

CellAg Summit 2023

Conference Report



Cellular
Agriculture
Australia

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EXECUTIVE SUMMARY

Last month, Future Alternative (FA) and Cellular Agriculture Australia (CAA) co-hosted Australia's inaugural cellular agriculture conference, the CellAg Summit, attended by over 140 representatives from multiple interest groups including cellular agriculture companies and consortia, investors, consumer-goods and contract manufacturing organisations, media companies, Australian universities and the Australian government.

From CAA's perspective, there were a number of common threads in the day's conversations, with a strong message that a unified voice and collaboration across the sector is needed urgently to support the sector's potential.

We have gone through the recordings of the day and overlaid this information with our knowledge of the sector. This report will highlight and elaborate on several of the common threads discussed on the day that we believe are crucial to the future of the cellular agriculture sector in Australia:

- **Collaboration:** The sector is likely to fail unless it focuses on working together on multiple fronts with a strong and unified voice.
- **Costs:** Media costs have already reduced beyond expected limits, creating an opportunity to re-frame the debate around scale.
- **Investment:** Investors and companies need to be open to new funding models and closer working relationships that better support mutual goals, whilst safeguarding their existing portfolios.
- **Scientific Challenges:** The burden of technical and biological challenges should be reduced with knowledge sharing and if they can't be met head-on, think outside the box and don't give up!
- **Consumers:** We urgently need more studies on awareness and perception of cellular agriculture among Australian consumers, and it is critical to focus on positive and transparent engagement right now. Companies also need to involve their customers much more thoroughly and earlier in the product development process.
- **Australian Made:** Despite the incredible opportunities an Australian cell ag sector presents, and the best intentions to build it, this will not happen without collaboration and government involvement and support.

- **Sustainability:** This needs to be a central (and early) focus, supported by honest and transparent LCAs (Life-cycle assessments) when sufficient data is available, as well as a commitment to build renewable energy into process design from the beginning.
- **Government:** To kickstart vital government support and policy levers (particularly at the Federal level) the sector needs to identify the Government's key motivator(s) – and then sell it with a unified voice.
- **Talent:** The development and supply of a skilled workforce is vital, particularly for those ready to scale now
- **Academia:** Universities and industry need to start working together to design training programs and better intellectual property (IP) ownership models.
- **Integrity:** Maintaining openness, transparency, and commitment to the mission over fast paths to profit is important for long term success and impact.
- **Incumbents:** Presenting as complementary rather than disruptive is critical for collaborations with existing food suppliers, which are vital for access to existing supply chains, infrastructure and markets.
- **Existing Businesses:** there is huge potential in working with, learning from and leveraging businesses across the existing food supply chain .



THE CELLAG SUMMIT: KEY TAKEAWAYS

1. The burgeoning Australian cellular agriculture sector presents many opportunities; how do we keep it here?

As outlined in CAA's [White Paper](#) last year, cellular agriculture offers an enormous opportunity for Australia to expand and diversify its capabilities in terms of food production and security, manufacturing, R&D, jobs creation and international trade. In turn, Australia has the capacity to offer cellular agriculture producers benefits such as world-leading agriculture and biotechnology researchers, access to feedstock industries (e.g. sugar) and extensive renewable energy supplies, and of course, the substantial market potential afforded by the Australian Made brand.

The sentiment of many attendees was that Australia has the potential to be a global superpower in the cellular agriculture sector. There is a real passion among companies, investors and even academics to build the sector here but the current landscape is falling short for companies struggling to get it started. The day's discussions centred on how it can potentially be brought to life, and the urgent need to enable this right now, with tangible action.



Courtesy: Queensland Cane Growers Association

2. What does the current investment landscape look like and how should it change to support the sector's growth?

While there has been a recent decline in investment funds going into the Australian cellular agriculture sector, this is not necessarily a reflection of declining investor interest or confidence. In addition to the global economic downturn, one of the main reasons cited was investors safeguarding existing portfolios. Investors have confidence in the sector but there is now greater realisation of the support needed to commercialise the technologies and move through pilot scale and regulatory processes to begin generating vital returns.

There was also recognition of the need to consider new models of investment. For companies, this could mean building relationships with long term capital investors and ensuring they incorporate different investment types and strategies into their early business models. For investors, there is a necessity to be involved further upstream in start-up development, to see what is needed from the beginning – particularly for those involved in infrastructure investment. Focusing on building a robust pre competitive environment is critical if investment returns are to be realised.

