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Industry Spotlight: Recalls: a review

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This article features otherwise unpublished food safety management data held by BRCGS and Safefood 360° which, combined with real-time events, provides an unparalleled view of current and emerging issues and trends in the food safety industry.

It is important to reflect on the recent past to help shape our assurance programmes in the future. This article looks back at food recalls and major incidents over the last 18 months, with a particular focus on 2023, to examine some of the key hazards and food types causing these issues together with associated trends.

The last 18 months has seen a period of continued pressure in the supply chain that has resulted in significant availability challenges and price inflation in the entire food system, with some easing of this in recent months. External drivers of this nature impact the risk in the supply chain. It can result in actions that introduce new hazards, or increase exposure to existing ones, as ingredient sources change in an effort to maintain continuity of product supply or management of cost. Efforts to drive operational efficiency in farming, manufacture and retail directly impact food quality and safety management and, if not done with risk assessment at its core, can lead to increased vulnerability to adverse consequences. And, if these weren't sufficient challenges, the global supply chain is also starting to see the impact of climate change in relation to both availability and the quality/safety of commodities.

Major Incidents 2023 to June 2024

Microbiological issues have dominated the major food safety incidents over the last 18 months with Listeria monocytogenes, Salmonella spp. and Shiga toxin-producing E. coli (STEC) featuring in a number of outbreaks and recall events.

In the USA, advisories are issued by the US Food and Drug Administration for "an outbreak investigation that has resulted in specific, actionable steps for consumers to take to protect themselves".

So far in 2024 there have been advisories issued for **Salmonella spp.** in cucumbers and organic basil, the former due to a reported 449 cases in 31 states and the latter affecting 36 individuals. Salmonella spp. prompted 4 advisories in 2023 including cantaloupe melons (407 illness, 6 deaths), diced onions (80 illnesses, 1 death), raw cookie dough (26 illnesses) and wheat flour (14 illnesses). The cantaloupe melon outbreak prompted widespread product recalls across multiple businesses (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20). Cantaloupe melons were also implicated in a large salmonellosis outbreak in the UK and Portugal (98 illnesses).

The UK also issued an alert to consumers for poultry products imported from Poland due to increased cases of salmonellosis. Salmonella spp. continue to present as significant hazards to a wide range of raw materials and finished products principally due to contamination with animal or human faecal matter at some point in the supply chain. Consequently, foods that receive little or no further processing as part of their manufacture including fresh fruit and vegetables, herbs and spices and a wide range of animal derived products e.g. milk, cheese, shellfish, eggs, meat and poultry are all vulnerable to spreading the organism.

Listeria monocytogenes outbreaks in 2023 and 2024 prompted advisories in the soft, fresh cheeses Queso Fresco and Cotiga (23 illnesses, 2 deaths). This resulted in the recall of 117 products, fresh whole peaches, plums and nectarines (11 illnesses, 1 death) and ice cream (2 illnesses). In the UK, outbreaks and/or an increased risk of listeriosis resulted in alerts for a semi-soft cheese and smoked fish.

One of the most common foods implicated in alerts issued in recent years due to incidents, outbreaks or the presence of Listeria monocytogenes is enoki mushrooms (1, 2, 3, 4, 5, 6, 7, 8) and detailed risk statements have been issued by regulators in some countries (UK, USA, Australia).

STEC outbreaks resulted in alerts in the UK on leafy greens (288 illnesses, 2 deaths; STEC O145) that included widespread recalls of sandwiches, salads and wraps together with raw milk Lancashire cheese (36 illnesses; STEC O145). In the USA, advisories were issued for organic walnuts (13 illnesses: STEC O157) and raw milk cheddar cheese (11 illnesses: STEC O157). In the context of leafy greens, widespread outbreaks in the USA led to the development of a Leafy Greens STEC Action Plan published by the USFDA that contains a detailed overview of the issue and comprehensive mitigation plan.

