Food safety at Nestlé: combining foresight, vigilance and harmonised standards

John O'Brien

Head, Food Safety and Quality, Nestlé Research Centre

Disclaimer

This presentation contains forward looking statements which reflect Management's current views and estimates. The forward looking statements involve certain risks and uncertainties that could cause actual results to differ materially from those contained in the forward looking statements. Potential risks and uncertainties include such factors as general economic conditions, foreign exchange fluctuations, competitive product and pricing pressures and regulatory developments.

Agenda

- Food safety and quality is becoming more complex
- Our approach to food safety
- Foresight and early warning
- Quality by design
- Measuring performance


FOOD SAFETY
FOOD SAFETY AND QUALITY IS BECOMING MORE COMPLEX

Food safety & quality: current reality

- Global supply chains are driving complexity and the **ongoing need for harmonized regulations and standards**
- Increased attention to **public perception** and **risk advocacy** is driving precautionary actions
- **Emerging risk** landscape needs to be understood and managed (e.g. overlooked hazards in foods of non-animal origin)
- **Increased monitoring** of the food chain by all stakeholders
- Concerns about **adulteration** and **food fraud** are high on the agenda following the horsemeat scandal
- Error tolerances are shrinking and the **cost of mistakes increasing**

The speed and nature of communication in a food crisis is changing radically

Crisis	Dates	Number of social media postings
Irish Dioxin Crisis	December 2008	1,229
German Dioxin Crisis	2010/2011	26,680
German STEC Crisis	2011	100,491

Source: Mary Friel, EUFIC, EC FoodRisC Project

Things have changed!

Communication and consumer expectations on food safety and nutrition will get even more complex!

FOOD SAFETY

OUR APPROACH TO FOOD SAFETY

Food safety & quality is always the first priority

Nestlé quality policy

We make Nestlé trusted

Change of focus in past two decades

- Scientific / technical focus
- Product quality control
- Challenge to detect defects
- Reactive focus

- Consumer focus
- Quality management entire supply chain
- Challenge to interpret, understand, prevent
- Proactive focus using Early Warning System

Food safety management = multiple, parallel and consecutive safeguards

Supplier verification and audit

Prerequisites and GMP

Food safety management plans

Risk assessment

Analytical verification

Food safety & quality at Nestlé

2 Research centres
27 PTC and R&D centres
26 Nestlé Quality Assurance Centres
>460 Factories





We build competence for Nestlé and transfer proficient staff to other R&D units and to operations

Staff training and development is an integral part of the mission of the Nestlé Research Centre

