

# Connecting the Dots: Building Effective Early Warning

## Networks and system for National Food Safety

### Success Stories & Implementation Challenges



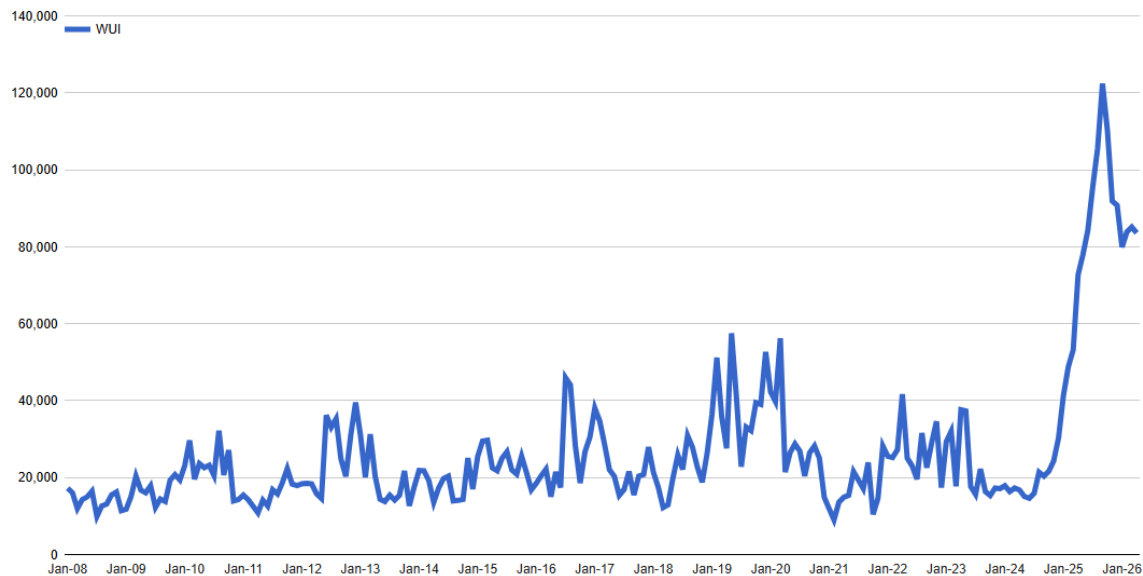




## World Uncertainty Index (WUI): Global

Index. GDP weighted average. January 2008 to April 2026

[Print](#) [Excel](#) [Copy](#)



Note: The WUI is computed by counting the percent of word "uncertain" (or its variant) in the Economist Intelligence Unit country reports. The WUI is then rescaled by multiplying by 1,000,000. A higher number means higher uncertainty and vice versa. For example, an index of 200 corresponds to the word uncertainty accounting for 0.02 percent of all words, which—given the EIU reports are on average about 10,000 words long—means about 2 words per report.

# What We Will Cover



## Why Emerging Risks?

Ireland's trade exposure & the intelligence gap in food safety



## ERISS – System & Tools

Architecture, scanning tools, team profiles & governance



## Live Case Study: Iran Conflict

Geopolitical shock → food safety & fraud risks for IE & EU



## Successes, Challenges & Take-Home Messages

What worked, what remains hard, and what other countries can adapt today

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# Ireland – A Small, Open, Trade-Dependent Food Economy

€16.6B

Agri-food exports (2023)

5.4M


Population

~75%

Food imports by volume

EU+

RASFF / EFSA / INFOSAN

 **Key insight:** A distant geopolitical shock — energy crisis, conflict, trade disruption — reaches Irish food systems fast via imports, freight costs and fraud incentives. We need an intelligence layer to see it coming.

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# What Is an Emerging Risk?

**EFSA definition:** A risk resulting from a *newly identified hazard* to which significant exposure may occur, or from an *unexpected new or increased significant exposure* and/or susceptibility to a known hazard.



