New Zealand Food Safety

Haumaru Kai Aotearoa

Using data to support decision making: insights and future potential

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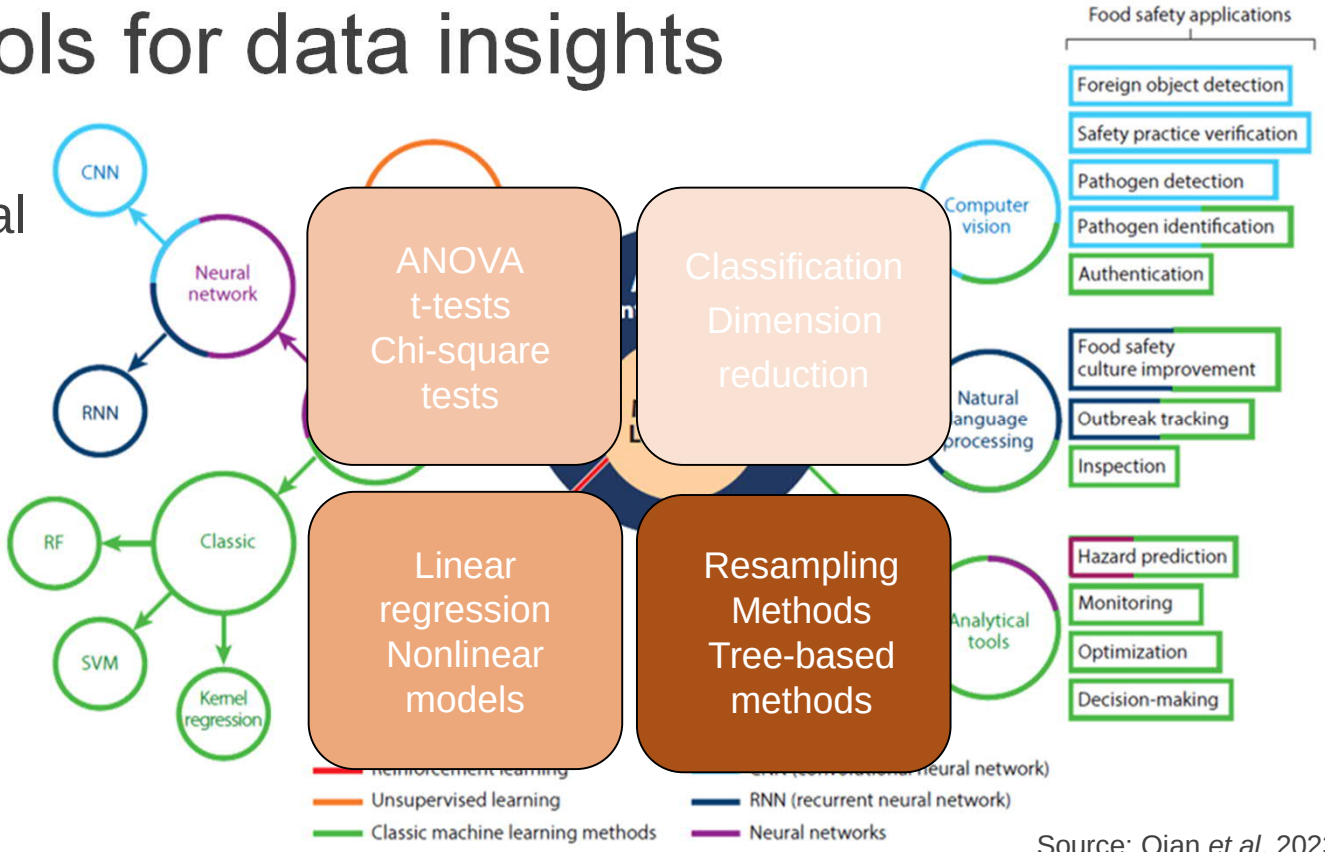
Manatū Ahu Matua

Analytical tools for data insights

- Range of analytical tools available to understand data
- Important to understand the suitability of different tools and the limitations