While there is a strong focus on supporting established enterprises, some investors, like Better Bite Ventures, recognise the importance of maintaining the inflow of new start-up talent and innovation into the sector and are therefore concentrating funds there. It is widely recognised that the cellular agriculture sector in Australia will not reach its full potential based on the current demographic of companies, as such early investment mechanisms are critical to ensure the sector continues to diversify and expand.



Courtesy: Better Bite Ventures

3. How important is collaboration within the Australian cellular agriculture sector?

Possibly the biggest theme of the day was the importance of building a pre competitive environment through collaboration and presenting as a unified whole.

What is the point of competition if there is nothing to compete for?

This will involve developing a clear vision of what the sector is and how it should fit into existing food production systems, and delivering it in a way that media, consumers and the government can understand.

Meaningful engagement with government, sufficient to unlock critical funds, will be best achieved with consistent input from a wide variety of sector stakeholders, brought together through a consolidated voice. Critically, these interactions need to focus on succinct, industry-developed plans that governments can enact. The success of this approach is exemplified by the achievements of Cauldron Farm who have made connections with various State governments.

Accessible fundamental research is another area crying out for collaboration. Intellectual property (IP) is obviously very important in start-up/investor arrangements, and that this leads to the inefficient siloing of research has long been recognised in the cellular agriculture sector. While it can be positive for individual companies it's not for the sector as a whole. Governments could work with academia to help build the pre-competitive environment though developing and sharing critical, fundamental research.

Attendees put the spotlight on the necessity of cross-sector collaboration and the important role dedicated organisations like CAA have to play as an enabler. Not collaborating on common problems and opportunities is dangerous for everyone. Investors need to recognise this and the sector needs to take responsibility for ensuring organisations like CAA remain well resourced and sustainable.

4. How important is collaboration with existing industries and how is cellular agriculture currently perceived by them?

Another common sentiment of the day was the need to be seen as complementary rather than disruptive to existing food producers.

Accessing existing supply and distribution networks, production facilities and consumer bases will be fundamental to the cellular agriculture sector's success and this cannot be achieved without cooperation and goodwill. The view of cellular agriculture by incumbent industry varies depending on the size of the organisation in question. In general, larger firms are more aware of cellular agriculture than smaller operations and they are more likely to see cellular agriculture as an opportunity to diversify or even expand their sustainability goals and for example, investment portfolios as has been seen by the likes of JBS, Tyson and Norco. Many might consider how different cellular agriculture products can fit within existing brands or how emerging businesses might be acquired or incorporated.

Smaller producers, particularly animal farmers, are potentially more likely to be distrustful or antagonistic towards cellular agriculture. They are also the most likely to be impacted by the sector in the future, as opposed to larger meat and dairy processing companies. It was highlighted that the cellular agriculture sector needs to engage broadly with everyone who could potentially benefit and be impacted by the sector in the future.

There is scope for cellular agriculture companies to be ingredient suppliers to large food producers. One example is cellular agriculture company Eden Brew's partnership with dairy producer Norco, who will produce and distribute Eden Brew's precision fermented dairy milk. Parts of the wine industry have also considered how they can be involved, with larger producers pondering how this technology could be employed in the off-season. Although there is some clear technological cross-over in the two sectors, particularly with precision fermentation, more discussion, then tangible feasibility studies are needed to evaluate the real potential.



Courtesy: Eden Brew

In addition, there is an opportunity to explore how the spent substrate like yeast as a by-product of the fermentation process could be used as an alternative source of protein. There is already a precedent set in the conventional food and beverage industries where spent brewer's yeast has broad uses including the animal feed industry.

Forming joint ventures or utilising side streams are other opportunities to work with and leverage the assets of existing food players.

5. Government engagement is critical; how can the sector unlock this now?

As mentioned, the best way to leverage support from the government is to agree on and propose a package that enables the sector and can be readily implemented – an approach commonly taken by other industries. Ideally this should be coordinated to fit within election cycles, and it was noted that now is actually a good time. This of course means that coming together to work on a proposal sooner rather than later is critical.

Proposals should focus on a key motivator for the government and something that benefits the entire sector over one particular entity. Food security is a major concern for Middle Eastern governments, and this was instrumental in unlocking

exceptional funding, incentives and access to high-level officials for Change Foods in the UAE. The sector needs to identify key drivers for Australian government engagement with cellular agriculture; sustainability, land use, climate resilience, export development, modern manufacturing and sovereign capability, could all be relevant.

Alongside pushing for a national food security policy that incorporates all kinds of proteins, the cellular agriculture sector could be targeting the likes of the National Reconstruction Fund, potentially focusing on Federally funded infrastructure and incentive platforms that utilise Australia's natural advantages, including renewables and feedstocks.

