

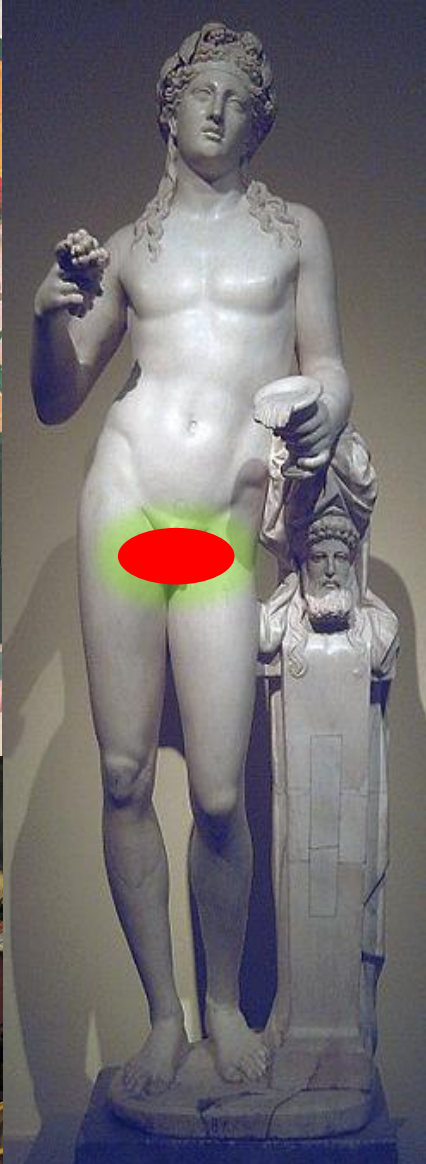
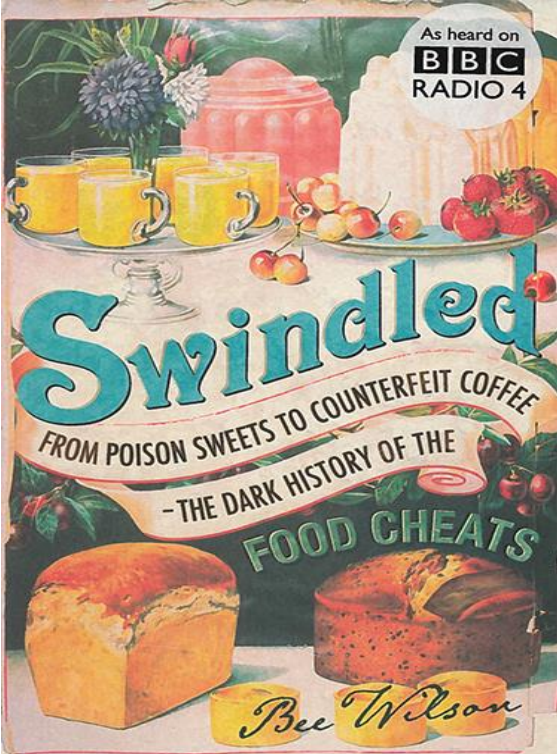
# **50 Year of Food Fraud and Facing Future Challenges**

IFST Jubilee Conference

14<sup>th</sup> May 2014

**Professor Tony Hines, MBE, FIFST,  
Head of Crisis Management**

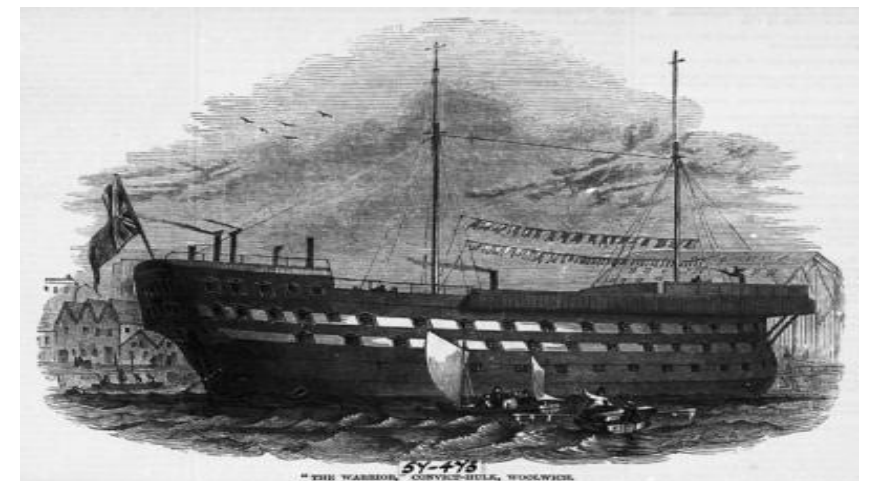
# Food Fraud: Invented by the Romans, perfected by the Victorians



# Great Expectations, set at Christmas 1812



'Pip' was to learn that the 'hulks' - ships carried fraud and fakers to Australia and that the punishment for returning to these shores early was to swing by the neck outside Newgate Prison!



1820 Accum had become aware adulteration through his analytical work and this led him to publish **A treatise on adulterations of food and culinary poisons** - the first serious attempt to expose the nature, extent and dangers of food adulteration. Accum remarked that the art of counterfeiting and adulteration had developed in England to such an extent that spurious articles of all kinds could be found everywhere, but he regarded the adulteration of food and drink as a criminal offence. **'The man who robs a fellow subject of a few shillings on the highway is sentenced to death', he wrote, but 'he who distributes a slow poison to the whole community escapes unpunished'**



## The catalysts for international deception, addition, removal and substitution of constituents:

- Global Food Transport began in the 1960's
- Opportunities to intentionally deceive – a crime of calculation
- Introduction of Labelling claims, provenance, organic, fair trade

## Wine Lakes, Butter Mountains and Intervention Beef

- 56lb boxes for frozen beef, stored at -30C for six years to protect beef prices in the Common Market for UK Farmers.
- EVO, sales outstrip production volumes
- Anti-Freeze in Wine, cheap sweeteners

### Meat

- Selling non-organic meat as organic
- Adding excessive water without declaring it
- Selling meat unfit for human consumption
- Adding beef and other meats to "100 per cent pork" sausages
- Selling "lean" mince containing as much fat as standard mince

### Alcohol

- Watering down spirits
- Substituting premium-brand spirits with cheaper varieties
- Adding extra sugar during wine production to increase alcohol content
- Selling alcohol that has been produced illegally

### Fish

- Selling farmed fish as wild
- Mislabelling the geographical origin

### Honey

- Mixing different blends and selling it as more expensive varieties such as Manuka or Corsican honey