Other micro-organisms making the headlines in the last 18 months included Clostridium botulinum due to the high profile outbreak at the rugby world cup where 15 people suffered botulism following the consumption of sardines from a restaurant in Bordeaux. Botulism incidents and outbreaks frequently occur due to home-produce fish, meat and vegetables and a recent outbreak in Germany implicating pickled mushrooms from Russia serves to reinforce the associated risks. The National Centre for Home Food Preservation in the USA provides an invaluable resource on safe preservation techniques. A hepatitis A outbreak prompted an advisory in the USA for frozen strawberries (10 illnesses).

Future articles will go into more depth on emerging and re-emerging microbiological hazards and their controls and so watch this space.

Chemical contaminants have also caused a number of major incidents in food prompting a number of alerts. The US FDA issued an advisory for chocolate bars, cones and gummies due to acute illnesses in 58 people, including 30 hospitalisations. The products reportedly contained psychoactive substances derived from mushrooms such as muscimol.

A similar alert was issued in the UK due to multiple cases of illness after consuming chocolate reportedly contaminated with the drugs Psilocin and THC, found in cannabis. Mushrooms themselves were the cause of an advisory following the report of 51 illnesses and 2 deaths in individuals consuming raw/undercooked Morel mushrooms at a restaurant in the USA. Morels contain natural toxins including hydrazine that require cooking to reduce to safe levels.

The presence of elevated levels of lead in the blood samples of a number of children in the USA resulted in an advisory on cinnamon-containing apple puree and apple sauce products that were implicated as a potential cause affecting 519 individuals. An unusual alert was issued in the UK due to reported adverse effects in children following the consumption of slush-ice drinks resulting in excessive intake of glycerol. Potentially lethal levels of caffeine in a protein powder also resulted in a UK alert.

Food recalls 2023

Product recalls are issued to protect consumers from potential exposure to hazards. In some cases this may be due to known illness or injury as is the case in many of the major incidents reported above. However, many are not associated with any known illness or injury but as a result of a known presence of a hazard that may cause such an adverse event.

To provide a global outlook, the databases in four different countries have been reviewed, covering the UK, USA, Australia and Germany. In order to compare the datasets, the products were assigned to categories which may differ from those specified in the country specific dataset. The data was accessed in June 2024 and these databases are regularly updated with records changed or removed. Multiple entries of products are included in the review.

Table 1. Recalls by country 2023 (Brackets indicates 2022 value)

	Australia Source: FSANZ	Germany Source: BVL	United Kingdom Source: FSA	United States Source: FDA and USDA
Most frequent reason for recall	Allergen (allergen)	Chemical (chemical)	Allergen (allergen)	Allergen (allergen)
Top allergen	Milk	Milk	Milk	Milk
Top micro-organism	*L. monocytogenes* (*L. monocytogenes*)	*Salmonella* spp. (*Salmonella* spp.)	*L. monocytogenes* (*Salmonella* spp.)	*L. monocytogenes* (*L. monocytogenes*)
Top food group	Dairy (Nuts, seeds, dried fruit and ambient snacks)	Nuts, seeds, dried fruit and ambient snacks (Nuts, seeds, dried fruit and ambient snacks)	Prepared foods incl. ready meals, pasta, noodles and pies (Prepared foods incl. ready meals, pasta, noodles and pies)	Meat and poultry (Prepared foods incl. ready meals, pasta, noodles and pies)

Data from the USA, UK, Australia and Germany in Table 1 show how consistent the issues are across different years and also the similarities between countries. Some differences in recall data is affected by the regulatory emphasis on specific hazards in their production systems. This is most obvious from the German data where recalls due to chemical non-conformance dominates. German surveillance programmes focus heavily on chemicals whereas allergens are the biggest driver of recalls in the other three countries reviewed.

Listeria monocytogenes is the top cause of **microbiological recalls** in the USA, UK and Australia - nearly double that of the next highest microbial pathogen Salmonella spp. In the USA, this can partly be explained by the zero-tolerance policy for L. monocytogenes. Of the USA recalls due to L. monocytogenes, nearly 40% were in fruit and vegetable products with the main foods including soya bean sprouts, enoki mushrooms and prepared salads.

