Food in the Platform Economy

Advancing risk regulation in the context of the platform economy

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Glossary

FSA – Food Standards Agency.

FSMS – Food Safety Management System.

LSE – London School of Economics & Political Science.

NFCU – National Food Crime Unit.

NHS – National Health Service.

NICE – National Institute for Health and Care Excellence.

RCUK – Research Councils UK.

SERD – Science, Evidence, and Research.

SME – Small & Medium Enterprises.

TRL – Technology Readiness Level.

MSMEs – Micro, small, and medium enterprises.

Executive Summary

Risk analysis[1] underpins the Food Standards Agency's (FSA) ability to be recognised as an effective, accountable, and modern regulator. COVID-19 bolstered growth in online food sales, which stressed a need to consider these activities' food safety and integrity risks. However, risk analysis in the context of the platform economy[2] is challenging. Online vendors can have digital storefronts across multiple intermediary platforms, and each platform may operate differently. The analysis must consider what can go wrong at vendor and platform levels – which will vary across platforms.

Question

The FSA's risk analysis know-how is ample, and the FSA has previously undertaken research about food in the platform economy. The existence of applicable resources motivated the following question: can existing FSA resources be joined into a tool to assess food safety and integrity risks in the context of the platform economy?

Main Findings & Attachments

Existing FSA resources can indeed be joined into two types of risk ranking[3] tools, one for guidance, one for audits and/or enforcement:

- A **self-assessment** tool to assist/guide online food vendors and intermediary platforms in gauging food safety and integrity risks – feasible in the short-term.
- An **assessment** tool for use in external audits/inspections by qualified auditors and/or enforcement personnel – feasible in the long-term.

The tools have value separately. Alternatively, they can be conceived as two ends of a regulatory cycle. Preliminary versions of both tools are attached.

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[1] Identifying issues that might pose threats and assessing the scale of these threats (i.e. risk assessment), exchanging information about these threats (i.e. risk communication), and considering potential measures to control these threats (i.e. risk management).

[2] Markets where economic and social activity is facilitated by digital platforms.

[3] A type of risk assessment that enables a comparison of the risks faced/posed by actors or types of actors.

Additional Findings & Attachments

Two documents developed in the process of building the tools above proved valuable themselves and are therefore also attached:

- A **typology** of online food actors, which organises online food businesses into comparable types.
- A **list of hazards**, which lists challenges faced by online food vendors and intermediary platforms that may contribute to food safety and integrity incidents.

Both documents were developed with this project's particular needs in mind. They cannot be taken as statements of fact or as generally applicable. However, they can facilitate the design of other FSA projects interested in the platform economy.

Next steps

This project was a capacity development effort. Its deliverables are flexible. They can be used in multiple ways. What follows, thus, are possible next steps but not, per se, the only possibilities.

Typology & List of Hazards

The typology and list of hazards have already assisted the design of several other FSA efforts. To facilitate the design of and increase coordination by FSA work looking at the platform economy, the FSA could:

- Motivate internal usage of the typology and list of hazards.
- Improve both documents iteratively by submitting them to revision, validation, and, ideally, consultation (as part of a greater effort, rather than specifically about these documents).

Self-assessments

Self-assessments seem a way to motivate/guide online food vendors and intermediary platforms to think about food safety and integrity risks and adhere to food safety and integrity best practices. Having said that, their final design would likely benefit from input by stakeholders. The report therefore suggests the FSA to:

- Enrol stakeholders into the process of finalising self-assessments.

Additionally, while self-assessments are a guidance tool, a further advice section (or column, depending on presentation) is currently unfeasible due to the absence of legal counsel. The report therefore also suggests the FSA to:

- Add further advice to self-assessments when legal counsel becomes available.

Assessments

Continuing the development of the assessment tool seems a way for the FSA and enforcement partners to get to a point where it could inspect online food businesses. That said, an enforcement-first approach to the platform economy may take very long to materialise and consume copious resources. Hence, this report suggests a stepwise approach that exhausts the value of all steps in the process, possible by:

- Extracting data from self-assessments: Self-assessments can be paper-based, but they might also be offered via an online app with an optional anonymous submission button. The data would likely be biased, but it would offer a baseline that can be improved via further data and statistics. Additionally, the data would also complement adjacent data and statistical efforts.
- Leverage auditors: It is possible to think of pilots to test if a cycle made of self-assessments and auditor-based assessments can increase participants' understanding of food safety and integrity risks and reduce their risk baseline.
- Lower the ask on enforcement: Pursue inspection-based assessments where the above does not suffice.

The usual caveats

The above should, of course, be pursued in combination with other efforts. Input from the FSA's National Food Crime Unit (NFCU) could contribute to improving the food integrity aspects of the tools delivered. Input from stakeholders could further relatability vis-à-vis the tools' respective target audiences. Input from the FSA's scientific network can contribute to improving all aspects of this report and attachments. All this implies modifications to everything herein contained; this is indeed what capacity development exercises are for, to provide a baseline for improvement.

Introduction

COVID-19 dynamics bolstered growth in online food sales. “In 2020, the amount spent in online retail sales increased by 46.1% when compared with 2019 as a whole, the largest annual increase since 2008” (Dalgleish 2021), and food platforms became top rising brands in the UK market (BRANDZ 2020). The Food Standards Agency’s (FSA) research about food in the platform economy[4] pre-dates COVID-19 (Prost 2018; FSA 2019a; Brice 2018), but the recent explosion in online food sales underlined the need for further advancing regulatory capacities vis-à-vis the platform economy.

The challenge is multifaceted. A concern is the absence of a systematic way to think of the food safety and integrity risks that accompany online food sales. The situation is problematic because risk analysis is foundational to the FSA’s “vision of being recognised as an effective, accountable, modern regulator” (FSA 2018, 2). Without a robust way to think about food safety and integrity risks in the context of the platform economy, the FSA’s efforts in this space are likely to suffer from a lack of clarity, miscoordination, and fragmentation.