### Pasta

- Selling durum wheat pasta that contains other types of wheat

### Eggs

- Selling eggs from battery-farmed hens as "free range"

### Cheese

- Adulterating mozzarella cheese made from buffalo milk with cheaper cow's milk

### Olive oil

- Dyeing basic olive oil green with chlorophyll to make it look like extra virgin olive oil
- Diluting olive oil with cheaper hazelnut oil

### Orange juice

- Diluting orange juice with cheaper juice
- Adding beet sugar to sweeten natural orange juice

### Fruit and vegetables

- Selling conventional produce as organic or giving the wrong geographical origin

### Parma ham

- Substituting Parma ham with a cheaper variety

### Basmati rice

- Mixing pure Basmati rice with cheaper long-grain varieties

### Coffee

- Mixing Arabica beans with cheaper varieties

### Potatoes

- Selling cheaper potatoes as a more expensive variety, such as King Edward

### Soya beans

- Adding genetically modified soya beans to non-GM beans but not declaring it

# Food fraud

The picture above shows the types of food that have been targeted by food fraudsters. We investigate the problem and explain what to look out for

# Fraud: It is not just about horsemeat

- It's about future threats
- It's about real time intelligence
- It's about analysis of intelligence to understand the implications
- It's about collaborative activity between many stakeholders
- It's about barriers and their removal
- It's about doing things differently, trust and commitment



Times  
29/08/13  
**LESS**  
253m .75l  
bottles

**Weather hits vines**

A cold, rainy spring and severe hailstorms mean France will have one of its worst grape harvests in 40 years; 43.5 million hectolitres will be produced, well below the ten-year average of 45.4 million. Alcohol levels will also be lower, the agricultural service said. (AFP)

The Telegraph reports that millions of fake free-range eggs have been sold to British consumers. Up to 36 million eggs laid by caged hens have been falsely sold as either organic or free-range over the last 3 years.

22<sup>nd</sup> June 2009

**Businessman jailed for selling battery hen eggs as free range**



Keith Owen is thought to have distributed about 100 million eggs

➤ Produce imported from France and Ireland repackaged to carry organic and Freedom Food labels



“The deliberate placing on the market, for financial gain, foods which are falsely described or otherwise intended to deceive the consumer”.



Supermarket apologises after food watchdog's findings

## HORSE MEAT IN TESCO BURGERS

By Sean Poulter  
Consumer Affairs Editor

**BEEFBURGERS sold by Tesco and other supermarkets have been found to contain horse meat, it emerged last night.**

Tests on products from four chains showed a third were contaminated.

Most revealed only small traces but in one Tesco offering 29 per cent of the 'beef' content was actually horse meat.

Last night, Tesco issued an apology and said the suspect burgers had been withdrawn. It is likely however that thousands have been eaten, with many more still stored in home freezers.

The highest level of horse meat was found in the chain's Everyday Value beefburgers but traces were also detected in its frozen quarter pounders.

The revelations emerged following checks by Irish food safety experts.

The affected burgers were made at two sites in Ireland and one in North Yorkshire owned by Dalebrook Foods.

Tesco confirmed the burgers had been on sale in the UK. Iceland said it has withdrawn from sale the two own-brand quarter pounder burger lines implicated in the study.

Other products that tested positive for horse DNA included Aldi's Oakhurst Beef Burgers and Lidl's Moorvale Beef Burgers. Aldi said its product was on sale only in Ireland and had been withdrawn.

The DNA tests on 27 burgers showed very low levels of horse meat in nine and a much higher level in Tesco's value product. Traces were also detected in batches of

Turn to Page 4

# Half of tested meat products in Leicester 'contained DNA of wrong animals'



Last year, a halal lamb burger supplied by Paragon Foods was found to contain pork

**Half of all meat samples tested by Leicester City Council contained the DNA of other animals, a report has found.**

The authority has published the results of its meat testing programme for 2013.

The testing aimed to reassure communities following an incident last year in which a **halal lamb burger** made by a company supplying local schools contained up to 50% pork.

No meat products were contaminated with undeclared pork or undeclared horse.

Undeclared beef, which is offensive to some communities, was found in some products, the council said.

## Related Stories

**Halal school burger 'up to 50% pork'**

**Call for action over halal burger**

**Pork found in halal school burger**

## Top Stories



**UK fastest growing economy - Osborne**

**LIVE** Live: Budget 2014

**Madeleine police seek sex attacker**

**Missing plane frustration boils over**

**Pro-Russians seize Crimea naval base**

## Features



### On the doorstep

Adopted woman's search for birth mother ends five minutes away



### Under the sun

Solar power for African school computers



### Royal kidnap

The day I took three bullets for Princess Anne



### Outback Bowie

When a pop star took a remote Aussie town by storm



### Is that a 2p?

Why the £1 coin is difficult for blind people to recognise

## Most Popular

# What's the problem with Fraud?

- Can affect everyone – enforcers, manufacturers, retailers and consumers. Fraud is historic.
- Global Supply Chain and increasing food prices provides greater opportunity/incentive/rewards.
- Fraud is about misleading the food chain, consumers, safety / health / choice / criminality / brand damage and reputation and money. The media love it!
- Fraud is often very sophisticated & fraudsters are difficult to detect – think watches and handbags!
- International problem - border control issues.
- Local Authorities have limited resources for surveillance
- Difficult to predict the next issue.

# Spanish Toxic Oil Syndrome

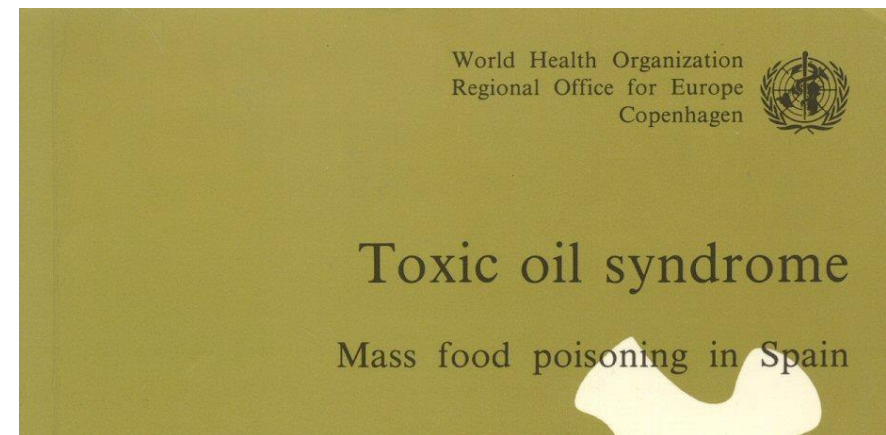
Thirty years ago, the Spanish "cooking oil" disaster began as a mystery illness. Years later, the toll was put at more than 1,000 deaths and more than 25,000 seriously injured, many of whom were permanently disabled.

