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An all-hazards approach to national security: Preparing for and responding to threats to Australian agriculture

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The federal government is adopting an all-hazards approach to national security—acknowledging that the response to both natural and man-made disasters is often similar and that improving community resilience is an important aspect of preparedness for disasters, whatever form they take. The forthcoming national security statement is expected to incorporate a more holistic assessment of national security by placing a growing list of transnational risks and pressures including terrorism, organised crime and pandemic disease alongside the more traditional state-based threats.

One area that deserves further attention is the threat to Australia's agricultural sector from either a deliberate or accidental disease outbreak. As the recent inquiry into the 2007 equine influenza outbreak in Australia has highlighted, there are continuing vulnerabilities in Australia's biosecurity systems.[1] Fixing these systemic problems is a high priority.

For Australia, the most serious challenge from infectious diseases remains the introduction of a severe influenza pandemic among the human population that threatened to overwhelm existing medical response capabilities. But, as part of an all-hazards approach to national security, the threat to the Australian agricultural sector deserves closer attention. This paper examines the current risk to Australian agriculture and suggests a number of policy responses to help mitigate the threat.

Threats to the agricultural sector

Agriculture remains an integral part of Australia's economic infrastructure—the consequences of a major disease outbreak would be very high. The agricultural sector contributes around 4% of annual gross domestic product. More than 350,000 Australians are directly employed by agro-businesses around the country. And around 1 in 12 people depend on the revenue earned from agricultural exports. A major disease outbreak in the agricultural sector, therefore, would have substantial economic repercussions from the farmyard to the kitchen table.

But the accidental introduction of foreign animal pathogens is just one form of risk. Terrorist groups have also shown an interest in acquiring and using biological agents as possible weapons.

How and when terrorist groups plan to use these non-conventional weapons is a growing problem for intelligence and police agencies. Despite the investment in counter-terrorism and national security measures since 2001, relatively little consideration has been given to the potential threats to the Australian agricultural sector, including farm production and processing facilities.

This is an important oversight and one that is out of step with counter-terrorism efforts in other parts of the world. The threat of agro-terrorism—the deliberate introduction of a biological agent, either against animals or into the food chain, for the purposes of undermining socio-economic stability and/or creating fear amongst the general population—continues to receive higher attention in comparable countries such as the United States.

The probability of a known terrorist group covertly obtaining and deliberately introducing a biological agent into the Australian farming sector or the food chain remains low. Isolating, cultivating and disseminating a biological agent as a weapon is still a complex task. And the Australian Security Intelligence Organisation (ASIO) continues to assess this particular threat as lower than the more conventional means of terrorist attack using a bomb or a gun.

But the threat is not zero. Several non-state actors have experimented with these types of weapons in the past. In 1952, members of the Mau Mau anti-colonialist group in Kenya poisoned thirty-three steers with a biological agent. During the 1980s, Huk terrorists in the Philippines contaminated pineapples destined for export and the Rajneeshee cult in the US used salmonella to poison local restaurants in Oregon.

More recently, a raid on the house of a senior terrorist financier associated with the Jemaah Islamiyah group in the Philippines found a 28-page booklet containing information on chemical and biological agents. And, in his statement to a US Congressional hearing last month, the Chief Medical Officer of the US Homeland Security Department warned that al-Qaeda and other terrorist groups were actively seeking biological weapons.

As the global biotechnology industry has continued to expand, information on biological agents and cultivation processes has become more readily available. Moreover, the growing intersection between chemistry and biology, from which some bio-agents can be synthetically constructed, has complicated international counter-proliferation efforts and the work of export control regimes such as the Australia Group.

According to estimates by the Productivity Commission, an accidental outbreak of Foot and Mouth Disease (FMD) in Australia, similar to the 2001 outbreak in the UK, could cost the economy up to $13 billion.[2] The consequences of the deliberate introduction of an infectious disease, potentially at multiple sites around the country, could be much higher.

In addition to the direct economic costs such as the need to destroy animals and the loss of export revenue, an agro-terrorist attack could undermine public confidence in the government. Given the community's dependence on the agricultural sector, there would be genuine public fears if food sources were compromised for whatever reasons.

Continuing vulnerabilities

The Australian agricultural sector is one of the cleanest in the world. We remain free from many of the exotic diseases that have crippled livestock industries and crops in other parts of the world, including in our own region (see table). But, as the recent equine influenza outbreak has shown, a number of factors indicate that Australia remains vulnerable to a major disease outbreak. These factors include:

- **Weak biosecurity measures**. The purpose of biosecurity is to prevent foreign diseases and pests from entering a country through science-based quarantine controls. However, the Callinan inquiry found that throughout 2007 'fundamental biosecurity measures were not being implemented in the largest government-operated animal quarantine station in Australia (at Eastern Creek)'. This represented a failure of the quarantine system and a potential risk in terms of agro-terrorism. In addition, Australia lacks the ability to inspect or check animals in pre-export quarantine facilities in many Asian countries, including Japan. Infected animals might not be detected until they arrive in Australia. And the incubation period for new or under-diagnosed exotic pathogens may be beyond the current quarantine measures.

- **Increasing susceptibility to disease**. Australia remains 'disease free' from most of the known agricultural pathogens. However, a lack of previous exposure to these organisms, and therefore a widespread lack of immunity, only increases the vulnerability of Australian agricultural commodities to accidental introduction or a deliberate attack.

