Food Safety: Hazards and Trends in a Globalized World

24. Fachtagung Haftpflicht – SVV
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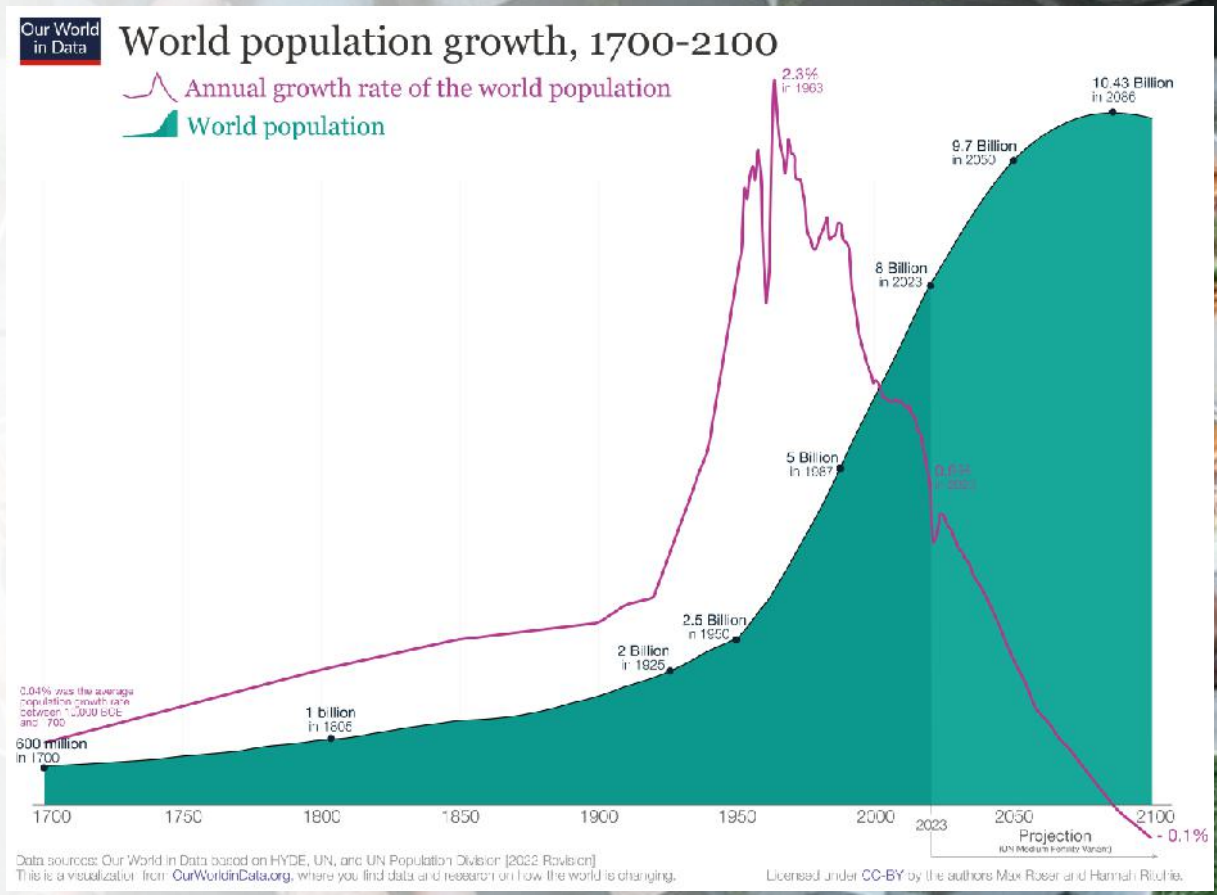
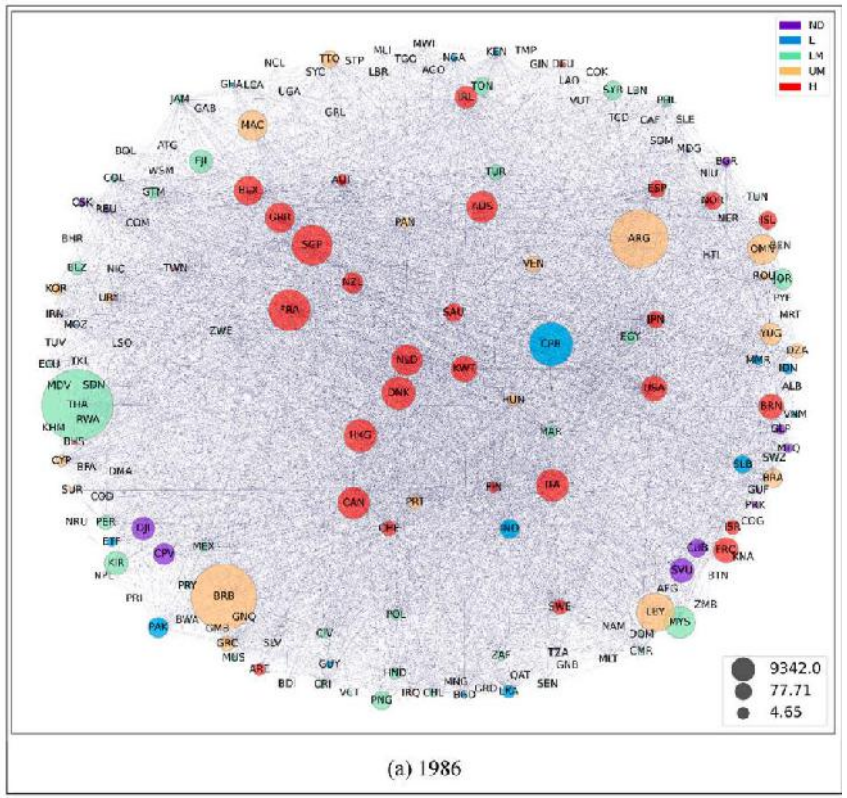
Food & Food Safety