It was the most devastating food poisoning in modern European history.

Wood et al (1984)



Epidemiologic studies demonstrated that affected subjects consumed a rapeseed oil containing fatty acid anilides. Oil from France that had been deliberately adulterated with aniline to prevent food use was illegally intercepted in Spain, heated to remove the aniline, and sold in and around Madrid in 1981. A one off incident due to opportunity and availability.



**PRODUCT RECALL**



**"1889"  
YORKSHIRE**

Shaws of Huddersfield are recalling these products due to the presence of a non-approved colour found in one of the ingredients, contrary to the supplier's specification.

**What you should do.**

**RETAIL SIZES**  
These products have a three year best before date (BB)  
Products affected are those bearing the date code **BEFORE BB 01.02.06**  
Products bearing a date on or **AFTER 01.02.06** are not affected by this recall.

- Red Pepper & Aubergine Relish 280g
- Hot Mango Chutney 300g
- Flaming Hot Chutney 300g
- Spicy Apricot Chutney 300g
- Mild Chilli Relish 300g
- Tomato Relish 300g
- Onion Chutney 300g
- Curried Fruit Chutney 300g
- Barbecue Relish 300g

**FOOD SERVICE (CATERING) SIZES**  
These products have a 1½ year best before date (BBE)  
Products affected are those bearing the date code **BEFORE BBE JULY 04**  
Products bearing a date on or **AFTER JULY 04** are not affected by this recall.

- Tomato Relish 2.4kg
- Mild Chilli Relish 2.4kg
- Tomato Chilli Relish 2.4kg
- Chilli Relish 2.4kg
- Red Hot Chilli Sauce 2.3kg

If you have purchased any of these products you should return them to your retailer or stockist where a full refund will be given.

*Shaws wish to apologise for the inconvenience caused.*  
For further information, please phone 01484 539999

Daily Telegraph  
1<sup>st</sup> August 2003

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25 x 9cm

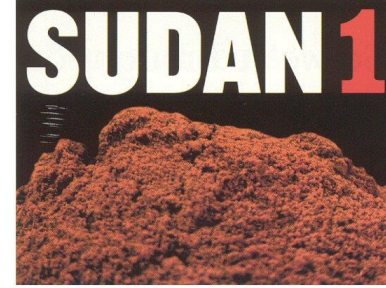
Dye in ready meals: The grim truth facing families

**WE'VE EATEN IT FOR MONTHS**

THOUSANDS of families have been eating tainted food for the last 18 months. It emerged last night.

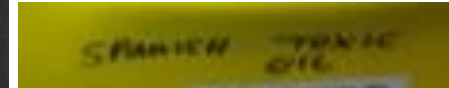
By Susan Pennington

It is a grim truth that the food we eat is contaminated with a dangerous dye. It has been found in ready meals, soups, and other products for months. The dye, Sudan 1, is a known carcinogen and has been found in a wide range of food products. The problem is that it is so cheap and easy to use that it has become a common ingredient in many low-cost food products. The discovery has caused a major scandal in the food industry and has led to a number of product recalls.



## CRISIS

- What the biggest food scare since BSE will mean for businesses and brands
  - How swiftly retailers reacted to the red alert
  - The cost to suppliers; and who's going to pay
  - How can the industry stop it happening again?
- >> MAJOR SPECIAL REPORTS START ON PAGES 4 AND 28**



In Food Defence we talk about **Threats**

**TACCP**

Threat Analysis Critical Control Point

To ensure a safe and robust supply chain consider:

**Temptation Analysis Critical Control Point**

Identify where in the value chain there is a temptation for fraudulent activity, where most value can be added, what the benefits are and the potential for detection.

Consider **Economic Temptation**

Stop being a Food Technologist / Safety Specialist, Quality Manager,  
supply Chain Specialist

and

**Think like a criminal**

What do you buy a lot of and could be subject to 'bulking' or 'diluting' to a degree that will not impact on the safety, sensory qualities of the product, not change it visually or physically, is expensive and untested?



# ‘Perfect storm’

**for adulteration of naturally derived food dyes**

*“For colorants, it’s the perfect storm: consumers are demanding it; they’re getting tougher to source,”* Griffith said. *“The signals are there. There’s a complacent public and an overactive advertising philosophy going with it...**There’s so much money that can be made so easily under the radar, you’re almost stupid if you’re not doing it.**”*

Speaking to FoodNavigator-USA at the IFT expo in New Orleans US Pharmacopeia (USP) director of food standards Markus Lipp, and vice president of food, dietary supplement and excipient standards James Griffith,

17<sup>th</sup> June 2011

**Table 4–Top 25 ingredients in the scholarly records dataset.**

<b>Ingredient</b>	<b>Number of records</b>	<b>Percentage of total records</b>
Olive oil (all) <sup>†</sup>	167	16
Milk (all)	143	14
Honey	71	7
Saffron ( <i>Crocus sativus</i> L.)	57	5
Orange juice	43	4
Coffee (all)	34	3
Apple juice	20	2
Grape wine ( <i>Vitis vinifera</i> )	16	2
Maple syrup	16	2
Vanilla extract (all)	16	2
Rice (all)	14	1
Cheese (all)	13	1
Milk fat (all)	13	1
Turmeric	12	1
Vegetable oil (all)	11	1
Chili powder	10	1
Sesame oil	10	1
Cocoa powder	9	1
Strawberry puree	9	1
Beeswax	8	1
Chinese star anise ( <i>Illicium verum</i> Hook. f.)	8	1
Durum wheat ( <i>Triticum durum</i> ) pasta	8	1
Guar gum	7	1
Palm oil	7	1
Paprika	7	1

Food fraud database (Lipp et al., (2012) J Food Science 77 pR118-R126  
[www.foodfraud.com](http://www.foodfraud.com).

