

# Climate Change: Food Safety Implications

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## Outline

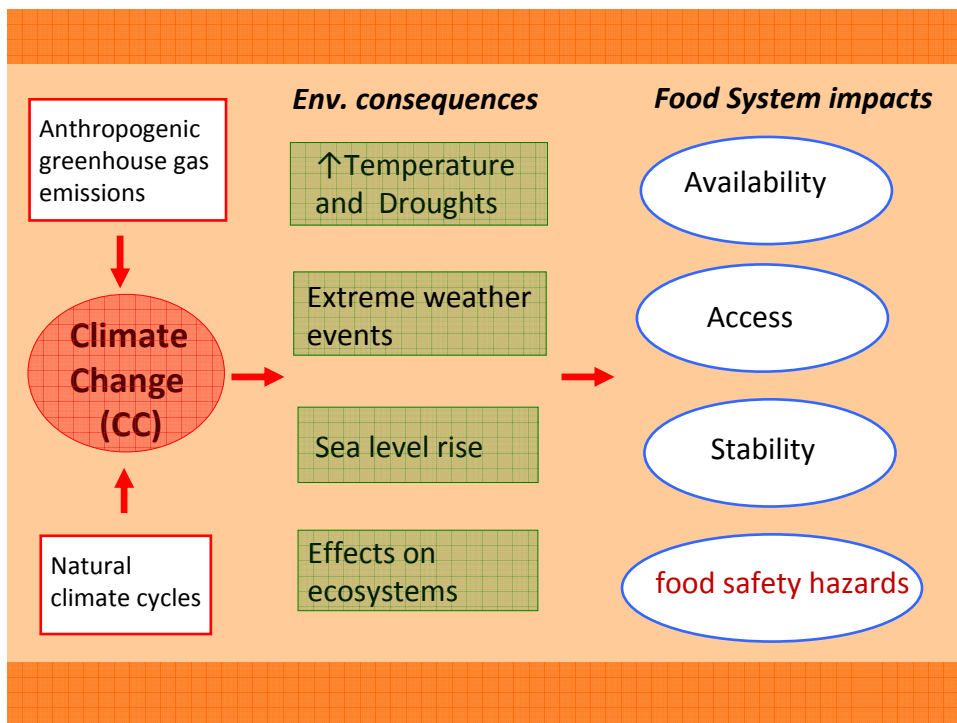
- Should the food safety community be concerned with climate change?
- What are the possible implications
  - microbiological hazards
  - mycotoxins and biotoxins
  - chemical residues
  - environmental contaminants
  - water availability
- So what do we do now?

## Good Food Safety Managers...

- Doing the same thing over and over again sometimes does not achieve the same outcome
- Climate change is one of many factors that might lead to new food safety risks

Many countries do not have the basic elements of a food control system properly in place

*- And addressing this remains their #1 priority*



## Where/how does CC impact Food Safety?

Bacteria, viruses and  
parasitic protozoa

Toxinogenic fungi

Toxic algae (HABs)

