Herman W. Raadsma

Emeritus Professor Herman Raadsma has a long history of collaborative research that produced many significant advances in the quantitative and molecular genetics of sheep diseases, reproductive biology, livestock and aquatic genomics.

Herman arrived in Australia from Holland in his late teens and obtained a diploma from Hawkesbury Agricultural College, followed by a DipScAgr and MScAgr from the University of New England. In 1981 he commenced a research position at the NSW Department of Agriculture's Trangie Agricultural Research Station where his research showed that selection for resistance to blowfly strike on the body (as distinct from the breech) in Merinos was feasible, using indicator traits such as the extent of fleece rot. Herman and his colleagues made good use of the relatively new concept of underlying polygenic/multifactorial liability for diseases traditionally categorised on a binary (affected/normal) scale. This research resulted in a series of six pioneering papers entitled 'Fleece rot and body strike in Merinos', and very clear guidelines as to how the practical application of quantitative genetics can achieve substantial benefits for the Merino industry.

He moved to the University of Sydney in July 1988 as a Research Fellow and commenced a PhD under Professors John Egerton and Frank Nicholas, into the inheritance of host resistance to footrot in sheep. Characteristically, from the very start Herman was able to generate sufficient external funding to not only support his research but to also pay his own salary, which was far from the norm in those days. Another pioneering series of papers entitled 'Disease resistance in Merino sheep' resulted with Herman and his colleagues showing that breeding for resistance to footrot was very feasible. This basic research laid the foundation for the introduction in 2013 of EBVs for footrot by Sheep Genetics in a collaboration involving NZ Merino, AGBU, University of Sydney and NeXtgen Agri.

Herman was involved in the early days of molecular genetics and quickly realised the potential of mapped DNA markers to identify chromosomal regions (QTL) contributing to genetic variation in economically important traits. He commenced genome scans in segregating families resulting from crossing Merinos with a breed such as Awassi, at the other end of the trait spectrum (to the horror of the key research-funding bodies!). Combining this powerful resource with extensive (and very challenging) phenotyping led to the identification of many QTL for health, milk, fleece, and meat traits in Merino sheep. This work led to the identification of likely causal variants for inherited diseases in sheep and cattle and the introduction of DNA testing to industry. This program of research was duplicated in Indonesia with a 10 year collaboration between Monash University, and Indonesian science institutes of Lipi, Balitvet and Balitnak, to map QTL for resistance to liver fluke, internal parasites, immune function, growth, carcass, reproduction, and body morphology using unique crosses between Merino and Indonesian Thin Tail (ITT) sheep.

Herman established the Centre of Advanced Technologies in Animal Genetics and Reproduction (ReproGen) within the University of Sydney in 1999. Throughout the next 15 years, ReproGen encouraged and facilitated enhanced collaboration between geneticists and reproductive biologists in the practical application of research discoveries. From 2001 to 2010, as Program Leader for Gene Discovery in the CRC for Innovative Dairy Products, Herman led innovative and productive research on dairy genomics, including characterisation and utilisation of linkage disequilibrium in dairy cattle populations, and pioneering work on genomic selection using high density Single Nucleotide Polymorphic (SNP) markers.

Through his involvement as a member of the Executive and Professorial Research Fellow of the ARC Research Hub for Advanced Prawn Breeding at James Cook University and

multiple ARC linkage projects, Herman has contributed to the use of "omics" (including the development and use of genomic EBVs) in the characterisation and improvement of diverse aquatic species including shrimp and pearl oysters. Herman was the conduit in transferring fundamental terrestrial animal breeding knowledge into many of these emerging aquaculture breeding programs. His contributions have had an immediate impact in accelerating these programs.

Despite formally stepping down from his fulltime chair in Animal Genomics and Biotechnology at the University of Sydney in 2014, Herman continued in a wide range of genomic projects including wildlife projects in dingo and koala genetic diversity, with the same aim of exploiting genomic technologies for the betterment of animal agriculture and conservation, as well as developing platforms for advanced phenotyping using artificial intelligence (AI). During his long career, Herman has mentored many PhD students and postdocs who have gone on to make major contributions to animal agriculture and conservation around the world. Within his close circle of colleagues, he is often affectionately referred to as the 'grandfather' of animal breeding, given the long list of current academics who were once mentored by Herman or his students themselves.

For his outstanding contributions to the genetic improvement of Merino sheep and the development of molecular genetics in the Australian sheep, cattle and dairy industries, the Association for the Advancement of Animal Breeding and Genetics is pleased to elect Herman Raadsma as a Fellow of the Association.