**Table 5– Top 25 ingredients in the media and other records dataset.**

<b>Ingredient</b>	<b>Number of records</b>	<b>Percentage of total records</b>
Fish (all)*	23	9
Honey	15	6
Olive oil (all)	10	4
Chili powder	9	4
Milk (all)	7	3
Black pepper	6	2
Caviar (all)	5	2
Cooking oil	5	2
Paprika	5	2
Rice (all)	5	2
Saffron	5	2
Turmeric	5	2
Patchouli oil ( <i>Pogostemon cablin</i> )	4	2
Pulses	4	2
Apple juice	3	1
Bergamot oil ( <i>Citrus bergamia</i> )	3	1
Ghee	3	1
Juice	3	1
Lavender oil ( <i>Lavandula angustifolia</i> )	3	1
Wheat flour	3	1
Wheat gluten	3	1
Wine (all)	3	1
Anise oil ( <i>Pimpinella</i> spp.)	2	1
Asafoetida	2	1
Chicken meat	2	1

Food fraud database (Lipp et al., (2012) J Food Science 77 pR118-R126  
[www.foodfraud.com](http://www.foodfraud.com).

Both Consumers and the food supply chain can be exposed to fraudulent activity.

- Fraud is not always price sensitive
- Fraud can make additional profit
- Just about any commodity can be labelled to mislead. Most FBO have not chosen crime as a profession. Most FBO's did not understand their exposure to fraud.
- We have had to move very fast in the last 12 months
- **Make the UK a very uncomfortable place to commit food fraud**

- 'Predicted'
- Happening
- or has happened

Fraud can be linked to a batch, production day or time period or an on-going long term issue.

**Fraud exists on a spectrum from:**

- simply misleading, (free range eggs)
- life threatening (melamine)
- driven by science to opportunistic

- simple misleading consumer issues, for example Fair Trade, Organic, Line Caught, Sustainably Sourced, Protected Species Free Range, Fresh / Frozen Country of Origin and a multitude of other 'claims', from Local to Handmade.
- Equally, ingredient substitution with lower grade and cheaper substitutes may be a 'one-off' event or a planned long term intention to mislead for financial gain.
- It can also be a desperate measure to fulfil an order or achieve a price point.
- **Let your professional ethics over-rule the fraud!**

From a food safety perspective, substitution and adulteration of ingredients or product of animal or non-animal origin may once adulterants are determined may identify low to chronic, immediate to long term human or animal health issues e.g. dioxins, melamine, aniline, bute(!)

## **Future Food Fraud incidents will be:**

- **Widely reported**
- **Political**
- **Brand damaging**

## The Known Knowns

The most often and product categories most frequently reported are:-

- The Unknown, Unknowns
- Nitrogen Replacers
- Colour stabilisers (Sudan 1)
- Alcohol Replacers (Methanol)
- Sweeteners (ethylene Glycol)
- What can food technology develop next?



## Predicting and mitigating problems

- Country of Origin, history of previous issues Prosecutions, Commodity, history of previous issues Supplier, Import Agent, history and track record Suppliers, suppliers, Vendor Assurance, Audits, Inspections, non Conformances
- Auctions / benchmark price / integrated supply chain

## Think like a criminal

- Ask the difficult questions - what could be substituted How would I / we introduce fraud to increase profit or to meet a price point?
- Due diligence surveys and testing. Is it 100% of what you specified?

Port Health Officers

UK Border Force

EU Regulations

- Certificates, what value a piece of paper?
- Paperwork
- Other customers, references
- Partnership and Trust
- Your nose, eyes and taste buds



# Data Mapping & Prioritisation Project



Food  
Standards  
Agency  
food.gov.uk

1. Workshop with industry stakeholders to seek support for the principle of intelligence sharing
2. Map and prioritise the sources available and identify any gaps where information that would be useful is not currently available.
3. Provide recommendations to the Agency which identify...
  - the optimal portfolio of information sources and stakeholders that are most useful for providing evidence for the detection of future risks to food
  - a plan to achieve this portfolio including how any barriers to sharing information that might exist between Agency and its industry stakeholders can be overcome

# Recommendations

1. All to work together to encourage voluntary sharing of unusual, unexpected and suspicious events.
2. Best achieved by taking a 'whole chain' approach including...
  - A network of Trade Associations where members can report and share information of concern
  - Industry owned, independent non-public 'Safe Spaces' where FBOs can share unusual, unexpected or suspicious information in an anonymised way
  - Partnerships for sharing intelligence between key FBO's and the FSA
  - FSA to share priorities for food safety and integrity thereby giving direction to both enforcement and industry

# My Vision: Could I make this happen?

Whole Food Chain, farm and sea to fork

Embrace the food supply chain with one message

*'We are all in this together'*

Relentless Communication to all

Trade Association Members and 'others'

