



Original thinking... applied

GLOBAL FOOD INTEGRITY
ISSUES AND EMERGING RISKS

October — December 2017

HOT SOURCE.





Contents

03	The Rise of Food Transparency – The Challenge of Change
05	HorizonScan in Summary
06	Increased Supply Chain Complexity
07	Original Thinking... Applied – Intelligent Quality Assurance Case Study (Meat Discolouration)
08	Tentative Biomarkers – Cause
09	HorizonScan Highlights: 2017 Q4 Roundup
14	Global Food Integrity Issues Reported on HorizonScan

Dear Reader

The Rise of Food Transparency – The Challenge of Change

The food industry occupies a unique and privileged place inside every single household. Food and beverages play a central role in our lives, for sustenance, health and pleasure. Collectively, Europeans assign 14 per cent of their expenditure to feeding themselves and their families.




Looking across the entire food supply chain, all industry layers are continuously facing challenging global trends and market forces. The dominant forces come from the consumers, who are increasingly considering new value drivers when making a purchasing decision, values like health and wellness, safety, social impact, experience, and transparency.

Global trends and market forces affecting the food industry

CAUSE

-  Climate change
-  Population growth
-  Growing middle class
-  Ageing population
-  Urbanisation
-  Technologies progress

AFFECT

-  **Changing consumer demand**
New consumer value drivers
Easy access to information
-  **Greater supply chain**
Increasing complexity of sourcing
Expanding logistics options
-  **Shifting regulatory framework**
Evolving Government law
Criminal liability exposure
Stricter industry standards





The Rise of Food Transparency, The Challenge of Change

Consumers want all relevant information at their fingertips at the time of purchase, in both online and bricks-and-mortar stores: What is in my food? How was it made? Where does it come from? Many organisations struggle to keep pace with more informed, more connected, and more demanding consumers; and hence to optimise market penetration in order to create sustainable and constant growth. Yet companies who are arriving late to the transparency game have perfectly good reasons for being behind: When an aspect of manufacturing that has never previously been a priority suddenly comes to the fore, the shift in focus demands an enormous investment in change.

When risks are well managed, the opportunities for growth are multiple and varied for those organisations that are willing and able to adapt to market forces and challenges, while retaining a competitive edge. Simply put, having online systems at your fingertips with accurate and timely information allows the decision makers to make informed decisions which can only be a positive step in the right direction. Enclosed within the next pages is a snapshot of just some of the headlines with regards to the main food integrity issues currently being reported on from the last quarter (July to September 2017). It gives you the insight in actuals pulled from our extensive global database of raw material and commodity issues across all food integrity areas, enabling a business to be pro-active when it comes to monitoring food supply chain issues.

HorizonScan intelligence houses data since 1999 to date and is a vital web based food safety alerting tool of raw material and global commodity, keeping you posted on hazard and risk assessments across all food sectors from around the world and specific issues that may concern you. Developed and researched by industry experts, these insights will keep you up to date with regulatory breaches and compliance (e.g. BRC v8, which is currently out for consultation), emerging risks in specific markets, industry developments and hazards focusing on food quality, safety and sustainability.

HorizonScan in Summary

“Supply chain risk control is not only a new FSMA requirement but is an important part of brand protection in today’s food safety environment. HorizonScan is a great resource to better understand where the risks are in your supply chain, and thus better manage those risks.”

Dr David Acheson, CEO of the Acheson Group and former Associate Commissioner for Foods at the US FDA

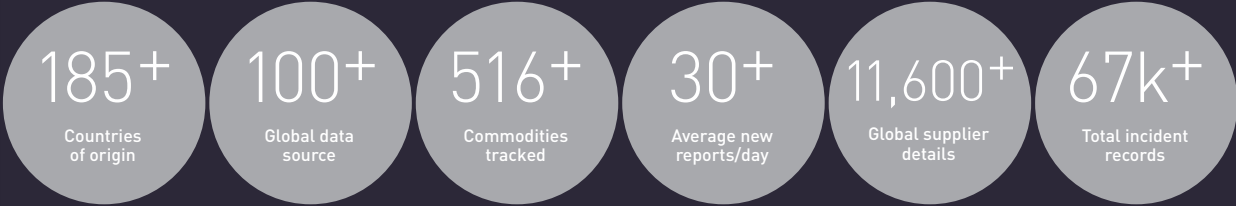
HorizonScan monitors global food integrity issues, allowing you to plan and ensure consumer safety and protect brand identity.

Benefits

- Identify food safety threats early
- Research your suppliers worldwide
- Access 15+ years of historical data
- Protect your brand and reputation
- Get food safety threat e-alerts
- Reduce risk of recalls

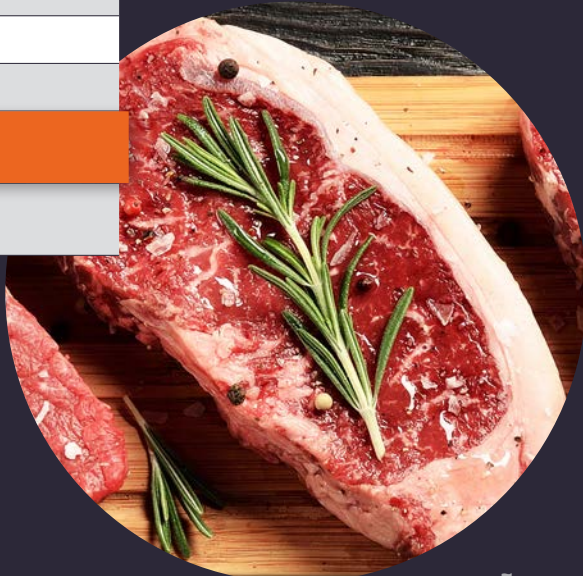
Incidents tracked

- Microbial contaminants
- Pesticide & veterinary medicine residues
- Adulteration, substitution & fraud
- Heavy metals
- Mycotoxins
- Allergens
- GM



Review Of Issues Being Reported (Rolling 12 Months)

Food Group	Change this year vs last year (%)	Now (2017)	Then (2016)
Fruit and Vegetables	Down by 20.5%	1720	2163
Nuts, Nut Products and Seeds	Up by 5.8%	511	483
Herbs and Spices	Down by 17.6%	709	860
Seafood	Up by 9.9%	1603	1458
Dairy	Up by 2.7%	455	443
Meat and Meat Products (other than poultry)	Up by 25.6%	716	570
Poultry Meat and Poultry Products	Down by 0.8%	262	264



Increased Supply Chain Complexity

For today's food companies, supply chain is in the crossfire of multiple and conflicting demands. The food industry has had to contend with a large number of new regulations and standards in the past few years and there's more to come, with Brexit just around the corner.

Executives of food companies also have to consider the impact of shifting consumer demand and the stricter regulatory framework with respect to food integrity across their entire value chain, from product development and design, to quality control, product consumption or return.