The Nestlé quality assurance centres

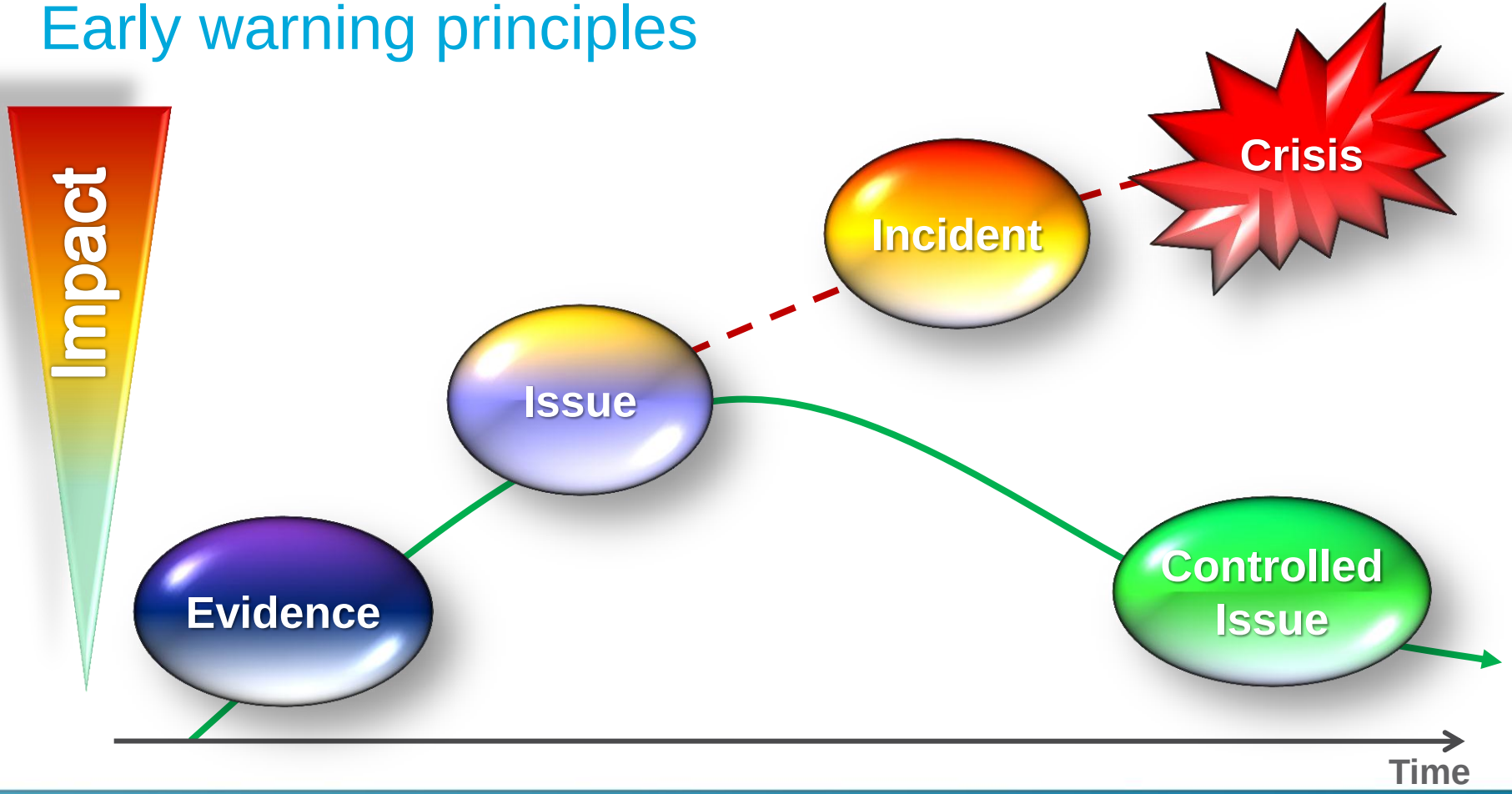
NQAC is a quality and food safety global operational unit, with clear line and functional responsibilities reporting to the corporate quality function.

