

Artificial proteins in Aotearoa New Zealand: Imagining futures for new technologies

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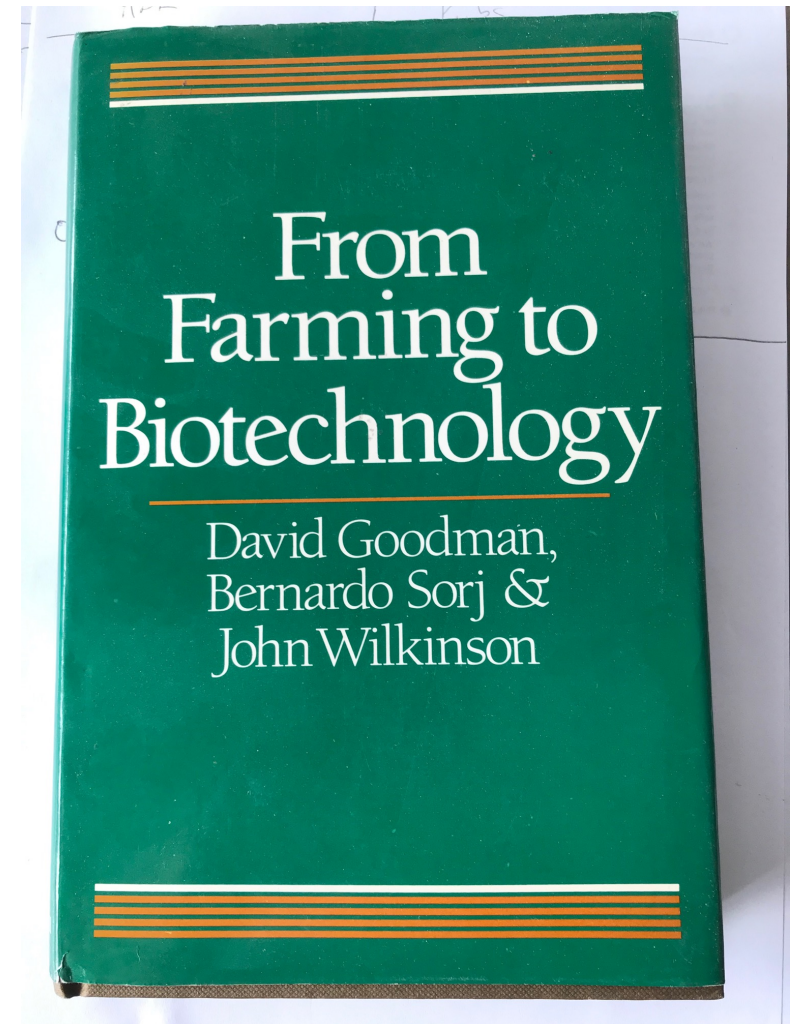
December 6th, 2023



Emerging Themes in Agrifood Research

- 2010s – Financialisation
- 2020s – Artificial Proteins
- 2020s – Digitalisation/AI

The artificial proteins moment has drawn up from the past at least one beloved old agrifood classic.



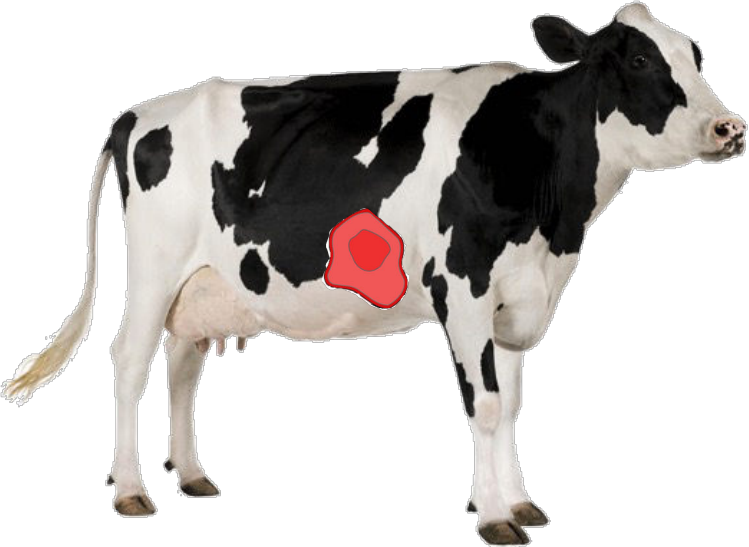
Presentation outline

- The rapid growth of the cultivated meat industry
- How is cultivated meat protein made?
- Recent developments in the sector: Upward and Downward?
- The view from Aotearoa New Zealand (plus some bonus Julie Guthman).

