

GFoRSS Webinar

**Harnessing Technology in Seamless
Exchange of Food Safety Information
for Imported/Exported Products**

17 September 2024



Enhancing International Trade

A Concept:
Global Food Safety Data Trust





About Creme Global

Providing a data science platform to the food and cosmetics industries, for expert decision making



➡ Creme Global

Safeguarding reputations
through trusted science
and data analytics



The Journey





We Do Science



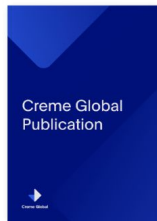
Industries ▾ Products ▾ Services ▾ About ▾ Log In ▾

Publications

Browse our publications

- ☐ All Publications (87)
- ☐ Chemicals (37)
- ☐ Exposure (51)
- ☐ Food Safety (41)
- ☐ Fragrances (9)
- ☐ Microbiology (7)
- ☐ Migration (6)
- ☐ Next Generation Sequencing (3)
- ☐ Nutrition (40)
- ☐ Patent (3)

Sort by ▾



Healthy ageing: the natural consequences of good nutrition—a conference report

Many countries are witnessing a marked increase in longevity and with this increased lifespan and the desire for healthy ageing, many, however, suffer from the opposite including mental and physical deterioration, lost productivity and quality of life, and increased medical costs. While adequate nutrition is fundamental for good health,...

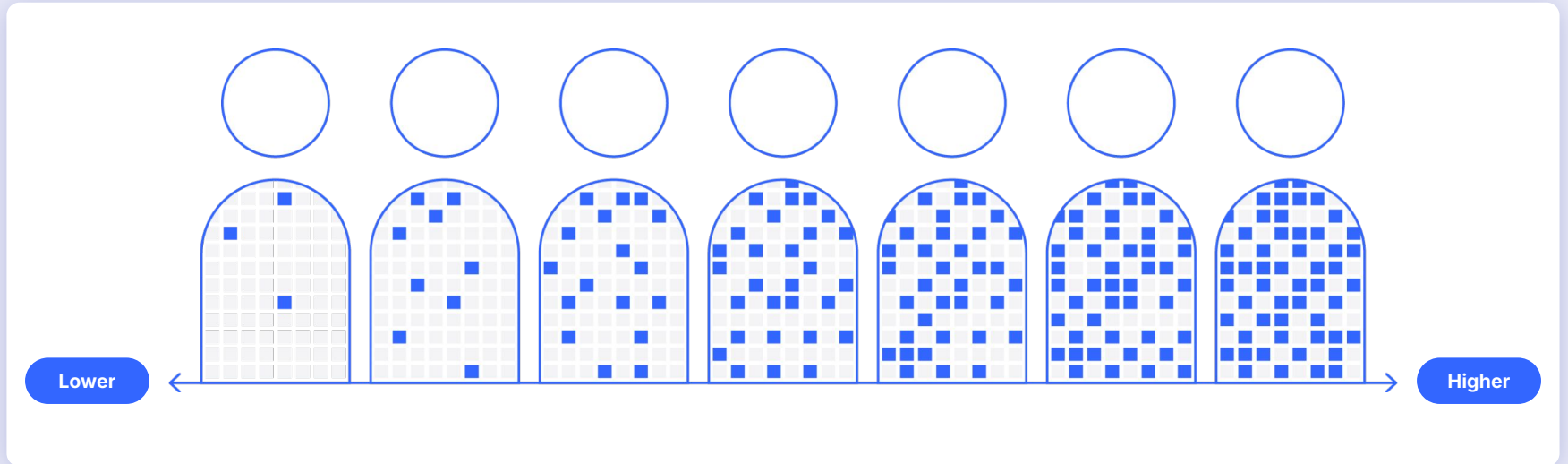
Authors: Marsman D, D. W. Belsky · D. Gregori · M. A. Johnson · T. Low Dog · S. Meydani · S. Pigat · R. Sadana · A. Shao · J. C. Griffiths

Publication date: 01/06/2018

<https://www.cremeglobal.com/publication/>



Population Exposure



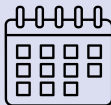


The most realistic aggregate exposure assessment model on the market



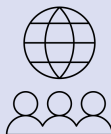
71

Products



7

Days



42,000

Subjects

Up to

20,000,000

calculations per assessment.

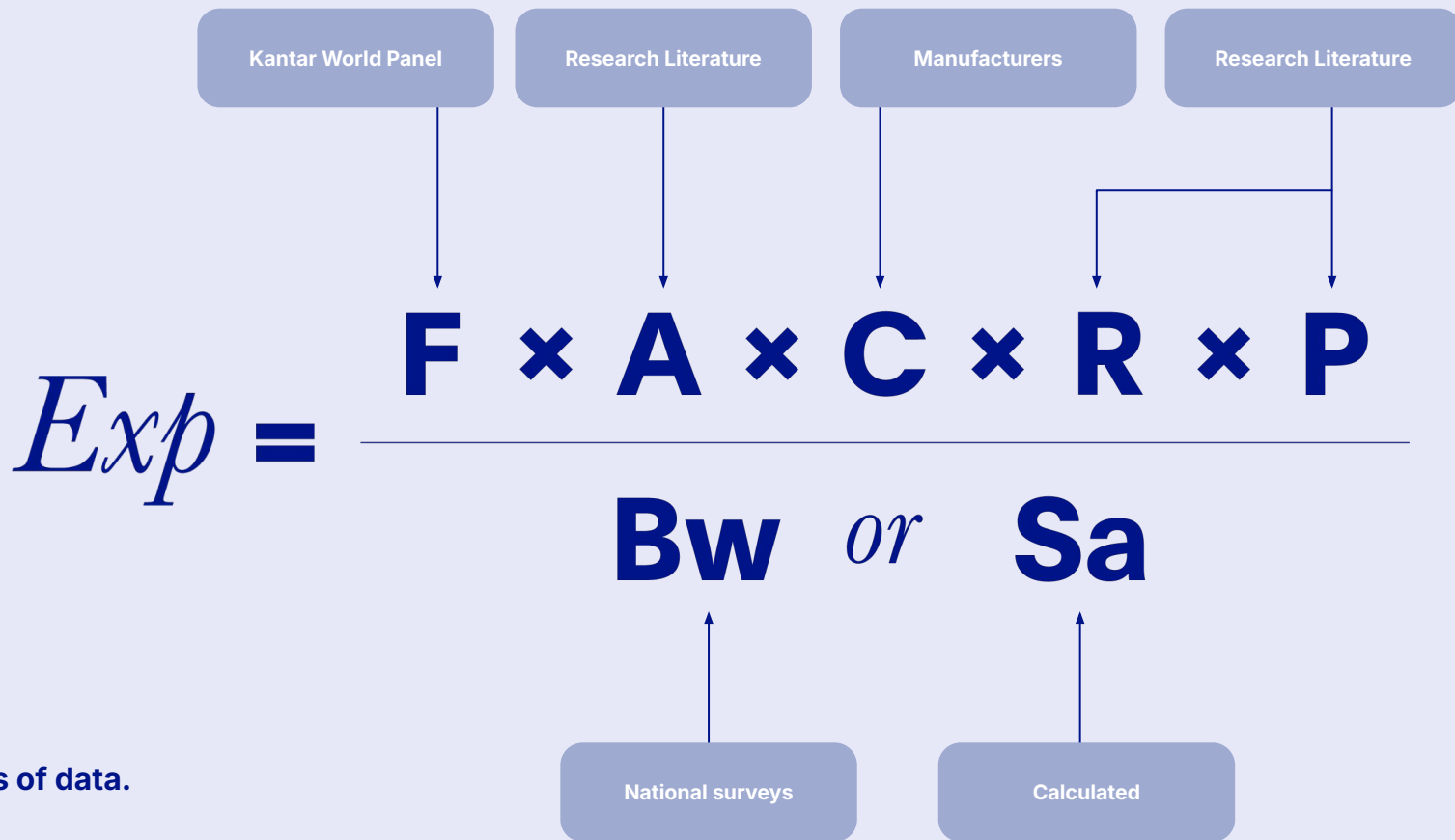
The model calculates the exposure for
each product used by a subject for each day.



