder guardians	accountants; accreditation body; auditor; British Retail Consortium (BRC); business associations; Campden BRI; Centres of Expertise; certification body; Codex; competent authority; consultants; EHOs; Eurofins; Europol; FERA; FIIN; Food Authenticity Network; food cluster groups; FSA; FSS; general public; GFSI; governance (international); governance (national); Global Meat Alliance; government laboratories; His Majesty's Revenue and Customs (HMRC); inspectors institutions; Interpol; laboratories; laboratory services; Laboratory of the Government Chemist (LGC); local government; Marine Stewardship Council; National Reference Laboratories; NFCU; primary authority; procurator fiscal; public analysts; regional regulatory groups; regulator; research bodies; Reading Scientific Services Ltd (RSSL); Safe and Local Supplier Approval (SALSA); standards owner; trade organisations; trading standards; The Stationery Office (TSO); United Kingdom Accreditation Service (UKAS); universities	-
Guardians	Guardianship	ability; accreditation; approval (approval criteria/approved premises); assurance; certification; competitors collaborating;	-
Hurdles	control measure; countermeasures; global countermeasures; specific countermeasures	hard controls: defensive space; infrastructure; site security: biometrics; keypads; thumbprint recognition; video surveillance; soft controls: training; adapting training to audience; education; expertise; past experience; knowledge; staff onboarding;	active controls; formalisation
Hurdles	Mass balance assessment	checks and balances; ingredients; inventory system; invoices; menus; order; packaging control; production records; bill of materials; production list; stock system; sales; stock control; transactions	reality checking
Operationalisation	accountability; capability; communication; competence; complexity; credibility; gaining trust; holistic; leanness; multidimensionality; permeation; reputation; responsibility; sophisticated; transparency; visibility;	business attitude; capable people; capable systems; skillset; process led thinking; structured decisions; integrated management systems; judgement; linear thinking; live systems - real-time detection; management commitment; organisational behaviour; organisational structure; preventative measures; real-time systems; redistribution; siloed thinking; systems thinkers;	accessible; barriers, bias; competitive advantage; embeddedness; farm to fork; fragmentation; non-competitive aspects; product development; speed of response; transactional;
Risk	-	acceptable risk; aggregate risk; biggest risk; external risk; food fraud risk; food fraud risk assessment; high risk; high risk countries; high risk ingredients; internal risk; long term risk; low risk; reputational risk; risk assessment; risk averse; risk awareness; risk matrices; risk minimisation; risk mitigation; risk prioritisation	dynamic; detectability; likelihood; perfect storm; severity; short termism; uncertain

Name	Importance: Level 1	Importance: Level 2	Importance: Level 3
Supply chain	upstream prevention	buying; buying on price; dedicated suppliers; designated suppliers; online sales; packaging; preferential supply chain; reputable source; reputable supplier; supplier assurance programme; supplier delisting; supplier information; supplier questionnaire; contingency suppliers; first tier suppliers; second tier suppliers; spot purchasing; supplier approval; supply base; supply chain relationships; third tier suppliers; trusted suppliers; supply chain mapping; supply chain standards; global supply chains; integrated supply chains; supply chain understanding; supply chain verification;	downstream; export; smaller supply mentality; primary production; import sampling; supply deficit re. supply; supply friction; trade offs; unlevel playing field; value; value proposition;

Regulatory aspects

Name	Importance: Level 1	Importance: Level 2	Importance: Level 3
Official controls (legal)	Compliance; consumer protection; coordination; coordinated intelligence sharing; corroboration; hybridisation; multi-agency collaboration; inspection; integrating food standards; labelling	advice; closure orders; unfair trading; confidence in management; improvement; inspection rituals; derogation;	-
Policing	cautioning; continuity; crime prevention; crime reduction; prosecution; situational awareness	analysts; crime intelligence system; crime reduction officer; four Ps; intelligence apparatus; intelligence officer; interview; Neighbourhood watch; police priorities;	career structure; police;