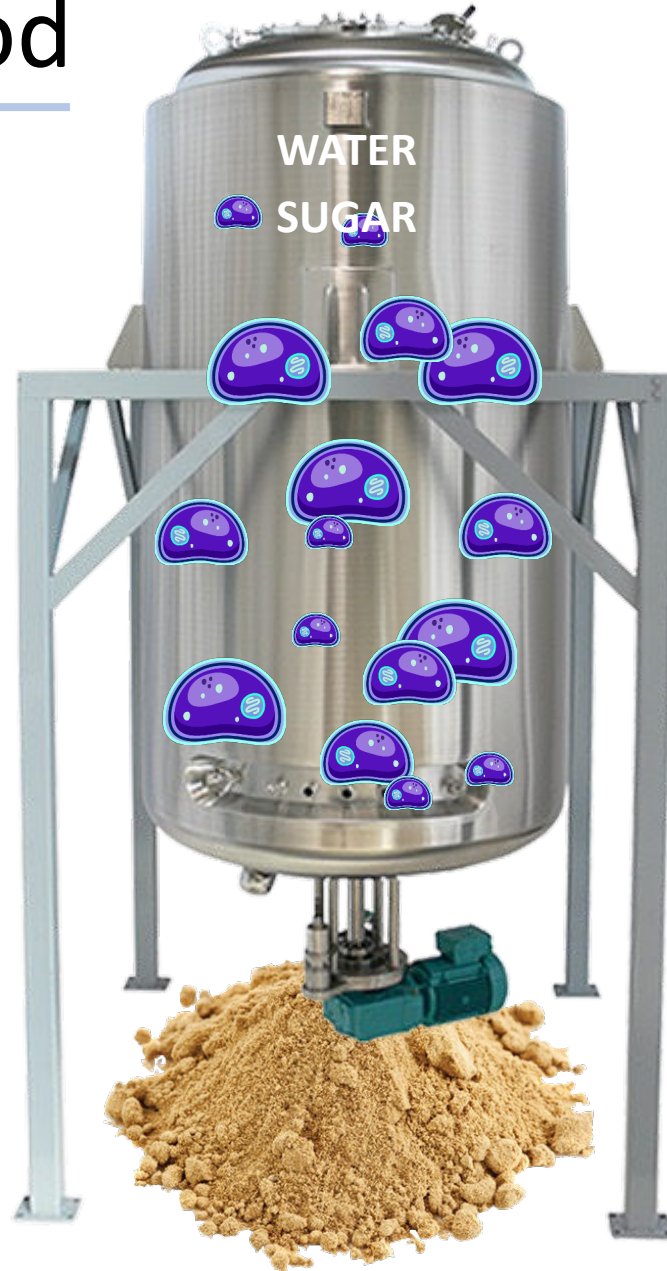
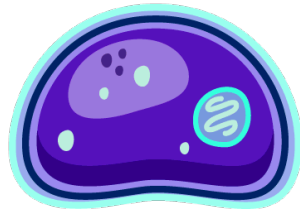
Part 1

How is cultivated animal protein
made?