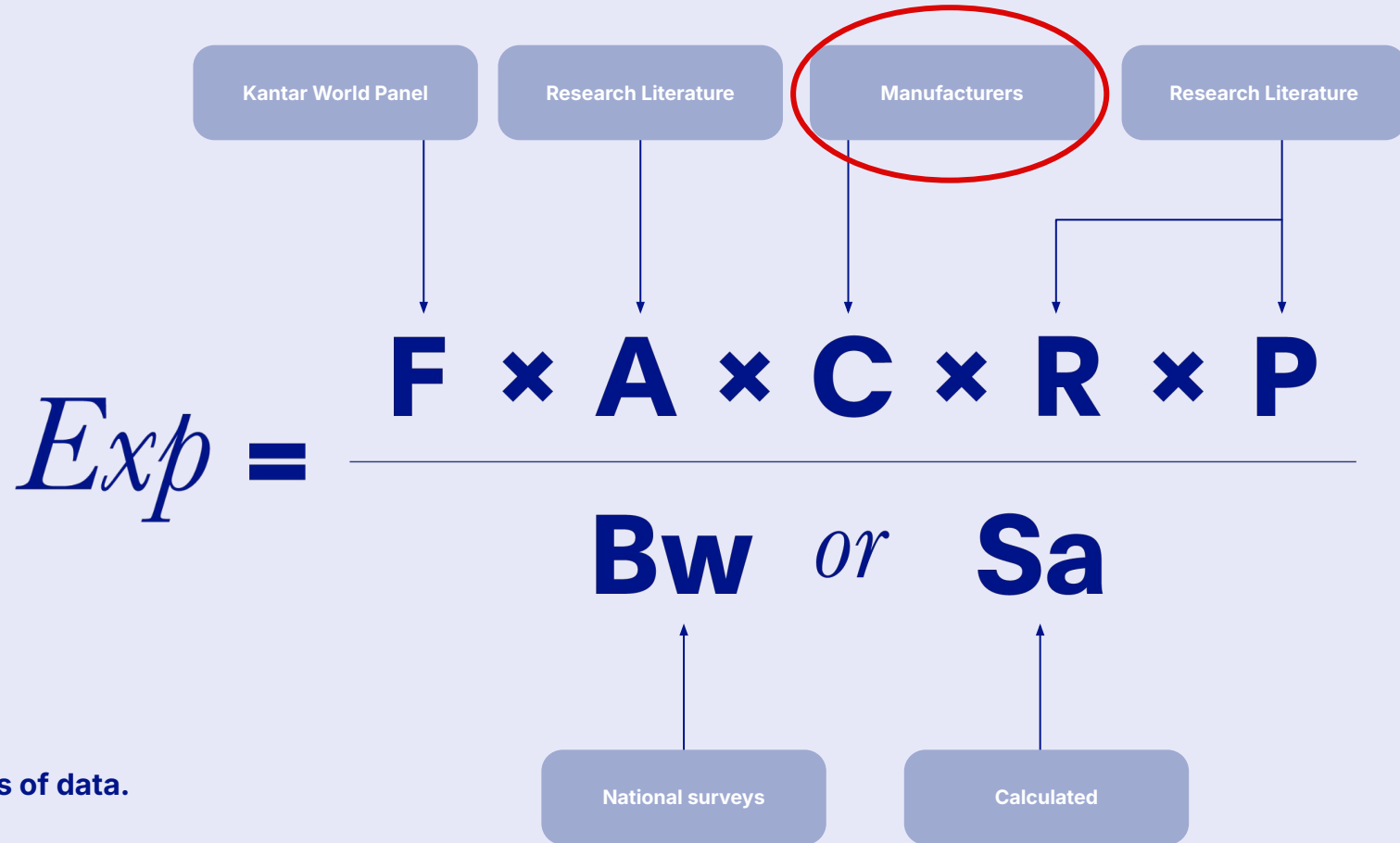
$$Exp = \frac{F \times A \times C \times R \times P}{Bw \text{ or } Sa}$$

Frequency Amount Concentration Retention Factor Penetration Factor

Bodyweight Surface area



Sources of data.



Sources of data.



Data Trusts

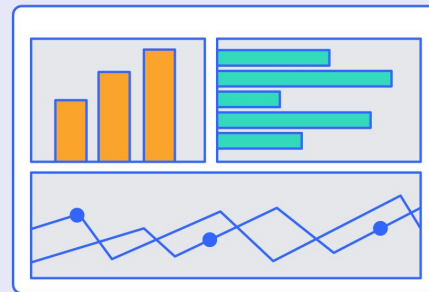




What is a Data Trust?



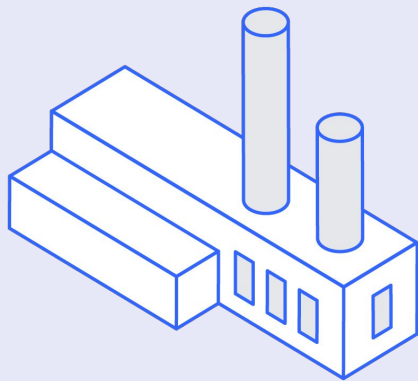
An agreement to share data



A platform to share data



Who shares the data?



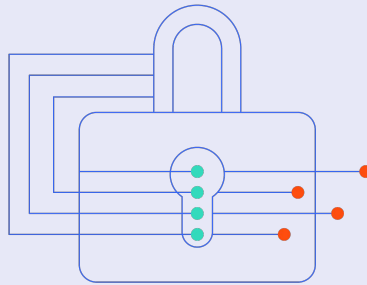
Industry



Governments



Who can see the data?



You control your own data access through agreements and platform security.

Data Sharing System

Supplemental Data
(e.g. public data)