25 state of the art laboratories
Accredited to ISO 17,075
Supporting all markets

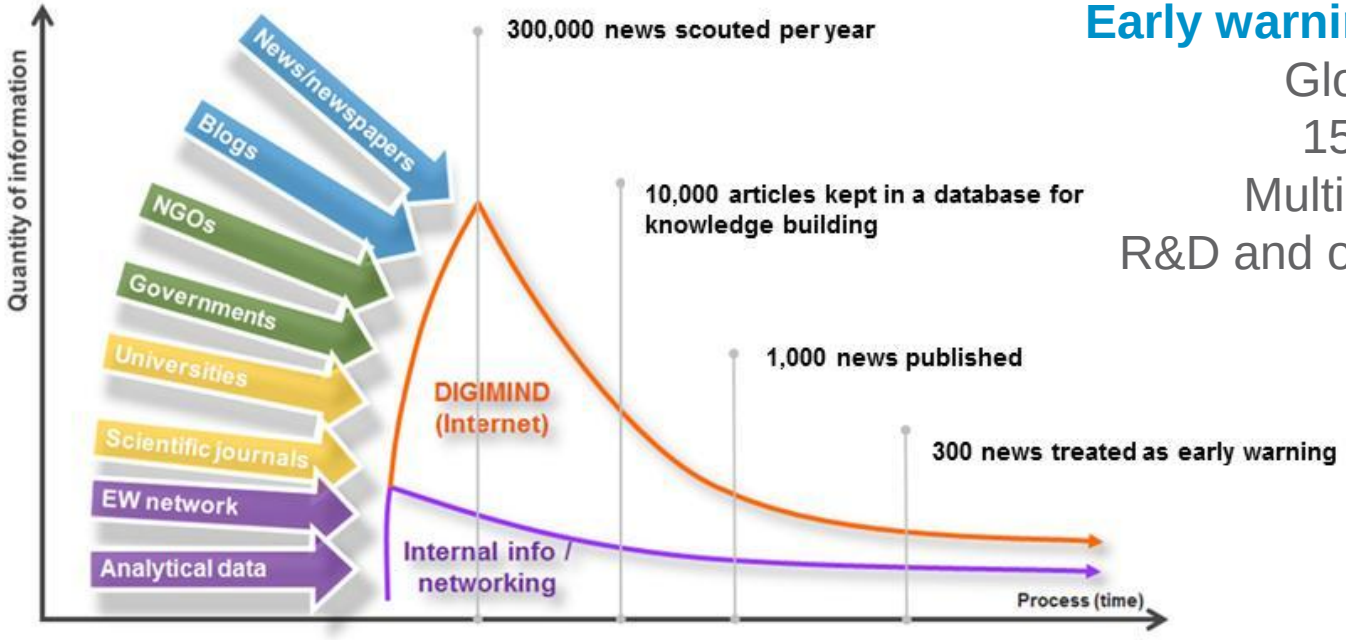
FOOD SAFETY

FORESIGHT AND EARLY WARNING

Early warning principles



Anticipating food safety issues and how we respond to them is critical: Early Warning System



Early warning expert network

Global reach

150 people

Multi-disciplinary

R&D and operations experts

EW = Early Warning

The analysis of a crisis (e.g. horse meat)

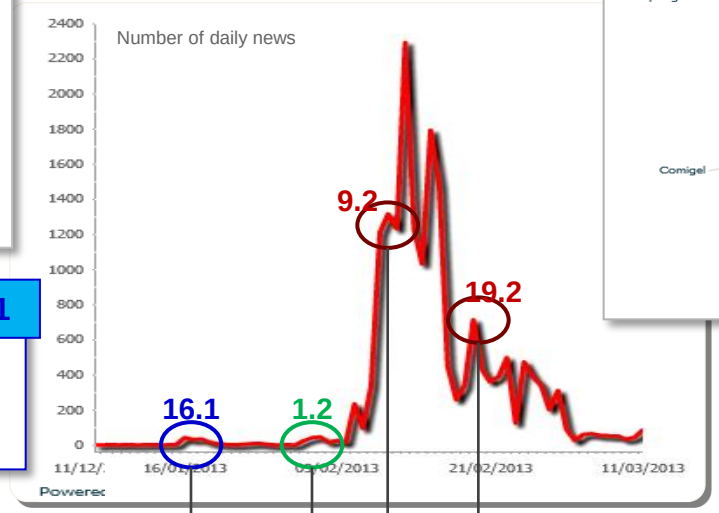
January 16, 2013

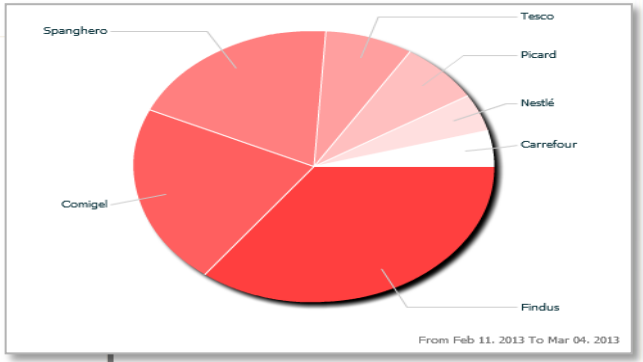
IRELAND: Horse DNA found in third of burger products surveyed

http://www.irishtimes.com/newspaper/breaking/2013/0115/breaking61.html

The presence of horse DNA has been found in more than one third of beef burger products tested in a study by the Food Safety Authority of Ireland. Pig DNA was found in 85 per cent of the beef burgers tested.

