

CLIMATE CHANGE AND FOOD SAFETY

Angelo Maggiore

Knowledge, Innovation and Partnership
Management Unit

OUTLINE



- 1 Climate change at EFSA - background
- 2 Past example: aflatoxins
- 3 The EFSA climate change project
- 4 Some follow-up (ciguatoxins, vibrio)
- 5 Climate change and the oceans
- 6 Conclusions/recommendations





What EFSA does



Provides independent scientific advice and support for EU risk managers and policy makers on food and feed safety



Provides independent, timely risk communication



Promotes scientific cooperation



**What
EFSA
Does
NOT
do**



Develop food safety policies & legislation



Adopt regulations, authorize marketing of new products



Enforce food safety legislation



FOOD SAFETY IN A TUNA WORLD



Cluster 1 A growing, urbanising and migrating global population

- a An ageing and stabilising European population facing global growth
- b People on the move
- c More people in urban areas



Cluster 2 Climate change and environmental degradation worldwide

- a Accelerating climate change and increasingly severe consequences
- b Increased pressures on ecosystems and biodiversity
- c Increasing environmental pollution and chemical pressure



Cluster 3 Increasing scarcity of and global competition for resources

- a Accelerating global demand for energy
- b Growing demand for materials worldwide
- c Ever increasing demand for land, food and water



Cluster 4 Accelerating technological change and convergence

- a Changing landscape of technological innovation
- b Acceleration, hyperconnectivity and digitalisation
- c Technological convergence



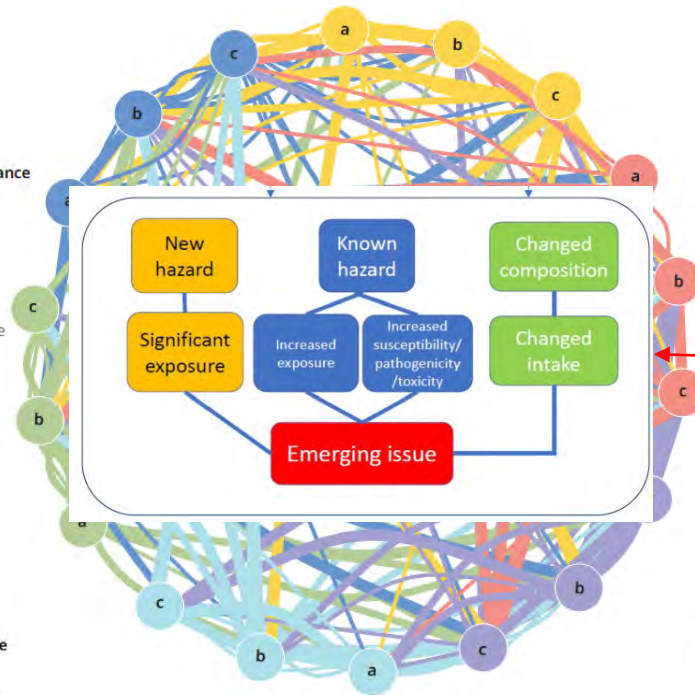
Cluster 6 Diversifying values, lifestyles and governance approaches

- a Emerging lifestyles, work patterns and learning opportunities
- b Shifting health and social challenges
- c Evolving governance challenges and approaches



Cluster 5 Power shifts in the global economy and geopolitical landscape

- a Global changes in economic power
- b Contrasting fortunes in the global economy
- c Geopolitical power shifts, tensions and uncertainties



TUNA, VUCA world

preparedness to the future

scanning the food safety environment: drivers of change, emerging trends, emerging risks

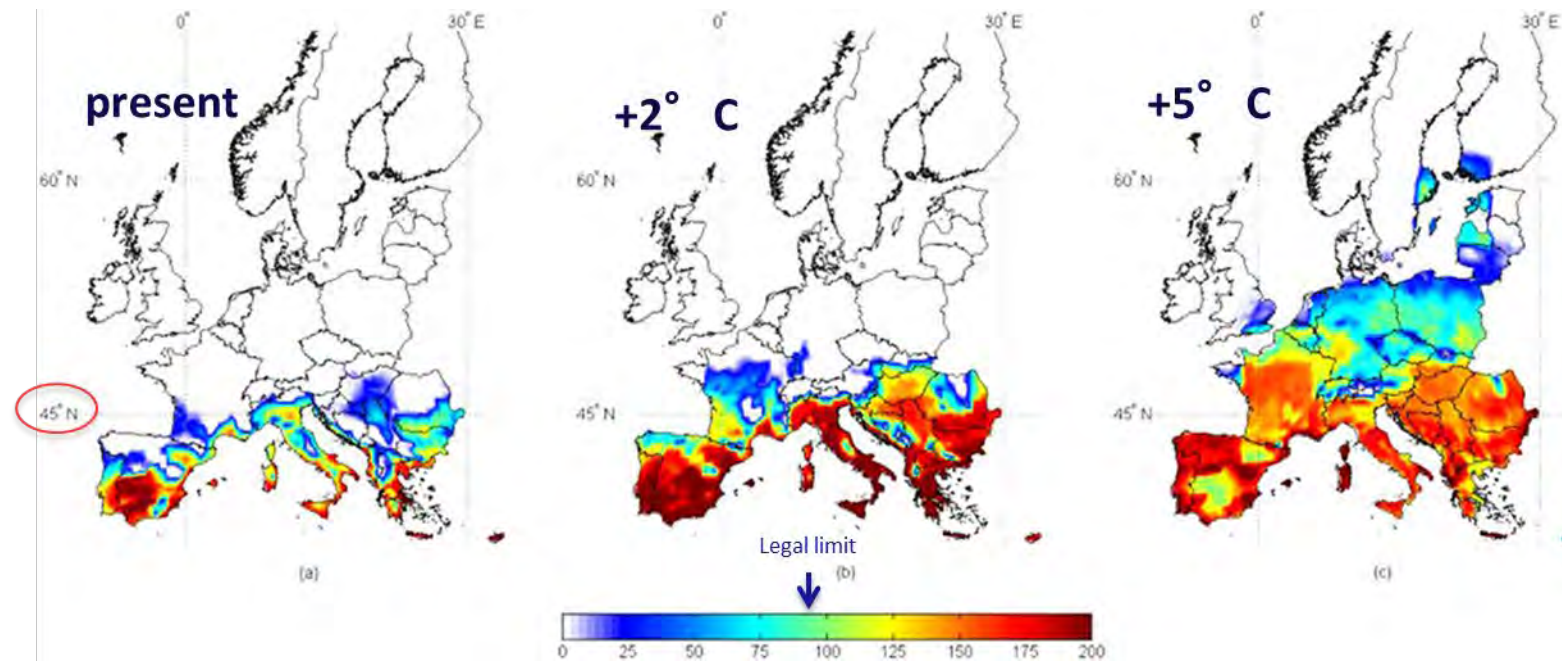
Climate change as a driver of emerging risks

long term anticipation/prevention



EXAMPLE: RISKS OF AFLATOXINS IN MAIZE, WHEAT AND RICE

The risk of aflatoxin contamination due to *A. flavus* is expected to increase in maize, both in the +2 °C and +5 °C scenarios, to be negligible in wheat and absent in rice.



Modelling, predicting and mapping the emergence of aflatoxins in cereals in the EU due to climate change



CLEFSA - CLIMATE CHANGE AS A DRIVER OF EMERGING RISKS FOOD AND FEED SAFETY, PLANT, ANIMAL HEALTH AND NUTRITIONAL QUALITY



Driver

- Long term anticipation/prevention
- Several emerging issues
- Scenarios/indicators



Horizon scanning for identification

- CLEFSA Network
- Crowdsourcing
- Broad range of signals - Variety of information sources



