Future Food Systems

2019/20 Annual Report

Contents

Chair's report

Fiona Simson
Chair

It has been rewarding to be a part of the Future Food Systems CRC's first year of operation, and to see the progress it has made.

The coronavirus pandemic that impacted the second half of the year has highlighted the importance of developing a resilient and self-sufficient agrifood sector. Fortunately, in Australia, there is great potential for the creation of a dynamic, globally competitive future food industry based on focused value-adding.

Already, food-product manufacturing is our largest manufacturing industry, accounting for more than a quarter of all manufacturing jobs. That said, Australia's food processors are under huge competitive pressure on the global stage and, for the most part – particularly in regional areas – need to upgrade facilities to remain competitive and adapt to changing consumer demand.

Now, more than ever, adopting advanced manufacturing technology and automation across the sector is an urgent priority. Related to this is the need to encourage active value-chain collaboration, with our farmers supplying produce to local value-adding firms rather than selling it into global commodity markets, often for low returns.

In October 2020, the IMF noted that to enable structural change post-pandemic, 'economic policies should be laser-focused on the world of tomorrow, not yesterday. This means facilitating industry restructuring and resource reallocation, including to sectors that will pave the way for stronger medium-run inclusive green growth'.

Success in a post-COVID-19 world will hinge on taking a 'whole of system' approach to the agrifood sector in which suppliers of inputs, freight providers, growers and processors work with government to chart a better way forward and meet Australia's 2030 goals for growth in the sector.

I believe that the Future Food Systems CRC's vision is very much in line with the times; thus, it is ideally positioned to help guide us in this important and necessary transition, leveraging our collective expertise across industry, research and government.

At the end of its first year in operation, I'm even more confident that the CRC's vision represents the right direction for Australia's agrifood sector.

I congratulate everyone in the CRC on a successful inaugural year.

CEO's report

David Eyre
CEO

This report covers the first year of operation of the CRC, which was focused primarily on the establishment process. Activities included extensive consultation with participants to establish research priorities and the governance structures of the CRC, the appointment of the Board and the head office team, and commencement of initial projects.

In December 2019, the CRC Participants' Agreements were executed by 47 industry, research and government foundation partners. Shortly afterwards, the Commonwealth authorised commencement of the CRC and the research team proceeded to formalise project agreements with research, industry and government participants. A substantial portfolio was in formation when COVID-19 hit.

Despite the disruption caused by the pandemic, a total of eight scoping projects was completed by June 30 and a further six projects commenced with industry and government partners across the CRC's three research programs. These were a mapping and analytics project for Western Sydney to help chart future industry growth; a study laying the groundwork for a specialised food-industry cluster in the Coffs Harbour region of New South Wales; the first stage of a multi-stage project to develop a smart (blockchain-enabled) trade hub for Australia's high-value food-product exports, with China the main counterparty; a systems engineering study for vertical-farming partner Sprout Stack; a greenhouse instrumentation project with network innovator WBS; and a major Northern Australian initiative exploring the sustainable commercial production of native rice involving five CRC partners.

The CRC's mainstream and digital media presence was established over the period, with strong media coverage of projects, a monthly eNewsletter and the web portal attracting significant traffic. The communications team did an excellent job promoting projects and generally building awareness of CRC activities and of innovation in the food industry more broadly.

In summary, while this was a challenging year, COVID-19 highlighted the importance of the CRC's value-chain transformation agenda. The pandemic made it clear that greater security and efficiency is needed in food supply chains, creating opportunities in logistics, urban agriculture (vertical farms), blockchain platforms and direct-to-consumer marketing models. It put better nutrition, provenance and safety at a premium. The pandemic also intensified the existing global 'health and wellness' trend, expanding opportunities for the CRC's partners in segments including health supplements and nutraceuticals, 'alternative proteins' and trusted fresh as well as functional, fortified and 'free-from' foods; along with targeted eating (foods to meet specific dietary needs); and 'energy-smart' (sustainably produced) foods.

At the same time, the CRC's overarching mission, objectives and research roadmap were aligned closely with Commonwealth and state government pandemic response initiatives that recognised the potential of regional centres as food-manufacturing clusters and the need for more supportive strategy and infrastructure staging. This creates opportunities moving into the 2020/21 year.

About Future Food Systems CRC

The Future Food Systems Cooperative Research Centre has been funded by the Commonwealth to support product innovation, industry collaboration and adoption of advanced technology across the Australian food value chain.

From specialised food-industry clusters that realise the unique potential of Australia's agrifood regions to high-tech, high-yield indoor cropping to cutting-edge precision-nutrition products, CRC research is helping to transform the way Australia produces, adds value to and delivers food worldwide, thereby helping to achieve the federal government's goal of near-doubling Australia's agrifood-sector revenue by 2030.

year in review

1 University of NSW Associate Professor Wen Hu, research lead on the 'IoT for indoor cropping' project, helps set up the wireless sensor system that will be used to monitor key crop variables at Western Sydney University's Hawkesbury Institute for the Environment (HIE). Assoc. Prof. Hu and colleagues started the set-up as soon as the COVID-19-related laboratory lockdown lifted. 2 Professor Sagadevan Mundree, Director of the Centre for Tropical Crops & Biocommodities at Queensland University of Technology (QUT), is a specialist in tropical crops and is working on the 'Commercialising native rice' project in collaboration with colleagues at Charles Darwin University. 3 Cityscape China: The 'Blockchain for smart trade' research team is consulting with buying groups across China about how best to adapt their blockchain-enabled beef supply-chain platform to other premium fresh-food exports from Australia. China's largely urban-dwelling middle and upper classes represent a large and growing market for premium foods, beverages, health supplements and nutraceuticals. 4 University of NSW Sydney's Professor Sami Kara: a sustainable manufacturing expert with international industry experience who is working with Sprout Stack on a project to design its next system upgrade. 5 Cordelia Selomulya, the CRC's Research & Commercialisation Director and a professor of UNSW's School of Chemical Engineering, addresses Program 3 Workshop attendees on 21 January 2020. 6 Fiona Simson addressing industry, research and government participants at a meeting to discuss CRC governance arrangements held in November 2019.

Executive summary

- Being the CRC's first year of operation, the focus was on set-up of operations and governance structures and developing streamlined processes for project formation and delivery.
- A fully independent Board was appointed consisting of six members with a wide range of skills relevant to the success of the CRC's program.
- All key staff appointments were completed, including the CRC's administration and communications team, and its research program leadership, drawn from within the CRC's participant universities.
- The Research & Commercialisation Committee was established, with representation from industry, research and government stakeholders.
- Regular lines of communication were established, among participants and between participants and the CRC Head office. This included numerous meetings, workshops and three major forums, held with participants to build collaboration across the group and shape the initial research portfolio.
- The Education and Training program of the CRC was established, tailored to incorporate an industry PhD component with the focus on giving students a good balance between lab-based research, a theoretical framework and practical, hands-on industry experience.
- In December 2019 the CRC was approved for commencement, with $174 million in investment from participants and the Commonwealth confirmed over 10 years.
- In the second half of FY2019/20, eight scoping projects were commissioned and completed and six R&D projects were commenced. The project formation process was significantly slowed by the pandemic. At the close of the reporting period, a further 17 projects were in various stages of development and an additional 24 EOIs had been submitted.
- The participant mix of the CRC represents the SME-heavy representation of the food sector. The pandemic has disrupted the business models of several SMEs, with corresponding impacts on their participation in the CRC. The CRC has taken a strategic review of its participants and has adopted a flexible approach to their cash contributions to provide the necessary support to this vital sector.
- COVID-19's impact on intake of overseas students has significantly affected the university sector. While this situation is not unique to this CRC, it did impact operations. The CRC team worked with its research participants as they underwent changes in their business models.
- The CRC's program is highly relevant to post-COVID-19 responses aimed at reinvigorating Australia's economy; to this end, the CRC teamed up with state government participants and other stakeholders around Australia to identify specific research projects that would help to lay the foundations for innovative industries and job growth post-pandemic.

Grant approved

Program forums

HQ opened

Web portal launched

AGM

Participants meeting

CRC commenced

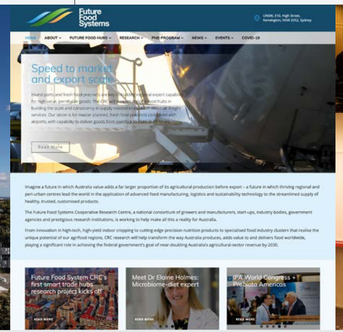
Full Board appointed

Education program launched

1st project commenced

1st milestones completed

Scoping projects completed



Government and industry investment over 10 years

$174m

Core partners

36

Total partners

47

Workshops conducted

19

Projects in development

17

Projects commenced

14

Projects completed

8

Achievements

The 2019/20 year was focused on the establishment process for the CRC. Activities comprised extensive consultation with participants to establish research priorities and the governance structures of the CRC, the appointment of the Board and head office team, execution of the Commonwealth Agreement and commencement of initial projects.

As preparation for the initial CRC project portfolio, forums were held for each of the CRC's three research programs. The forums brought partners together to discuss opportunities and challenges across the future food sector. These major events were attended by the staff of industry and research partner organisations and were structured to include presentations, tours and workshop sessions. In the spirit of building national collaboration and to facilitate attendance, the events for Research Programs 1, 2 and 3 were held in Sydney, Brisbane and Perth, respectively (see Appendix 3).

In parallel to this, the CRC core team was recruited and administrative systems were established.

In October 2019, an administrative and communications office was opened in the Hilmer Building on UNSW's Sydney campus. The following month (25 November 2019), the CRC hosted its inaugural General Meeting, followed by its first all-participants meeting, on UNSW's Ultimo campus.

The Board was elected by Members of the company in December 2019. Prior to Christmas, the CRC also convened its Working Group (WG), Research & Commercialisation Committee (RCC WG) and Finance, Risk & Audit Committee (FRAC). (See Appendix 1A, 1C, 1E and 1F for Board Committee details).

In January 2020, the CRC launched its Education program and commenced advertising for its first cohort of PhD students. Four Industry PhD scholarship positions were advertised in the FY2019/20 period, with one student appointed in the first half of 2020, embedded within the 'Commercialising native rice' project.

The CRC's communications strategy was rolled out progressively over the year, starting with the CRC website – the CRC's primary 'public interface' and a substantial participant resource. Over 2020, the CRC established its presence on social media, posting with increasing regularity on Linked In and Twitter, with consequent upticks in followers and engagement. It also sent out a quarterly CEO's Update to participants and a monthly, subscription-based eNewsletter.

With the arrival of COVID-19 up-ending 'business as usual' from late February 2020, the CRC's core staff transitioned successfully to remote working. It pivoted to enable several initial scoping projects to move forward during NSW's lockdown period and worked with participants negatively impacted by the pandemic to adjust funding obligations and research operations as necessary.

The pandemic challenged many of the CRC's participants, particularly the universities, with substantial funding and staff cuts, lab lockdowns and difficulty attracting PhD students. Some initial industry participants were unable to meet their funding commitments and the CRC worked hard to replace them.

That said, the initial participant cohort, for the most part, stayed committed to the consortium and its goals, delivering eight research-based scoping reports over the first half of 2020 and commencing six collaborative projects spanning the CRC's three research streams in its first year (see Appendix 5).

1 *Minister Andrews at the Future Food Systems CRC's Commonwealth Grant announcement. (Left to right): Mirjana Prica, CEO of Food Innovation Australia Ltd (FIAL); Professor Elaine Holmes, Head of the Centre for Computational and Systems Medicine and part of the world-leading Australian National Phenome Centre (ANPC) research team at at Murdoch University; CRC CEO David Eyre; Australian Government Minister for Industry, Science and Technology, the Hon Karen Andrews MP; Professor Mark Hoffman, former Dean of Engineering, UNSW Sydney; WSU Deputy Vice Chancellor, Research and Innovation, Professor Deborah Sweeney; Shane Hetherington, Horticulture Director, NSW Department of Primary Industries; QUT's Professor Doug Baker, CRC Research Program 1 lead; and Liverpool Mayor Wendy Waller.* **2** *NSW Department of Primary Industries' Senior Research Scientist Sophie Parks surveys a field-grown blueberry crop: Parks is working with research lead and WSU Professor Priti Krishna on the 'Blueberry nutritional optimisation' project, trialling the effects of light-spectra-selective films.* **3 & 6** *Workshops and forums are essential to building stakeholder engagement in projects and to sharing information and ideas.* **4** *Dr Penny Wurm in a trial plot of Australian native rice: Dr Wurm is working with CDU colleague Dr Sean Bellairs, NT DPIR, QUT's Prof. Saga Mundree and several industry partners, including Indigenous-run enterprises in Australia and Canada, to commercialise this hardy, high-nutrient and potentially high-value crop across Queensland and the Northern Territory.* **5** *Hilmer Building, UNSW Sydney: In Q3 of 2019, the CRC established its admin office in the Hilmer Building on UNSW's Randwick, Sydney, campus, part of the university's School of Engineering.*

Risks and impediments

COVID-19 had a significant impact on both industry and the university sector over the second half of FY2019/20.

Australia's food industry (and the CRC's industry participant group) has a large number of SMEs and, for many of them, raising capital and sustaining cashflow once the coronavirus pandemic hit was challenging.

All CRC university partners experienced a significant loss of student revenue, leading to staff attrition and restructuring of departments. In addition, laboratories were closed during the shutdown period, resulting in substantial delays to some projects and difficulties in attracting and placing suitable PhD students.

The CRC adopted a flexible approach with its SME participants, acknowledging their cashflow challenges and believing that SMEs will be instrumental in creating the new, high-value products and markets needed to drive growth in local manufacturing.

Its university partners worked hard to keep projects moving under COVID-19 restrictions – for example, by getting on with project elements that did not require lab access.

While the June 2020 milestones of the CRC were met, project formation was slowed significantly by the global disruption to 'business as usual'. It remains to be seen what further impacts the pandemic will have on Australia's economy.

Over its first year, the CRC worked to augment its participant base with firms committed to value-chain transformation, and to driving new growth in onshore manufacturing of high-value Australian foods, beverages and nutraceuticals. In addition, the CRC worked on a range of strategic initiatives with its existing local and state government partners and Food Innovation Australia Ltd (FIAL), and consolidated its relationships with key Commonwealth teams in Austrade and AusIndustry.

The Australian Government's response to COVID-19 may present significant opportunities. The CRC's agenda is well aligned with the current government focus on shoring up local production, boosting manufacturing and strengthening the resilience of supply chains. Moreover, food production has been identified by government as a priority area.

Performance against activities

During FY2019/20, the CRC made substantial progress towards achieving its research and capability outcomes and completed all June 2020 milestones.

Achievements in the period include having:

- completed extensive stakeholder workshops (Appendix 3) to confirm research priorities and drive collaborative project formation;
- commenced 14 projects (eight completed) and initiated a further 17 Project Agreements;
- committed $1.5 million to projects extending to 2024, with another $1.7m of commitment in the pre-execution pipeline;
- developed and launched a high-standard web portal to communicate and promote CRC activities and share information about innovation across the future food sector; and
- launched the CRC's Industry Masters and PhD program and enrolled the program's first student.

The CRC also extended its networks and capability activities across industry and government stakeholders, forming new strategic relationships with Austrade, AusIndustry and state government teams in New South Wales, Western Australia, the Northern Territory and Queensland.

On the communications front, the CRC extended its online presence via its web portal, eNewsletter and other channels. This included providing curated content and promoting the activities and achievements of related organisations.

The CRC strove to adapt and to support its partners over a challenging first year, with successive major disruptions to the agrifood sector and wider society – first, the widespread bushfires of spring 2019; then the COVID-19 pandemic and subsequent restrictions, including lab and business lockdowns and restrictions on domestic and overseas travel.

COVID-19 impacted the agrifood sector heavily over the second half of FY2019/20, with SMEs hit particularly hard. The CRC's program, however, is strongly aligned with the COVID-19 response strategy of government and industry, and to programs for longer-term growth and innovation in the agrifood sector, advanced manufacturing and STEM-based industry.

The pandemic, while up-ending business as usual, presented significant opportunities to innovative firms in the Australian agrifood sector and heightened the need for innovation in food systems. By actively communicating its mission and relevance, and engaging constructively with partners and the broader network of stakeholders, the CRC continued to receive a strong positive response to its agenda and research capability over the final quarter of FY2019/20.

Research

The CRC's research activities are organised across three programs: Planning for growth; Future farming systems; and, Future food products and precision nutrition.

A register of current projects is maintained on the CRC portal. In addition, news stories, social media posts and mentions in the monthly eNewsletter keep the CRC's participant cohort and interested parties informed about and updated on the progress of CRC projects.

Cordelia Selomulya
Director Research & Commercialisation

Doug Baker
Research Lead Program 1: Planning for growth

Ian Anderson
Research Lead Program 2: Future farming systems

Jeremy Nicholson
Research Lead Program 3: Future food products and precision nutrition

Brian Sindel
Education and Training Program

1 Professor Priti Krishna and a student inspect trial crops in the state-of-the-art experimental glasshouse facility that is the centrepiece of the National Vegetable Protected Cropping Centre (NVPCC) at WSU. 2 Costa Group's Paul Butterworth in the group's vast glasshouse facility near Guyra, near Armidale in northern NSW: CRC industry participant Costa has partnered with researchers at UNE in a CRC project exploring the root microbial ecosystem - or 'rhizobiome' – of tomatoes grown hydroponically, and how varying application of nutrients impacts it. 3 Blueberries: Can we grow blueberries in protective polytunnels, but match the nutritional potency of field-grown berries? WSU researchers are developing a novel tech-based solution with CRC industry partner LLEAF. 4 Prof. Cordelia Selomulya, CRC Research & Commercial Director, brings academic excellence and a string of successful industry collaborations to the role.

P1 Planning for growth

Four projects commenced in FY2019/20 under the CRC's Research Program 1:

- the 'Agrifood hubs' scoping project;
- the 'Western Sydney agrifood mapping and analytics' project;
- the 'Coffs food ecosystem' project; and
- the 'Blockchain for smart trade' project.

The 'Agrifood hubs' scoping project, undertaken over Q4 of FY2019/20, provided a rationale and models to inform the planning and development of specialised agrifood clusters in regional and peri-urban hubs across Australia. It looked at global best practice in specialised food-industry clusters, Australian examples, and the theoretical underpinnings of clusters and their role in conferring competitive advantage.

In the 'Western Sydney agrifood mapping and analytics project', UNSW data experts are working with Liverpool City Council to map and analyse the food-supply industry around the planned new Western Sydney International Airport. This entails collecting data from numerous sources to model development scenarios. COVID-19 impacted this project directly, with the project lead leaving UNSW during the major restructure to faculties and reductions in staff. The CRC succeeded in finding and appointing a suitable replacement; however, the downtime resulted in significant delays to the project.

The 'Coffs food ecosystem' project, involving Coffs Harbour City Council and researchers at Queensland University of Technology (QUT) in constructing a detailed view of the region's food production, proceeded according to plan, with some adjustments to data-gathering – such as meetings held via remote communication channels rather than face-to-face due to COVID-19-related restrictions.

The 'Blockchain for smart trade' project, in which industry partner BeefLedger is collaborating with QUT and buyer groups in China, is the first in the CRC's 'Smart trade hub' research stream. Future projects will develop the soft and hard digital infrastructure required to support the growth of blockchain-enabled trade in a post-pandemic cross-border trading context, with the China market the principal counterparty. The project experienced some challenges over the reporting period, thanks to pandemic-related shutdowns and restrictions on travel along with a deterioration in the relationship between China and Australia that negatively impacted bilateral trade. However, the overarching goal of the 'Smart trade hubs' project stream – to help Australia build capacity to implement end-to-end digital systems that are seamlessly interoperable with those in key markets – is even more relevant in today's safety – and provenance-conscious 'new normal'. By the end of FY2019/20, the project was on track to deliver as per its initial timeline.

1 Undercover cropping in Almeria province, Spain, where more than 60% of the nation's greenhouse horticulture is concentrated into 31,000-odd highly productive hectares, owned by 15,000 growers grouped into cooperatives and auction groups that export more than 70% of their harvest across the EU – accounting collectively for 13% of the province's GDP. **2** *Streamlining freight logistics speeds the journey of perishable produce from farm to fork, and is thus a key component of a sustainable future food system. The CRC is looking at tech-and-big-data-enabled logistics and supply-chain solutions.*
3 *CRC industry partner Greenbio Group's high-tech vertical cropping facility in Redlands, in Brisbane's south-east.* **4** *Netherlands agrifood precinct: the Netherlands is known for its large, well established agrifood-industry cluster, which includes growers, manufacturers, related services and research institutions including Wageningen University & Research.* **5** *Data-mapping experts at UNSW's City Analytics Lab: Researchers here will use regional data collected from multiple sources to create multi-layered maps for the 'Western Sydney agrifood mapping and analytics' project. The database and multi-layered maps will help stakeholders plan a future agrifood cluster in the region.*

P2 Future farming systems

Six projects commenced in FY2019/20 under the CRC's Research Program 2:

- the 'Sprout Stack system redesign' project;
- the 'IoT for indoor cropping' project; and
- four scoping projects:
  - 'Innovation needs for priority crops';
  - 'Advanced phenotyping sensing technology';
  - 'Automation and robotics'; and
  - 'Future facilities'.

The four scoping projects were designed to cover the terrain of next-gen protected cropping systems; together, they explored the current state of the industry as well as the latest advances in technologies, facilities, phenotyping and robotics for low, medium and high-tech commercial protected-cropping operations. All four studies were undertaken and completed within Q4 of FY2019/20.

The 'IoT for indoor cropping' project, a collaboration between industry partner WBS Technology and researchers at UNSW and WSU, involves designing and developing an inexpensive wireless Internet of Things (IoT) system enabling precise, automated monitoring and control of key variables for plant health, growth, quality and yield in indoor farms. The project started in mid-2020 after a three-month-long delay due to lab closures. Set-up of the sensor system was completed in the WSU lab soon after it opened in mid-2020 and initial trials began shortly afterwards. The project, set to run until 31 December 2024, is proceeding according to plan. Two PhDs, one at each of the participating universities, will be appointed to the project and will commence work early in 2021.

The 'Sprout Stack system redesign' project is assisting vertical farm operator Sprout Stack in scaling up its production by designing a new, automated, more water-wise and energy-efficient system configuration. Soon after the project started, however, COVID-19 hit, precipitating lockdowns at both participating universities. The project partners pivoted to remote working, engaging regularly via Zoom meetings to discuss first steps and initial data needs. Sprout Stack set up cameras to monitor its existing modular vertical growing system and this information was conveyed to lead researcher Professor Sami Kara at UNSW, who is using it to find system inefficiencies to inform the redesign. While Sprout Stack is very happy with the work, impacts of COVID-19 on its business may require variation to the project.

1 *Sprout Stack CEO Hugh McGilligan in one of his high-tech modular vertical growing facilities; currently, the company is looking to scale up with the help of the CRC.*
2 *Greenbio Group CEO Chris Spies (left) with CRC team members in the company's high-tech indoor-cropping facility: The company's business model "demands advanced automation and informatics solutions", says Spies, with potential foundation projects under the CRC including "co-investment in phenotyping using machine vision; and specific engineering solutions for growing systems that maximise production efficiency with regard to labour, water and energy usage."*
3 *A crop specialist at WSU's Hawkesbury Institute for the Environment.*

P3 Future food products and precision nutrition

Four projects commenced in FY2019/20 under the CRC's Research Program 3:

- the 'Food product innovation' scoping study;
- the 'Food manufacturing regulations and QA' scoping study;
- the 'Advanced food manufacturing' study; and
- the 'Commercialising native rice' project.

The three scoping studies were designed to cover the essential components of new food-product development and manufacture in Australia.

The first major project to commence under Research Program 3 was the 'Commercialising native rice' project, a four-year, multi-disciplinary collaboration. It involves researchers at Charles Darwin University and Queensland University of Technology, Northern Territory Department of Primary Industry and Resources (DPIR), and industry partners Pudakul Aboriginal Cultural Tours, Olive Vale Pastoral Pty Ltd and Canada-based indigenous enterprise, Myera Group, which has successfully commercialised Canadian native rice. The multi-partner project is laying the groundwork for commercialising nutritious, potentially high-value Australian native rice and simultaneously creating new opportunities for Indigenous enterprise across Queensland and the Northern Territory. It also aims to lay the foundations for an exciting first-nations collaboration between indigenous producers in Canada and Australia. While COVID-19 disrupted elements of the project, including the enrolment of PhD students working on the project, it is now proceeding according to plan.

1 *Professor Jeremy Nicholson, formerly of Imperial College, London, and now Director of the new Australian National Phenome Centre (ANPC) at Murdoch University, brings world-leading expertise on metabolic phenotyping – and a crack research team – to the CRC.* **2** *A tray of biological samples, ready for testing in one of the ANPC's nuclear magnetic resonance (NMR) spectroscopy machines, which enable researchers to carry out large-scale, sophisticated analyses of food functionality and quality.* **3** *Researchers in the ANPC lab, which houses millions of dollars' worth of state-of-the-art scientific equipment from CRC industry participant Bruker BioSpin, including the largest collection of mass spectrometers in the Southern Hemisphere.* **4** *The Australian National Phenome Centre is conveniently sited in Harry Perkins Institute of Medical Research (South), part of the Fiona Stanley Hospital precinct adjoining Murdoch University campus.* **5** *A sample of Australian native rice: Researchers at CDU, along with QUT crop experts, NT DPIR and Indigenous industry partners, are exploring cost-effective, sustainable ways to grow, harvest and market the species for the benefit of Indigenous enterprises across Northern Australia.* **6** *The George Institute for Global Health's internationally successful FoodSwitch app, enabling consumers to make healthier food choices in-store: The George Institute of Health and Liverpool City Council are set to collaborate on the 'FoodSwitch Connect' project, which will expand the FoodSwitch database to include Western Sydney-region food-service providers.* **7** *An ANPC researcher, about to test a batch of biological samples: By analysing the molecular, physical and biochemical characteristics of biological tissue and fluids such as blood and urine, researchers at the ANPC aim to predict the complex genetic, environmental and lifestyle interactions causing disease.*

Commercialisation

CRC projects are co-funded and co-designed by industry participants to ensure commercial relevance and adoption of CRC project research outputs.

The CRC's Research & Commercialisation Committee has set a governing framework for projects that requires regular reporting on commercialisation progress and other utilisation of outputs.

The projects funded so far all include utilisation plans and progress against these plans is satisfactory in this initial year of the CRC.

All CRC projects are designed to deliver concrete outcomes of direct utility for the participants funding the projects. To illustrate, the 'IoT for protected cropping' project involves creating and validating specialised remote-management solutions for commercial greenhouses. WBS Technology is a successful building services company that has seen an opportunity in the protected cropping field. It has collaborated with UNSW previously to develop and commercialise other technology, and has a sound commercialisation plan for the outcomes of the present four-year CRC project, which commenced in January 2020.

Education and training

The CRC's Education and Training program was established over the second half of FY2019/20. It offers Doctorate and Masters placements on long-term collaborative CRC projects under all three Research Programs, with full and top-up scholarships available for both domestic and international students.

The CRC's Industrial PhD Scholarship program connects doctoral candidates with a unique transdisciplinary research ecosystem and industry network, ensuring strong real-world industry engagement and academic mentors across a range of science, social and STEM disciplines. It is being marketed to student cohorts that do not typically see the food industry as a career path.

The CRC encourages applications from candidates seeking to address topics of relevance to their employers and several participants are seeking to place mature-age staff in the program.

Restrictions on overseas travel to and from Australia resulting from the COVID-19 pandemic halted overseas student intakes at universities across Australia, negatively impacting the CRC's postgraduate placement program by shrinking the pool of available candidates.

Despite this challenge, four CRC Industry PhD Scholarship positions were advertised over the second half of FY2019/20 within the 'Commercialising native rice', 'IoT for indoor cropping' and 'Blueberry nutritional optimisation' projects, with one doctoral candidate appointed to the 'Commercialising native rice' project.

Intellectual property management

Future Food Systems is on target to achieve its commercialisation and utilisation outputs, with commercialisation and future research pathways embedded into every project.

The CRC is structured to allow project participants to own IP created by the research activities.

To reduce potential delays in commercialisation and maximise the impact of projects on the Australian economy, IP rights are negotiated by partners during the project design and scope phase, and are embedded in the Project Agreements signed by partners.

Further, and in alignment with the Australian Research Council National Principles of IP Management, the CRC Project Agreement ensures that:

- Research participants have unencumbered rights to use the IP for education, teaching and research purposes;
- Students retain the copyright to their theses;
- IP owner's commercialisation pathway will not be hampered by the publication of the thesis (a requirement) and, as such, all publications need to be approved by the CRC;
- there is a mechanism for minimising stranded IP and a framework under which IP can be retrieved when the IP rights holder has not commercialised and does not intend to commercialise for the benefit of the Australian economy; and
- a framework is in place to define IP rights by market to ensure that IP is exploited across various use cases and industries where applicable.

As FY2019/20 was the CRC's first year of operation, no IP of significance was developed over the period.

Collaboration

The CRC has brought together a complementary group of industry, research and government partners from around Australia to drive innovation across the entire future food value chain from farm to consumer.

Building a collaborative culture

As a first step in building networks, relationships and collaborative projects, more than 20 meetings and events of different scales and focus were held around Australia, as is detailed in Appendix 3. This was essential to clarify research priorities, ascertain the shared objectives of participants and support project ideation for the initial portfolio. Altogether, more than 300 staff of participant organisations were involved in these meetings, which in and of itself was an important step in developing a shared vision.

In the spirit of building national collaboration and to facilitate strong attendance by staff of organisations located in different states, major forums were held in Sydney, Brisbane and Perth. These highly successful events were structured to include presentations, laboratory tours and workshop sessions as well as media opportunities.

1 Kiersten Fishburn, former CEO of Liverpool City Council (left) and CRC Chair Fiona Simson at a CRC forum in October 2019. 2 (Left to right): Charles Darwin University (CDU) researcher Dr Penny Wurm; Pudakul Aboriginal Cultural Tours co-owner Lynette Kenyon; CRC CEO David Eyre; NT Department of Primary Industry and Resources (DPIR) Director Plant Industries, Mila Bristow; at a Pudakul facility in the Northern Territory for a meeting to discuss native rice research. 3 Industry and government participants discussing research priorities. This was one of more than 20 events held in the inception phase of the CRC. 4 The Globe interactive sphere at the Cube, on QUT's Brisbane campus, one of several advanced visualisation facilities available to the CRC. 5 (Left to right): Greenbio CEO Chris Spies, Professor Doug Baker and CRC COO Satish Nair at a CRC forum held in Western Australia. 6 Professor David Morrison, Murdoch University Deputy Vice Chancellor Research and Innovation, addressing dignitaries at the ANPC launch in October 2019. 7 Touring the ANPC laboratory during construction.

Collaborative projects

The CRC is structured with a view to engaging multiple research, industry and government partners in collaborative projects.

The CRC research partners were brought together on the basis of complementary strengths and laboratory capabilities. To illustrate, UNSW is strong across all engineering disciplines, while Murdoch University, with its Australian National Phenome Centre, is a world leader in precision nutrition. Western Sydney University has a particular strength in protected cropping and brings the most advanced experimental greenhouse in Australia; UNE has expertise in broadacre farming systems; and QUT and CDU are especially strong with regard to Northern Australian crops and production systems. This breadth of expertise encourages the formation of cross-disciplinary teams involving several research participants.

Specialist LED lighting systems provider and CRC industry partner WBS Technology partnered with researchers at two participant universities, UNSW and WSU, to form the 'IoT for indoor cropping' project. The project is drawing on the expertise of WSU's crop scientists, as well as the university's state-of-the-art experimental glasshouse, to conduct trials of the novel IoT system being designed and developed jointly by UNSW engineers.

The 'Commercialising native rice' project involves four industry partners – two of them Indigenous enterprises – along with researchers at CDU and QUT, and the NT government.

A different kind of collaboration is exemplified by Research Program 1's 'Blockchain for smart trade' project. This is the first stage of a multi-stage program aimed at developing secure smart (blockchain-enabled) trade of premium perishable food products into export markets, with buying groups in tier-one Chinese cities as initial counterparties. The lead project party, BeefLedger, brings pre-established business relationships with these buyer groups, which is critical to establishing a viable end-to-end digital marketing and provenance solution.

Company	Sector	State
Apex Greenhouses (Australia) Pty Ltd	Greenhouse and greenhouse equipment designer and manufacturer, protected cropping	South Australia
Austgrains Pty Ltd	Diversified agribusiness	New South Wales
BeefLedger IO	Food-product traceability technology (blockchain)	Queensland
E Agri Management and Technical Services Pty Ltd	High-tech protected cropping (vertical farming) technology	Victoria
Escavox	Fresh-food supply chain logistics	Victoria
Fable Food Co (Butcher's Harvest Pty Ltd)	Product innovation, food processing	Queensland
Food Innovation Partners Pty Ltd	Consulting services	New South Wales
Greenbio Group Pty Ltd	Medicinal crop production, protected cropping	Queensland
Horticulture Innovation Australia Ltd	Research and Development Corporation	New South Wales
Mt Lindesay	Mixed farming, specialty (including indigenous) crops	Western Australia
Myera Group	Indigenous food production	Manitoba, Canada
NSW Farmers' Association	Industry association	New South Wales
Olive Vale Pastoral Pty Ltd	Mixed farming, new product lines for export (including indigenous species)	Queensland
Oz Medicann Pty Ltd	Medicinal crop production, cannabis-based therapeutic solutions, personalised medicine	New South Wales
P'Petual Holdings Pty Ltd	Horticulture	South Australia
Provenir (FarmGate MSU Pty Ltd)	Mobile abattoir and on-farm processing	Victoria
Providence Asset Group	Renewable energy	New South Wales
Pudakul Aboriginal Cultural Tours	Indigenous tourism, experts in traditional 'bush' foods and medicines	Northern Territory
Rijk Zwaan Australia Pty Ltd	Horticulture	New South Wales
Savannah Ag Consulting	Consulting services	Queensland
Sprout Stack Pty Ltd	Horticultural producer, protected cropping (modular vertical farms)	New South Wales
Varona Fine Foods Pty Ltd / Great Southern Truffles	Supplier of premium Australian produce, principally for export markets	Western Australia
WBS Project H Pty Ltd	Manufacturer and provider of specialist LED lighting	New South Wales

SME engagement

While the CRC includes some major firms – for example, Costa Group and Perfection Fresh – the great majority of its industry participants are SMEs. This is typical of the Australian food industry, which comprises a small number of dominant incumbents and an array of very small firms, many of which struggle to grow beyond a few employees.

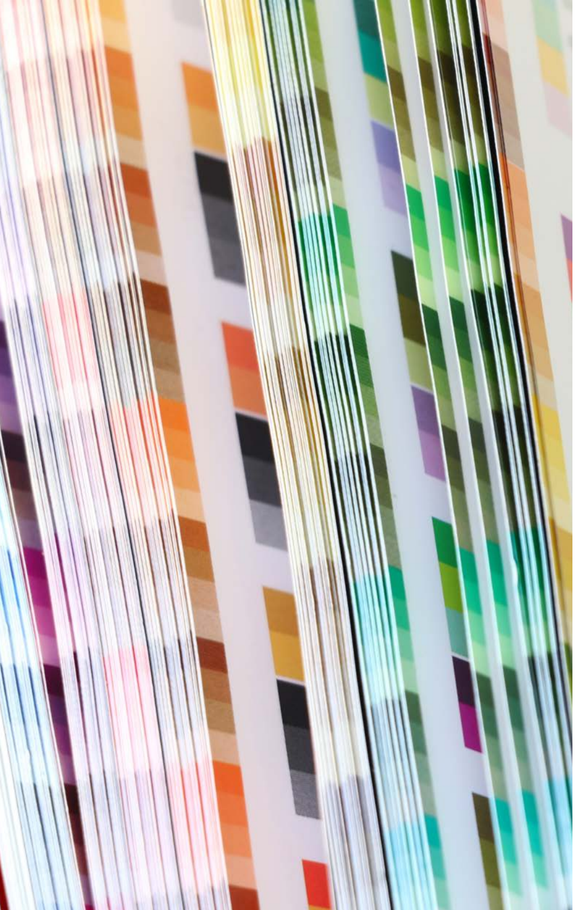
The CRC includes a diversity of talented SME partners based in five states and the NT, all of which are endeavouring to achieve a leap in scale (see Appendix 2 and table opposite).

The CRC supports SMEs in several ways, including by:

- providing cost-effective R&D services to help them develop the specific IP needed to scale up facilities or take a product concept to market;
- helping to identify and build commercial synergies – for example, matching a solution provider with a firm that needs a solution;
- helping to improve the operating environment via Research Program 1 planning and industry cluster activities; and
- the CRC's Industry PhD Scholarship program, which provides a cost-effective way for SMEs to obtain or retain and upskill staff.

Two of the CRC Board members have significant experience supporting SMEs and owning and operating SMEs (Fiona Simson, as President of NFF and a farmer; and Peter Schutz, as former Chair of FIAL and owner of a small food-manufacturing company).

Cashflow is a constant problem for smaller SMEs, which makes it difficult for them to fund longer-term and high-risk research projects. In future years, the CRC aims to extend general capability services to SMEs via its industry cluster work in Research Program 1 and projects with government participants.



Communications

With three intertwined research streams, ambitious goals and a 10-year agenda for achieving these, the Future Food Systems CRC has a challenging communications task.

The Communications team used its first year to:

- create suitable communications materials for the CRC;
- help foster a sense of community and shared purpose among participants;
- establish and foster connections with participating organisations' media units and communications staff;
- convey the overarching mission and goals of the CRC to participants and interested parties, and explain how the various parts fit together to make the whole;
- convey the diverse capabilities of the CRC's research and government participants to industry partners (and vice-versa);
- promote key meetings, workshops and forums to participants and detail their outcomes; and
- promote CRC projects as these were approved and commenced.

Over the first half of FY2019/20, the Comms team helped to plan and execute various events designed to bring industry, research and government participants together, outline the CRC's goals and strategies for achieving them, inspire participants and foster potential collaborations.

Key collaborative events pre-pandemic included a stakeholder-engagement event with Liverpool City Council in October 2019, and the Board and all-Participants meetings in late November 2019 as well as several well-attended forums and workshops over the second half of 2019 and early 2020. There were also CEO visits to participant universities and business HQs in Perth, Brisbane, regional NSW and Darwin; and numerous face-to-face and virtual meet'n'greets among research, industry and government participants.

With COVID-19's arrival, the CRC postponed its planned media launch (scheduled for mid-April at Queensland University of Technology's the Sphere) and shifted the bulk of its meetings, events and networking opportunities to online forums, run via Zoom or Teams.

The CRC's digital communications strategy was rolled out progressively over the period, starting with the Future Food Systems website, the CRC's primary public interface.

The website evolved substantially over FY2019/20 to include sections detailing the CRC's vision and mission; key people; capabilities across all partner universities and research bodies; education and training program; and projects approved under its three principal research streams.

The website is also the repository for a growing list of long and short-form articles detailing:

- project and partner news;
- PhD and researcher profiles;
- details on relevant events;
- articles summarising academic papers of relevance published by CRC partners, including research from Murdoch University's ANPC, UNSW and WSU; and
- globally sourced 'Newsbyte' information – external news that relates to the CRC's key research themes.

The team established a quarterly Partner Update for internal circulation as well as a monthly, subscription-based, public-facing eNewsletter detailing the latest CRC project, partner and research-theme-related news and events, and information on its Education program and PhD scholarships. Google Analytics showed a generally upward trend in numbers of eNews subscribers, organic site searches, page views and time spent on site.

In 2020, the CRC ramped up its presence on social media, posting regularly on Linked In and Twitter, with consequent upticks in followers and engagement.

Over FY2019/20, the Communications team established and maintained contact with the media arms of its research, government and industry participants to share information, text and images, arrange interviews/expert comment and coordinate press releases around CRC projects. The Comms team was also in regular contact with the Communications staff of other CRCs, sharing resources and information and attending regular CRC Comms meetings and catch-ups via Zoom.

In the CRC's first year of operation, external communications were not a particular focus. With initial projects still in the early stages, there was little in the way of outcomes to report. The Communications team therefore concentrated on promoting the CRC's key research themes, objectives and activities to participants and interested parties, principally via its own communications channels.

That said, the team secured coverage of the CRC and its activities in some partner and external media over the period, including feature articles in Peel Development Commission's *Peel Magazine*, NSW Farmers' *The Farmer* and UNSW and QUT News, as well as shorter pieces in *ICT News, the Muster* (NSW Farmers' EDM) and the CRC Association's *CRCA News*. The team also submitted information about the CRC and its projects to the media units of partner universities as well as to researchers from ABC-TV's *Catalyst*.

In its next year of operation, the CRC Comms team intends to use SCIMEX, the Australian Science Media Centre's breaking science news portal for Australia & New Zealand, and other channels to attract more external media coverage as projects currently underway reach reportable milestones/completion.

All CRC materials and communication activities over the reporting period adhered to proper use of CRC Program Branding, as specified in the Grant Agreement. The Communications team has established a brand and style for the CRC that aims to evoke the high-tech nature of the future food sector and strives to achieve high editorial, science communication and design standards.

Networking with partner Comms teams

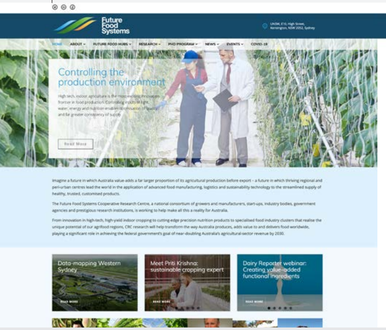
Upgraded and enhanced website

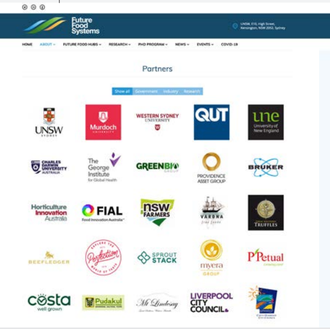
Established social media channels

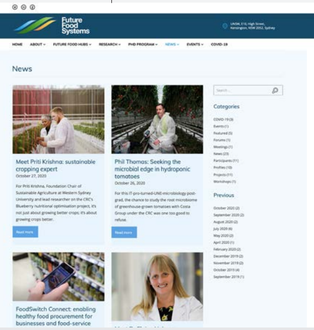
Curated News articles and related Newsbytes

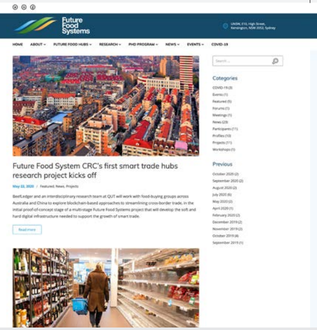
Curated Research content and related Resources

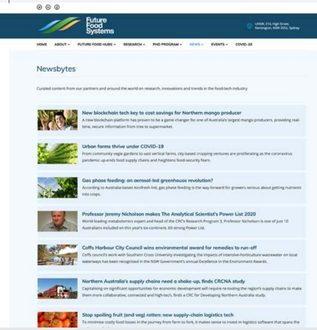
Monthly eNews to growing subscriber base

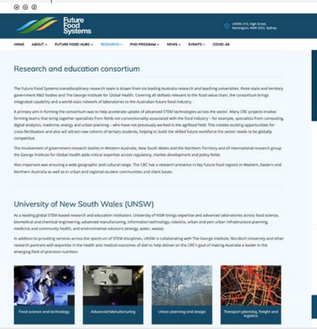


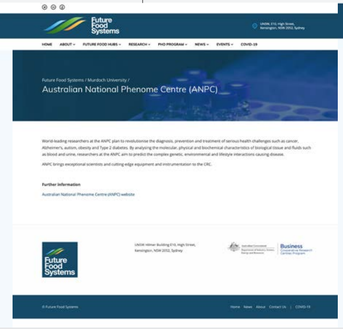












Page views FY2019/20

42k

New users FY2019/20

10k

Sessions FY2019/20

14k

News articles FY2019/20

124

Resources FY2019/20

40+

Subscribers FY2019/20

392

Government partners

Industry partners

Research partners

Supporting partners

Partner network

The Future Food Systems partner network spans the Australian food industry including agrifood businesses, technology companies, research institutions, financiers, service providers and government organisations.

Its consortium comprises around 50 partners (including 13 strategic partners): a mix of large and small-to-medium enterprises, contributing cash and in-kind payments.

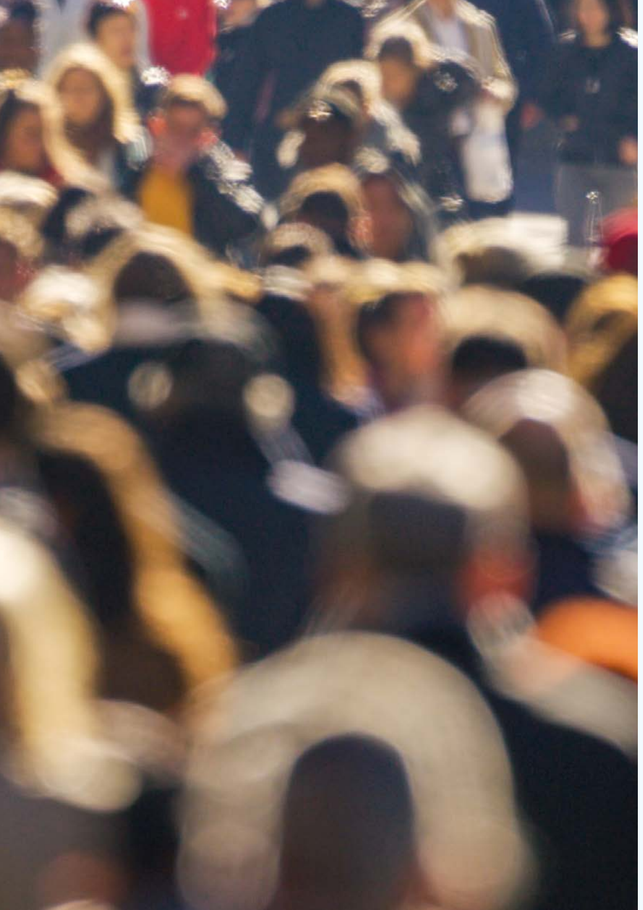
Over FY2019/20, the CRC's core team worked tirelessly to connect agrifood businesses with cutting-edge technology companies and world-class researchers to co-create optimal solutions; adopt new, collaborative approaches to R&D; and identify the most appropriate digital tools for their needs.

Over the same period, the CRC brokered numerous potentially productive connections between technology companies and innovative agrifood businesses and researchers so that, together, they could explore the joint development of advanced digital tools and premium products for a rapidly growing market.

The CRC supported its participant universities' researchers in delivering the first eight scoping projects in mid-2020, and worked with prospective collaborators from industry, government and research institutions to form high-impact projects with commercial application, surrounded by recognised researchers, technologists and industry leaders.

The CRC also worked to develop new digital technologies and services to support effective regulation, help ensure food safety, promote the Australian brand and inform evidence-based policy.

For a full list of Future Food Systems partners, see Appendix 2.



Governance

No significant governance or management issues were experienced and there were no changes to the Board composition during the year.

The CRC is operated by Future Food Systems Ltd, which is a Company Limited by Guarantee, registered with the Australian Charities and Not-for-profit Commission. The Company is exempt from income tax.

The governing documents of the Company include the Constitution and the Participants Agreement.

The governance structure of the company includes a Board of Directors and two sub-committees of the Board, with appropriate terms of reference – the Finance, Risk & Audit Committee (FRAC), and the Nominations & Remunerations Committee (NRC). The Board and its committees are fully independent of the participants of the CRC. The Board and the FRAC meet at least four times a year.

The Nominations & Remunerations Committee recommends candidates to the members, who elect Board Directors at the CRC's Annual General Meeting. Casual vacancies can be appointed by the Board; such appointments continue until the following Annual General Meeting.

The Board set up an advisory committee – the Research & Commercialisation Committee (RCC) – to provide it with strategic oversight of the Research and Commercialisation roadmap. The RCC comprises a Board representative and participant representatives.

The Board






Fiona Simson
Independent Chair

Chair of Nominations & Remunerations Committee

Peter Schutz
Independent Director

Chair of Finance, Risk & Audit Committee

Member of Nominations & Remunerations Committee

Valerie Linton
Independent Director

Member of Finance, Risk & Audit Committee

Member of Nominations & Remunerations Committee

Carolyn McNally
Independent Director

Member of Finance, Risk & Audit Committee

Member of Nominations & Remunerations Committee

Bob Mullins
Independent Director

Chair, Research & Commercialisation Advisory Committee

Maggie Dowling
Independent Director

Member of Finance, Risk & Audit Committee

Financial management

The CRC achieved 75% of its targeted contributions from participants. This was in the context of a significant economic downturn caused by the pandemic and a shorter year of operation (the Participants Agreement was executed in December 2019). The economic fallout from the pandemic negatively impacted the SME sector and resultant contributions.

The CRC is implementing the following strategies to address this emerging issue:

- deferral of cash contributions on a case-to-case basis;
- re-balancing the mix of participants to reduce the CRC's reliance on SMEs;
- the introduction of new, larger participants that can commit to longer-term projects and bring stability to the CRC's research roadmap; and
- continuous feedback to the CRC Grants office.

The CRC managed its cashflow prudently over the reporting period. As of 30 June 2020, it had a healthy cash balance of $4.26m. It is well positioned to fast-track projects with its participants.

	Target	Achieved
Participant cash contribution	$2.67m	$1.83m
Participant in-kind contribution	$11.04m	$8.47m
Total participant contribution	$13.71m	$10.3m

CRC future plans

The CRC is liaising with State and Commonwealth authorities regarding COVID-19 response plans and how CRC research and capability activities may be of assistance with regard to supply-chain modernisation and opportunities to boost manufacturing and value creation in regional and peri-urban economies.

Activities not covered by the Grant Agreement

The CRC liaises actively with FIAL regarding industry development strategy and the FIAL Sector Competitiveness Plan.

The CRC was successful in securing a $300k grant under the NSW Research Attraction and Acceleration Program which is being allocated to supporting collaborative initiatives in regional NSW that complement CRC Research Program 1 activities.

Statement of profit or loss and other comprehensive income

For the period ended 30 June 2020

	Period from 23 May 2019 to 30 June 2020 $
Revenue	**13,995,197**
Other income	**50,113**
Depreciation expense	**(1,869)**
Employee benefit expenses	**(818,442)**
Legal expenses	**(49,565)**
Research and development expenses	**(388,475)**
Research and development expenses – in kind	**(8,473,898)**
Consultancy expenses	**(75,228)**
Computer software and hardware expenses	**(20,610)**
Travel and accommodation expenses	**(14,087)**
Other expenses	**(95,194)**
Surplus before income tax	**4,107,942**
Income tax expense	**-**
Surplus for the period	**4,107,942**
Other comprehensive income for the period, net of income tax	**-**
Total comprehensive income for the period	**4, 107,942**

Statement of financial position

As at 30 June 2020

	30 June 2020 $
Assets	
Current assets	
Cash and cash equivalents	**4,263,170**
Trade and other receivables	**240,625**
Total current assets	**4,503,795**
Non-current assets	
Plant and equipment	**7,040**
Total non-current assets	**7,040**
Total assets	**4,510,835**
Liabilities	
Current liabilities	
Trade and other payables	**362,408**
Employee benefits	**40,485**
Total current liabilities	**402,893**
Non-current liabilities	
Total non-current liabilities	**-**
Total liabilities	**402,893**
Net assets	**4,107,942**
Equity	
Retained earnings	**4,107,942**
Total equity	**4,107,942**

Appendices

Appendix 1A Attendance at Board meetings by Directors during FY2019/20

Director's name	Role	No of meetings attended	Key skills	Organisations represented	Sub-committee membership	Sub-committee meetings attended
Fiona Simson	Chair	8 of 8	Governance, Industry engagement	Growers	1	2 of 2
Peter Schutz	Director	7 of 8	Governance, Manufacturing	Food manufacturers	2	3 of 3
Valerie Linton	Director	7 of 8	Research leadership	Research partners	2	3 of 4
Carolyn McNally	Director	3 of 3	Planning and regulation	Government partners	2	3 of 3
Bob Mullins	Director	3 of 3	R&D management and commercialisation	Service provider partners	1	2 of 2
Maggie Dowling	Director	3 of 3	Governance, business management finance and HR	N/A	1	2 of 2

Appendix 1B Names and details of key staff serving during FY2019/20

Name	Appointment	Part time / full time	Status FY2019/20
David Eyre	CEO	Full time	Ongoing
Satish Nair	COO	Part time (0.6 fte)	Ongoing
Cordelia Selomulya	Director Research & Commercialisation	Part time (0.5 fte)	New appointment
Douglas Baker	Research Lead Program 1	Part time (0.5 fte)	New appointment
Ian Anderson	Research Lead Program 2	Part time (0.5 fte)	New appointment
Jeremy Nicholson	Research Lead Program 3	Part time (0.5 fte)	New appointment
Brian Sindel	Education Program	Part time (0.5 fte)	New appointment
Emily Dix	Executive Assistant	Full time	Resigned
Merran White	Communications Manager	Full time	New appointment
Anthony Battaglia	Digital Assets Manager	Full time	New appointment
Bonnie Chiu	Executive Assistant	Full time	New appointment

Appendix 1C Research & Commercialisation Committee (RCC) FY2019/20

Name	RCC role	Key skills	Independent or organisation	Role	Meetings
Bob Mullins	Chair	R&D management and commercialisation	Independent	Director	2 of 2
Adam Wilson	Member	Food manufacturing and marketing	Varona Fine Foods Pty	Managing Director	2 of 2
Ana Deletic	Member	Research leadership	University of New South Wales	Pro Vice Chancellor Research	2 of 2
Bogdan Dlugogorski	Member	Research leadership	Charles Darwin University	Deputy Vice Chancellor & Vice President Research and Innovation	2 of 2
Bruce Mullan	Member	Research leadership, industry strategy	Western Australia Government Department of Primary Industries and Regional Development	Director, Livestock Research & Industry Innovation	1 of 2
Christopher Guthrie	Member	Economic development	Liverpool City Council	Coordinator Business Development	2 of 2
David Morrison	Member	Research leadership	Murdoch University	Deputy Vice Chancellor Research & Innovation	2 of 2
Deborah Sweeney	Member	Research leadership	Western Sydney University	Deputy Vice Chancellor Research and Innovation	2 of 2
Gudrun Seynsche	Member	Research leadership	Queensland University of Technology	Director Major Research Initiatives	2 of 2
Heiko Daniel	Member	Research leadership	University of New England	Deputy Vice Chancellor Research	2 of 2
Henry Sun	Member	Circular economy technology	Providence Asset Group	CEO	1 of 2
Hugh McGilligan	Member	Food manufacturing and marketing	Sprout Stack	CEO	2 of 2
Matt Brand	Member	Farm sector knowledge/industry strategy	Horticulture Innovation Australia (Hort Innovation)	CEO	1 of 2
Peter Arkle	Member	Farm sector knowledge/industry strategy	NSW Farmers' Association	CEO	2 of 2
Shane Hetherington	Member	Farm sector knowledge/industry strategy	NSW Department of Primary Industries (NSW DPI)	Director Horticulture, NSW DPI Agriculture	2 of 2
Warwick Powell	Member	eCommerce, trade and marketing	BeefLedger	Chairman	2 of 2
David Eyre	Member	Research leadership/industry strategy	Future Food Systems Ltd	CEO	2 of 2
Cordelia Selomulya	Member	Research leadership	Future Food Systems Ltd	Director Research & Commercialisation	2 of 2

Appendix 1D Nominations & Remunerations Committee (NRC) FY2019/20

Name	RCC role	Key skills	Independent or organisation	Role	Meetings
Fiona Simson	Chair	Governance, industry engagement	Independent	Chair	2 of 2
Carolyn McNally	Member	Planning and regulation	Independent	Director	1 of 1
Valerie Linton	Member	Research leadership	Independent	Director	2 of 2

Appendix 1E Finance, Risk & Audit Committee (FRAC) FY2019/20

Name	RCC role	Key skills	Independent or organisation	Role	Meetings
Peter Schutz	Chair	Governance, manufacturing	Independent	Director	2 of 2
Carolyn McNally	Member	Planning and regulation	Independent	Director	2 of 2
Valerie Linton	Member	Research leadership	Independent	Director	1 of 2
Maggie Dowling	Member	Governance, business management, finance and HR	Independent	Director	2 of 2

Appendix 1F Research & Commercialisation Working Group (RCC WG) FY2019/20

Name	RCC role	Key skills	Independent or organisation	Role
Cordelia Selomulya	Chair	Research leadership / food science and technology	Future Food Systems Ltd	Director Research & Commercialisation
David Eyre	Member	Research leadership / industry strategy	Future Food Systems Ltd	CEO
Satish Nair	Member	Accounting / commerce	Future Food Systems Ltd	COO
Douglas Baker	Member	Research leadership / planning and transport	Future Food Systems Ltd	Program Lead
Ian Anderson	Member	Research leadership / horticulture	Future Food Systems Ltd	Program Lead
Jeremy Nicholson	Member	Research leadership / precision nutrition	Future Food Systems Ltd	Program Lead
Brian Sindel	Member	Education and training	Future Food Systems Ltd	Program Lead

Appendix 2 List of partners

Partner	Participation type	ABN or ACN	Org type
Apex Greenhouses (Australia) Pty Ltd	CRC Partner	85 606 488 911	SME
Armidale Regional Council	CRC Partner	39 642 954 203	Local government
Austgrains Pty Ltd	CRC Partner	97 069 573 100	SME
BeefLedger IO	CRC Partner	622 620 875	SME
Bruker BioSpin Pty Ltd	CRC Partner	86 002 561 328	Large industry
Charles Darwin University (CDU)	CRC Partner	54 093 513 649	University
Chinese Academy of Inspection and Quarantine	CRC Partner	N/A	Government
Coffs Harbour City Council	CRC Partner	79 126 214 487	Local government
Costa Group (Tomato Exchange)	CRC Partner	23 870 133 940	Large industry
CRC for Developing Northern Australia Ltd	CRC Partner	43 618 131 150	Organisation
E Agri Management and Technical Services Pty Ltd	CRC Partner	37 625 845 276	SME
Escavox Pty Ltd	CRC Partner	71 627 455 261	SME
Fable Food Co (Butcher's Harvest Pty Ltd)	CRC Partner	95 632 438 094	SME
Food & Fibre Gippsland	CRC Partner	68 491 193 041	Local government
Food Innovation Australia Ltd (FIAL)	CRC Partner	50 164 124 609	Organisation
Food Innovation Partners Pty Ltd	CRC Partner	45 125 270 064	SME
Greenbio Group Pty Ltd	CRC Partner	44 619 105 654	SME
Horticulture Innovation Australia Ltd	CRC Partner	71 602 100 149	SME
iMove Australia	CRC Partner	11 618 758 491	Organisation
Liverpool City Council	CRC Partner	84 181 182 471	Local government
Mt Lindesay	CRC Partner	96 086 533 776	SME
Murdoch University	CRC Partner	61 616 369 313	University
Myera Group	CRC Partner	N/A	SME
Northern Territory Government Department of Primary Industry and Resources (NT DPIR)	CRC Partner	84 085 734 992	Australian government
NSW Department of Primary Industries (NSW DPI)	CRC Partner	72 189 919 072	State government
NSW Farmers' Association	CRC Partner	31 000 004 651	SME
Olive Vale Pastoral Pty Ltd	CRC Partner	30 116 164 419	SME
Oz Medicann Pty Ltd	CRC Partner	92 618 959 783	SME
P'Petual Holdings Pty Ltd	CRC Partner	86 000 431 827	SME
Peel Development Commission	CRC Partner	87 080 446 375	Local government
Perfection Fresh Australia Pty Ltd	CRC Partner	75 127 389 682	Large industry
Provenir (FarmGate MSU Pty Ltd)	CRC Partner	44 620 533 673	SME
Providence Asset Group	CRC Partner	89 631 604 129	SME
Pudakul Aboriginal Cultural Tours	CRC Partner	58 329 303 582	SME
Queensland University of Technology (QUT)	CRC Partner	83 791 724 622	University
Regional Development Australia – ACT	CRC Partner	78 439 379 275	Australian government
Regional Development Australia – Sydney	CRC Partner	42 973 708 239	Local government
Rijk Zwaan Australia Pty Ltd	CRC Partner	14 054 390 902	SME
Savannah Ag Consulting	CRC Partner	61 376 946 877	SME
Sprout Stack Pty Ltd	CRC Partner	87 611 729 161	SME
The George Institute for Global Health	CRC Partner	90 085 953 331	University
University of New England (UNE)	CRC Partner	75 792 454 315	University
University of NSW (UNSW)	CRC Partner	57 195 873 179	University
Varona Fine Foods Pty Ltd	CRC Partner	58 606 783 699	SME
WBS Project H Pty Ltd	CRC Partner	74 166 824 906	SME
Western Australian Agriculture Authority (WAAA)	CRC Partner	86 611 226 341	State government
Western Sydney University (WSU)	CRC Partner	53 014 069 881	University

