

Our Research Into Precision Biology - Do We Need Cows?

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On February 26th, 2020 Cidel hosted its 9th annual Investment Themes Day where a number of topics are presented to allow us to understand the wide range of auxiliary threats or catalysts that could impact investors in the coming years. Cidel's investment philosophy focuses on the long-term cash flows and balance sheet strength of a wide variety of global companies in order to arrive at an intrinsic valuation. While knowing every headwind a business may face is difficult, performing scenario analysis can provide greater clarity around a company's ability to generate free cash flow.

This year's winning topic was "Precision Biology" or more provokingly titled "Do we need cows?" The following presents a brief summary of the presentation that we hope conveys our research process and constant pursuit to be the best stewards of our clients' capital.

At the end of 2019, the world's population had risen to 7.7 billion. Most importantly, population growth in the last 60 years has been exponential, increasing by 150%.³ With this massive growth, humans were required to become more resourceful and, alas, factory farming was born. Humans were able to maximize land, feed, and antibiotic distribution as well as become efficient at using animal by-products. For example, it was common to use organs, bones, and hooves to make medicines, cosmetics and nutritional supplements. Today, forecasts are projecting that in the next 30 years we will add another 2.3 billion to the world's population. This, in conjunction with increased meat consumption in emerging markets, leaves us to wonder how we will evolve from here.²

In the alternative meat space, there are two technologies that are worth focusing on: fortified meat and precision fermented meat. Fortified meat is the plant-based burgers we are seeing gaining recent popularity in grocery stores and fast food chains. These are typically veggie burgers with the addition of heme iron, which improves the texture and taste of the traditional veggie burger.⁵ The second and much more controversial option is precision fermented or

"lab grown" meat. Precision fermentation is the process that allows us to program micro-organisms to produce almost any complex organic molecule. This includes the production of proteins, fats, and vitamins.⁵ You begin with animal stem cells which are added to a bioreactor along with cell culture media. This cell culture media causes the cells to proliferate and create the desired structure.⁵ This is not new technology and anyone who is eating cheese or taking insulin is currently consuming a product that has undergone this process.

ATKearney, a well-respected research company, expects that only 40% of meat consumption to come from conventional meat sources in 20 years.¹ While we won't debate the timeline, we assumed a significant disruption in the cattle industry and tried to understand the impact on various secondary sectors. For example, pet food is a \$24 billion industry that uses animal by-products not considered fit for human consumption. There are 160 million pets in the United States alone and the amount of meat they consume makes them the fifth largest consumer of meat in the world.⁵ What happens when the industry is no longer able to use cow by-products? Similar parallels can be drawn to the healthcare industry (over 80% of global antibiotic use is on animals), materials and crops (over 75% of global soybean crops are being used to feed livestock).⁵ The key message is that the disruption could be extremely wide-ranging.

If the studies are correct, how fast could this disruption happen? Most successful new technologies follow an S curve path with adoption being slower in the beginning, ramping up exponentially in the middle of the curve, and flattening again as the market becomes saturated.⁵ Who controls the slope of the S curve? There are a few key stakeholders that will need to buy in before we move to the middle part of the curve including business investors, policy makers,

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and individuals⁵To try and draw the best parallels, we looked at various food industry technologies such as rennet to see how fast their S curve moved. Rennet is a complex set of enzymes that are produced in the stomachs of baby calves to help with the digestion of their mother's milk. It is also used quite wildly in the cheese industry to separate liquid milk from solid curds⁵In the 1960s, with the increasing demand for cheese coupled with growing animal rights movements and the overall distaste of slaughtering baby calves, costs for rennet skyrocketed and cheesemakers turned to inferior vegetable forms to keep pace with demand. In 1990, precision fermented rennet was approved by the Food and Drug Administration (FDA) and in the 20 years that followed, 90% of all cheese was created using this precision fermented rennet⁵ While we do not believe this is the path alternative meats will take, it is useful to understand how fast things can change when public perception shifts.

Regarding business investment, it has yet to be determined how much money will flow into this sector. Beyond Meat's 734% surge post-IPO may indicate that investors are predicting a rise in the alternative meat category. However, the market itself is still quite narrow and funding for cultured meat has been limited thus far⁵ Another consideration is how the oversight may look. The U.S. determined that cultured meat should be jointly regulated by the Food and Drug Administration (FDA) & the United States Department of Agriculture (USDA)⁵ This could be a major tailwind as studies show that consumer confidence in meat products is boosted by FDA oversight. On the opposing side of this, Missouri has already passed a law reserving the term "meat" for products derived from live animals⁵ This could be a major challenge for the industry as consumers are increasingly leaning towards purchasing natural and organic labelling. Lastly, but most importantly, will consumers eat this? Will the cost be higher than organic or grass-fed beef or will it be more cost-effective than traditional ground beef and used in ground meats and fillers for various off the shelf products?⁵

The question still remains "Do we need cows?" While the expected exponential population growth indicates yes, it does not show how the meat market will evolve as new technologies emerge and challenge traditional beef from a cost, taste, and health perspective.

Resources

- 1 Gerhardt, Carsten, et al. "ATKearney." ATKearney, 2019.
- 2 Lin, Doris. "Is There a Way to End Inhumane Factory Farming Techniques?" ThoughtCo, ThoughtCo, 2 Oct. 2019, www.thoughtco.com/why-do-we-have-factory-farming-127703.
- 3 "Population." United Nations, United Nations, www.un.org/en/sections/issues-depth/population/index.html.
- 4 Roquas, Patrick. Kepler Cheuvreux, 29 May 2019.
- 5 Tubb, Catherine, and Tony Seba. Ret

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