THE IDENTIFICATION OF FUTURE FOOD RISKS

Report by Alison Gleadle, Director, Food Safety

1. SUMMARY

1.1. Early identification of food safety risks is fundamental to the effective management and implementation of timely, proportionate and decisive corrective or preventative actions. To achieve this, it is essential to have an in-depth understanding of the strengths and weaknesses within the ever growing and complex web of global food chains that exists today.

1.2. The FSA’s Emerging Risk programme aims to provide a co-ordinated approach to the collation and analysis of intelligence relating to food safety. The programme will provide a clearer picture of when, why and how food safety issues develop. The analyses will be used to predict new and re-emerging risks to food safety and to build knowledge of new technologies and novel foods.

1.3. The Board is invited to note and discuss the following paper outlining the principles and practices underpinning the Emerging Risks programme of work.

2. INTRODUCTION

2.1. An independent review of the contamination incident involving Sudan 1 in 2005 expressed the view that:

“a vital tool in preventing future incidents is adequate horizon scanning and early warning activities involving all stakeholders. We recommend that these activities should be more intensive and far reaching and that the FSA should take a central role in ensuring more co-ordinated attention to intelligence gathering and horizon scanning and implementing early warning systems as well as proactively sharing this information with the food industry. The food industry should seek ways to share information based on its ingredient sourcing practices and experience of hazards”.

2.2. Key learnings from the Agency’s Incident Prevention Strategy (2005 to 2010) were that the Agency needed to develop an emerging risks programme encompassing data gathering, intelligence assessment and improved networking with stakeholders. The use of statistical analysis and “intelligent software” would then be used to identify new or re-emerging risks within our global food web.
2.3. The FSA’s General Advisory Committee on Science (GACS) has also stressed the importance of continuing to address strategic, cross-cutting and longer-term evidence needs. The need for collaboration with industry and other stakeholders, including European partners, has been particularly highlighted.

2.4. As a result of these recommendations and based upon the Agency’s established incident management and horizon scanning procedures, the programme is developing and implementing methodology for the identification of new and re-emerging risks.

2.5. The Emerging Risks programme commenced in April of this year and is planned to run for the period of five years to 2015. A bespoke internal working group has been established and initial pilot studies conducted. We are engaging with both policy and enforcement colleagues at the Agency in addition to our External Incident Prevention Board (EIPB) in order to assess our initial findings and identify future needs. Currently, we are in the process of establishing formal Governance for the programme.

3. STRATEGIC AIMS

3.1. The Emerging Risks programme supports Outcome One of the Agency’s current Strategic Plan namely “Food produced or sold in the UK is safe to eat” and specifically aims to deliver the associated main priority to:

   “increase horizon scanning and improve forensic knowledge, and intelligence on, global food chains to identify and reduce the impact of new and re-emerging risks – particularly around chemical contamination”.

3.2. The programme will also contribute to activities under Outcome Two (“Imported food is safe to eat”) supporting the main priority to:

   “ensure risk-based, targeted checks at ports and local authority monitoring of imports throughout the food chain”

3.2. Additionally, the programme supports Evidence Theme 6 of the Agency’s Science & Evidence Strategy entitled “Strategic and cross-cutting evidence and analysis”.

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4. DISCUSSION

Intelligence Acquisition

4.1. Core intelligence for the Emerging Risks programme is being derived from historical incident data, research and surveillance programmes as well as intelligence drawn from stakeholder networking activities. Such knowledge is of known origin and limitation.

4.2. In addition to core intelligence, there are a large number of sources of other data available for scrutiny. Examples include RASFF data, FDA recall data and WHO information. These sources have been assessed to understand their origins, limitations and credibility. The knowledge attained will be used to inform the ongoing programme. We are working with industry and Local Authority colleagues to develop a methodology for “root cause” analysis to ensure that the reasons for any breakdown in food safety are fully understood. It is intended that this methodology will be rolled out to Industry and Local Authorities.
4.3. In addition to existing stakeholder networking activities, a comprehensive programme of targeted stakeholder engagement is being developed at local, national and international levels. This additional communications network will also provide further opportunities for intelligence gathering through collaborative working with industry, enforcement authorities and international partners including EFSA. This will lead to improved information and intelligence sharing with industry and third countries particularly with respect to imported foods.

Detection of Emerging Risks

4.4. We are working with Agency statisticians to develop analysis methodology and are starting to use specialist “intelligent” software (Memex patriarch) to identify emerging food safety issues. The Agency’s existing incident classification system and the National Intelligence Model’s credibility matrix are then being used to rank potential risks. Electronic linkages will be installed between Memex patriarch and the FSA’s Incident Response and UK FSS databases to improve data collection, transfer and analysis.

