2026-28 Producer identified RD&A priorities

Council: Southern Australia Livestock Research Council

Table 1: Identify research, development or adoption gaps, activities, and strategies to achieve the desired outcome/s.

MLA Program area	Rank	Committee	New or ongoing priority?	**Outcome sought:** Describe the issue and the outcome(s) producers/industry are seeking.	**To adequately achieve the outcome, identify R&D and/or adoption gaps or strategies:** • **For R&D, clearly identify the research gap.** • **For adoption, detail a possible strategy that producers would engage with to achieve the intended outcome.**
Animal Wellbeing	AW Priority #1	CWNSW & QS NNSW SNSW	New	**Interrupting parasite lifecycles**- Putting more tools in the IPM toolbox. **Outcome sought:** Increased understanding of interrupting parasite lifecycles (and molecular biology). **Background:** Increasing parasite resistance to available chemical control and associated labour costs to prevent and treat livestock is negatively impacting the productivity, profitability and sustainability of southern livestock production systems. The 'tool-box' of chemical, management and genetics options that integrated parasite management systems (IPM) are based on is being challenged by a rapidly diminishing range of available chemical options and a reluctance by multi-national chemical companies to develop new chemical options applicable to the relatively small Australian market. Alternative solutions are required that focus on production system interventions that reduce parasite burdens through interfering with normal parasite development and transmission rather than preventative treatments applied to livestock.	**R&D Gap:** • Quantification of paddock parasites burdens. o develop a means of testing pasture for a range of parasites (number and species) o develop a decision risk matrix based on paddock history to accurately predict parasite infestation • Development of effective means of parasite or vector eradication or reduction of burden (i.e. target the carrier) that reduce the need to treat livestock (e.g. pasture sprays). o identify multiple points throughout the lifecycle of internal and external parasites or variation of metabolic and biochemical pathways that can be interrupted to control parasites • Develop rapid on-farm diagnostics and/or gene markers to identify resistant animals. • Improved means of detecting fluke and development of practical control measures for the snails that carry fluke to break the lifecycle. • Quantify the impact of feral animals on paddock parasite burdens (i.e. consistent presence of goats in paddocks due to difficulty in achieving a clean muster). **Adoption Gap:** • Develop tools using new fundamental science and make these tools available to producers.

				Current IPM solutions need to be further refined to reduce the labour required to administer and reduce the cost of preventative options and treatment of affected animals. Internal and external parasites are estimated to cost the southern livestock industries $1.27B annually (comprising $126M, $310M and $939M in treatment costs, prevention costs and production losses respectively)[8].	• Improved extension messages around managing critical control thresholds for parasites - best management practice.
Animal Wellbeing	AW Priority #2	WVIC	New	**Non-surgical husbandry alternatives** – Smarter livestock husbandry, fewer surgical interventions. **Outcome sought:** Elimination (reduction, non-invasive) of all on-farm surgical procedures (dehorning, castration, docking, mulesing, marking) with no negative impact of production or labour requirement. This can also be a shift from majorly invasive procedures to less invasive practices (i.e. tail stripping rather than tail docking). **Background:** There is an increasing imperative to reduce reliance on surgical animal husbandry practices as consumer expectations, animal welfare standards and social licence considerations continue to evolve. Invasive procedures are associated with acute pain and stress, with growing recognition that chronic stress can negatively affect lifetime productivity, health and performance of livestock. These practices also impose psychological burdens and occupational safety hazards on staff. In addition, long-standing cultural practices, such as tail docking in regions with minimal flystrike risk, are being increasingly questioned on ethical, welfare and risk-based grounds. Continued use of surgical grass interventions in southern livestock production	**R&D Gap:** • Develop non-invasive alternatives to current on-farm surgical husbandry procedures with a positive impact on livestock production. ○ investigate all possible enabling technologies - gene editing, remote sensing and robotics, pharmaceuticals • Develop a reliable means of non-confounding means of monitoring of livestock during these replacement procedures to quantify likely impacts on production. • Scope the impact of non-invasive practices in southern livestock production environments industry and identify which technologies will deliver impact the fastest. • Quantify the productivity benefits and stress impact of castration. • Identify any link between pain from surgical husbandry procedures and lifetime immunity. • Develop effective on-farm pain management alternatives that are both quick acting and long-lasting. **Adoption Gap:** • Develop producer-facing extension material that outline the neuroimmune impact of pain states on lifetime performance of livestock (i.e. Mark Hutchinson – Adelaide University). • Develop and extend a clear business case for provision of pain relief to livestock to drive adoption by livestock producers.

