



International 58th Meat Industry Conference “Meat Safety and Quality: Where it goes?”

## Meat safety in the climate change context

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### Abstract

Climate change is a global phenomenon in the 21<sup>st</sup> century which may have impact on the occurrence of meatborne hazards at multiple points in the meat chain continuum, from the primary production through to consumption. The assurance of meat safety is a complex task, which requires strong inter-sectoral cooperation between relevant stakeholders such as Competent Authority, Academia, Food Industry and Consumers. The emerging food safety risks due to climate change may pose a serious challenge to the meat safety control system. Therefore, a better understanding of anticipated changes would be of the utmost importance for governments to ensure preparedness.

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### 1. Introduction

Climate change is a global phenomenon in the 21<sup>st</sup> century which may have both direct and indirect impact on the occurrence of meatborne hazards at multiple points in the meat chain continuum, from the primary production through to consumption<sup>1</sup>. Assuring the meat safety is a complex task, which requires an active involvement of the major stakeholders: Competent Authorities, Academia, Food Industry and Consumers. The modern, risk-based meat safety management system relies upon integrated, synergistic and coordinated controls at major stages/modules

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along the meat chain, 'from farm-to-fork' (Table 1). However, emerging food (meat) safety risks due to climate change may still pose a serious challenge to the meat safety control system, in terms of industry food safety management programmes, public sector food safety activities (environmental/veterinary/food/health authorities) and risk assessors.

Table 1. A 'modern' - integrated meat safety management system.

Meat chain – modules	Risk management
I On-farm	Animal welfare
	Animal Health Status/Heard Health Surveillance Programme (HHSP)
	Biosecurity
	Feed
	Vaccination
	Waste management
II Transportation	Pathogen-free farms
	Animal welfare
	Stress prevention
	Prevention of cross-contamination between animals
Livestock market	Logistic separation of animals from different farms
Collection centre	
Lairage	
III Slaughter	Training
Meat processing	GHP/GMP
	SSOP
	HACCP
	Microbiological criteria (process hygiene and food safety)
IV Storage	Good Warehousing practice (GWP)
Distribution	Good Distribution Practice (GDP)
Retail	Good Retail Practice (GRP)
	Prevention of cross-contamination during handling
V Consumer	Proper cooking
	Prevention of post-cooking re-contamination

A better understanding of changes that might arise in the close future is an essential first step to ensuring preparedness for those changes. It would be, therefore, of utmost importance for governments to be prepared for those anticipated events.

## 2. Meatborne disease agents

Evidence of the impact of climate change on the transmission and incidence of foodborne diseases comes from a number of sources, e.g. seasonality of foodborne and diarrheal disease, changes in disease patterns that occur as a consequence of a temperature<sup>2</sup>, and association between increased incidence of foodborne illness and severe weather events (e.g. floods, draughts, storms)<sup>3,4</sup>. Extreme climate events may alter the risk of pathogen infections and diseases in both animals and plants, modifying the host–pathogen dynamics in a wide range of species. Valuable information on complex interactions that occur between hosts (meat animals), pathogens, and the environment, is needed in order to pave the way for predictive models and ultimately, early and efficient response to disease threats<sup>5</sup>. For instance, the change of local climatic conditions may influence local vegetation and crop production which, in turn, may affect the quality/safety of animal feed and provoke changes in food (meat) animal epidemiology<sup>6</sup>. Furthermore, insects and other vectors may carry foodborne pathogens and enter new ecological zones. Therefore, farmers may need to adjust the timing of on-farm pest control as pest life cycles also respond to climate change.

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