

Ensuring Food Security Through Surveillance: Rapid Diagnostics for Emerging Pathogens and Antimicrobial Resistance in Food Systems

Terence Lau

Interim Chief Innovation Officer, Hong Kong Baptist University, Hong Kong

ABSTRACT:

More than 60% of newly emerging infectious diseases originate from zoonotic sources. The growing human intrusion into natural habitats, along with the intensified agricultural practices and livestock production, and global trade have greatly heightened the chances for cross-species transmission of pathogens. Additionally, climate change worsens these challenges by modifying the distribution of disease vectors and putting stress on ecosystems, which in turn promotes the emergence and spread of pathogens. The excessive use of antimicrobials in both human healthcare and animal farming accelerates the rise of antimicrobial resistance (AMR), jeopardizing the effectiveness of existing treatments. The escalating threat posed by emerging infectious diseases, the rising occurrence of zoonotic spillover events, and the increase in AMR are endangering global food security.

Recent advances in automated molecular diagnostic platforms enable surveillance that improves our ability to detect zoonotic and emerging pathogens early, prevent disease emergence, monitor AMR trends, and effectively respond to these complex challenges – thus enhancing the safety of our food supply chain and ensuring food security under climate change.