Strategic surveillance and data

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The FSA's strategic surveillance service develops tools and techniques to turn data into intelligence, using machine learning and artificial intelligence. This helps the FSA, and our external users, make quicker, better-informed actions to protect consumers. We have established a flexible, responsive data-enabled strategic surveillance service which harnesses the power of data science to identify emerging risks before they become risks to public health, using a variety of data sources.

Objectives in 2021/22

To continue to develop tools and techniques which will provide relevant data to each area of the business, allowing them to achieve their goals effectively, in a data led way.

Progress against objectives

- implemented business change activity to embed the solutions into 'business as usual', by providing user support for adopting solutions, collecting feedback and maintaining request backlogs or each service.
- introduced an ethics approach to all our artificial intelligence (AI) activities, including machine and deep learning.
- established a systematic and repetitive process for identifying use cases, conducting 'hackathon' events, regularly engaging with stakeholders.
- improved data architecture, governance and introduced dashboards and data standards to bring consistency to reporting. Additionally, we have transitioned to a cloud-based environment that standardises the way we ingest, store and visualise data.

Listed below are some of the tools and techniques we have developed.

Signal Prioritisation Dashboard (SPD)

We have developed the SPD in collaboration with the Receipt and Management (RaM) team. The SPD is a short-term horizon scanning application. It consolidates food, feed, and food contact material related signals from over 48 open sources each day into a single access point. The SPD provides users with complete transparency and control over the data sources and the logic used for the prioritisation of signals. It dramatically improves our overview of food safety issues which may affect the UK. SPD was also shortlisted for the Food and Drink Federation awards 2021 in the Digital Transformation category.

The SPD has reduced our dependency on third-party systems and has resulted in significant annual savings. We have also observed occurrences of SPD reporting signals a week before other third-party systems. Having this earlier notification is invaluable to those analysing strategic, tactical, and operational issues and trends, and for those organising interventions. The SPD has proven itself to be one of the key tools in our ability to responding to major events such as EU Exit and COVID-19. Beginning from March 2013, SPD has banked over 77k records, thus lending itself to valuable trend analysis. The tool is regularly accessed by 125+ users.

Presented below are some insights from how the RAM team utilises the information presented by SPD:

Our new receipt and management function processed over 12,000 signals:

- 27 new incidents identified
- 99 referrals to local authorities
- 371 further signals were also passed on for information only
- 9 emerging risks identified, for example listeria in enoki mushrooms from Asia which found a 90% non-compliance rate.

Risk Likelihood Dashboard (RLD)

The dashboard identifies high-risk commodities imported into the UK. This dashboard helps present complex information on ‘risky’ food and feed, in an understandable way and flags potential and emerging food and feed safety risks in terms of commodity, country of origin and hazard. The dashboard is used by FSA teams, including Imports, incidents, and National Food Crime Unit. Other users include FSS and 150 port health and local authorities across the country. Inputs from the dashboard have contributed to the imported food sampling plan and helped increase the non-compliance hit ratio in sampled commodities by an average of 60%. The dashboard was one of the sources for the FSA Imports-led sampling survey conducted in February to March 2020. With inputs from the dashboard, the non-compliance ratio in sampled commodities increased by 132%.

Identifying online display of food hygiene ratings

The FSA wish to extend Wales and Northern Ireland requirements to make display of food hygiene ratings mandatory for businesses operating in England, and to make display compulsory for online businesses in all three countries. We undertook this project to support the rollout and enforcement of mandatory online display, by providing insight into current practice. The findings from this investigatory piece are helping the FSA modernise regulations.

Monitoring high risk food

In anticipation of the post EU-transition period landscape, we have continued to collaborate with the Imports team to strengthen our risk identification capability and capacity by building on proven mechanisms (such as monitoring of key data sources). We have created a solution for monitoring unauthorised imports of food and feed commodities at certain ports, ports, starting with Dover. We are in the process of extending this analysis to other ports.

Operational Transformation segmentation

We collaborated with the Operational Transformation Programme (OTP) to create a compliance risk model driven segmentation for meat establishments. We have also developed an ‘explainability’ dashboard that helps explain the outcomes of the compliance risk model. This will help the OTP andField Operations to improve the efficiency of resource utilisation and move away from the current ‘one size fits all’ approach towards delivering official controls.

FHRS machine learning predictor

As part of the COVID-19 local authority We supported the COVID-19 Local Authority recovery plan by designing and developing this service that aims to ease the increased load of new inspections on local authorities by providing a prediction of expected compliance levels of new establishments, thus helping authorities prioritise inspections. This project is currently being

piloted by 16 local authorities across England, Wales, and Northern Ireland.

Automated feed identifier (AFI)

On behalf of the Regulatory Compliance team, an automated tool ‘automated feed identifier’ was created that aimed to reduce manual effort in detecting feed commodities listed in manifests, thus improving the delivery of official controls, supporting efficient resource utilisation, and reducing trade friction. The tool made the manifest documents searchable and also highlighted feed terms on the manifests themselves. The FSA have also increased the performance of the tool (as compared to the previous iteration) in terms of the time it takes to process a document. Feedback from Local Authorities involved in this project indicates that the manual process of going through a 100-page document takes on average about 1 hour.

Realised AFI MVP solution features: performance times

Number of pages	Previous system time	New system time
1	34 seconds	less than 3 seconds
12	2 minutes	16 seconds
23	5 minutes	30 seconds
100	22 minutes	2.5 minutes

Local authority performance analysis

Designed a set of reusable patterns and processes to ingest, clean, analyse and report information on a regular basis in relation to local authority performance in England, Wales and Northern Ireland. We can then measure local authority progress against the recovery plan and target timely assistance where is more needed. So far we have completed surveys for the last two years and we are now starting to use the accumulated data to develop a trend analysis to monitor local authority performance over time. Additionally, we continue to facilitate the completion of the survey by local authorities. We have introduce the use of individual email links for local authorities. This prevents duplicate responses and seems to promote a higher number of earlier responses.

Register of regulated food and feed products

The FSA developed a service that brings together all authorised uses of regulated products in Great Britain. The European Commission publishes this information in piecemeal form, in various databases, lists and pieces of legislation. We wanted to publish this information in a more coherent way, in a format that is standardised and easier to search and browse. The register is used by a range of stakeholders in industry and local government. We were also able to appropriate the same technology to quickly publish the CBD public list of validated applications. There are currently 4 registers published, for authorisations concerning feed additives (1,579 authorisations), GMOs (234), flavourings (2,499) and smoke flavourings (10). There is also a list of 12117 CBD products for which an application has been submitted, which tells local authorities, businesses and consumers which products are progressing towards approval and which have

failed to complete the approval process.

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