Appendix 3 Collaboration across and between research partners in workshops during FY2019/20

Workshop/discussion	Participating organisations (Partners)	Date	Location
Forum: Food Hubs, Logistics and Trade	Armidale Regional Council AusIndustry Camden Council Charles Darwin University (CDU) Coffs Harbour City Council CRC for Developing Northern Australia Ltd (CRC-NA) Escavox Pty Ltd Food & Fibre Gippsland Greenbio Group Pty Ltd GS1 Australia HiveXchange iMove Australia James Cook University Liverpool City Council Monash University Murdoch University NSW Department of Industry NSW Department of Primary Industries (NSW DPI) NSW Farmers' Association Provenir (FarmGate MSU Pty Ltd) Queensland University of Technology (QUT) Regional Development Australia – ACT Regional Development Australia – Sydney Regionality Pty Ltd Rijk Zwaan Australia Rita's Farm Produce Sumo Salad The George Institute for Global Health Tocal College (NSW DPI) University of New England (UNE) University of NSW (UNSW) Varona Fine Foods Western City and Aerotropolis Authority Western Sydney University (WSU)	28 Jun 2019	The William Inglis Hotel, 155 Governor Macquarie Drive, Warwick Farm, NSW, 2170
Forum: Next Generation Indoor Cropping	Apex Greenhouses (Australia) Pty Ltd Armidale Regional Council Brisbane Airport Corporation (BAC) Costa Group (Tomato Exchange) Department of Agricultural Fisheries, Queensland Government E Agri Management and Technical Services Pty Ltd Greenbio Group Pty Ltd HIE | Hawkesbury Institute for the Environment (WSU) Horticulture Innovation Australia Ltd Liverpool City Council Northern Territory Government Department of Primary Industry and Resources NSW Department of Primary Industries Oz Medicann Pty Ltd Queensland University of Technology (QUT) Regional Development Australia – ACT University of New England (UNE) University of NSW (UNSW) WBS Project H Pty Ltd	11 Jul 2019	QUT Kelvin Grove Campus, Queensland
Forum: Breakthroughs in value-adding	Bruker BioSpin Pty Ltd Charles Darwin University (CDU) City of Mandurah Fresh Delights Greenbio Group Pty Ltd Monash University Murdoch University Peel Development Commission Provenir (FarmGate MSU Pty Ltd) Queensland University of Technology (QUT) SGC Economics & Planning Shire of Murray Southern Dirt The George Institute for Global Health University of New England (UNE) University of NSW (UNSW) Varona Fine Foods Pty Ltd Western Australian Agriculture Authority Western Sydney University (WSU) Wiley Food	26 Jul 2019	Australian National Phenome Centre and the Sebel Mandurah, Western Australia

Liverpool CC workshop Smart regional specialisation: building a Western Sydney food plan (Hosted by Liverpool City Council)	Costa Group (Tomato Exchange) Escavox Liverpool City Council NSW Farmers' Association Queensland University of Technology (QUT) Western Sydney University (WSU) Western City Aerotropolis Authority	18 Oct 2019	Western Sydney Airport
Participants Meeting	Coffs Harbour City Council Fable Food Co (Butcher's Harvest Pty Ltd) Food & Fibre Gippsland Food Innovation Australia Ltd (FIAL) Greenbio Group Pty Ltd iMove Australia Liverpool City Council Murdoch University NSW Department of Primary Industries (NSW DPI) NSW Farmers Association Oz Medicann Pty Ltd Providence Asset Group Provenir (FarmGate MSU Pty Ltd) Regional Development Australia – ACT Sprout Stack Pty Ltd The George Institute for Global Health University of New England (UNE) University of NSW (UNSW) WBS Project H Pty Ltd Western Australian Agriculture Authority Western Sydney University (WSU)	25 Nov 2019	UNSW City Campus Sydney
NT Engagement Meetings	Charles Darwin University (CDU) CRC for Developing Northern Australia Ltd (CRC-NA) Northern Territory Government Department of Primary Industry and Resources Pudakul Aboriginal Cultural Tours	3-5 Dec 2019	Darwin

Research Program 3 Research Team Workshop	Australian National Phenome Centre (Murdoch University) Centre of Computational and Systems Medicine (Murdoch University) HIE | Hawkesbury Institute for the Environment (WSU) School of Chemical Engineering – UNSW Sydney School of Computer Science and Engineering – UNSW Sydney School of Electrical Engineering and Telecommunications – UNSW Sydney School of Mechanical and Manufacturing Engineering – UNSW Sydney The George Institute for Global Health The Perron Institute UNESCO Centre for Membrane Science and Technology Water Research Centre (WRC) – UNSW Sydney Western Sydney Univiersity (WSU) Wiley Food	21 Jan 2020	UNSW Sydney
Research Program 2 2.1 & 2.4 Research Team Workshop	Built Environment, Science and Engineering Faculty (QUT) Centre for Tropical Crops and Biocommodities (QUT) Evolution & Ecology Research Centre HIE | Hawkesbury Institute for the Environment (WSU) Institute for Future Environments (QUT) NICM Health Research Institute (WSU) NSW Department of Primary Industries Research Services | Western Sydney University (WSU) School of Civil and Environmental Engineering – UNSW Sydney School of Chemical Engineering – UNSW Sydney School of Computer Science and Engineering – UNSW Sydney School of Electrical Engineering and Telecommunications – UNSW Sydney School of Mechanical and Manufacturing Engineering – UNSW Sydney School of Photovoltaic and Renewable Energy Engineering – UNSW Sydney School of Design and Architecture (QUT) School of Electrical Engineering and Robotics (QUT) School of Science | Western Sydney University (WSU) UNESCO Centre for Membrane Science and Technology	5 Feb 2020	Poolside Function Centre, Western Sydney University, Hawkesbury Campus, NSW

Future Food Systems CRC Indigenous Initiatives Workshop	Aboriginal Health and Wellbeing (AHW) Clinical Academic Group Access and Benefit-Sharing Capacity Development Initiative, Nagoya Protocol, UNSW Australian Government Indigenous Land and Sea Corporation First Hand Solutions Aboriginal Corporation Food Innovation Partners Pty Ltd Global Water Institute – UNSW Sydney Liverpool City Council Myera Group NSW Department of Primary Industries (NSW DPI) Queensland Department of State Development, Manufacturing, Infrastructure and Planning Queensland University of Technology (QUT) School of Chemical Engineering – UNSW Sydney The George Institute for Global Health Western Sydney University (WSU)	19 Feb 2020	UNSW Sydney
Industry Clusters Discussion	University of NSW (UNSW)	10 Feb 2020	UNSW Sydney
Environment and Energy Discussion	Australian Government Department of the Environment and Energy	17 Feb 2020	UNSW Sydney
Renewable Energy Discussion	Providence Asset Group University of NSW (UNSW)	10 Mar 2020	UNSW Sydney
Deputy & Pro Vice Chancellor Research Update	Charles Darwin University (CDU) Murdoch University Queensland Univeristy of Technology (QUT) University of New England (UNE) University of NSW (UNSW) Western Sydney University (WSU)	12 Mar 2020	Zoom
COVID-19 impacts Discussion	Western Sydney University (WSU)	26 Mar 2020	Zoom
Planning Discussion	NSW Department of Planning, Industry, and Environment (DPIE) Regional Growth NSW Development Corporation	1 Apr 2020	Zoom

Fresh Food Supply Chain Initiative	Escavox Pty Ltd Perfection Fresh Australia Pty Ltd University of NSW (UNSW)	8 Apr 2020	Zoom
Peri-urban and Circular Economy Discussion	NSW Circular	14 Apr 2020	Zoom
Council Discussions	Liverpool City Council	22 Jun 2020	Zoom
Western Sydney Agrifood Mapping and Analytics Project discussion	Built Environement, City Analytics – UNSW Sydney Greater Sydney Local Land Services Liverpool City Council NSW Farmers' Association Regional Development Australia rCiti – UNSW Sydney	23 Jun 2020	Zoom

Appendix 4 Diversity FY2019/20

Position	M	F
Board	2	4
Executive/management	3	3
Research leads	4	

Appendix 5 Postgraduate students FY2019/20

Student name	Start date	End date	Research program	Project title	Host research institution	Country of origin
Gehan Abdelghany			RP1	Commercialisation of native rice for Indigenous enterprise development: Agronomy and value-adding	WSU	Egypt

Note: A further three PhD positions were advertised in FY2019/2020.

Future Food Systems

Future Food Systems CRC

The Future Food Systems Cooperative Research Centre (CRC) is a national initiative created to drive innovation and growth in the agrifood sector by accelerating adoption of STEM technologies and cluster approaches to industry development, resilience and sustainability. It is funded as part of the Australian Government's CRC Program, established to drive industry-led collaborations between researchers and the community to improve the competitiveness, productivity and sustainability of Australian industries, especially in sectors where Australia has a competitive strength.

Australian Government
Department of Industry, Science, Energy and Resources

Business Cooperative Research Centres Program