Trends such as globalisation of supply, increased difficulty of control, higher quality expectations, less farm land, more production outsourcing, higher corporate social responsibility standards, responsible sourcing and new consumer demand patterns are converging – making it even harder to source on time, in right amounts and at expected quality levels. So, in terms of food manufacturing this translates into consistency, being able to provide consumers with the desired flavours, textures and appearance time and time again, no matter where the purchase takes place.

The Problem



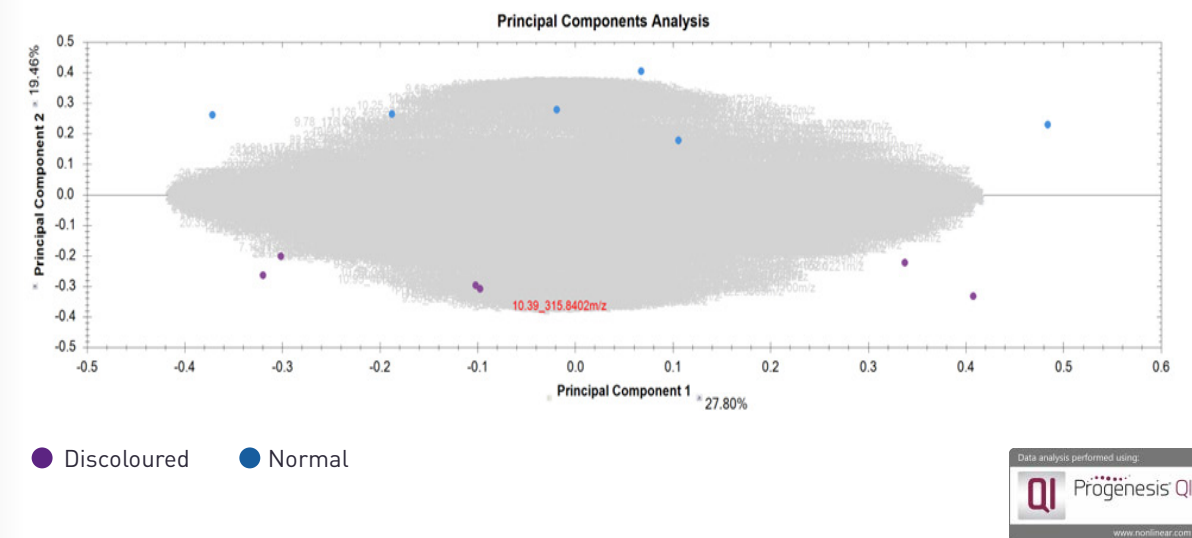
Original Thinking... Applied

Intelligent Quality Assurance Case Study (Meat Discolouration)

Fera were recently challenged by ABP Food Group, UK to identify the root cause of inconsistent and detrimental quality issues that internal investigations had failed to solve:

1. **Their packaged meat product was developing discolouration during production producing a quality issue relating to appearance.**
2. **Only a small number of samples were showing these signs of discolouration and there was no pattern of occurrence between production runs.**
3. **The manufacturer's internal investigations were not able to identify the root cause.**

Taking the principle of measuring 'normality' Fera profiled representative non-discoloured samples, and analytically compared them to profiles acquired from samples showing signs of discolouration.



- Data shows a significant difference between discoloured and normal steaks.
- Data represented above – normal and discoloured parts of 'part-discoloured' steaks.
- Variables significantly different (18) examined in all other samples (including another 'part- discoloured steak') – Of these 8 were significantly different.

Tentative biomarkers – Cause

- Separate methodologies detected amino acids (mono-peptides), di-peptides and tri-peptides.
- Analyte concentrations were **increased in discoloured steaks**.
- Protein degradation **caused by enzymes**: from either internal (autolysis) or external (microbial) sources.
- Peptides are **released during heating**, through elevated enzyme activities.
- Myoglobin is the enzyme responsible for meat colour, denatured at 65°C.

With our chemical knowledge of these biomarkers, we could identify why there were differences between samples and ultimately the root cause of the discolouration.

Combining theory with our original thinking and experimentation in the lab we were able to apply our expertise to test novel strategies in the real world, introducing new methodology, interpreting analytical findings to understand and solve the challenge, ultimately allowing ABP to take the necessary steps to rectify the issue.





HORIZONSCAN HIGHLIGHTS: 2017 Q4 Roundup

Emerging issues:

- **18/10/2017**
The report concerning brewer yeast from Brazil contaminated with pesticides (mandipropamid and epoxiconazole) has been considered an emerging issue by HorizonScan.
- **18/10/2017**
An emerging issue has appeared for potassium salt, originating from the Ivory Coast and contaminated with arsenic (3.2 mg/kg dry matter).
- **19/10/2017**
For the first time, pasta from Italy contaminated with aluminium has been reported.
- **19/10/2017**
An emerging issue has been picked up by HorizonScan for dried mangoes from Taiwan contaminated with undeclared sulphur dioxide.
- **15/11/2017**
The presence of dioxins and dioxin-like polychlorobiphenyls (sum: 1.685 pg WHO TEQ/g) in herbal mixtures for cattle from Germany has been considered an emerging issue. The feed was distributed to the Czech Republic, Italy and the Netherlands as well as in Germany itself.
- **12/12/2017**
For the first time, pesticide residues (2,4-D) have been reported by Japan after finding residues at 0.03ppm in Kenyan beans.
- **19/12/2017**
An emerging issue has appeared in HorizonScan following the release of a RASFF report over mineral oils in pasta from Kazakhstan imported into the EU. The pasta has been distributed to the following countries; Belgium, Czech Republic, France, Germany, Greece, Ireland, Italy, Netherlands, Spain, Switzerland, and the United Kingdom.
- **21/12/17**
For the first time, undeclared peanuts have been detected in a spice mixture (fish masala spice mix) from India which was imported into the EU and distributed in the United Kingdom and Ireland.



Undeclared peanuts have been detected in a spice mixture from India which was imported into the EU and distributed in the United Kingdom and Ireland

HORIZONSCAN HIGHLIGHTS: 2017 Q4 Roundup

Increasing issues:

- Following previous highlights in HorizonScan regarding hazelnuts from Azerbaijan contaminated with aflatoxins and the special controls put in place in 2016 by the EU, this issue appears to still be increasing, suggesting this continues to be a problem despite the new controls. (See figure 1)
- An increasing issue has appeared in HorizonScan concerning the presence of salt crystals (struvites) in canned squid in sunflower oil originating from Spain. Over the past 4 days the products have been recalled in six different countries so far; Switzerland, Germany, UK, Austria, Ireland and Italy. Struvites can form naturally during the processing of seafood and could pose a potential health risk. (See figure 2)
- An increasing issue has been picked up by HorizonScan regarding the presence of aflatoxins in almonds from Spain, with alerts received from Denmark, Japan and Germany. (See figure 3)
- An increasing issue has been picked up by HorizonScan concerning the presence of pesticides in olive oil from Italy, reported by the USA. (See figure 4)
- An increasing issue has been picked up by HorizonScan regarding the presence of Salmonella in crustaceans from India, with alerts received from Scotland, the wider United Kingdom, the USA and Spain. India is one of the larger global exporters of crustaceans and seafood. (See figure 5)

