



## Supply chain solutions report 2023, Part 2:

Spotlight on food safety and quality

# Introduction

Food safety failures can be hugely costly for food businesses – and can have tragic consequences for consumers. From aflatoxins and undeclared allergens to pesticide residues, we look at some of the major food safety and quality issues impacting the industry and identify the most appropriate solutions to face these challenges.

*The Supply Chain Solutions report 2023 is written in two parts. You are reading part two.*





## Common contaminants

**T**he risk of ingredient contamination can happen at almost any step along the supply chain. Foodborne diseases like E. coli and salmonella outbreaks emphasise the importance of having robust preventative measures in place to better ensure food safety.

## Aflatoxins

Relatively unknown to the public, aflatoxins, a type of mycotoxin, are prevalent in the food supply chain and responsible for huge financial losses. Aflatoxins are naturally

occurring toxic chemical substances known to contaminate wheat, corn, rice, peanuts, and other ingredients and can lead to serious illnesses such as anaemia, cancer or, worse, death.

Tackling aflatoxin contamination isn't unique to one continent or country and can start on the farm or at the factory. With that in mind, businesses, NGOs, government agencies and businesses have formed the Food Safety Coalition (FSC). This group of like-minded organisations has committed to sharing data and knowledge that could lead to solutions to combat contamination in raw materials and improve food safety. Focusing on aflatoxin contamination, the group is developing data models and advanced risk management procedures, among a long list of other initiatives.<sup>1</sup>



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Extreme heat from climate change affects wheat yields and could allow for the growth of aflatoxins,

for example. As a result, contaminated wheat must be destroyed. That's where FSC

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experts see the importance of waste handling procedures to reduce further contamination. With further study, the group hopes to dial back the amount of waste and potential downstream contamination, thus bolstering an already shaky supply.

In mid-western US states, aflatoxin can seep into corn stalks in extremely hot weather. Rainfall on the other hand, seems to inhibit aflatoxin growth. Experts recommend planting more corn in climate friendly zones, like Texas and adhering to Good Agricultural Practices. Post-planting practices include keeping ingredients cool and dry and reducing the need for long-term storage.<sup>2</sup>

### **Antibiotics and chemical residues**

Just as aflatoxins wreak havoc on the grain supply chain, the overuse of antibiotics in farming is reducing



**READ MORE:** How widespread are pesticide residues on fresh fruit & vegetables? (click image)

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the efficacy of antibiotics worldwide. A 2022 report by Eurobarometer for the European Food Safety Authority (EFSA) on food safety in the EU found that 39% of Europeans are worried about antibiotic, hormone, or steroid residues in meat. In fact, these residues topped the list of food safety-related concerns.<sup>3</sup>

Speaking at the 2022 Institute for the Advancement of Food and Nutrition Sciences' (IAFNS) annual meeting and science symposium, Dr Felicia Wu, professor in food safety, toxicology, and risk assessment at Michigan State University, said that at the intersection of aflatoxin and pesticide use, "... there are predictive models that the agrifood sector can use to assess whether it would make sense to apply a fungicide based on crop, temperatures, geographic location, and other factors".<sup>4,5</sup>



**Undeclared allergens**

**T**he most common undeclared allergens are wheat, shellfish, eggs, fish, peanuts, milk, tree nuts, and soybeans, which, according to the United States Department of Agriculture (USDA), account for 90% of all food allergic reactions combined.<sup>6</sup> In addition, they are the sources from which many other ingredients are derived, such as soy lecithin, an emulsifier. Serious injury or death can occur because of an allergic reaction to unknowingly ingesting these allergens.

Allergen cross-contamination can signal not only financial loss and reputational damage for the company in question but can force the manufacturer to overhaul its operations. If a manufacturer's ingredient(s) become contaminated, they must be destroyed, potentially forcing disposal of the run and the need to implement new ingredient sourcing.<sup>7</sup>

"Recalls have an impact on companies and supply chains at various levels. First of all, they have a financial impact and this, in terms of revenue, is easily between 0.1% to sometimes even 10% of total revenue of the company," said

Rob Kooijmans, CEO of the Food Strategy Institute, during a presentation on food safety and allergen management as part of the 2023 Fi Global Webinar series.<sup>8</sup>

Sometimes it can also cost the company the entire year's profit, Kooijmans added, depending on the size of the recall but also on other mechanisms.