16.1





19.2.2013 Nestlé is touched

9.2.2013 : Issue sprays all over Europe, FINDUS concerned

1.2.2013 : Ireland, Burger King is touched

16.1.2013 : Ireland, 30% of burgers found contaminated with horse meat

Early warning works: two case studies

Signal	Action Taken	Results	Outcome
Evidence of use of leather tanning liquour as a source of cheap protein in a food company in China	Analytical Survey (2010) of markers of leather tanning (chromium hydroxyproline)	No evidence of adulteration of 12 different classes of raw materials (3000 samples)	European Authorities raised concerns in 2012 and analytical data were shared to ensure informed decision making
Concerns about the possible presence of pharmaceutical residues in water supplies (2008)	Global analytical survey of water supplies (public and private) (August 2009)	120,000 results, 640 analytical parameters including 43 pharmaceutical residues; Some pharma compounds could be detected at parts per trillion levels; Risk assessments gave no cause for concern	European authorities discuss significance of exposure to pharmaceuticals and personal care products through the food chain (2012). Analytical data were pooled and used to inform the discussion

FOOD SAFETY
QUALITY BY DESIGN

Addressing emerging risks: new food safety microbiology research facilities (2013)

- Inauguration of the **most up-to-date microbiology research facilities in the food industry**
- Goal: new research capability to **address emerging risks** especially in the areas of virology, STEC* organisms and molecular tools
- **Biosafety Level 2 and 3**
- 1000 m^2 total area
- CHF 5 million investment plus three years of planning and project execution

*Shiga toxin producing E. coli

Examples of current Nestlé R&D participation in external food standards organisations

Organisation	Activity	Objective
AOAC	Board, Scientific Committee, SPIFAN Working Group	Fit for purpose analytical standard methods, harmonization Various analytical methods for nutrients, chemical contaminants and pathogenic organisms
CODEX	CCMAS	Realistic sampling plans for product testing
	CMPR	Contribute to optimal management of pesticide residues in the food supply chain
	CCFH	Principles for the Establishment and Application of Microbiological Criteria for Foods
ICMSF	Board	Contribute to the development of microbiological food safety criteria for consumer protection
CEN	CEN TC275	Analytical Standard methods
	CEN TC/275 WG6	Implement standards for the analysis of foodborne pathogens and Genetically Modified Organisms
ISO	ISO TC34 Food Products	Statistics, method validation, proficiency testing, probiotics
IDF	Analytical Standard	Standard for melamine analysis

Safer food through new screening tools

Background: Nestlé is committed to removing bisphenol A from packaging material in contact with food due to consumer concerns and in compliance with new legislation in some countries (eg France) (~150 ongoing projects)

Challenge: to replace a technologically proven material with a novel packaging material

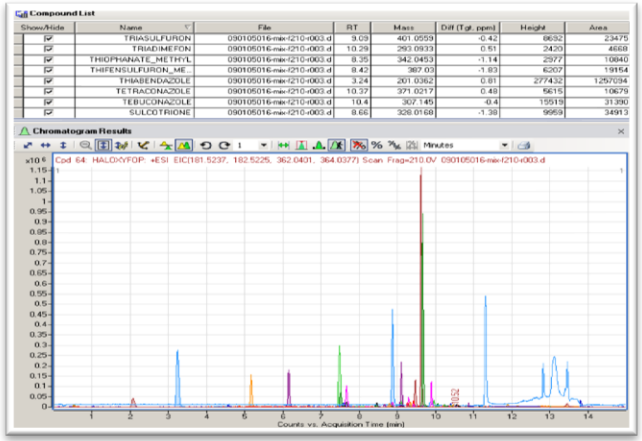
Solution: we apply a new approach to quality based on screening of a range of biological activities in alternative packaging materials