Licensed FBO communication for LA's

Supported by 'the feet on the ground', EHP's, TSO's, PHAO

Strategic, joined up thinking using all resources better from  
Government

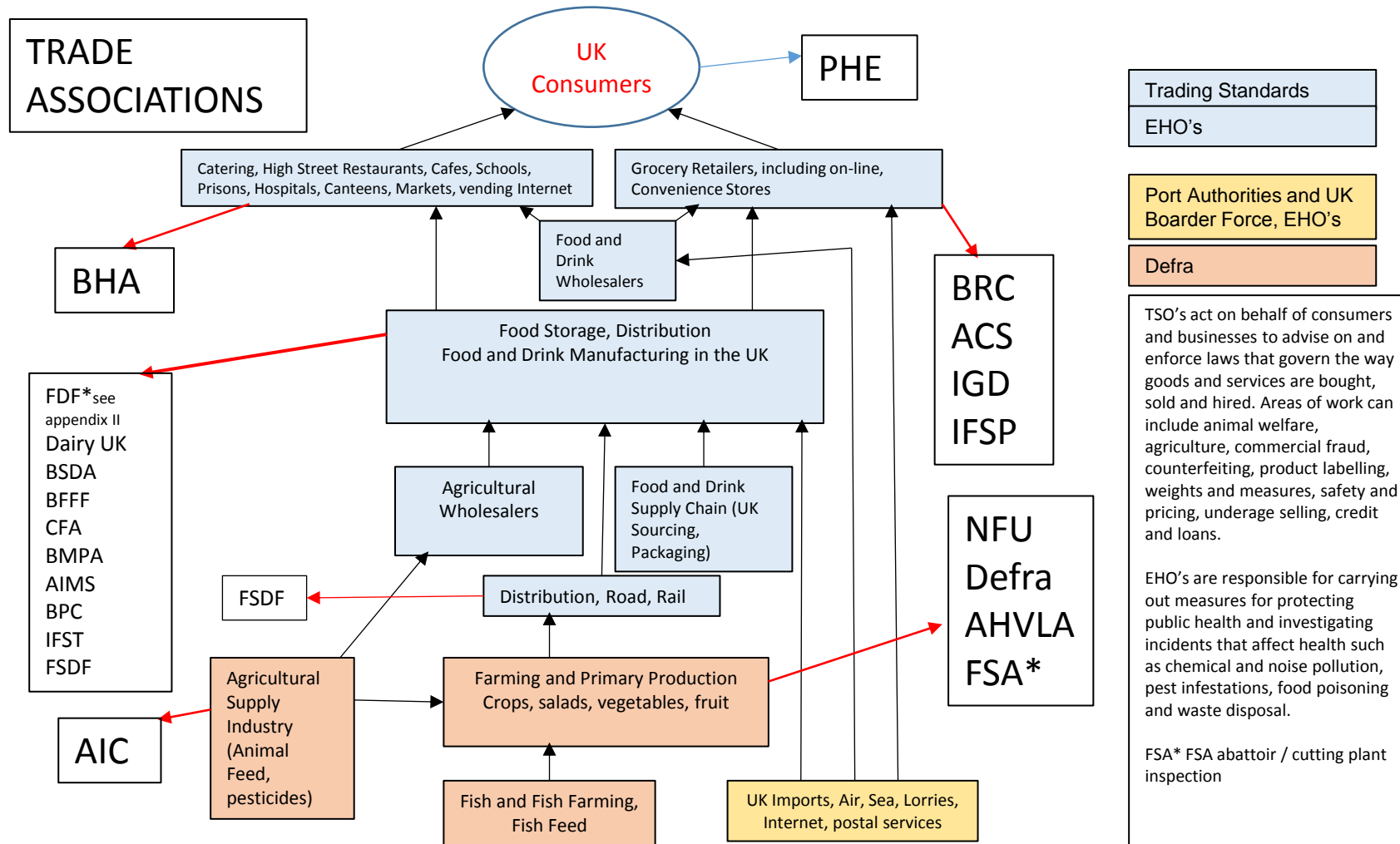
**Analogies .....**

## *The Coroners Statement*

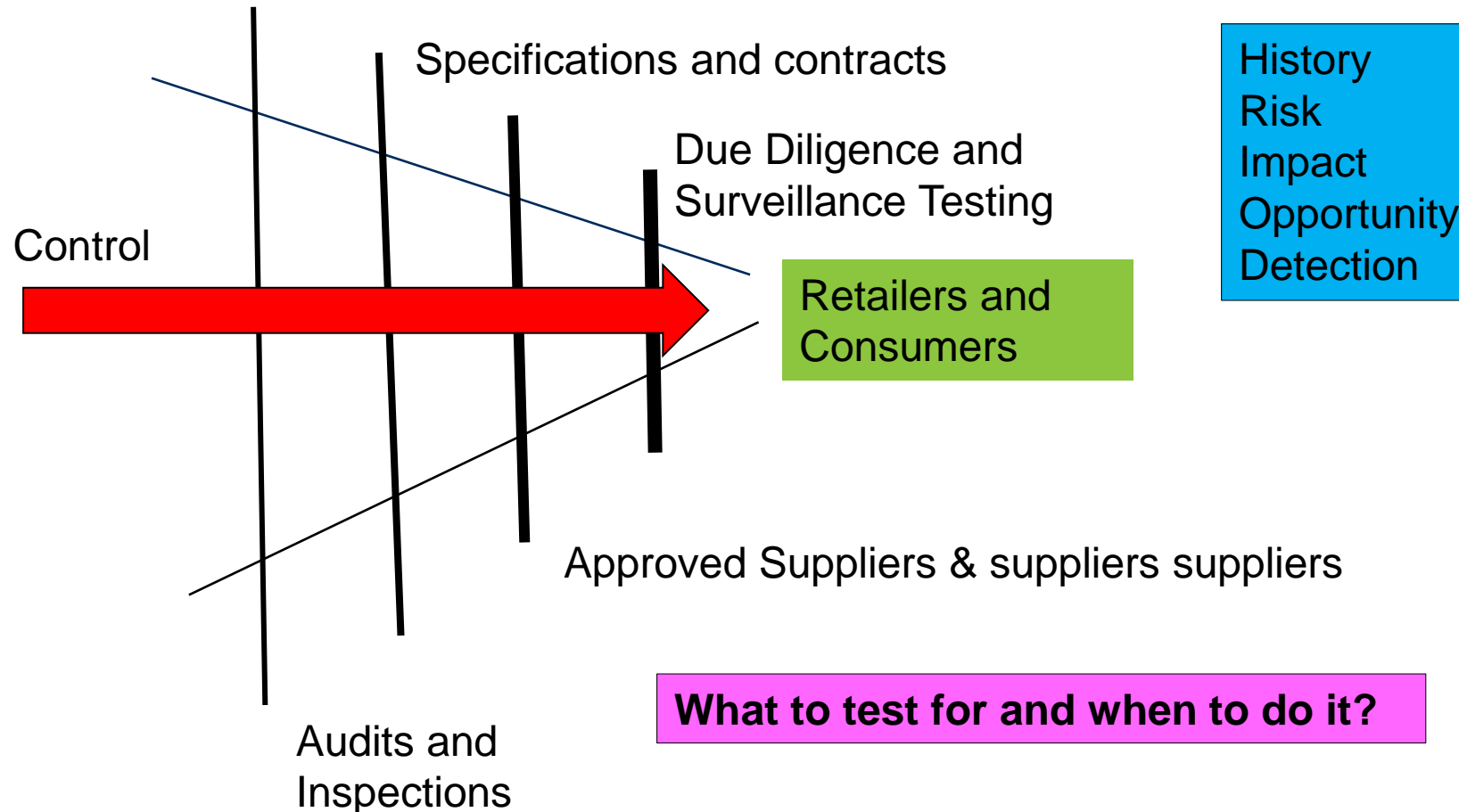
“This fatality could have been prevented if all the relevant agencies had shared their intelligence and communicated with one another.”

Let's share what we know and make the UK a very uncomfortable place to commit food fraud.