## New Hazard

A previously unknown contaminant, pathogen or adulterant entering the food chain (e.g. novel environmental inhibitors, new mycotoxin variants)



## New/Increased Exposure

A known hazard with changed exposure dynamics — e.g. economic pressure driving substitution fraud, conflict disrupting cold chains



ERISS focuses on the horizon — **what might be coming** — not what is already a confirmed crisis

# Two Complementary Layers

## Traditional Surveillance

- ✓ Inspections & sampling programmes
- ✓ Laboratory surveillance
- ✓ RASFF / INFOSAN notifications
- ✓ Incident & crisis response
- ✓ EU official controls framework

## ERISS Intelligence Layer

- ◆ Horizon scanning & weak signal detection
- ◆ Geopolitical & economic analysis
- ◆ Food fraud intelligence
- ◆ Hybrid & cyber threat monitoring
- ◆ Scenario building & early warning notes

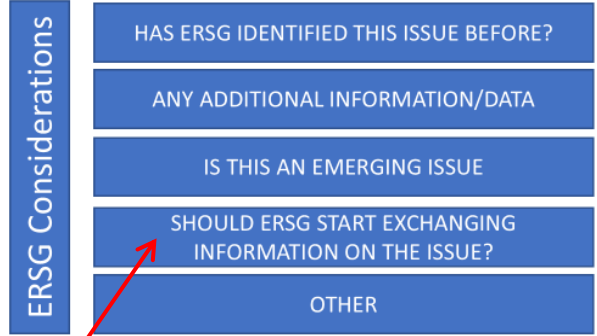
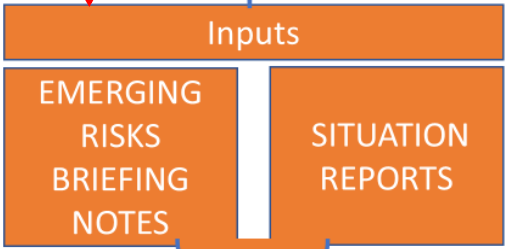


ERISS **complements, not replaces** existing systems — it is the intelligence layer that asks "what's next?"

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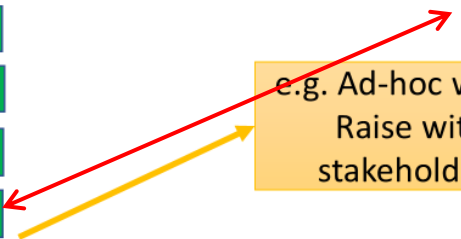


