

2020-21 Investment Call
12 Proposals

Project code	Proposal Title	Lead Investigator	Research Organisation	Project Summary
2.11/ J16685	Developing and implementing objective sheep lifetime pain measurement and mitigation strategies	Mark R Hutchinson	The University of Adelaide	Seeks to develop innovations in lifetime pain measurement and mitigation for sheep. Designed for widespread adoption and directly lead to quantifiable gains in productivity at an enterprise and industry level. Aim to develop tools that can objectively diagnose and measure pain in sheep, with associated innovations in new persistent pain mitigation that stop the pain pathology developing.
3.A.29/ J16688	Accelerating sheep reproduction best practice	Dr Andrew Kennedy	Thrive Agri Services (AJ and KL Kennedy)	This project will create a PDS style adoption program that links component PDS's to a focus farm that emulates a best-practice farm system and will include facilitated small groups that are linked to each component PDS. This project will be located across southern Australia (Victoria, South Australia and Western Australia). The benefit of this project is the economy of scale from combining several PDS's and using R&D specialists to design and oversee the management and implementation of protocols, the development of learning materials and tools and the linkage of participatory and facilitated adoption mechanisms to accelerate best practice in sheep reproduction.
3.A.41/ J16696	Managing Merino weaners to survive and thrive	Caroline Jacobson	Murdoch University	This project will identify opportunities for post-weaning nutrition and management to deliver cost-effective improvements in weaner survival and subsequent (life time) reproductive performance across a range of Merino genotypes. Modelling will be used to demonstrate impact of interventions on farm profitability. Demonstration sites with direct links to producer networks will showcase strategies that focussing on genetics, optimum use of stubbles, supplementary feeding, and use of electronic ID to capture data that informs decision-making. surviving to slaughter, increased ewes available for ewe flock replacements, and improved animal welfare outcomes to mitigate risk to consumer and community support for sheep meat.
4.A.05/ J20423	Serradellas for new environments	Rebecca Haling	CSIRO	Opportunity exists to add up to \$750M/year by addressing the pasture yield gap that exists across 7M ha of south eastern Australia; 60% of which is thought to be due to nitrogen deficiency. A more reliable pasture legume is required than sub clover - serradellas are candidates for this region. This project develops past investments in nutrient use efficiency if southern systems addressing key gaps in knowledge regarding how to establish and manage serradellas in permanent pasture environments, appropriate cultivar selection coupled with demonstrations, development of producer advocates to support change of practice. The investment proposition is to prove that serradellas are a species with

				widespread utility and production benefits, when they are used to replace or augment sub clover.
4.A.13/ J20434	Development of High Quality Forage Sorghum and Canola for a Sustainable, Climate-Resilient Livestock Industry of Australia	Dr. Thomas Vanhercke and Dr. Srinivas Belide	CSIRO	Gene editing and mutagenesis to produce 1. a high-quality 'triple trait' forage sorghum suitable to dryland cropping systems in subtropical Australia, and 2 an 'energy-dense' canola suitable to medium to high rainfall areas in Australia for year-round livestock grazing, either as a dedicated forage or dual-purpose grain crop. Plants to be high in protein and energy, and low in lignin (making them more digestible). Expected higher quality to increase production and reduce methane production. CRISPR and TILLING techniques.
4.B.06/ J20424	Mixed species fodder crops to adapt to a changing climate, reduce feedbase variability and enhance farming systems	Dr Mark Norton	NSW Department of Primary Industries	While single species fodder crops enhance farm operation flexibility, they can cause animal production problems such as mineral imbalances and suboptimal growth rates. There is growing producer interest in the use of mixed species fodder crops. However, research is needed to verify these benefits and develop Australian relevant establishment and management packages to optimise forage crop mixtures for crop and livestock farming systems thereby promoting adoption of the benefits of this technology. This project will gather evidence on the potential of these crops to improve or extend forage growth and quality, enhance animal production, mitigate animal health issues and provide legacy agronomic benefits.
4.D.10/ J20601	Management of Spinifex pasture across northern Australia	Matthew Fletcher	DPIRD, WA	This project will foster the required translation of technical information relating to spinifex pasture management in northern Australia into key management strategies through the collation of scientific literature and experiences of landholders (pastoralists and indigenous). The information will be integrated into multiple producer-based resources. In turn, the key elements of spinifex management can be more readily accessed and implemented in northern Australia thus aiding with sustainable feedbase management.
4.A.16/ J20433	Transformational and integrated feedbase for mixed farming zones of southern Australia	Hayley Norman	CSIRO	This project will increase sustainability and productivity in the Mixed Farming Zone of WA and NSW using advanced forage systems to support livestock enterprises. It will compare emerging and existing forage options, identify novel mixtures and demonstrate more practical and flexible options to transform feed supply and fill nutrient gaps for greater winter biomass, use annual legumes to extend the growing season and strategic forage conservation and perennial systems targeting soils marginal for cropping.
5.B.05/ J16691	Use of 3-NOP for methane mitigation by programming rumen microbiome development in calves	Dr Chris McSweeney	CSIRO Agriculture & Food	Technologies that significantly reduce enteric methane emissions from ruminants need to be developed for most grazing operations to reach a carbon neutral position by 2030 (MLA's 'CN30' goal). DSM has developed the investigational compound, 3-nitrooxypropanol (3-NOP) which acts as a greenhouse gas (GHG) mitigant by inhibiting methane production in the rumen. Recent evidence suggests that changes in colonization of the rumen by microbes prior to weaning may influence the rumen and modify function

