Pathogen Surveillance in Agriculture, Food and the Environment (PATH-SAFE)

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At a glance…

Aim: Pilot a national surveillance system that better monitors and tracks of foodborne pathogens (FBP) and antimicrobial resistance (AMR) in the agri-food system and environment, taking a One Health approach.

Timeline:
2021- 2024

Funding:
Shared Outcomes Fund
£19.2m

Key benefits

- Reduction in commercial losses
- Strengthen UK science excellence
- Efficient use of resources
- Wider societal benefits

Over 50 partners in delivery and advisory capacities, our core bid partners are:

Food Standards Agency
Food Standards Scotland
Department of Health & Social Care
UK Health Security Agency
Department for Environment Food & Rural Affairs
Veterinary Medicines Directorate
Environment Agency

Theory of Change

ACTIVITIES

WS1

Establish a curated and national FBP (and their AMR) genomic data platform with Salmonella as exemplar pathogen

WS2

Pilot new FBP and AMR surveillance approaches based on regular, multi-location sampling in a range of settings, combined with novel technologies (e.g. whole genome sequencing)

WS3

Map and test new and repurposed technologies for rapid onsite FBP testing in collaboration with end users

WS4

Develop a pilot AMR surveillance system based on mechanisms of AMR spread in the environment

TRL: Technology readiness level
WGS: whole genome sequencing

OUTPUTS

WS1

Functional and scalable data platform that houses sequences of exemplar pathogens and their AMR genes

Data platform is interoperable and can interact with other systems like Enterobase and provide an interrogatable user interface

WS2

AMR and FBP curated sample data captured from multiple sources, and tested using novel analysis techniques

Combined evidence from the piloted FBP and AMR surveillance and modelling approaches

WS3

TRL assessment of rapid onsite FBP testing tools with end users
Evidence on utilising COVID-19 testing technology (LAMP) for FBP detection in wastewater

WS4

AMR surveillance framework and suite of diagnostics monitoring of AMR across the environment within a catchment area

OUTCOMES (2-5 years)

- Key stakeholders can more easily share and access data across organisations for rapid identification and tracking of foodborne pathogens and AMR, bringing together multiple data sources
- Predictive assessment of risk and threat is enabled when assessing a new isolate through access to a comparative repository of pathogen sequences and metadata
- Improved understanding of source attribution and infection threat of FBP and AMR through various environments and international entry points
- Additional knowledge of how to expand existing surveillance mechanisms to support a robust national surveillance infrastructure and improved monitoring
- Guide the use of novel and existing/repurposed rapid onsite FBP testing technology with improved knowledge of where further development is needed
- Informed consideration, based on evidence surfaced, on how proactive, rapid and efficient management can be used to reduce the risk of FBP and AMR introduction into the wider environment and food systems
- Key stakeholders and decision makers are brought together to engage with evidence and take forward policy recommendations
- Contributing to the One Health ambitions of reducing threats to public health and the ecosystem

IMPACTS (5-10 years)

- Improved monitoring helps track spread of food borne pathogens and AMR across the agri-food system and wider environment
- Knowledge and technology is added to the UK's capability to respond to and build resilience to AMR threats
- Policy makers make informed, evidence-based decisions which improves efficient use of resources and strengthens cross-government collaboration in FBP and AMR surveillance and management
- Detection of pathogen emergence and spread supports development of mitigation strategies to stop increased incidence of foodborne illness
- Reduced incidence of foodborne illness
- Innovations enable step change in approach to FBP/AMR surveillance and decision making promoting UK's food sector reputation internationally in FBP and AMR surveillance
- Reduction of commercial losses from reduced food waste through prevention of FBP contamination