4.5. The programme will identify specific global food supply chains for review and, using risk assessment techniques such as HACCP, determine food safety issues and areas of potential weakness. In addition, and as part of the programme of targeted stakeholder engagement, a series of forums is being established to provide an Industry-wide view of global chains and risks that might warrant further investigation. This will enable recommendations to be made for surveillance programmes that target areas of safety risk within our global food web.

4.6. An internal Emerging Risks Evaluation Board (EREB) will be established to consider and filter new and re-emerging issues identified by the programme. This will ensure that effective and proportionate risk management activities, particularly those based around incident prevention, are identified as well as minimising the risk of “setting hares running” unnecessarily.

4.7. Where gaps in our knowledge of food safety are identified, additional targeted research, surveillance and networking is being undertaken with the outputs fed back into the Emerging Risks programme.

Horizon Scanning

4.8. The Agency’s Science & Evidence Strategy sets out the science, evidence and analysis needed to underpin and support delivery of the existing Agency Strategic Plan and inform development of future strategy beyond 2015. Horizon scanning is used to identify, analyse and prioritise global cross-cutting and longer-term issues and their impact upon food safety. Working with the
Agency’s social science team, the programme underpins research and evidence by providing advice on methodology and the review of in-house work.

4.9. As we develop our understanding of safety risks across the global food web, impact assessments of initiatives, such as the introduction of proposed regulations or new technologies, will identify potential future scenarios for consideration.

4.10. Sensitivity analyses such as “FORESIGHT”, the FSA’s chosen scenario assessment programme, are already being used to assess risk resulting from longer-term movements in key global drivers such as climate change or economic recession.

4.11. Outputs from these horizon scanning activities and scenario predictions will be applied as intelligence to inform the Emerging Risks programme.

**New Technologies**

4.12. Our global food web continues to expand due to the emergence of new technologies based on novel foods and processes. Examples include genetically modified foods and animal cloning. Although generally welcomed, each of the technologies may have the potential to introduce new safety risks into our food web or trigger emotive responses from the Agency’s stakeholders. Hence there is a need for the Agency to be able to react in a timely, considered and decisive manner to new Technological needs and advancements.

4.13. New technologies and novel foods are already being identified using expert judgement, FSA scientific advisory committees, stakeholder engagement, current affairs literature and other relevant sources. Input from the Agency’s Science Advisory Committee (SACS), specifically the Advisory Committee on Novel Food Processes (ACNFP) is providing specialist knowledge and recommendations relating to the approval of novel foods and new technologies.

4.14. Intelligence surrounding specific technologies will be used to inform the Emerging Risks programme so that targeted research, surveillance and stakeholder engagement programmes can be planned as with other global food chains.

**New Risks**

4.15. The detection of new food safety risks hitherto unrealised have been responsible for a number of the larger and more challenging incidents
experienced by the Agency. Examples include contamination incidents involving Sudan 1 in 2005 and Melamine in 2008.

4.16. The detection of such new risks will be driven by global chain analysis of foods and processes using horizon scanning and gap analysis to identify previously unrealised areas of concern. Additionally, stakeholder networking including the assessment of “hot” intelligence such as “whistle-blower” information will also play a role in detecting new safety risks.

4.17. Specifically, the potential for economically motivated food safety risks arising from, for example, fraudulent practices, will be assessed as each global chain is investigated. This will enable the implementation of early and targeted corrective or preventative actions.

Projects

4.18. Further to the recent pilot study, the Agency is working with Industry to progress the following themes:-

- Development of “root cause” analysis methodology
- Assessment of the “global food web” for potential new and re-emerging Risks
- Identification of “economically motivated” risks to food safety
- “Targeted stakeholder engagement” for the detection of emerging risks and the identification of appropriate incident prevention activities
- Development and implementation of the “National Intelligence Model”
- Development of appropriate “information technology” systems for data acquisition, storage and intelligence evaluation.

5. RISKS TO DELIVERY

Potential risks to the successful delivery of the Emerging Risks programme include:

- difficulty in engaging effectively with industry and other key stakeholders
- failure to identify the “unknown, unknowns” and the corresponding risk to the Agency’s reputation
- the risk of “setting hares running” unnecessarily
6. IMPACT

6.1. A programme of work is underway to establish principles and practices for using food safety intelligence from many sources to inform risk based and intelligence led policy development and enforcement. This programme of activity is key to delivering the strategic outcome that food produced or sold in the UK is safe to eat.