FIGURE 1		
Issue	Date	Notifying Country
aflatoxins (B1 = 60.1; Tot. = 67.1 µg/kg - ppb) in shelled hazelnuts from Azerbaijan, via Georgia	11/12/2017	Italy
aflatoxins (B1 = 11.9; Tot. = 16.6 µg/kg - ppb) in shelled hazelnuts from Azerbaijan, via Turkey	26/10/2016	Spain

FIGURE 2		
Issue	Date	Notifying Country
Squid in sunflower oil recalled due to containing salt crystals (struvite) which could be a safety risk	03/11/2017	Romania
Squid in sunflower oil recalled due to containing salt crystals (struvite) which could be a safety risk	30/10/2017	Switzerland

FIGURE 3		
Issue	Date	Notifying Country
aflatoxins (B1 = 13; Tot. = 15 µg/kg - ppb) in almonds from Spain	09/11/2017	Denmark
aflatoxins (Tot. = 12 µg/kg - ppb) in shelled almonds from Spain	17/01/2017	Germany

FIGURE 4		
Issue	Date	Notifying Country
Chlorpyrifos may be present in extra virgin olive oil	21/12/2017	The United States
Dimethoate detected in olive oil	12/12/2016	The United States

FIGURE 5		
Issue	Date	Notifying Country
Salmonella may be present in frozen shrimp	20/12/2017	The United States
Salmonella may be present in tikka king prawns	29/12/2016	Scotland

(Please note that not all the reports concerning these particular issues are displayed in the tables, they are just the first and the last report being encountered over the 12 months period).

Food fraud issues:

- Confectionery containing fair trade or organic cocoa and sugar carry one of the highest risks of adulteration and mislabelling in the food & drink industry, according to Ecovia Intelligence.
- It has been suggested that tuna originating from Spain is being treated with vegetable additives to strengthen its colour and make it appear fresher. There is concern that this activity is linked to the surge in histamine poisonings that have been seen recently, linked to Spanish tuna.
- Danish consumer watchdog Forbrugerrådet Tænk carried out testing of oregano over the summer which revealed 4 in 10 samples of dried oregano contained other plant material. Three products were found to contain only 50% oregano. The amount of adulteration was so large that Forbrugerrådet Tænk feel it unlikely to be accidental contamination.
- The International Organisation of Vine and Wine have projected a drop of 8% in global wine production by the end of 2017, with Europe hitting a historical low with a 14 % drop in production. While production is falling the market demand for wine is steadily rising, all of which could lead to an increase in the occurrence of fraud within the wine sector.
- Concerns have been raised about discrepancies in Canadian and Vietnamese lobster export data. Vietnam's Department of Animal Health claimed to have inspected and imported about 120 tonnes of fresh and frozen lobster from Canada in 2016. However Canadian export authorities say Canada shipped 1331 tons of frozen lobster and 604 tons of live lobster to Vietnam in 2016. This hints at the size of the grey market exports of lobster going in to China, raising concerns about the traceability of the products and wider fraud.
- Dozens of producers from the National Chamber of Organic Agriculture (Canagro) have raised concerns that 3 companies in the San Carlos area of Alajuela, Costa Rica are exporting non-organic pineapples to the USA and Europe, claiming that the fruit are organic. Costa Rica were the largest importer of pineapples to the EU in 2016, having imported 736,268,000 kg into the EU last year.
- A tea packaging company in India has been found to have been adding cashew nut husks to tea. 14,500kg of potentially adulterated tea was seized. Not only is this a case of fraud, but it could also be dangerous for those who are allergic to cashew nuts.
- Due to adverse weather conditions, the number of organic kiwis entering the USA from Italy has declined. This may lead to the possibility of fraud, with inorganic kiwis labelled as organic to meet demand.
- A Public Interest Litigation has been filed against officials at Sanchi milk in India following the discovery that milk had been adulterated with milk and salt. On the 31st of October 7 people were arrested, and the lab in charge of testing was suspended.
- Greek police have arrested 7 people following an investigation into suspected olive oil adulteration. The criminal organisation behind the adulteration had been adding green dye to sunflower oil to give it the appearance of olive oil, and then sold it on under various brand names in Greece and wider European markets. It is believed the gang involved had been active since at least the beginning of 2015.
- A massive fraud concerning organic fruits and vegetables was discovered in Sicily. The products were cultivated by conventional methods using pesticides, which violates the legalisation on organic producing methods. The farms were exporting to France, Germany and the United Kingdom.
- Concerns have been raised over reports that supplies of vitamin A and vitamin E are becoming tight following a major fire at the BASF plant where 45% of global supply of citral is produced. This could open the door to potential fraud in feed.

At a Glance

STATISTICS

Global food integrity issues reported on HorizonScan



KEY

'%' relates to the number of issues concerning that commodity in its group, for example 28.4% of all issues concerning nuts, nut products and seeds involved pistachios.

'Main issues' reflects the majority of issues reported for that commodity, but does not include every minor issue, for example, most reported issues concerning chicken meat were either the presence of *Salmonella*, *Campylobacter* or *Listeria*.

'Issues' relates to food recalls, border rejections and other such notifications at a global level collated from over 90 official government and other additional reliable sources around the world.

For further information or free trial on HorizonScan, contact **Amy Nicklin** at Fera:
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Poultry meat and poultry products

Quarter change from Q3 2017

↓ 42.8%

Annual change from Q4 2016

↑ 56.6%



Seafood

↓ 15.5%

↓ 2.9%



Milk & dairy products

↓ 20.2%

↑ 8.0%



Meat and meat products (excluding poultry)