- Food: a basic need of a growing population
- Global food industry: USD 5-10 trillion, CAGR +5%
- Food is safer than ever before, but according to the WHO:
  - 1 in 3 people in industrialized countries affected by a food-borne illness every year
  - 420'000 people die/year from consumption of contaminated food
- USA (CDC, foodborne disease estimations):
  - 48 million people (1/6 Americans) get sick, 128,000 are hospitalized, and 3,000 die each year
  - In 2019, 7 major pathogens caused 9.9 million foodborne diseases, 53,300 hospitalizations and 931 deaths
- Switzerland (BLV, 2023):
  - 40 foodborne outbreaks were reported; 260 individuals fell ill due to these outbreaks, 40 required hospitalization and 6 died



Global Food Trade Network



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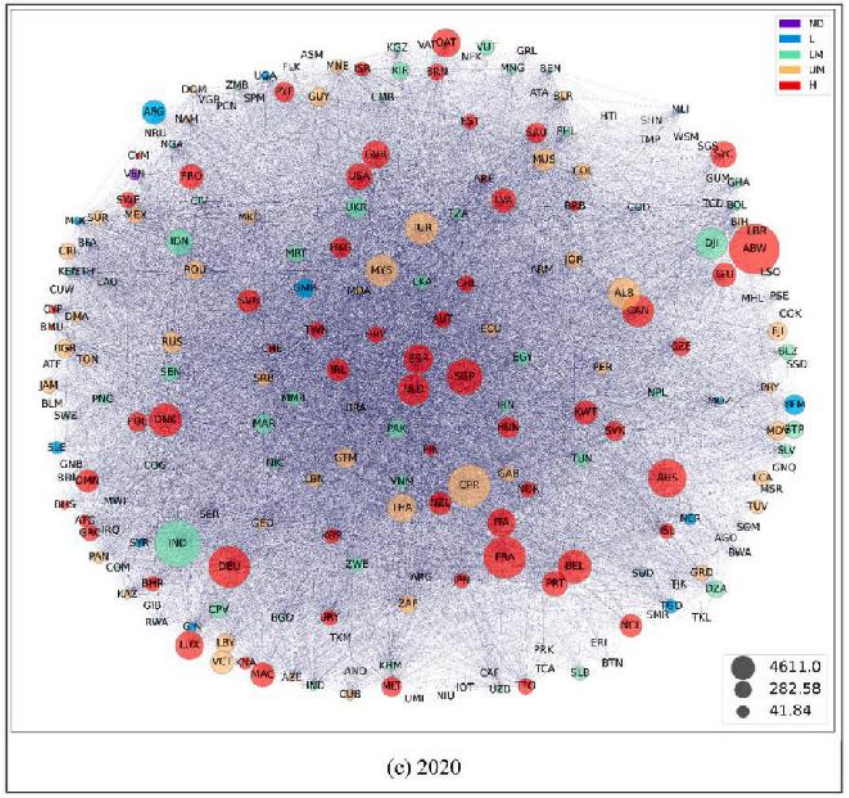
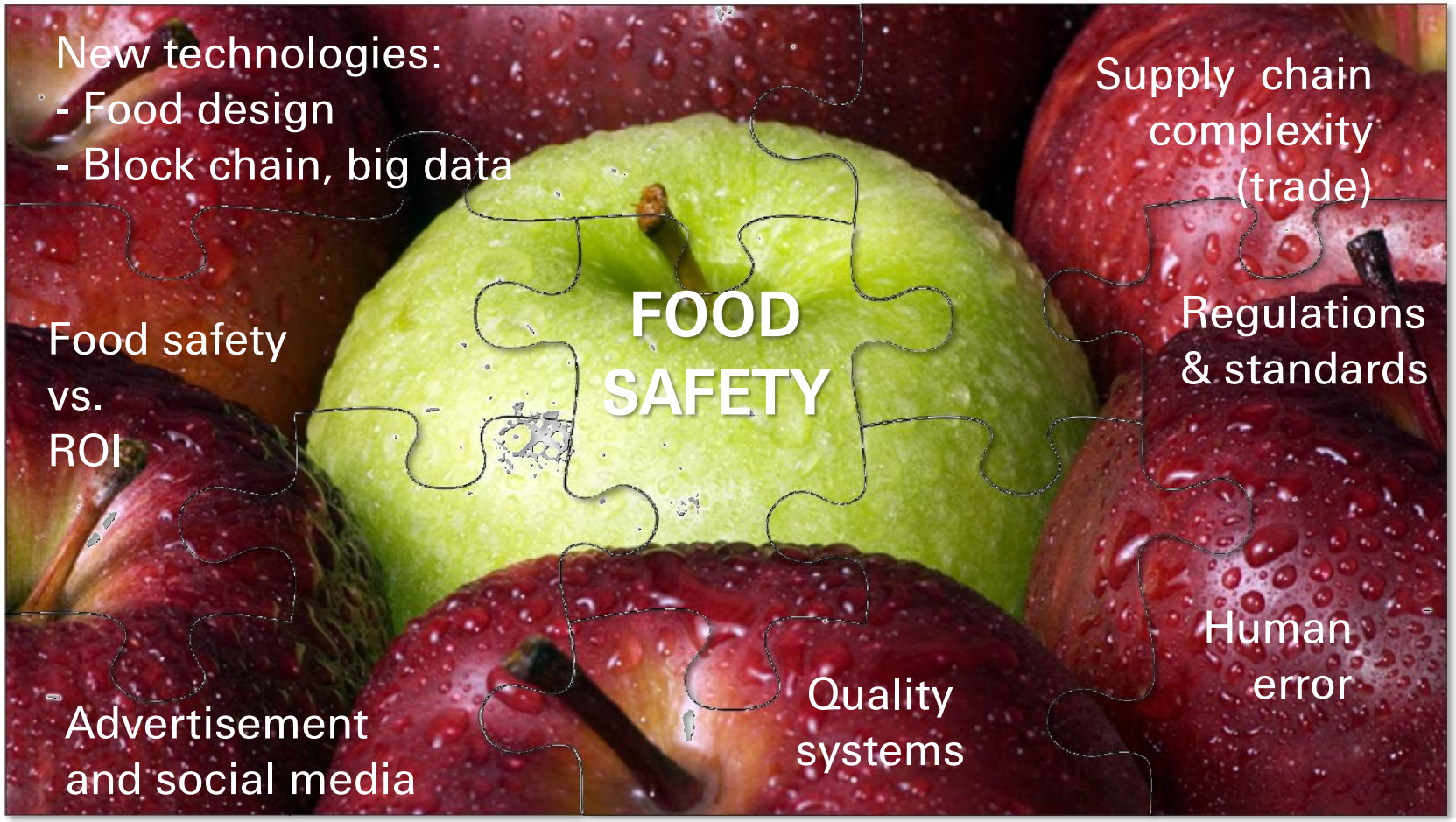


