

THE
HUNGER

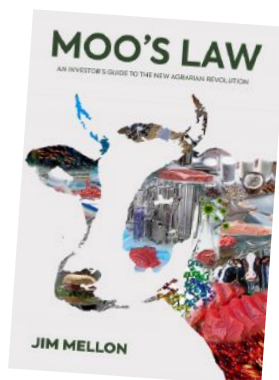
A I M S

Jim Mellon tells Louise Davis what role cell ag and alternative proteins can play in feeding the 10 billion

Cell ag guru. Investment expert. And soon-to-be children's book author. It's fair to say Jim Mellon has fingers in many (meat-free) pies. His ground-breaking book, *Moo's Law* – written during the 2020 lockdown – is a bible for investors who want a piece of the agrarian revolution and left readers in no doubt that, among the entire alternative proteins sector, it is cell ag that Mellon is enthusiastically backing.

What was it about this market that initially piqued his interest? "I realized that it was very much under the radar – that if you ask most people on the street, they might have heard of Beyond Burger and other plant-based products but very few understand there is a revolution coming in precision fermentation and cellular agriculture," he explains.

Many of the players that Mellon interviewed for *Moo's Law* had a 'road to Damascus' moment that set them on the path to cell ag. But, coming from more than 15 years in biotech (whose processes and equipment form the heart of cell ag), Mellon describes his own move as a more natural transition. It has also, the vegetarian of many years explains, been a long time coming. "My interest in the elimination of animal cruelty predates cell ag," he says.





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COWBOYS AND RUSSIANS

Overwhelmingly positive in his approach, it's hard to get Jim Mellon to knock anybody's efforts in this burgeoning marketplace. When pushed to comment on any cowboys in the sector, he'll concede he's come across a few, shall we say, 'non-starters'. "One from Russia was lab-grown fur," he recalls. "Bearing in mind that it's

absolutely frowned upon to wear real fur, it seems crazy to try and do fur in a lab.

"And then there are companies doing exotic animals such as lions and tigers. Since none of us would have really eaten these animals in the past, why would we start doing it now? I just don't think they've got a viable market."

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“In a way I was already converted. But when the technology advanced to the point where it became apparent to me that this wasn’t just science fiction, then I did what I always do – write a book around the subject!”

The tipping point

Moo’s Law comes more than 20 years after books such as Eric Schlosser’s *Fast Food Nation* and Joanna Blythman’s *The Food We Eat*, which radically exposed exactly what goes into mass-produced foods. We’ve known about ‘shit’ (the cow faeces variety) in burgers for two decades and not much has changed, so what’s different now?

“That is an excellent question, and I don’t think there’s an easy answer to it,” Mellon admits. “One part is that there’s a much greater awareness, particularly among young people, of the current damage caused by intensive farming and recognition of the need to do something about it. The second is that the technology has advanced – largely due to biotech but subsequently due to large amounts of money coming into the sector – to where you can see *Moo’s Law* and ‘Griddle Parity’ [Mellon’s trademarked phrase to describe when cell ag products scale-up sufficiently to achieve the same or lower price-point as conventional products] becoming realizable.

“Both the pandemic and Russia’s invasion of Ukraine have raised awareness of the fragility of the food system, and Covid also showed what the impact of an antibiotic-resistant pandemic might look like,” Mellon explains. This last point is something that scientists have been raising the alarm over for years. Mellon observes that “Around 80% of all antibiotics go into intensively farmed animals, and people who eat meat regularly are building up a resistance to antibiotics that is becoming quite frightening. Covid would be like a tea party compared with an antibiotic-resistant pandemic. So, there’s a whole range of reasons why this is taking off now.”

Sustainability is obviously a key driver in the cell ag sector and it’s evident that we cannot sustain the amount of production required to produce the meat that the population demands. Putting this into context, Mellon states, “There are about 10 billion farmed animals waiting for

slaughter at any particular time and 80 billion farmed animals are eaten every year. And somewhere between 50-70% of all crops that are grown around the world are grown at the cost of enormous environmental destruction for us to produce food for animals, which are very inefficient converters of protein. There had to be a better way and scientists have now come up with it!

