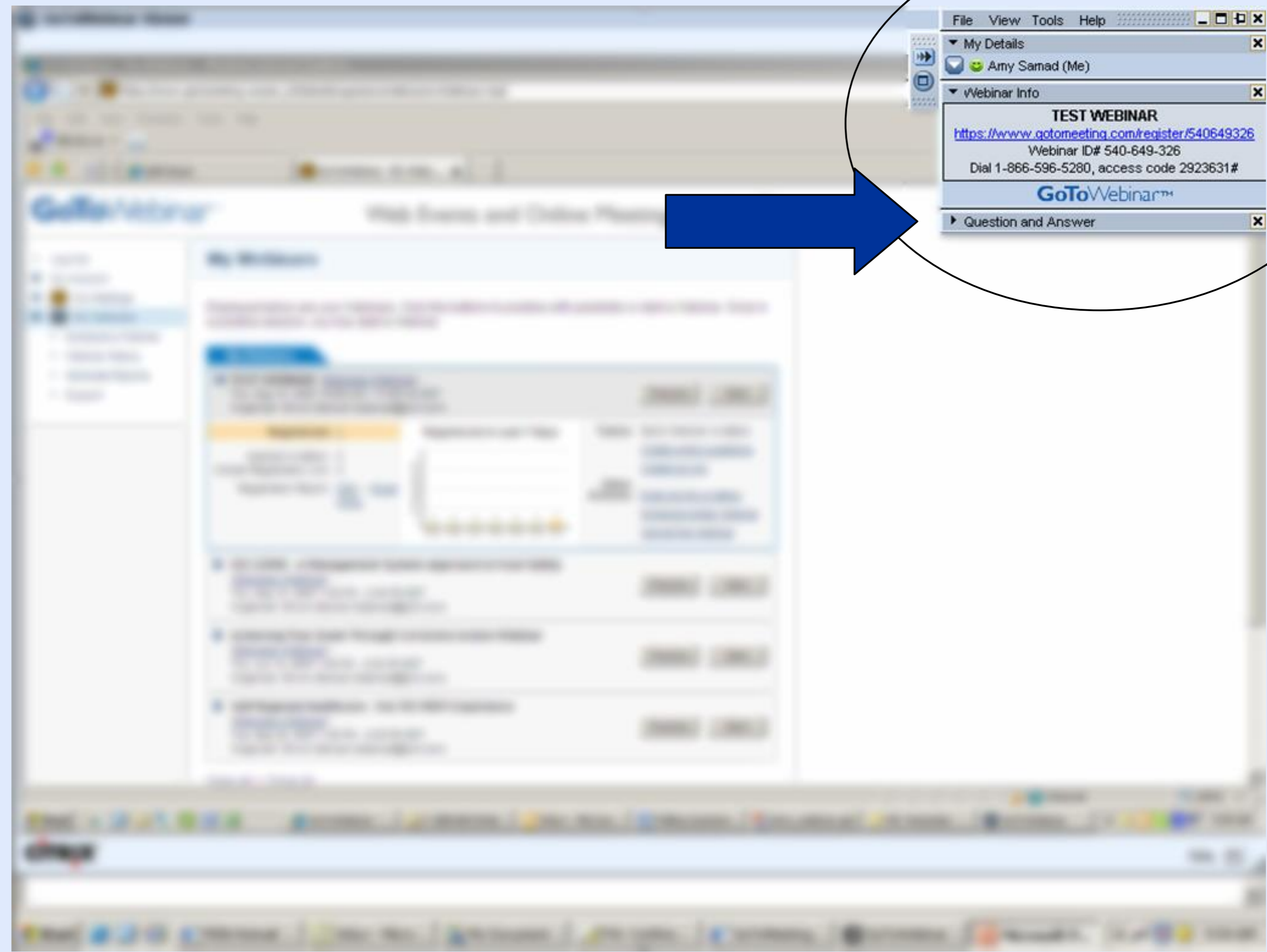


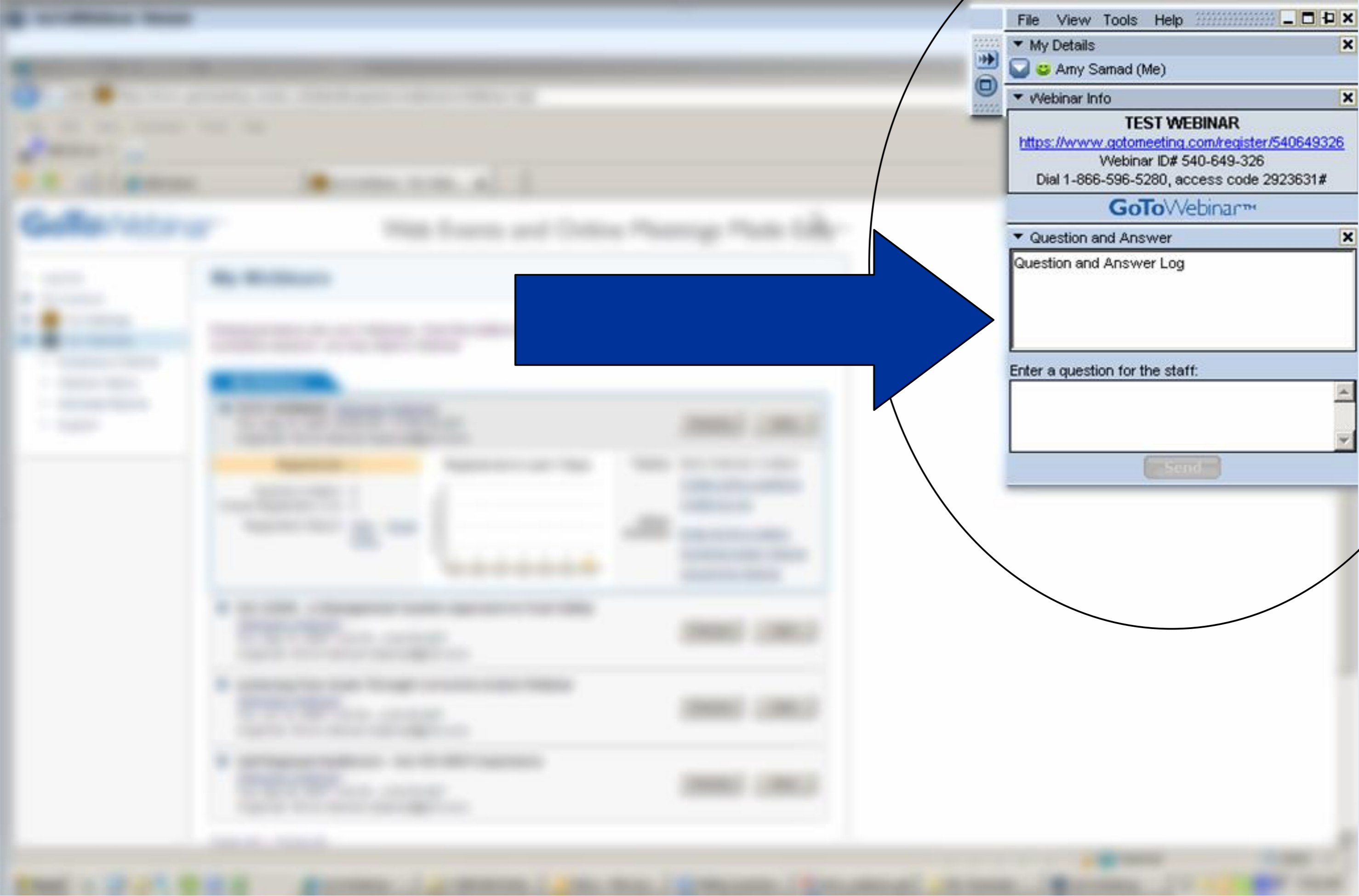
Agroknow

Nikos Manouselis (PhD),
CEO, Agroknow



Food Risk Intelligence & AI for Food Risk Prevention







Paul Damaren

Senior Vice President of
Food Safety & Supply
Chain, PJRFSI



PJRFSI – Your Partner for Food Safety

WEBINAR TOPICS

- WELCOME & INTRODUCTIONS - 5'
- AI & FOOD RISK INTELLIGENCE - 40'
- DIGITAL RISK MATURITY – 10'
- DISCUSSION & WRAPPING UP – 5'



OUR MISSION

We empower the people ensuring that **everyone has access to safe & healthy food.**



COMPANIES TURN TO AGROKNOW WHEN...

...in order to prioritize risk mitigation measures they need to **be early informed about external risks that may affect their supply chain**



OUR OFFERINGS



**FOOD RISK INTELLIGENCE
PLATFORM**

**FOOD RISK DATA
AS A SERVICE**



EXTENSIVE COVERAGE OF EXTERNAL RISKS



>155 million
Records from official trusted sources

15
Data types

>880
Data sources

196
Countries covered

>1 billion
Records from
social media

>9,000
Social media
data sources



ARTIFICIAL INTELLIGENCE IN FOOD RISK PREVENTION

DEFINITIONS



Full Definition of *artificial intelligence*

- 1 : a branch of computer science dealing with the simulation of intelligent behavior in computers
- 2 : the capability of a machine to imitate intelligent human behavior

DEFINITIONS



artificial intelligence (AI), the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience.

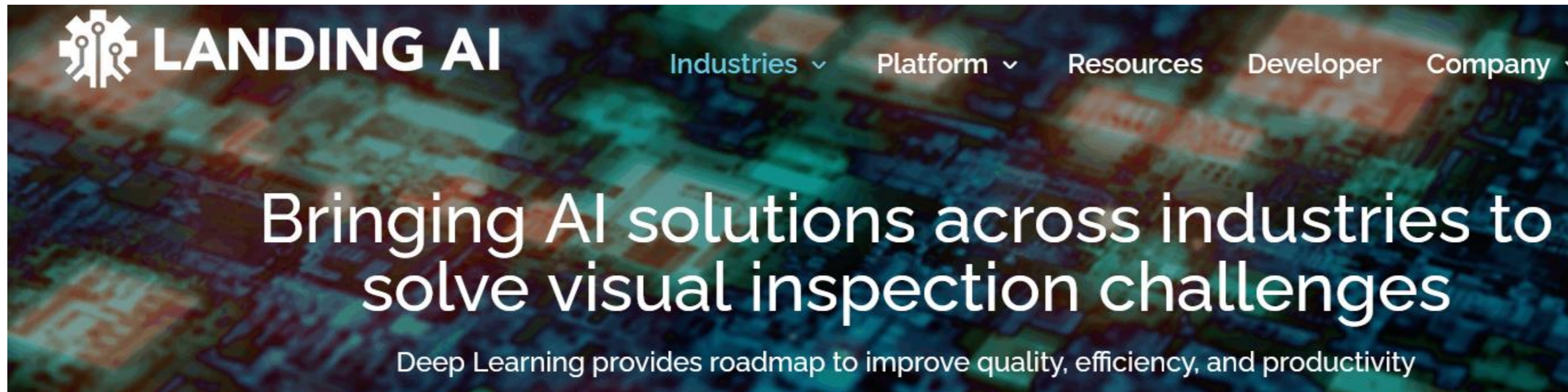
AN AI APPLICATION IN **FOOD SAFETY**

Artificial Intelligence Advances Food Safety

Landing AI is helping food producers overcome not only the limitations of their human workforce but of traditional machine vision as well, using machine learning to better evaluate issues around food safety.

Author — Aaron Hand, Editor-in-Chief, ProFood World

Sep 22nd, 2020



Machine vision has long found a place in food safety, working 24/7 without fatigue. But as data access increases and processing power improves, machine vision is finding even more opportunities through the added capabilities of artificial intelligence (AI).

FOOD INDUSTRY DISCUSSION PAPER

Carletta Ooton from Amazon.

Zoltan Syposs from The Coca-Cola Company.

Vera Steullet from Nestlé.

Dean Holroyd from the ABP Food Group.

Dr. Bizhan Pourkomialian from McDonald's.

Roy Kirby from Mondelez International.

Jos Wellekens from Danone (now in Philip Morris International).

Andrew Harrison from Hazel Analytics.

John O'Brien from Creme Global.

Roger Hancock from Recall InfoLink Inc.

Michael Gibbons from Provision Analytics.