				<p>later in life. The influence of dietary manipulation from birth on growth, methane production, and gastrointestinal microbial ecology in intensively raised dairy calves appears to be an effective strategy for dairy cow production but needs to be evaluated in extensive beef cattle systems. This proposal aims to demonstrate that 3-NOP, delivered to the calf from birth will influence the rumen microbiome development in a way that reduction in methane will persist for a period of time long after treatment has stopped.</p>
5.B.17/ J16692	Pathways to a carbon-neutral 2030: grazing systems biodiversity and carbon accounting	Matthew Harrison	University of Tasmania	<p>Using a transdisciplinary and farmer-centric approach, this five-year project will:</p> <ol style="list-style-type: none"> (1) develop practical, cost-effective farm-level accounts for a range of production systems and drive producer participation in the Carbon Neutral 2030 Initiative (CN30) (2) quantify benefits of biodiversity for enhance grazing land management and profitability (3) undertake a literature review of the differences between grazing systems and management in terms of soil carbon sequestration, pasture persistence and profitability. <p>The project will include case study farms and workshops with producers to engender participation in the CN30 and understanding of the value of factors affecting GHG emissions mitigation, productivity, profitability and natural capital. Case study farms will be used to create carbon accounts and farm-level emissions intensities under current farming systems and used as basis for designing systems that are more resilient to future climates in terms of economic risk. Project outputs will examine carbon and biodiversity markets that have potential for farm income generation. Outputs will be generated through a farmer-centric design and further disseminated through a range of extension and engagement activities to ensure farmer participation, awareness and learning from project activities. Impacts from the project include maintaining community support by demonstrating environmental stewardship and pursuing income diversification opportunities presented via ecosystem services markets.</p>
3.C.25/ J20336	Design, establishment and benefits of edible shelter to improve lamb survival and whole-farm profitability	Serina Hancock	Murdoch University	<p>This project will investigate the impacts of different types and designs of edible shelter on the physiology, behaviour, welfare and survival of sheep along with the nutritional benefits of the feedbase in mixed farming enterprises.</p> <p>Outputs will include an improved understanding of the advantages and risks associated with integration of shrubs into mixed farming enterprises and the utilisation of crops for shelter during lambing. Demonstrated producer guidelines will be developed for the establishment, management and use of edible shelter, including modelling of the long-term system benefits for lamb survival, animal welfare, management of the feedbase and ecosystem health. It is expected that this project will build on previous investments by examining the use of shrubs and vegetative crops to provide shelter to improve lamb survival, minimise heat stress, fill feed deficits, maximise land use and thus improve the productivity and profitability of sheep enterprises.</p>

3.B.30/ J20194	Fit to join Ewe assessment tools	Leanne Sherriff	Macquarie Franklin	To date most RDE&A has focused on improving ewe nutrition during pregnancy and management during lambing and weaning. There remains an untapped opportunity to improve lamb survival outcomes though more rigorous ewe assessment and selection before joining. As such, this project will develop a series of producer ewe assessment tools to aid the selection process prior to joining, this will include selection and management criteria for ewe lambs through to older ewes and will accommodate factors that hamper ewe capacity to rear a lamb such as udder health and lameness.
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