“And how lucky are we?” he exclaims. “We’re going to have nutritious food in abundance without price volatility, without waste, no antibiotics, no animal cruelty, without the huge use of land and water, and not forgetting harmful environmental emissions. It’s a terrific confluence of events leading to what will be a tremendous boon to mankind.”

Hot property

In *Moo’s Law*, Mellon makes it clear that he regards intellectual property as a defining factor in giving cell ag-based products the commercial edge. But what sort of processes can be protected here? “Basically, this is not like biotech IP, where you have a typical trajectory of 10 years to get a product on the market followed by a commercial exploitation of the patent for another 10 years, then it goes generic,” he explains. “This is much more to do with IP around the use of cell lines and the processes by which the cell lines grow into biomass.

“But IP is not the most important thing. The most important thing here in cell ag is that the food and materials produced by processes such as precision fermentation have the capacity to be cheaper. Although almost everything

INVESTMENT STRATEGY

We talk before Jim Mellon heads into a board meeting for Agronomics, his UK-based cell ag investment firm that’s managed by his close colleague, Anthony Child. Mellon succinctly describes the Agronomics business model as: “Invest in the best, create the best in white spaces, use network to gain licenses.” He believes the qualities that make a good investor in the cell ag market are being “committed, patient, mission-driven and rigorous in analysis”.

As an investor, what is he looking for in a cell ag start-up? “Great idea, good team, IP and trade secrets, large total addressable market (TAM) and low entry valuation!”

Mellon predicts that 2022 will double again the investment records seen in 2021. But he reckons we’re a long way off from any overinvestment scenarios. “It’s a dribble so far – the overinvestment is likely to occur in about 10 years’ time.”

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produced in cell ag conditions today is more expensive than conventionally farmed foods and conventionally produced materials, but that is going to change very quickly.

“You can already see it in the trajectory,” Mellon notes. “If you take an alternative protein burger patty, as an example, in 2013 it was €300,000 to produce one and now, getting down to the price that you would pay in a store for a conventional one is well within sight. And the price will keep on going down and the reason for that is because the inputs into cell ag are approximately 2:1 compared with 25:1 for a cow, 6-9:1 for a chicken and in between for the other animal species. So, if you have fewer inputs for one unit of output, your capacity to produce at a lower price than the ‘inefficient factories’ that are animals is absolutely there.”

Mellon predicts that it won’t be very long before cell ag becomes a self-sustaining industry and the knock-on effect will be conventional meat, dairy and fish producers going bust as a result of the lack of economies of scale. “It’s going to be a very quick process,” he feels. Bad news for the ‘Big Meat’ lobbyists, then, but Mellon doesn’t believe those players are too much of a danger. “Meat is indeed the number one area in which lobbying is a threat to progress – fish and materials markets are not very well organized. In the USA, there have been numerous attempts at both state and federal level to address the nomenclature of cell-based meats; for instance, will they be called ‘cell culture’ or labeled as ‘synthetic meat’? But any attempts to halt development of the products themselves have so far failed. This could change the closer we get to cell ag meat products joining

the market – it’s really only Singapore and Israel that have them on sale today,” he acknowledges.

Mellon cites the resistance of horse and cart drivers toward the motorcar to describe his view of lobbyists. “Ultimately, though, the better product is the one that’s going to win. And you have to remember that the cell ag sector is getting bigger and stronger as well. It will have its own lobbying efforts.”

Religious conversion

Another facet to the lobbying issue is the potential effects of any religious issues on the scale-up and roll-out of cell ag products – and whether some of the current traditional livestock will stay in circulation for such reasons (for instance, the demand for halal meat). Mellon has given this some thought. “As far as I’m aware, there are two religious aspects to this that may or may not be contentious. One is halal and the other is kosher. In Israel, there is a pretty active cell ag business with firms such as SuperMeat among the leaders. And they have heard Rabbinic views expressed that state, because there is no animal slaughter involved, then cell ag products are indeed ‘kosher,’” he comments.

Mellon tends to view that the enormous benefits of cell ag products will overcome any possible religious issues, even in areas that you’d think might be contentious. “Obviously the Middle East is one of the key areas for the potential of this activity because the food situation is very insecure,” he explains. “Taking the UAE, as an example, 95% of food is imported. If they could produce their own proteins at home, it would be a huge advantage to them.”