- **Inefficient disease reporting.** Responsibility for reporting an outbreak of suspicious diseases lies with farm producers as part of the government's 'outbreak' website and emergency disease hotline programs. However, there are strong economic disincentives against reporting suspected outbreaks because the mass culling of animals is still the primary means of eradicating foreign animal diseases. And, although the 2001 Australian Veterinary Emergency Plan (AUSVETPLAN) provides overall policy guidance in handling foreign animal diseases, there is still a degree of overlap and lack of coordination between the various state and federal agencies as well as industry groups responsible for biosecurity.

- **Lack of training for veterinarians**. Effective disease surveillance would require all Australian veterinarians and animal handlers to recognise and diagnose foreign diseases. However, comprehensive training in the recognition of foreign animal pathogens is not emphasised enough in Australian universities. And most graduate veterinarians return to the cities following relatively short periods of work experience in rural practices.

Preparedness and response

Given the current situation, what can the Australian government do to mitigate the potential threat of a major disease outbreak? Six broad policy options appear relevant.

1. *Improve biosecurity standards and procedures at laboratories and research centres*. It is clear that biosecurity arrangements in Australia and the region lag behind the recent expansion of the biotechnology industry.[3] As more laboratories and scientists are assigned to address the region's infectious disease problems, whether of natural origin or biological weapons-related, it is vital that such research does not increase the risk of outbreaks occurring either by accident or by deliberate action.

2. *Understand and trace foreign animal disease outbreaks*. In addition to high-profile diseases such as the equine influenza virus, Australian authorities need to have a better understanding of foreign animal disease outbreaks throughout Asia, especially in countries such as Vietnam and the Philippines where diseases like FMD are common. Australia should continue working with governments throughout Southeast Asia and relevant international organisations to ensure better visibility of animal disease outbreaks.

3. *Coordinate intelligence and first responders*. Relevant and timely information to first responders would be critical in the event of a disease outbreak despite recent improvements in the information flows between ASIO and the business community. The government should undertake an assessment of how to foster better communication links between the agricultural sector, the intelligence community and local health providers so that an early warning system is developed.

4. *Train more personnel*. Universities around Australia should be funded to train more personnel with skills in the identification and treatment of new or exotic foreign animal diseases, including vets, animal handlers and farm workers. Maintaining that skill set over time could involve relevant online training modules and programs.

5. *Provide a risk assessment*. As part of its current review into import risks, Biosecurity Australia should be tasked with providing a comprehensive disease risk analysis in conjunction with relevant intelligence and security agencies.

6. *Focus on recovery.* In order to limit the impact of a major disease outbreak, relevant agencies should examine their laboratory testing procedures to ensure public confidence in food supply is maintained following an event. At the federal level, consideration might be given to including a deliberate terrorist attack against the agricultural sector as part of any future planning exercises.

Such efforts would address some of the gaps that exist in Australia's bio-emergency preparedness and response initiatives. Over the longer term, additional focus may need to be given towards the inclusion of an agro-terrorism strategy that is integrated among all relevant federal agencies as well as state and territory governments. This strategy should be incorporated into an all-hazards approach to national security and identify the resource implications to prevent such a disaster.

Table 1: 'List A' pathogens, host range, possible transmission, and status in Australia[4]

Disease	Host range	Possible transmission	Status
Foot-and-mouth disease (FMD)	Cloven-footed domestic and wild animals - cattle, sheep, pigs etc	Direct or indirect contact with infected animals; airbourne up to 60km over land.	Free
Vesicular stomatitis	Cattle, pigs, horses, humans	Contamination by transcutaneous or transmucosal route	Free
Swine vesicular disease	Pigs	Contact with infected meat scraps or faeces	Free
Rinderpest	Cloven-footed domestic and wild animals - cattle, sheep, pigs etc	Direct contact with animal saliva, urine or faeces	Free
Peste des petits ruminants	Goats, sheep	Direct contact between infected animals, all secretions	Free
Contagious bovine pleuropneumonia	Cattle	Aerial transmission up to several kilometres; droplets emitted by coughing animals	Free
Lumpy skin disease	Cattle	Infected saliva	Free
Rift Valley Fever (RVF)	Most animals - but mainly cattle, sheep, goats, humans	Zoonotic virus; spread by mosquitoes; can affect humans through inoculation or inhalation	Free
Bluetongue	Sheep, cattle, goats	Biological vectors	Virus present
Sheep pox and goat pox	Sheep and goats respectively	Direct contact; indirect transmission by contaminated vehicles or products	Free
Africal horse sickness	Horses, mules	Biological vectors or mosquitoes	Free
African swine fever	Pigs	Contact between sick and healthy animals; feeding on garbage containing infected meat	Free
Classical swine fever	Pigs	Direct contact; indirect contact through vehicles, clothes, needles	Free
Highly pathogenic avian influenza (HPAI)	Most avian species	Direct contact with secretions from infected birds, especially faeces	Free
Newcastle disease	Poultry	Direct contact with bird secretions; contaminated feed, water, implements and clothing	Virus present

Endnotes

[1] 'Equine Influenza: The August 2007 outbreak in Australia', Report of the Equine Influenza inquiry, The Hon. Ian Callinan AC, April 2008 http://www.equineinfluenzainquiry.gov.au/eiiexhibits/REP.0001.001.0001.pdf.

[2] Productivity Commission, *Impact of a foot and mouth disease outbreak on Australia*, Research Report, Canberra, 2002.

[3] From January 2009, the Australian Government will introduce tighter regulations on the handling of a range of biological agents including anthrax, botulinum toxin and the H5N1 virus.

[4] Data for this table was obtained from United States Animal Health Association *Foreign Animal Diseases 'The Gray Book'*; Table 1 of *Animal Health in Australia 2003,* (Canberra, Australia, 2004); and the World Organisation for Animal Health http://www.oie.int/eng/en_index.htm

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