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Biosecurity and exotic disease surveillance in the New Zealand pig industry

A thesis presented in partial fulfilment of the requirements for the degree of
Doctor of Philosophy
at Massey University, New Zealand.

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2013

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Abstract
The New Zealand commercial pig industry is modern and highly productive. The industry is free from many of the important infectious diseases present in much of the rest of the world. However, alongside the commercial industry are a large number of non-commercial pig holdings operated with minimal attention to biosecurity. The extent to which the activities in the non-commercial sector might negatively impact the commercial sector was unknown therefore a series of projects was undertaken to explore the likelihood of an exotic disease occurring.

A risk assessment was undertaken to determine the likelihood porcine reproductive and respiratory syndrome (PRRS) virus would be introduced into New Zealand through imported fresh pork. The study estimated that at least 4.3 pig herds per year were likely to become infected with PRRS and that 36% of these incursions would spread to additional herds. It was recognized that the data describing the interactions between commercial and non-commercial pigs could be improved so a prospective study was undertaken to collect information about the movements of pigs and genetic material between farms.

To assist in development of a national surveillance programme, two additional studies were then initiated. First, a study was conducted to determine the effect of blood sample mishandling on the performance of ELISA assays and second, a retrospective analysis of data from a national abattoir-based lesion recording system (PigCheck) was conducted. These studies were done with the realization that future surveillance activities would need to incorporate creative means of generating high-quality surveillance data, from various surveillance components, using both laboratory- and field-based staff.

Investment Logic Mapping was then used to assist the industry in establishing a biosecurity and surveillance strategy. A single strategy ‘improve surveillance’ was identified as the key area for biosecurity investment. In response to this finding, modelling of potential surveillance activities was completed and a surveillance programme was proposed costing approximately $0.50 per pig annually.

The work presented in this thesis demonstrates the New Zealand pig industry is susceptible to introduction of an exotic disease and that the population of non-commercial pigs must be considered when developing biosecurity, and disease readiness or response plans for the commercial industry. The described studies show that a cost effective national disease surveillance programme can be implemented through use of a combination of existing and newly developed sources of surveillance information.
Acknowledgements
This work would not have been possible without assistance provided by many friends and colleagues:

Past and present colleagues from the EpiCentre including Jackie Benschop, Chris Cunningham, Naomi Cogger, Nigel French, Cord Heuer, Wendy Maharey, Bryan O’Leary, Mark Stevenson, Masood Sujau, and Simon Verschaffelt.

The team of pig industry experts at NZ Pork including Ian Barugh, Grant Boston, Frances Clement, Sam McIvor, and Chris Trengrove.

The One Health team for covering a number of my other work responsibilities while finishing this thesis especially Ron Jackson, Jo McKenzie, Peter Jolly, and Lachlan McIntyre.

My particular appreciation goes to both Roger Morris and Bill Hall for their steadfast encouragement, challenging discussions, camaraderie, capable assistance, and critical review of my work. Guidance from Mark Stevenson in bringing this thesis to its conclusion is appreciated.

And finally, thanks very much to my ever-supporting wife Jan and our three children Leisha, Tyler, and Katie for putting up with my innumerable late nights, early mornings, and disruption to our family time together.