

Risk Engineering Services

Casualty Risk Trends: Food Industry



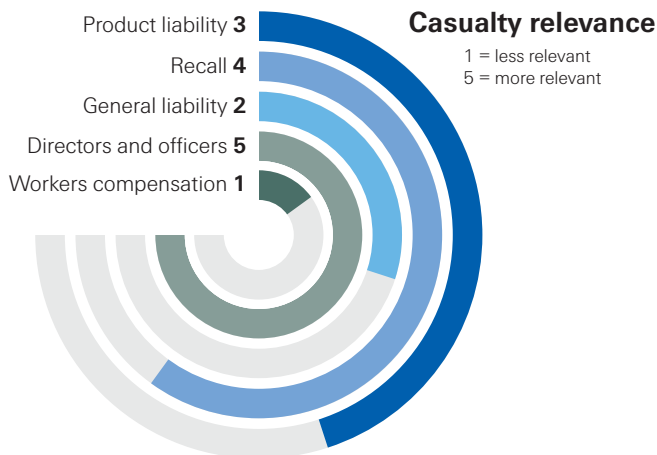
This report explores key developments shaping the future of the food industry: the increasing influence and liability of social media, the emergence of cultivated meat and its insurance implications, heightened concerns about ultra-processed foods, and the growing use of CRISPR-Cas9 gene-editing technology in food and agriculture.

Aimed at risk managers and industry stakeholders, this report provides valuable insights to help navigate evolving risks, identify emerging opportunities, and make informed decisions in a rapidly changing landscape. Join us as we examine how these trends may reshape risk profiles and challenge conventional frameworks in the casualty insurance sector.

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Social Media and the Food Industry: Risks and Opportunities



Social media is profoundly transforming the food industry by serving as a dynamic platform for marketing, trendsetting, community engagement, and direct sales, making it essential for businesses to stay competitive in the digital era. It offers restaurants, chefs, brands, and producers a cost-effective and high-impact way to showcase their offerings, particularly through visually appealing content on platforms, where photogenic food can quickly go viral and boost brand visibility. Additionally, user-generated content – such as customer-shared food experiences – acts as authentic, free marketing, while collaborations with food influencers allow brands to effectively reach targeted audiences in ways that traditional advertising often cannot.

False advertisement through social media

False advertising in the food industry involves deceptive marketing practices that misrepresent a product's characteristics, ingredients, or benefits. This includes exaggerating nutritional claims, misleading labelling, and using images that do not reflect the actual product.

For example, a product may be marketed as "100% natural" despite containing artificial ingredients, or advertised as "low in calories" when it is low in fat but high in sugar. Others may be advertised as "heart-healthy" without scientific evidence to support these claims (misleading health claim), or hold claims like "weight-loss" or "miracle" foods without scientific backing (exaggerated benefits promise). Further, pictures that show food as larger, fresher, or more appealing than the actual product can influence consumer choices and health decisions, often fostering poor dietary habits. This, in turn, can potentially lead to legal action due to misrepresentation of the product's true appearance and nutritional characteristics.

Social media has amplified the impact of false advertisement in the food industry, contributing to the spread of misleading food health or nutritional claims. These ads often reach large audiences quickly, and they can significantly influence consumer behavior.

Social media plays a critical role in false advertising in several ways:

- **Exaggerated health claims:** Social media is flooded with terms like "superfoods", "miracle ingredients", "detox", and "anti-aging", which are often used to promote products with limited or no scientific evidence to back these claims. Additionally, phrases like "natural" can be misleading when used for products containing artificial additives or preservatives.
- **Influencer marketing:** Brands collaborate with influencers to promote products, which can lead to false advertising when influencers make unsubstantiated claims. For example, influencers often share exaggerated before-and-after images depicting weight loss or skin improvements attributed to a food product, potentially without disclosing that they are being paid to promote the product.
- **Unregulated dietary challenges:** Viral diet trends, such as detox tea diets promoted on social media, often involve exaggerated claims like "losing 10 pounds in 3 days," which can mislead consumers and may not be backed by scientific evidence. Moreover, these trends may pose significant health risks.
- **Influencer-driven dietary trends:** Diet trends such as "keto"¹ or "paleo"² diets, which are often promoted by independent influencers, can give rise to misleading product claims. Items marketed under such labels may not truly adhere to the core principles of diets, potentially driving consumers into purchasing products that fall short of the diet's advertised guidelines. When such claims originate from independent influencers, however, manufacturers may not bear liability.