# FSAI Emerging Risk Identification and Screening System (ERISS)



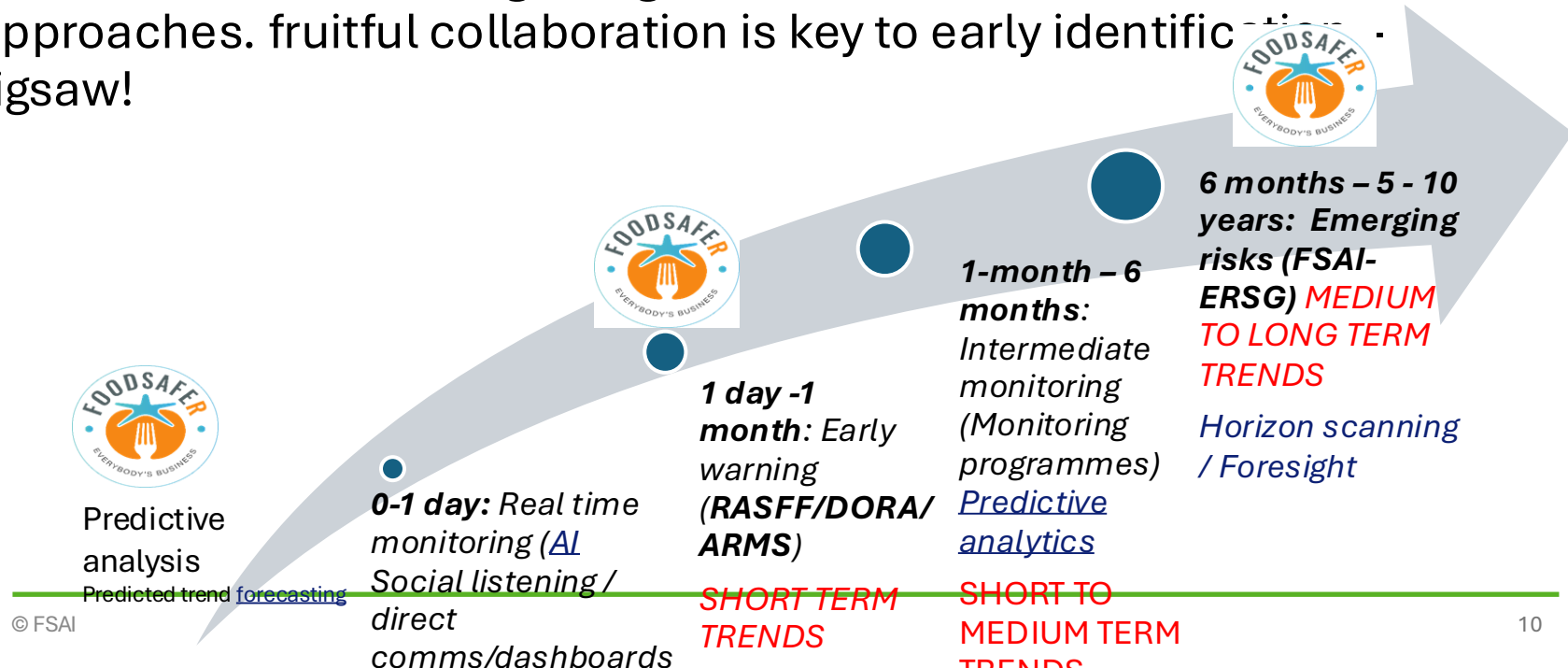
Score Each Factor 1-5 =

e.g. Ad-hoc v  
Raise with stakeholders



# Ireland's Food Safety Landscape

- FSAI's emerging risk mandate spans a **6-month** (early warning) to **10-year horizon** for emerging risk identification and mitigation.
- Continuous monitoring using diverse data sources and approaches. fruitful collaboration is key to early identification. Jigsaw!



# Key areas FSAI use FoodSafeR as a regulator

## National & International Collaboration



# ERISS Horizon Scanning Toolkit



## Product & Market Databases

EU/MEA market products by ingredient, health claim, country — maps new exposure vectors



## Literature Mining (R/Scopus)

System screens thousands of papers against pre-set search terms; generates ~100-140 paper priority shortlist for SME review per month



## Geopolitical & Trade Tools

Country-to-country trade flows, commodity price forecasts factoring in world events & economic landscape reports e.g. IRAN



## Social Listening Tool

Detects media/social spikes around food topics; tracks net sentiment, geography & trend shifts



## Food Fraud Database

Global historical fraud cases searchable by product; distinguishes incidents vs. inferences for evidence grading



## EU Emerging Risk Community

EU MS, EFSA, Official agencies & FBO groups used for peer-sense-checking; early validation of weak signals before formal assessment

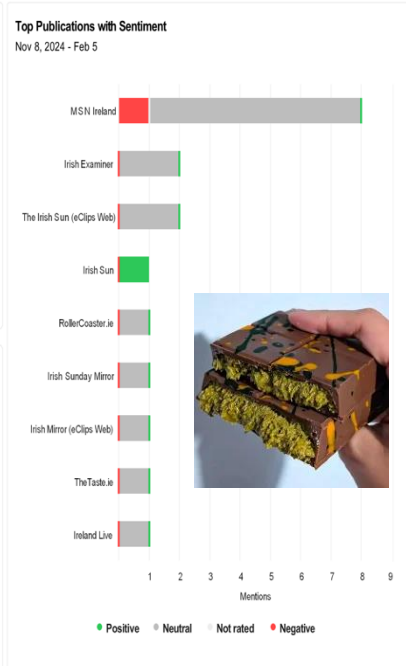
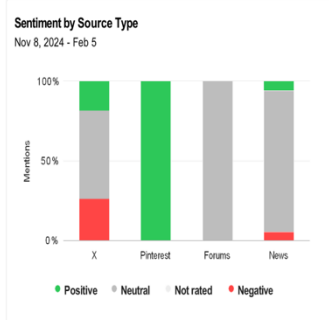
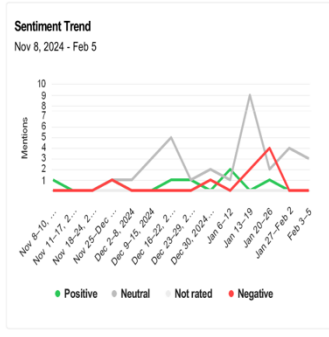
# Integration of New Technologies

