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

<table>
<thead>
<tr>
<th>Crisis</th>
<th>Dates</th>
<th>Number of social media postings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irish Dioxin Crisis</td>
<td>December 2008</td>
<td>1,229</td>
</tr>
<tr>
<td>German Dioxin Crisis</td>
<td>2010/2011</td>
<td>26,680</td>
</tr>
<tr>
<td>German STEC Crisis</td>
<td>2011</td>
<td>100,491</td>
</tr>
</tbody>
</table>

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

Corporate Business Principle 2
Quality Assurance
and Product Safety

We make Nestlé trusted
...by never compromising on the safety and quality of our products so that our consumers can enjoy them with eyes closed.
We make Nestlé trusted

Nestlé quality policy

QUALITY
PREFERENCE & CONSISTENCY
Consumer confidence and satisfaction in all our brands, products and services

ZERO-DEFECT,
NO WASTE ATTITUDE
We always strive for excellence and no waste in everything we do

FOOD SAFETY
& FULL COMPLIANCE
We never compromise on food safety and always comply with all applicable regulatory requirements

EVERYBODY’S
COMMITMENT
Quality is a Group-wide objective
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.

More than 950 people, including 30 group and regional experts and V&A Managers

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

300,000 news scouted per year
10,000 articles kept in a database for knowledge building
1,000 news published
300 news treated as early warning

EW = Early Warning
The analysis of a crisis (e.g. horse meat)

IRLAND: Horse DNA found in third of burger products surveyed
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 65 per cent of the beef burgers tested.

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

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

<table>
<thead>
<tr>
<th>Signal</th>
<th>Action Taken</th>
<th>Results</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence of use of leather tanning liquor as a source of cheap protein in a food company in China</td>
<td>Analytical Survey (2010) of markers of leather tanning (chromium hydroxyproline)</td>
<td>No evidence of adulteration of 12 different classes of raw materials (3000 samples)</td>
<td>European Authorities raised concerns in 2012 and analytical data were shared to ensure informed decision making</td>
</tr>
<tr>
<td>Concerns about the possible presence of pharmaceutical residues in water supplies (2008)</td>
<td>Global analytical survey of water supplies (public and private) (August 2009)</td>
<td>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</td>
<td>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</td>
</tr>
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</table>
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 m² 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

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