Other
Data

Dashboard Results

Predictive
Modelling

Data
Anonymization

Providing Access to Organisations

Org 1

User #1

User #2

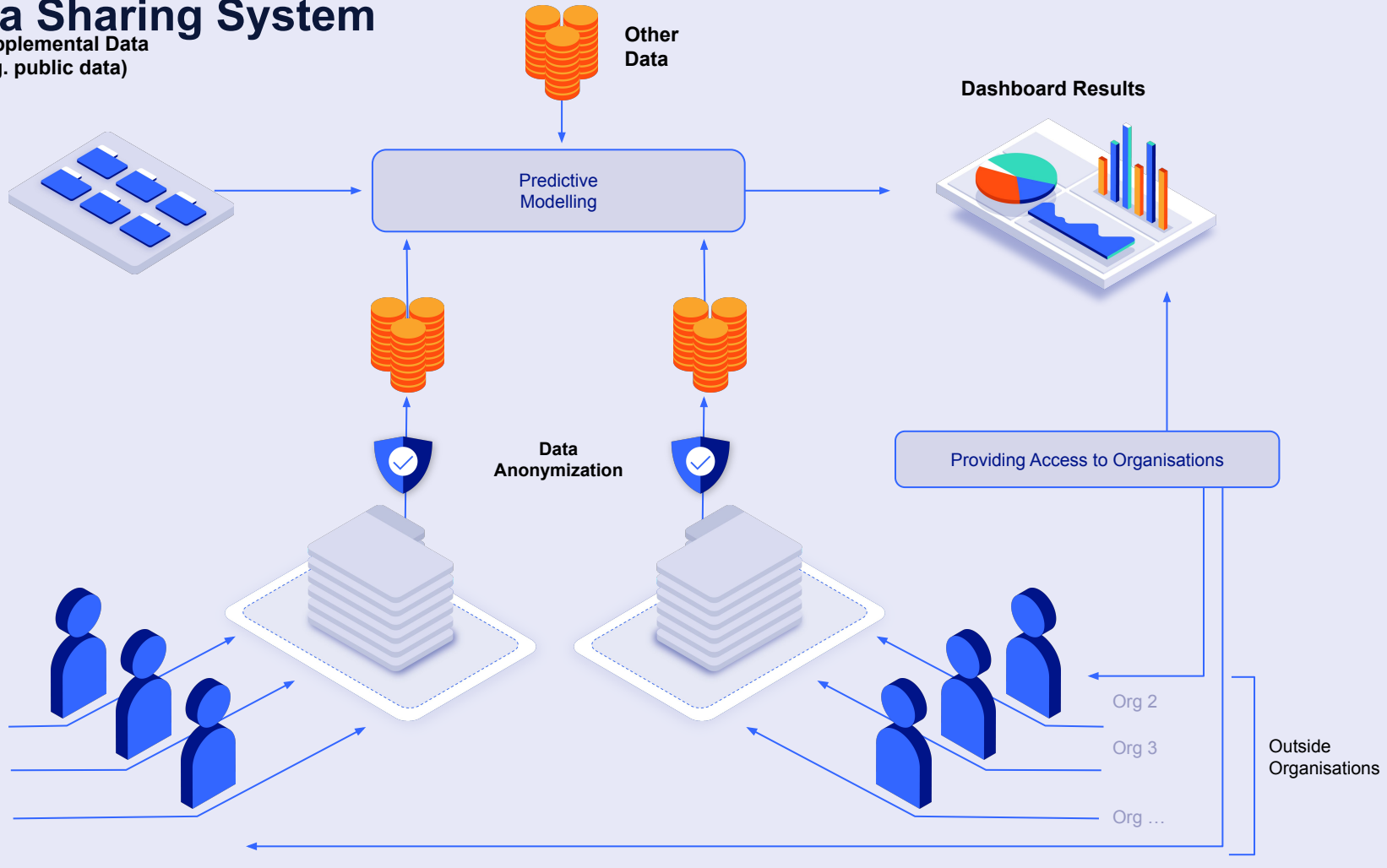
User #...

Org 2

Org 3

Org ...

Outside
Organisations





Case Study

FDA Food Safety Data Sharing Platform





FDA Food Safety Data Sharing



Trusted Data Sharing

Aggregating and anonymizing multiple internal and external (e.g., industry, academia) data resources to enable FDA and stakeholders to collaborate and gain insights on shared topics of interest

Motivation

FDA's New Era of Smarter Food Safety, which leverages technology and other tools to create a safer and more digital, traceable food system

Data Sharing Mission

Accelerate collective learning and enable comprehensive understanding, and ultimately prediction, of food safety vulnerabilities



Examples of Data Sharing Benefits

- Leverage resources
- Reduce duplication of effort
- Optimize productivity and efficiency
- Increase transparency
- Foster trust
- Enable food safety benchmarking efforts
- Provide early warning signals of food safety issues



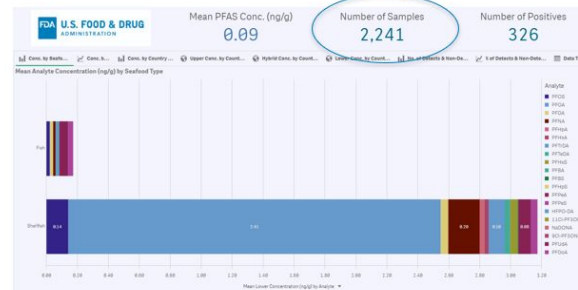
Benefits

- Directing data growth - asking better questions for targeted data collection
- FDA have **already seen** a massive increase in available data by linking data sets between partners.

FDA

Combined

Sample Numbers



↑ Samples
↑ % Fish
↑ % +



Benefits

- **Directing data growth** - asking better questions for targeted data collection
- **Revealing new insights** - examining the presence and concentrations of contaminants in seafood products and from different regions.
- **Resource management** - allocating resources for the highest impact testing.



FDA Food Safety Data Sharing Platform



Food Safety Data Sharing Platform

- Provides a centralized, harmonized data repository, with advanced data visualization, and predictive analytics capabilities

Current Data Types Included

- PFAS
- Toxic Elements
- Biotoxins
- Seafood Decomposition
- Aquaculture Drug Residues
- Microbiological Pathogens

Email Contact

- FoodSafetyDataSharingPlatform@fda.hhs.gov



➡ **Creme Global**



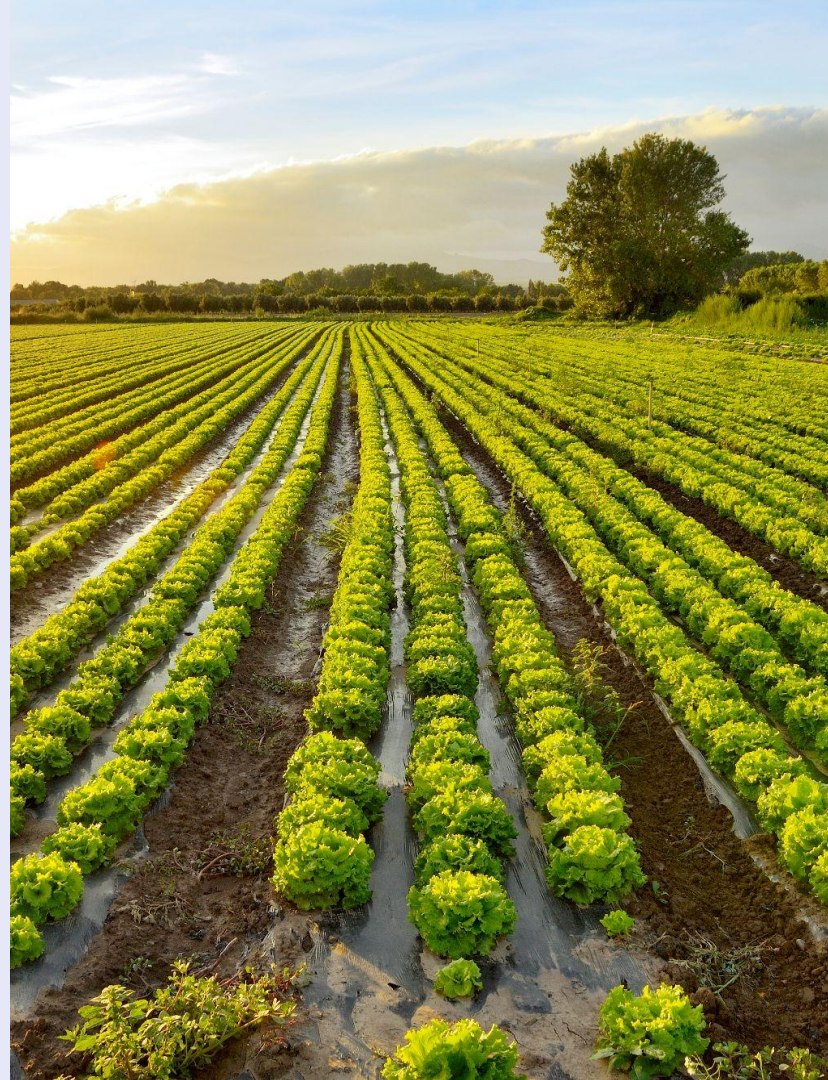
Case Study

Western Growers GreenLink® Platform



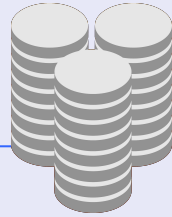
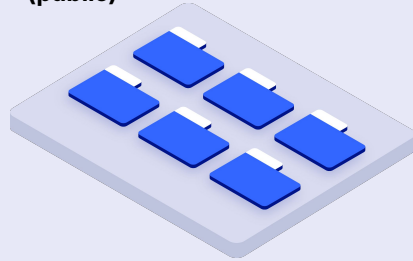
Western Growers Food Safety Data Sharing GreenLink® Platform

The First Fresh Produce Online Platform for Food
Safety Risk Management



GreenLink[®] Platform Structure

Supplemental Data
(public)



Data
Modeling

Dashboard Results



Data
Anonymization



Secure Data Storage



Organization 1

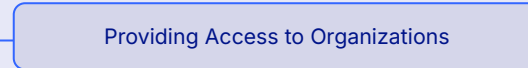
Organization 2

Organization 3

Organization ...