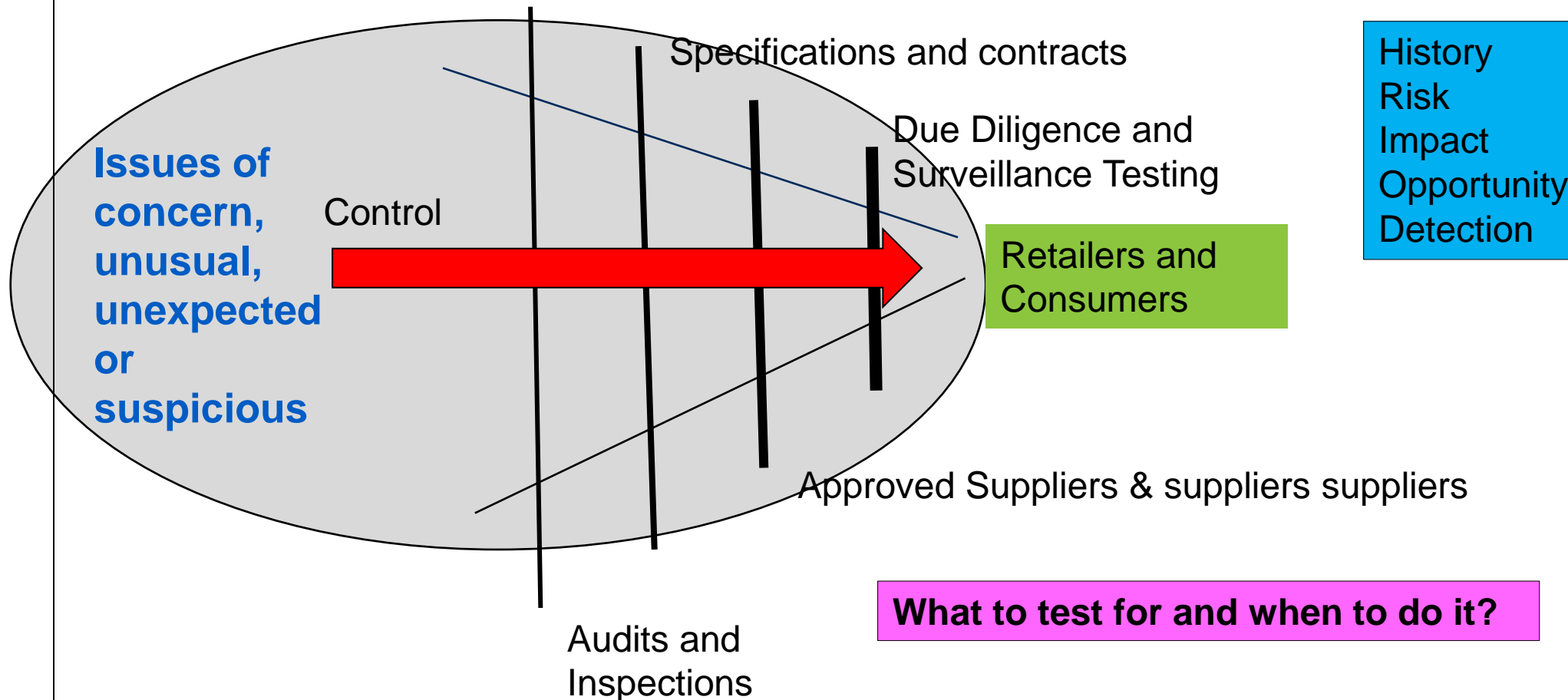
## Local sourcing vs global supply chain web





# How robust are your barriers?

## Local sourcing vs global supply chain web



# Recommendations, continued...

- A network of Trade Associations where member Food Business Operators (FBOs) can report and share information of concern, with the Trade Associations providing a consolidated output of key issues to the FSA
- Industry owned, independent non-public 'Safe Spaces' where FBOs can share unusual, unexpected or suspicious information in an anonymised way
- Partnerships for sharing intelligence between key FBO's and the FSA
- Mechanisms for the FSA to share strategic and tactical priorities for food safety and integrity together with synthesised intelligence 'products' that give direction to both enforcement and industry.



# Specifics:

Port Authority Officers, UK Border Force and APHA

**Support and Strengthen our Fist Line of Defence**

HorizonScan – (Country of Origin, Commodity, Manifest and Threat)

Fraud Representative at each Port, identify the Agents, flights, ships

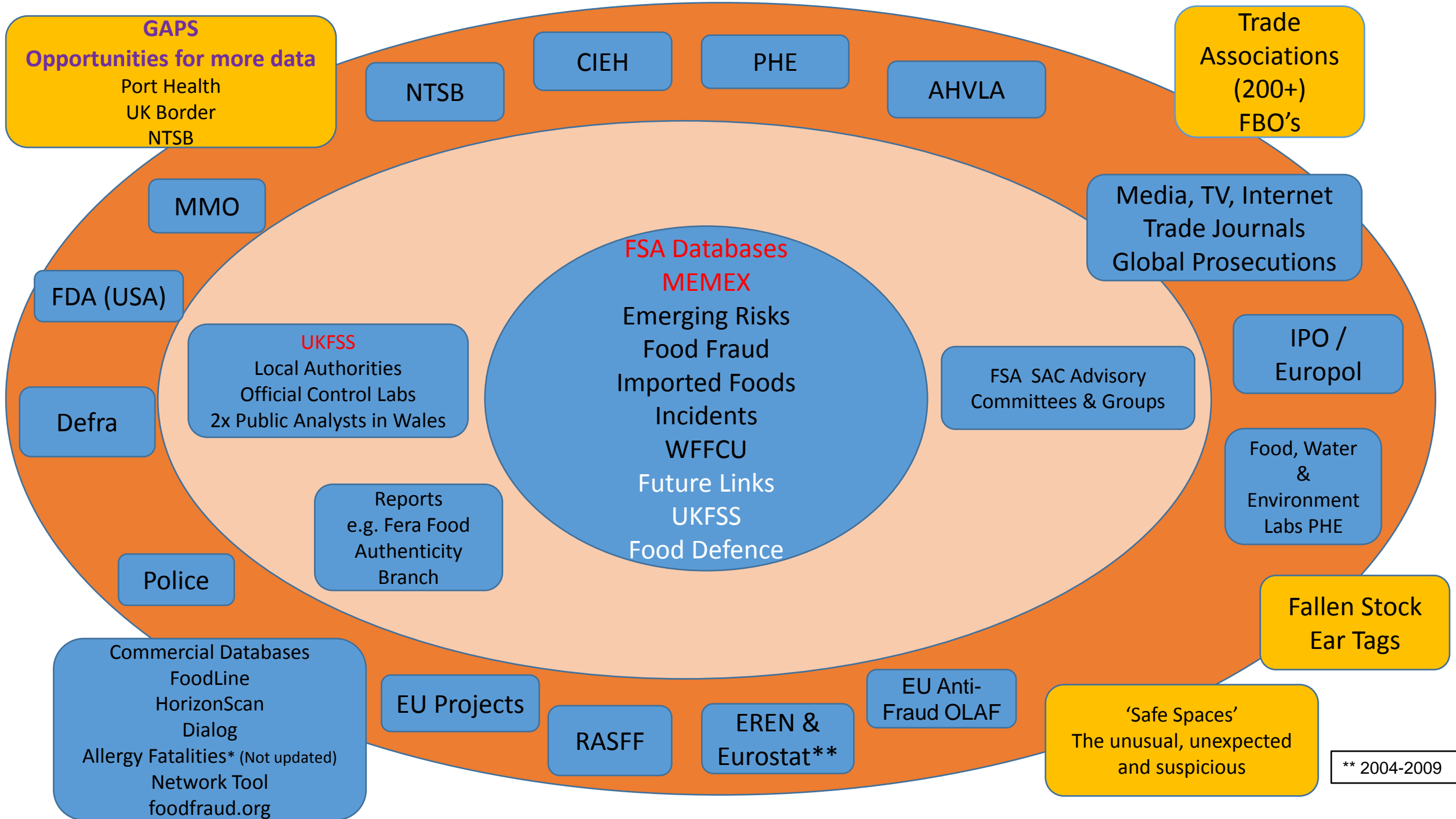
Build knowledge and enthusiasm with communication.