↑ 3.1%

↓ 17.4%



Herbs & spices

↑ 12.3%

↓ 19.8%



Fruit & vegetables

↑ 24.8%

↓ 6.0%



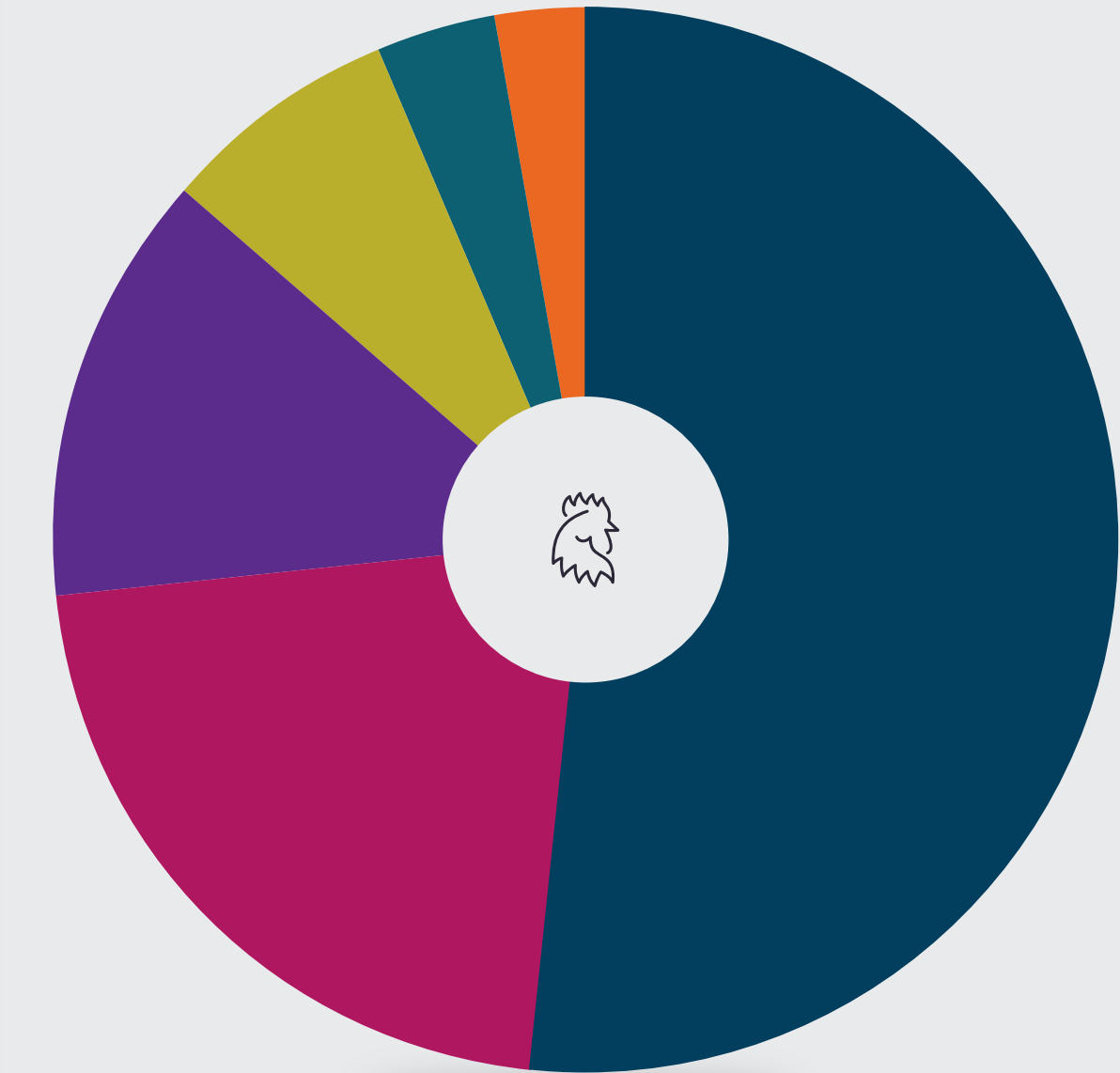
Nuts, nut products and seeds

↑ 77.3%

↑ 28.6%

Poultry meat and poultry products

Main issues reported during Q4 2017



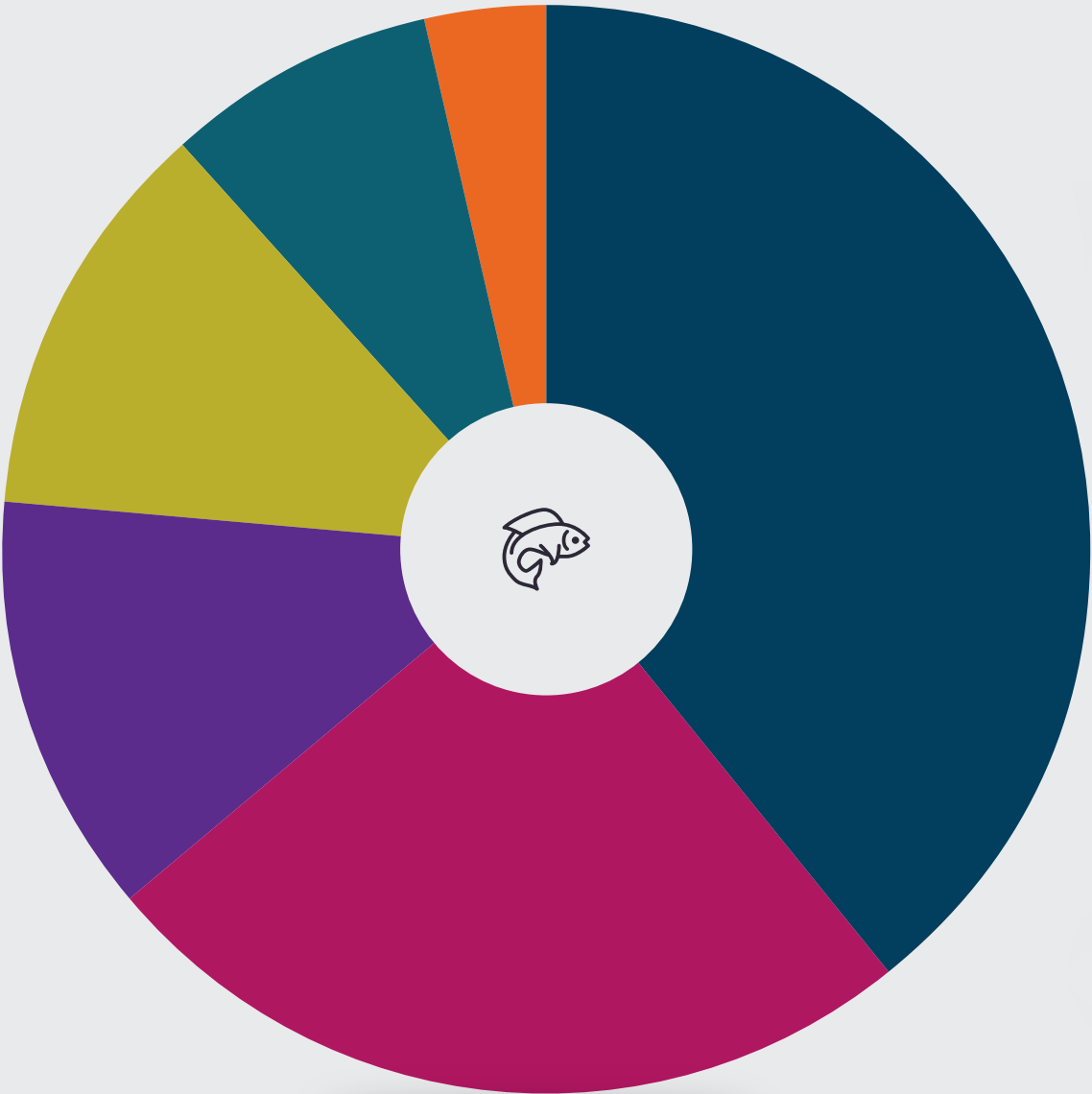
Total of 155 issues

Key	Commodity	%	Main issues
●	Meat – chicken	49	Salmonella
●	Eggs	20.6	Pesticides
●	Meat products (pate, burgers etc)	12.3	Salmonella, Listeria, foreign bodies or multiple allergens
●	Meat – Turkey	7.1	Salmonella, Listeria or foreign bodies
●	Eggs (dried/powdered)	3.2	Pesticides or Salmonella
●	Meat – Goose	2.6	Salmonella or unapproved premisis