<https://agroknow.com/resources/predictive-analytics-for-food-risk-prevention/>

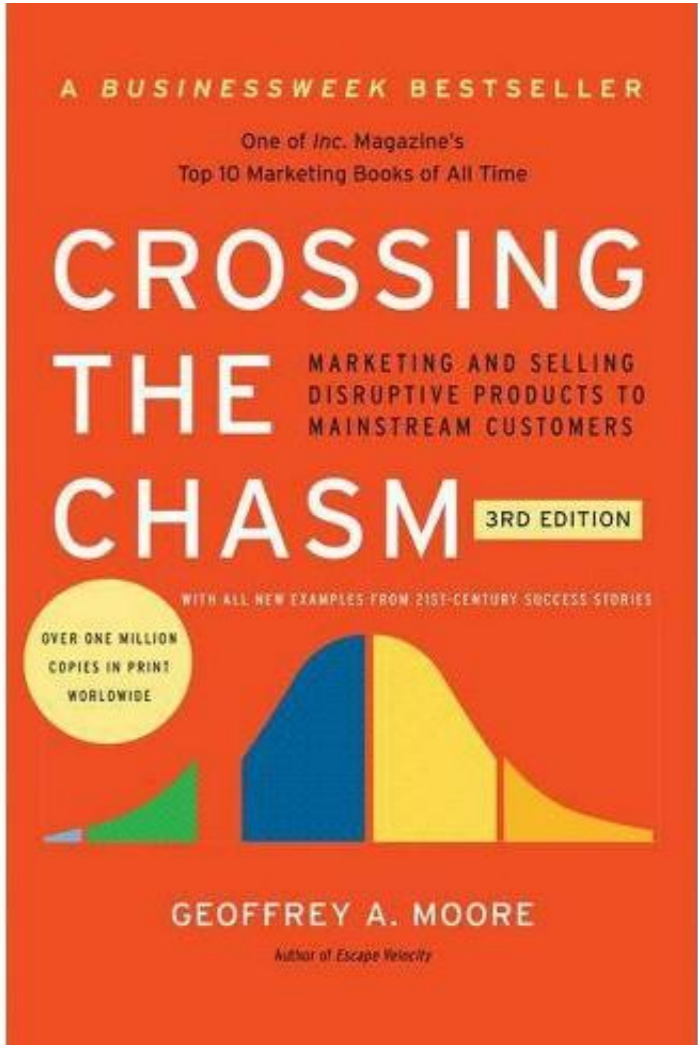
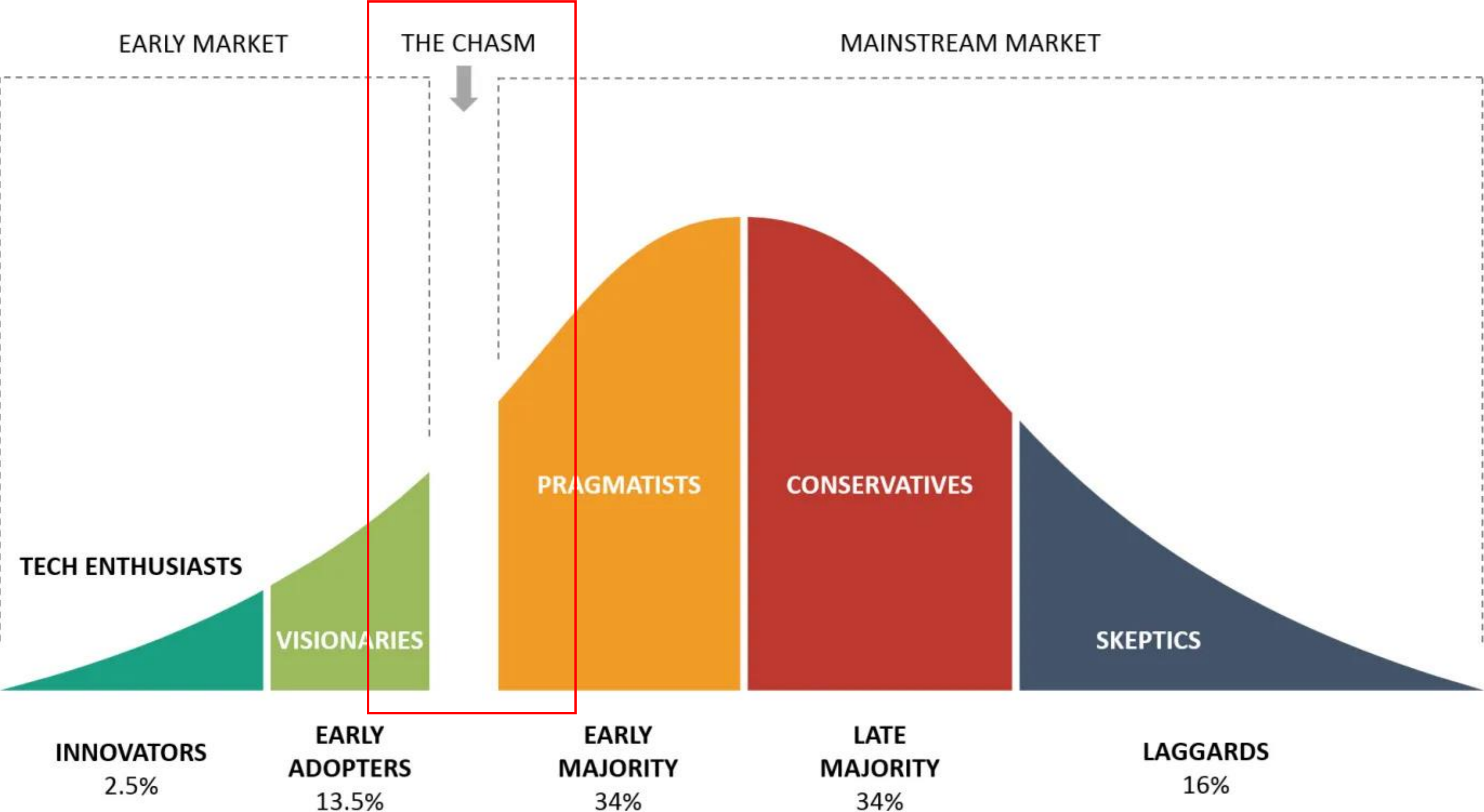
Artificial Intelligence & Predictive Analytics for Food Risk Prevention

AUGUST 2021



EDITED BY  Agroknow

CROSSING A TECH INNOVATION CHASM





DEMYSTIFYING FOOD RISK INTELLIGENCE

WHAT DOES **FOOD RISK INTELLIGENCE** MEAN?