(c) 2020

Source: Mazzotti Silvestrini et al, Current Research in Food Science, 2023; https://doi.org/10.1016/j.crfs.2023.100517

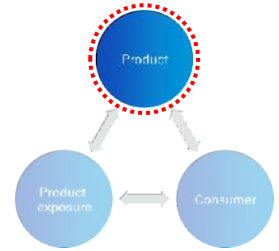
- Food and Agriculture Organization (FAO): global food trade increased by 133% over the past two decades (more than food production)
- Food trade is highly concentrated among high- and upper middle-income countries
- Social and political globalization linked to population nutritional status: countries network metrics associated with overweight/obesity

Food safety in a globalized world



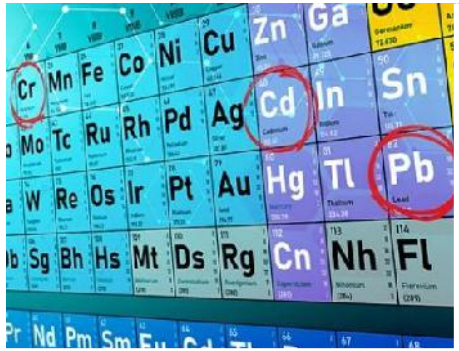
Food Safety Risks

Risk considerations I: Inherent risks

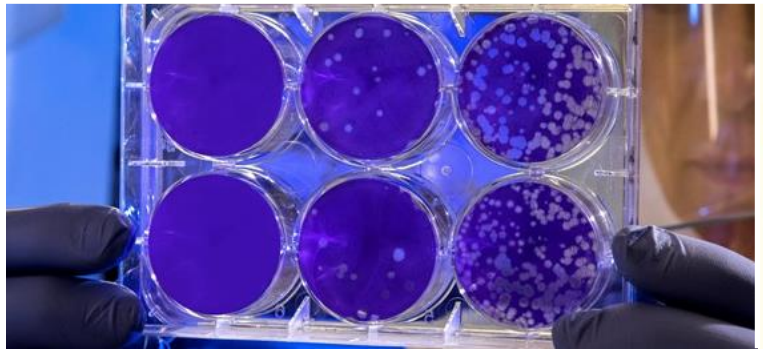




What product?

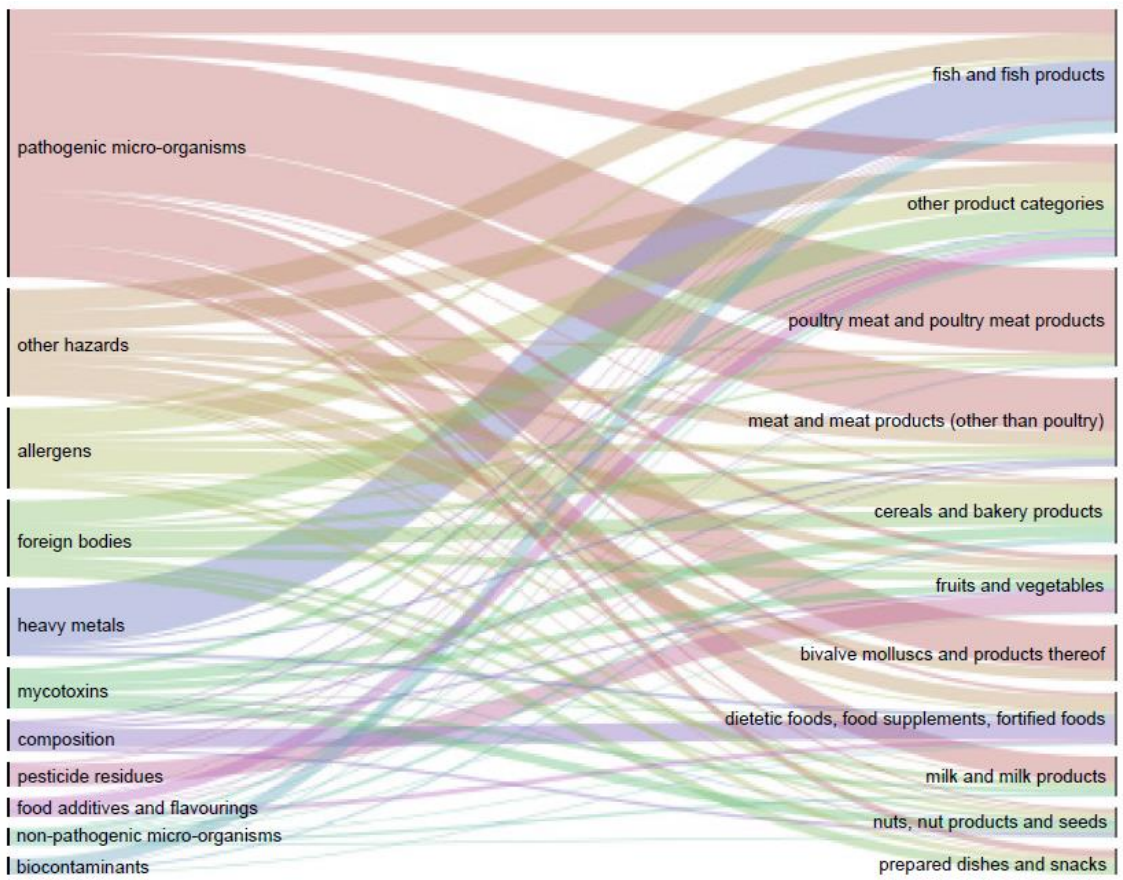

What hazards?

