

21 October 2019

ISSUE 2/2019



Food Safety Update

Introduction

Welcome to the second edition of our United Fresh bi-monthly Food Safety Update. These updates will provide you with a snapshot of information on topical and relevant food safety issues including links to allow you to take your knowledge further.

We welcome your feedback on this service as well as any questions and comments on the topics included.

In this issue we are looking at three articles on climate change and its potential impact on foodborne illness, production and business management.

Climate change is a result of greenhouse pollutants (e.g. carbon dioxide and methane) collecting in the atmosphere, where they act as a blanket, warming the surface of the Earth. These gasses mainly come from human activities such as burning oil, coal and gas, as well as industrial agriculture. As the world warms up, we are experiencing more and more devastating cyclones, droughts, floods, food shortages, sea level rise and coastal erosion¹.

Climate change continues to be in the news. The Youth Climate Strike Movement continues to put pressure on governments to take action in order to preserve our environment for generations to come through sustainable practices. Land is crucial to almost everything we do from food production to energy creation and use as well as cultural identities. It is therefore important that we find more sustainable ways to use and look after our land.

The latest pressure group to emerge, the Extinction Rebellion², claims on its website that *"We are facing an unprecedented global emergency. Life on Earth is in crisis: scientists agree we have entered a period of abrupt climate breakdown, and we are in the midst of a mass extinction of our own making."*

Whether we agree with these views or not, at the very least we need to understand the impact groups like these can have on the way the fresh produce industry conducts its business.

¹ <https://www.oxfam.org.nz/what-we-do/issues/climate-change>

² <https://rebellion.earth/>

Adapting to Climate Change - Information for the New Zealand Food System

(A joint project involving the Institute of Environmental Science and Research (ESR), AgResearch, NIWA & Massey University and funded by a Sustainable Land Management and Climate Change Fund administered by MPI completed in 2017)

This project looked at the anticipated changes in the New Zealand food system, as a result of climate change over the next 50-100 years. Until this project, there had been no assessment of New Zealand's food system and the many links and processes in the food value chain that might be impacted, from greater cooling needs and energy requirements, quicker food spoilage, to food safety issues.

The project team looked at issues such as cold storage, food spoilage, food safety, changing food disease profiles and harvest times with a focus on the impact of increased temperature and moisture change.

The objective was to make qualitative evidence-based predictions of the likely effects on the food system, so that industry can prepare and adapt to maintain economic performance.

Climate change in New Zealand has already seen air and sea temperatures rise by ~1°C and sea levels increase by 20cm since 1910. In addition, rainfall patterns across the country are much more variable and are affected by shifts in the prevailing winds and El Niño Southern Oscillation (ENSO), a natural climate and sea temperature pattern that affects weather all around the world.

It is likely that most New Zealand's primary industry sectors (meat and wool, dairy, arable, horticulture, viticulture, aquaculture and forestry) will experience changes in productivity and relative profitability. These changes could shift production zones within New Zealand and test the adaptability of farmers. Table 1 lays out some of the potential interactions.

The project concluded with the production of a series of climate change and food system risk matrices and fact sheets, based on a qualitative assessment of the literature and through workshop discussion.

For more Information on this project visit
<https://www.mpi.govt.nz/dmsdocument/28164/direct>

Potential Climate Change Interactions on Food Quality/Safety Systems in the Supply Chain

Supplier	Processing & Manufacturing	Transport & Retailer	Consumer
Changes in the nutritional environment	Changes in pesticide and antimicrobial use leading to increased contamination by chemical residues	Increasing average temperatures could increase hygiene risks associated with storage and distribution of food commodities	Rising CO ₂ can influence nutritional content of foods
Changes in productivity aquaculture	Extreme weather events can lead to contamination by agri-chemicals	Extreme weather events can disrupt food distribution	Changes in preferences and food preparation behaviours
Changes in microbial population of the macro-environment (soil, air, water) and the population of pests or other vectors	Increased costs for maintaining cold chain		
Changes in time and length of season			
Changes in diseases and infections which are naturally transmitted between vertebrate animals and humans	New hazards – chemical, including mycotoxins, agricultural chemicals, algal toxins, antimicrobials		
Increased regulatory controls, testing and surveillance			

Table 1

IPCC Identifies Climate Change Impacts & Vulnerability for New Zealand in 2007

Climate change is not a new topic. Twelve years ago NIWA produced an article in which it predicted future climate change impacts. Some of these 2007 predictions are scarily accurate when viewed from a 2019 perspective. Here is an excerpt from the NIWA article.