The task is not easy. Risk analysis splits into three components (Poppy 2020, 7):

- Risk assessment: Identifying issues that might pose threats to human and/or animal health and assessing the scale of these threats (risk assessment).
- Risk communication: exchanging information and opinions about these threats throughout the risk analysis process.
- Risk management: considering potential measures to control the risk of these threats.

The first of these components, risk assessment, is quite challenging in the context of the platform economy. The digital nature of online activities makes it difficult to identify threats, which will be management-like situations that can foster food safety and integrity incidents rather than the physical/microbiological hazards themselves that trigger health issues. Also, vendors can have digital storefronts across intermediary

[4] Markets where economic and social activity is facilitated by digital platforms.

platforms, and each platform may operate differently, which means a need to consider vendor and platform level dynamics and account for variability across platforms.

Notwithstanding the challenge, an opportunity exists in the fact that the FSA's risk analysis know-how is ample, and the FSA has research about food in the platform economy. The existence of applicable resources motivated the following question: can existing FSA resources be joined into a tool to assess food safety and integrity risks in the context of the platform economy?

The interest in determining the FSA's risk assessment capacities vis-à-vis the platform economy caught the attention of multiple FSA teams. As a result, input by FSA staff involved in risk analysis was pivotal to this project's foundational design and underlay many aspects of the deliverables. Additionally, other parts of this project benefited from and, reciprocally, contributed to other FSA efforts.

Results were positive. The project found that while the FSA did not have a framework to join the different parts of a risk assessment focused on online food businesses, it had many of the parts needed for a risk rank tool.[5] This prompted the development of a 'canvas' that could act as a framework to join existing pieces. The result is two types of risk ranking tools: a self-assessment (for guidance), and an assessment tool (for audits and/or enforcement). Preliminary versions of both tools are attached, as are some of the parts used to build these two tools. This reports details how the tools were constructed and their inner workings.

Work ascribed to the Technology Readiness Level (TRL) method, originally developed to measure the maturity of space technologies (Mai 2017) but now widely used in the development of innovative policy tools (Héder 2017). The TRL breaks the innovation process into a series of levels, each representing a step into completion. Attachments are estimated at a TRL 3: basic principles are observed (TRL 1), concept/application is formulated (TRL 2), and an experimental "proof of concept" tool demonstrates feasibility and, thereby, enables larger-scale prototyping (TRL 3) (EC 2019, 27).

[5] A type of risk assessment that enables a comparison of the risks faced/posed by actors or types of actors.

Foundation

The platform economy is “a set of things working together as part of an interconnected whole” (Bhunnoo 2018, 3), i.e., a system. The platform economy is also often described as complex (Chan, Voortman, and Rogers 2018, 2; Demir, Sandström, and Laurell 2021). The designation of a system as being ‘complex’ deserves unpacking.

Complex systems are often complicated.[6] By itself, however, complication does not equal complexity. Additionally, complex systems also typically involve reflexivity[7] and uncertainty.[8] To understand a complex system like the platform economy, there is a need for more than enumerating its parts. It is also necessary to understand how the actors in the system think, behave, and influence each other. There are limits to the extent any actor, even the FSA, can do such thing (e.g. technical capacities, privacy considerations). The practical consequence is the need to accept that there will be many unknown and unknowable causal feedbacks that will limit the degree to which any actor can directly control behaviour in complex systems.

How can the FSA be confident that online food actors appropriately think and manage food safety and integrity risks in a system it cannot fully control? The short answer is that the regulation of food in the platform economy necessitates much engagement with and participation by actors in the platform economy. The long answer follows.

Regulatory scholars and practitioners readily acknowledge complexity. For instance, “regime complexity theories highlight relationships among nested, overlapping, and parallel regimes […] and analyses of institutional “interplay” address institutions’ effects on one another” (Eberlein et al. 2014, 4). Furthermore, foundational regulatory concepts such as polycentrism (Andersson and Ostrom 2008; Black 2008; Ostrom 2010), hybridity (Bair 2017; Kurunmäki and Miller 2011), and responsiveness (Ayres and Braithwaite 1992; Baldwin and Black 2008) embody the idea of myriad actors affecting one another in partially unknown manners. Today, regulation is known to be about leveraging behaviour in partially uncontrollable complex systems.

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[6] Having many parts.
[7] Situations where the parts of a system mutually influence each other.
[8] Unknown and unknowable unknowns.

A way to leverage behaviour in such conditions is to influence how actors think of the problems they will eventually face. Due to inability to understand everything there is to understand about their system, absolutely all actors in complex systems must aid their understanding in models, logics, or 'thinking infrastructures' (Kornberger et al. 2019, 1; see also Kurunmäki and Miller 2011, 1101) "that structure attention, shape decision-making, and guide cognition". Suppose actors' thinking infrastructures support the protection of food safety and consumer interests – in that case, their actions may be concurrent with the FSA's ideals. Suppose the opposite is true – severe cognitive dissonances may forever pervade the regulation of food in the platform economy.

Therefore, fostering a common understanding of food safety and integrity risks is key to the FSA's ability to regulate food in the platform economy. A best practice that may contribute to this goal is developing risk assessment resources that double as self-assessment/guidance for online food actors. Challenges are implied. Risk assessment and analysis can be a sophisticated affair, which may challenge communications. However, many platform economy actors are comfortable with sophistication – they can handle substance. Furthermore, sophisticated guidance can be additional to rather than a replacement for simpler documents.

Method

As noted, the FSA has rich risk analysis know-how and exploratory research about food in the platform economy. This represented a challenge and an opportunity. It called for avoiding duplicate resources, which was achieved by focusing on issues or threats explicitly or significantly to the online aspects of online food actors' activities. But it also enabled a foundation on which to build.