7. RESOURCE IMPLICATIONS

7.1. As a strategic priority, appropriate resources are being allocated to this programme and will continue to be.

8. CONCLUSION & RECOMMENDATIONS

8.1. This paper is intended to provide an overview of the principles and practices being established by the FSA for the identification of future food safety risks.

8.2. The Board is invited to note and discuss the information in this paper which outlines the Emerging Risks programme of work and its progress to date.

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GLOSSARY

a) **EFSA**
The European Food Safety Authority (EFSA) is the keystone of European Union (EU) risk assessment regarding food and feed safety. In close collaboration with national authorities and in open consultation with its stakeholders, EFSA provides independent scientific advice and clear communication on existing and emerging risks.

b) **EIPB**
The External Incident Prevention Board (EIPB) is a high level peer group for the FSA comprising representatives from Industry and Enforcement.

c) **Emerging Risk**
A new or developing food safety issue which, based on the intelligence available, gives rise to concern about actual or suspected threats to the safety or quality of food that may require intervention to protect the consumer’s interests.

d) **FDA**
The Food and Drug Administration (FDA) is an agency of the United States Department of Health and Human Services responsible for protecting and promoting public health through the regulation and supervision of food safety, tobacco products and dietary supplements amongst other commodities.

e) **Global Food Supply Chain**
A worldwide sequence of events and processes which is required to produce a specified food product from its component parts. It can be best characterised using the phrase “from farm to fork”

f) **Global Food Web**
The complex inter-relationships between a series of global food supply chains

g) **HACCP**
Hazard Analysis Critical Control Points (HACCP) is a risk management tool recognized internationally for use in the proactive management of food safety issues. It is used in the food industry to identify potential food safety hazards, so that key actions can be taken to reduce or eliminate the risk of the hazards being realised.

h) **Horizon Scanning**
The systematic examination of global risks, threats, opportunities and likely future developments which may impact upon food safety and are at the margins of
current thinking and planning. Examples include political, economic, social/cultural, technological, legal and environmental drivers.

i) **Hot Intelligence**
   Intelligence of topical concern relating to food safety issues of interest to the Agency’s Emerging Risks programme.

j) **Incident Prevention Strategy**
   A programme of activity aimed at developing effective interventions to reduce the number of incidents by tackling food safety problems at source. With the emphasis based strongly upon partnership working, there were three key themes to this strategy, namely,
   
   - intelligence gathering and horizon scanning
   - building trust and partnerships
   - better science, better regulation

k) **Intelligence**
   Data or information which is targeted, relevant, measurable and specific to a particular subject

l) **Intelligent Software**
   Based upon the National Intelligence Model, specialist “intelligent software” (Memex patriarch) will store and process large quantities of intelligence from differing sources and formats including free text. By identifying linkages between items of related intelligence, it will identify potential new and re-emerging risks and threats to food safety. The software is currently used successfully by the Agency’s food fraud team.

m) **National Intelligence Model**
   The National Intelligence Model (NIM) is an intelligence led Business Model, utilised by Police Forces in the UK to gather and manage information in order to make the most effective decisions. It is a three stage process, namely:-

   - The development and analysis of information/intelligence to enable a deeper understanding of issues and their priorities
   - Effective decision-making guided by the identified priorities. Resources and information gathering activities are coordinated and tasked to the areas which pose the most significant risk or threat
   - The outcome of each tasked activity is evaluated and fed back into the system, which continually develops existing intelligence, increasing the capability to tackle problem areas
The model assesses the credibility of each piece of intelligence using a “5 x 5” matrix which evaluates the source, quality and the sensitivity of each input

n) RASSF
Managed by the European Commission, the Rapid Alert System for Food and Feed (RASFF) provides intelligence relating to food and feed safety risks throughout European Member States.

o) Root Cause Analysis
A technique commonly used in accident investigation to identify the initiating step of a causal chain which leads to an outcome or effect of interest

p) Sensitivity Analysis
A range of techniques for systematically changing key parameters in a model in order to determine the effects of such change as a means of prediction

q) UKFSS Database
UK Food Surveillance System (UKFSS) is a central database that holds data on UK food and feed sampling carried out by LAs and Port Health Authorities as part of their official controls to ensure Food business are compliant with feed and food law. It allows early identification of food/feed hazards and trends.

r) “Unknown unknowns”
Future circumstances, events or outcomes that are impossible to predict, plan for, or even to know where or when to look for them

s) ‘Whistle blower’
A person who provides intelligence relating to potential food safety risks or threats usually on a confidential basis

t) WHO
The World Health Organisation (WHO) is the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends.