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Published October 2018

MLA acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this report.

MDC AT A GLANCE

MLA Donor Company Limited (MDC) is a fully-owned subsidiary of Meat & Livestock Australia.

MDC accelerates innovation across the value chain so the Australian red meat and livestock industry can remain competitive on the world stage.

It does this by attracting commercial investment from individual enterprises and others that share a mutual interest to co-invest in innovation that will benefit the industry.

PURPOSE

MDC was established in 1998 as a fully-owned subsidiary of MLA.

MDC is incorporated under the *Corporations Act 2001*. The principal activity of MDC is to act as an approved donor under s61 (1) of the *Australian Meat and Live-stock Industry Act 1997* for research and development matching funding purposes.

MDC supports MLA's strategic purpose of fostering the long-term prosperity of the Australian red meat and livestock industry via:

- ▶ extending MLA's strategic priorities into future-focused, transformational impact areas
- ▶ facilitating capability and adoption of innovation by industry
- ▶ acting as a catalyst to accelerate the development of innovations with new types of provider partnerships
- ▶ partnerships that facilitate 'big picture' change in the industry
- ▶ engaging leading global providers and entrepreneurs that bring new ideas and new value to the industry
- ▶ attracting new investment partners to co-develop key priority areas.

MDC has the same vision, mission and values as MLA (see mla.com.au/about-mla/who-we-are).

FUNDING

MDC attracts co-investment from individual enterprises and others that share a mutual interest with MLA to invest in innovations that will benefit the Australian red meat and livestock industry.

Through MDC, the Australian Government matches voluntary partner contributions in projects that address industry and government priorities and benefit the Australian community.

MDC includes an access fee in projects to cover operational costs.

STAKEHOLDERS

MDC attracts investment from every part of the red meat and livestock value chain, including processors, value-adders, breed societies, large pastoral companies, universities, international collaborators and technology providers. It works in partnership with these value chain partners and the Australian Government to deliver innovation products and services to the cattle, sheep and goat industry (see Figure 1).

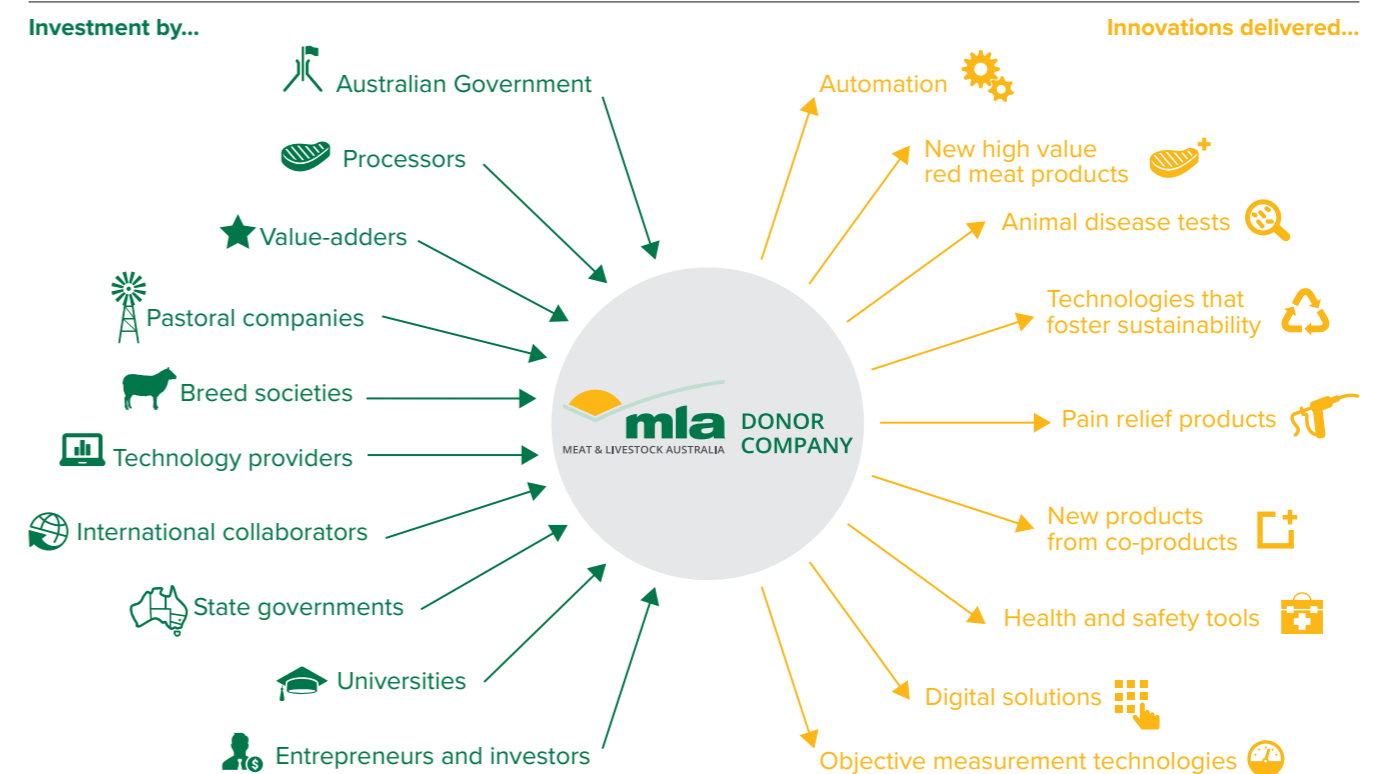
MDC also works with the Australian Meat Processor Corporation via the Plant Initiated Project initiative, to develop projects that address key processing issues and support the development of innovation capabilities.

FIGURE 1: The value of MDC



*Sourced from the Impact Assessment of MLA Expenditure 2010–11 to 2014–15 – Economic quantification of benefits by the Centre for International Economics, ISJ Investments and AgStrat. The full report is available at: mla.com.au/performanceview

FIGURE 2: The role of MDC



2017-18 HIGHLIGHTS

Our year

2017 JULY

MDC announced an additional **\$14 million** to co-fund the commercial installation of DEXA objective measurement systems in individual red meat processing plants keen to accelerate the adoption of the technology.