				enterprises exposes the industry to reputational, market and regulatory risk. There is a clear need for interim steps and an extension program for livestock producers regarding pain management and reducing invasive practices while the fundamental research into non-invasive alternatives, linkage between pain and lifetime immunity and novel means of pain management progresses.	• Create the impetus for breed societies to eliminate horned cattle via targeted extension messaging to commercial cattle producers. ○ via the LPA program

Grassfed Beef Productivity	GBP Priority #1	CWNSW & QS
		CVIC
		SA
			New	**Bull breakdown during joining** – building bull resilience: more pregnant cows, fewer broken bulls.
				
				Outcome sought: Early identification of bull breakdown during joining to boost conception rates and increase longevity of yearling bulls in commercial cattle herds.
				
				Background: Bull breakdown describes situations where bulls become unable or unwilling to mate during joining, resulting in reduced conception rates. One of the most common causes is inflammation of the penis and prepuce that can progress to severe injury if not identified early. Pain and lesions can lead to bulls refusing to serve cows, directly impacting conception rates. Other causal factors include poor leg and foot structure, Bovine Herpesvirus infection, virgin bull status and stress. Early detection and management can significantly reduce the severity of bull breakdown and its impact on herd productivity.
				
				Bull breakdown can have a significant economic and reproductive impact in commercial beef herds, particularly if the condition is detected late in the joining period. Bulls need to be removed from the mating group and replacements sought; the number
					R&D Gap:
					• Develop a reliable means to remotely monitor bull behaviour during joining to avoid joining failure (more than proximity monitoring) and determine if bulls are working.
					• Quantify the causal issues of joining failure relating to bulls and their interaction with management leading up to and during joining:
					  ○ penile considerations
					  ○ fat versus fertility
					  ○ legs and structure
					  ○ social behaviour (e.g. dominance and bullying)
					  ○ sperm morphology and motility
					  ○ linkage to disease (e.g. IBR)
					  ○ others
					
					Adoption Gap:
					• Develop best practice guidelines encompassing genetics, optimal management and health to reduce the incidence of bull breakdown during joining and increase the longevity of young bulls in commercial herds.
					  ○ include environmental considerations to ensure bulls are acclimatised to the environment they will be working in (e.g. bulls purchased specifically for undulating topography / hilly country).
					• Increase the emphasis on longevity in bull breeding programs
					  ○ studs to report on the average age of bulls and longevity in their herds

				of empty cows will be increased as will the number of late-born calves disrupting calving management and subsequent joining of late-calving cows. A recent MLA PDS project survey reported[1] 20% of virgin bulls broke down during joining, with the average working life of a bull ranging between 2.3 and 3 years. The overall cost of bull breakdown to a beef business varies widely between businesses and depends on a variety of interactive factors including the timing of onset, speed of detection, and availability of replacements.	
Grassfed Beef Productivity	GBP Priority #2	CVIC SNSW	New	**Bloat prevention management** – Beating bloat: reducing risk in Southern beef herds. **Outcome sought:** Reduced incidence of bloat in commercial beef herds and development of optimal management options. **Background:** Bloat is due to accumulation of excess gas in the rumen and occurs in two forms free gas (gas accumulation due to rumen disfunction which cattle can't clear via burping) and frothy (chemicals increase the surface tension of rumen fluid, trapping gas in a stable foam). Bloat can develop in less than one hour after cattle are introduced to a high-risk paddock, although it more commonly develops after one day. Bloat causes severe discomfort and, in advanced cases, sudden death. As onset can be rapid and often affects groups of cattle, bloat represents a significant animal welfare and productivity risk if not actively managed. Sub-clinical levels of bloat are likely to impact the productivity of commercial beef herds. Bloat risk increases when cattle are grazing or consuming:	**R&D Gap:** • Quantify the impact of sub-clinical bloat on the productivity and profitability of commercial beef herds. • Develop a reliable means of early identification of bloat (i.e. link to remote sensing, daily animal movement patterns, feed intake). • Quantify the relative impact of feedbase (i.e. composition, growth stage), feed intake (pasture versus silage) and time of calving. • Determine the most effective treatment options across production regions/livestock systems. • Develop new treatment and management options (i.e. rumen capsules, non-bloating legume varieties). ○ evaluate the impact of mineral supplementation on bloat • Undertake fundamental research to quantify the impact of saliva as a natural buffer for bloat and the possibility of manipulating saliva production to reduce the occurrence of bloat. • Evaluate the possibility of using the Bloat Alert app to provide quantitative data to industry regarding the incidence of bloat in southern beef herds and update future editions of the Australian red meat endemic disease priority list. • As bloat, pulpy kidney, grass tetany share risk conditions (i.e. dietary change and lush, high-quality feed) develop stackable technology (i.e. a bolus that impacts grass tetany or delivers trace elements) that is effective for all three conditions.

				• Lush, rapidly growing legume pastures, particularly at the vegetative stage • Pastures that are highly digestible with low dry matter content • Highest-risk legumes: lucerne (highest risk), followed by white clover, then subterranean clover • Wilted green forage, where prussic acid can cause rumen paralysis and free gas bloat • Intensive feeding systems with low fibre diets, where more than 80% of the ration is grain (commonly in feedlots or during drought feeding). Quantifying the economic impact of bloat currently relies on ad hoc producer surveys. The most recent survey of southern Australian beef production systems[2] estimated morbidity and mortality rates of 3.7% and 5.0% respectively. Just 21% of survey respondents reported bloat as a rare event. The Bloat Alert app uses community-based reporting to locate occurrences by postcode and to track bloat for research purposes to better understand the prevalence and associated risk factors. Losses continue to occur despite preventative measures being used, suggesting that current means of preventing bloat (i.e. pasture risk assessment, grazing management, use of roughage, provision of anti-foaming agents, bloat blocks, licks and supplements) are suboptimal. Preventive measures are less effective under heavy challenge and bloat outbreaks can occur suddenly with heavy losses. Bloat is estimated to cost the southern beef industry $66.8M annually (comprising $2.1M, $15.2M and $49.6M in treatment	**Adoption Gap:** • Develop best practice guidelines for early identification and management of bloat in commercial herds. • Quantify the user base and distribution of producers using the Bloat Alert app to increase producer uptake. • Develop text alerts when the bloat risk is high (linked to soil moisture, short fast-growing grass) for producers not using the app.

				costs, prevention costs and production losses respectively)[3].	

Sheep Productivity	SP Priority #1	CWNSW & QS SEVIC & TAS	New	**Optimal lamb growth and carcass quality on high performance pastures** – More weight, more lambs sold: grass-fed finishing that works.
				
				Outcome sought: Pasture fed lambs routinely growing at 300 grams per day with 98% survivability (post weaning to sale).
				
				Background: Growth rate is a key driver of profitability in pasture-based weaner finishing systems with early growth performance setting the finishing potential of each animal (i.e. time to reach target slaughter weights). Weaners that fall behind rarely catch up without effective interventions which require additional labour and costs to implement.
				
				Nutrient intake is the primary driver of post-weaning growth and health. High-quality pastures (i.e. those that are green, digestible and actively growing) enable weaners to grow faster, reach target weights sooner and convert feed more efficiently. Weaner growth rates of 300g/day or higher are achievable where pasture quality and intake are maintained. High quality pastures maintain continuous growth, enhance immune response and lower susceptibility to clostridial disease, pneumonia and parasitism[4].
				
				While it is well known that lamb growth rates decline rapidly when pasture quality drops and feed become limiting, sheep producers are reporting high mortality rates among well-grown, fast-growing weaners grazing on high quality pastures. While this may be related to bacterial proliferation, pulpy kidney and internal parasite burden, variation between animals in rumen and intestinal function may also contribute.5 This indicates a mismatch between feedbase and
					R&D Gap:
					• Develop finishing systems for weaners on high performance pastures.
					  ○ what are the key profit drivers? (breed, bloodline, growth rate)
					  ○ quantify variation with seasonal conditions and prices (feed and stock)
					• Understand the causes of variable lamb mortality and variable lamb growth on high performing pastures.
					  ○ both under and over performers in the mob
					• Develop optimal weaner management systems that preserve drench efficacy in all southern sheep production systems.
					• Undertake fundamental research to quantify the impact of saliva as a natural buffer for metabolic disruptions on high performance feedbase and the possibility of manipulating saliva production to manage metabolic disruptions.
					• Update nutrition tables to provide the required information to prepare accurate feed budgets for high performance feedbase and high performance sheep genetics.
					• Development of on-farm test technology to test for nutritional deficiencies on-farm to provide the basis for independent cost-effective administration of trace elements (cobalt, copper and trace elements.
					  ○ blood sampling
					  ○ saliva sampling
					
					Adoption Gap:
					• Quantify the cost of production of grass-finished lamb across the range of southern production regions.

				weaner genetics that requires novel management approaches to ensure high growth and low mortality.	

Sheep Productivity	SP Priority #2	CWNSW & QS SEVIC & TAS	New	**Early recognition and management of metabolic disease in ewes** - Building metabolically resilient ewes
				
				Outcome sought: Early detection and intervention of metabolic disease before progression to a clinical diagnosis.
				
				Background: Ewes deplete their stores of calcium each time they lamb. Older twin-bearing ewes area a high-risk group for hypocalcaemia due to their reduced ability to mobilise calcium from bone stores compared with younger ewes, particularly when under nutritional or management stress. While hypocalcaemia has several underlying causes and syndromes, the risk peaks in late pregnancy and early lactation, when calcium demand is highest.
				
				While an integrated management strategy that encompasses nutrition, targeted mineral supplementation, stress minimisation and optimising flock age structure can be effective, affected ewes require early treatment to avoid mortality. Early identification and prevention are more effective and economical than treatment.
				
				Hypocalcaemia is estimated to cost the southern sheep industry $44.4M annually (comprising $3.2M, $15.1M and $26.1M in treatment costs, prevention costs and production losses respectively)[6].
					R&D Gap:
					• Quantify the interaction between ewe age and hypocalcaemia (metabolic disease).
					• Develop a means of early detection of ewes and lambs at risk of metabolic disease.
					• Develop effective management strategies based on ewe age.
					    ○ commercial or home-made licks
					    ○ communicate and extend these strategies
					• Determine the potential to identify and manage young breeding ewes to reduce the risk and occurrence of metabolic disease issues during their productive lifetime.
					    ○ an effective proactive approach to preventing hypo- and hyper-glycaemia
					• Update nutrition tables to provide the required information to adequately feed ewes to reduce the occurrence of metabolic disease (i.e. account for genetic improvement in sheep over the past 20 years).
					
					Adoption Gap:
					• Clear messaging extended that is regionally applicable.

Sheep Productivity	SP Priority #3	CVIC SNSW SA	New	**Foot health and function -** Built to last: sound feet for productive sheep **Outcome sought:** Increased emphasis on foot structure and health to improve the functional longevity of sheep in commercial flocks.	**R&D Gap:** • Quantify the relationship between foot structure and foot health and determine if there is between and within breed variation in the relationship. ○ integrate anatomy, health, genetics, management and productivity impacts

				Background: Significant changes have occurred in the landscape for Australian sheep production enterprises over the past 20 years driven by variation in the relative value of meat to wool with consequent changes in breed and demographic structure of the flock. Advancements in genetic evaluation have increased the range and accuracy of genetic tools used to identify and select high performing sheep and quantified the variation existing in the Australian flock for a wide range of production, animal welfare and sustainability traits. Development of best-practice with-flock selection and animal husbandry suitable for exploiting and managing that variability has occurred. Together these developments have increased the complexity of decision making and range of potential on-farm interventions to ensure the future productivity, profitability and sustainability of sheep enterprises.
				
				These advancements have reduced the focus on structural and conformation traits, particularly those related to foot health and function. Foot structure and health are closely linked to the functional longevity of sheep within a flock, as well-structured feet allow even distribution of body weight, efficient movement and grazing and maintenance of normal hoof shape over time. This facilitates a sheep's ability to maintain normal gait, allow effective grazing and travel, and reduces susceptibility to foot injury and infection. Compromised foot function, negatively impacts movement, grazing behaviour, and body condition, reducing the animal's capacity to convert feed into wool, growth, or reproduction. There is a clear integrated relationships between foot structure, function and sheep productivity.
					• Quantify the foot structure requirements for various feedbase/production systems.
					    o grazing cereal crops
					    o pasture grazing
					    o rangelands production systems.
					• Develop genetic parameters and ASBVs for foot structure.
					• Quantify environmental causes/variation in foot scald and foot rot.
					• review current testing methods
					• develop consistent testing methods (across states) and reporting templates
					• Quantify causes of and management options for foot abscess.
					• determine the trade-off with litter size
					• develop a risk matrix to identify at-risk animals
					• evaluate current options for prevention and management
					• establish the impact on ewe wastage
					
					Adoption Gap:
					• Develop hands-on training programs for stud and commercial producers to build industry capacity to assess conformation (leg and foot structure).
					    o What do normal feet look like?
					• Promoted balanced selection based on ASBVs and visual assessment.

				Foot paring is routinely practised to maintain foot shape, but this practice has effectively masked the issue and eroded the knowledge and skill base related to foot structure and health in both the stud and commercial sectors.	

Feedbase Production	FP Priority #1	CVIC
		WVIC
			New	**Nitrogen Fixation in Legumes** - Eliminating lazy legumes by promoting effective nodulation.
				
				Outcome sought: Optimising nodulation and nitrogen fixation in southern livestock production systems to reduce reliance on nitrogenous fertiliser application.
				
				Background: A biological symbiotic relationship between legumes and *Rhizobium* bacteria allows fixation of atmospheric nitrogen via root nodules. The nitrogen is used by the legume for growth and is available for surrounding pasture species which reduces reliance on synthetic nitrogen fertilisers. When legumes are growing well and effectively fixing nitrogen, pasture quality and livestock performance improves and the resilience of the feedbase increases.
				
				Nitrogen fixation only occurs when legumes are well nodulated and the nodules are functioning properly to allow the bacterial processes to occur. Poor or absent nodulation can limit nitrogen fixation and pasture performance. Many soil and management factors impact nodulation and nitrogen fixation including acid soils, waterlogging, nutrient availability (phosphorus, sulphur and potassium), herbicide application and root development.
				
				In 2017, GRDC estimated the national economic value of nitrogen fixed by pasture and pulse legumes at $2.4 billion per year[7], based on N fixation rates of about 110 kg N/ha/year, legume areas of 25 million ha and
					R&D Gap:
					• Develop a means of increasing nodulation and N fixation in pasture legume species.
					    ○ identify novel traits for plant breeding and practical on-farm means of enhancing nitrogen fixation in existing and new pasture species comprising the southern feedbase
					• Validate the nitrogen fixation potential of modern legume varieties under the range of environmental conditions (e.g. soils, temperature, soil moisture levels, fertility constraints, pH) across the southern feedbase.
					• Develop a rapid in paddock method to quantify the availability of soluble sources of N and mineralised N (current N testing can take 2-3 weeks) to allow producers to assess the economic benefit of fertiliser at key times in the growing season.
					• Quantify the interaction between environment and species.
					• Development of an in-paddock test for nodulation performance that confirms nodule function and nitrogen fixation.
					
					Adoption Gap:
					• Review and refine current protocols for in-paddock assessment of nodulation performance to increase the frequency and accuracy of on-farm assessment.
					    ○ define the triggers required to undertake a nodulation assessment.
					    ○ quantify the time required to effectively and accurately assess nodulation in paddock.
					    ○ define the business case (cost:benefit) for producers to assess nodulation and act.
					    ○ outline the actions (decision support tool) required once nodulation has been assessed. What are the best methods to increase nodulation so plants can reach their maximum nodulation and N fixation potential.

				N fertiliser (urea) costs to the grower of $0.70/kg N (equating to $0.88/kg plant-available N in the soil). Livestock producers report sub-optimal performance of sub clover in many regions, with producers losing confidence in the ability of the legumes to supply adequate nitrogen to support their feedbase.	

Feedbase Production	FP Priority #2	CVIC
		SA
		WVIC
			New	**Long-term (10 year) perennial pasture persistence** – Staying power: perennial pasture persistence.
				
				Outcome sought: Identify perennial pasture species that persists for 10+ years and understand the performance of long-term perennial pastures under commercial grazing conditions.
				
				Background: Pasture persistence refers to the ability of a pasture to maintain a high proportion of desirable perennial species and productive ground cover over time. Soil constraints, seeding recruitment, weed incursions, grazing management and rainfall all impact persistence of perennial species in the feedbase. Perennial pastures have a high establishment cost with a relatively long payback period. Long-term persistence is critical to recover establishment costs and maintain livestock productivity. Inconsistent investment in pasture species specifically for Australian conditions has reduced genetic progress in pasture plant breeding in Australia and eroded the research expertise base required for genetic improvement programs.
				
				The Pasture Trials Network (PTN) is an industry-led, independent pasture variety testing program that provides access to for livestock producers and advisors across temperate Australia. The PTN brings
					R&D Gap:
					• Quantify the long-term productivity and persistence of modern perennial pasture cultivars in Australian pasture environments over at least a 10-year period.
					• Explore nitrogen fixing plant species and their contribution to feedbase sustainability (e.g. Sainfoin) for long-term perennial persistence.
					• Identify key morphological and metabolic traits of perennial plants for future climate scenarios.
					    ○ what plant traits contribute to persistence?
					    ○ EBVs for plants: expanding on PTN
					• Quantify the soil and plant interactions that contribute to persistence (i.e. legumes in alkaline soils).
					    ○ conduct a desktop review
					
					Adoption Gap:
					• Support longer-term trials that generate reliable information on persistence of various pasture species (the current pasture trial network funding cycle is too short-term to generate reliable data).
					    ○ ensure regional and species gaps are addressed
					• Develop best practice guides for optimal management and persistence of perennial pasture species.
					• Facilitate producer engagement with the G by E Tool developed from the PTN database.
					• Evaluate the persistence and productivity of perennial species (compared to annual species) and best establishment methods for different regions via targeted Producer Demonstration Sites (PDS) trials.

				together data from a coordinated network of independent pasture trials based on standardised trial protocols so producers can compare how pasture varieties perform in different regions and environments. Completed trial data is independently analysed and uploaded to the PTN e-Tool. The current PTM system provides useful information to livestock producers, however it is limited in terms of the trial periods which range from less than one year for annual pasture varieties to three years or beyond for perennial species. Evaluation of perennial species needs to continue for 10-years, with evaluation sites representing the breadth of southern Australian livestock production regions (i.e. high, medium and low rainfall) and soil types (i.e. acid and alkaline).	○ perennial or biannual grass: drought tolerance for low rainfall zones • Develop a cost: benefit analysis tool to evaluate long-term pasture species and their role in resilient farming systems. ○ consider management, rainfall, fertiliser, trace elements, soil type
Environmental Sustainability (On-farm)	ES Priority #1	CVIC NNSW SEVIC & TAS SNSW WVIC	Ongoing	**Reduce and reuse of plastic waste** - Circular plastics in livestock production systems. **Outcome sought:** Practical, cost-effective alternatives to plastics to optimise production, reduce plastic waste and microplastic contamination in southern Australian livestock systems. Development of a circular economy for plastic on-farm inputs. **Background:** On-farm plastic use is coming under increasing scrutiny due to ESG expectations and environmental regulations. Agricultural plastics (e.g. silage wrap, twine, containers etc) are emerging topics in sustainability discussions but are not yet incorporated into national red meat frameworks as material issues and remain outside the formal reporting scope, despite growing expectations from regulators, markets, consumers and livestock producers. New	**R&D Gap:** • Conduct an international literature review on opportunities to reduce or recycle on-farm plastic waste. ○ potential development of improved silage wrap, bale twine (i.e. recyclable, reusable, biodegradable) or alternatives. • cost-effective system for collecting, recycling and re-purposing core waste products (e.g. silage wrap, hay string, grain bags, ag chemical containers, vaccine packaging) • Quantify the scale of microplastics issue in red meat production and their impact on farm safety and food safety. • Undertake social science research to capture livestock producer perspectives regarding plastics on farm (i.e. scale of the issue, perceived social license issues etc). **Adoption Gap:**

				Zealand has active product stewardship schemes, financial incentives linked to sustainability performance and government endorsed national plastics action plans. The United Kingdon operatives a livestock industry led farm plastics recycling accreditation scheme that focusses on collection, traceability. Reducing waste, improving waste management, developing sustainable on-farm alternatives to plastics together with identifying opportunities to convert wastes into value-added products are key factors that underpin the development of a circular economy for livestock enterprise inputs. While some schemes are in operation (i.e. drum muster, bag muster), current options for dealing with plastics waste are limited and becoming more restrictive limiting productivity of southern livestock enterprises (i.e. reluctance to use plastic wrapped silage). Microplastics are a potential risk to livestock production, having been identified in livestock tissues at levels that make it a potential consumer safety issue. However, the source of the microplastics, whether they originate on-farm or along the supply chain, remains unknown. Livestock ingest microplastics from their environment (i.e. feed or soil) with 74–50,583 particles per kg detected in ruminant faeces [9]. The impact of ingestion of microplastics on livestock productivity, and incorporation into livestock products remains unknown, despite preliminary research showing that microplastics are vectors for heavy metals, antibiotics, antibiotic resistance genes and microbes.	• Develop a PDS program using a coordinated supply chain approach (i.e. producers, resellers, councils, recyclers) to scale up ethical means of disposing on-farm plastics.[10]

MEAT & LIVESTOCK AUSTRALIA

Environmental Sustainability (On-farm)	ES Priority #2	CWNSW & QS
		NNSW
		SA
		SNSW
				Pest management in livestock systems - Precision pest control for productive and biodiverse grazing landscapes.
				
				Outcome sought: Cost-effective, novel and practical weed and feral animal management in southern livestock production systems that balance livestock enterprise productivity with biodiversity and natural capital.
				
				Background: The Centre for Invasive Species Solutions (CISS) estimates the annual average cost of weeds and feral animals (rabbits, wild dogs, foxes, feral pigs, feral deer and other vertebrate pests) to southern Australian livestock production enterprises to range between $1.09 to 1.12 billion annually[11]. The cost estimate includes the impact of weeds on the feedbase, production losses due to feral animals and the cost of weed and feral animal management. Importantly these estimates do not include the biosecurity risks from vertebrate pests nor the impact of weeds and feral animals on environmental stewardship (impacts on biodiversity, natural capital) or on-farm safety.
				
				Effective management of weeds, feral animals and native species will enhance biodiversity and ecological abundance and reduce grazing pressure in southern livestock production systems.
					R&D Gap:
					• Quantify the impact of weed and feral animal management in southern livestock production systems.
					  ○ where are production losses occurring and what is the extent of the losses?
					  ○ what are the likely implications of climate change?
					  ○ what is their impact on natural capital and diversity?
					  ○ the reduction in productive agricultural land (weed density per hectare, total grazing pressure, predation)
					• Develop new means of control of weeds and feral animals that take account of social license and reduce labour.
					  ○ remote systems based on thermal imaging and AI technology
					  ○ effective means of sterilisation of feral species to reduce numbers going into drought without impacting on production species
					  ○ increased utilisation of known and proven technologies (i.e. cat eradication on KI vis poison spray)
					• Develop technologies such as AI recognition and automated surveillance systems for weeds, feral pest and native species recognition and management to quantify when populations are prolific and where they are present for targeted pest management.
					• Develop alternative protein markets for a range of native and feral species (e.g. kangaroo, emu, camels, donkeys, deer, rabbits) that compete for feedbase resources.
					  ○ both human and pet food
					  ○ potential to shift current low value production to higher value
					
					Adoption Gap:
					• Promote the wider use of existing locator tools for feral animals in extensive production environments.
					• Develop clear cost-benefit of pest management in livestock systems that encompass time, labour, capital outlay and inability to eradicate (i.e. repeated control) to increase adoption.

MEAT & LIVESTOCK AUSTRALIA

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[2] Allworth et al. (2023) A survey on bloat in southern Australian beef production systems Australian Veterinary Journal 101, 121-126 DOI https://doi.org/10.1111/avj.13226

[3] Shephard et al. (2022) Priority list of endemic diseases for the red meat industry - 2022 update. Meat & Livestock Australia Limited 30 June 2022 North Sydney: MLA Limited

[4] Cullen and Smith (2024) Pasture mixes to finish lambs in East Gippsland - Nexus Involve & Partner. Final Report Project code P.PSH.1415 Meat & Livestock Australia Limited 30 April 2024

[5] Beef+Lamb New Zealand (2010) 400 Plus A guide to improved lamb growth for farmers and advisors. Beef+Lamb New Zealand

[6] Shephard *et al*. (2022) Priority list of endemic diseases for the red meat industry - 2022 update. Meat & Livestock Australia Limited 30 June 2022 North Sydney: MLA Limited

[7] GRDC (2017) Use the four-step 'nod' check to assess your legume nodulation. GRDC Grow Notes™ Tips & Tactics Legumes and Nitrogen fixation. Grains Research & Development Corporation

[8] Shephard *et al*. (2022) Priority list of endemic diseases for the red meat industry - 2022 update. Meat & Livestock Australia Limited 30 June 2022 North Sydney: MLA Limited

Parasite	Treatment	Prevention	Production	Total
Cattle				
Buffalo fly	0	3.6	4.6	8.2
Cattle tick (southern cattle)				6
Internal parasites	0	59.2	40.7	99.9
Therileriosis (southern cattle)	1.2		16.5	17.8
Trichomoniasis	0	0	3.7	3.7
Hydatids	0	0	2.3	2.3
Tick fever				
Sheep				
Internal parasites	0	102.5	562.5	665.4
Flystrike - body & breech	121.5	83.8	227.4	323.7
Lice	3.3	59.5	44.8	107.6
Liverfluke	0	1.4	36.8	38.2
	126	**310**	**939.3**	**1272.8**

[9] Olmo & Holman (2025) The sources and impact of microplastic intake on livestock and poultry performance and meat products: a review. Animal Production Science, 65: **DOI** https://doi.org/10.1071/AN25022

[10] National Landcare Programme – Small Farms Small Grants 2017-18 Embedding a Recycling Culture for Silage Wrap and On Farm Plastics, Holbrook Landcare Group

[11] Centre for Invasive Species Solutions (2026) Co-pilot summary

	National baseline	Allocation	Estimated cost to southern livestock production systems
Weeds	Agricultural weed costs $4,813.7m. Livestock share assumed 25%	Cattle share - 40.2% Sheep share - 80.1%	$779.2m
Vertebrate Pests	*Production losses*		
	Non-deer pests Beef $204.0m, Wool $94.5m, Sheepmeat $50.5m Deer - $69.1m	Cattle share - 40.2% Sheep share - 80.1%.	$198.0m Deer $27.8m to $55.3m
	Management costs		
	Non-deer pests Broadacre & livestock farm control $46.13m Commonwealth $14.74m State/Territory $69.58m = $130.45m Deer - $17.8m	Average share 60.1% Cattle share - 40.2% Sheep share - 80.1%.	$78.4m $7.1m to $14.3m
Total estimate			**$1,090.6m to $1,125.2m**