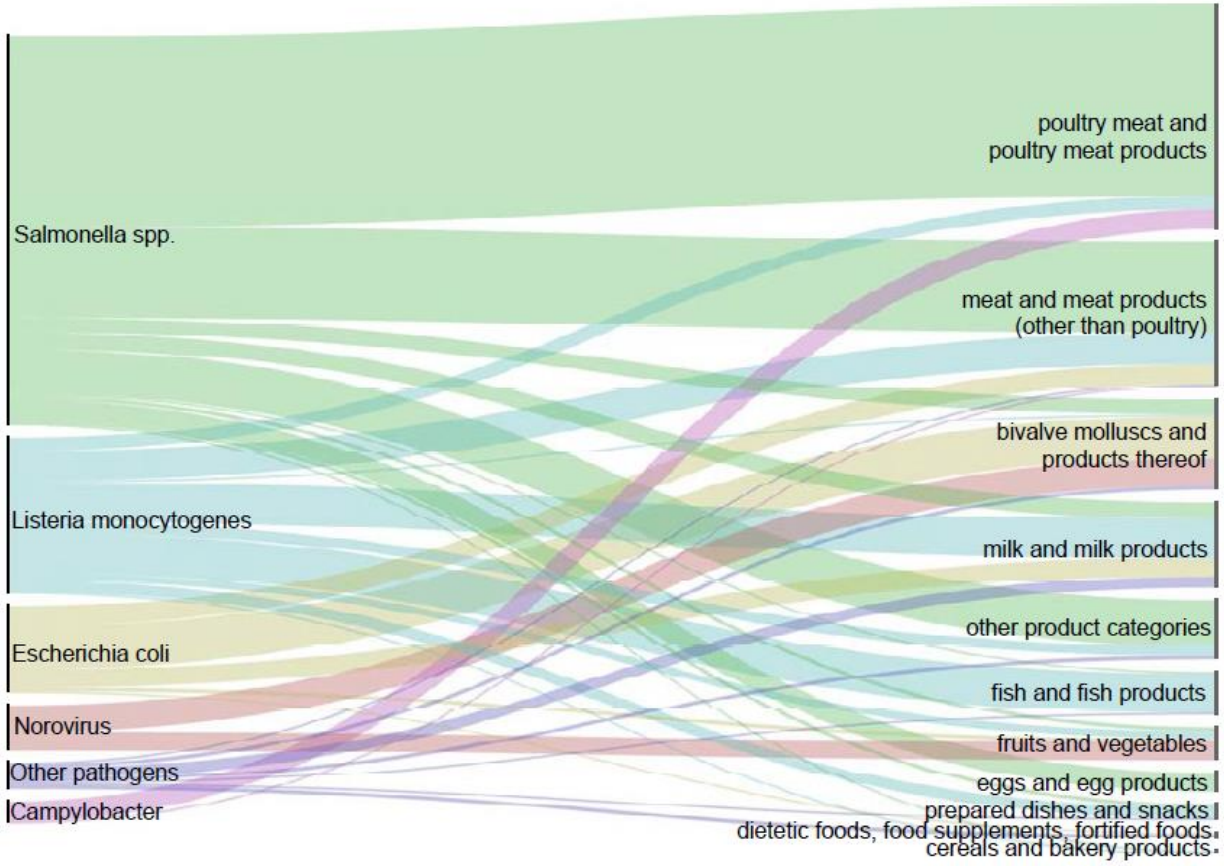



Food intrinsic hazards

Risk Driver	Example
 **Microbiological contamination** (bacterial, virus, parasite, mold, yeast)	• E. coli contamination in meat products • Spoilage of product due to yeasts
 **Chemical and Physical Contamination** (Pesticide, veterinary drug residues, environmental contaminants, intrinsic food toxins)	• Pesticide residue on fruits • Mercury contamination in Seafood • Almond oil: insufficient removal of cyanide
 **Intentional contamination** (tampering)	• Addition of a toxic ingredient to food
 **Declaration of allergens, ingredients and quantities; warnings**	• Non-declaration of an allergen