The project, thus, begun with a rapid review of internal and published documents by the FSA's Science, Evidence, and Research Division (SERD) and conversations with staff from across the FSA. The most salient documents were the two previous reports about food in the platform economy by Brice (2018) and Prost (2018), and a chain of emails with risk analysis staff at the FSA. The former two documents contributed to categorising online food actors and identifying hazards/threats, and the conversation with FSA risk analysts informed risk maps (presented later) and contributed to shaping deliverables.

The resources in the previous paragraphs acted as a foundation for conversations with others at the FSA, which can be grouped into three efforts. Conversations with FSA staff that also needed a way to categorise online food actors, which led to adjustments to ensure the typology worked for all three projects. Conversations with FSA staff working on intelligence-driven approaches to enforcing food standards, centred on the possibility of developing guidance material to motivate online food actors in adhering to food safety and integrity best practices. Conversations with teams from across the FSA about the contents of this project's list of hazards (presented later).

Deliverables

This section presents the different parts of the tools attached to this report and details how they work. Risk assessment can be split into three tasks. There is a foundational need to (A) determine the objects of analysis. Once this is known, risk assessment needs (B) a way to identify hazards/threats (FSA 2018, 1; Poppy 2020, 7). Once threats against which to estimate things are available, there is a need for (C) rules to gauge the likelihood of hazards being realised, their potential impact, and the uncertainty of measurements (FSA 2019b; Poppy 2020, 14). This section is organised accordingly.

Typology (A)

As noted, the typology for this project builds primarily on research by Prost (2018) and Brice (2018), but also slightly on a brief about the size of and actors in the UK takeaway market (FSA 2019a) that used similar categories. What derived from these documents was combined with input from across the FSA.

The primary division that equalises/differentiates actors in the platform economy (and by extension, the challenges they face) is the systemic role they perform. Typically, online actors are divided into vendors, i.e., the providers of food products or services, and digital platforms, i.e. online spaces which "specialise in enabling two or more groups […] to locate and assess a variety of potential transaction partners" (Brice 2018, 12). After considering Brice's (2018, 16) further notes and engaging with others as described above, a need for separating platforms with limited informational role and those intermediating or facilitating exchanges became evident. Table 1 details the resulting categories.

Table 1: Types of systemic roles

Online vendors	Informational platforms	Intermediary platforms
Food businesses the sell or otherwise trade their own food products or services online.	Websites or online platforms where food products from or services by external vendors are advertised/marketed but where sales are not intermediated or purposely facilitated.	Websites or online platforms that intermediate or purposely facilitate the sale or exchange of products from or services by external vendors.

As is the case with any actor, numerous subcategories are possible. The tables in the next two pages present a way to subcategorise online food vendors and intermediary platforms into types likely to face similar food safety and integrity risks.[9] Table 2 is influenced by Prost's (2018) and Brice's (2018, 6) interest in how activities by small unconventional operators may differ from those by more established businesses, and table 3 by Brice's (2018, 6) separation of intermediary platforms into those involving low/high curation, i.e. clear rules or structure for vendors to follow. Conversations with others reinforced the importance of having a way to differentiate small 'personal' types of food operators from more traditional businesses, and emphasised a need for a clear separation between social media platforms that offer a means for advertisement and marketing and social marketplaces that facilitate the sale or exchange of food products and services.

[9] Due to the informational nature of their activities, this project did not further consider informational platforms in subsequent sections.

Table 2: Vendor sub-types.

Vendors
Food businesses the sell or otherwise trade <u>their own</u> food products or services online.
Personal
People or households without dedicated food premises selling or otherwise exchanging their own food products or food services online (regardless of whether they do it via their website or an intermediary platform). Examples: Home kitchens, home-based vegetable growers, food surplus enthusiasts.
Goods (groceries) | Experiences (events) | Cooked meals
Click & Collect | On-demand | Scheduled
Ordering* | Logistics** | Direct handling
MSMEs
Micro, small, and medium businesses (MSMEs) selling or otherwise exchanging their own food products or food services online (regardless of whether they do this via their website or an intermediary platform). Examples: Takeaways, restaurants, food trucks, local grocery stores with online shops.
Goods (groceries) | Experiences (events) | Cooked meals
Click & Collect | On-demand | Scheduled
Ordering* | Logistics** | Direct handling
Large
Large businesses (typically but not necessarily operating across regions, jurisdictions, or market segments) selling or otherwise exchanging their own food products or food services online (regardless of whether they do this via their website or an intermediary platform). Examples: Ocado, Gousto, Hello Fresh, Domino's, McDonald's.
Goods (groceries) | Experiences (events) | Cooked meals
Click & Collect | On-demand | Scheduled
Ordering* | Logistics** | Direct handling

* Ordering involves taking part in the realisation of a sale but without involvement with food products or services (a typical example being aggregators that limit their activities to order intermediation).

** Logistical support occurs when a business is not directly involved in delivering food or realising a food event but facilitates such thing via outsourcing tasks.

*** Direct handling of food occurs when a business undertakes food delivery or management/realising of a food event by itself (via contracted staff).

Table 3: Intermediary platforms sub-types.

Intermediary platforms
Websites or online platforms that intermediate or purposely facilitate the sale or exchange of products from or services by external vendors.
Personal
Blogs with shops that include products or services from external vendors (they exist but are not covered by the remainder of this project).
Click & Collect | On-Demand | Scheduled
Ordering* | Logistics** | Direct handling***
Mixed food & non-food | Food | Sectoral*
Booking & Ordering
Platforms aggregating food products or services from external vendors in a manner that includes but is not limited to booking and ordering (with or without involvement in logistics by means of contributing to delivery or event management). Examples: Olio, Farmdrop, Amazon Fresh, Caterwings, EathWith, CityPantry, Feast It, JustEat, Deliveroo, Too Good to Go, Karma, Bookatable.
Click & Collect | On-Demand | Scheduled
Ordering* | Logistics** | Direct handling***
Mixed food & non-food | Food | Sectoral*
Open/social
Town-square-like platforms (a.k.a. marketplaces) that facilitate the trade or exchange of food products or experiences by providing a digital space designed to match vendors' products and services with potential consumers. Examples: FB marketplace, Craigslist, Gumtree.
Click & Collect | On-Demand | Scheduled
Ordering* | Logistics** | Direct handling***
Mixed food & non-food | Food | Sectoral*

* Focused on a specific sector of the food industry. Magazines are the archetypal example, but larger social networks can also be focused. Tidbit Social, for instance, is restaurant-oriented.

Some caveats exist. Firstly, the typology enables a perspective of the whole system. For the same reason, it does not imply priorities. Secondly, some actors operate across categories. This is a challenge for efforts like mapping, which may require assigning actors to single classes. Conceptually, however, the matter is a non-issue because categories can be conceived as involving overlaps. Thirdly, there is a need to subject the typology above to improvement, for numerous reasons, including it being a preliminary version developed with a specific purpose in mind – which may or may not be compatible with broader normative, legal, and procedural considerations.

List of hazards (B)

The section also builds on considerations in existing FSA research. For example, Prost (2018, 23) and Brice's (2018, 8–9) interest in the extent to which small vendors may operate in informal bases, and Brice's (2018, 9) note about allergen declarations varying across platforms. The concerns drawn from these reports were improved upon feedback by and interaction with FSA staff.

As table 4 shows, the full list is extensive. It would be impossible to provide a play-by-play overview of its evolution. That said, it is possible to note that improvement came largely in the form of better understanding of initial concerns in published documents, additional issues to consider, and clarity. The resulting list of identified hazards is summarised in table 4.

It is worth noting ahead of examination of table 4 that in the food sector, the term 'hazard' tends to be linked to microbiological issues. At the foundation, however, any issue that may develop into an undesired event is a hazard. Non-microbiological issues that may develop into undesired food safety and integrity events are hazards. Further research linking the type of general level risk assessment undertaken in here and risk assessment at other levels is, of course, recommended. To facilitate this, the vendor items in table 4 are phrased to emphasise the interest in determining how online operations influence food activities at other levels.

It is also worth noting that while table 4 is extensive, this project built on a rapid review, so the list cannot be considered complete. Instead, it is a departure point in need of modifications and additions. For example, there is much room for more food integrity considerations. The rapid nature of the research design forced exclusion of documents or processes by the National Food Crime Unit (NFCU), which likely means that table 4 is biased toward food safety (over food integrity) considerations.

Table 4: List of hazards

General
Foundational: concerns applicable to all online food businesses

• **Imperfect registration.**
  ○ Some online food vendors may not be aware of or interested in registration. Registration expectations for platforms are unclear.
• **Limited experience.**
  ○ New entrants might be tempted to prioritise the learning of online market dynamics over food safety and integrity concerns.

Online food vendors

Vendor-101: concerns applicable to all online food vendors.

- **Cleanliness.**
  - Cleanliness is a foundational requirement. It would be good to confirm if online vendors prioritise it.
- **FSMS.**
  - It is unknown whether all online vendors have a food safety management system (FSMS) in place.
- **FSMS (online considerations).**
  - Even if a vendor has an FSMS, the vendor might be unaware of the various ways in which online operations may affect the process.
- **Lack of food safety training.**
  - The extent to which online food vendors pursue food safety training is unknown, but much variation across types of vendors is plausible.
- **Traceability.**
  - It is unknown whether many online vendors keep due records of all steps in the intermediation process.
- **Allergens (understanding).**
  - Gaps in communication vis-à-vis the platform economy may mean some vendors are only partially aware of allergens and applicable procedures.
- **Allergens (display across sales channels).**
  - Some online food vendors may not display allergen information across all online sale channels.
- **Allergens (packaging/service).**
  - Some vendors may not display allergen information in packaging or during service due to considering online declarations sufficient.
- **FHRS (coverage).**
  - Very small online food vendors may not be covered by the FHRS.
- **FHRS (herd effects).**
  - Display of FHRS by vendors covered by it may be challenged by their need to appear in listings alongside vendors not covered or not displaying FHRS.
- **Food fraud (quality of supply).**
  - Online vendors may be at increased risk of being targeted by organised crime.
- **Food fraud (lack of customer oversight).**
  - The disconnection between preparation and consumption may increase the opportunity for fraudulent behaviour by some online food vendors.

Logistics: concerns applicable to vendors involved in food delivery and/or food events' management, including those that outsource these tasks to contractors or independent partners/associates.

- **Delivery (oversight).**
  - The relation between the vendors and those fulfilling logistical needs for them may vary significantly, implying varying degrees of oversight over food delivery and/or events' management.
- **Delivery (training).**
  - Trained delivery personnel are less likely to incur food safety and integrity issues than untrained personnel.

- **Delivery (temperature).**
  - Food (including groceries) is susceptible to changes in temperature.
- **Delivery (contamination).**
  - Food (including groceries) can be unintentionally or intentionally contaminated during delivery.
- **Mix-ups (foundational).**
  - Accidental mix-ups seem likely in the context of the delivery of multiple orders or management of large events.
- **Mix-ups (non-foods).**
  - Some online vendors may deliver mixed food and non-food products or manage events involving both types of products. The digital aspects of logistics involved may increase all associated risks.
- **Mix-ups (allergens).**
  - Given separation between production and consumption, products containing allergens may easily be confused during or after transport.

Personal: concerns applicable to very small 'personal' type of online food vendors.

- **Mixed activities (storage).**
  - Some small online food vendors may not store domestic and business foods separately.
- **Mixed activities (preparation).**
  - Some online food vendors may not separate the preparation of food for business and domestic consumption.
- **Nomadic practices (foundational).**
  - Some online food vendors travel or otherwise change kitchens in the process of providing services.
- **Nomadic practices (procedures).**
  - o A degree of nomadic practices may be impossible to avoid, but procedures to manage the location changes involved may reduce their risk.

MSMEs: concerns applicable to micro, small, and medium enterprises.

*There are currently no additional items to include in this section of the table. During research, MSMEs seemed to be perceived as the archetypal type of online food vendors. As a result, most applicable hazards are covered in the vendor-101 or logistics sections of this table. Additional thinking is suggested.

Large: concerns applicable to large or industrial type of online food vendors.

- **Assessment.**
  - Large food businesses often have food safety and integrity procedures in place, but it is uncertain if they have specifically assessed added risks that may arise from online operations.
- **Regulatory mismatch.**
  - Aspects of some online food vendors' online operations may fall under the remit/supervision of different local authorities (LAs), which may further challenge the regulation of online activities.

Online intermediary platforms

Intermediary-101: concerns applicable to all intermediary platforms.

- **Unregistered vendors.**
  - Platforms not requiring vendors to be registered food businesses may contribute to an increase in the number of unregistered food operators.
- **Traceability.**
  - It is unknown whether online platforms (or how many) are sufficiently close to their vendors to facilitate traceability should a need for such thing arise (this can be extended to the ability to consider complaints).
- **Communications with vendors.**
  - Platforms that regularly engage with their vendors on food safety and integrity issues can help communicate applicable guidance if/when needed; the opposite might represent a communications challenge.
- **Interest in food safety/integrity.**
  - The degree to which different platforms encourage vendors to think about food safety/integrity is not well known (especially outside the takeaway sector).
- **Interest in food safety culture.**
  - The degree to which different platforms encourage vendors to think about their food safety culture is unknown.
- **FSA/LA communications.**
  - Good communicate with LAs and the FSA can facilitate regulation; poor communication may represent a challenge.
- **Facilitating allergen declarations.**
  - Functionality differentials may affect the extent to which a platform facilitates allergen declarations (and their visibility).
- **FHRS (admission).**
  - Platforms that require vendors to have a minimum FHRS score may represent a lower risk than those that do not.
- **FHRS (display).**
  - Functionality differentials may affect the extent to which a platform facilitates FHRS display (and their visibility).
- **Quality assurance.**
  - Platforms with quality assurance processes may help to reduce the likelihood of unintentional incidents and fraud-related incidents.

Logistics: concerns applicable to intermediary platforms involved in food delivery and/or food events' management, including those outsourcing to contractors or independent associates.

- **Ownership.**
  - The ownership over issues that may arise during food delivery or management of food events/experiences may vary as per the relation between platforms and contractors/associates.
- **Delivery (training).**
  - Trained delivery or event management personnel are less likely to incur food safety and integrity issues than untrained personnel.
- **Delivery (temperature).**
  - Food (including groceries) is susceptible to changes in temperature.

- **Delivery (contamination).**
  - Food (including groceries) can be unintentionally or intentionally contaminated during delivery.
- **Mix-ups (foundational).**
  - Accidental mix-ups seem likely in the context of the delivery of multiple orders and during the management of large events.
- **Mix-ups (mixed goods).**
  - Some platforms sell food and non-food products. It is unknown if food is being mixed with other products in a way that could lead to cross-contamination.
- **Mix-ups (allergens).**
  - Mix-ups of allergen and non-allergen items seem particularly feasible in the context of intermediated sales and outsourced delivery of food or management of food events/experiences (too many hands involved type of problem).
- **Vendor matching (foundational).**
  - Some platforms may deliver orders combining goods/services by multiple vendors, which may increase risks beyond the single-vendor model.
- **Vendor matching (traceability).**
  - Without due internal record-keeping by the platform, vendor matching activities may challenge traceability even further.
- **Meta-aggregation (foundational).**
  - Platforms that complement their listings with products or services from other platforms might face added food safety and integrity challenges.
- **Meta-aggregation (traceability).**
  - Platforms that complement their listings with products or services from other platforms might represent a particularly poignant traceability challenge.

Open/social marketplaces: concerns applicable to 'marketplace' platforms.

- **Illicit activities.**
  - Marketplaces are attractive for vendors who want to sell illegal food items.
- **Repeat offenders.**
  - Marketplaces not requiring proof of ID or registration from vendors may provide an opportunity for repeat offenders to continue business indefinitely.

A note on format/presentation of the list of hazards

Hazards are presented differently in this report than in attachments. In this report, the objective is to itemise hazards as clearly as possible. In the attachments, the vendor and platform components of table 4 are used as the foundation for questions to use in the self-assessment and assessment tools. The tools are Excel files that use macros, which calls for formatting that may challenge readability. So, for clarity, the notes in the following paragraph aid the readability of attachments.

Self-assessment and assessment tools work not with the items in the list above but with questions based on them. The questions are declared in the respective files in a column next to the items in table 4. Additionally, the assessment tool (and only the assessment tool) has two further columns to enter impact estimates for each hazard – one column is for health impacts and the other for impact on other consumer interests. The file currently has values in these cells (highlighted in red), but these are for functionality. As noted extensively, this project's goal was to determine if existing FSA resources could be joined into a tool to assess food safety and integrity risks in the context of the platform economy, not to undertake such assessment. Determining real impact estimates is out of scope.

Risk Maps (C)

A risk rank also needs rules or thresholds to determine the potential impact of hazards, the likelihood of hazards being realised into incidents, and measurement uncertainty. Thresholds vary across sectors. For example, for a football team, a 10% failure rate may win the championship, but it would be catastrophic if 10% of aeroplanes failed to land. However, irrespective of sector, thresholds are typically presented in risk maps, tables that visualise all rules. In the interest of consistency across the sector, this project's risk maps are based on documents and input from risk analysis staff at the FSA. Not to say changes will not be needed; they likely will. That said, the idea here is to homogenise the departure point to reduce final differences.