"For instance, if you are a supplier of ingredients and [...] your customers have used your [recalled] product, the total financial value is potentially much bigger than the product you have just sold. You will get claims really going far above and beyond the sales volume of that one batch."

Companies might also need to change their manufacturing schedule as customers affected by the recall may send batches back for replacement.

"That's where you'll get a significant loss of efficiency," said Kooijmans.



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"You can also suffer from brand damage, especially if your brand is in retail or you have a free-from brand. If you are a free-from brand and [your product] has allergens inside, it will of course be in the press. Then you might easily see a drop in sales volume, which could take you 10 years to recover."





that can be made during the printing process. You need to be aware of those and manage those from the onset.”

Another important building block for a robust allergen management system relates to manufacturing operations. Manual dosing can easily lead to cross contamination due to simple human errors.

“If you have those two bags stored at your minor dosing station and the operator [wants to] manually scoop sodium carbonate but doesn't read well what is on the bag and instead scoops sodium casonate, then you have milk as an undeclared allergen in your product,” he said.

Product sequencing is very important as is correct cleaning execution, validation, and verification. Working with barcodes and using automated ingredient dosing systems can also reduce cross contamination risks.

“I really suggest looking into those systems,” he said. “If you don't want to invest in [barcode scanners], at least put coloured stickers on the



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ingredients that contain allergens to visually identify them as allergens.”

When it comes to boosting supply chain resilience, industry partners may want to consider manufacturing plants rooted in a modern and dynamic production environment. This approach is aligned with an increasing interest in technology like using artificial intelligence and data analytics to improve manufacturing processes and to avoid slipping incorrect items into the supply chain, thereby better avoiding long term and costly damage to brands.<sup>12</sup>

Further down the supply chain, experts point to the use of social media data analytics from surveys, for example, as a real time indicator of consumer brand insights. Such intelligence could quickly identify brand sentiment and/or highlight if the brand is on trend or not.<sup>13</sup>

Knowledge in hand, manufacturing gets smarter and faster, and depending on the insights gleaned online, brands can better plan for what's next.

# Sourcing solutions



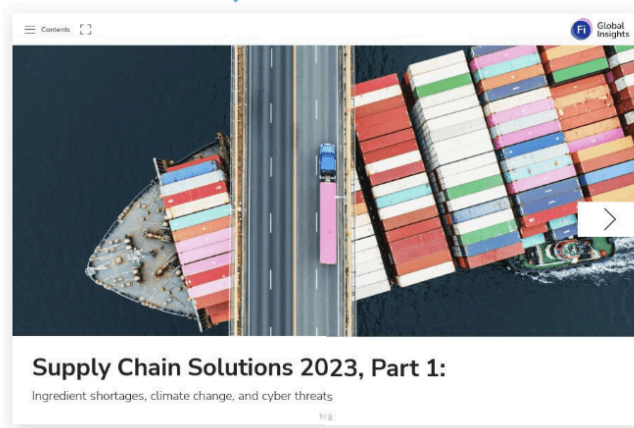
**A**merican auto manufacturer Ford once branded its cars under the slogan “Quality is job one.” The same sentiment applies to sourcing ingredients. The first responsibility of the sourcing agent to ensure quality ingredients is to check for the inclusion of third-party certifications that have verified testing through the production process that the ingredients are of the highest quality. It may cost more for the frequent testing, but the product recall could be costlier and impart more headaches.

Speaking during a 2023 Fi Webinar Series panel on sourcing challenges and ingredient substitutions, Rob Kooijmans said: “It is time that companies start to understand their supply network in much more detail. Just knowing your suppliers is not enough. Digging deeper through the suppliers of suppliers back to the farms is essential. Only then can true risks be tabled, monitored, and appropriately addressed when they emerge.”<sup>14</sup>

He added: “A structured risk reduction strategy based on deep insights from ongoing horizon-

scanning will help companies to reduce the impact of supply chain issues in the future. Another way to put it is that companies should reduce their risks and costs by looking at their supply chain in a more holistic way.”