Social media's role in food safety awareness

Social media has become a powerful force in shaping public awareness of foodborne illnesses and influencing how companies respond. When consumers share experiences with contaminated or unsatisfactory products, posts can spread rapidly, heightening concern and prompting swift action – sometimes even triggering product recalls. In the best cases, this helps limit the scale and severity of foodborne outbreaks.

At the same time, social media platforms give consumers a public outlet to voice dissatisfaction, even if the product complies with safety regulations. Reports of similar issues by multiple users or public statements from consumer associations can quickly gain momentum and go viral. If recalls are mishandled or communication is lacking, public trust may erode, and legal action can follow. Viral posts often draw the attention of law firms, which may use them to organise class action lawsuits – even in cases where the product is technically safe. These platforms make it easy for consumers to share evidence, amplify concerns, and coordinate legal efforts, putting pressure on companies to manage both safety and public perception effectively.

Defamation and reputational damage

A single negative or exaggerated social media post can severely harm a food brand's reputation – even if the claims are false. Posts that include photos or videos can spread quickly, sparking boycotts and attracting media attention. For smaller or newer brands, the damage can be particularly devastating, resulting in lost trust and significant financial losses.

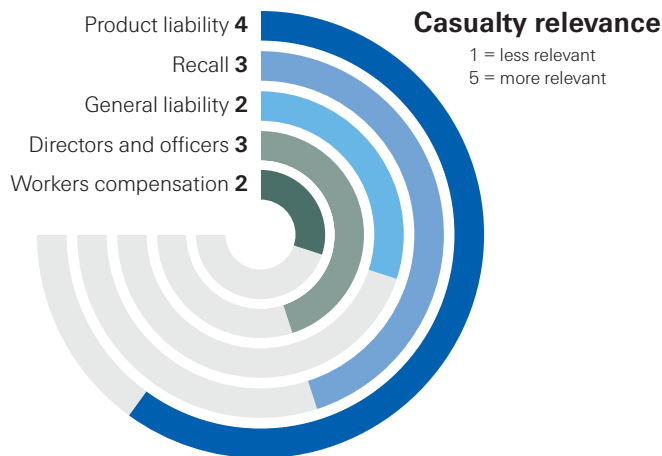
Defamation on social media is difficult to address legally, as it's often hard to hold individual users accountable. Companies may be forced to invest heavily in public relations campaigns or legal action to protect their image. Even after false claims are disproven and posts are removed, their impact can persist. For instance, a sensational but unfounded video alleging the discovery of a foreign object in food may leave a lasting negative impression – long after being proven false.



What can insureds do to minimise these risks?

- Make sure that health or nutritional claims are supported by scientific evidence. Food certifications, such as 'organic', should be independently assessed by reliable third-party organisations whenever possible.
- Create internal policies governing acceptable advertising practices – what can be posted in official accounts – and how to respond to customer feedback.
- Use social listening and monitoring tools to track mentions and trends related to the brand(s) in real time; flag and assess potentially damaging content early and before it spreads.
- Be prepared to assess whether a negative social media post is based on a real problem or whether it is untrue. Have a crisis communication plan in place to address complaints or misinformation quickly and transparently, including a social media dimension.

Meat the Future: Insurance Insights for Cultivated Meat Production



1. Cell Selection

A sample is taken from an animal



2. Cultivation

Cells are grown in a bioreactor



3. Harvesting

Cells are harvested from the bioreactor



4. Food Processing

The meat product is prepared and packaged

Cultivated meat – often called cell-based, lab-grown, or slaughter-free meat – can be seen as an innovation with the potential to reshape the USD 514 billion global livestock and meat industry.³ It could play a key role in addressing pressing global food challenges;⁴ while the global cultured meat market size was valued at approximately USD 1 billion in 2024, it is projected to grow to more than USD 10 billion by 2033.⁵ However, cultivated meat also raises questions about the future of farming, and how our food system will change. Furthermore, concerns around safety, taste, and naturalness remain, but as regulatory frameworks evolve and more products reach the market, the need for tailored insurance solutions is steadily increasing.