Characterisation

- Multi-Criteria -> scoring
- Participatory

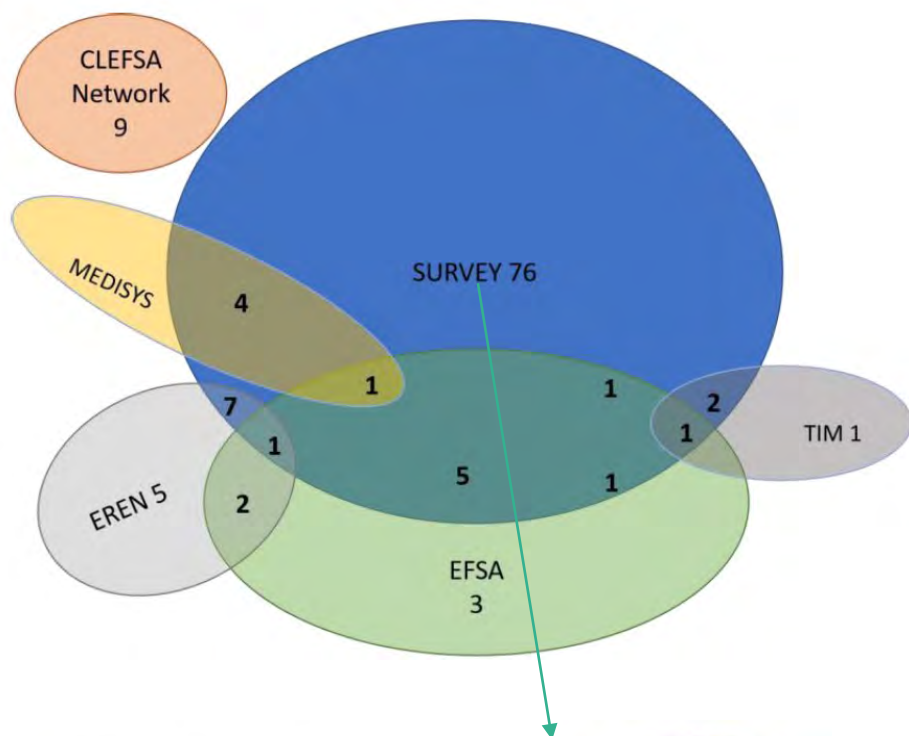


Analysis

- Impact-likelihood
- Indicator of effect of climate change
- Indicator for uncertainty



HORIZON SCANNING FOR IDENTIFICATION OF EMERGING RISKS/ISSUES DRIVEN BY CLIMATE CHANGE



- Scientific publications
- Reports
- Newspapers
- Social media
- Conferences
- Magazines
- Trade or business publications
- Specialised scanning systems
- Other



EFSA's areas	# characterised	# uncharacterised	TOTAL
Animal health	34	-	34
Biological hazards human health	25	5	30
Plant health	17	19	36
contaminants	19	4	23
nutrition	6	-	6
TOTAL	101	28	129

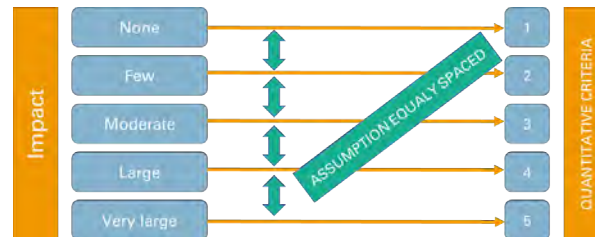
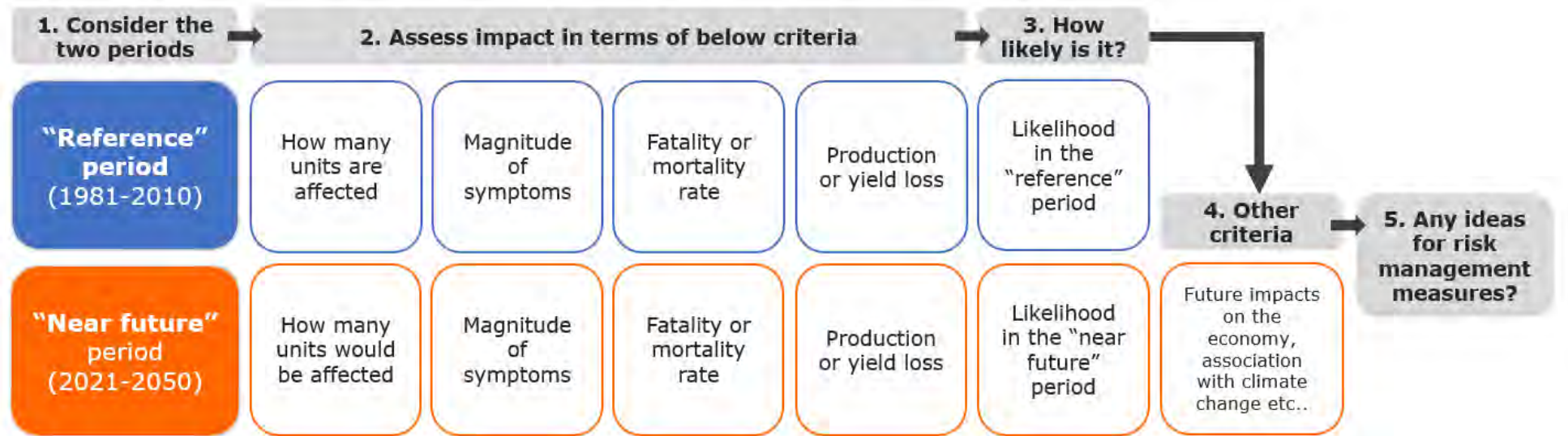