Most reported food hazards in EU





Source: EC, RASFF Annual report

Most reported food hazards in the United States

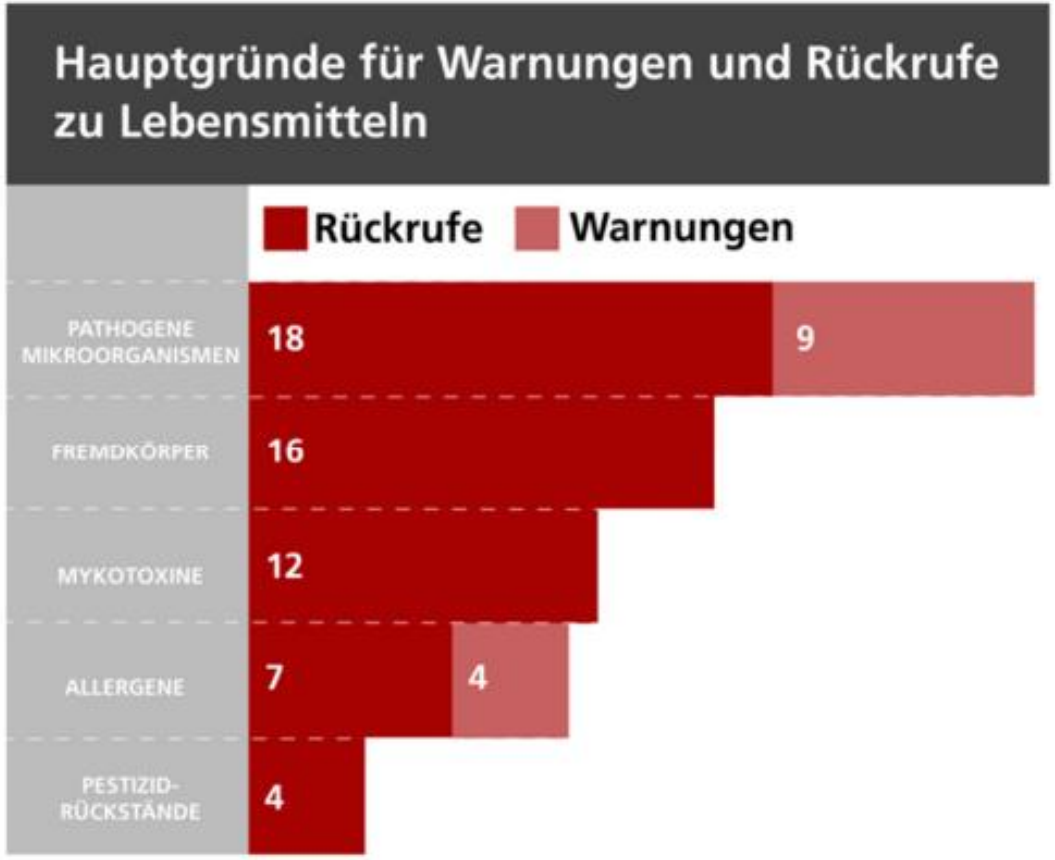
Estimated annual number of foodborne illnesses, hospitalizations, and deaths caused by seven major pathogens, United States, circa 2019

Pathogen	Illnesses	Hospitalizations	Deaths
Campylobacter spp.	1,870,000	13,000	197
C. perfringens	889,000	338	41
Listeria	1,250	1,070	172
Norovirus	5,540,000	22,400	174
Salmonella	1,280,000	12,500	238
STEC	357,000	3,150	66
Toxoplasma	NA	848	44
Total	**9.9 million***	**53,300**	**931**

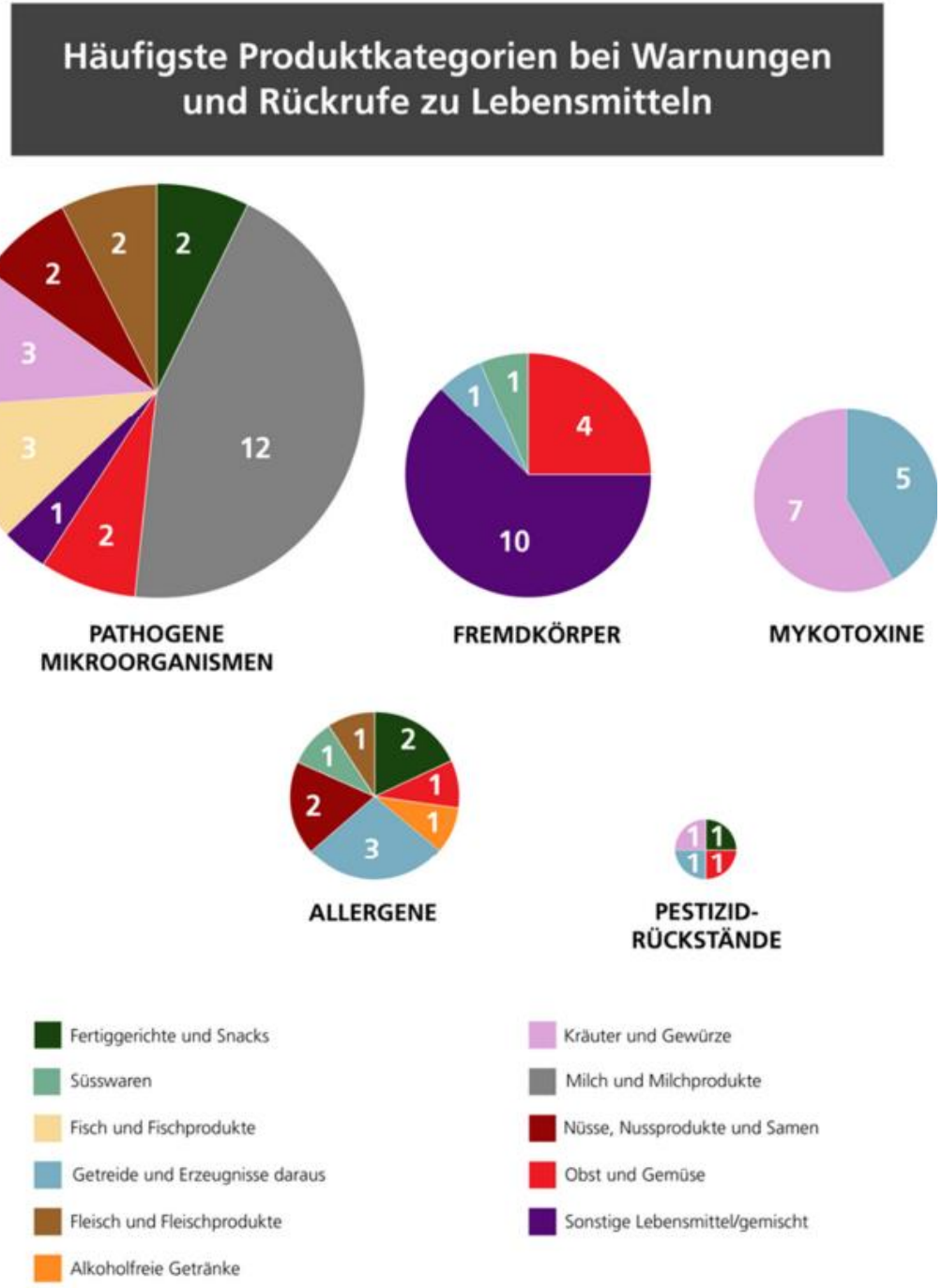
Source: CDC Foodborne illness acquired in the US—Major pathogens, 2019 (2025)