Cultivated meat is produced by growing animal cells in controlled environments, eliminating the need for traditional animal farming. The production process involves four main stages: cell selection, cultivation, harvesting, and food processing. It starts with the selection and isolation of animal cells, which are used to establish cell lines that serve as a consistent source of starter material for each production cycle. These cells are then cultivated in a sterile environment using a nutrient-rich culture medium, allowing them to multiply and differentiate into muscle tissue or other desired types, such as fat cells.

Once the tissue has grown to the desired size and structure, it is harvested from the cultivation system. This marks the end of the primarily biotechnological phase of production. The final stage – food processing – aligns more closely with conventional food science and technology. Here, the harvested tissue is treated to develop the appropriate texture, flavour, colour, and shelf life. This involves the addition of fats, flavour, and other ingredients, after which the cultivated meat is shaped into familiar products such as sausages, patties, or nuggets.⁶ Given the intricate production methods and ingredients (not commonly found in home cooking) involved in cultivated meat, some experts suggest it could be considered an ultra-processed food.

Each stage of the process presents its own set of challenges and risks, ranging from maintaining sterility in critical manufacturing steps, to ensuring consumer acceptance and food safety in the final product.

Challenges and risks

- Contamination at multiple stages (cell selection, production, harvesting, processing)
- Genetic instability of selected cell lines (leading to an alteration in the cells' characteristics which may affect the quality and safety, or consistency)
- Allergenicity of the final product (new or unknown allergens)
- Unknown long-term health effects from consuming cultivated meat
- Inadequate labels may lead to serious consumer health risks or recalls
- Religious dietary compliance (e.g., Halal, Kosher certification)⁷
- Regulatory uncertainty, due to the novelty and complexity of the final product

Producing cultivated meat involves legal risks, especially product liability if the product harms consumers through contamination, allergens, or unknown health effects. It's important to note that many of these risks overlap with multiple liability policies. For instance, a contamination incident may trigger both product liability (due to consumer harm) and recall coverage (due to the need to withdraw the product), while also involving D&O exposure if management failed to implement adequate quality and safety protocols. Ethical and reputational risks can also trigger financial loss indirectly, through boycotts, lawsuits, or class actions.

Regulatory challenges

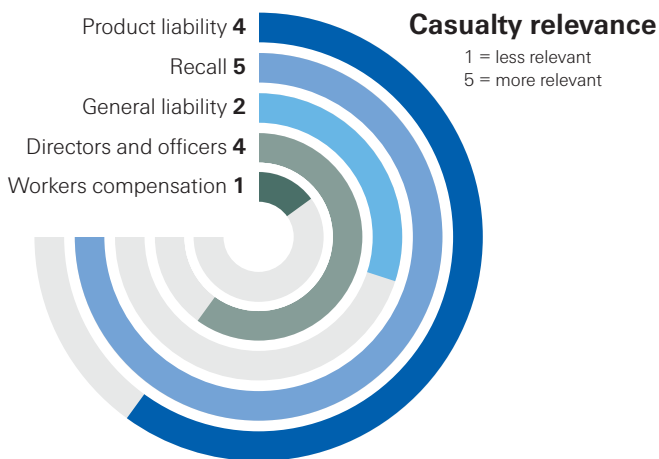
The regulatory landscape for cultivated meat varies by region. Singapore leads in cultivated meat approvals, having authorised the first cell-cultured chicken in 2020, while Israel and Australia are still developing their own regulatory frameworks. The EU remains more cautious, requiring approval under its Novel Foods Regulation⁸ – a centralised and extended regulatory process. As of now, no cultivated meat product has received full approval in the EU. In contrast, the US has made faster progress through a joint regulatory approach between the Food and Drug Administration (FDA) and United States Department of Agriculture (USDA), streamlining approvals and already authorising the sale of two products in 2022 and 2023. Recently the FDA has completed a pre-market consultation on human food made with cultured pork fat cells.⁹



What can insureds do to minimise these risks?

- Define and set up specific processes along the production stages, to ensure sterility, contamination testing, and overall quality control.
- Trace allergens not just in the final product, but in all raw materials, additives, growth media, and processing aids.
- Implement a recall plan with strong traceability, conduct regular mock recalls, and train staff in effective crisis management.
- Provide clear, truthful information on product labels.
- Keep up to date with legal and regulatory developments.