CHARACTERISATION

For each emerging issue...



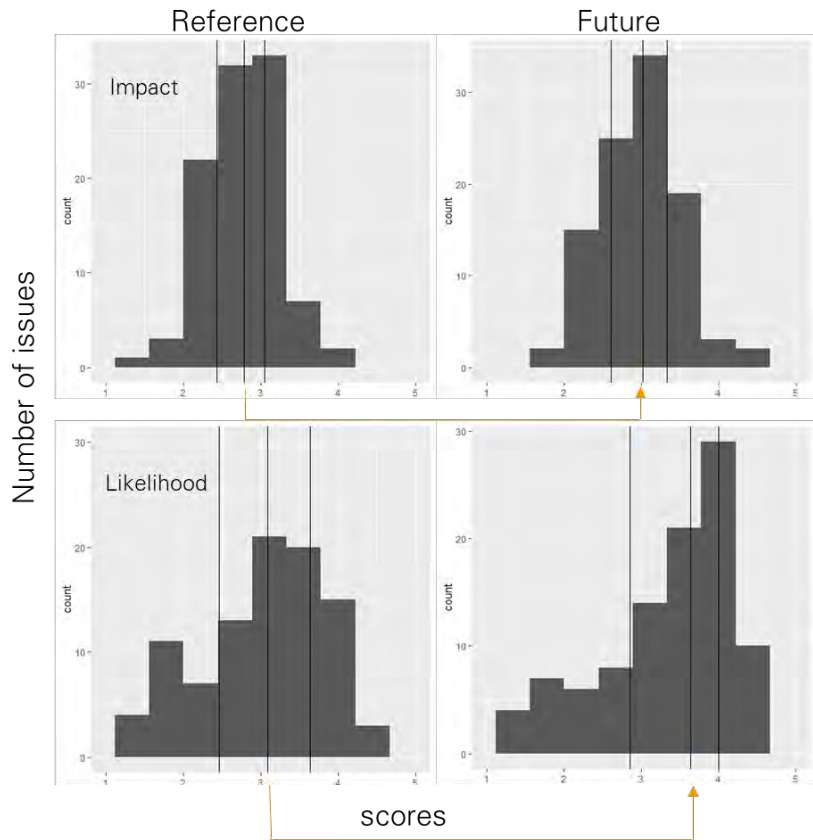
60 experts



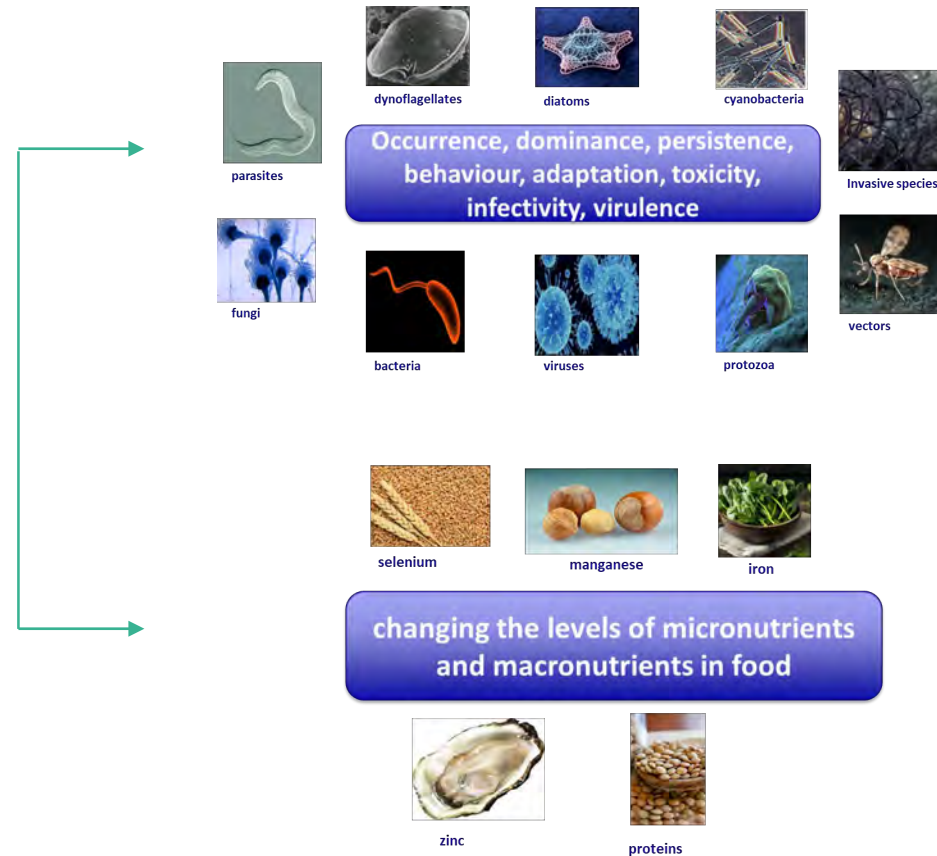
LIKELIHOOD OF EMERGENCE	Score
Very Unlikely: $\leq 10\%$	1