STATISTICS

Seafood

Main issues reported during Q4 2017



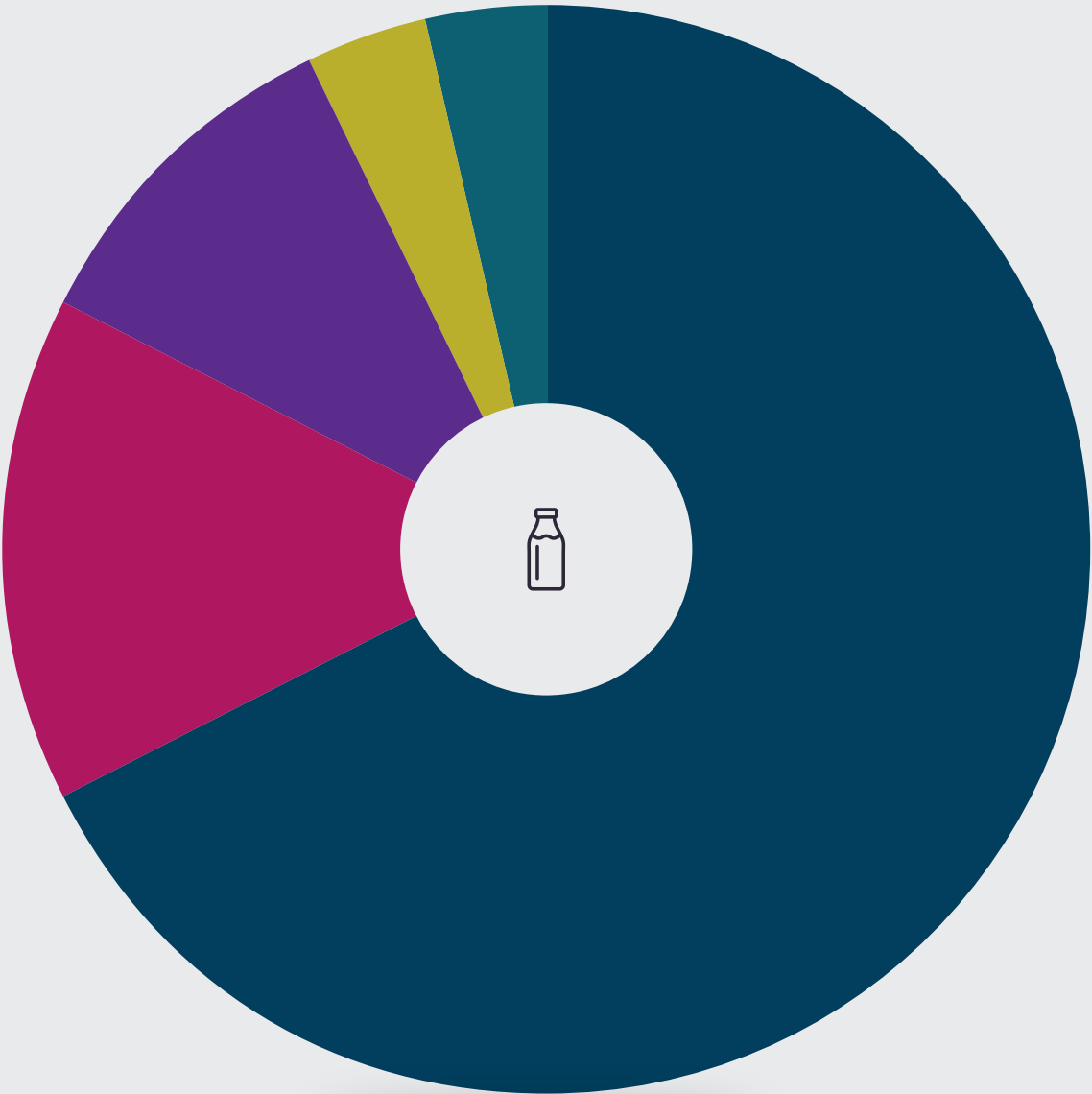
Total of 235 issues

Key	Commodity	%	Main issues
	Fish – fresh/frozen	39.1	Mercury, <i>Salmonella</i> or nematodes
	Crustaceans (crab, shrimps etc.)	24.7	Veterinary drugs, Sulphur dioxide and sulphites (E220-4, E226-8) or <i>Salmonella</i>
	Bivalve molluscs (mussels etc.)	12.3	<i>E. coli</i> , <i>Salmonella</i> or PSP
	Fish – smoked/cured/dried	11.9	<i>Listeria</i> , histamine or <i>Clostridium botulinum</i>
	Cephalopods (octopus, squid etc.)	8.1	Cadmium or altered organolepsis
	Other seafood	3.4	<i>Clostridium</i> or <i>Listeria</i>