Providing Access to Organizations



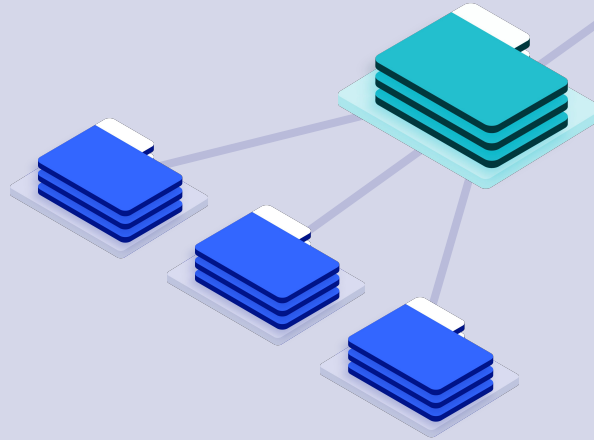


Data Visualization



Data Collection

- Data Upload Portals
- Excel, CSV, XML, JSON
- Data APIs





Benefits

- **Advance food safety** - data-driven hypothesis testing on best practices.
- **Maximize resources** - optimize cost-effective preventative measures.
- **Learn from the Data** - identify emerging trends.
- **Build Trust** - demonstrate effectiveness to regulators, retailers and consumers.





Case Study

fiin data trust





Food Industry Intelligence Network (fiin)

An anonymized data-sharing platform.

Giving fiin members insight across the global supply chain.





Combating Food Fraud in a New Way

Established in 2015

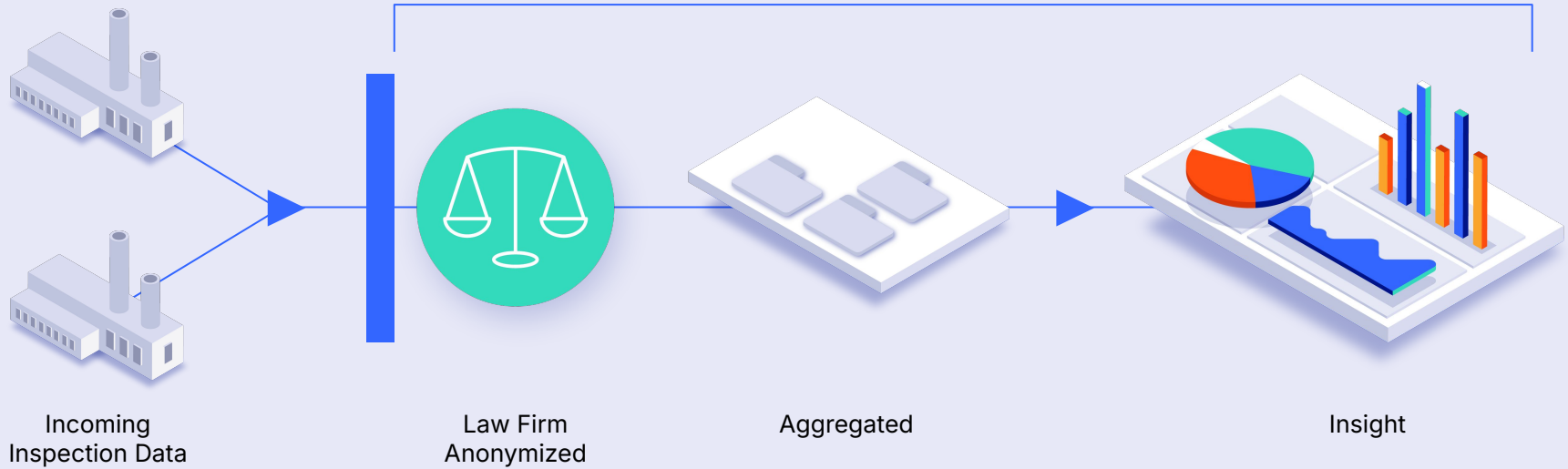
To ensure integrity of food supply chains and
protect the interests of the consumer.





fiin Data Trust Structure

Data Platform

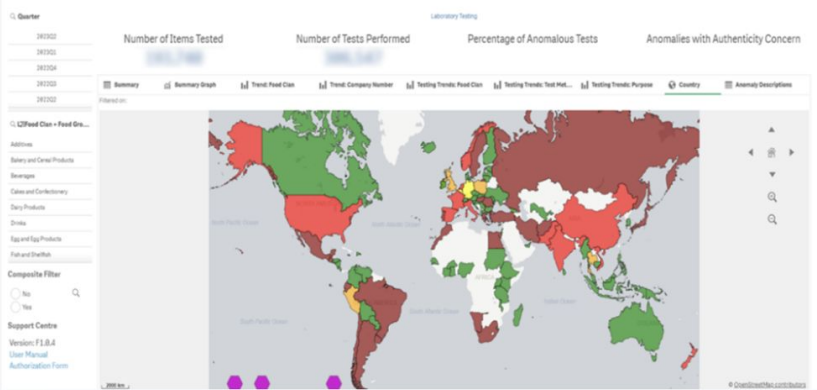
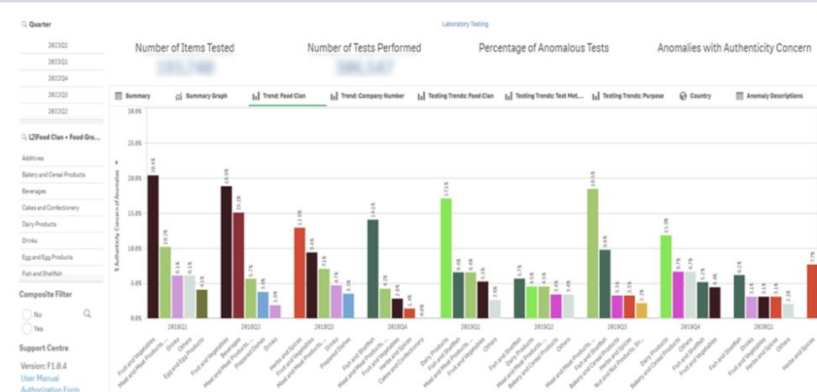
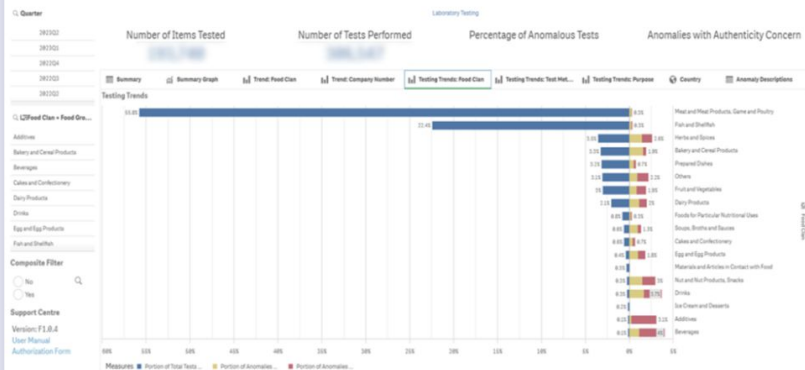




Benefits

- **Prediction and prevention** - anticipating changes in the landscape using data.
- **Safer, high-quality food** - flagging anomalies for shared food security.
- **Crowd-source knowledge** - discover trends that never would have been apparent to an organization in isolation.