Most reported food hazards in Switzerland

In 2023 73 food recalls and 17 warnings were recorded

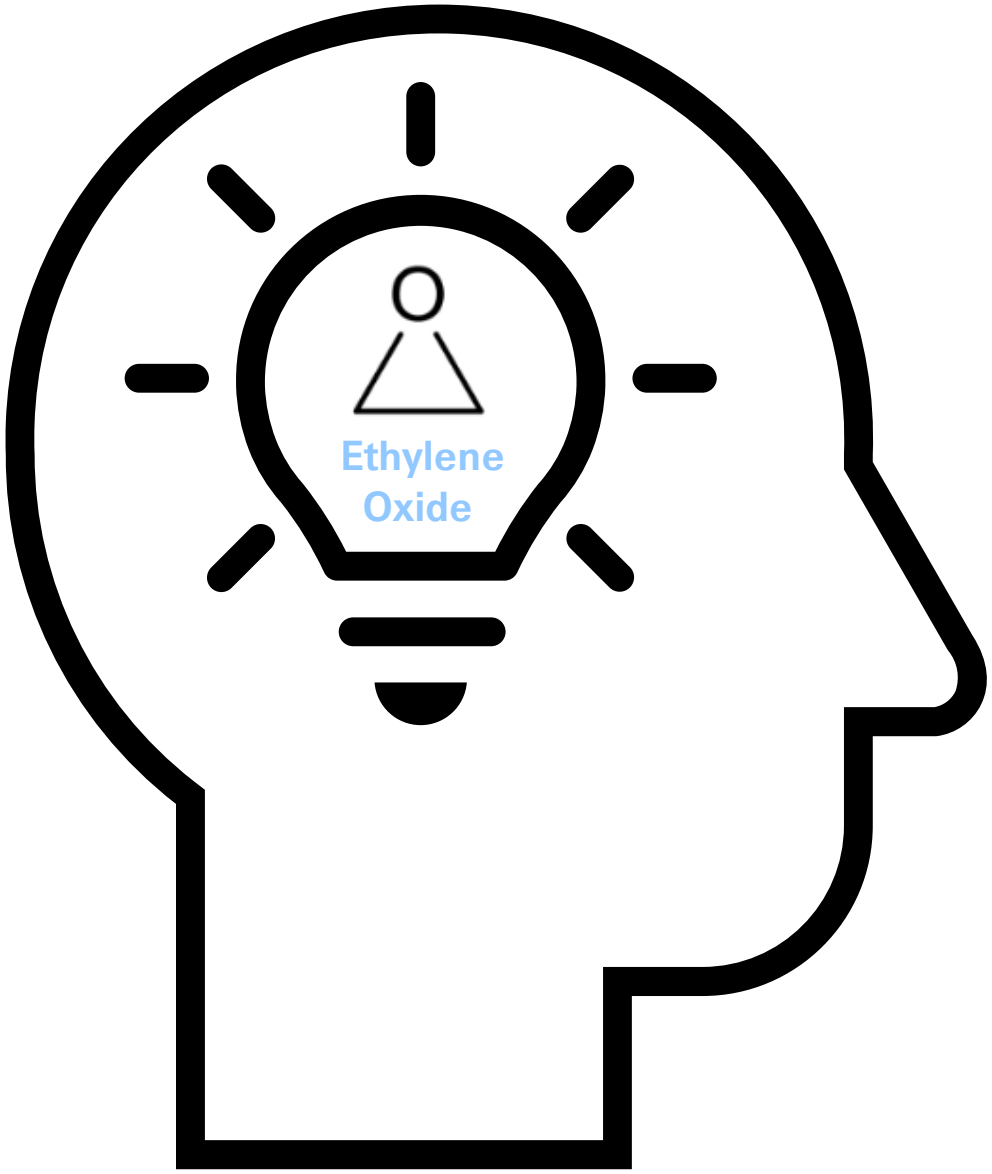


Source: BLV-RASFF Annual report 2023



Ethylene Oxide (EO)

- Very reactive: flammable, irritating, mutagenic, carcinogenic (IARC class I), etc.
- Many uses across industries
- Food industry: fumigation agent for grains (antibacterial activity, etc.)
- EO not allowed for food use in CH and in EU
- EO authorized in food in other countries (US) or even a phytosanitary requirement in others
- The EU definition considers EO as the sum of ethylene oxide and 2-chloro-ethanol (EO degradation product)