Unlikely: $\leq 33\%$	2
About as likely as not: $\approx 50\%$	3
Likely: $\geq 66\%$	4
Very likely: $\geq 90\%$	5



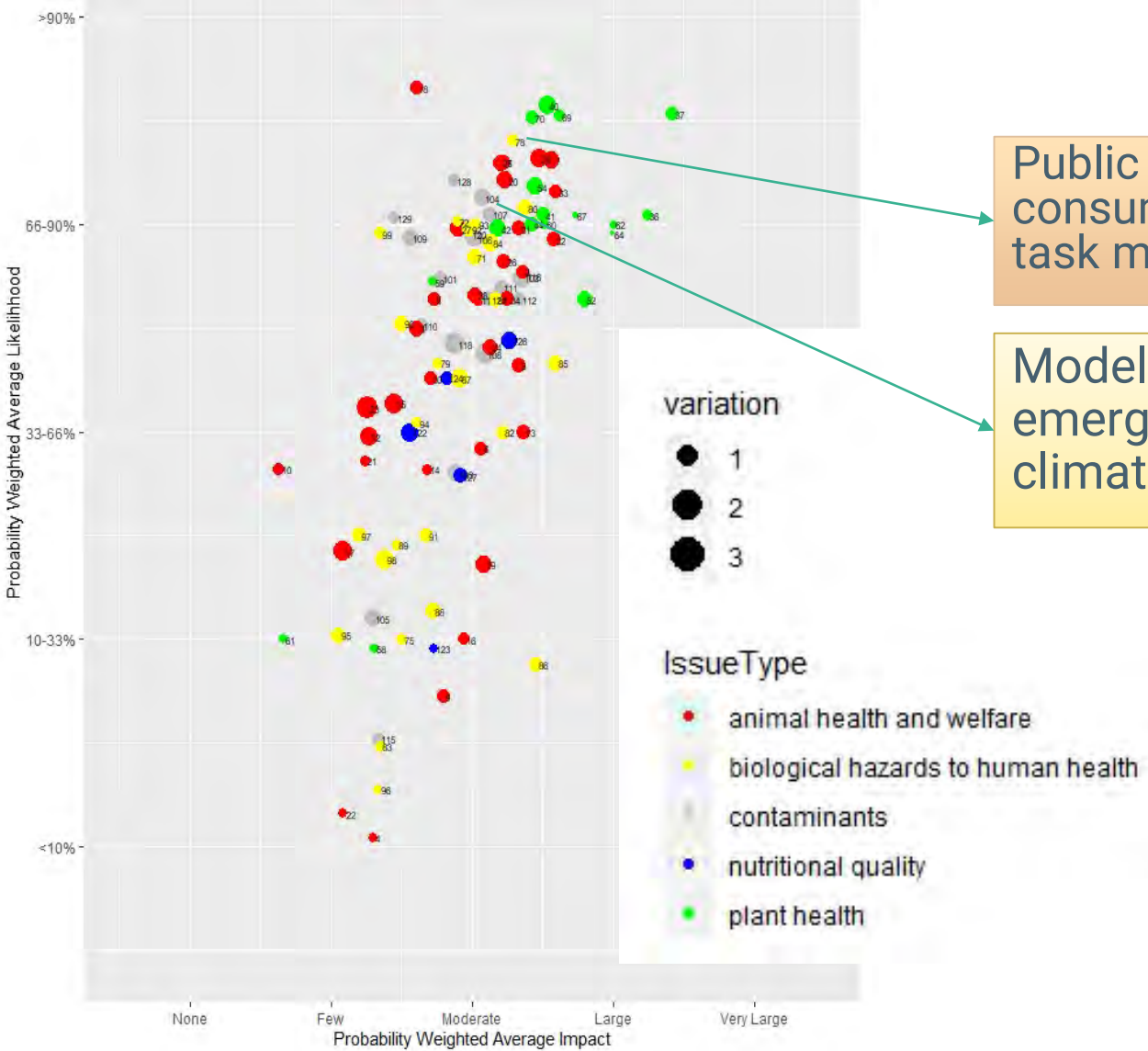
ANALYSIS - OVERALL EFFECTS OF CLIMATE CHANGE