Applications opened for GrowLab, Australia's first 'deep technology' AgTech commercialisation program developed by Cicada Innovations and MDC.



SEPTEMBER

A Hitachi Transformation Award for achievements in beef production innovation, using data-mining and enabling the 'Internet of Things', was awarded to MDC for a technology project run in conjunction with Australian Cattle and Beef Holdings and Australian Country Choice.



NOVEMBER

MDC-funded innovations and technologies were showcased at MLA's Red Meat 2017 in Alice Springs.



2018 JANUARY

Launch of the **\$8 million** Northern Australian Climate Program to improve the capacity of the red meat industry to manage drought and climate risk across northern Australia.



MARCH

A five-year project to develop a benchmarking tool to measure animal welfare and demonstrate its continuous improvement is launched, co-funded by MDC through the Strategic Partnership for Animal Welfare Research, Development and Adoption.

SmartShepherd, a NSW-based start-up that has developed an electronic pedigree ID system for livestock with support from MDC, triumphed at the global AgFunder Innovation Awards.



MAY

MDC partnered with Elders to launch a three-year pilot to co-develop, establish and evaluate a new research adoption and co-innovation model to better identify producer needs, increase adoption and engage with innovative Queensland producers.

Commercial trials, co-funded via MDC, of a new model designed to more accurately predict the shelf-life of red meat and ultimately reduce waste showed promising results in a domestic supply chain.



AUGUST

MDC announced **\$28 million** over five years in new research on converting CT technology for use in the processing sector and on-farm.

A **\$3 million** investment over three years to reduce the incidence and costs of endemic health conditions affecting South Australia's sheep flock was unveiled.

MDC partnered with WA Government and University of Queensland, to co-invest **\$2.3 million** over three years to breed, assess and trial a sterile line of leucaena for use in WA and, potentially, the NT.



OCTOBER

NSW Department of Primary Industries, University of New England and CSIRO commenced the Livestock Productivity Partnership.



DECEMBER

Applications for Producer Innovation Fast-Track program were extended as open call exceeds expectations.



FEBRUARY

MDC commenced a partnership with Aerodyne in a pioneering study into the role of autonomous drones and sensors.



APRIL

A Producer Innovation Fast-Track program project to explore the potential for bringing indigenous branded beef products and services to both the domestic and international market got underway.



JUNE

A group of 24 agrifood professionals and producers graduated from the MDC-supported Insights2Innovation Young Food Innovators program.



HIGHLIGHTS

During 2017-18 MDC:



402

new contracts approved

valued at

\$343m



56%

of MLA research and development was funded via MDC



Collaborated with industry to implement two major research partnerships – the Strategic Partnership for Animal Welfare Research, Development and Adoption and the Livestock Productivity Partnership.



start-ups focused on red meat challenges supported through I+E Connect



First time ever utilised 99% of available matching funding



470+

producers engaged in Producer Innovation Fast-Track



186

organisations partnered with MDC



23

future industry leaders supported

MANAGING DIRECTOR'S REPORT



Richard Norton, Managing Director

MLA Donor Company (MDC) began in 1998 as a means of attracting commercial investment to accelerate innovation in the Australian red meat industry.

Over the past 20 years, MDC has co-invested with every part of the value chain, including processors, large pastoral companies, breed societies, value adders and more. Without this co-investment, the industry wouldn't be in the same position it's in today.

MDC has delivered to our industry more efficient automation and objective measurement technologies, pain relief solutions, cutting edge health and safety tools, capability building programs and uncovered high value growth opportunities.

In recent years, we actively sought to attract additional commercial investment from new partners who may not have previously considered our industry attractive. The opportunity to attract this additional investment was due to MLA having access to more Australian Government funding than it would have been able to match with levies alone.

Strategies and initiatives were put in place to attract new ideas and new technology and solution providers.

The elevation of MDC's role has been an overwhelming success, attracting millions of dollars in commercial investment in projects across the value chain. In fact, MLA's revenue in 2017-18 was \$272.5 million – 35.9% higher year-on-year. This increase was primarily due to partner contributions and Government matched funding for investments made via MDC.

In previous years, the level of commercial investment MLA attracted meant it was only able to access around 50%-60% of available matching funds from the Government. However, in 2017-18, MDC investment increased by \$59.3 million (158.1%) to \$96.8 million, resulting in the MLA group using almost 99% of the Government matching funds available. Through partnerships with 186 organisations, MDC accounted for approximately 56% of MLA's R&D investments.

“The elevation of MDC's role has been an overwhelming success, attracting millions of dollars in commercial investment in projects across the value chain.”

Richard Norton

The recent promotion of MDC has attracted new investors and partners to the Australian red meat industry, including global companies such as Rapiscan Systems and Hitachi, ag-tech and food-tech entrepreneurs and more than 470 producers investing in innovation capability building through the Producer Innovation Fast-Track program.

I'm proud of the results that MDC achieved in 2017-18 and its efforts in strengthening the industry for the future.

I would also like to acknowledge the work of former MDC CEO, Dr Christine Pitt, in positioning MDC as an attractive funding mechanism for the Australian red meat industry. I'm confident that under the management of Sean Starling, MDC will continue to accelerate innovation for the industry, helping to ensure we remain competitive on the world stage.



GENERAL MANAGER'S REPORT



Sean Starling, General Manager, MDC, Research, Development and Innovation

MLA's purpose is to foster the long-term prosperity of the Australian red meat and livestock industry. By bringing together the management of MLA Donor Company (MDC) with our Research, Development and Innovation business unit, we're ensuring that MLA's investments in R&D and innovation contribute to the prosperity of the industry today, tomorrow and into the future.

Technology and objective measurement

Technology and the ability to share real-time, objective information across the supply chain is vital to our industry's future competitiveness. MDC continues to make a significant impact in the area of objective carcass measurement, co-funding the evaluation and development of DEXA technology for both beef and lamb.

In 2017-18, the first beef DEXA unit to specifically provide producer feedback on carcasses was commissioned at Teyes Australia's Rockhampton plant. DEXA hardware was also installed in lamb processing plants resulting in an algorithm being developed for accurate lean meat yield analysis that can now be applied in a commercial system for both beef and lamb.

Strategic partnerships

MDC collaborated with industry to implement two major research partnerships in the past year – the Strategic Partnership for Animal Welfare Research, Development and Adoption (RD&A) and the Livestock Productivity Partnership (LPP).

There are currently five projects underway through the Strategic Partnership for Animal Welfare RD&A, which will see up to \$35 million invested in animal welfare over five years. The LPP now has 11 projects underway covering key areas of red meat productivity gains that producers have asked for, also valued at \$35 million over five years.

Collaboration

Collaboration is a key factor in the success of many MDC investments. MerinoLink's Producer Innovation Fast-Track project is a great example, involving 27 ram breeders and more than 200 producers in a project designed to double the rate of genetic gain.

The Insights2Innovation cross-sectoral project, supported by \$10 million of co-funding via MDC, identified innovation opportunities and has helped many agri-food organisations explore new products, brands, value chains and business models. This project also demonstrated the importance of collaboration in helping the agriculture and food sectors get product to market and increase value chain efficiencies.

Part of the role of MDC is to attract new, leading-edge and disruptive ideas to our industry. Our work in this space is being recognised internationally, such as the project undertaken with Australian Cattle and Beef Holdings and Australian Country Choice using data to drive innovation that was awarded the inaugural Hitachi Transformation Award.

SmartShepherd™, a start-up that developed a re-usable smart tag enabling livestock breeders to collect maternal pedigree quickly and cost effectively, also took out Most Innovative International Startup Pre-Series A in the Farm Tech category at the 2018 Global AgFunder Innovation Awards.

Looking ahead

In 2017-18, MDC continued to demonstrate its ability to attract investment from every part of the red meat and livestock value chain, as well as attract investment from new sources. This *MDC Outcomes Report* highlights the impact of just some of these projects.

The increased level of investment through MDC in the past year demonstrates its successful positioning as an attractive funding mechanism. I look forward to reporting on the continued success, beneficial outcomes and impacts of MDC investments in the year to come.





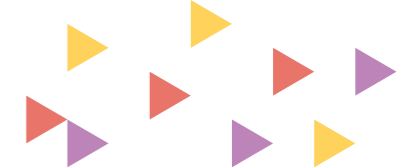
MDC attracts investment from every part of the red meat and livestock value chain, including processors, value-adders, breed societies, large pastoral companies, international collaborators, entrepreneurs and technology providers.

MDC co-invests with these partners to deliver research, development, innovation and adoption outcomes that benefit Australian cattle, sheep and goat producers.

These investments flow across the research and development continuum from strategic basic and applied research, through to industry adoption and capability building.

MDC's strategic investment portfolio is aligned to extending the achievement of the *Meat Industry Strategic Plan 2020* and *MLA's Strategic Plan 2016-2020*





MDC invests in a wide range of areas to enhance on-farm productivity and profitability, including livestock genetics, animal health and welfare, and pasture utilisation.

It also invests in research and development to improve processing productivity, including automation, objective carcass measurement, health and safety, and environmental management to keep our industry globally competitive and sustainable

PILLARS



Award-winning technology for northern beef

MLA, in conjunction with vertically integrated beef supply chain business Australian Cattle and Beef Holdings (ACBH) and Australian Country Choice (ACC), was awarded the inaugural Hitachi Transformation Award for its work in using data to drive innovation in the red meat industry.

Hitachi's sensor-driven data collection and analytics technology is being used in a research project in Queensland with ACBH and ACC, co-funded by MDC. The project assists value chain partners to share and mine data to benefit their operations.

Data collection from individual paddocks will enable ACBH to identify and address supply chain inefficiencies. Together with individual animal data mapped across the whole value chain, process intelligence will allow producers to make more informed and timely management decisions.

Flicking the switch on beef DEXA

On the back of successful lamb DEXA work, objective carcass measurement for the beef industry took a step forward in May 2018 with the commissioning of beef DEXA (dual energy X-ray absorptiometry) technology at Teys Australia's Rockhampton processing plant.

Teys Australia has installed the first beef DEXA unit to specifically provide producer feedback on carcasses.

Federal Minister for Agriculture and Water Resources, David Littleproud (pictured with MLA Managing Director Richard Norton), switched on the machine for the first time during Beef Australia 2018, effectively starting the commissioning phase of the technology.

DEXA technology provides a scientific measurement of carcass lean meat yield, bone and fat. The technology installed by Teys will have the capacity to measure up to 500 sides/hour. MDC funding has supported the evaluation and development of DEXA technology for both beef and lamb.



MLA Managing Director Richard Norton and Federal Minister for Agriculture and Water Resources, David Littleproud, switching on the DEXA machine at Teys Australia.

New shelf life management tool

MLA and the Tasmanian Institute of Agriculture have developed a new shelf life management tool for beef and lamb.

The computer model predicts the shelf life of vacuum-packed product and has been validated in domestic and international supply chains.

Trials conducted in a domestic supply chain have suggested an 8% reduction in wastage is possible as a result of accuracy of shelf life prediction.

An MDC-funded trial involving three products was completed in 2018, while international trials of the shelf life prediction tool have been conducted with more to follow.

The model can also be used to build confidence in product shelf life, simplify the supply chain and improve control over product, leading to less markdowns and waste in stores.

Internationally, the shelf life tool will be used to further address technical trade barriers. The new model has already given importing countries confidence in shelf life of Australian red meat without having to conduct extensive studies.

For example, in May 2017, the United Arab Emirates government extended accepted shelf life limits for Australian vacuum-packed meat. Chilled beef standards increased from 90 days to 120 days and sheepmeat from 70 days to 90 days.

Industry is hopeful other countries will also increase acceptable shelf life for Australian product to allow access to premium markets.

Development of LEAP V

The development of the LEAP V automated lamb forequarter processing module was completed in 2017-18, and the technology has been installed at two processing plants to date.

