# Climate change and food safety

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#### Climate change an issue for food safety?

 Results of an international Delphi Survey performed in GO-GLOBAL (EU FP6 project)

#### Potential effect of climate change on food safety

### Conclusions



### Is climate change an issue for food safety?

Collation of expert opinion of global stakeholders regarding drivers of food safety risks was performed in the EU FP 6 project GO-GLOBAL



www.goglobalnetwork.eu

#### Method used: Delphi technique

Wentholt, M.T.A., Fischer, A.R.H., Rowe, G., Marvin, H.J.P., & Frewer, L.J. (2010). Effective identification and management of emerging food risks: results of an international Delphi survey. Food Control, 21; 1731-1738.



#### A procedure to:

"obtain the most reliable consensus of opinion of a group of experts ... by a series of intensive questionnaires interspersed with controlled opinion feedback"

Some characteristics of Delphi method:

- Internet based with several rounds
- Number of rounds may vary
- Anonymous
- Shows issues of consensus



## Overview of the GO-GLOBAL Delphi study





## Results of the GO-GLOBAL Delphi (round 1)

#### First round Delphi (summer 2007)

- 49 returned questionnaires with usable data
- Global response
- Language: English
- Emerging risk definition needed
- Issues of importance for global society
  - Climate change
  - Increased disease prevalence
  - Development of technology
  - War and terrorism
  - Economic depression



## Results of the GO-GLOBAL Delphi (round 3)

Most important drivers of emerging food risks in your country (next 20 years)





## Results of the GO-GLOBAL Delphi (round 3)

What are the most important emerging food risks *in your country*?





## Results of the GO-GLOBAL Delphi (round 3)

What are the most important emerging food risks *in your country*?

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## Results of the Delphi survey supported by trend analysis performed in WP3 of GO-GLOBAL

- Database with research projects
- > 600 entries
- 11 countries includes

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Research topics with common interest (all countries):



Microbial & chemical contamination, Mycotoxins, pesticides (monitoring, analysis)



### Major drivers of food safety risks





## Climate change: driver of food safety risks

#### Projected effects of Climate change

- Food production (due to elevated temperatures and increased CO<sub>2</sub> levels)
  - Differences per region
    - Temperate regions; an increase (e.g. Europe, Canada, China [5-12%])
    - (sub) tropical region; a decrease (e.g. India, Mexico, South-Africa, Ethiopia [21-29%]
- Fluctuations in food production and food prices
- Diseases and plagues (shifting and new)
- Food safety
- Changing ecosystems
- Employment
- Migration



#### Changing temperature of land and sea in Europe





#### Projected temperature increase (land) in Europe



Note: Temperature change (°C). Relative to average temperature in the period 1961–1990. Intermediate ACACIA scenario in a broad range of possible future emissions. Source: IPCC, 2001b; Parry *et al.*, 2000.



### Climate change: driver of food safety risks

Most relevant climate factors related to food safety risks

- 1. Precipitation
- 2. Temperature (land and water)
- 3. Drought
- 4. Weather extremes
- 5. CO<sub>2</sub> levels
- 6. Floods



#### Examples of expected food safety problems

#### Climate change driven:

- Increase growth of weeds, plant diseases and effect of pesticides => risk of more residues
- Increased prevalence of natural toxins (mycotoxins, phycotoxins, phytotoxins)
- Increased contamination of surface water (e.g. heavy metals, PAHs, PCBs, etc.) => uptake by crops
- Increased bioavailability of contaminants (e.g. Hg with increasing temperature)
- Increase of animal diseases => increase use of veterinary drugs
- Increase of microbial infections as a consequent of increasing temperature (e.g. *E. coli* O157, *Campylobacter, Salmonella*)
- Growth of microorganisms in the fresh chain



### **Conclusions**

- There is general consensus that climate change will have an effect on food safety
- Microbial and chemical contaminations are seen as the most important emerging risks in the future
- Information exchange and data sharing are key elements in a successful strategy to combat food safety risks



# Thank you for your attention

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