Cellular method



Fermentation method



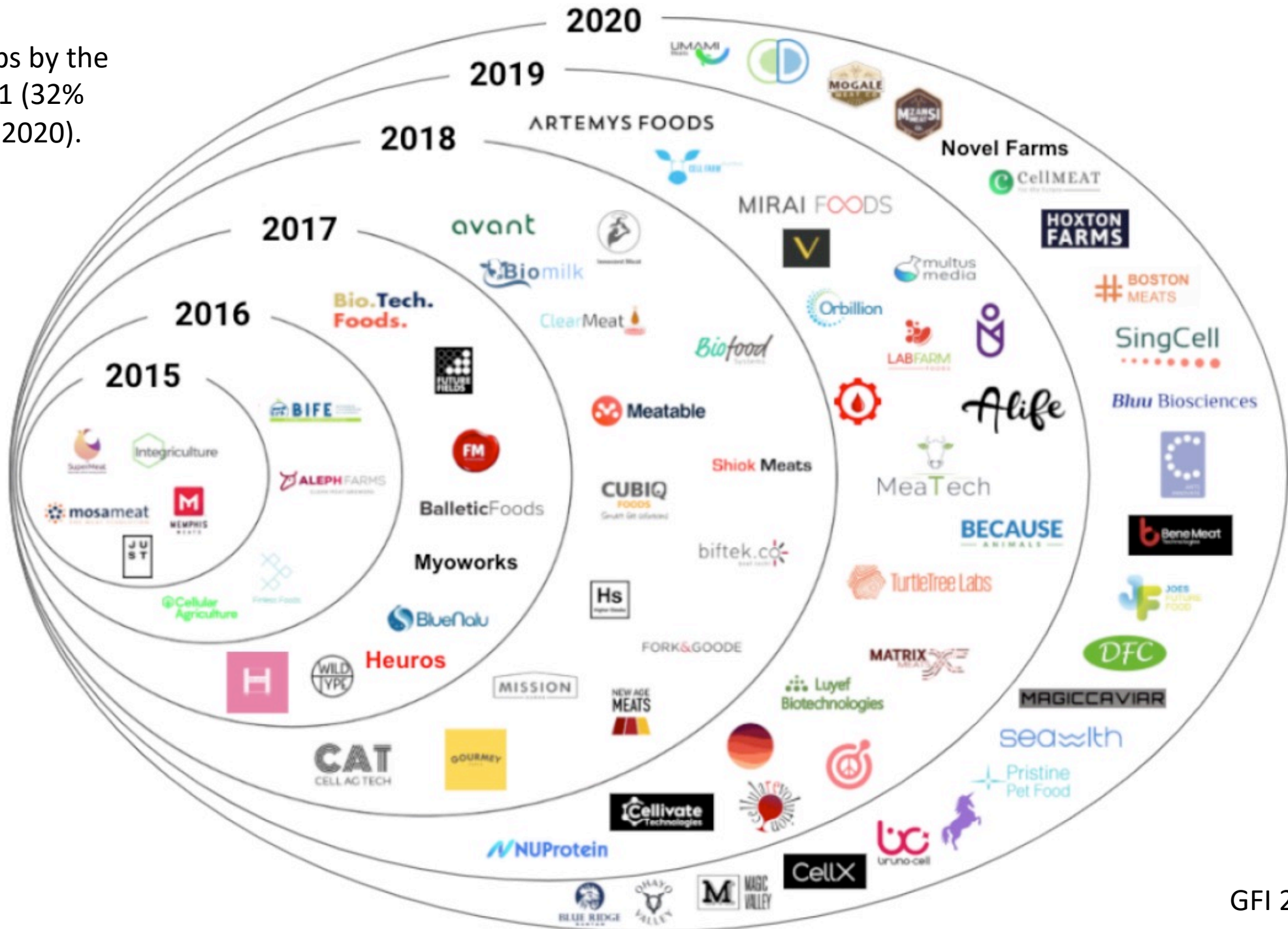
Source: Motif Foodworks



Part 2

The rapid growth of the cultivated
meat industry

107 Startups by the end of 2021 (32% more than 2020).
 (GFI, 2022)



Accumulated total capital raised (\$US millions) and number of startups by time since first startup

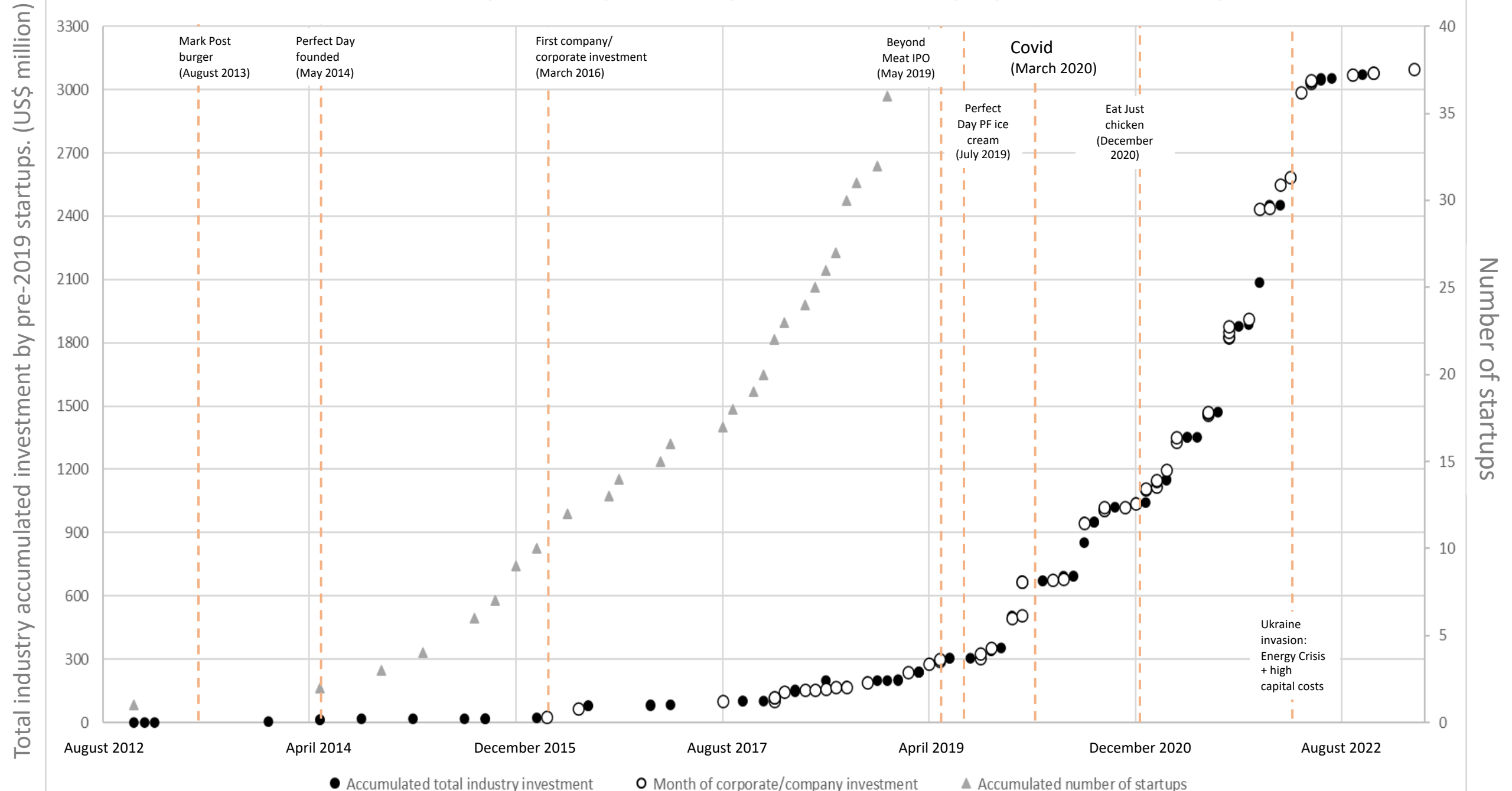
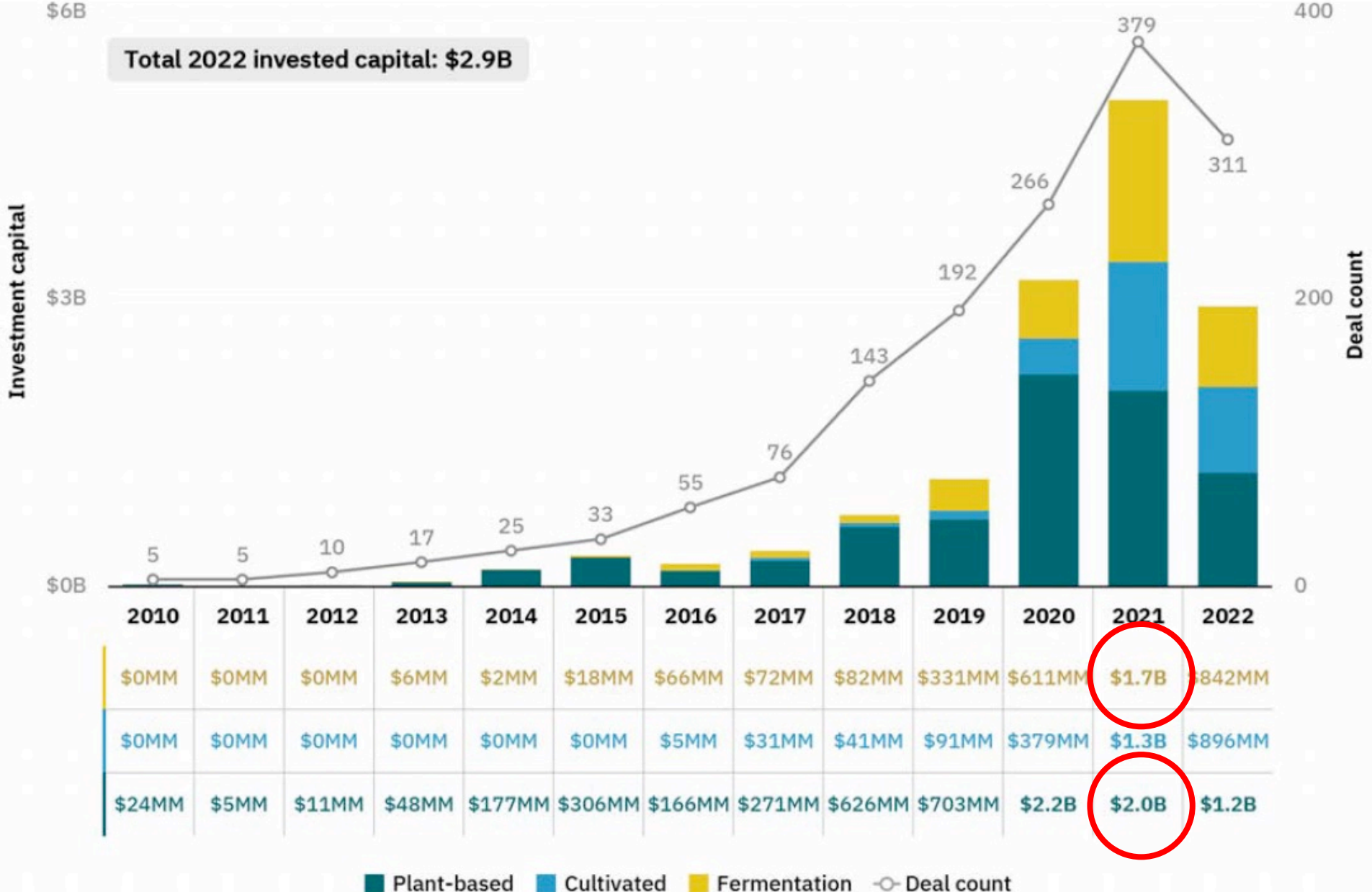