The lamb forequarter is a primal component of the carcass requiring a series of bandsaw cuts to separate the neck, separate the shanks, and splitting to produce the square cut shoulder portions. At processing line speed in the lamb boning room, this is a repetitive and physically demanding task.

MDC partnered with global technology provider, Scott Automation & Robotics to develop the LEAP V automated bone-in forequarter processing cell.

The fully automated cutting solution features a robot and motor-controlled bandsaw, capable of processing the main bone-in cuts of the carcass forequarter including knuckle tip removal, neck cuts, shank and brisket removal and vertebrae splitting.

Wagstaff Cranbourne has installed one LEAP V machine to manage cycle speed, while three have been installed at JBS's Brooklyn plant to process 10 carcasses per minute.

The technology further adds to the LEAP series of modules, designed to deliver a more consistent product, increase workplace safety by separating the operator from the cutting blade and contribute to labour efficiencies.

Lamb processing progress

A single tower lamb primal cutting system for lower throughput plants has been successfully manufactured and the first commercial unit installed in June 2018 at a Wagstaff Cranbourne Pty Ltd plant.

This system has been designed to make it available for smaller processing plants to take the first step into introducing automation technology to their site without investing in a full DEXA objective measurement system.

The system consists of a downsized LEAP III single tower (without an X-ray sensing system) and is easier to install.

While the DEXA system uses X-ray technology prior to cutting carcasses, the single tower system requires an operator to mark cutting lines with a laser level tool.

The development of the single tower enabled the LEAP III system to reduce from two stations to a single station with combined clamping to enable the forequarter and saddle cuts to be performed within a cycle rate of five carcasses/minute.

Benefits include improvement of the cut accuracy from the current manual head saw cutting/pre-marking process, as well as the ability to add an additional tower and X-ray system in the future, equivalent to a LEAP III.

Northern Australian Climate Program

The Northern Australian Climate Program (NACP) is an \$8 million partnership between the Queensland Government, MDC, and University of Southern Queensland, with extra on-ground support from the Northern Territory and Western Australian governments and Rangelands NRM.

NACP research includes attempting to improve seasonal forecasts, predictions of multi-year droughts and wet season onset, and quantifying the development of fast developing or 'flash' droughts.

A focus of the program is improving the knowledge and skills of producers across northern Australia to enable proactive management of climate variability, which minimises exposure to environmental, profitability and productivity losses.

SwagBot: The robot farmer

A robot to muster livestock, control weeds and send pasture quality and soil moisture data to the farm computer is no longer a fantasy. SwagBot, developed by the University of Sydney's Australian Centre for Field Robotics, is an autonomous on-farm robotic ground vehicle, capable of navigating through rugged terrain.

The vehicle is fitted with sensors for a range of data collection and farm monitoring tasks including livestock location, pasture measurement and farm infrastructure monitoring. The MDC-funded project focused on developing a prototype user interface, data processing software and data integration with farm mapping tools.

SwagBot has successfully demonstrated interaction with livestock, detection of certain weeds such as serrated tussock and African box thorn, and precision spraying. The robot can also interface with on farm mapping program, Farm Map 4D, communicate and work co-operatively with drones, as well as pull a trailer and move livestock.

Swagbot developer Professor Salah Sukkarieh shared updates on the research at MLA's Fostering Beef's Prosperity: Fork to Farm seminar at Beef Australia 2018, and the robot featured on MLA's trade stand.



Image courtesy of the University of Sydney's Australian Centre for Field Robotics

A skilled and capable workforce is critical to the red meat industry delivering on the ambitious targets set out in its strategic plans – and to building a more profitable and resilient industry.

MDC invests in programs that engage with producers, young professionals and value chain partners in a range of capability building initiatives to accelerate innovation adoption, increase the industry's investment in innovation and facilitate cultural change.

PILLARS



Producer Innovation Fast-Track

The Producer Innovation Fast-Track pilot program was developed by MDC to actively involve producers in driving innovation.

This program identified industry trailblazers – whether they be early adopters, ag-tech entrepreneurs or future value chain leaders – and provided the support and expertise required to build their capabilities.

More than 470 producers were engaged in the pilot that began in November 2017, through projects such as value-adding to Brahman humps for foodservice, researching what customers want in ethically produced meat and improving the rate of genetic gain in hard-to-measure traits.

Participants had access to a customised capability building program, including technical and business expertise and resources, networks of like-minded, future-focused producers, co-investment funding and mentoring.

The program has also helped MLA identify producers' pain points, needs and priorities. It's also allowing MLA to develop and trial new approaches to accelerate adoption, stimulate increased innovation investment by producers and facilitate greater collaboration.

Smokin' Yak on the Fast-Track

A beef business is serving up slow-cooked, smoked Brahman hump in a delicious and innovative way to value-add this underutilised cut.

The Smokin' Yak is the brainchild of two Brahman beef breeding families – Matthew and Fiona Noakes of Solo Brahmans and Gary, Sharon and Alison Polkinghorne of Copperville Brahmans.

As participants in the Producer Innovation Fast-Track program, they used the co-investment model to access advice and support as they navigated their way through business growth and branching out into value-added product.



The Smokin' Yak's Gary Polkinghorne (left) with employee Chris Harth at Beef Australia 2018.

INNOVATION CAPABILITY BUILDING

Industry teams up to double genetic gain

The DNA Stimulation project is a collaboration between not-for-profit research group MerinoLink, University of New England, stud and commercial Merino breeders and MDC via its Producer Innovation Fast-Track program.

The project aims to double the rate of genetic gain among participating flocks within five years by providing breeding program support and expertise.

MerinoLink was overwhelmed by the enthusiasm of participants in the project designed to double the rate of genetic gain in participating Merino flocks by 2022.

Within four days of MerinoLink putting the call out for participants, there was close to \$3 million worth of commitment from their members.

The collaborative and grassroots nature of the project is one of its biggest strengths, with the involvement of 27 ram breeders, 14 commercial producers breeding their own rams and up to 200 commercial producers purchasing rams.

“I have to say the support I’ve had from MLA has been outstanding, which tells me they’re very serious about having an impact on the industry and are keen to work with us at all levels to achieve this.”

Sally Martin, MerinoLink



Sally Martin, MerinoLink

Large scale ‘cell’ grazing

Buoyed by evolving natural resource management techniques and strong prices, brothers Angus and Toby Nichols are implementing an ambitious plan for achieving sustainable long-term livestock productivity on their Murchison, WA property.

Supporting this is a Producer Innovation Fast-Track project to revitalise soil health and livestock productivity.

Angus and Toby took on the 50-year pastoral lease of the 100,000ha Edah Station, between Yalgoo and Mt Magnet, with a view to running sheep.

It didn’t take them long to realise that any plans they had to raise livestock profitably would have to address the total grazing pressure created by high populations of goats and kangaroos, as well as the impact of wild dog depredation.

The Fast-Track project is supporting the development of the plan to implement, manage and monitor total grazing pressure in a 30,000ha fenced cell while accurately assessing the impact of kangaroos and wild dogs.

The cell captures seven water points, and rangeland self herding and stress-free stockmanship methods will be tested for rotating the sheep around these water points to minimise internal fencing. To date, the fence has proved a successful barrier and Angus plans to install electric wires on high pressure areas to reduce pressure from the outside and thus reduce the need for continual monitoring and repairs.

“It was somewhat daunting to realise how much there was to do, but the process of applying for the program and reporting back to MDC has helped us to clarify our short and medium-term goals, as well as bringing more discipline to our approach.”

Without Fast-Track we might have attempted the fence, but we certainly wouldn’t have been as disciplined in managing and monitoring the grazing pressure and making sure the whole system works.”

Angus Nichols, Edah Station

Meat’s future

A group of 10 next generation livestock consultants started a two-year internship in June 2017, in the second intake of the Future Livestock Consulting Internship program.

Established as a partnership between MDC and participating consulting firms, the program is designed to ensure a flow of new consultants to Australia’s livestock industry.

Managed by Meridian Agriculture, the program provides the interns with the industry experience, foundational skills and knowledge to accelerate their livestock consulting careers.

It provides them with valuable personal development support, practical skills and access to industry networks whilst they undertake a Graduate Certificate in Agricultural Consulting. Over the two years, the interns also identify, develop and implement a major industry research project, giving them a real-world understanding of the implementation of research and development.

Georgia Reid

“This is an opportunity that’s unique and invaluable. I feel incredibly lucky.”

Agricultural consultant Ed Riggall of AgPro Management has a growing business and was keen to invest in someone in the early stages of their career. The co-investment from MDC gives Ed the flexibility to encourage Georgia Reid, his intern, to attend a wide range of learning opportunities, both as part of the program and more informal opportunities such as field days and industry events.

“I come from a mixed farm in south-west WA, and have always been in the agricultural industry. I’ve completed an Agricultural Science degree at the University of Western Australia. After a stint with the Royal Agricultural Society working in education and ‘advocacy’, I was keen for a more hands-on role working with producers. I want to help promote sustainable and profitable productivity from within the industry, and be part of the link between producers and the latest research and development.

“Together with Ed, I’m working on a range of producer-driven feedbase projects investigating pasture manipulation (spraying timing), grazing cereal crops and the role of chaff carts as a feed gap resource (an MLA-funded Producer Demonstration Site).

“A highlight has been learning about benchmarking and understanding the often-misunderstood drivers of profit and productivity. I feel so privileged that clients are willing to share their data with me – it’s been by far the greatest and most valuable learning curve of the internship.”



Georgia Reid, Future Livestock Consulting Intern

INNOVATION CAPABILITY BUILDING

An innovative approach

A collaborative innovation strategy program with Pardoo Beef will help northern producers think outside the square with real commercial data on a range of production options.

The three-year project supports the development of a northern Australian Wagyu production system, with a focus on measurement and data analysis and its enormous capability to manipulate environment and production systems through large-scale irrigation.

Through data collection and analysis, Pardoo is exploring the production/economic benefits of different pasture and breeder management systems and how to best utilise their 15-gigalitre annual water allocation.

Led by former Professor of Animal Production Systems at Murdoch University, Kevin Bell, the research team is measuring Pardoo's production parameters. These include pasture growth/ megalitre of water, fodder production costs (in cents)/megajoule of energy, nutrient profile and comparative performance of pasture grasses such as Rhodes and panic, legumes (lucerne) and crops (maize silage).

They are also assessing cattle performance through direct growth measurements, as well as blood and tissue tests to monitor nutrient or trace element deficiencies and effectiveness of parasite control.

“We realise that the beef production system is truly innovative and pushing the boundaries of accepted practice in this northern region. The results of these analyses will not only inform our business practices and direction, but also help other northern beef enterprises realise what is possible.”

Professor Kevin Bell



Pardoo Beef, Pardoo Station, Port Hedland, WA

From insights to innovation

A cross-sectoral project to translate market insights into innovation opportunities has encouraged agri-food supply chains to collaborate for market advantage.

The Insights2Innovation initiative, part of the Federal Government's Rural R&D for Profit program, focused on capturing market insights, identifying high-value opportunities in export markets and helping producers and their supply chain partners respond to those opportunities. Completed in 2018, the project was supported by \$10 million of co-funding from MDC.

By collaborating with stakeholders, including red meat, horticulture, wine, seafood, pork and dairy, insights were captured for the China, South-East Asia and Middle East/North Africa regions.

Insights2Innovation took a two-pronged approach to translating these insights into innovation opportunities – one at the enterprise level (Value Chain Flagship Demonstrations) and the other at the individual level (Young Food Innovators).

Through these two models, significant innovation opportunities were identified and have contributed to agri-food organisations exploring new products, brands, value chains and business models.

Under the Value Chain Flagship Demonstrations model, processors Teys Australia undertook a project to employ design-led innovation in the creation of a sustainable, long-term business models focused on food solutions, not just the beef supply chain.

Emerging industry leaders in the Australian agri-food sector developed a plate-to-paddock approach and built their strategic value chain thinking and capability under the Young Food Innovator model.

The Insights2Innovation project has also provided a framework for the sector to develop the necessary innovation capabilities to be able to understand and respond to market insights and investment opportunities, enabling them to transform their organisations and drive growth.

“The Teys Business Accelerator project was designed to systematically explore four growth opportunities. The single greatest learning from this project was putting the understanding of the consumer at the centre of everything we do.”

Kate Morrison, Group General Manager, Strategy and New Business Ventures, Teys Australia.

Young Food Innovators

Twenty-four young innovators are ready to shake up the food sector after graduating from the Insights2Innovation Young Food Innovators in 2018.

While 13 participants came from the red meat sector, the 'whole-of-chain' program also incorporated the Australian and New Zealand seafood, pork, dairy and horticulture sectors.

Through residential workshops, participants learnt about advanced design-led innovation and value chain approaches to support them in becoming catalysts for innovation.

In June 2018, the participants came together for the final instalment of the program and a graduation dinner at Old Parliament House in Canberra. Minister for Agriculture and Water Resources David Littleproud attended the dinner, where he heard about some of the Young Food Innovators' projects from three participants including Michael Shannon, a fifth generation producer who runs Lowanna Properties, a 1,500ha sheep and cattle enterprise at Cathcart in southern NSW.

Michael's project focused on creating linkages directly between producers and consumers and has evolved to become N2T Meats (nose to tail). N2T Meats now has a feasibility study underway and the next stage is a market evaluation with a prototype.

“Young Food Innovators introduced me to the resources available to support the development of the business. Once I knew this it really helped my pitch and helped me understand the value chain issues I was talking about.”

Michael Shannon, Young Food Innovator



Michael Shannon with the Hon David Littleproud MP

STRATEGIC PARTNERSHIPS



MDC's collaborative and strategic partnership model enables effective leveraging of the expertise, reach and depth of universities and state government funded research partners in order to improve outcomes for the red meat industry.

Through these partnerships, MDC aims to align research and development to key industry challenges and develop viable commercialisation and adoption models. This work also supports the fostering of early career researchers to help build long-term capacity for the industry.

PILLARS

 Consumer and community support	 Productivity and profitability
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Strategic Partnership for Animal Welfare Research, Development and Adoption

MLA is collaborating with a number of leading research organisations to implement one of the largest investments in livestock welfare research to date.

The Strategic Partnership for Animal Welfare Research, Development and Adoption is funded through MLA Donor Company, universities and state agricultural departments. The 50:50 partnership between MDC and collaborating research bodies will see up to \$35 million invested over five years.

Five out of 12 projects have already commenced through the Partnership, with a focus on improving or replacing adverse husbandry practices and reducing livestock mortality rates.

The projects will:

- ▶ benchmark animal welfare parameters
- ▶ assess public attitudes towards animal welfare
- ▶ develop new approaches to reducing lamb mortality
- ▶ assess how automated tools such as walk-over-weighing and auto-drafting systems could be used to manage animal welfare.

Livestock Productivity Partnership

Eleven research and development projects, valued at \$35 million over five years, are now underway as part of the Livestock Productivity Partnership (LPP).

Over the next five years, the LPP aims to increase productivity gains for livestock producers in northern NSW and southern Queensland. However, some of the intended findings and tools will have application in other regions and nationally.

Researchers will work to develop and commercially validate several management strategies, and will primarily focus on:

- ▶ meeting animal requirements through better management of feed supply
- ▶ enhancing ruminant nutrient efficiency to improve growth
- ▶ improving maternal efficiency
- ▶ meeting market specifications to increase whole-farm profitability.

The LPP is a collaborative research and development funding partnership, currently involving MDC, NSW Department of Primary Industries, University of New England and CSIRO.

Combining the skills and resources of the LPP partners prevents duplication and enables accelerated research, development and adoption on farm. It also fosters early career researchers and builds long-term capacity for the red meat and livestock industry.

National Livestock Genetics Consortium

MLA established the National Livestock Genetics Consortium (NLGC) as a genetics and genomics collaboration model in 2016.

The aim of the Consortium is to double the annual rate of improvement in the industry's genetic value by 2022 through investment in livestock genetics projects that deliver one or more of the following:

- ▶ world-leading research and development
- ▶ cultural change
- ▶ disruptive technologies
- ▶ accessible data platforms.

MDC continues to make a significant contribution in the area of genetics. Previous project calls in 2016 and 2017 resulted in 24 projects receiving \$32 million in funding, with 89% of funding via MDC.