## Sentiment

- Fraudulent element to story in DE. In Aldi Sud, chocolate made in Turkey was sold as 'Dubai chocolate'. This was stopped after court proceeding. This might explain some of the negative sentiment observed [Court halts Aldi's pistachio chocolate over false label claims](#)

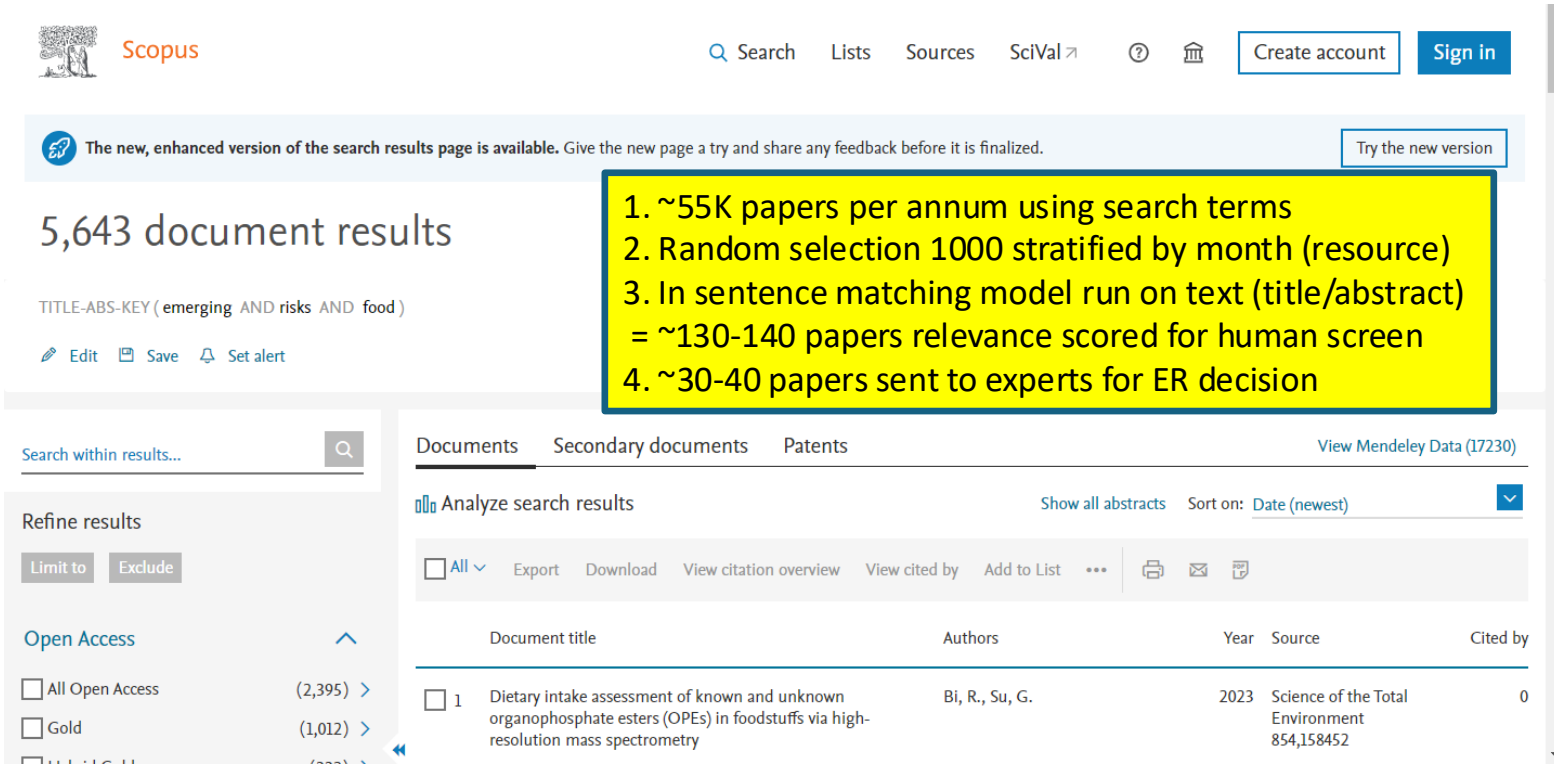
- Avoca Ireland launched bar costing €10.95, sold out in days. ingredients include ' pistachio cream, tahini and for the signature crunch – kataifi, a crispy, shredded filo pastry.'