STATISTICS

Milk & dairy products

Main issues reported during Q4 2017



Total of 95 issues

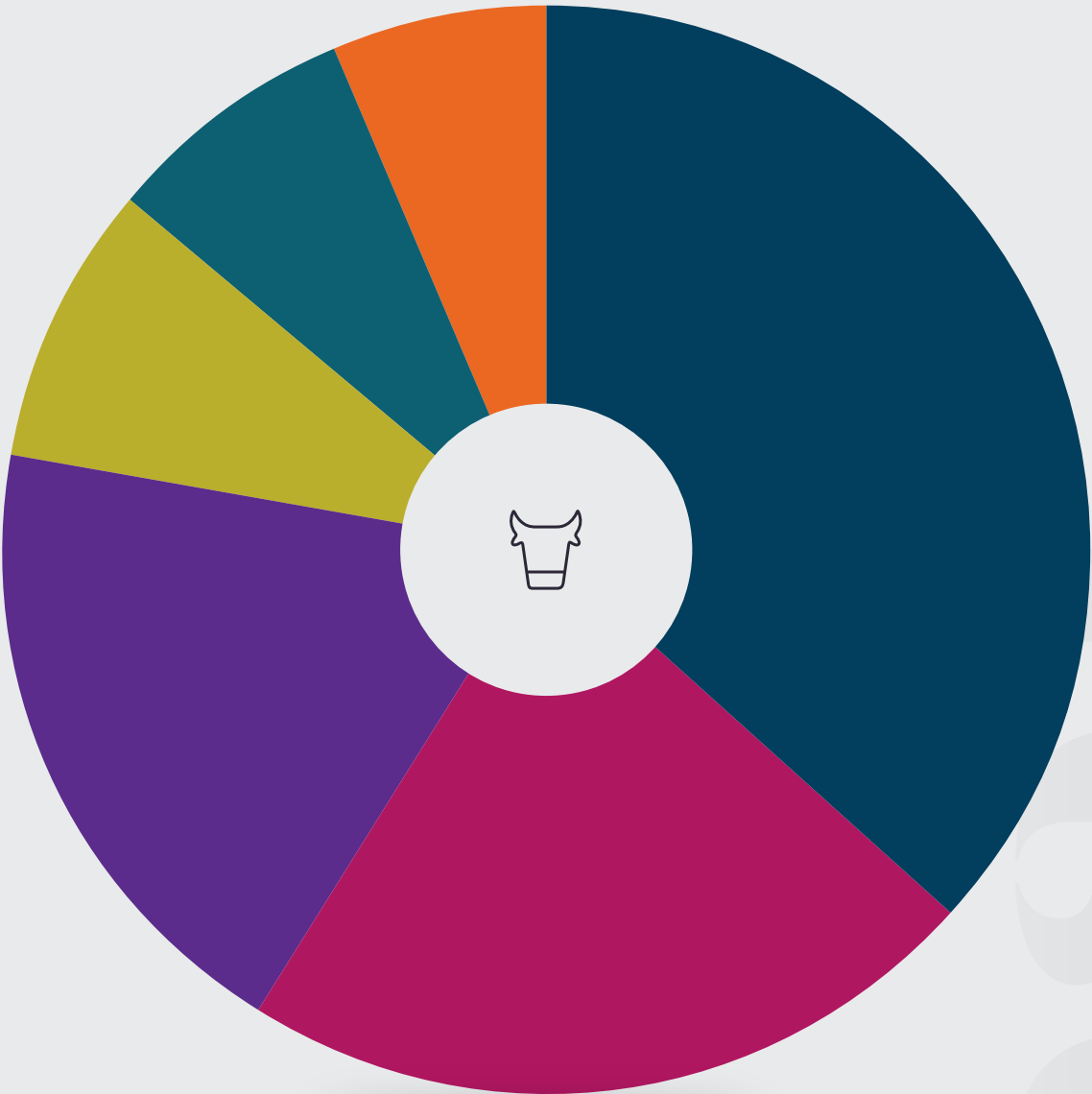
Key	Commodity	%	Main issues
	Milk products – cheese	62.1	<i>Listeria</i> , <i>Salmonella</i> or foreign bodies
	Milk products – ice-cream etc.	13.7	Colours or undeclared allergens
	Milk products – yoghurt	9.5	Foreign bodies or microbiological contaminants
	Milk – based beverages	3.2	Moulds and yeasts, adulteration or <i>Listeria</i>
	Milk products – butter and ghee	3.2	<i>E.coli</i> or <i>Listeria</i>

STATISTICS

Meat and meat products

(other than poultry)

Main issues reported during Q4 2017



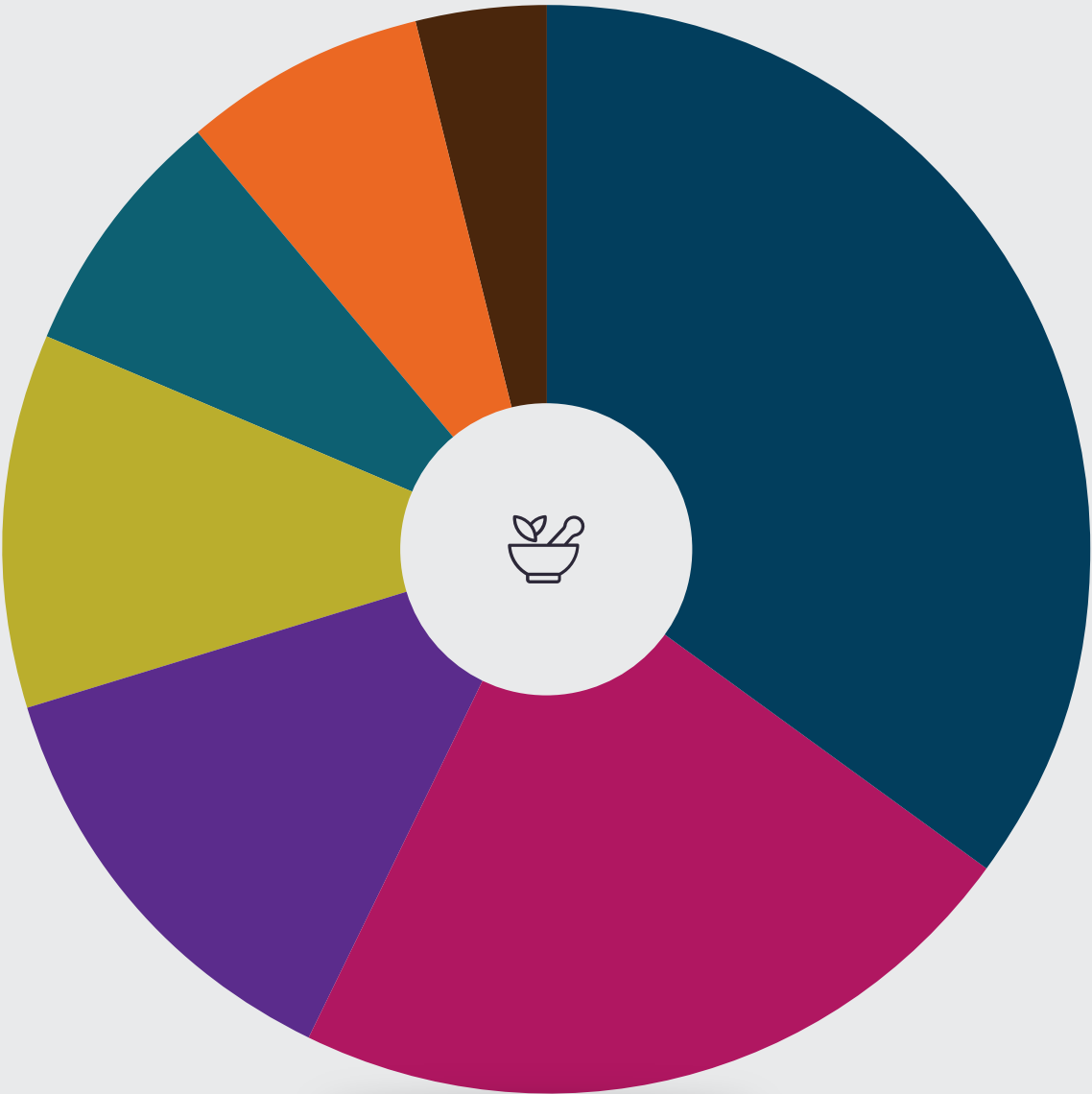
Total of 166 issues

Key	Commodity	%	Main issues
	Meat products – sausages	31.9	Salmonella, Listeria or altered organolepsis
	Meat products – preparations	19.3	Salmonella, Listeria or foreign bodies
	Meat – bovine (beef, veal, cow)	16.3	E. coli or Salmonella
	Meat products – pork hams	7.2	Listeria or Salmonella
	Meat – porcine (pork, pig)	6.6	Salmonella or Listeria
	Minced meat – (beef, veal, cow)	5.4	Salmonella or E.coli