Ultra-Processed Foods



Ultra-processed foods (UPFs), also known as highly processed foods, are foods that have undergone extensive industrial processing and contain *refined* ingredients that are not typically found in a home kitchen, such as oils, sugars, preservatives, artificial flavours, colours, sweeteners, which are combined in ways that significantly alter the food's original form. Although there is no universally accepted definition, UPFs are generally characterised as products with little or no whole food components, designed for high palatability, convenience, and extended shelf life, but offering limited nutritional value – unlike minimally processed foods like fruits, vegetables, or whole grains. Examples of UPFs include sugary snacks, fast food, ready-to-eat and ready-to-cook meals, packaged baked goods, sugary beverages, and processed meats like hot dogs or sausages.

The global consumption of UPFs is increasing, and they make up more than half of the total dietary energy consumed in high-income countries such as the US, Canada and the UK and between one-fifth and one-third of total dietary energy in middle-income countries such as Brazil or Mexico.¹⁰ This upward trend has generated significant concern over their potential health risks and observational studies have found associations between high consumption of UPFs and negative health outcomes, possibly due to their artificial ingredients, added sugars, high levels of sodium, unhealthy fats, and lack of essential nutrients. Some of the suggested risks associated with consuming UPFs include:

- **Increased risk of chronic diseases:** Diets high in processed foods are linked to an increased risk of obesity, heart disease, type 2 diabetes, and hypertension due to their high content of unhealthy fats, sugars, and salt.
- **Weight gain:** Processed foods tend to be calorie-dense and low in fibre, making it easier to overeat and leading to weight gain and metabolic issues.
- **Nutrient deficiency:** These foods are often stripped of essential nutrients like vitamins, minerals, and fibre, which are important for maintaining overall health, leading to potential deficiencies if consumed in excess.

- **Impact on mental health:** Some studies suggest a link between the consumption of highly processed foods and mental health issues like depression and anxiety, possibly due to their effect on brain chemistry and gut health.
- **Increased inflammation:** Highly processed foods can contribute to chronic inflammation in the body, which is linked to a variety of health conditions, including arthritis, heart disease, and cancer.
- **Poor digestive health:** The lack of fibre and nutrients in processed foods can negatively affect gut health, leading to digestive problems like constipation and an imbalance of gut bacteria.

Clear evidence linking consumption of UPFs and negative health outcomes could fuel litigation against food manufacturers, distributors, and regulatory and public health authorities because of inadequate warning, deceptive advertisement and labelling, alleging negligence, failure to warn, misrepresentation or fraudulent concealment.

Contamination vulnerabilities of UPFs

Ultra-processed foods, such as frozen pizzas, are composed of numerous ingredients – up to dozens – sourced from various local and global suppliers and undergo complex manufacturing processes that include multiple stages like moulding, pre-frying, and the incorporation of chemical additives and preservatives. This intricate composition and production chain significantly elevates the risk of contamination, as each ingredient and processing step introduces potential points of failure, as compared to the simpler preparation of minimally processed foods. This could not only endanger consumer health and lead to higher recall rates but also expose manufacturers to product liability, financial losses, and reputational damage. This underscores the need for rigorous quality control and traceability in the UPF industry.

The addictive nature of UPFs: a growing concern

Many of these foods are designed to be “hyper-palatable,” meaning they are intentionally engineered to trigger intense cravings and promote overconsumption. The addictive nature of these foods could lead to lawsuits alleging that food manufacturers are intentionally creating products that are difficult for consumers, especially children, to resist. In fact, the first class-action lawsuit related to UPFs was filed in December 2024, accusing major food producers of deliberately designing and marketing UPFs to make children addicted to them, which ultimately led to significant health issues.¹¹ Should lawsuits like this one succeed in setting a legal precedent, they could spark new waves of similar claims.

Regulatory challenges and litigation risks

Regulation of UPFs is an emerging area of public health policy. While comprehensive regulation is still rare, several countries are implementing targeted measures to curb the consumption and negative health impacts of UPFs.

Issues associated with UPFs

- **Lack of clear definitions:** Lack of a universally accepted legal definition of UPFs complicates efforts to regulate them – most categorisations, like the NOVA classification, are academic rather than legal.¹²
- **Complex ingredients and formulations:** UPFs often contain numerous additives, artificial ingredients, and novel compounds that are difficult to assess individually and in combination, making comprehensive regulation challenging.
- **Insufficient labelling requirements:** Existing labelling laws may not adequately inform consumers about the level of processing or health impacts of UPFs. Nutrition labels often focus on nutrients rather than processing.
- **Industry influence and lobbying:** The food industry often resists stricter regulations through lobbying and marketing, which can delay or dilute policy efforts.
- **Limited public awareness:** Consumers may not fully understand what UPFs are or their health implications, reducing public support for regulatory measures.
- **Scientific uncertainty and evidence gaps:** While evidence links UPFs to negative health outcomes (e.g., obesity, diabetes), more causal, long-term research is needed to form the basis of robust regulatory policies.

