Farm Animal and Veterinary Public Health

2002 - 2005

Faculty of Veterinary Science
FACULTY REPORT

FARM ANIMAL and VETERINARY PUBLIC HEALTH

Introduction

I would like to present this report on research and post graduate activity in Farm Animal and Veterinary Public Health on behalf of the Faculty of Veterinary Science, and commend the commitment and activity of the large group of people who have contributed so much during the period 2002-2005.

Farm Animal and Veterinary Public Health encompasses both teaching and research, and links these to provide the greatest possible benefit for the community. The undergraduate teaching outcomes are to be covered in a separate report from the Learning and Teaching Committee, and this report focuses on the achievements in research, post graduate coursework and post graduate research.

Academics and support staff in Farm Animal and Veterinary Public Health form a critical mass and are able to provide service to the community across many species, industries and scientific disciplines. We work extensively with collaborators from other institutions and the private sector both in Australia and overseas. We have a large network of contacts in government, academia and business and strive to ensure that our work is relevant and meets current and future community need.

In this report we provide a brief biography for each member of academic staff, and a project outline for their research projects. Most have been funded through external competitive research grants, which illustrates the calibre of the projects. We place high value on our post graduate students as they will be future leaders, and a summary of each of their projects is also included. Overall, there have been many scientific publications and conference proceedings from our work, a further measure of success, and these are listed in the report.

Farm Animal and Veterinary Public Health includes the traditional disciplines of veterinary medicine, epidemiology, state veterinary medicine, infectious diseases and public health. Each of the traditional and some emerging farm animal species and industries is also included: sheep, cattle, other ruminants, pigs, chickens and aquatic animals. To cover so much the Faculty has made significant investments in staff and because of its commitment to the production animal industries it will continue to play a key leadership role in ensuring animal health professionals have the skills needed to support and strengthen Australia’s livestock industries.

In 2001 the Faculty identified an expanding range of opportunities available for veterinary graduates of the 21st century. Nowhere was this more evident than in the area of farm animal and public health. For a two year period from 2000, the Faculty moved strategically to rebuild its core teaching and research expertise in this area and received strong industry support for this. With funding from Meat and Livestock Australia a Chair in Farm Animal Health was created. This Chair is a key investment for the Faculty and its industry partner, providing the leadership needed to push forward major research programs and stimulate the interest of undergraduate students in production animal veterinary science and public health. A factor increasingly recognised as important by the international and Australian communities is understanding of the key issues in farm animal health and food safety. The Faculty is about to begin a vital new partnership with industry to establish a Chair in Veterinary Public Health and Food Safety. Building capacity in these fields is critical for the long-term viability of the farm animal sector.

A selection of significant achievements is outlined here and more details can be found in the report.
Veterinary Public Health Management Program

By 2005 the Faculty had 49 postgraduate students in a new program designed to equip animal health professionals to be future leaders with technical and other skills needed to support the livestock sector. Leadership and project management are key components of the program which also covers epidemiology, food safety, risk analysis, surveillance and much more. Most of the students are from Australia, but there are also international students who enrich the program and extend the network of animal health professionals for the benefit of our industries. A unique feature of the program is its online classroom that enables students from remote areas to participate, and short residential workshops ensure that an academic community is established and students participate in a traditional face-to-face environment for key units of study in leadership and project management. Feedback from both students and employers has been very encouraging, and we are confident that the community is receiving long term benefits from the program.

Investment in infrastructure

The University of Sydney has made a strategic investment of $2.1M to renovate the JL Shute Building at Camden to accommodate the new farm animal and veterinary public health team together with researchers in technologies that underpin animal health and production. State of the art laboratories, including biosecurity laboratories for study of infectious diseases and molecular biology facilities were opened in October 2003. Technology available includes flow cytometry, SELDI mass spectrometry, other proteomics technologies, quantitative real time PCR, laser capture microdissection, and more.

Major research program in Johne’s Disease

In the most concerted effort yet to come to grips with a complex and frustrating disease, the Faculty has joined with Meat and Livestock Australia (MLA) to undertake intensive research into Ovine Johne’s Disease (OJD), a devastating and ultimately fatal disease of sheep already entrenched in south eastern Australia. MLA has provided a $3.2 million grant, funded by the sheep industry, to support research focused on the early diagnosis of infection. This complemented a series of large and small grants to enable a comprehensive on-farm and laboratory-based research program. As this is such a complex and difficult disease, quarantine restrictions have failed to halt the spread of disease, the sheep industry has been polarised in its views on control options and the newly released vaccine does not fully prevent infection. Johne’s Disease exists worldwide and many countries live with the disease. Efforts are being made in Australia to control the disease long term, but the lack of basic knowledge about the disease is hindering the design of improved tests, treatment and vaccines. The MLA grant has enabled a team of four leading post doctoral scientists and additional research students to be established to study the basics of Johne’s infection. The latest genomics and proteomics technology will be applied to the problem, and over three years it is hoped that discoveries will be made leading to tests capable of detecting the infection before it has had a chance to spread.