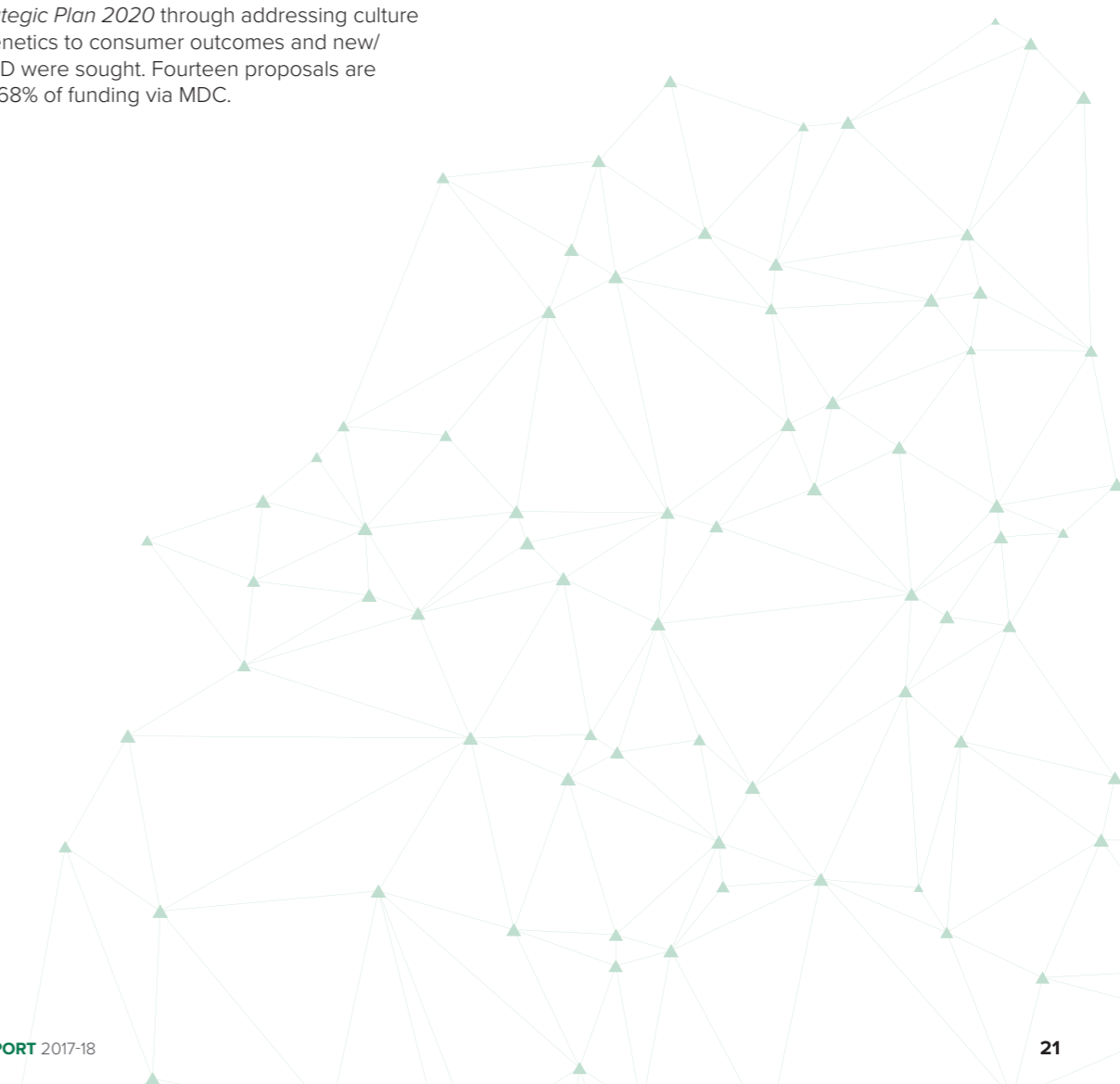
In December 2017, the NLGC Taskforce made a third call for projects that achieve outcomes in line with the Consortium's priorities. Proposals contributing to the goals of the NLGC and *Meat Industry Strategic Plan 2020* through addressing culture change, linking genetics to consumer outcomes and new/novel genetics R&D were sought. Fourteen proposals are progressing, with 68% of funding via MDC.

14

Proposals progressing in 2017-18

68%

Funding via MDC for 2017-18 proposals



HIGH VALUE FOOD FRONTIERS



High Value Food Frontiers is a partnership for red meat-focused organisations to develop future high value growth strategies to target evolving global food trends in a supported innovation environment.

Through high value innovation, the aim is to drive higher premiums and increased consumer preference for Australian red meat and associated products in global markets.

PILLARS



Market growth and diversification

Identifying innovation opportunities

Consumers are changing – living longer, travelling more and accessing huge volumes of data and information. Changes in behaviour and lifestyle are affecting how, when and why we eat certain foods.

MDC is working to ensure red meat is best positioned to target these trends – and those quickly emerging – by collaborating with innovative businesses, as well as with global food trend experts, technology developers and health and wellness experts.

Through High Value Food Frontiers, MDC has identified six high value growth themes – on-the-go snacking, ageing population, experience more, personalised nutrition, food without fear and sustainable food.

Various activities were undertaken in 2017-18 including workshops, hackathons, participation in conferences and the creation of communication materials such as videos, brochures and media releases to explore where products, services and technologies could potentially capture high value.

MDC partnered with six companies to develop value-added export strategies and new business models. These included dry-aged beef where ageing is undertaken in transit to Europe, ready meals for Asian markets, beef snacks for Japan and dumplings containing Australian red meat for the China market.

Some of the value-adding technology platforms and solutions under investigation include 3D printed food for those with chewing and swallowing difficulties, freeze-drying and extrusion. MDC is also working with research partners to develop active and intelligent smart packaging that meets consumer needs around food safety, freshness and optimal cooking methods.

The impact of emerging technologies, such as smart fridges, on how consumers order, cook, store and consume red meat is also being explored.

Targeting China's dumpling market

A new line of frozen dumplings featuring Australian beef and lamb is set to be launched in China, challenging other proteins traditionally used in the popular Chinese cuisine staple and opening up new opportunities for red meat.

Marketed under the Crazy Dragon brand, the dumplings are the result of a collaborative project between MDC and My Crazy Auntie's Food, a 100% Australian owned and operated company based in Melbourne.

Crazy Dragon's traditional Asian style dumplings and buns feature across eight product lines sold in around 2,500 supermarkets in Australia. However, they did not contain red meat before the collaboration with MDC.

Support from MDC and insights and data from MLA helped Crazy Dragon explore high-value red meat growth opportunities in China. Research undertaken through the partnership revealed valuable insights around food safety and quality concerns in China, and the growth of the frozen food sector, particularly the entertainment and snacking category.

The partnership with MDC has helped Crazy Dragon understand the opportunity for value-added beef and lamb products in China, explore disruptive business models, identify the right distribution and processing partners, as well as develop a unique point of difference for their product.

To ensure consumer confidence, the packaging incorporates a QR code linking to a custom-made video that tells the story of the producer and farm behind the key ingredient to the Chinese consumer.

This research provides a new model for the Australian red meat industry to access the China market.

“This project would not have been possible without MLA Donor Company. I hope it sets a clear path for other Australians to follow.”

Juy Hepner, Director, Crazy Dragon.





I+E Connect is an innovation (I) and entrepreneurship (E) platform that provides a unique landing pad for local and global AgTech and FoodTech entrepreneurs, start-ups and investors who want to work with the Australian red meat industry.

It helps deliver transformational change by attracting and supporting entrepreneurs, start-ups and scale-ups to develop and commercialise new and disruptive ideas, connecting investors with opportunities and building internal capability to disrupt and fast-track innovation.