Executive Summary



FILTERS

Testing Type Data

Laboratory Testing

Traceability Validation

Data Compared With

Previous Quarter

Previous Year

Top 10 categories of concern

Rank	Food Type	Number of Traces Performed	Number of Non Conforming Traces	Impacts Assurance	Non Conforming Traces as % of Total Traces
1 ▲ +1	Meat and Meat Products, Game and Poultry	457	3	0	0.3%
2 ● 0	Fish and Shellfish	457	3	0	0.3%
3 ● 0	Dairy Products	457	3	0	0.3%
4 ▼ -2	Fruit and Vegetables	457	3	0	0.3%
5 ▲ +2	Bakery and Cereal Products	457	3	0	0.3%
6 ● 0	Egg and Egg Products	457	3	0	0.3%
7 ▼ -1	Prepared Dishes	457	3	0	0.3%
8 ▲ +1	Cakes and Confectionery	457	3	0	0.3%
9 ▼ -1	Drinks	457	3	0	0.3%
10 ● 0	Others	457	3	0	0.3%



Concept Overview



Enhancing International Trade

A Concept:
Global Food Safety Data Trust



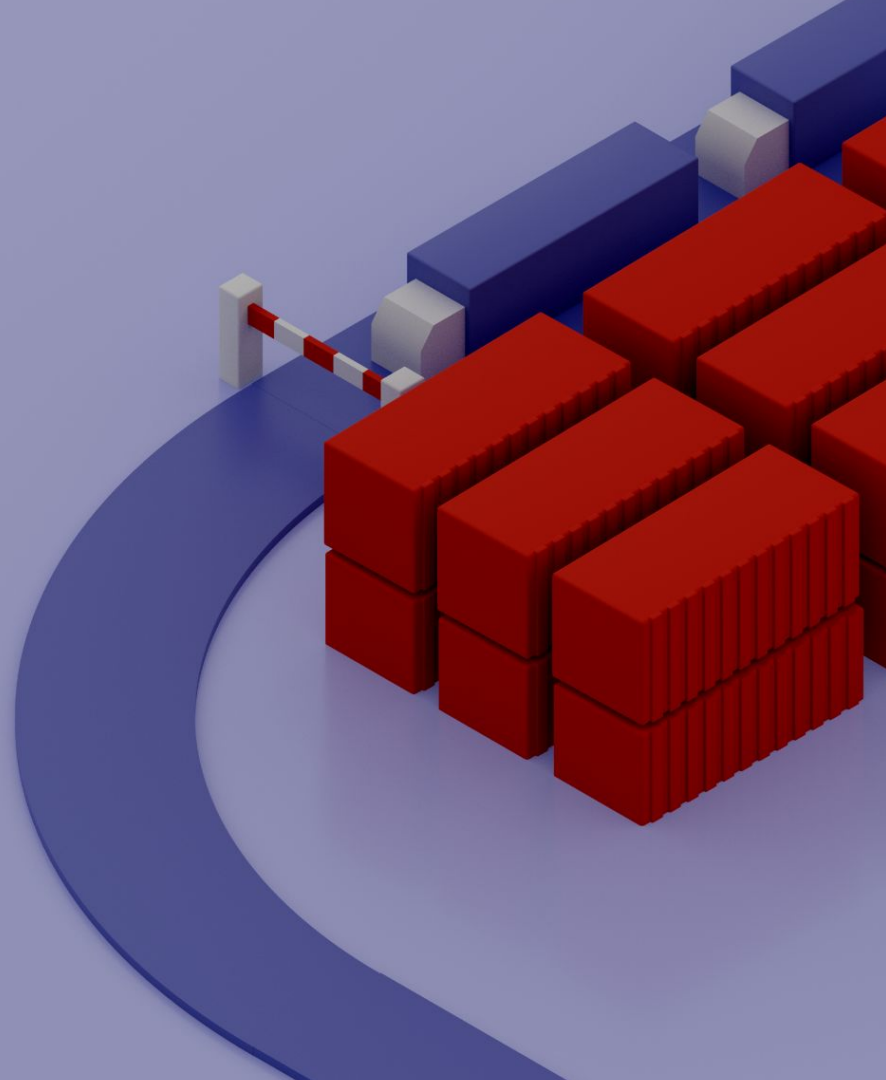


Overview

Current Challenges

Shipments are often delayed at customs due to insufficient food safety data.

Lack of real-time, comprehensive food safety information leading to unnecessary hold-ups.





Overview

Possible Solution?

Provide detailed, batch-specific food safety data sourced from producers and shippers.

Use predictive analytics to score the food safety risk of each shipment.

Enable customs officials to make informed decisions quickly, reducing unnecessary delays.





Overview

What Could it Solve?

Reduces the frequency of shipments being held unnecessarily.

Ensures smoother transit through customs, supporting efficient global trade.

Protects public health by ensuring all approved shipments meet food safety standards.



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Current Challenges





Current Challenges

Delays in Customs Due to Insufficient Food Safety Data

Lack of Comprehensive Data

Impact on Trade

Need for Data-Driven Decision Making





Challenge 1

Lack of Comprehensive Data

Current certifications and compliance documents are related to general production practices.

Customs officials typically lack access to detailed, batch-specific food safety information?





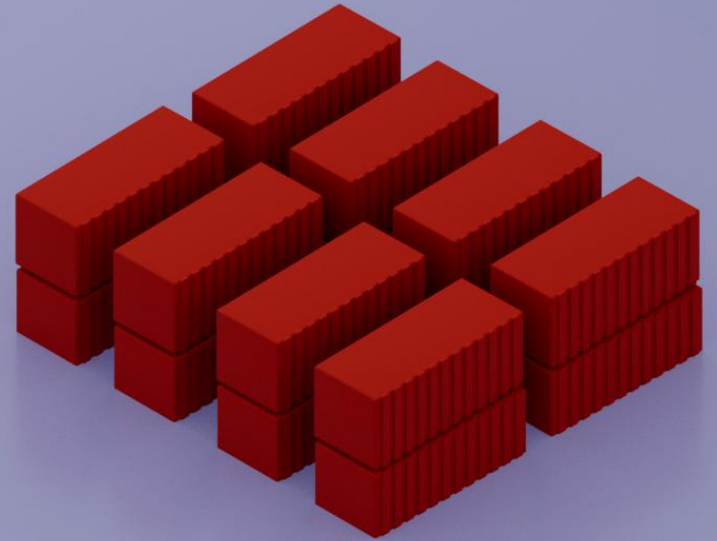
Challenge 2

Impact on Trade

Delays lead to increased costs for exporters and importers due to storage and handling fees.

Perishable goods risk spoilage or quality degradation, affecting marketability and consumer safety.

Insufficient data trigger precautionary holds, resulting in unnecessary delays and scrutiny?



