Biosecurity and exotic disease surveillance in the New Zealand pig industry

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Table of Contents

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.

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