increase the IMPACT (severity, duration and/or frequency) of food-borne or vector-borne diseases or increase the LIKELIHOOD of their emergence.



SPECIFIC EMERGING ISSUES DRIVEN BY CLIMATE CHANGE



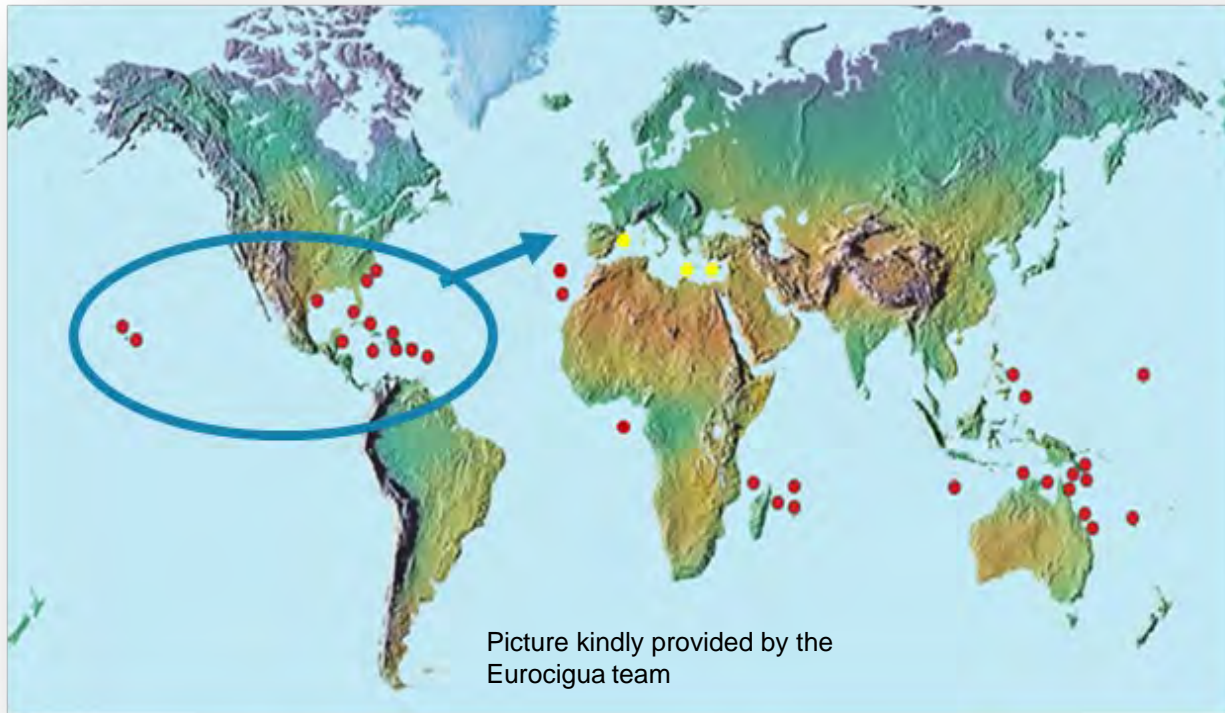
Public health aspects of **Vibrio** spp. related to the consumption of seafood in the EU (Biohaz panel self-task mandate)