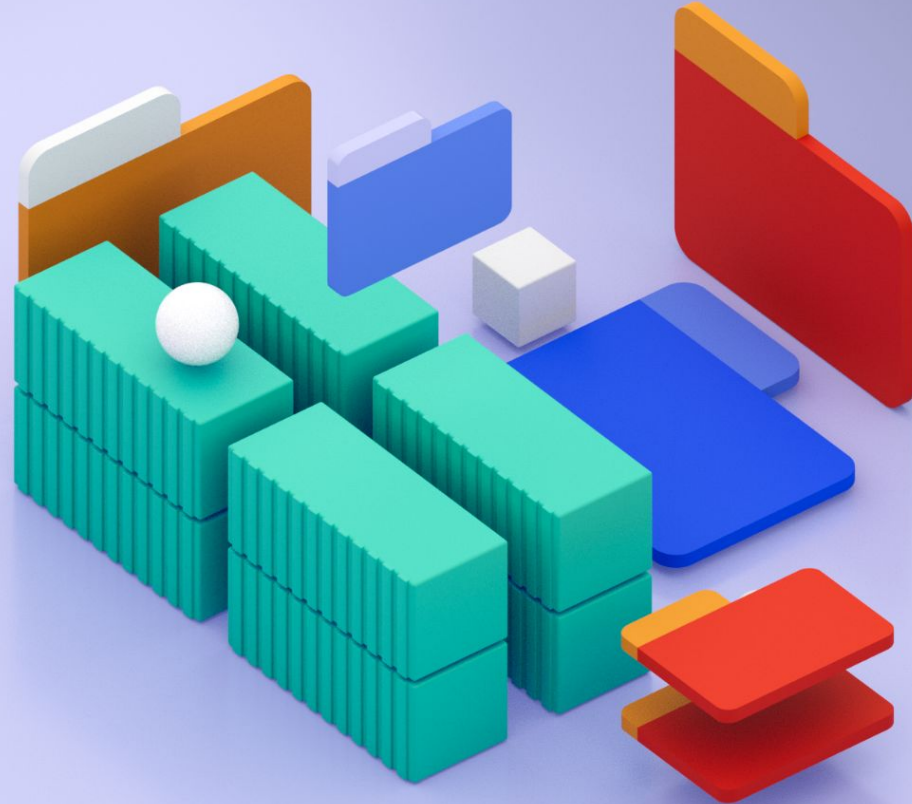


Challenge 3

Need for Data-Driven Decision Making

Customs officials need accurate, timely data to make informed decisions quickly?

Improved data availability can help streamline customs processes and minimize trade disruptions?





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Possible Solution?





Possible Solution

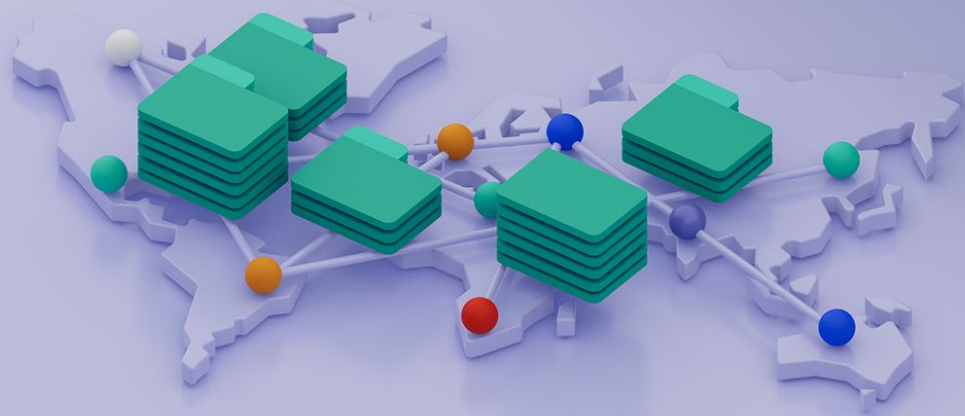
The Global Food Safety Data Trust





Objectives

- Supporting exports and imports
- Improving food safety
- Optimizing resources





Possible Solution

How the Data Trust Works

Batch Specific Insights

Detailed Data from Producers and Shippers



Collect specific information about each batch, including origin, processing conditions, handling practices, and storage parameters.

Real-Time Data Integration



Utilize sensors and IoT devices to monitor real-time conditions like temperature, humidity, and handling throughout the supply chain.

Customizable Data Inputs



Tailor data requirements based on the type of product, destination regulations, and known risk factors to ensure all relevant safety information is captured.



Possible Solution

How the Data Trust Works

Predictive Analytics



Risk Scoring Models

Bespoke models will assess the likelihood of food safety risks based on historical data, environmental conditions, and handling practices.



Anomaly Detection

Identify deviations from normal patterns that could indicate potential safety issues, allowing for proactive intervention before the shipment reaches customs.



Scenario Planning

Use simulations to predict the impact of various shipping conditions and identify potential hazards, helping to optimize routes and handling practices for maximum safety.



Possible Solution

Integration with Customs and Regulatory Systems



Compatibility with Existing Systems

Standardized Data Formats, compatible with existing customs software and regulatory systems. APIs to facilitate seamless data integration. No requirement for manual entry.



Full Interoperability

Customizable integration options, tailored to the specific requirements.



Secure Data Sharing

End-to-End Encryption: Ensure all data transfers are encrypted to protect sensitive information from unauthorized access.



Possible Solution

Integration with Customs and Regulatory Systems

Enhanced Decision-Making Tools?



Automated Risk Assessment Reports

Provide customs officials with automated, easy-to-read reports that summarize potential food safety risks based on batch-specific data and predictive analytics.



Real-Time Alerts and Notifications

Automatically notify customs officials of any anomalies or safety concerns detected in the data, facilitating quicker response times and reducing clearance delays.



Possible Solution

Integration with Customs and Regulatory Systems

Regulatory Compliance Support?

Compliance Checklists and Dashboards



Provision of tools that enable customs officials quickly verify whether a shipment meets all required safety standards and regulations, streamlining the inspection process.

Continuous Updates on Regulatory Changes



Keep the data trust system updated with the latest food safety regulations and standards to ensure compliance across all shipments.



Possible Solution

Integration with Customs and Regulatory Systems

Advanced Notification?

Automated Alerts



- Ongoing monitoring of food safety conditions
- Automatically notify relevant stakeholders when data indicates a potential issue
- Importers, shippers,
- Customs Officials
- Facilitate corrective or preventive steps, rerouting etc.

Possible Solution

Integration with Customs and Regulatory Systems

Reduced Workload

- Reduce time spent on manual reviews and inspections?
- Reduce number of out of spec shipments received?





