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# Why the alternative meat ecosystem is booming

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The world of venture investments has historically been concerned with returns on investment at seemingly any cost. Now, that world is waking up to the most important ROI -- the health of our planet. That's especially true given the latest IPCC report that predicts a hotter, more catastrophic future, but also sheds light on a short window to prevent such devastation.

Investments in solutions that reduce carbon emissions in every single sector are seeing a massive boost, and one of the most important is the meat industry. The climate impact of plant-based foods is typically 10 to 50 times smaller than that of animals. To produce 1 kilogram of beef, you'd emit nearly 30 kilograms of carbon dioxide. For comparison, 1 kilogram of tofu only emits 3 kilograms of carbon dioxide. With this in mind, investors are turning to the alternative meat market, which is set to explode over the next decade.

Fuelled by health, animal welfare, environmental concerns and carbon emissions, many people are looking for a more sustainable, cleaner and more ethical meat and dairy choices than factory farming. The two major alternatives that have sprung up in recent years are plant-based and cell-based meat and animal products.

According to a Markets and Research report, the global plant-based meat market is expected to reach \$US14.9 billion (\$20.3 billion) by 2027, which is up from \$US5.6 billion (\$7.6 billion) last year. The global cultured meat market, or cell-based market, is expected to reach \$28.6

billion in 2026 and \$94.54 billion by 2030. While it's not yet at the level of the global beef market, which is expected to reach \$383.3 billion by 2027, traditional meat alternatives are coming in hot.

At Aera VC, we are taking a hybrid approach to this market. We've invested in cell-based companies like Shiok Meats (lab grown seafood) and New Culture (lab grown mozzarella) as well as plant-based dairy and beef companies like Eclipse and Fable Food Co. We're also backing companies that create novel proteins or 'scaffolding' to support the growing sustainable food industry, like Shiru.

### **Plant-based meat: Scaling now**

Plant-based meat and dairy are often made from ingredients like soy, peas, mung beans, wheat gluten or mushrooms, as in the case of Fable, an Australian start-up we recently backed. As opposed to cell-based meat, it's easier to get this product to market fast because you don't have to plot out a road map of multiple years spent figuring out how to get the science from the lab to the real world, cheaper.

One of the main paths to market for this product comes from building out a brand story for a consumer audience. If a new entrant can own the brand positioning of a particular texture or food type, they stand a chance to establish themselves as a major contender for the coming decade and beyond -- and the proof is in the patty.

Everyone now knows Beyond Burger, but they don't know the 20th entrant into the plant-based burger industry, and we're likely to see that same trend in every category. Fable, for example, has the chance to own both the mushroom-based meat market and to dominate the demand for that briskety or pulled pork texture.

We'll also increasingly see more food service oriented brands that are not available for retail purchase but will be known as something you can get at a specific restaurant. This could be a much more scalable path to market than building out a purely direct-to-consumer brand, akin to the 'Intel inside' strategy.

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Another path to market we might expect is unbranded foods sold to catering companies or airlines that will serve the food with a descriptor of what type of product it is.

### **Cell-based meat: The furthest to market with the greatest potential**

The cell-based approach produces meat or dairy products by in vitro cell cultures of animal cells using a process of tissue engineering. In other words, it's actual meat or cheese that's grown in a lab. The idea is, all the juicy goodness of a steak with a fraction of the carbon emissions, water and land use and none of the slaughter, nitrate run offs, unsanitary factory conditions and hormones of a cow.

Unlike plant-based, this type of meat starts off very expensive to produce. When it first makes its way into shops and restaurants – and in some countries it already has – it will be a higher-end brand distribution.

Shiok Meats, for example, is a Singapore-based start-up that owns the cell-based shrimp, crustaceans and lobster meat market. It's a specific niche with a significant market. When we were investigating the company, we could immediately translate its offerings into the vast global market potential of dumplings, which have the added benefit of not requiring an entire reproduced shrimp – dumplings would only need to be stuffed with something that has the same taste and texture.

By investing in Shiok, we're making the bet that the unit economics can go way down, that they can reduce the price of one dumpling, which starts off in the thousands of dollars per kilogram in the lab an order of magnitude year over year.

Aside from the problem of expensive technology, the companies producing cell-based meat and other products will have to prove the willingness of the general public to adopt it as well. The mental stigma will likely be one of the biggest hurdles to market cell-based companies

will face, but in a world where demand for carbon neutral solutions and better health and animal welfare, we think this will largely be overcome in this generation. For every single animal-based product you see in the supermarket aisle today, somebody in the world is cooking up a plant or cell-based alternative to replace it.

### **Alternative protein building blocks: Expanding the ecosystem**

Part of our hybrid approach to cell and plant-based dairy and meats is to also focus on those companies that will create the scaffolding, the functional proteins or ingredients like collagen or different textures that will help existing food companies enhance their foods' nutrition or goodness.

One of our portfolio companies Shiru, based in California, is using machine learning and high throughput screening to identify, design and produce proteins with targeted food functions. A big part of Shiru's business model could be selling ingredients to plant-based companies that can improve the taste, textural or nutritional offerings that dairy, meat and egg replacements need to match or improve upon the status quo.

### **What's the better bet?**

Aera VC takes a hybrid approach because we think both plant- and cell-based end-products, and the Shirus augmenting them all, will succeed in different ways and together will shape transform the way the world eats.

Due to the invaluable nature of a cell-based company's unique and high-cost IP, we take the risk to back these trailblazers because once they get the combination of product, positioning and price right, they stand to dominate a sector and may well command much higher strategic value in the long run.

But again, that's some years away, and in the meantime, the alternative meat industry isn't going to wait around. While a cell-based version is being produced, there will end up being a Beyond Burger in every category that can scale and achieve outsized returns and outcomes.

Having been involved in the forefront of sustainability for over a decade, it's more clear to me now more than ever that the market for reversing climate change and reducing carbon in all aspects of society is a market that's bigger than any of the markets we've experienced in our lifetimes.

Every single market, whether it's the food or chemicals or construction, must answer the question of how it's going to become carbon neutral or carbon negative.

The pressure to combat climate change is far greater than any amount of pressure capitalism alone could put on the market.

Nearly half of the world's annual GDP comes from 121 nations that have set or are going to set targets of bringing carbon emissions to net zero by 2050. These countries collectively produce \$39 trillion in GDP, and they'll be fuelling the demand for solutions and creating a level of positive pressure on our global system.

So when it comes to alternatives to combating high-emissions from factory farmed meat, it's not a question of if, but when. We know that in order for people who are otherwise unconvinced by the vegetarian argument to make the switch to plant or cell-based meat and dairy the products have to be tastier, cheaper and, to an extent, healthier. With the amount of energy, talent and money pouring into this space right now, if the giant incumbents of the global food system don't figure it out, someone else will.

*Derek Handley is a co-founder of Aera VC, which invests at the frontier of deep technology and sustainability to accelerate the world to a better future. Aera was one of the cornerstone investors in Fable today.*