**'Join up the Ports'**

Challenge the 'least line of resistance' at all 24 Designated Points of Entry

Capture and Share the issues of concern

**Key Words: Strategic and Tactical Opportunities**



**GAPS**

**Opportunities for more data**

Port Health  
UK Border  
NTSB

NTSB

CIEH

PHE

AHVLA

Trade Associations  
(200+)  
FBO's

MMO

Media, TV, Internet  
Trade Journals  
Global Prosecutions

FDA (USA)

**FSA Databases  
MEMEX**

Emerging Risks  
Food Fraud  
Imported Foods  
Incidents  
WFFCU  
Future Links  
UKFSS  
Food Defence

**UKFSS**

Local Authorities  
Official Control Labs  
2x Public Analysts in Wales

FSA SAC Advisory  
Committees & Groups

IPO /  
Europol

Defra

Food, Water &  
Environment  
Labs PHE

Reports  
e.g. Fera Food  
Authenticity  
Branch

Police

Falling Stock  
Ear Tags

Commercial Databases  
FoodLine  
HorizonScan  
Dialog  
Allergy Fatalities\* (Not updated)  
Network Tool  
foodfraud.org

EU Projects

RASFF

EREN &  
Eurostat\*\*

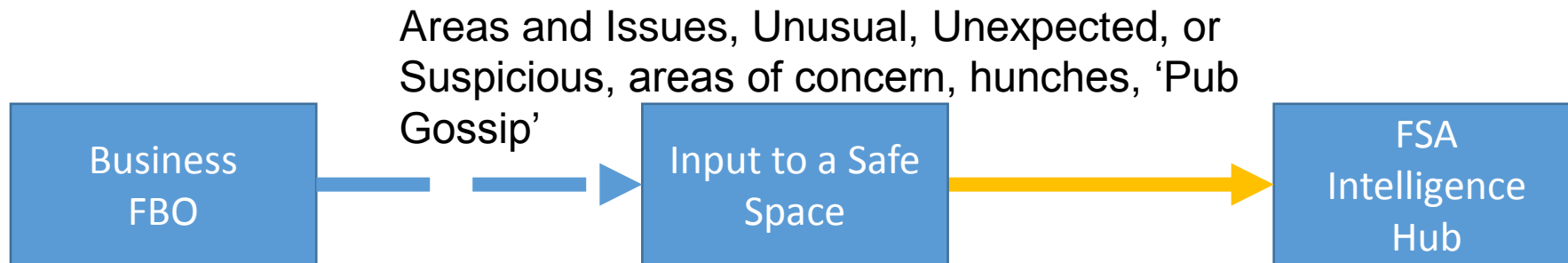
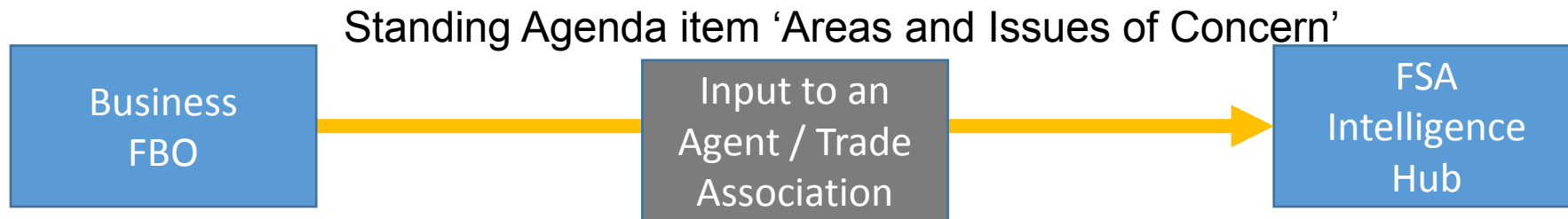
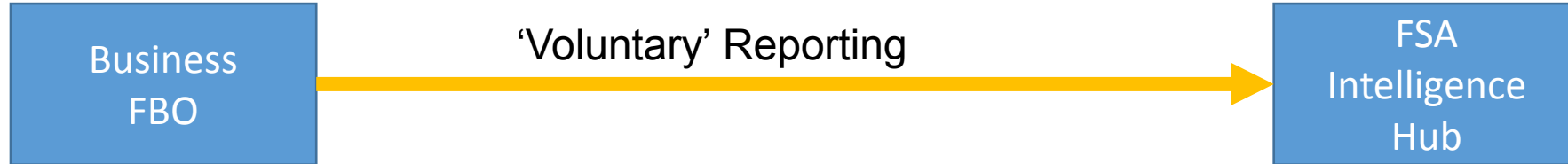
EU Anti-Fraud  
OLAF