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Data Flow

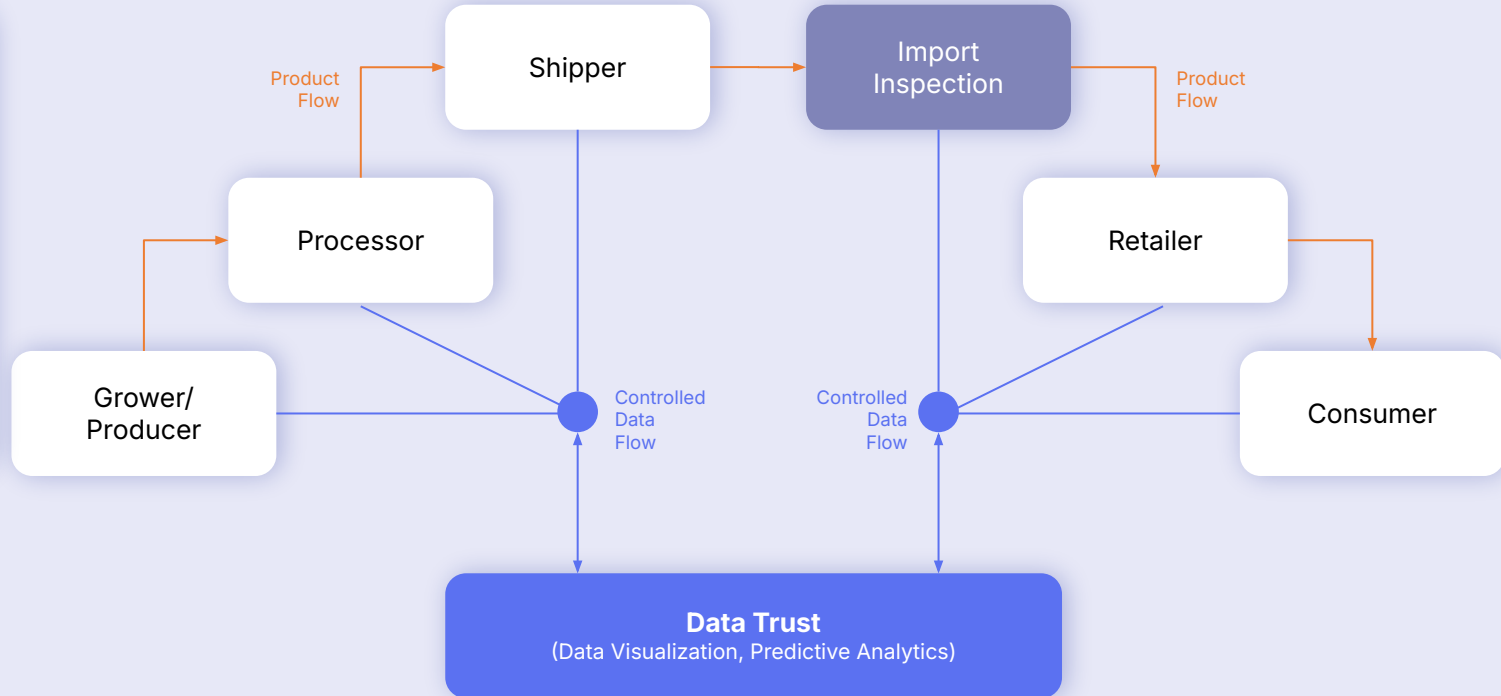


Export

Import

Regulatory
Agency
Dept. of Ag.

Food
Safety
Agency
Dept. of Health



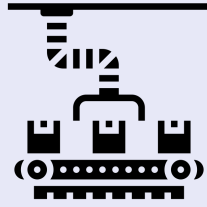


Sample Data



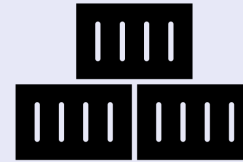
Producer

- Batch specific tissue test (bacteria profile, ingredients, kill step)?
- Variances from national guidelines already agreed with importing country?
- Relevant weather data from key times (e.g. harvest)?



Processor

- Recent audit or inspection report anomalies, Warning letters?
- Key factory environmental monitoring data?
- Final packing and product test data?



Shipper

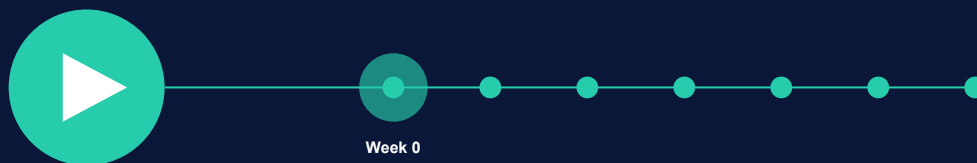
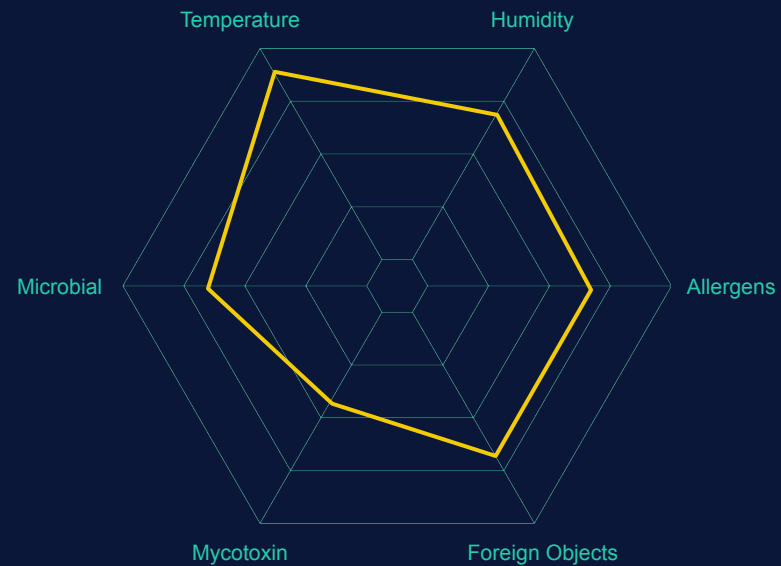
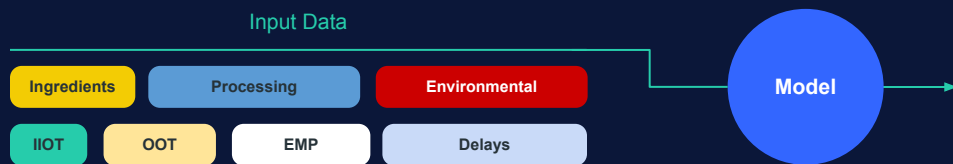
- Parameters that impact bacterial growth (Temperature, humidity, ventilation) per container?
- Time delays, diversions, etc?

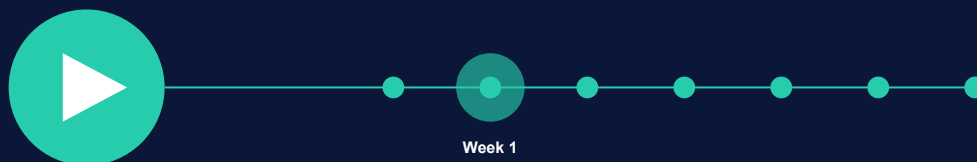
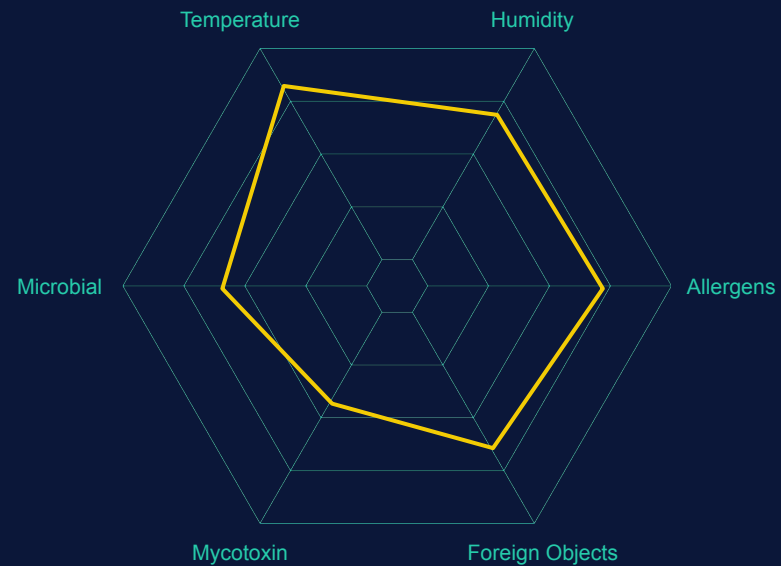
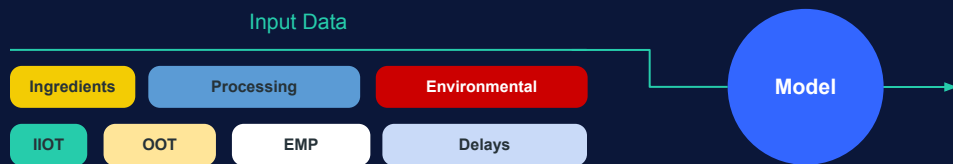