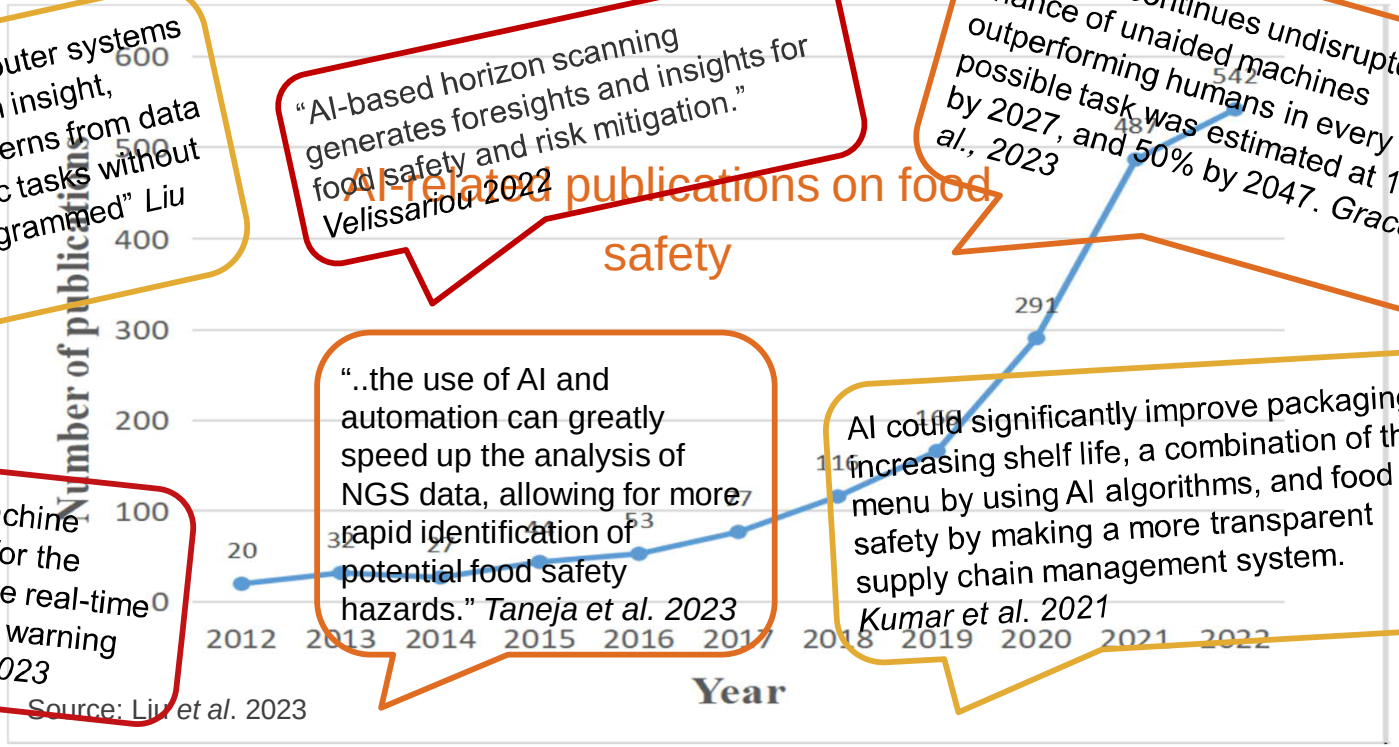
Source: Qian *et al*. 2023

Artificial Intelligence

"AI has enabled computer systems or algorithms to learn insight, knowledge, and patterns from data and perform specific tasks without explicitly being programmed" *Liu et al. 2023*

"AI-based horizon scanning generates foresights and insights for food safety and risk mitigation." *Velissariou 2022*

If science continues undisrupted, the chance of unaided machines outperforming humans in every possible task was estimated at 10% by 2027, and 50% by 2047. *Grace et al., 2023*



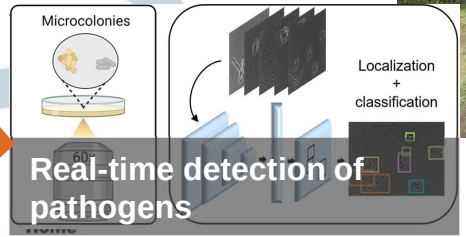
"Automation and machine learning are crucial for the development of future real-time food safety risk early warning systems." *Mu et al. 2023*