Fruit and vegetables were also the main food group driving recalls due to contamination with Salmonella spp. with the vast majority being due to cantaloupe. In the UK, the majority of recalls due to L. monocytogenes were for dairy products where cheeses predominated and, although cheeses featured in recalls due to contamination with Salmonella spp., these were mostly driven by meat and poultry products.

The Australian recalls due to L. monocytogenes were almost exclusively due to its presence in enoki mushrooms with soft cheese being the only other food implicated and, of the small number of recalls due to Salmonella spp., sprouted seeds (soya bean and alfalfa) were the main drivers. Foodborne pathogen recalls in Germany were dominated by Salmonella spp., (approximately 75%), with nearly half of these being as a result of contamination of tahini-based products such as halva.

Across all four countries, the STEC recalls were predominantly caused by products of animal origin (ground beef, venison, cheese, milk, yogurt, cream) although its presence in an organic frozen herb mix was one unusual source reported in the German data.

Undeclared **allergens** were the biggest cause of product recall events in 2023 in the USA, UK and Australia but came only fourth in Germany, behind chemical, microbiological and physical contamination. In all four countries, the top single allergen was milk, highlighting the likelihood of a common fundamental problem with the management of this allergen.

The vast majority of allergen recalls were due to the misdeclaration of the allergen and, although the root cause was not generally specified, in general, this pointed to simple labelling errors with mispacking of product being an occasional reason. Interestingly, the undeclared presence of sulphites was vying for top spot in the German allergen recall data, which again highlights the increased focus on chemical contamination in the German regulatory and enforcement framework.

There were no single food groups that dominated the allergen recalls although the majority were broadly ambient, dry and bakery goods. There is plenty of useful guidance on managing allergens available from BRCGS, regulators (UK, New Zealand) and industry (Campden BRI, Australian Food and Grocery Council) to help manage this all too common cause of product recalls.

An often-forgotten hazard that causes a large number of recalls each year is due to the **physical** contamination of products. Here, the risk is generally one of injury rather than illness. Physical contamination includes obvious issues such as the presence of glass, metal, plastic, etc. but may also include choking hazards due to container explosion resulting from excessive carbonation or fermentation

The UK had the highest percentage of recalls due to physical hazards (approximately 22%) followed by Germany, Australia and the USA (approximately 6%). Plastic was the biggest cause of physical recalls in the UK and USA, with metal being the biggest driver in Australia and glass in Germany. No specific food group predominated in the recall data for physical contamination.

Chemical contamination was the biggest percentage driver of recalls in Germany - 10 times higher than the USA, UK and Australia, where it was the lowest cause of recalls. The underlying driver for this has already been indicated insofar as the regulatory and enforcement framework focusses in these areas. The reasons for the chemical recalls were dominated by the detection of chemicals above the legal limit such as pesticide exceedances, mycotoxins, etc. or the presence of an illegal chemical. Chemical recalls from other countries fell into similar categories with some examples including undeclared alcohol levels, excessive caffeine, the presence of unapproved botanicals, illegal dyes and high levels of heavy metals such as lead.

This review has purposefully focussed on incidents and recalls but has not addressed the many root causes and mitigations needed to prevent them. This will be subject to further reviews later in the year but there is plenty of material available if you want to explore root causes with a recently published Incidents and Resilience Annual Report from the UK Food Standards Agency and also other country reviews of incidents and recalls (Australia, Germany). And if you are really interested in delving into the source data, you will find the links to this in Table 1.

Finally, what is clear from this review is that a detailed understanding of hazards is absolutely essential for any business as the starting point to assessing risk and developing control measures. All too often this critical part of the hazard analysis and critical control point (HACCP) process is not given sufficient focus resulting in hazards that are missed - a missed hazard means a hazard not controlled. Many food safety management system solutions come with extensive hazard databases to support this key step in the food safety management process.

I hope this short overview of incidents and recalls has provided you with some thought-provoking insights to help you in your management of food safety and quality throughout your supply chain.

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