Existing FSA thresholds focus on physical hazards. The hazards in the context of the platform economy are not, per se, physical, but the final impact on health remains the same. So, existing impact thresholds seem applicable. Additionally, uncertainty is declared in a sufficiently agnostic as to apply generally. Furthermore, the upper and lower likelihood thresholds seem universal, and a granular calibration of middle thresholds cannot take place in the absence of pilots. In other words, much of the FSA's existing approach seems to transpose to the challenge of assessing food safety risks in the context of the platform economy. Therefore, thresholds for assessing food safety risks in the context of the platform economy can be based on existing FSA processes. These thresholds are declared in table 5.

Table 5: Food safety risk map.

	Low impact	**Medium impact**	**High impact**
	Mild illness: not usually life-threatening, usually no sequelae, normally of short duration, self-limiting symptoms (e.g. transient diarrhoea).	Moderate illness: incapacitating but not usually life-threatening, sequelae rare, moderate duration (e.g. diarrhoea req. hospitalisation).	Severe illness: causing life-threatening or substantial sequelae or illness of long duration (e.g. chronic hepatitis).
Very high likelihood Events occur almost certainly.	6	12	18
High likelihood Occurs very often (>99%).	5	10	15
Medium likelihood Occurs regularly (10-99%).	4	8	12
Low likelihood Rare but does occur (1-10%).	3	6	9
Very low likelihood Very rare but cannot be excluded (<1%).	2	4	6
Negligible likelihood Extremely rare, does not merit consideration.	1	2	3
	Uncertainty		
	Low Solid and complete data available; strong evidence in multiple references; authors report similar conclusions.	**Medium** Some but no complete data available; evidence in a small number of references; authors' conclusions vary.	**High** Scarce or no data; evidence in unpublished reports, observations, or personal communication; authors' conclusions vary.
	1	2	3

Similar ready-made rules for food integrity were not found. That said, SERD research recently engaged with quality-adjusted life years (QALY). The idea of a QALY is that a year of life requires different valuation depending on the health state of the individual during the same, i.e. a year of life in poor health is valued, or given lower weight, than a year in full health – there is a vast range of methodologies and approaches to capture this qualitative appraisal. SERD's research extended this idea to food regulation, to gauge the impact on life quality of losing income due to food-related health issues (Daniel et al. 2020, 11–12).

It is not possible to directly use the FSA's QALY's research to construct a risk map. However, the foundational idea, namely, that food incidents may cause losses that impact consumers' quality of life applies. Table 6 combines this idea with the wireframe used in table 5 into a risk map for the purpose of assessing food integrity risks.

Not all thresholds in tables 5 and 6 could survive iterative improvement. For example, it does seem that the difference between a very low and a negligible likelihood of an event is too fine as to allow measurement in the context of hazards that are ultimately the result of social or management situations. However, as noted, calibration at this level of granularity cannot take place without empirical evidence from pilots.

Table 6: Food integrity risk map.

	Low impact	**Medium impact**	**High impact**
	No effects, or so mild that they do not merit to be considered	Concrete non-health impact (e.g. financial loss).	Systemic non-health impact (e.g. loss of trust in sector).
Very high likelihood Events occur almost certainly.	6	12	18
High likelihood Occurs very often (>99%).	5	10	15
Medium likelihood Occurs regularly (10-99%).	4	8	12
Low likelihood Rare but does occur (1-10%).	3	6	9
Very low likelihood Very rare but cannot be excluded (<1%).	2	4	6
Negligible likelihood Extremely rare, does not merit consideration.	1	2	3
	Low uncertainty Solid and complete data available; strong evidence in multiple references; authors report similar conclusions.	**Medium uncertainty** Some but no complete data available; evidence in a small number of references; authors' conclusions vary.	**High uncertainty** Scarce or no data; evidence in unpublished reports, observations, or personal communication; authors' conclusions vary.
	1	2	3

Putting it all together

The final step is assembling all above into functional tools. There is not much to say about this other than the self-assessment and assessment files attached to this report do such a thing. Both files are Excel documents that use macros to join different aspects of the above into either a self-assessment or an assessment questionnaire.

Figure 1 offers a snapshot of the self-assessment tool. Users select the type of online food business they are, which populates the questionnaire with questions pertinent to them (the questions come from the lists of hazards). After questions are answered, the form automatically offers risk level indicators next to each answer. The indicators can then act as signals to nudge users into improving aspects of their activities. Additional guidance is possible by adding a column with full-length FSA-sanctioned guidance advice, but this is a separate task that requires legal counsel – which was not feasible for this project due to the rapid nature of research.

Figure 2 offers a snapshot of the assessment tool. Users, in this case, auditors or inspectors, select the type of online food business to analyse by clicking on the buttons provided. The form populates the questionnaire with questions applicable to the chosen actor type (as per the list of hazards). The form also imports the impact estimates from the additional columns in the list of hazards. Finally, there is also an option to format the questionnaire for business- or type-level analysis. Assessors can then answer each item via the dropdown menus provided. A risk score appears next to each answer, which results from multiplying the assessors' answer as "likelihood" estimate and the estimates of impact from the list of hazards. It is then possible to rank different online food vendors or intermediary platforms as per their total risk score.

It is worth recalling that the impact estimates currently in the list of hazards are placeholders needed to demonstrate the functionality of the assessment tool. As detailed in the next section, while self-assessments seem a feasible short-term goal, assessments would need a long-term process. A reason is that there is a considerable process to determining precise likelihood, impact, and uncertainty estimate, including but is not necessarily limited to revision, validation, and consultation with the FSA's wider network of scientific advisers and stakeholders. Separately, since the tool is a proof of concept product, visual design is not considered.