Imitate human decisions that help
identify, assess and mitigate a food risk

e.g. *Discover meaning*

Generalize

Learn from past experience

THE THREE PILLARS

- 1. Risk monitoring:** scanning, investigating & reporting relevant incidents globally
- 2. Risk assessment:** calculating risk indicators for thousands of ingredients & suppliers using multiple data inputs
- 3. Risk prevention:** planning & prioritizing risk mitigation actions (e.g. lab testing, supplier audits, facility audits)

#1 EXAMPLE: RISK MONITORING



#2 EXAMPLE: RISK ASSESSMENT

HorizonScan
INGREDIENT RISK ASSESSMENT SYSTEM

High

MRL exceedences have been found in the last 3 years

Medium:

> 5% of samples examined in the last 3 years have residues > reporting limit

Low:

residues > reporting limit found in the last 3 years but usually in < 5% of samples

Very low

Pesticide not listed - no record of any residues found to date

It would clearly be prudent to ensure your analytical lab sought all these residues

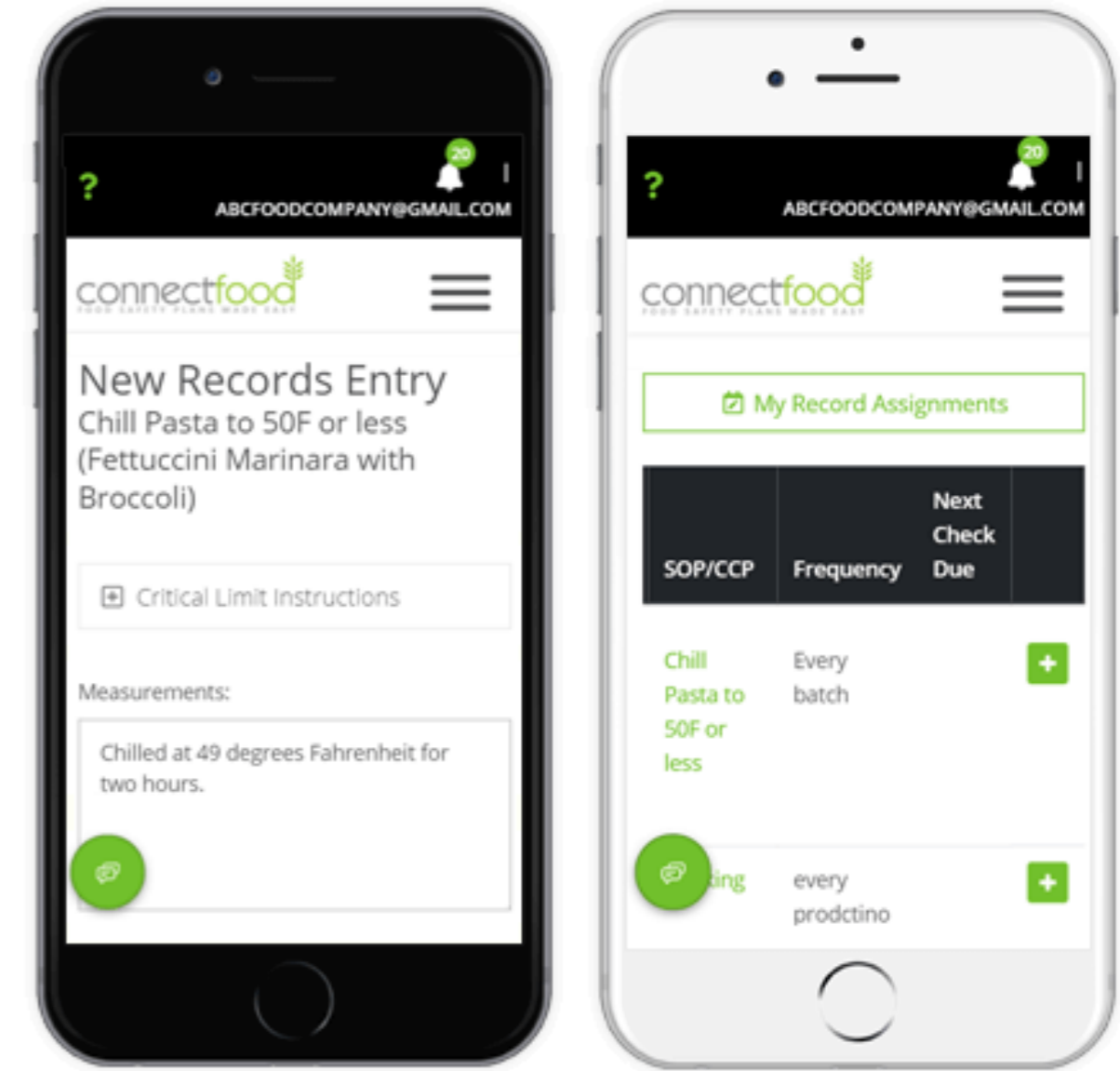
Recommendations for analytical prioritisation for pesticide residues in Oranges

Results per page

25 60 100 All

Commodity	Country of origin	Pesticide	Analytical Priority
Oranges	Turkey	Fenvalerate	High
Oranges	Turkey	Bifenthrin	Medium
Oranges	Turkey	Imazalil	Medium
Oranges	Turkey	Pyridaben	Medium
Oranges	Turkey	Pyriproxyfen	Medium
Oranges	Turkey	Thiabendazole	Medium
Oranges	Turkey	Esfenvalerate	Low