PILLARS

<p>Consumer and community support</p>	<p>Market growth and diversification</p>
<p>Supply chain efficiency and integrity</p>	<p>Productivity and profitability</p>
<p>Leadership and collaborative culture</p>	

Accelerating ideas

I+E Connect has formed collaborations with accelerators, incubators and new investment groups, including strategic partnerships with four accelerator programs: SproutX, GrowLab (through Cicada Innovations), SparkLabs Cultiv8 and AgriStart.

In 2017, partnerships with Sprout X and GrowLab supported 10 new ventures in areas such as robotics, animal health, remote sensing, food technologies and decision support tools.

Two additional partnerships were formed in 2018 with SparkLabs Cultiv8 and AgriStart. Taking into account new intakes for the existing programs with SproutX and GrowLab, there are now 16 new ventures being supported via accelerators.



International accolade for Australian innovation

With support from I+E Connect, NSW-based start-up SmartShepherd developed a lightweight, re-usable smart tag to gather and transmit relationship data to enable more efficient, accurate identification of mothers and their offspring.

SmartShepherd works by attaching small devices to ewes and their lambs to record pedigrees. The tags and collars are reusable, affordable and eliminate the need for expensive DNA testing to establish parentage. It also allows full pedigree recording over an entire flock.

“Field trials of the SmartShepherd system in Australia achieved 96% pedigree accuracy within 48 hours of the tags being placed on the ewes and lambs.”

David Rubie, SmartShepherd co-founder and CEO

The technology works without GPS or internet connection and utilises low cost bluetooth technology and an Internet of Things (IoT) architecture. It is designed around existing animal husbandry techniques, to substantially decrease the barrier of entry to full pedigree recording and reduce inbreeding.

I+E Connect allowed the commercialisation of the tagging system to leap forward a year through financial support for more rigorous and targeted trials.

SmartShepherd triumphed at the 2018 global AgFunder Innovation Awards in San Francisco, winning Most Innovative International Startup Pre-Series A in the Farm Tech category against entries from around the world.

Development is ongoing to make the system practical for cattle and to develop further applications for the system, such as monitoring livestock behaviour.

Fast-tracking ‘Fitbits’ for cattle

A biohacker-breakthrough in the form of ‘Fitbits’ for cows, or EmbediVets as the devices are now known, look like becoming market reality as soon as early 2019 according to Livestock Labs CEO (and biohacker) Tim Cannon.

“When it was suggested our tracker would be ideal for cattle it was like ‘of course why didn’t I think of that?’” Tim said.

GrowLab, a ‘deep tech accelerator’ program developed by Cicada Innovations and MDC, supported the development of the business plan for Livestock Labs and road testing, which initially involved three University of Utah cows being implanted to assess the physical viability of EmbediVets.

Livestock Labs have now partnered directly with MDC to co-fund large-scale paddock trials with commercial producers and research herds at Charles Sturt University and University of New England.

The trackers will transmit data such as consumption of food and water, number of steps taken and health indicators like temperature and changes in heart rate. This could allow producers to remotely monitor and detect early the onset of illness, distress or labour.

This data will be managed through a smartphone app with built in alerts. Other potential uses for the tracker extend to traceability, genetic feedback and identification.

According to Tim a ‘thinking outside the square approach’ using innovators like hackers is speeding up the process to commercialisation.

“Hackers are used to working differently and quickly. They like solving problems and they tend to do it rather cheaply,” he said.



SmartShepherd tag



Livestock Lab's EmbediVet device

CORPORATE GOVERNANCE FRAMEWORK

MDC operates under MLA's Corporate Governance Framework which is set by the board, having regard to the best interests of MLA's members, the values of the organisation, MLA's obligations set out under its statutory funding agreement with the Commonwealth of Australia (deed) and in accordance with the ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations (3rd edition)*.

This long-established framework has been implemented to ensure MLA remains accountable to its stakeholders, and stakeholder interests are protected. MLA's governance arrangements are reviewed regularly to reflect industry developments, stakeholder expectations, and regulatory and legislative changes.

STRATEGY AND PRIORITY SETTING

MDC follows the MLA Annual Investment Plan (AIP) and all investments align to MLA key milestones and major initiatives. The MDC Board approves an MDC AIP that outlines targeted focus areas of investment. The budgets developed for MDC are indicative values in portfolio focus areas. They are subject to periodic review as the nature of the MDC co-investment mechanism means that if the partners do not invest in certain focus areas, MDC cannot invest in those areas.

PROGRAM AND PROJECT APPROVALS

MDC operates under the MLA Project Governance Framework for all program and project approvals with the MDC Board approving programs of work over \$5 million, individual projects over \$1 million where not part of an approved program and the MLA Leadership Team approving all other projects.

To manage the MDC 'pipeline' and to inform new project approvals, the MDC Board determines the preferred portfolio balance including a maximum allocation of funds for specific program initiatives where considered appropriate. Program managers are required to submit program strategy papers as determined by the Board.

MEASUREMENT AND EVALUATION

All MDC contracts are subject to a cost/benefit analysis and evaluation process. This is followed by further impact/benefit analyses at regular intervals during the life of the research and development phase of the project, and through the subsequent industry adoption and commercialisation stages.

MDC investments are evaluated within an overall 'path to impact' measurement and evaluation framework. This is based around the Input-Output-Outcome-Impact logic model, which is generally considered to be best practice for impact assessment and delivery.

This model is focused on the delivery of outputs (or products) that have attributable outcomes (via adoption) and generate impact.

Outcomes and impacts relating to MDC investments are measured via a variety of approaches, including ex ante (forecast) and ex post (actual) independent cost/benefit analyses. While impact measurement is primarily focused on productivity and demand creation benefits within the Australian red meat industry, triple bottom line benefits are also considered both at an individual product, product group and pillar/priority level.

In some cases, both MLA levies as well as MDC investments (inputs) have contributed to delivering outcomes and impacts. MDC based inputs are clearly identified in the evaluation process and hence the contribution of the MDC to broader industry impacts can be assessed using a variety of tools such as partial and general equilibrium economic modelling.





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