Modelling **ciguatoxin** producing microalgae and the emergence of ciguatoxins in fish in Europe under climate change scenarios (Eurocigua grant)



EUROCIGUA II

AN INTEGRATED APPROACH TO CHARACTERIZE THE HUMAN HEALTH RISKS OF CIGUATOXINS IN FISH IN EUROPE



- Modelling toxin producing microalgae and the emergence of ciguatoxins in fish in Europe under climate change scenarios

EFSA's topics: [Ciguatoxins and other marine biotoxins](#)



INDIRECT EFFECTS: SOME EXAMPLES



PESTICIDES AND
VETERINARY
DRUGS



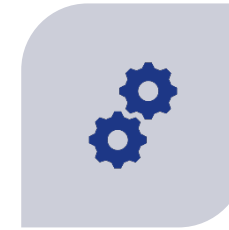
FOOD HYGIENE



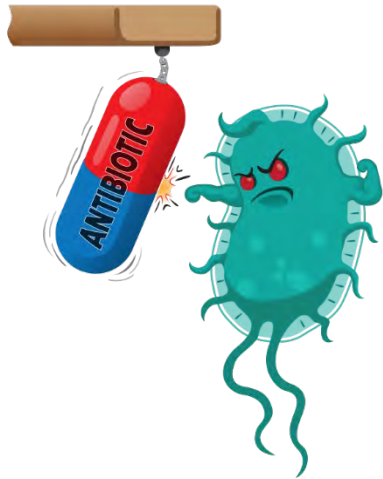
UPTAKE OF
CIRCULAR
PRACTICES



UPTAKE OF NEW
TECHNOLOGIES



TRANSFORMATION
AGRIFOOD
SYSTEMS



without systems thinking even desirable innovations might have unintended consequences for food safety



CLIMATE CHANGE AND THE FUTURE OCEANS



Transport and trades



Energy production (e.g. waves)



Deep sea mining rare elements



Recreational and cultural



packaging



Floating cities?



Ocean crops (e.g. rice)



Saline farming



Deepwater farming



Marine permaculture



Integrated multi-trophic aquaculture (FAO 2009)