- "The Bon Chocolatiers Dubai chocolate bar is available in Fallon & Byrne and their website for €7 (the bar is 52grams), and the Grá Chocolates Emerald Dream is available online – but note it's on back order due to demand – for €35 for 200grams." [Dubai's Viral Chocolate Inspires New Creations by Irish Chocolatiers](#)



- Artificial Intelligence & Machine Learning automate risk signal detection (*Copernicus satellite, AI and ArcGis*).
- Digital tools can provide data driven real-time monitoring and alerts.
- Enhances predictive capacity and bridges traditional and modern regulatory practices.

# Literature mining (R + Scopus) Bespoke AI



Scopus

Search Lists Sources SciVal ⓘ ⓘ Create account Sign in

The new, enhanced version of the search results page is available. Give the new page a try and share any feedback before it is finalized. Try the new version

5,643 document results

TITLE-ABS-KEY (emerging AND risks AND food)

Edit Save Set alert

Search within results...

Refine results

Limit to Exclude

Open Access

All Open Access (2,395) >

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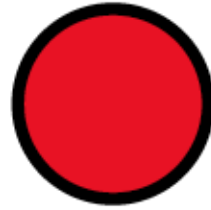
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Analyze search results Show all abstracts Sort on: Date (newest)

All Export Download View citation overview View cited by Add to List ... Print Email PDF

	Document title	Authors	Year	Source	Cited by
<input type="checkbox"/> 1	Dietary intake assessment of known and unknown organophosphate esters (OPEs) in foodstuffs via high-resolution mass spectrometry	Bi, R., Su, G.	2023	Science of the Total Environment 854,158452	0

1. ~55K papers per annum using search terms
2. Random selection 1000 stratified by month (resource)
3. In sentence matching model run on text (title/abstract) = ~130-140 papers relevance scored for human screen
4. ~30-40 papers sent to experts for ER decision



Live Case Study

# Iran Conflict & Ireland's Food System

A distant geopolitical crisis cascades into food safety, fraud and supply chain risks for Ireland and the EU. We walk through exactly how ERISS is responding.

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# Iran Conflict – Key Scenario Features

## Energy Shock

Strait of Hormuz disruption → oil & gas price surge → energy-intensive food processing and transport costs spike across EU supply chains

## Shipping Disruption

Rerouting, port congestion, insurance surcharges → longer transit times, extended storage, temperature compliance risk for perishables

## Economic Pressure

Commodity price inflation → increased fraud incentive for substitution, dilution, origin misrepresentation in high-value categories (oils, spices, seafood)

## Hybrid Threats

Increased state-sponsored cyber ops targeting western critical infrastructure including food manufacturing, logistics and cold-chain control systems

IE **Ireland's specific exposure:** Imports ~75% of food by volume; heavily reliant on energy imports; significant seafood, dairy & meat export dependency on stable EU logistics corridors

# Emerging Food Safety & Fraud Risks



## Input Supply Integrity

Fertiliser scarcity → unapproved alternatives enter market.  
Veterinary medicines and pesticide substitution under economic stress. Sub-standard feed ingredients from redirected trade flows.



## Food Fraud & Origin Fraud

High-value/scarce commodities (olive oil, honey, spices) at elevated adulteration risk. Mislabelling of origin as disruption create trade rerouting opportunities.



## Cold Chain & Storage Integrity

Extended transit → temperature abuse risk for chilled & frozen products. Port congestion → prolonged dwell times. Spoilage risk in some categories.