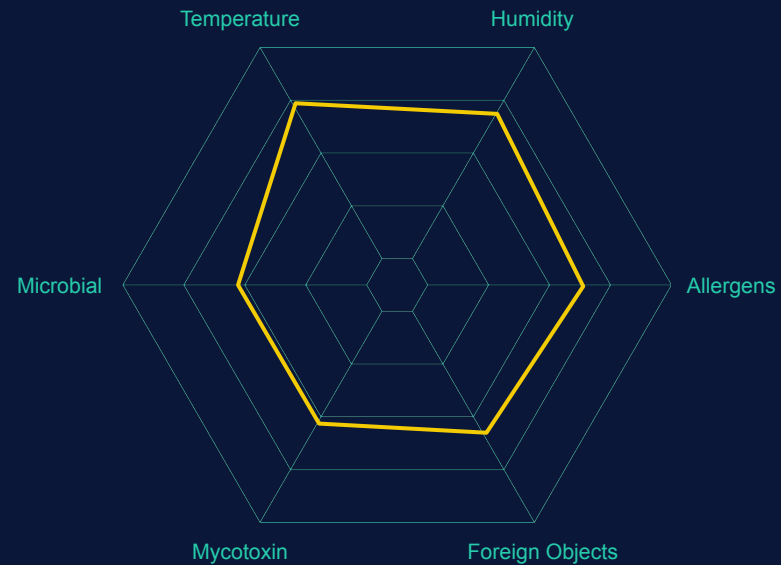
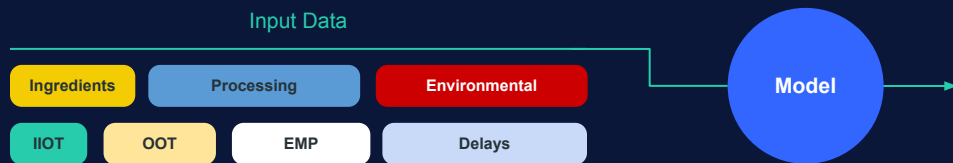
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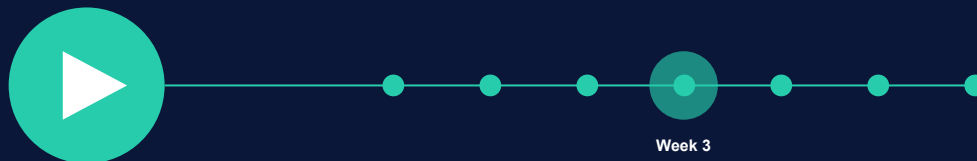
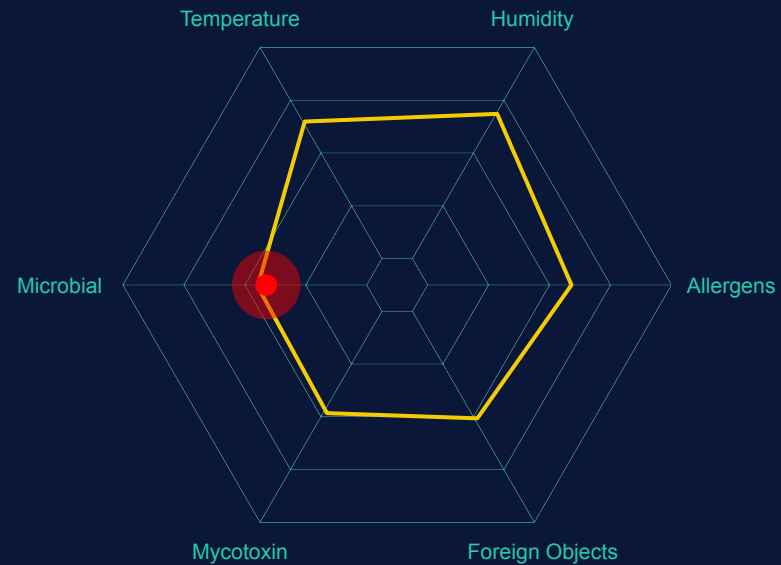
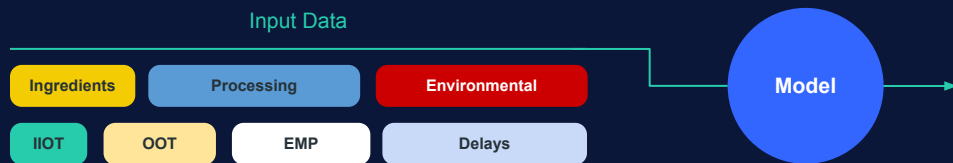
Sample Model

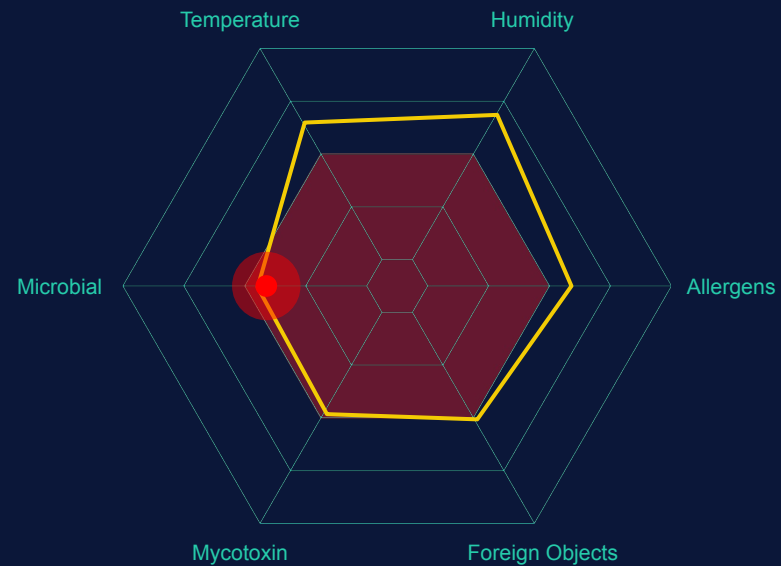
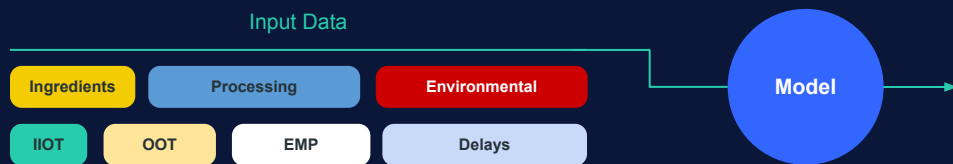














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Sample Output





Executive Summary

FILTERS

Testing Type Data

Laboratory Testing










Traceability Validation

Data Compared With

Previous Quarter

Previous Year

Top shipments of Concern

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4  -2	Fruit and Vegetables	457	3	0	0.3%
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6  0	Egg and Egg Products	457	3	0	0.3%
7  -1	Prepared Dishes	457	3	0	0.3%
8  +1	Cakes and Confectionery	457	3	0	0.3%
9  -1	Drinks	457	3	0	0.3%
10  0	Others	457	3	0	0.3%



Enhancing International Trade

Next Steps?





Many Open Questions

The Data?

- What to collect?
- When and where?
- Analysis & predictive models?

The Stakeholders?

- Who should provide data?
- Who should see the data?
- Who should see the predictions?

The Output?

- Format?
- Integration & Interoperability?
- Visualisations?

**Enabling faster clearance
decisions based on
comprehensive insights.**



Thank you

Brendan Ring

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