#3 EXAMPLE: RISK PREVENTION



connectfood
FOOD SAFETY PLANS MADE EASY



CHALLENGES TODAY

RISK ASSESSMENT

Uncertainty whether food safety incident alerts received are accurate, complete and up-to-date

Difficulties at identifying data that is relevant to various teams and roles from extremely large and highly heterogeneous data pools

Performing critical ingredient & supplier risk assessment using spreadsheets

Lack an integrated system for risk and vulnerability assessment of suppliers

Lack a systematic & informed way to design/update food risk prevention plans in near real time

Increased concern about unexpected, unforeseen food safety risks that may emerge in supply chain

RISK MONITORING

RISK PREVENTION



THE CASE OF **EARLY THREAT WARNING**



WHAT DOES **EARLY RISK WARNING** MEAN?

Refers to **food risk monitoring tools**

– also known as **horizon scanning, surveillance** or **foresight** tools

HOW TO PERFORM **RISK MONITORING?**

Option 1: Rely upon suppliers to inform about a critical incident



HOW TO PERFORM **RISK MONITORING**?

Option 2: Regularly monitor 2 or 3 official sources of information in markets of interest



HOW TO PERFORM **RISK MONITORING?**

Option 3: Systematically devote time to research numerous online sources



HOW TO PERFORM **RISK MONITORING?**

Option 4: Develop an internal software that monitors a variety of online sources



HOW TO PERFORM **RISK MONITORING**?

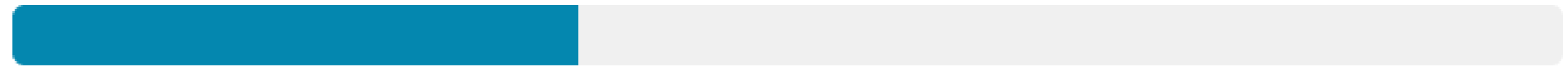
Option 5: Use a 3rd party service that performs a global scan to deliver aggregated insights



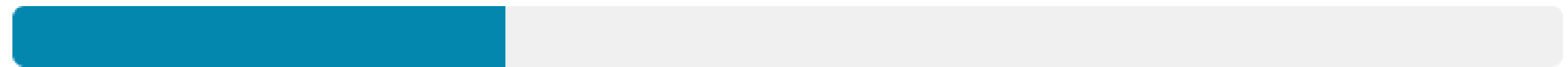
HOW DO OTHER COMPANIES MONITOR RISKS TODAY?

Risk monitoring practices & tools

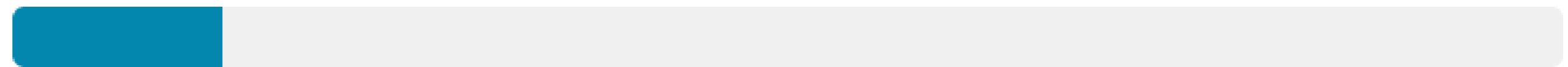
We systematically devote time to search various online sources & sites about emerging issues and hazards that could affect our supply chain. 36.4%



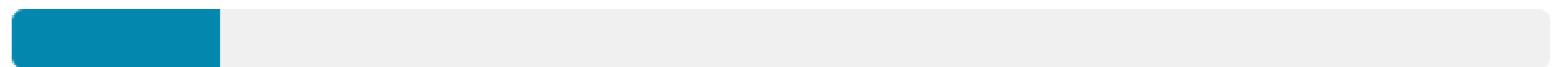
We are using a 3rd party horizon scanning service that provides us with alerts & notifications about relevant incidents. 31.8%



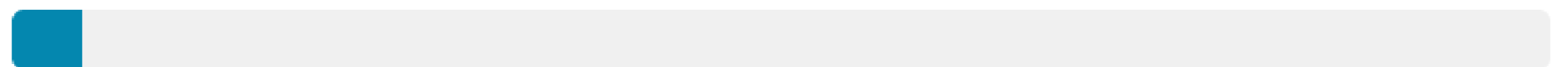
We regularly monitor 2 or 3 official sources of information (such as RASSF and the FDA) for incidents of relevance. 13.6%



We rely upon our suppliers to notify us about critical incidents and do not search online for relevant announcements. 13.6%