Protein-rich animal feed

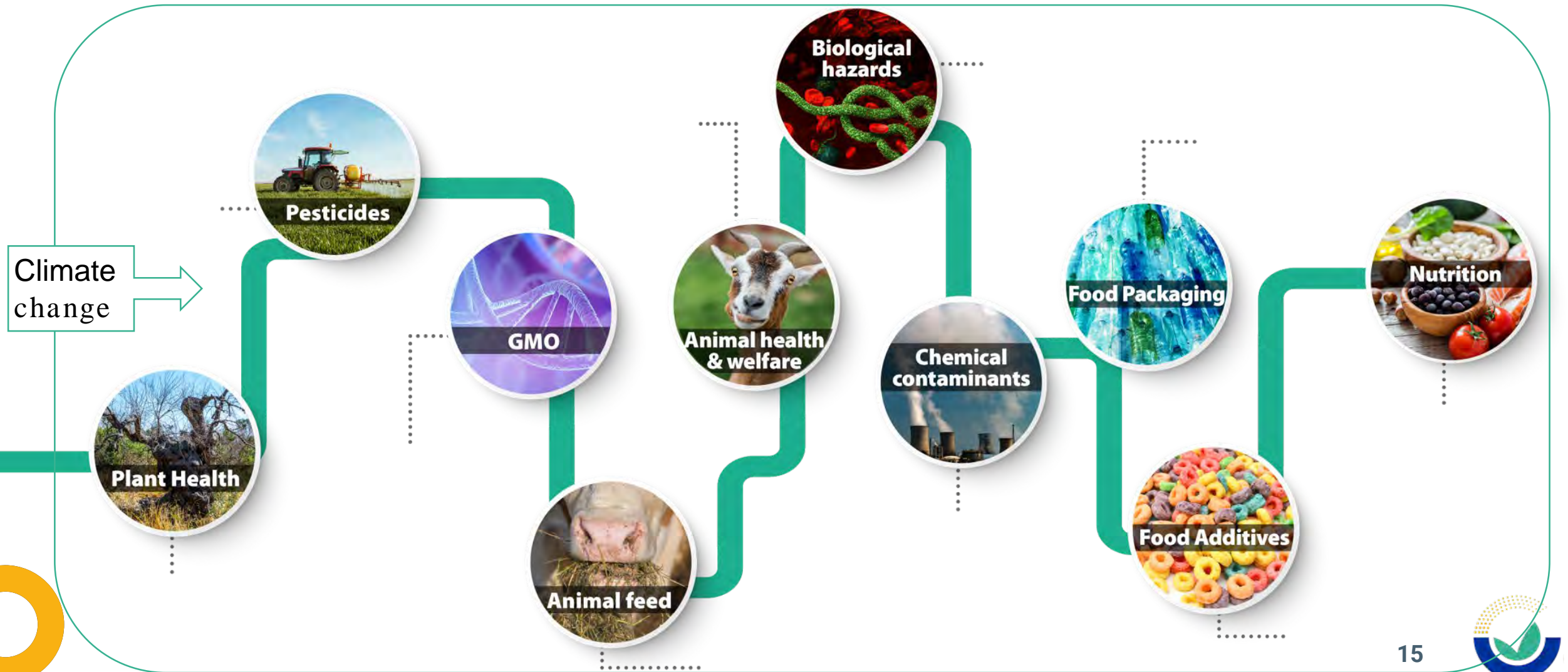


<https://www.weforum.org/agenda/2020/02/ice-melting-arctic-transport-route-industry/>

Future uses of the ocean and its resources that may impact the food and feed systems, in a context of global drivers of change



FOOD SAFETY FROM FARM TO FORK



CONCLUSIONS



Navigating an uncertain and complex world -> drivers of change



Cooperation, engagement and public participation allow to identify many potential issues (... weak signals)



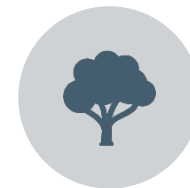
Expert knowledge/networking needed for characterisation and sense making



Increase severity, duration and/or frequency of the potential effects



Increase the likelihood of emergence



marine biotoxins and biological hazards





RECOMMENDATIONS



Methodological developments for preparedness to the future (e.g. *post-normal science*)



Surveillance and monitoring



Integrated policies (one-health)



Revisiting risk assessment approaches



Cooperation



QUESTIONS?

LISTEN TO OUR PODCAST
Science on the Menu – Spotify,
Apple Podcast and YouTube

- Episode 7 – [Climate change: what it means for food safety](#)



The screenshot shows the EFSA website interface. At the top, there are navigation links: 'Other sites', 'EFSA', 'Open EFSA', 'EFSA Journal', and 'Contact'. The EFSA logo is prominently displayed, along with the text 'EUROPEAN FOOD SAFETY AUTHORITY'. There are also language options for 'EN' and 'English', and a 'Menu' button. A search bar is visible on the right. Below the navigation, there are breadcrumb links: 'Home', 'All contents', 'Podcast', 'Episode 7 - Climate change: what it means for food safety'. The main heading of the page is 'Episode 7 – Climate change: what it means for food safety'. Below the heading, it states 'Published date: 15 May 2023' and 'Duration: 20:16'. There are social media sharing icons for Twitter, Facebook, and LinkedIn. The main text of the episode description reads: 'Most of us will be familiar with the impact climate change has on the environment – biodiversity loss, rising sea levels, higher temperatures and much more. But it also has direct and indirect effects on the safety of our food and this is something that EFSA has to take into account when assessing risks to human, animal and plant health. Join us as we talk to one of our experts, Angelo Maggione, about how climate change can act as a driver of emerging risks in the area of food and feed safety.' At the bottom, there is a video player interface showing a play button, a progress bar, and the duration '20:16'.



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