Aquatic Animal Health

There is a national goal for Australia to increase aquaculture production three fold to $2.5 billion by 2010. Leadership in teaching and research in aquatic animal health is on the Faculty’s agenda with a proposal for a vertically integrated program of study to become part of the animal health and production curriculum. Aquatic animal epidemiology is included as a unit of study in the Veterinary Public Health Management post graduate program and aquatic disease research was made available for the first time in 2004 to students in the BSc(vet) program, a one year full-time research stream within the BVSc curriculum. The Faculty is well-connected to the aquatic animal industries through national and international research projects, participation in the National Aquatic Animal Health Technical Working Group which advises government and the Fisheries Research and Development Corporation Scientific Advisory Committee. The Faculty also has an internationally-recognised role in epidemiology and diagnosis of one of the internationally notifiable viral diseases of finfish, epizootic haematopoietic necrosis virus (EHNV). The Faculty and the Australian Animal Health Laboratory host the Office International des Epizooties (OIE) Reference Laboratory for EHNV which provides research and a diagnostic referral service to the Australian industry, and ensures international diagnostic capabilities by providing technical advice, protocols and immunological and molecular biological
reagents to laboratories worldwide. This supports international trade in aquatic animal products. Diseases such as EHNV present real challenges to both commercial fisheries and to the management of ecosystems worldwide. The Faculty has the opportunity to make an increasing contribution to an often over-looked discipline within veterinary science.

**Australian Biosecurity Cooperative Research Centre**

The Faculty of Veterinary Science is a supporting partner in the Australian Biosecurity CRC, which will provide solutions to the growing number of issues in emerging infectious diseases of animals and man. The AB-CRC is a truly collaborative venture with enormous potential. The outcomes of the education and training program will be a large number of trained researchers and a new set of training opportunities in epidemiology, risk analysis, emergency response and other disciplines that underpin biosecurity.

**Interdisciplinary Network in Public Health**

We commenced a new alliance in 2004 to address public health issues from both veterinary and human disciplines. Interdisciplinary Network in Public Health (INPH) grew out of the realisation that the Faculty of Veterinary Science and the School of Public Health in the Faculty of Medicine needed to build linkages, especially in the area of emerging infectious diseases. The Veterinary Public Health Management postgraduate program provided the initial impetus through a joint project with a medical Honours student to develop on-line zoonoses fact sheets appropriate for both medical and veterinary practitioners. Members of the INPH are now drawn from the Faculty of Veterinary Science, the School of Public Health, the National Centre for Immunisation Research, Westmead Hospital, Discipline of Medicine, Department of Infectious Disease, Northern Rivers University Department of Rural Health, and the Australian Centre for Agricultural Health and Safety. The primary concern is to develop core links in research, teaching and community related issues with a focus on infectious diseases and public health. The INPH is an evolving venture and represents an exciting step forward in the development of important and lasting partnerships between veterinary science, medicine and public health, disciplines that traditionally have remained separate.

**Gut Immunobiology Research Team**

Academic staff from the parasitology and Johne’s disease research groups have formed a gut immunobiology team to advance studies on intractable problems facing the sheep industry – gastrointestinal nematodes, which have developed resistance to common anthelmintics, and paratuberculosis. There are many parallels at immunological and pathophysiological levels. The gut immunobiology group is able to pool ideas, equipment, technology and physical resources to maximise the possibilities of finding solutions to these problems.

**Pig Health**

The pig health group led by Dr Trish Holyoake was recognised in 2005 with the award of a prestigious Australian Research Council Linkage Grant to evaluate vaccination against *Lawsonia intracellularis*, an important intestinal pathogen. Tackling this intractable problem is made possible by the unique partnership with industry (Boehringer Ingelheim and NSW DPI) and the diverse skills in the Faculty in pig husbandry, epidemiology, gut immunobiology and infectious diseases.

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Professor Richard Whittington  
Chair Farm Animal Health  
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