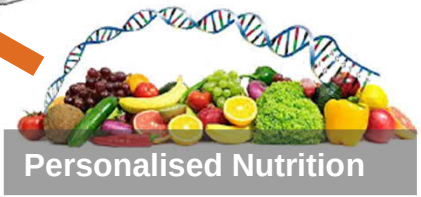
"..the use of AI and automation can greatly speed up the analysis of NGS data, allowing for more rapid identification of potential food safety hazards." *Taneja et al. 2023*

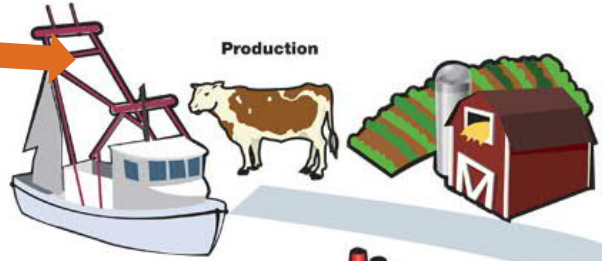
AI could significantly improve packaging, increasing shelf life, a combination of the menu by using AI algorithms, and food safety by making a more transparent supply chain management system. *Kumar et al. 2021*

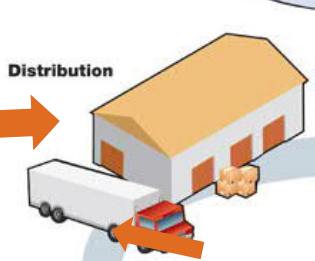
Source: Liu *et al*. 2023

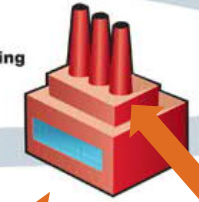
The Food Production Chain

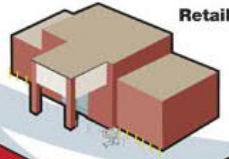


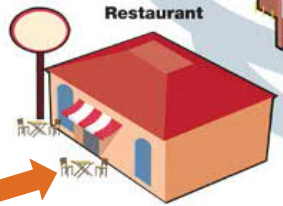












Potential Future Use within NZFS

- Literature review and information gathering
- Design of sampling plans, surveys, questionnaires
- Help with data analyses - drafting R code, pipelines
- Data visualisation – real time

- Customer enquiry management – email responses
- User-experience – My Food Rules tool to help businesses understand and navigate legislation

NZFS and Food Industry Potential Use

- Informing risk management decisions – early detection or prediction of issues within supply chain
- Identify and detecting pathogens
- Creating Food Control Plans/Risk Management Programmes

- How will NZFS assess these techniques are valid?
- What guidance and evidence is needed to provide confidence that new techniques works?
- How do they compare against “gold standard” approaches to ensure they are fit-for-purpose?
- How do we ensure businesses understand what is developed and ensure they can use it?

MPI Draft Policy and Governance

1. Define the scope of ‘Automated decision systems’ including artificial intelligence, machine learning and algorithms.
2. Direct those who wish to use these systems towards a Risk Assessment and subsequent governance process to ensure that any risks associated with the use are mitigated.
3. Embed internal responsibilities for assessing, endorsing and approving the use of automated decision systems at MPI.

Policy Principles

- Inclusive and sustainable development
- Human-centred values
- Transparency and explainability
- Safe and security
- Accountability

Challenges

Data Sovereignty

Data Quality

Data Sharing

Privacy and Security

Copyright and IP

Summary

- Artificial Intelligence and underlying algorithms have great potential use in food safety science – part of the toolbox.
- Use should be assessed using a risk-based approach.
- Several challenges to be overcome at the same time as continued development and innovation in AI.
- Data – quality, monitoring, collation, standardisation all key.
- Technical experts still needed to help design and understand what AI is producing is accurate and true.

Ngā mihi nui

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