'Safe Spaces'  
The unusual, unexpected  
and suspicious

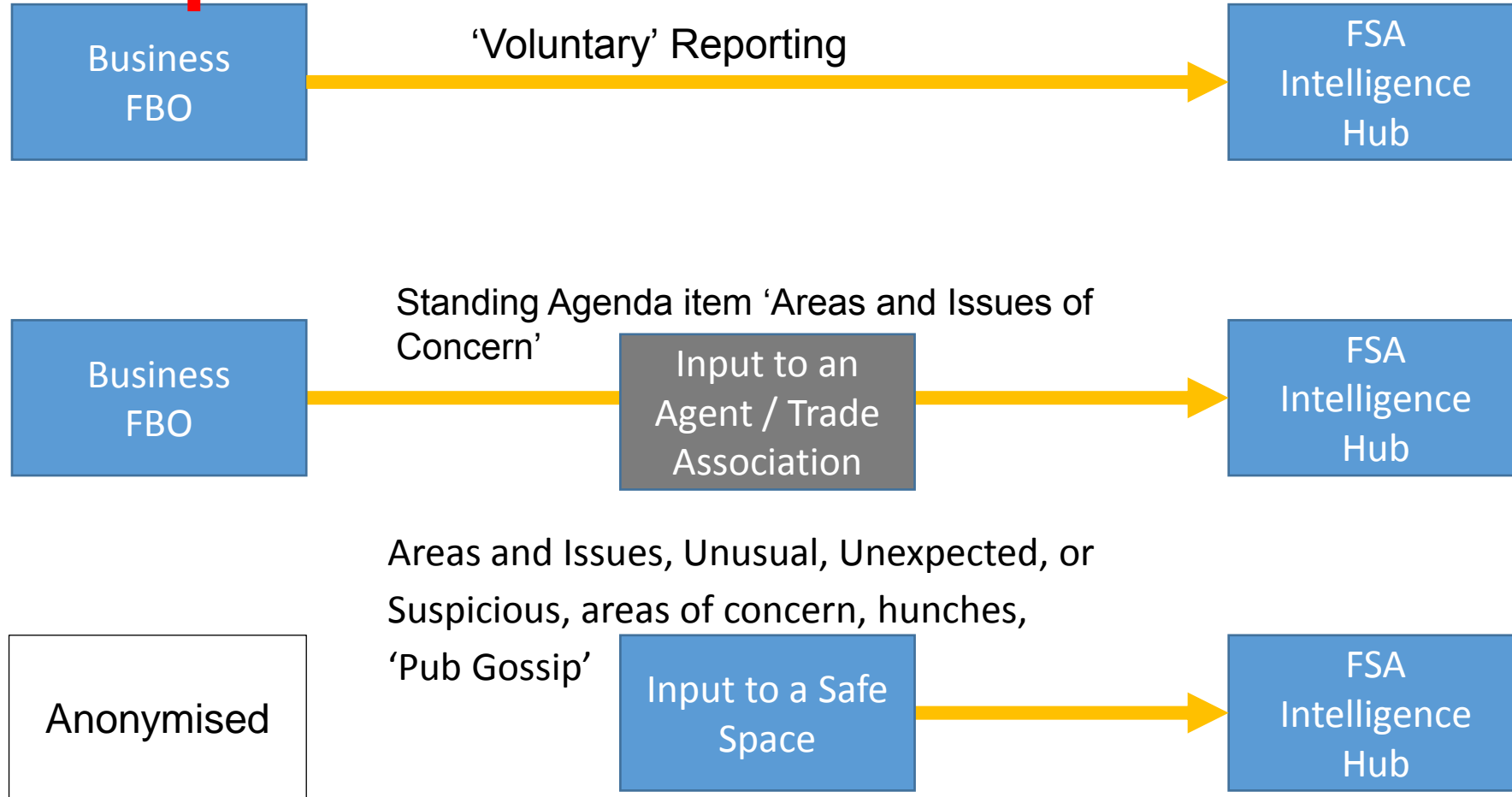
\*\* 2004-2009



# Safe Space - Unusual, unexpected and suspicious



# Safe Space - Unusual, Unexpected and Suspicious





This is 'historic'                      Yes [ ]                      No [ ]  
 Happening Now                      Yes [ ]                      No [ ]  
 Is likely to be an ongoing issue                      Yes [ ]                      No [ ]

I am suspicious about this [ ]  
 I have evidence to support this (witnessed or have seen test results) [ ]

I believe the adulterant or substitution to be

I believe the hazard to be

The product or product / produce affected is

I believe the origin of the product / produce to be

I am happy to be contacted about this [ ]

I do NOT wish to be contacted [ ]

**This is an example ONLY**



In a timely manner, such comments will be passed to an Intelligence Hub or Agent for further investigation. The 'source' will however always be protected.



Independently Funded  
 Industry Governance  
 Independent and  
 Authoritative  
 Non-public body  
 Not subject to the FOIA  
 Data considered as  
 'legally privileged'  
 Could be several  
 Access by 'whole food  
 chain'



# How could a 'Safe Space' Work

Relentless communication throughout the entire food chain will drive usage and awareness

What is it worth to a company to 'make the UK an uncomfortable place for food fraud'?

Do you want a proactive or reactive 'Safe Space'?

Think '  or **CRIMESTOPPERS**'



[safespace@stopfoodfraud.com](mailto:safespace@stopfoodfraud.com)

How much of the unusual, unexpected or suspicious is there to collect?





## Horizon Scan



## & Contaminants On-line



# Meat: Bovine and Fraud from HorizonScan

				permitted limit in wine
Canned foods	Greece	Fraud	25/04/2013	Actual weight of canned peaches 18% lower than the weight declared on the can
Frozen ready meals	The United States	Fraud	01/05/2013	Frozen pasta meals processed without benefit of inspection
Honey	Poland	Fraud	09/04/2013	Unauthorised additive sulphite caramel (E150d) detected in honey
Meat - bovine	Italy	Fraud	09/04/2013	adulteration (presence of horse DNA > 1 % and <20 %) of cooked beef meat from Greece, with raw material from Italy
Meat - bovine	United Kingdom	Fraud	05/04/2013	adulteration (presence of horse DNA: >1 %) of frozen diced beef steak from the United Kingdom
Meat - mixed or unspecified	The Czech Republic	Fraud	05/04/2013	Lower muscle content than legal limits in sliced meat
Meat - mixed or unspecified	France	Fraud	04/04/2013	adulteration (horse DNA: 99.8%) of frozen meat kebab from Greece, with raw material from Poland and France
Meat - mixed or unspecified	Poland	Fraud	04/04/2013	adulteration (horse DNA: 99.8%) of frozen meat kebab from Greece, with raw material from Poland and France
Meat - processed - sausages/salami	Lithuania	Fraud	11/04/2013	adulteration (horse DNA 9% %) of smoked sausage from Lithuania
Meat - processed - sausages/salami	Estonia	Fraud	10/04/2013	adulteration (detection of horse DNA 10 %) of parmesan smoked sausage from Estonia
Meat - processed - sausages/salami	Italy	Fraud	09/04/2013	adulteration (presence of horse DNA 10 - 25 %) of

.....recommendations are truly ground breaking in terms of the opportunities they offer us now.

They provide us with a roadmap of how we might make best use of the information available to us in a coordinated and constructive fashion. However, to be successful, we now need **buy in, and action.**

**Professor Tony Hines MBE, FIFST,**  
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