“Water security, natural ecosystems, and coastal communities are the three sectors most vulnerable to climate change in New Zealand, according to an Intergovernmental Panel on Climate Change (IPCC)³ report from 2007. Changes already observed since 1950 include:

- A warming in mean temperature for New Zealand of 0.4 °C;
- A decrease in cold nights and frosts by 10–20 days per year;
- Sea level rise of about 70 mm;

³ The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change.

- Loss of at least a quarter of alpine ice mass;
- Increased seed production in beech forest.

The anticipated effects upon horticulture in 2007 were identified as:

Kiwifruit: Warmer summer temperatures for Hayward kiwifruit are likely to increase vegetative growth at the expense of fruit growth and quality. Kiwifruit budbreak is likely to occur later, reducing flower numbers and yield in northern zones. Production of current kiwifruit varieties is likely to become uneconomic in Northland by 2050 because of lack of winter chilling, and be dependent on dormancy-breaking agents and varieties bred for warmer winter temperatures in the Bay of Plenty. In contrast, more areas in the South Island are likely to be suitable.

Apples: are very likely to flower and reach maturity earlier, with increased fruit size, especially after 2050.

Grapes: Earlier ripening and possible reductions in grape quality are likely by 2030. In cooler Australian climates, warming is likely to allow alternative varieties to be grown. With warming in New Zealand, red wine production is increasingly likely to be practised in the south, with higher yields. Higher CO₂ levels increase vine vegetative growth and subsequent shading is likely to reduce fruitfulness. Distribution of vines is likely to change depending upon suitability compared with high yield pasture and silviculture, and with irrigation water availability and cost.

New Zealand is likely to be more susceptible to the establishment of new horticultural pests. For example, under the current climate, only small areas in the north are suitable for oriental fruit fly, but by the 2080s it is likely to expand to much of the North Island."

The following links provide useful information:

NIWA: <https://www.niwa.co.nz/news/ipcc-identifies-climate-change-impacts-vulnerability-new-zealand>

Ministry for the Environment: Climate change projections snapshot:

<https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/climate-projections-snapshot.pdf>

Likely impacts of climate change (relevant to horticulture): <https://www.mfe.govt.nz/climate-change/likely-impacts-of-climate-change/likely-climate-change-impacts-new-zealand>

Land use mapping and projections: New Zealand: <https://www.niwa.co.nz/climate/our-services/climate-mapping>

From the Ground Level to the Board Level: Considering Climate Change and its Risks to Fresh Food Safety

Our United Fresh Food Safety Representative, Anne-Marie Arts, attended the Fresh Produce Safety Centre (FPSC) conference in Sydney in August. One of the more noteworthy presentations for her was given by Dr Turlough Guerin, the chair of the Ag Institute of Australia. His presentation to the conference was based on a paper in which he examined the relationship between company directors and their inherent responsibilities and climate change related food safety issues.

The increase in adverse weather events will have great impact on seasonality in horticulture, influencing production, harvests and consumer expectations. How can company directors ask the right questions at the right time of the right people to ensure future planning and risk mitigation for their brands, products and consumers?

Boards will need to be actively engaged in considering the operational, financial and strategic consequence of any risks attributed to climate change and environmental changes and the impacts these will have upon the fresh food supply chain. How these risks are framed and explained, is extremely important to ensure informed decisions about controls and how these are actioned.

How businesses decide to respond to climate change also impacts on how customers perceive the business as a whole. The moves towards sustainable practices across the fresh food chain are inter-related and should be not be considered in isolation.

Dr Guerin's paper can be found at: <https://www.slideshare.net/turloughguerin/from-the-ground-level-to-the-board-level-considering-climate-change-and-its-risks-to-fresh-food-safety>