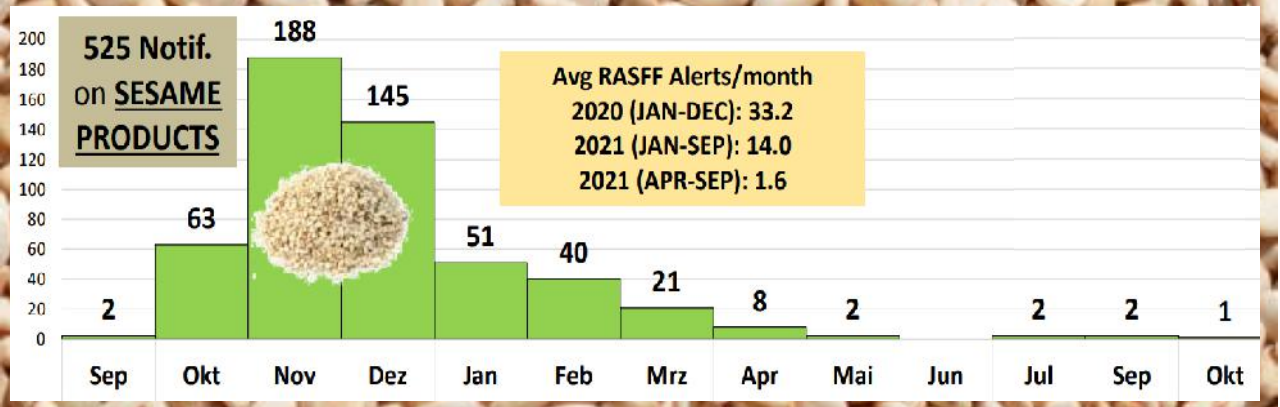


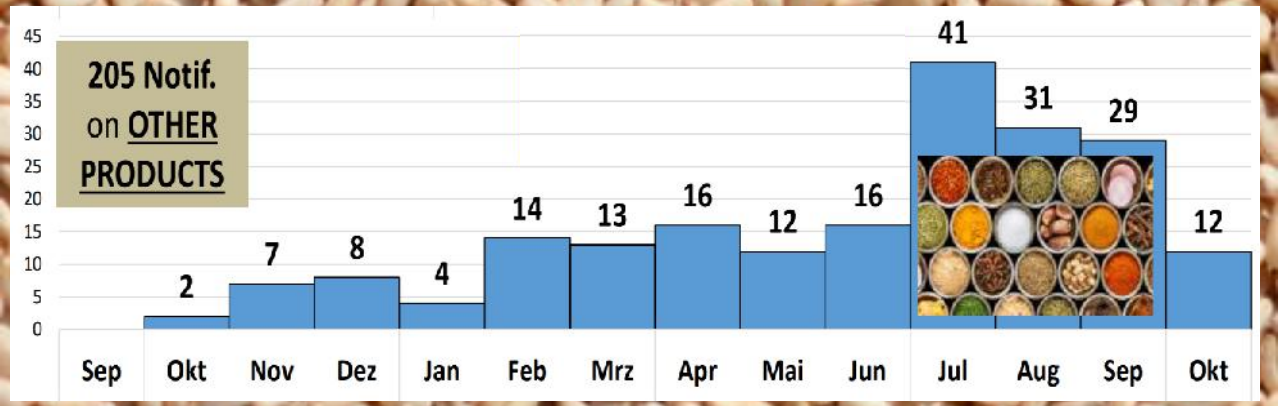
Ethylene Oxide (EO)

- More than half of EU's sesame import (ca 70'000 tonnes annually) originates from India
- On 9 Sep 2020, a notification concerning EO residues was published in the RASFF portal
- Tracing: the affected sesame seeds lots had been delivered to several countries and used to produce various foodstuffs
- Multiple Member States also started a massive tracing and testing operation:
  - 20 Nov 2020, ca140 notifications concerning EO in sesame from India had been notified within the RASFF portal (34 countries associated)
  - As of Jan 2021, 477 notifications on EO (and reports were still coming).

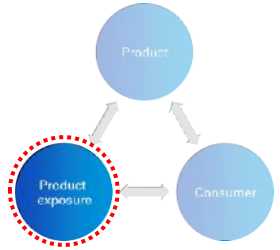
[EU recalls of sesame seed products due to EO residues]

RASFF notifications related to the use of EO until (Sept 2020 – Oct 2021)





Risk considerations II: Product exposure

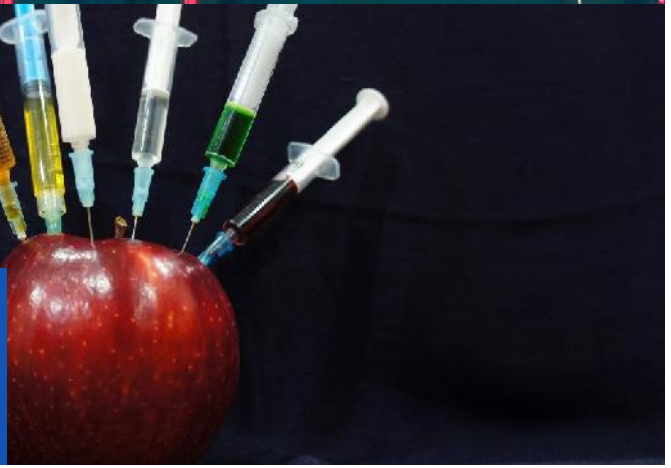


Consumers?

Importance of product?

Product exposure

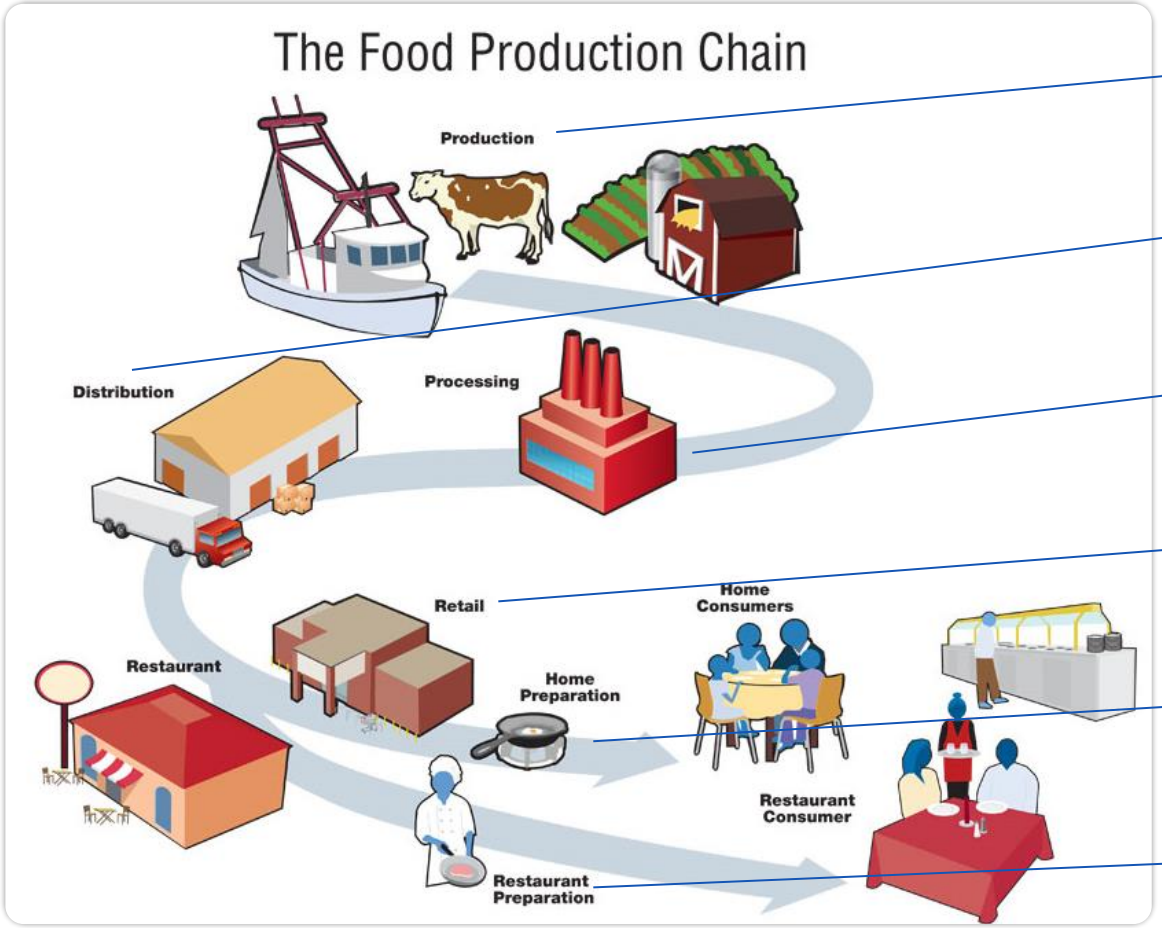
Complexity of supply chain?