6. How can the sector ensure its integrity to the mission, particularly in terms of environmental sustainability and climate change?

Whilst a profit-driven business model may be simpler and more straightforward for companies, staying on mission is critical to the sector's validity and ultimate success. This includes being accountable and transparent. Summit participants agreed that companies overstating their environmental or sustainability credentials should be held to account. Internationally there have been some questionable statements from a number of companies, and while these should be expected in any emerging field, businesses need to be careful because overstating claims impact the credibility of the whole sector.

In terms of the sector's sustainability claims, there has been much debate recently, spurred on by media hype around the results of various preliminary LCAs. It was noted that all of these are based on assumptions, both overly negative and positive, and that a true understanding of potential environmental impact and broader sustainability metrics cannot be achieved without more data. The likes of Vow are intending to conduct and publish LCAs under full transparency.

In terms of ensuring sustainability, utilising renewable energy will be critical and should be incorporated into bioprocess development plans from the beginning,

as should any potential side stream utilisation in waste management processes. Sustainability needs to be a fundamental part of process design.

7. How are current biological and technological challenges being met?

The burden of technological and biological challenges was discussed with examples of how these have been, and could be addressed, and how they can be lessened with knowledge sharing. Scaling, particularly for cultivated meat production, is a major challenge if producers are aiming for bioreactor volumes in the 100s of thousands or even million litre range. Difficulties lie in energy requirements, waste management, potential shear forces for suspended cells and the fact that large stainless-steel vessels are capital intensive and in short supply. However, several attendees noted that immense bioreactor volumes are likely not even necessary for economic viability (successful production might still be achieved with bioreactor volumes as low as 20,000L), while others reiterated alternatives that have long been proposed within the sector, including disposable plastic bags or vessels developed for adherent cells (i.e., perfusion).



Courtesy: Cauldron Ferm

Media cost is another challenge recently (hotly) debated within the sector. According to Vow, however, costs below the target of \$1/L are likely achievable by

switching out particular pharma grade components for food grade alternatives that are not foreseen to produce any significant issues around quality or consistency. One potential area of progress is more involvement from media and other cell culture suppliers, something that Merck is already doing with its [Cultured Meat Innovation Field](#).

A challenge that has emerged as potentially greater than first imagined is controlling cell differentiation, particularly to replicate structure for cultivated meat. However, it's recognised that this might not be necessary; by utilising advances in plant-based meat extrusion technology, muscle and fat cells could still be formed into viably structured meat products. This approach may alleviate a lot of burden, with the remaining challenge being to simply identify cells that are tasty and easy to grow at scale.

Again, collaboration and knowledge sharing is the key to reducing the burden of these challenges, both among companies and with external parties such as suppliers, adjacent industries and academic researchers.

8. The sector urgently needs talent; what immediate and long-term actions are needed to unlock that?

Talent is a pressing issue for the whole sector but particularly for those ready to scale. Both CAA's [White Paper](#) and [Pathways](#) platform previously highlighted the urgent need to build a talent pool in our education sector. This includes building awareness among students in relevant existing biological and engineering courses (and encouraging their transition to cellular agriculture), as well as developing new, bespoke and cross-disciplinary courses tailored specifically for a cellular agriculture workforce. Summit attendees reiterated this, with some observing a very low rate of transition from conventional pathways so far, and high competition from the pharmaceutical sector that is also reportedly grappling with talent shortages.

Fortunately, two programs have recently been put in place to help mitigate this. The Queensland University of Technology is looking to develop an industry-led graduate certificate program, the main intention being to provide industry-ready workers sooner than a PhD program. In addition, the Mackay Biofutures Hub, is

developing 5 high school lesson curriculums focused on precision fermentation that are set to roll out over the next two years.

Outside of emerging workforce training is the potential of government redeployment programs. This is happening in a number of states, an example of which being the Western Australian government's dedicated fund for new industries to redeploy jobs in areas transitioning away from coal-based enterprises. This has enormous potential for the cellular agriculture sector because for every scientist that is needed, even more engineers, machine fitters and other skilled trades are needed, many of which could be easily transitioned from these sunset industries.

Additional proposals to help boost the talent pool include improving government incentives to attract international talent and ensure that such talent is not lost offshore when companies are closed or acquired.

CAA is also working with Co-Labs and the Australasian Synthetic Biology Challenge to bring a critical mass of stakeholders together to create scalable and accessible education and training programs that can be integrated into existing and future courses at university and TAFE institutions.