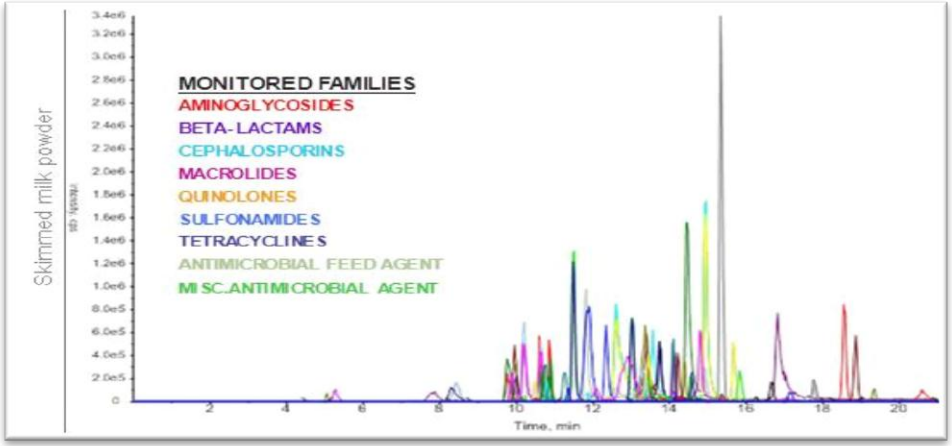
Next Steps: we will work proactively with regulators and external scientific organisations, such as ILSI, to achieve scientific consensus on the application of new tools for packaging safety. We will work with our packaging suppliers to ensure that all packaging materials are screened for the presence of oestrogenic activity.

Multi-Residue Screening: A solution to manage a complex chemical environment

TOF-MS

- **500** pesticides were screened by LC and GC-TOF
- In most cases, results were comparable with reference values produced by LC-MS/MS





TFC-MS/MS

- Analysis of 79 veterinary drug compounds belonging to 8 families of antibiotics
- Screening at MRL 4-10 mg/L for a large majority of analytes and 100-200 mg/L for aminoglycosides
- Applied to MSK and infant formula

A new analytical approach is being applied to detect milk adulteration quickly at factory level

Shuangcheng factory

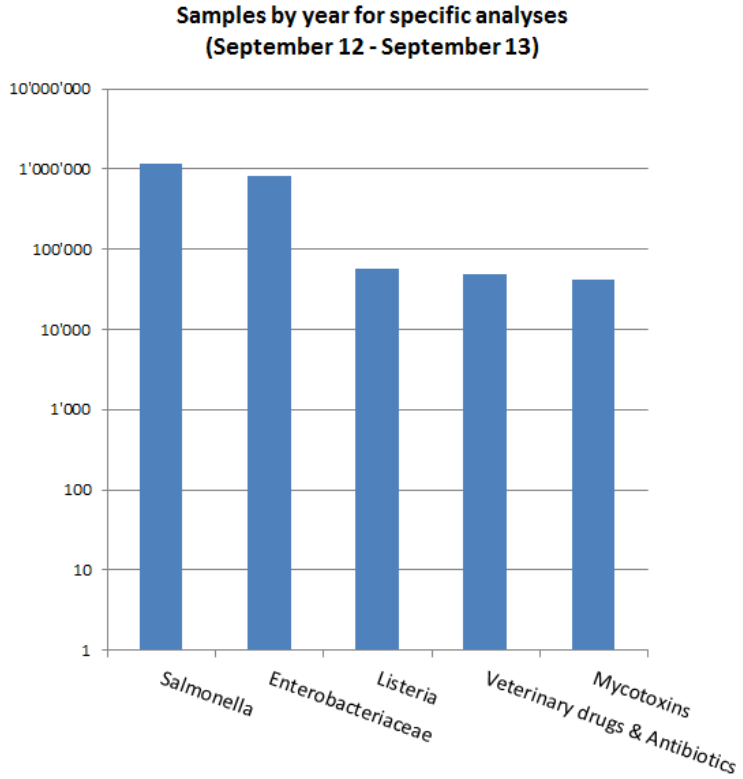
- > 10’000 farmers
- 81 milk collection centers
- 200 lorries/day
- 2000 milk analyses/day