Potential of misuse / alteration / fraud?

Parties involved in Food Supply

From farm to fork: Food safety along the chain



Production
food ingredients

Distribution
failure in refrigeration and storage practices

Processing
Unsanitised equipment.
Cross-contamination

Retail
Incorrectly stored.
Past used-by. Tampering

Home Preparation
Under-cooking

Restaurant
Poor hygiene procedures

Trace

Trace the location and status of products across the supply chain

Certifications

Enable reliability with instant acaess to digitized records and documents

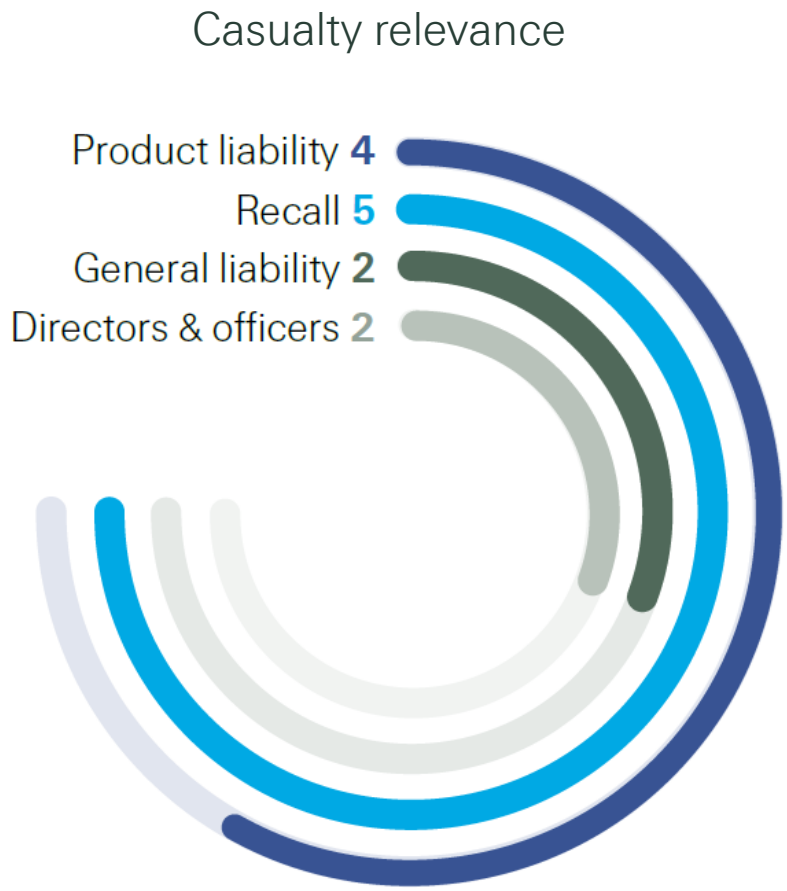
Fresh Insights

Real time supply chain data to extend product shelf-life and freshness

Full traceability of supply chains

Key points to look out:

- Understand the insureds position and responsibilities along the supply chain, as well as their exposure across different regions.
- While new technologies should be embraced, suitable quality management systems (e.g. global Total Quality Management Systems, TQM) will remain at the core of product quality.
- Such quality systems have to be integrated in complex technical and logistic set-ups and should be updated and tested regularly.



Risk Trends in the Food Industry: emerging liability scenarios

Short vs long-tail risks

"traditional" hazards/exposures

- Contamination of tomatoes, water or other ingredients:
  - Bacteria
  - Toxins
  - Chemicals
- Macroscopic contamination, e.g. metal parts
- Labeling, advertising
- Product tampering, Product extortion: brand reputation and deep pocket

long tail exposures

- High sugar content, up to 30 gr/100gr: "Obesity"; "sugar addiction"
- Nanotechnology: nano-silica particles to keep products viscous
- Packaging: Migration from (plastic) packaging to food (PFAS, Phthalates, BPA, etc.)
- Ultra processed foods (altered nutrients mix, poor nutritional value, additives, etc.)

Food Industry Trends

Observations captured through Swiss Re's risk assessments

1	Full traceability of supply chains	Trend description & associated risks
2	Ultra-processed foods	Casualty relevance for the concerning LoBs
3	False advertisement and social media	Insured's view on risk mitigation
4	Lab-grown meat	Insurer's critical view on these risks

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