Figure 10: Annual investment in alternative proteins (2010–2022)



Part 3

Recent developments: Upwards and Downwards

1. Big food brands/corporates moving into the niche

2021: Mike Selden from Finless Foods observed: “*All the major meat and seafood companies* now have a cultured meat team internal to their companies. That did not exist when we started the company four years ago.”

2. PF milk producers building factories

April 24th 2022

- Perfect Day acquires Sterling Biotech Limited (SBL) India
- Obtains three manufacturing facilities with PF capability
- Announces development of new manufacturing plant in USA

April 25th 2022

- Remilk announces 50,000 cow eq. factory in Denmark

October 21st 2022

- Change Foods 10,000 cow eq. factory in U.A.E.

3. Pilot meat factories established

24th June 2021

- Believer Meats (FMT) opens world's first production facility (Israel)

4th November 2021

- Upside Foods opens a production facility (USA)

8th December 2022

- Biotech foods to invest €30 million in meat production facility
- Plant to open in 2024 (Spain)

4. **BUT** Weaknesses in sector are emerging

9th February 2023

- Remilk cancels its plan to build a 50,000 cow PF factory
- Claims existing bioreactor capacity now available

24th March 2023

- New Age Eats (founded 2018) closes
- January: sold «90% complete» pork manufacturing plant
- Announced closure due to lack of VC funding

4th April 2023

- Steakholder Foods announces closing of subsidiary «Peace of Meat»
- Cites need to cut costs (saves \$4.5m per year)

Part 4

The View from Aotearoa New Zealand

Protein Futures NZ project funded in 2022/23

- Are novel proteins a threat or opportunity for changing land-use?
- Sum total of one very excited science institute, and some investment by Fonterra in a PF dairy startup.
- But for most, it is a potential threat.

Protein Futures NZ project funded in 2022/23

- Some economic modelling was done, but in the strict academic terms they use - it was 'a wash'.
- Much pivots around the growth trajectory and scale of the global 'protein economy'.

Finishing with some Julie Guthman

- She has been publishing on this notion of the ‘global protein economy’.
- She is ‘somewhat scathing’.
- How it is defined, locks in a set of key assumptions about what is the problem we are trying to solve.

Some vintage Guthman....

“In short, private sector actors have characterized a protein crisis in such a way that their investment appears as the solution. This has at once absorbed and occluded the motivating concern with meat and industrial livestock production, instead offering a proliferation of alternative proteins and putting lipstick on the veritable pig of conventional livestock. Because their work revolves around the heroic nutrient protein, these investments perform virtuousness. But is more protein really the answer to what ails us? Are there roads not being taken because the map has been drawn by those who already know where they want to go? Other possibilities for framing the problem are an essential first step for careful consideration of what else might be done.”
Guthman et. al. (2022) ‘In the Name of Protein’. *Nature Food*.

Conclusion

- Alternative Proteins are more than a 'start-up' bubble.
- But they have stalled – for now.
- They are, however, good to think with, and take us to interesting questions about the future shape of global (and local) agrifood systems.



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*Tena kotou, tena kotou, kia ora
tatou, katoa!*

Professor Hugh Campbell,
Centre for Sustainability.