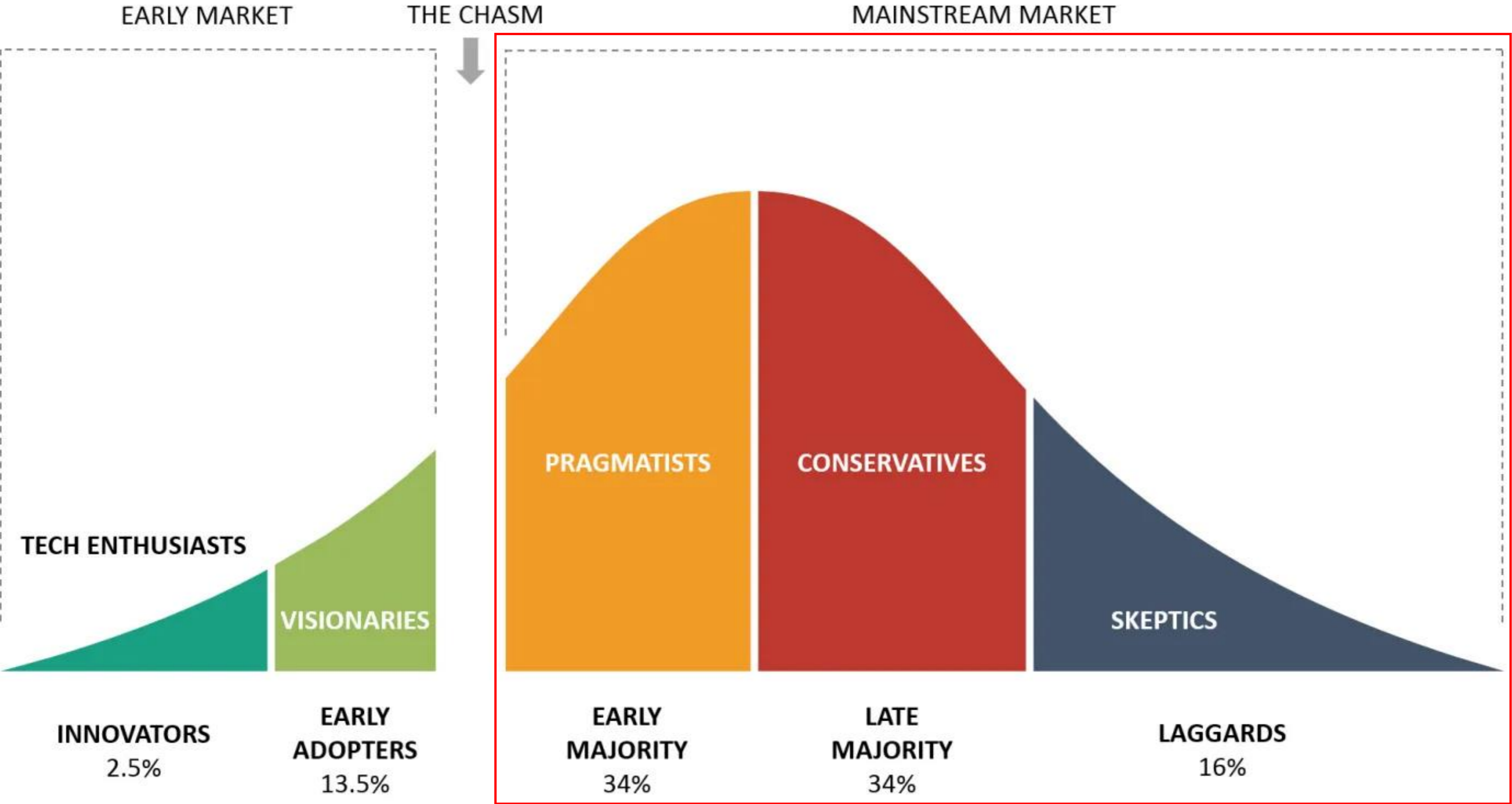
We have developed our own horizon scanning software that monitors a variety of online sources and provides us with alerts & notifications. 4.5%





HOW TO FIGURE OUT WHERE TO START FROM

CHALLENGE: THE LONG TAIL OF CHANGE



**DIGITAL
RISK
MATURITY
MATRIX**

How do you rank in Digital Risk Maturity?

Understand better your company's digital maturity in terms of food risk intelligence.