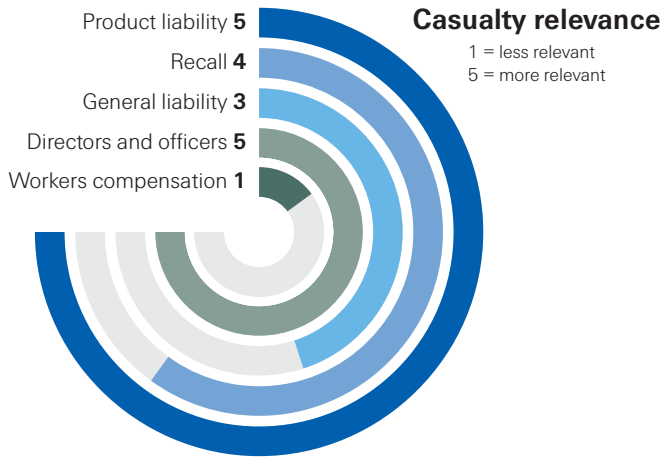
In addition, international trade laws limit how countries can label or restrict imported products, along with mounting pressure on regulators to tighten oversight of food additives. Inconsistent food safety standards across regions may increase the risk of litigation for food companies: some food additives may be banned in some countries or states, while permitted in others, or vice versa. These disparities create a regulatory minefield for food companies that may find themselves at risk of non-compliance with country- or state-specific regulations that can lead to consumer-driven lawsuits and claims, or product recalls.



What can insureds do to minimise these risks?

- Stay up to date with regulatory changes in the relevant business regions, and be ready to implement any changes.
- Consider new, simpler formulations when designing and developing new or substitute food products.
- Prepare to promptly identify the root cause of any contaminated product or ingredient throughout the supply chain, and initiate an efficient recall.
- Conduct regular mock recalls and train staff in effective crisis management.

CRISPR-Cas9 in Food and Farming: Big Promise, Many Questions



CRISPR adoption in agriculture

CRISPR is quickly becoming a valuable tool in the food supply chain, namely in crops. It's being used to alter specific traits, for example to make crops stronger, improve their nutritional value, reduce food waste, and even create new types of food. This technology is already having a major impact on the creation of new varieties of agricultural value. Some CRISPR-modified crops and livestock are already on the market, and many others are in development. In the US, high oleic CRISPR-modified soybeans have been introduced to the market, to produce healthier, more stable cooking oil. Japan has released tomatoes with higher GABA^{IV} levels, a bioactive molecule which may help lower blood pressure. In Belgium, CRISPR-modified yeast is being tested to improve beer fermentation and flavour. Meanwhile, the US and Europe are developing low-acrylamide forming potatoes or wheat that produce fewer harmful compounds during cooking.¹³

Role of CRISPR in animal breeding

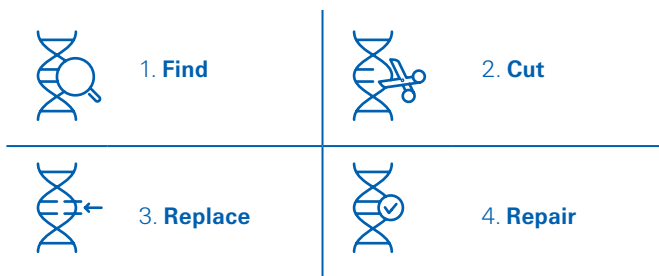
CRISPR is also being used to improve livestock production. The idea is to make animals healthier, more productive, and resilient to climate change-related stressors – such as rising temperatures, increased disease pressure, reduced water availability, and feed scarcity. Some examples include:

- Hornless cows, developed in the US and Brazil, to avoid dehorning.
- Pigs resistant to porcine reproductive and respiratory syndrome (PRRS), a serious and costly disease, being tested in the US and UK.¹⁴
- Heat-resistant cattle in Brazil and Australia to cope with rising temperatures.
- Faster-growing salmon in Norway and Canada to boost fish production.