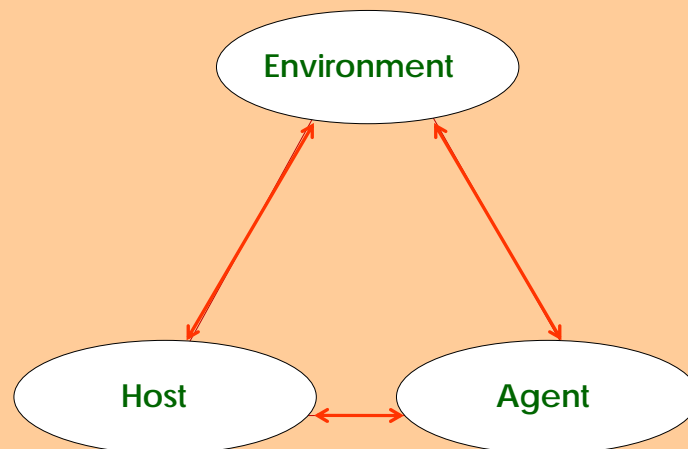
Environmental  
contaminants

Changing patterns  
of plant and animal  
disease

Emergency  
situations

Water quality and  
availability

## Climate change and disease



## Bacteria, viruses and parasitic protozoa

- Seasonality of some foodborne disease is well documented
  - environmental factors can influence abundance, survival and virulence of pathogens
  - unclear how this would relate to long-term warming effects
  - population susceptibility and behaviour are also factors
- Factors affecting proliferation of micro-organisms can be complex e.g. *V. cholerae*
- Microbial evolution and stress response
  - exposure to sub-lethal stress can condition organisms to survive even greater stress
  - cross protection and gene transfer potentially complicate the issue further

## Mycotoxin contamination

- A major food safety issue with huge public health and trade implications
- Rising temperatures could lead to an extension of latitudes at which toxicogenic fungi can compete
  - A. *Flavus* occurrences leading to outbreaks of contamination in S. Europe and in US
- Adverse conditions to the plant
  - drought stress
  - poor nutrient status
  - stress induced by pest attack
- Infrastructure and facilities to minimise post-harvest accumulation of mycotoxins

## Harmful Algal Blooms

- A longstanding public health issue
  - Surveillance and control of access to contaminated sites are main elements of control strategy
- Changing distribution, patterns of occurrence and toxicity
  - Surface temperature and water stratification
  - Nutrient pulses and nutrient composition
  - Acidification of waters

## Zoonoses and other animal diseases

- Increase in the susceptibility of animals to disease
  - exposure to intense cold, droughts, excessive humidity or heat may predispose animals to disease
- Increase in the range or abundance of vectors/ animal reservoirs
  - Climate change can alter the range, seasonality and incidence of many zoonotic diseases
- Prolonged transmission cycles of vectors
  - Earlier spring prolongs the transmission cycle of mosquito and other vectors, resulting in an increased incidence of human infection

Coping with new zoonoses and other animal disease requires considerable scientific and technical capacities:

- Scientific data on drugs to facilitate risk assessment and establishment of mrls
- Ensuring good animal husbandry practices

## Environmental contaminants

- Contamination of water
  - pollutants (pesticides, fertilizers, organic matter, heavy metals, etc.) will be increasingly washed from soils to water bodies by growing intense rainfall
- Flooding
  - increased frequency of inland flood leads to higher chemical contamination of agricultural and pastureland soil
  - alternating periods of drought and floods increases degradation
- Ocean warming
  - Increasing ocean temperatures facilitates methylation of mercury, and subsequent uptake of MeHg by fish and mammals

## Emergencies situations

CC is altering disaster risk patterns:

- increase in the frequency and intensity of extreme events
- changes in the geographical distribution of areas affected
- increase in the vulnerability of particular social groups and economic sectors
- Increase in natural disasters and humanitarian crises

**Food in affected areas may become contaminated either microbiologically and/or chemically**



**Importance of emergency preparedness and response plans that adequately consider food safety**

## Conclusions

- Existing FAO guidance on ***national*** Food control systems remains valid in the face of climate change
  - Effectively managing merging challenges related to cc require many of the same tools and capacities
  - Need to optimise use of those tools by looking for the right things, in the right places, in the right way
- Interdisciplinary approaches are needed - environmental health, human, plant and animal health, and food safety are inter-related
- Good practices along the food chain remain the cornerstone of food safety management – Guidelines may have to be adjusted according to improved understanding of changes in occurrence of chemical and microbiological hazards
- Monitoring and surveillance are essential
- Strengthen dialogue with the public
- Establish mechanisms that assure effective management of food safety in emergencies

## Conclusions

### **Issues to be addressed at international level**

- Ensuring continued support and enhanced cooperation in delivering effective assistance for food safety capacity building in developing countries
- Improving our understanding of what to expect and what to look for
  - Integrated and global surveillance
  - Collaboration in developing predictive models
- Meeting needs for international food safety risk assessment
- Collaboration on key research priorities
  - Which wonders of nanotechnologies?
  - Meeting EHS targets for research

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