Start

press Enter ↵

🕒 Takes 1 min

COLOR-CODING DIGITAL RISK MATURITY

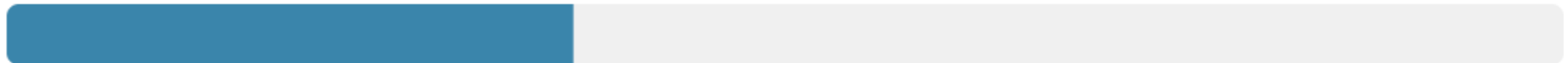
Assessing the Digital Risk Maturity of Food Companies								
v. 24/6/2021								
							Rating	Colour Code
Risk monitoring practices & tools								
We rely upon our suppliers to notify us about critical incidents and do not search online for relevant announcements							1	
We regularly monitor 2 or 3 official sources of information (such as RASSF and the FDA) for incidents of relevance							2	
We systematically devote time to search various online sources & sites about emerging issues and hazards that could affect our supply chain							3	
We are using a 3rd party horizon scanning service that provides us with alerts & notifications about relevant incidents							4	
We have developed our own horizon scanning software that monitors a variety of online sources and provides us with alerts & notifications							5	
Risk assessment practices & tools								
We rely upon our experience to intuitively assess risks associated to ingredients and suppliers when the need occurs							1	
We have regularly scheduled meetings in which experienced team members discuss about which risks we should be focusing on							2	
We use a periodically updated spreadsheet that calculates risk scores of ingredients or suppliers using various data inputs							3	
We are using a 3rd party risk assessment service that automatically combines various data inputs to calculate risk							4	
We have developed our own digital risk assessment software that automatically combines various data inputs							5	
Risk prevention practices & tools								
We have a specific risk prevention plan that changes only when a major incident occurs or we hear about a serious emerging risk							1	
We regularly revisit & revise our risk prevention measures to ensure that they are up-to-date							2	
We have a systematic process to interact with external experts & the market to find out about emerging risks we should give emphasis on							3	
We are using a 3rd party risk prediction service that helps us identify emerging risks & -re-prioritize our preventive measures							4	
We have developed our own risk prediction software that helps us identify emerging risks & re-prioritize our prevention plan							5	

CLIENT CASE: TODAY

Risk monitoring practices & tools

We systematically devote time to search various online sources & sites about emerging issues and hazards that could affect our supply chain.

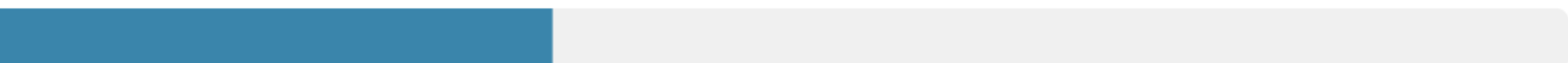
36.4%



Risk assessment practices & tools

We have regularly scheduled meetings in which experienced team members discuss about which risks we should be focusing on.

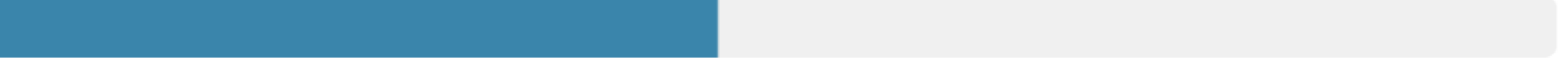
36.4%



Risk prevention practices & tools

We regularly revisit & revise our risk prevention measures to ensure that they are up-to-date.

47.6%



CLIENT CASE:
3-YEAR DIGITAL
PRIORITIES

RISK
MONITORING

3rd party
horizon
scanning
service

RISK
PREVENTION

3rd party
emerging
risk
prediction
service

RISK
ASSESSMENT

3rd party
service that
automatically
calculates
risks

HOW IS EVERYONE GETTING THERE TOGETHER?



TRY IT FOR YOURSELF

[https://agroknow.typeform.com/
maturity](https://agroknow.typeform.com/maturity)



WHAT ABOUT AI?

AN EXAMPLE YOU KNOW WELL



3 THINGS AI CAN DO IN **FOOD RISK INTELLIGENCE**

Extract **meaning from data**

Forecast **expected numbers of incidents** in product categories

Calculate **likelihood of emerging threats/risks**

EXTRACT MEANING FROM LOTS OF DATA

Incident

 [Mail this incident](#)

MONDAY

15

FEBRUARY

2021

Origin:



Senegal

Salmonella in moringa powder by Zena from Senegal

Summary:

Unidex B.V. is recalling Zena Moringa Powder due to the presence of Salmonella. The presence of Salmonella may make this product unsafe to consume.

Hazard:

biological > pathogen > pathogenic bacteria > salmonella


Product category:

Herbs And Spices

Product:

moringa powder


Supplier:

Zena 


Related Suppliers:

Unidex B.V. 

Announced by:

Ministry of Agriculture, Nature and Food Quality of the Netherlands  (15/2/2021)

RASFF  (10/2/2021)

German Federal Office of Consumer Protection and Food Safety  (18/2/2021)

Food Safety Authority of Ireland  (19/2/2021)

LIKELIHOOD OF EMERGING, UNKNOWN THREATS

Your live Risk evolution and prediction for aflatoxin in **nuts, nut products and seeds** ⓘ

An increase in the risk by 8.94% is predicted to happen in 10 months



FOODAKAI

Actual Values

Predicted Values

THE NEXT FRONTIERS

Formulate **problems** better

Manage **expectations**

Share what we learn



Upcoming Webinars



[Brand Protection, Going Beyond Food Safety in 2022](#)

December 9, 2021 – 2:00 pm EST

Speaker: John Kukoly, Global Director, BRCGS

Description: During this session we will explore brand protection with John Kukoly, Director of BRCGS. John will take us a step beyond food safety, highlighting the importance of quality management as it applies to the food industry.



Audience Q&A

<https://agroknow.typeform.com/maturity>