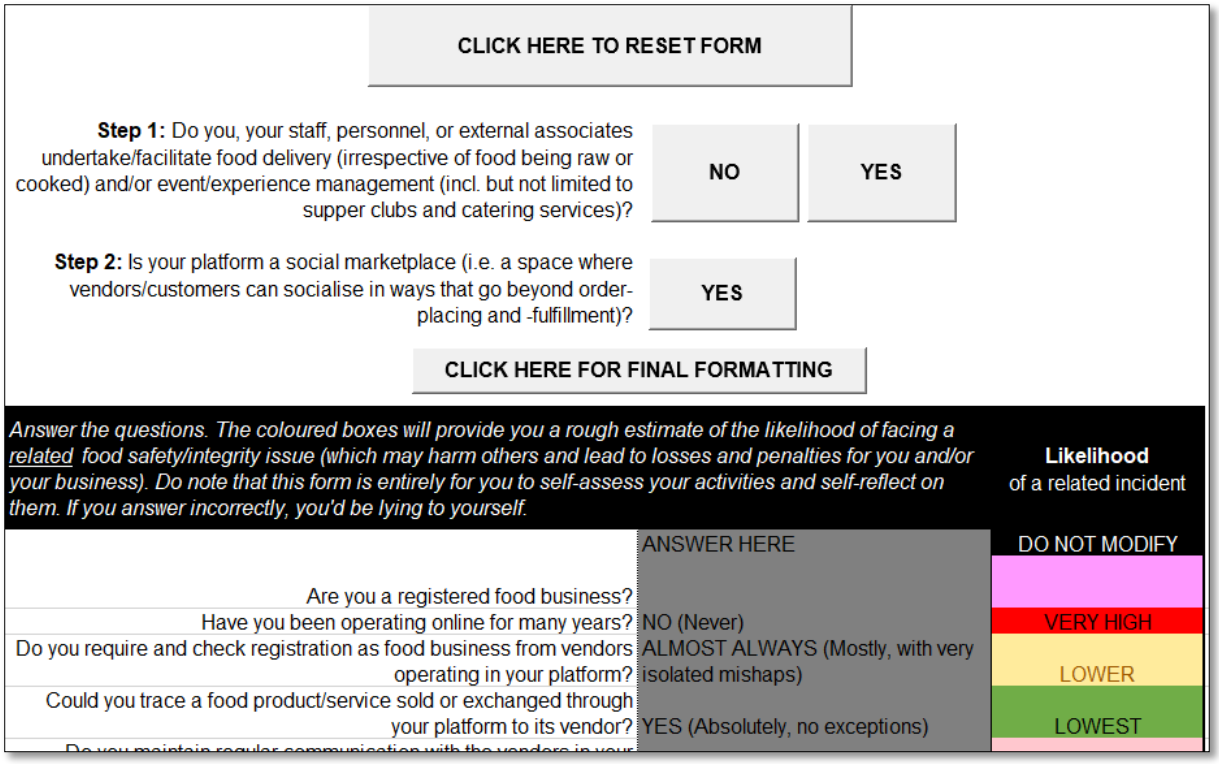

Figure 1: Self-assessment module.

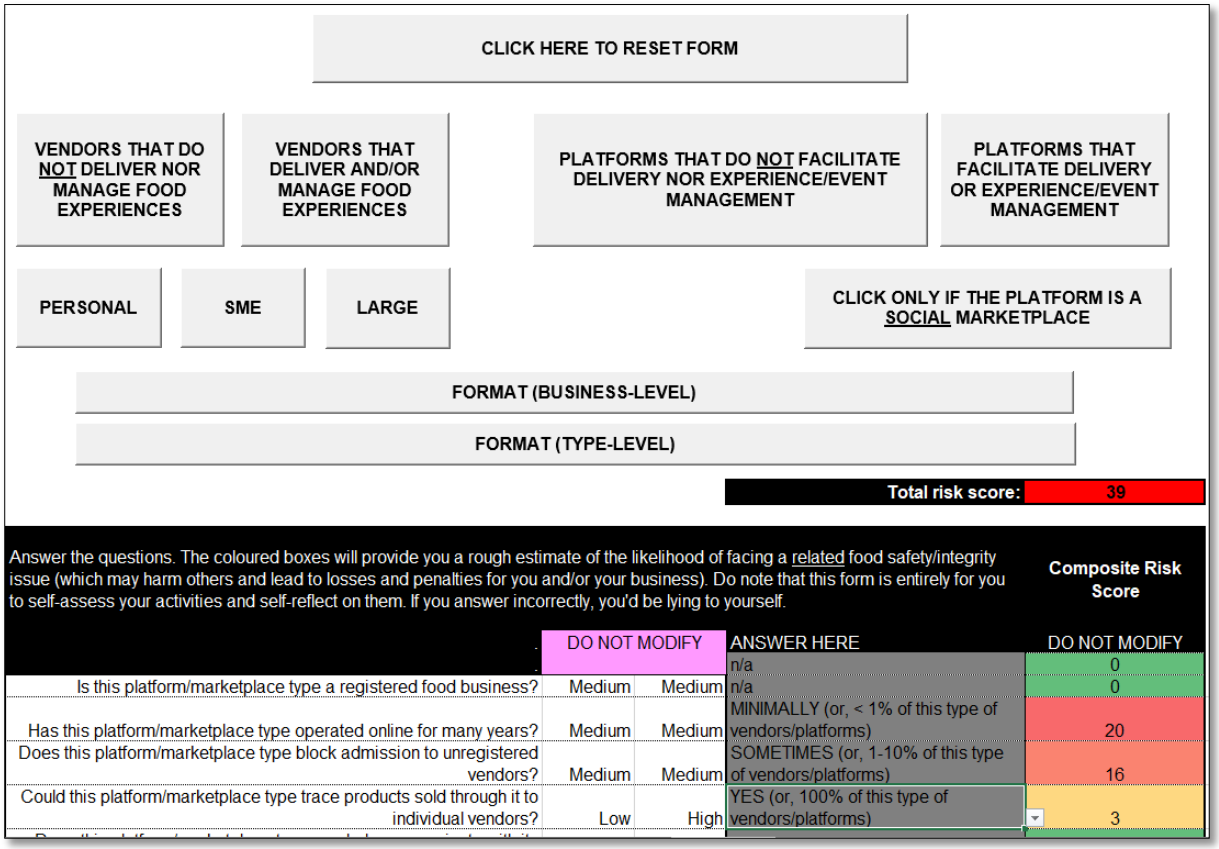

Figure 2: Assessment module.