STATISTICS

Herbs & spices

Main issues reported during Q4 2017



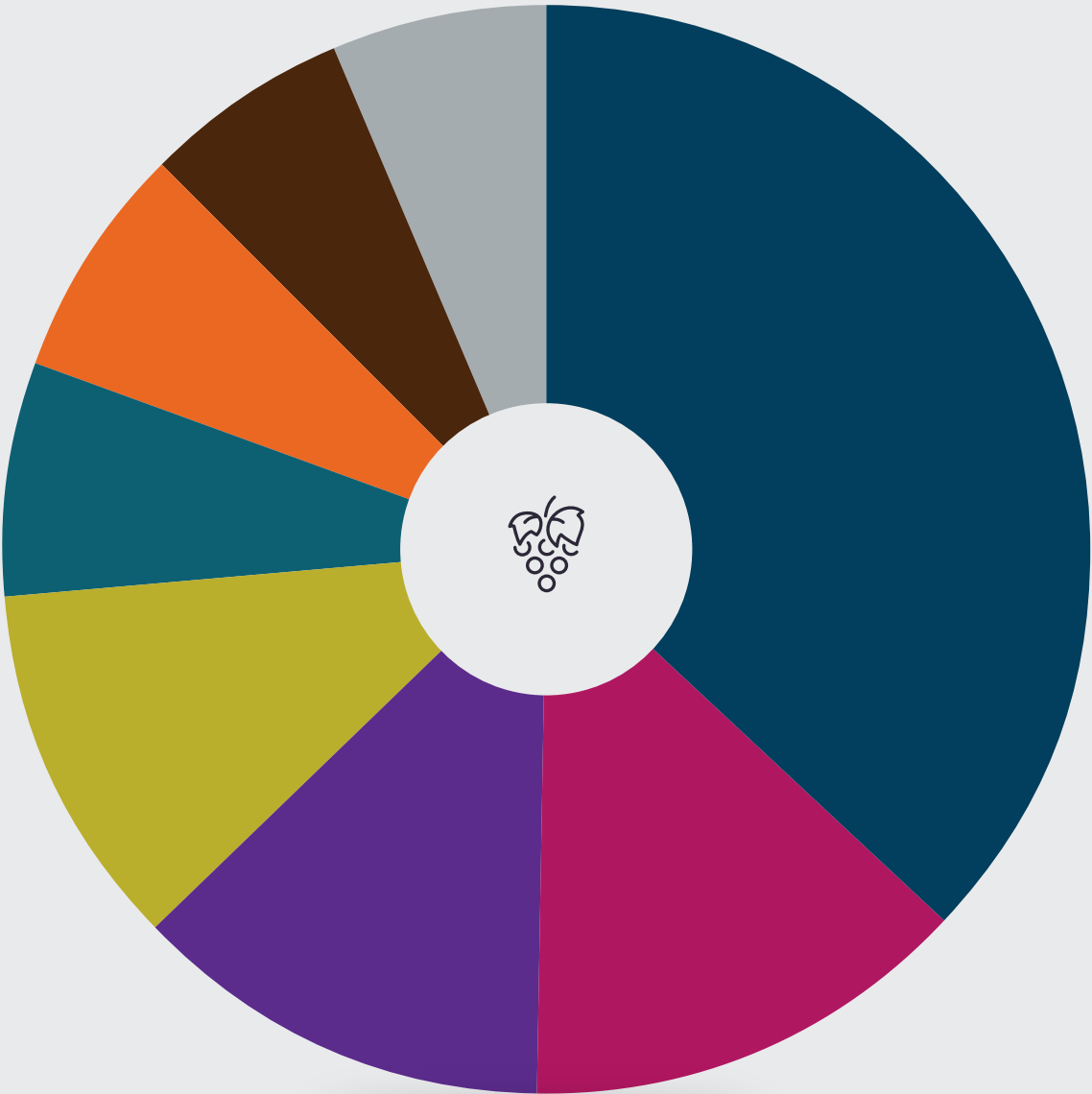
Total of 73 issues

Key	Commodity	%	Main issues
<div></div>	Spice mixtures and curry powder	26	<i>Salmonella</i> , undeclared wheat or Aflatoxins
<div></div>	Paprika and chilli powder	16.4	Aflatoxins or adulteration
<div></div>	Pepper, black, pink and white	9.6	<i>Salmonella</i> or infestation (insects, mites etc.)
<div></div>	Coriander leaves (cilantro)	8.2	Pesticides
<div></div>	Mint	5.5	<i>E.coli</i>
<div></div>	Basil	5.5	<i>Salmonella</i> or adulteration
<div></div>	Cinnamon	2.7	Altered organolepsis or <i>Bacillus cereus</i>