The man behind the money

Mellon is 65 now but as with many people who are passionate about what they do, he shows no signs of contemplating retirement. He has a relentless schedule that begins every day at 04.30. Extremely early risers are a character trait among super-successful people and although he’s not one for the ‘bulletproof coffee and 10-mile run’ routine, Mellon appreciates being able to accomplish a great

ONES TO WATCH

There are a huge range of innovative companies featured in *Moo’s Law*. Jim Mellon’s standouts include the likes of Aleph Farms (cultivated meat), Blue Nalu (cell-cultured seafood) and CellulaREvolution (‘biotech cellular disruptor’). Of the latter, he says, “Early calculations for their technology’s footprint show that one of their bioreactors is equivalent to a football pitch worth of conventional bioreactors.” This aptly demonstrates how scaling-up cell ag solutions is certainly achievable.

Mellon also discusses companies working on stem cell fat and liver products but it’s clear his focus is on the main conventional products (meat, dairy and fish) and less on peripherals or niche products such as cell ag-produced foie gras.

And he’s consistent in his positive acknowledgement for what he calls the “picks and shovels” – the enabling equipment such as bioreactors, scaffolds and media that cell ag companies will need to call upon to differentiate themselves.

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CHICKEN OR THE EGG?

Although progress in cell ag meats such as chicken is fast, Jim Mellon says it's the dairy sector that will be most impacted to begin with, in part because the traditional sector is utterly broken. "The economies of scale don't work unless you have the whole market," he says. "The two biggest producers of milk in the USA have gone bust in the past few years. It's a horribly cruel industry and it's incredibly contaminated."

Dairy products are also now substitutable by the production of whey and casein and in precision fermentation. "We've actually set up Liberation Labs in conjunction with the two godfathers of the fermentation industry. That will be the contract manufacturer for many of these dairy products. It's going to be a super-exciting thing to do because these are very large-scale plants that can produce for multiple companies at once."

“Meat is the number one area in which lobbying is a threat to progress”



ENVIRONMENTAL PAW PRINT OF PET FOOD

Around 20% of the meat and fish used globally is for pet food. A team of researchers from University of Edinburgh recently examined the environmental impact of this consumption, which revealed that global pet food production accounted for average GHGs of 106 million tons of CO₂e a year, making it the 60th highest emitter if it were a country. Feeding dogs and cats in the USA alone has been found to be as damaging as pumping the exhaust of nearly 14 million cars into the atmosphere for a year. Hence Jim Mellon's interest in finding a more sustainable (and kinder) alternative is a worthwhile quest for this self-confessed animal lover.

deal before the rest of the world awakes. (He counters the early start by making an afternoon nap non-negotiable.)

He has a journalistic knack for making complex technical content accessible to all and his natural engaging style makes him ideal for TV work. Many years ago, he was invited to become a 'dragon' in the popular UK investment show, *Dragons' Den*, but sadly for viewers (and indeed the candidates pitching for investment), being based in Hong Kong at the time meant he couldn't commit to the filming schedule.

Notably, Mellon doesn't have much of a profile on social media. This turns out to be deliberate – he describes most social media as 'toxic' and reveals sadly that a friend of his went down the 'anti-vax' rabbit hole and ended up dying from Covid. Mellon regards social media as 'disruptive' – and not in the good sense of that word.

Furry friends

Like an increasing number of people with a focus on sustainability, Mellon and his long-term partner don't have kids. His dependents are of the canine variety – and they look set to reap the benefits of one of his current areas of interest. “We've recently set up a company called Good Dog Food in conjunction with the Rosalind Institute (where Dolly the sheep was cloned). We expect to have a cell ag pet food product on the market within a year,” he reveals.

When asked how he thinks the overall alternative proteins and cell ag space will evolve in coming years, he predicts: “It will be as seamless as the internet by 2050 and we'll see dramatic growth on a par with e-commerce 10 years ago in the next five years.”

For now, though, Mellon is focused on encouraging a new generation of cell ag enthusiasts. “My children's book will be published in March 2023. It's called *Juno's Ark* and it tells the story of how animals can be saved.” **PPTI**