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Cell-Based Milk Startup TurtleTree Labs Raises \$80 Million Series A To Support Full Commercialization In The Coming Years



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Food & Drink

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Fengru Lin (left) and Max Rye (right) cofounded TurtleTree Labs to make cell-based food products ...

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TurtleTree Labs expects to launch its first products in the U.S. using its cell-based dairy ingredients through multiple B2B partnerships in September, and fully commercialize its cultured milk within the next four to five years, according to the Singaporean biotech startup.

The move is enabled by TurtleTree Labs' recent \$80 million series A fundraise, led by VERSO Capital, coupled with the firms' previous \$3.2 million and \$6.2 million seed and pre-A funding, respectively.

TurtleTree Labs, which is currently building a R&D and large-scale manufacturing facility in Davis, California, says the newly raised capital will also fuel its continued development of IP technologies, research on new applications, and team expansion to include world-class scientists, product management and business development associates.

Mounting Interest In Cultured Milk And Potential Exit

Citing higher efficiency and a more environmentally-friendly processing than the traditional \$800 billion global dairy industry, cell-based milk is quickly amassing investor interest from both private and public sectors with Israel-based BioMilk recently becoming the world's first cultured milk company to go public.

VERSO Capital, which has led TurtleTree Labs' latest round with \$20 million, taking board membership of the company, will leverage its knowledge of corporate finance and operations to help the company validate its unit economics, and the overall business plan, according to managing partner Julien Machot.

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Machot believes TurtleTree Labs will become his merchant banking and financial services firm’s “most significant investment” in cell milk, and expects an exit in the next five to seven years.

“TurtleTree Labs’ mission and operational plan appear to be much broader than the couple of existing competitors, who tend to limit their research to cell-based milk,” he said.

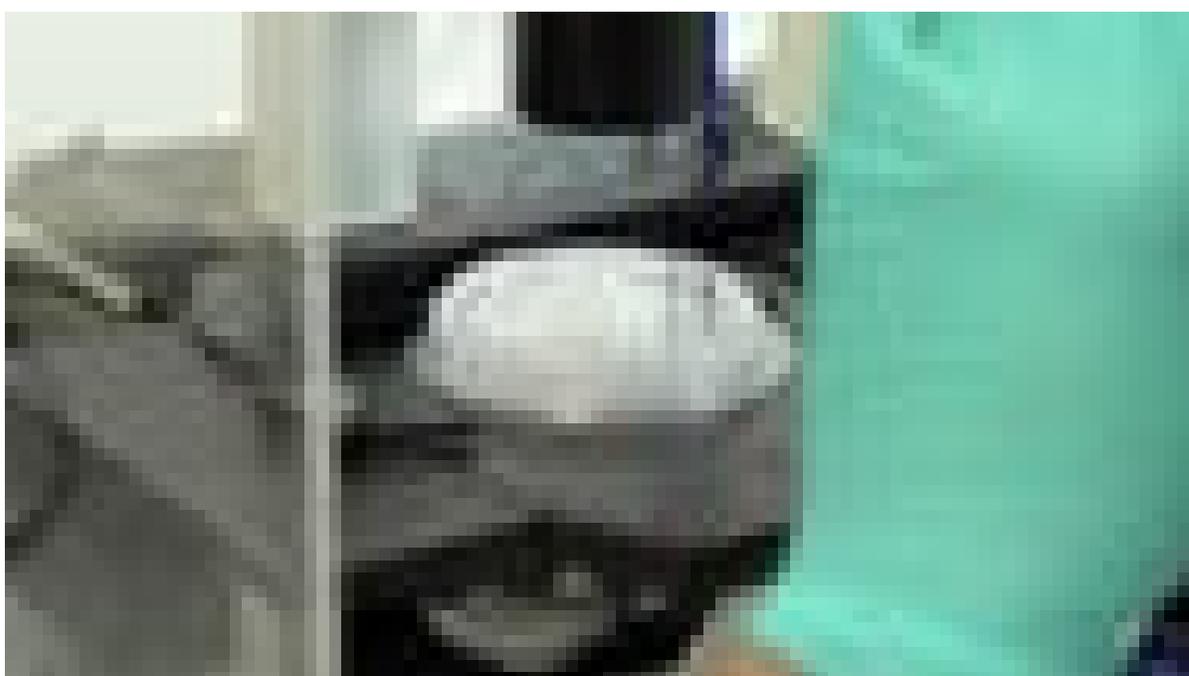
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Cell-based milk sources cells from mammals to produce the full composition of dairy milk, according
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“It is a tech platform with a number of verticals — embracing the scientific advancement they are capable of, and developing commercial capabilities to support their large B2B partners and client accounts based on their particular requirements.”

