

Food Animal Health: Epidemiology and management of diseases of food-producing animals including public health and zoonoses

- **Hemorrhagic disease in cattle:** Identification of dicoumarol in mouldy sweet clover led to the development of warfarin: F. Schofield (1922)
- **Neonatal Calf Diarrhea.** Development of an apparatus for IV fluid therapy in large animals. R. Willoughby (1970s)
- **Bovine Respiratory Disease:** Development of methods of epidemiological analysis including identification of risk factors for Bovine Respiratory Disease; *Pioneered area of veterinary epidemiology.* S. W. Martin, A. Meek (1970-90).
- **Bovine Mastitis and Ketosis:** Successful use of antibiotics to treat *Staphylococcus aureus* mastitis. Discovery of the Newbould strain of *Staphylococcus aureus*. D. Barnum and F. Newbould (1956). Identification of risk factors and monitoring methods for udder health and subclinical ketosis K. E. Leslie, T. Duffield (1985 - present)
- **Food Safety and Antimicrobial Resistance.** Pioneering research on risk assessment and molecular epidemiology of antimicrobial therapy in food animals. S. McEwen, J. Prescott, C. Gyles, P. Boerlin (1985-present)
- **Porcine Stress Syndrome:** Discovery of a Ca²⁺-release channel mutation of sarcoplasmic reticulum lead to the development of a DNA-based test for PSS in pigs. P.J. O'Brien (1990)
- **Poultry Pathology:** Identification of cardiovascular and musculoskeletal disorders in rapidly growing poultry R.J. Julian (1985-2005)
- **Ecosystem Health:** Epidemiology of zoonotic diseases and food and water safety in community and agroecosystems and the associated socio-ecological impact. *Pioneered the field of ecosystem approaches to public health.* (D. Walter- Toews, 1980-present)

Applied Clinical Science: Multidisciplinary study of the causes, diagnosis, and treatment of naturally-occurring diseases in horses and companion animals including use of animal models to study human disease.

- **Experimental Surgery.** Development of surgical techniques and aseptic surgery. *Pioneering work in small animal surgery* Dr. J. Archibald and Dr. J. Markowitz (1950s)
- **Canine hemophilia:** Identification of FIX deficiency as a cause of canine haemophilia B; *Pioneered the area of coagulation, thrombosis, & experimental atherosclerosis:* JF Mustard, HG Downie, HC Rowsell, J.E. Leeson, and J.A. Archibald (1960)
- **Serum acid-base and chemical imbalances;** development of balanced intravenous electrolyte solution for treating dehydration in animals; *Pioneered the discipline of veterinary clinical pathology & laboratory medicine:* B. McSherry, (1950s-70s)
- **Canine cardiomyopathy:** Investigation of the pathogenesis, genetic susceptibility, novel therapies (e.g. Pimobendan) and diagnostics (e.g. Holter monitors) for dilated cardiomyopathy in Doberman Pinschers. M. O-Grady (1990s-present)
- **Cardioversion in horses:** Development of transvenous electrical cardioversion of atrial

fibrillation in horses with patented catheter-mounted electrodes. P. Physick-Sheard D. Kenney, K. McGurrin, and (1990s-present).

- **Allergic airway disease in horses:** Use of bronchoalveolar lavage & pulmonary function test for diagnosis. Inhaler therapy & development of “Aeromask”. L. Viel, (1990-present)
- **Critical Care:** Research in the areas of peri- and post-operative analgesia, percutaneous endogastric tube feeding and nasal oxygen administration in critical care. *Pioneered the discipline of small animal critical care:* K. Mathews (1980s-present)
- **Lymphoid neoplasia in animals:** Development of classification schemes of different types of lymphoma in cattle, dogs and cats. V.E.O. Valli (1975-1995)
- **Cartilage repair in horses:** Development of mosaic arthroplasty, a surgical process involving transplantation of joint plugs to repair cartilage defects M. Hurtig, J. Dickey, J. Runciman, and S. Pearce. (2001-present)
- ***Clostridium difficile* and diarrhea:** Identification of *C. difficile* as a cause of acute diarrhea in dogs and horses –S. Weese, L. Arroyo and H. Staempfli, (2006-present)

Infectious Disease and Host-agent Response: Pathogenesis of production-limiting infectious diseases and immunology including vaccinology and host resistance to disease

- **Fowlpox:** Development of a vaccine for Fowlpox, a slow-spreading viral disease of poultry that causes skin lesions R. Gwatkin (1923)
- **Brucella abortus:** Development of vaccine and serodiagnostic control program: C.D. McGilvray, (1930s-40s)
- **Pullorum disease in poultry:** Development of a disease control program for *Salmonella pullorum* in poultry. C.D. McGilvray, 1930s and 1940s
- **Edema disease in pigs:** Purification and characterization of the Shiga toxin (verotoxins); toxoid immunization. D. MacLeod & C. Gyles. (1990-1991)
- **Canine distemper:** Distemper virus attenuation through growth in eggs led to development of safe vaccines. J. (Belcher) Budd, (1951)
- **Mink enteritis:** Discovery of Mink enteritis F. Schofield (1949), and development of vaccine, C.G. Willis and J. (Belcher) Budd. (1960)
- **Enterotoxigenic *E. coli*:** Discovery of enterotoxin: sequence the toxin genes and purify the toxin C. Gyles & D. Barnum, (1967)
- **Aleutian disease (plasmacytosis) in mink:** Evidence of viral etiology. PK Basrur, L. Karstad L. (1966) Virus identification, immunopathogenesis and serodiagnostic-based control – D. Ingram and Cho (1970s)
- **Shipping fever:** Purification of the leukotoxin of *Mannheimia hemolytica* lead to the development of “Presponse” a highly successful patented veterinary vaccine. P. Shewen & B. Wilkie (1988)
- **Vector borne diseases in wildlife:** Epidemiology and pathogenesis of borreliosis and West Nile virus infection in wild animals. I.K. Barker (1990 – 2000).
- **Laboratory Animal Diseases:** Characterization of the pathology of viral infections of the liver, respiratory system and salivary glands of rats. *Established the discipline of*

laboratory animal pathology. D.H. Percy (1985-2005).

Reproductive Biology and Biotechnology: – In vitro fertilization, embryo culture and development, biology of early pregnancy and animal cloning

- **Frozen Semen** Development of protocols for freezing cattle semen. Use of glycerinated milk diluents greatly prolonged storage time J.W. McPherson (1950s)
- **Artificial Insemination:** First birth of a foal from artificial insemination with frozen epididymal sperm. *Pioneered the development of AI of cattle and horses in Canada*. J.C.C. Gandier J.A. Henderson, C.A.V. Barker (1950s)
- **Early Bovine Embryo development:** Development of embryo culture. Study of genetic causes of embryo death and genetic makeup of cloned animals. Discovery that thyroid hormone supplementation improves bovine embryo development. W.A. King (1980s-present)
- **Theriogenology:** Identification and characterization of stimulation and metabolism of gonadal steroids in horses and swine. *Pioneering research in hormonal control of reproduction*. R.M. Liptrap, J.I. Raeside. (1960s-80s)
- **Cytogenetics and infertility:** Identification and characterization of inherited chromosomal and molecular cytogenetic abnormalities that impact on reproductive efficiency and breeding of domestic animals. *Pioneering research in cytogenetic causes of infertility*. P Basrur, J. Gilman and WA King. (1960- present)