Courtesy: Australasian Synthetic Biology Challenge

9. Academia has a vital role in fundamental research and talent development; how can partnerships with the sector be activated now?

As mentioned, there is a clear need for tailored courses to be developed in tertiary institutions, however attendees agreed that this cannot happen without increased consultation. Both academia and industry need to start working smarter together to understand each other's needs. This of course includes the best way to fund courses, ideally through public channels, so again, collaboration is key to unlock government involvement.

Another key role for academia is in fundamental research, including both blue sky research and that which is more short-term and directly translational. If this could be undertaken in an open and public manner the issue of research duplication could be overcome. This would likely form a key component of a precompetitive ecosystem and is totally dependent on effective collaboration between industry, academia, and government, as well as investors and industry bodies.

Less fundamental and more commercially sensitive research is also a critical space for academics. It was noted that there are currently very few successful IP models operating in Australian universities. Some question the need for universities to hold on to IP if they are not in a position to readily commercialise, particularly as one attendee pointed out, "20% of nothing is worse than 5% of something". In many cases though, IP is critical for their own funding. More discussion, more involvement with trained business development managers, more flexibility, openness and trust and longer-term relationships were put forward as potential ways to improve the current system, which again needs to form part of critical collaboration conversations.

10. What does consumer awareness of cellular agriculture look like in Australia?

Insights were presented from a recent study of consumer awareness in key Asian markets, conducted by Food Frontier. Interestingly the study highlighted that awareness does not necessarily translate into acceptance. While Singapore rated

highest in awareness of cultivated meat, it had the highest concerns around naturalness and price which potentially implies a trust shortfall. Those consumers that showed the highest acceptance identified as 'early adopters', 'eco-conscious' and 'premium/ethical' buyers; should the sector focus on this category first? The study also showed that there was generally a higher acceptance rate for precision fermentation than cultivated meat.

A recent study by FSANZ showed that while 65% of Australian/NZ participants had heard about cultivated meat, half said they would definitely not purchase it, largely due to safety concerns and to some extent, perceived nutritional deficits. This is not ideal, but some intention is better than none. However, we must also beware of the intention/behaviour gap, where intentions are sometimes linked to factors (such as the environment) that are not good predictors of behaviour which is always driven by price, taste, and convenience.

These insights aside, it was acknowledged that there is a severe shortage of data on how Australians actually perceive cellular agriculture. The sector urgently needs more knowledge to inform research directions and messaging and there was a call out for a coalition-of-the-willing to initiate more studies. These should not only concern consumer awareness but also health, nutrition, and sustainability (LCAs) so the sector can be confident in its messaging.



Courtesy: Green Queen Media

11. How can the sector ensure positive engagement with Australian consumers?

Despite the absence of concrete data, there was considerable agreement on some aspects likely to impact consumer acceptance. Despite the absence of concrete data, there was considerable agreement on some aspects likely to impact consumer acceptance. As mentioned, the key determining factors are price, taste, and convenience, which the sector has been aware of from the beginning. Further, familiarity and connection with cuisines is important and should drive the conversation, as opposed to the many added benefits of cellular agriculture (e.g. animal welfare, environmental benefits). Instead, these benefits should be treated as an added bonus once consumer acceptance has already been reached. Health and nutrition benefits should also be worked into earlier marketing due to being reasonable drivers of consumer choice.

It was noted that there is great trust in our regulatory system, so companies should be careful about rushing to market and potentially undermining their reputation. Rather, championing the lengthy and robust approvals process for products may be a way to showcase their safety.

The role of media and the example of consumer acceptance of genetically modified (GM) technologies was also covered. As mentioned, a clear and unified message that the media can grasp will be hugely beneficial. It should purvey transparency without too much technical information and focus on benefits without overstating claims. A major learning from past experience is that negativity sticks and that very little can be done to change it, so engendering trust early on and ensuring the consumer feels the products are genuinely for their benefit is critical. Media outlets are likely to sensationalise headlines because that is how they sell, but the sector should learn effective ways to push back when necessary, as it should in the case of misrepresentation.

In terms of ensuring consumer acceptance, one important message from an FMCG marketing perspective was that 'education' is actually a high-risk approach because building products and then trying to figure out how to sell them is rarely successful. Companies will be better placed to involve consumers during the entire development process, allowing them to guide decision making and

messaging strategies from the very beginning. In this way companies will better know how to tell their story when they are ready to enter the market.

GET IN TOUCH

If you have any questions about the CellAg Summit or ideas about what you would like to see in a 2024 event, please get in touch with us through our [website](#).