Next steps

This project was a capacity development effort. Its deliverables are flexible assets that can be used in multiple ways. What follows, thus, are possible next steps but not, per se, the only possibilities.

It is worth noting that the below also builds on existing FSA research about food in the platform economy. Brice (2018, 46) stressed the need to consider a "working group or expert committee focused on developing strategies for cooperation with platform operators to improve food safety among their vendors". Brice's point remains valid. As elaborated in the foundation section of this report, there is a need for engagement that transcends this project's specifics. Ergo, the suggestions below are intended as part of a greater effort rather than, per se, the action.

Typology & List of Hazards

Preliminary as they are, the typology and the list of hazards can immediately contribute to the FSA's activities. In fact, the typology has already done so. As noted, the typology was developed in communication with other FSA efforts. In the process, the typology showed the ability to facilitate the design of other FSA projects in this space.

The principal value of the list of hazards is that it lists numerous concerns applicable to online food vendors and intermediary platforms. So, while improvement is needed to move from the current to a complete version, the current list can help to reduce the likelihood of accidental oversights.

Therefore, a way to maximise contributions by the typology and lists of hazards would be for the FSA to:

- Motivate internal usage of the typology and list of hazards.

Having noted the potential of immediate contributions, it remains the case that these two documents are preliminary. Room for improvement is ample. Inviting comments on the typology and list of hazards could lead to better versions and improve their ability to contribute to FSA activities. Additionally, making these documents part of a broader process of engagement may add to the FSA's understanding of the platform economy, build bridges with actors in it, and, overall, contribute to cementing progress. Therefore, this report also suggests the FSA to:

- Improve these documents iteratively by submitting them to revision, validation, and, ideally, consultation by/with others.

An improvement point that deserves a note is the need to consider the list of hazards' completeness, particularly regarding food integrity. Additionally, as noted before, there is a need to determine estimates for the impact of hazards, which would benefit from involving experts and stakeholders more widely, potentially as part of a greater consultation.

Risk maps

Efforts to tackle risk in the context of the platform economy should avoid accidentally creating more complexity. If existing FSA thresholds are applicable, there is no need for complicating things further. Ergo, it is suggested that future risk-oriented efforts addressing food in the platform economy at the FSA consider the risk maps in this report or otherwise find a way to ascribe to how the FSA assesses risk elsewhere.

That said, infallibility is unlikely. Implied in the developmental nature of this project is a need to further discuss whether the risk maps apply as given or need adapting.

Self-assessments[10]

Self-assessments are a logical next step. They are a more manageable challenge than assessments because they do not face as many challenges vis-à-vis measurement of likelihoods, impacts, and uncertainties. Therefore, self-assessments seem a way to guide online food vendors and intermediary platforms to think about food safety and integrity risks and adhere to food safety and integrity best practices. Having said that, this project built primarily on input by FSA officials, so final design may benefit from input by stakeholders. Accordingly, the report suggests the FSA to:

- Enrol stakeholders into the process of finalising self-assessments.

[10] A helpful clarification is that while the self-assessment tool can enable self-assessment by both online food vendors and intermediary platforms, this is not a strategic suggestion. As noted, this report and attachments are flexible assets that can adapt to regulatory priorities. If a decision is made to focus only on platforms, for example, all that is needed is deleting the vendor components from the final public version of the tool.

Self-assessments are a guidance tool. They offer a sense of direction by flagging issues representing a high level of risk. These flags may nudge users into improving aspects of their activities. It is also possible to use self-assessments as an entry point into richer guidance that includes additional FSA-sanctioned advice. That said, the specific advice in that column must consider broader input than what this project design allowed – including but potentially not limited to legal counsel. The report therefore also suggests the FSA to:

- Add advice to self-assessments when legal counsel becomes available.

Assessments

For readers with a preference for enforcement, the key deliverable is the assessment tool. Continuing this tool's development seems a way for the FSA and enforcement partners to ultimately inspect online food businesses.

There are various ways in which assessments can be taken forward, and this report wants to avoid being overly-prescriptive about it – there is value in brainstorming about it. As a point for brainstorming, however, it is valid to note that an enforcement-first approach to the platform economy may take long to materialise and consume copious resources. It is reasonable to exhaust the value of other options, which is possible by conceiving assessments as a final step in a series of short- to mid-term victories:

- Extracting data from self-assessments: Self-assessments can be paper-based, but they might also be offered via an online app with optional anonymous submission. The data would likely be biased, but it would offer a baseline that can be improved via further data and statistics. Additionally, the data would also complement adjacent data and statistical efforts.
- Leverage auditors: Another feasible next step is to pursue pilots to test if/how a combined usage of self-assessments and input from assessments by external auditors can (1) increase the understanding of food safety and integrity risks posed by participants, and (2) reduce their risk baseline. These pilots may show much is possible without inspections and/or help refine the tools ahead of an inspection-based effort.
- Lower the ask on enforcement: The benefit of sequencing steps is that the final toll on enforcement could be reduced. Every step would mean developmental

improvements. Each step might resolve much. The ask on enforcement would be reduced.

The usual caveats

The above should, of course, be pursued in combination with other efforts. Input from the NFCU could contribute to improving the food integrity aspects of tools. Input from stakeholders could further relatability vis-à-vis the tools' respective target audiences. Input from the FSA's scientific network can contribute to improving all aspects of this report and attachments. All this implies modifications to everything herein contained; this is indeed what capacity development exercises are for, to provide a baseline for improvement.

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