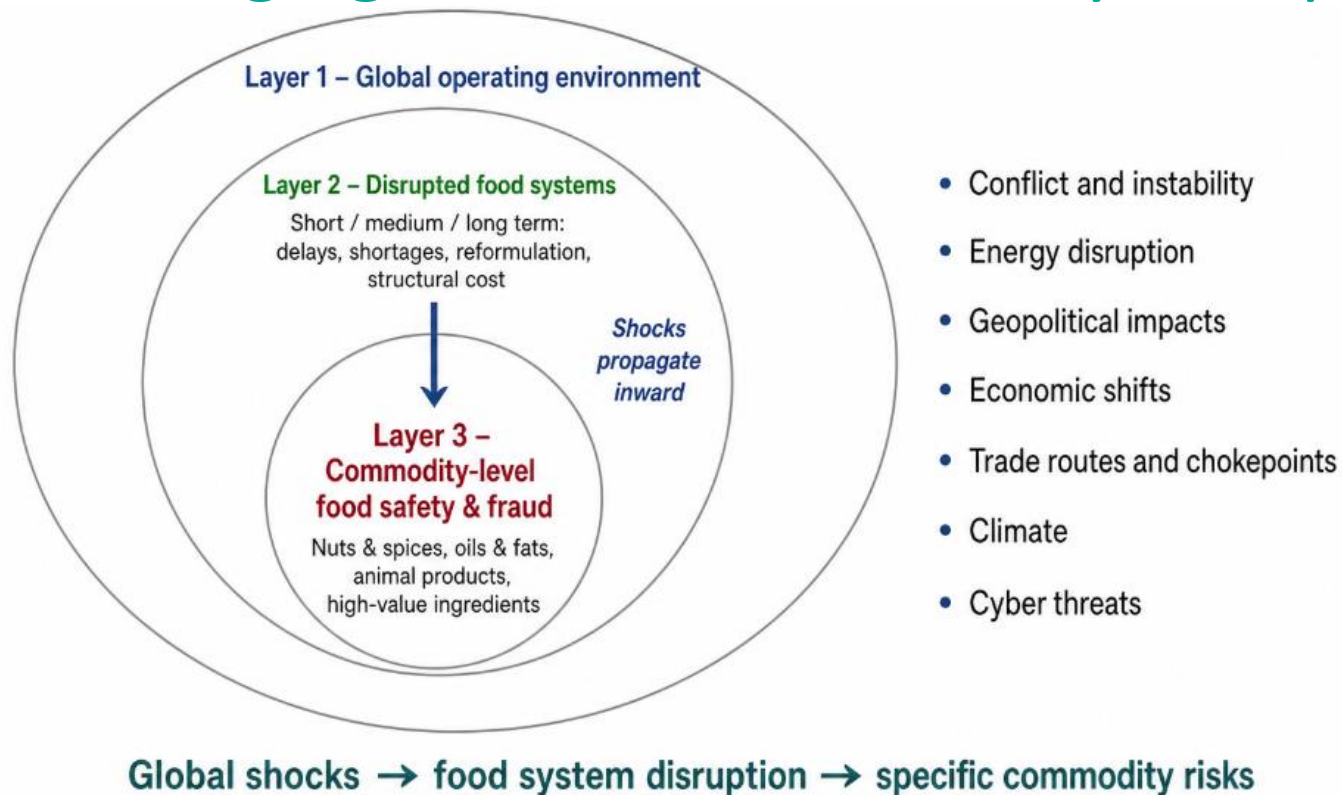


## Cyber & Infrastructure Risk

Ransomware targeting food processors, logistics & cold-chain operators. Doesn't appear to be elevated due to IRAN conflict



# Overview: Emerging Risks for Food Safety & Supply



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A three-layer briefing for Irish food industry stakeholders examining the operating environment, disrupted food systems, and commodity-level impacts.

Maturity & Value →

**Descriptive**

What happened?



**Diagnostic**

Why did it happen?



**Predictive**

What might happen next?



**Prescriptive**

What should we do about it?



# Joining the dots...What Has Worked in Ireland



Standardised ERSG notes, Intel Briefing Notes and SITREPs create a common language and ensure consistency regardless of who drafts the assessment



Not relying on a single expert — cross-disciplinary team plus Food SafeR & EU/global community relationships enable rapid sense-checking and knowledge mobilisation



Food SafeR created protected space for experimentation and engagement across non-typical stakeholder groups



Short, structured notes with clear scores and recommendations — not long reports that sit unread. Gets intelligence into decision-maker hands fast – next step real time tracking of emerging issues e.g. IRAN

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Questions & Discussion

# Thank You

IE Dr Cormac McElhinney

| FSAI Ireland

| [www.fsai.ie](http://www.fsai.ie)

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