

UWA-CSIRO Alliance on Versatile Livestock Systems

The UWA animal scientists joined their CSIRO colleagues in July 2011 with a view to building on existing capacity and providing for the development of a new generation of early career researchers in the field of agro-ecological systems. The combination of skills now includes farming systems, rumen function, novel forages (including native plants), reproductive physiology and technology, sensors and spatial informatics, the science of animal ethics and welfare, and behavioural science.

General Research Theme – ‘clean’, ‘green’ and ‘ethical’ (CGE) animal production:

Clean – minimal use of hormones, drugs and chemicals;

Green – minimal environmental footprint (esp greenhouse gases);

Ethical – maximize animal welfare.

The *CGE* theme unifies our teaching, drives our research, and provides context for postgraduate projects. We focus primarily on pasture-based production systems, although we also work with intensive industries, including aquaculture.

The people and their expertise

Behavioural science (Leader: D Blache)

The biology of temperament; the consequences of selection for temperament on production, behaviour and welfare; stress-affected aspects reproduction, growth, immune function, milk yield, meat quality.

Rumen function (Leaders: P Vercoe, Z Durmic)

The molecular microbial ecology of gastrointestinal microorganisms; phytochemicals in forages that can replace *antibiotic growth promoters*, reduce *methane emissions* and control internal parasites.

Reproductive physiology and technology (Leaders: G Martin, I Malecki, P Hawken)

The brain and hormonal systems that regulate reproduction and how they are influenced by environmental factors – nutrition, season, socio-sexual signals (pheromones), stress; reproductive technology in birds, with special expertise in the emu and ostrich.

Applied nutrition; Diet formulation (Leaders: S Liu, J Milton)

General digestive physiology, quantitative nutrition and nutritional chemistry; ruminant and non-ruminant animals; partnerships to commercial feed manufacturing companies.

Aquaculture (Leader: C Lawrence)

Partnership with the WA Department of Fisheries; biology, reproduction, genetics, and breeding of freshwater bony fish and crustaceans.

Regulation of body and brain temperature in mammals (Leader: S Maloney)

The physiological mechanisms used by mammals and birds to cope with thermal stress, particularly the regulation of brain temperature.

Partners in CSIRO

Dr Dean Revell: ruminant nutrition, landscape systems, epigenetics

Dr Hayley Norman: plant ecology, perennial plants in the landscape

Dr Dean Thomas: animal movement, grazing preferences, systems modeling

Dr Waqar Ahmad: spatial informatics, environmental remote sensing

Experimental Resources

The latest techniques in neuroscience, histology, endocrinology, metabolic physiology, behaviour, reproductive technology, and molecular biology; computer modelling.

Facilities for studies of rumen function and methane mitigation

Hormone analysis laboratory (primarily high through-put radio-immunoassay)

Emotional reactivity in animals

Aquaculture facilities: aquarium to field

Animal care areas (ranging from intensive care to on-farm flocks)

UWA Future Farm 2050: <http://www.ioa.uwa.edu.au/future-farm-2050>