STATISTICS

Fruit & vegetables

Main issues reported during Q4 2017



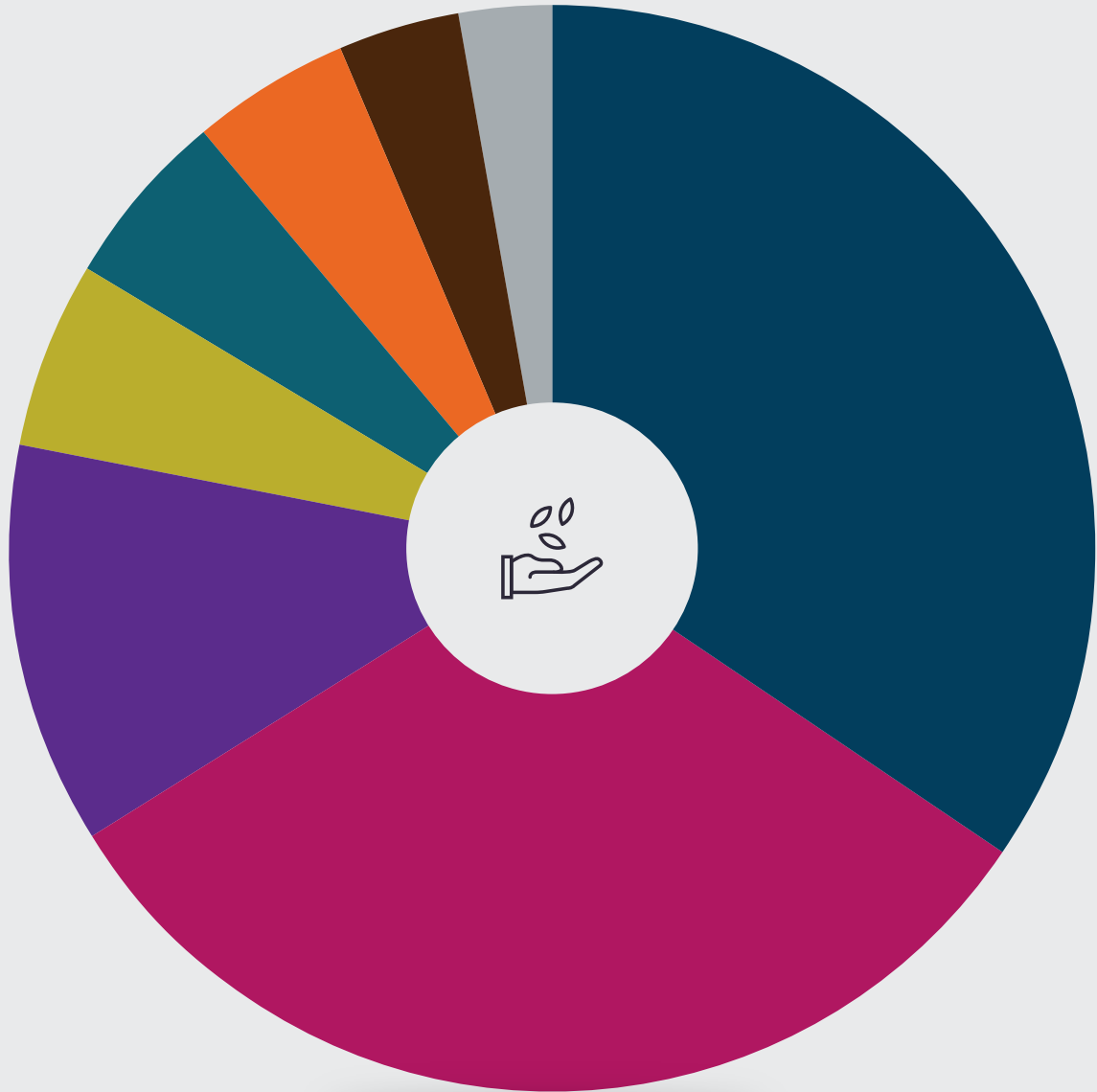
Total of 297 issues

Key	Commodity	%	Main issues
	Figs – dried	18.2	Aflatoxins, Ochratoxin A or infestation (insects, mites etc.)
	Peppers (sweet or bell)	6.4	Pesticides, <i>Salmonella</i> or <i>E.coli</i>
	Apricots – dried	6.1	Sulphur dioxide and sulphites (E220-4, E226-8)
	Chilli peppers – fresh or dried	5.4	Pesticides, aflatoxins or fraudulent documentation
	Goji berries (wolfberry)	3.4	Pesticides or undeclared sulphites
	Vine fruits – raisins	3.4	Ochratoxin A, undeclared sulphite or pesticides
	Beans (dry)	3	Pesticides or fraudulent documentation
	Apples – fresh or dried	3	Pesticides, <i>Listeria</i> or undeclared sulphites

STATISTICS

Nuts, nut products and seeds

Main issues reported during Q4 2017



Total of 117 issues

Key	Commodity	%	Main issues
	Hazelnuts	32.5	Aflatoxins
	Pistachios	29.9	Aflatoxins
	Almonds including ground almonds	11.1	Aflatoxins
	Other tree nuts and mixed nuts	5.1	Aflatoxins or undeclared tree nuts
	Melon (egusi) seeds	5.1	Aflatoxins or fraudulent documentation
	Apricot kernels	4.3	Hydrocyanic acid
	Walnuts	3.4	Infestation (insects, mites etc.)
	Coconut juice, milk, cream or water	2.6	Multiple microbial cont., foreign bodies or adulteration

HORIZONSCAN

Global Food Integrity and Risk System

The BRC Global Standard for Food Safety now focuses more on the transparency of the supply chain.

HorizonScan can help you keep ahead of the game by daily monitoring of emerging, new and novel issues in the commodities you use, wherever you might source them.

The system can also aid with the data needed to complete your vulnerability assessments for BRC in the prevention of food fraud from adulteration, substitution, fraudulent documentation to expiry date changes, production in unapproved premises, production with inspection and unsuitable means of transport.

For supply chain managers with multiple ingredient responsibilities and complex international supply chains, or companies looking for new supply options, this system enables you to conduct top line investigations and be alerted to issues very quickly.

With a global database of raw material and commodity issues across all food integrity areas running from 1999, HorizonScan can help put your mind at rest. Whether you need to illustrate proactive monitoring of supply chain issues, be it fraud and authenticity concerns, pesticide or veterinary drug residues, environmental and other contaminants, microbiological problems or allergens.

- Regular email alerts related specifically to your commodity interests so no need to look every day if time is of the essence
- Searchable summary of all problems in individual commodities at an international level
- Official sites of 63 countries with over 90 independent sources scanned daily
- Links to original data sources
- Historical database of known supplier problems
- Detailed breakdown of fraud and authenticity issues pre-dating horsegate by several years

Risk prioritisation for:

- Pesticides residues
- Veterinary drug residues
- Mycotoxin incidence
- Microbiological incidence
- Unlabelled allergens

International coverage

HorizonScan sources recall, alert and food integrity information at a global level on a daily basis. Reports from major food importing countries and others are all monitored.

Sector coverage

HorizonScan provides information to assist with hazard and risk assessments across all food sectors from around the world.

Issues

HorizonScan provides information on all the issues that may concern you including:

- Fraud
- Residues (pesticides & veterinary drugs)
- Mycotoxins & natural toxicants
- Heavy metals & environmental contaminants
- Processing contaminants
- Microbiological issues
- Undeclared allergens
- Food additives & colours
- Infestation & foreign bodies
- Including emerging and increasing issues

Flexible Search

HorizonScan's modular structure allows you to search for the areas that interest you, either at the individual commodity level or for specific residue or contaminant issues.

Supplier Check

HorizonScan allows you to check individual companies for previous commodity-specific references to food integrity issues in their supply chain.

Up-to-date information

All traded food and commodities are tracked, with data of food integrity issues from 1999 to today. Information on produce & exports from 183 countries, typically with 30 new issues added daily.



www.horizon-scan.fera.co.uk

KEY FEATURES & BENEFITS

- Flexible search
- Supplier check
- Daily global coverage
- Information bulletins
- Email alerts
- Risk prioritisation

FREE TRIAL
AVAILABLE



Spotting risks in the food chain is a daily challenge faced by growers, importers, processors and retailers. It is a task made all the more difficult by having to wade through endless regulations and other data sources to find the parts that might be applicable to you. FC24 changes all that.

FC24 is a regularly updated, comprehensive guide to EU food contaminants legislation and residue limits. It is designed to meet the needs of food industry professionals connected with:

- Food production
- Own label food retail
- Importing produce and food stuffs into the EU
- Food testing
- National regulatory standards for export to the EU
- Food produce and processing for export to the EU

Flexible Search

FC24 has been designed to provide simple, intuitive search options allowing you to undertake single or multiple item searches with equal ease. Search by:

- Commodity
- Contaminant
- Country of origin
- Recipe picker

Where appropriate, search results contain links to corresponding EU legislation for sampling protocols and analytical techniques so you can quickly access further information. Links are also made via country of origin and commodity to any provenance concerns which may arise through the protected designation of origin (PDO), protected geographic indication (PGI) or traditional speciality guaranteed (TSG) listings.

Recipe Picker

The recipe picker allows you to select all the ingredients you may be processing to make an existing or new product. You can then find the minimum levels permissible for any contaminants that could be present in the selected recipe ingredients, with the option to display all levels if required.

Information Bulletin

An automatic, free weekly email bulletin service informs you of any new or changing legislation affecting the data in FC24.



FC24 pulls together relevant information from across the EU relating to food contaminants and residues, including metals, nitrates, veterinary drugs, pesticides and dioxins

HOT SOURCE.

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