

# Animal Health

## – Winter 2011

### INTRODUCTION

The livestock sector represents \$4.1 billion worth of commodities to NSW each year. Maintaining animal biosecurity is a key challenge for governments worldwide and for Australia in particular with its unique environment and biodiversity. The expansion of international travel and trade increases the risk of pest and disease. The NSW Department of Primary Industries (NSW DPI) is committed to minimising these impacts with a responsive research capability that provides three key outcomes:

- » Tactical R&D to enable responses to immediate biosecurity challenges from pests and diseases;
- » Strategic R&D that anticipates future and emerging biosecurity threats;
- » Underpinning science to inform risk analysis and policy

Our portfolio features more than 20 projects on animal health and biosecurity for a range of livestock industries. Research focus includes; development of improved vaccines and diagnostic tests for viral and bacterial disease, validation of probiotic approaches for improved animal health and feed conversion efficiency, disease epidemiology and management strategies to minimise impacts, management options for animal parasites, risk management approaches to food safety and export testing for livestock industries.

### RESEARCH CAPABILITIES

Animal health and biosecurity R&D is delivered from the Elizabeth Macarthur Agricultural Institute at Menangle, currently undergoing a \$56 million biosecurity upgrade to enhance capability and ensure regulatory compliance.

Research capabilities include veterinary virology, microbiology, molecular biology, parasitology, pathology and epidemiology for a wide range of animal industries.

Strong partnerships with livestock industries and research organisations within university and government sectors.

### CONTACT US

For more information on our full portfolio please contact John Seaman (02) 6391 3248 or [john.seaman@industry.nsw.gov.au](mailto:john.seaman@industry.nsw.gov.au).

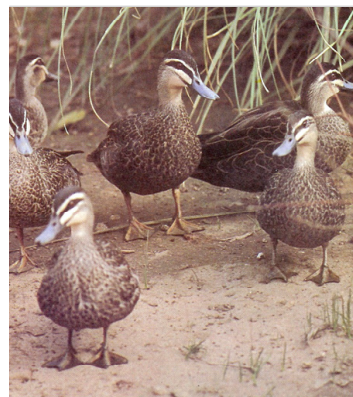
### PROJECT UPDATES

#### SURVEILLANCE IN WILD BIRDS FOR INFLUENZA VIRUSES (2005–2011)

**INTRODUCTION:** Highly pathogenic strains of avian influenza (HPAI) viruses have emerged in wild bird populations in many countries, especially in Europe and Asia, e.g. HPAI H5N1 strain (“bird flu”) that has resulted in the death of 68% of people infected and the death and destruction of millions of poultry and wild birds between 2004 and 2011. Water bird species migrate seasonally from or through HPAI-infected countries to Australia and then intermingle with local water birds. This project monitors wild bird populations nationally for avian influenza (AI) viruses and may provide an early warning of the emergence of pathogenic HPAI viruses in Australia.

**FINDINGS:** No HPAI virus has been detected to date. Other clear benefits resulting from the national wild bird avian influenza surveillance program include:

- » Maintaining national animal health laboratory readiness to respond to biosecurity emergencies (as demonstrated clearly during the equine influenza outbreak).
- » Maintaining Australia’s ability to detect currently circulating Australian AI viruses.
- » Providing epidemiological information about circulating avian influenza viruses in wild birds in Australia to provide the basis for systems to protect Australia’s poultry industries.



**CONTACT:** Dr Peter Kirkland, Menangle, (02) 4640 6331 or Edla Arzey, Menangle (02) 4640 6339

**COLLABORATORS:** DAFF, Other State Government Animal Health Departments; AQIS; Universities of Newcastle, James Cook, Deakin; CSIRO; DEWHA; WHO; industry organisations

## MYCOPLASMA HYOPNEUMONIAE VACCINE DEVELOPMENT IN PIGS (2008–2011)

**INTRODUCTION:** Mycoplasmal pneumonia in pigs is responsible for production inefficiencies. By targeting genes from *Mycoplasma hyopneumoniae* (*Mhp*) that assist it to gain a foothold in the respiratory tract, NSW DPI researchers aim to develop a new generation vaccine to prevent the initial steps in the disease process from occurring.

**FINDINGS:** Using DNA technology, we have produced adhesin proteins from *Mhp* genes to evaluate as vaccines for pigs. Mouse studies have shown that these proteins produce a measurable immune response, and pilot studies in pigs have identified the most suitable sampling methods to assess disease. This is a very positive step towards a vaccine to eliminate *Mhp* in pigs.



**CONTACT:** Dr Graeme Eamens, Menangle (02) 4640 6358

**COLLABORATORS:** University of Queensland, University of Technology

## DEVELOPMENT OF PROBIOTICS TO REDUCE GASTROINTESTINAL DISEASE IN PIGS (2007-11)

**INTRODUCTION:** The pig industry is trying to decrease its dependence on antimicrobials in managing health issues because of increased resistance in microbes that cause disease and also because of public perceptions. Probiotics are a possible cost effective alternative, but little research has been done so far on their effectiveness in pigs.

**FINDINGS:** In collaboration with industry partners, we have developed a probiotic treatment based on a mixture of benign bacterial species. After laboratory testing and a small scale trial at the Elizabeth Macarthur Agricultural Institute, these probiotics are now being field tested under commercial conditions. We are following these animals to see how the probiotic impacts their life time health status and productivity. If successful, the probiotic treatment will improve pig health and productivity without the need for antimicrobials.



**CONTACT:** Dr Huub Brouwers, Menangle (02) 4640 6379 and Dr Toni Chapman, Menangle (02) 4640 6360

**COLLABORATORS:** Industry partner (IAHP), Pork CRC, University of Wollongong, University of Queensland

## SMALL HIVE BEETLE CONTROL (2005–2011)

**INTRODUCTION:** The establishment of the South African small hive beetle in eastern Australia is causing devastating losses to the beekeeping industry. This research has developed a patented refuge trap that exploits the natural behaviour of the pest and combines a preferred beetle refuge structure with a contact insecticide that is not accessible to the bees.

**FINDINGS:** The commercially available device (APITHOR™) is being manufactured by Ensystem in Thailand. Field testing demonstrated that APITHOR™ treated hives are as productive and healthy as untreated hives and also that the honey and wax from APITHOR™ treated hives contained no detectable insecticide residues. Preliminary trials indicate that mean adult beetle numbers were reduced by 96% in hives treated with APITHOR™. This simple and effective approach promises to reduce small hive beetle populations to below economic levels in Australia's bee hives.



**CONTACT:** Dr Garry Levot, Menangle (02) 4640 6376

**COLLABORATORS:** RIRDC, commercial partner (Ensystem)

## BENIGN THEILERIOSIS IN CATTLE (2009–2011)

**INTRODUCTION:** During 2007 and 2008 veterinary investigations showed that the disease Benign Theileriosis in NSW cattle herds. Cattle with the disease displayed a variety of clinical signs, including anaemia, abortions and mortalities. The disease is considered to be caused by a protozoan parasite spread by ticks.

**FINDINGS:** Investigations into outbreaks of Benign Theileriosis have better defined the nature of the disease and its impact on the NSW cattle industry. New molecular diagnostic tests have been developed and investigations are continuing on disease transmission and management/treatment strategies to control the disease.



**CONTACT:** Dr Graham Bailey, Orange (02) 63 913870

**COLLABORATORS:** Industry partners (LHPA), MLA.

# PIS&R PROJECT UPDATES