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When it comes to sourcing or agreeing to an ingredient source, think about end use application and ingredient functionality, and view inspection reports. Wheat from Canada is not the same as wheat from the Ukraine. Manufacturers should therefore take heed that wheat may be sourced from Ukraine, the US, or South America, each with varying soil and pH

levels at different times of the year.<sup>15</sup> It is important that manufacturers remain up-to-date about geo-political events in their sourcing region.

Failing to establish an ingredient sourcing timeline and locking in prices early are further complications that could impact manufacturers' supply chain. It is therefore best to build in adequate time to navigate unexpected delays, environmental challenges, and product shortages – all three of which were common in 2022 and will continue to upset the supply chain into this year. Finally, locking in a fair price early on may allow companies to reduce the risk of incurring unforeseen price increases that may be unsustainable for an indefinite duration.

### **Navigating issues of contamination**

Product contamination issues can start anywhere in the supply chain — as early as in the field or in the water, for instance. Down the line, use of contaminated water or ice to wash, pack, or chill fruits or vegetables, could spread contamination to those items.

Serious contamination concerns might include pesticide use, which is the number one food safety concern for Europeans.<sup>16</sup> Pesticide residues are common globally.

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ReportLinker's "Pesticides Global Market Report 2022" predicted the global pesticides market would grow from \$78.16 billion in 2021 to \$85.11 billion in 2022 at a compound annual growth rate (CAGR) of 8.9%. Looking ahead, the firm predicts the market will grow to \$105.39 billion in 2026 at a compound annual growth rate (CAGR) of 5.5%.<sup>17</sup>

When used at safe, allowable levels, governing agencies certify that pesticide residue is not considered harmful to consume. However, the World Health Organization states that the overuse of pesticides such as dichlorodiphenyltrichloroethane (DDT), for example, remains in the soil, and, eventually, the food product.<sup>18</sup> Many theories have been floated around how to reduce the reliance on pesticide use. Experts at the University of California point to nonchemical strategies, such as pest screening, crop rotation, biological control, and weed control to reduce the use chemicals and consequently slow the development of pesticide resistance.<sup>19</sup>

Technology may be a future resource in reducing reliance on pesticide use. From drones to autonomous farm equipment, machines are being viewed for aiding in the identification and on-farm elimination of pests and disease control. Drone spray, for example, could be a way to reduce farmer costs and maintain crop yields by identifying pests sooner. Similarly, smart farm equipment includes sensors on robots that can drive through a field to find and

eliminate weeds by spraying individual weeds with small amounts of pesticides instead of covering an entire field or section.



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# Introducing Fi Webinar Series 2023

The Fi Webinar Series 2023 covers key food and beverage market topics, offering attendees the opportunity to get up to speed on marketing strategies, sourcing of ingredients and product applications.

10 live webinar days covering 5 key themes will feature live discussions and Q&A with topic experts. The sessions will cover market updates, consumer insights, regulatory updates, sourcing tips, innovation updates and relevant startups.