These innovations could improve food production and animal welfare. But there are concerns, too.

Imagine a tomato plant that gets sick easily. Using CRISPR-Cas9 (CRISPR for short)^I – the most powerful gene-editing tool available today – scientists can precisely target and edit the plant's DNA^{II}, much like cutting and pasting text in a document. A special guide-RNA^{III} locates the exact gene responsible for the plant's weakness, and an enzyme called Cas9 makes a precise cut. As the plant naturally repairs its DNA, scientists can delete the faulty gene or insert a stronger one – either from the same species or a different one – to boost disease resistance. The result is a healthier tomato plant that may require fewer chemicals to thrive. This is just one example of the transformative potential of CRISPR, which allows us to remove unwanted traits or add beneficial ones with remarkable precision.

CRISPR Steps



^I Clustered Regularly Interspaced Short Palindromic Repeats/CRISPR-associated protein 9

^{II} Deoxyribonucleic Acid

^{III} Ribonucleic Acid

^{IV} Gamma-aminobutyric acid

Risks and challenges

CRISPR is precise, but not without risks. Gene editing can sometimes introduce changes in unintended parts of the genome – these are known as off-target effects. Such unintended edits can lead to health issues in animals, including weakened immunity, poor growth, or reproductive challenges, and may affect how animals grow and develop. The long-term effects remain uncertain and could potentially impact the safety of products like meat, milk, or eggs. There's also a potential risk of introducing new allergens through novel proteins. Beyond science, ethical, religious, and cultural concerns persist, making transparency and clear labelling especially important.

Different rules around the world – innovation and trade challenges

CRISPR is widely regarded as the next generation of genetic modification technology, building on earlier genetically modified organism (GMO) approaches that have been in use for decades. While regulatory systems were originally developed for traditional GMOs, many countries are now determining how CRISPR fits within – or challenges – those existing frameworks. Consequently, regulations for gene-edited organisms vary widely depending on the type of organism and the country. In the EU, both CRISPR-edited crops and animals are regulated as GMOs, requiring thorough safety assessments and mandatory labelling.^{15,16} The US takes a more flexible approach. Gene-edited crops without foreign DNA are not considered plant pests and are generally exempt from regulation as GMOs under the U.S. Department of Agriculture's biotechnology regulations (Title 7 of the Code of Federal Regulations, Section 340.1), allowing faster approvals.¹⁷ In contrast, gene-edited animals are evaluated individually by the FDA under veterinary drug laws.¹⁸ Food products derived from GMOs face strict labelling requirements in the EU, but in the US, labelling is often not required if the product contains no foreign DNA and is deemed safe.¹⁸ Countries such as China maintain stricter regulations across the board, whereas Japan allows some gene-edited products with fewer restrictions.^{19,20} This diversity in regulatory approaches creates challenges for innovation and international trade in gene-edited agriculture and food products.²¹

CRISPR and insurance: what's at stake?

The rise of CRISPR technology in food and agriculture is not only transforming how crops are developed – it's also creating new challenges for the insurance industry.

One of the key concerns is product liability. Gene-edited foods, while promising improved nutrition, may still trigger health-related claims, even when there's no clear scientific evidence of harm. For instance, CRISPR can disable genes that produce anti-nutrients (natural compounds that interfere with nutrient absorption) improving nutrition but potentially causing unintended changes like new proteins that may trigger allergies. This uncertainty is where liability risks for insurers begin.

Gene-edited crops also carry operational risks. Mix-ups between gene-edited and non-edited products are common, especially during processing or transport, when considering the diversity in regulatory approaches towards gene editing. Cross-contamination – for example, from machinery not properly cleaned between batches – can further complicate matters.

In cases where safety or labelling issues emerge, product recalls may be required, making recall insurance essential. Moreover, modified genes may spread to wild or non-genetically modified plants through cross-contamination, which may affect biodiversity and lead to ecological harm – potentially exposing producers to environmental liability claims.



What can insureds do to minimise these risks?

- Ensure CRISPR-edited products are safe and reliable by conducting thorough safety and quality assessments and develop clear strategies to address off-target effects.
- Implement rigorous quality control and traceability systems to prevent mix-ups between gene-edited and non-edited products.
- Maintain transparent labelling and communication to reduce the risk of consumer mistrust and potential litigation.

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