On site factory:

- Infrared spectroscopy is being applied to develop a rapid chemical fingerprint for each milk sample
- This technique (FTIR) is already used in milk factories (compositional analyses, milk payroll)

FOOD SAFETY
MEASURING PERFORMANCE

Nestlé laboratories are an asset



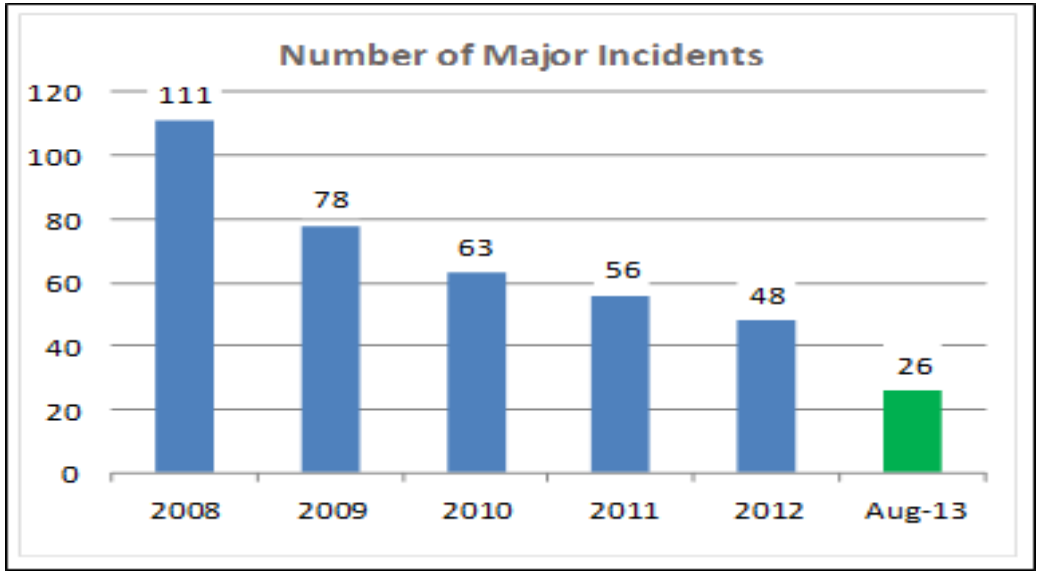
- 100 million tests are performed per year
- The test results underpin important food safety, quality and compliance decisions
- Many tests are complex; results require expert interpretation
- A recent report from the American Proficiency Institute highlighted the risk of inaccuracies of routine food analyses: **false negative rate for some food pathogens up to 10%**; a false positive rate between 2 and 4%

Nestlé laboratory standards and performance

How do we achieve confidence in laboratory data?

- Investment in people: **competent staff**
- **ISO Accreditation** (ISO 17,025)
- **Internal Proficiency tests**
- Expert **Audits**
- **750** Validated laboratory standards (laboratory instructions)
- Application of official methods, whenever possible, **validated for our matrices**
- Development of internationally harmonized standards **aligned with methods in use by the authorities**

Complaints, defects and incidents are addressed in activities at factory, regional and corporate level



- Aggressive push to decrease defects (1000+ projects)
- TPM Implementation ongoing
- Quality pyramid, tracking tools implemented

Summary

- Food safety and quality is becoming more complex
- We apply foresight and early warning tools to anticipate and ensure early management of emerging issues
- Quality by design: safety is integrated into the product development process
- Risk assessment tools permit us to develop ambitious new consumer offerings
- We continuously develop competence and appropriate standards, internally, and in partnership with external standard-setting organizations

Research in food safety is a passionate journey that will never end.

Consumer trust is and will be even more the driver of research in the area of food quality and safety.

Food safety at Nestlé: combining foresight, vigilance and harmonised standards

John O'Brien

Head, Food Safety and Quality, Nestlé Research Centre