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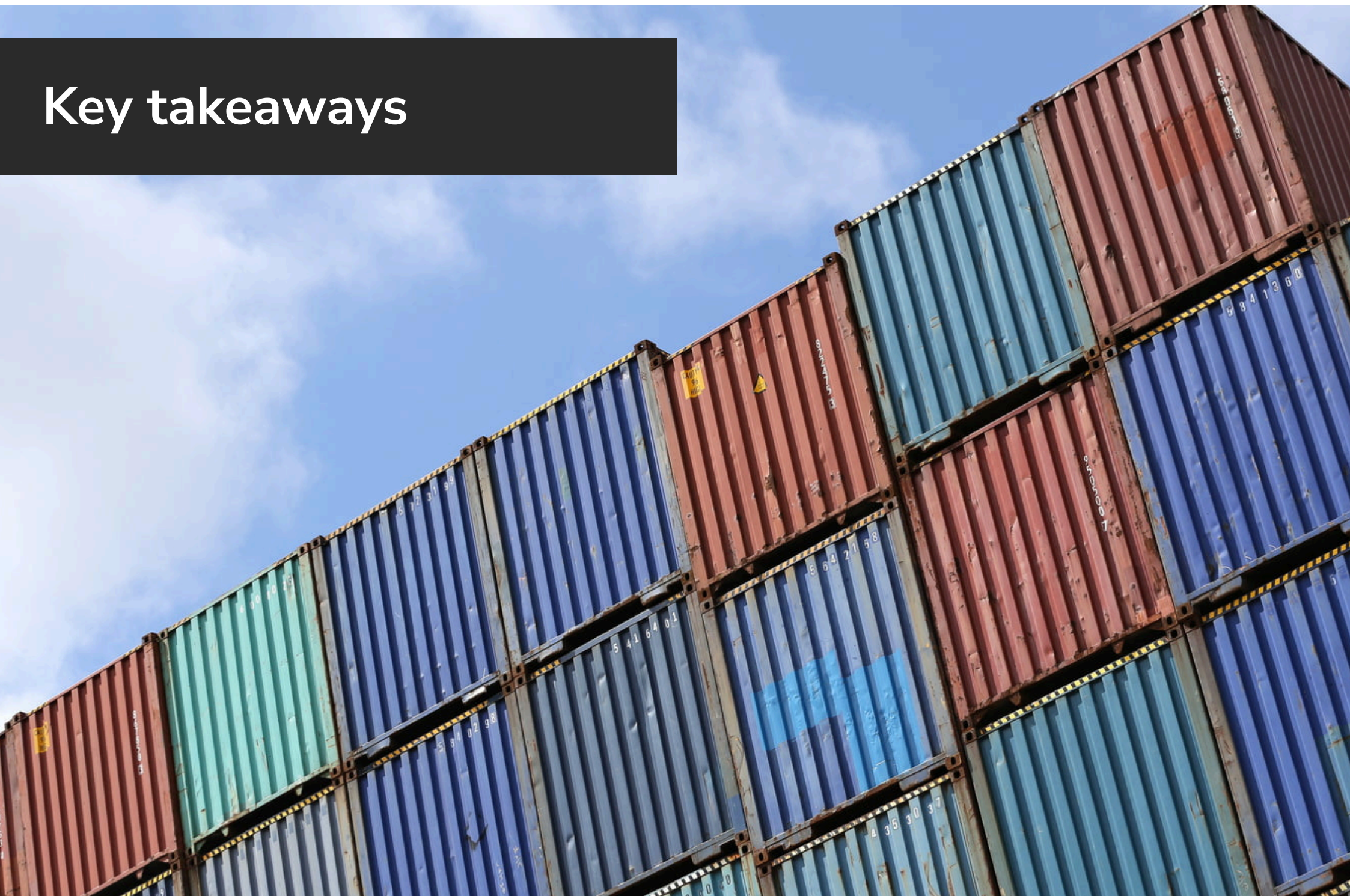
Healthy snacking: From healthy indulgence to 'mood food'



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# Key takeaways



- The ongoing impacts of climate change events such as extreme heat are leading to smaller crop yields and making dangerous contaminants, such as aflatoxins, more common. Predictive data models are one tool that can help producers deal these challenges.
- Food recalls can be hugely costly both in terms of financial impact and reputational damage. Manufacturers should have a robust allergen management strategy in place to avoid cross contamination during manufacturing.
- Contamination can occur at any point within the value chain, meaning transparency is key. It is no longer sufficient for brands to know who their suppliers are; they should also know who supplies their suppliers, right down to the farm level.
- Consumer concerns over the health impact of pesticide residues on fresh produce and the environmental impact regarding soil health and biodiversity loss are set to grow – as is projected global pesticide use.
- Manufacturers should ensure their suppliers and producers use pesticides, herbicides, and fungicides responsibly and within national limits. Agri-tech advances such as drone spraying and smart farming equipment can help but costs are still high.



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