

PhD studentships available

Available for immediate commencement or by 5 March 2012

Applications are invited for the following two scholarships leading to the degree of PhD in the School of Paediatrics and Reproductive Health.

**Field of Study:** Fetal programming and epigenetics in cattle; Quantifying the effect of nutrient-gene interaction in utero in key tissues instrumental to productivity and sustainability of the beef industry.

The effects of altered maternal nutrition on development of the fetal and postnatal calf are substantively different than in the offspring of small animal species, such as the rodent as organogenesis, myogenesis and adipogenesis are complete before birth in the cow (as in the human) which is not the case in the rat or mouse. In a unique series of recent studies in beef cattle, we have demonstrated for the first time that exposure to varying levels of maternal protein intake during early pregnancy markedly affects postnatal reproductive and production traits in the offspring.

There are remarkably few studies which have investigated the impact of maternal nutrition on the expression of genes which regulate reproductive and production capacity in animal models of significant agricultural importance. The potential reciprocal relationship between adipose tissue and muscle development is of fundamental biological importance and has a potential economic importance for the agricultural and meat industries.

This study represents a world first in terms of conceptual focus, scale and capacity to identify the nutrient-gene interactions which result in specific outcomes for fat, muscle and reproductive development in the cow. This animal model in which adipose tissue is deposited before birth is relevant to the human as there is a current world wide interest in how changing patterns of maternal nutrition- particularly in the periconceptional period and early pregnancy will impact on the metabolic health of children.

The applicants will be based in the Robinson Institute at the University of Adelaide and work on 288 primiparous heifers based 2 hours north of Adelaide in a purpose built research feedlot established by S.Kidman and Co.

The research is funded jointly by industry (S.Kidman, Ridley Agriproducts) with the **ARC** and represents an international collaboration of research staff with corresponding opportunities of study overseas.

The PhD students will focus upon determination of the impact of maternal diet during the periconceptual period and first trimester on: a) The developing fetus and placenta via ultrasound in vivo, placental hormones and fetal placental sampling at 90d, 180d and birth b)The expression of genes regulating the growth and development of the skeletal myocyte and the adipocytes in different regional fat depots c) Expression of genes in the hypothalamus which regulate appetite 3) Gonad development during fetal and postnatal life and reproduction parameters in the F1 generation 4) Production parameters of growth, milk intake, carcass characteristics, birthweight and feed conversion efficiency.

**Eligibility:** Applicants must be Australian Citizens or permanent residents of Australia who are acceptable as candidates for a PhD degree at the University of Adelaide. The PhD students should have experience in handling beef cattle or the willingness to gain this rapidly.

**Stipend:** $23, 278 per annum. It is likely to be tax exempt, subject to Taxation Office approval. There may also be $9000 top up funds available for a candidates meeting industry criteria.

**Enquiries**: Associate Professor Viv Perry (University of Nottingham School of Veterinary Science or Professor Ray Rodgers School of Obs and Gyn, Adelaide University viv.perry@nottingham.ac.uk; vivienne.perry@adelaide.edu.au or ray.rodgers@adelaide.edu.au

Application for admission must be submitted using the Online Application Form available at:
<https://hdrapp.adelaide.edu.au./auth/login>

Please email a summary of your Application for admission to Associate Professor Viv Perry viv.perry@adelaide.edu.au with "Fetal programming and epigenetics in cattle PhD Scholarship" in the subject heading.
You can request a copy of your application summary by emailing scholarships@adelaide.edu.au with the subject heading “Request for application summary.”