Competitive Advantages

TurtleTree Labs argues its advantages lie in its ability to produce naturally occurring ingredients found in human breast milk, including HMOs Lactoferrin, and Alpha-Lactalbumin; source a variety of mammalian cells from bovine, camel, sheep, and goat; and its unique “B2B2C” business model that will allow it to scale faster than competitors in the same space.

“We start off the process by obtaining mammary gland cells from various sources, then multiply these cells, after which we put them in our in-house special lactation media — a liquid of various components that is naturally present in living mammals,” Max Rye, TurtleTree Labs’ cofounder and chief strategist, explained. “The cells then convert this lactation media into milk.”

Rye noted how their upcoming B2B collaborations using its key ingredients and functional blends will span across infant formulas, sports performance, and nutraceuticals, and these product launches will be enabled by TurtleTree Labs’ recent acquisition of a proprietary C1 filamentous fungi expression system from Dyadic as a platform for its protein production.

Separately, the company has also struck a commercial agreement with JS Bioscience to access its low-cost basal media that will help TurtleTree Labs expand into large-scale manufacturing in the future.

“Our early target is to make use of the dyadic technology to produce milk ingredients. This method has been well accepted by the FDA for milk

products from other companies like Perfect Day,” Fengru Lin, TurtleTree Labs’ founder and CEO, said.

“Cell-based milk is using cells from mammals to produce the full composition of milk,” Lin added. “This process would produce all more than 2000 components in milk, and even characterizing all of that, and working with the FDA takes time.

“We are working through that at the moment, but we envision this cell-based milk to commercialize in four to five years.”

Regulatory And Other Challenges

Regulatory framework across the globe for cell-based food is in the works as Singapore has recently become the first country in the world to legally sell cultured meat.



Rye and Lin expect full commercialization of TurtleTree Labs' cell milk in the U.S. within the next ...

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However, the main difference between these two products is cultured milk doesn't contain cells in its end product, therefore, safety evaluations are solely based on biosimilarities between cell milk and mammalian milk, according to Lin.

She noted: "Mammalian milk is currently the benchmark of milk composition and concentration of different components like protein, fats, and carbohydrates.

"In the U.S., FDA and USDA are working on establishing a regulatory framework for cell-based food. As for now, no country has approved the sales of cell-based bovine milk yet. However, a recent [ISO standard](#) deems that TurtleTree's ingredients can be considered as natural."

In addition to educating consumers, who widely perceive cultured foods as a novelty, about their safety and health benefits, TurtleTree Labs says the biggest challenge for the sector is the high cost associated with the maturing cell culture medium technology.

"Instead of using pharmaceutical-grade components, we have been progressively synthesizing the components needed for the lactation media in-house, driving these costs down and in turn, allowing us to scale quicker," Lin explained. "We are also working with contract manufacturing partners to help us on this front."

Taking Market Share From Traditional Dairy

Moving forward, TurtleTree Labs expects to carve out a significant share of the traditional dairy market, between 5-10%, and it plans to become "one of the biggest players" in the sustainable food industry, the company noted.

It said: "Turtles and trees symbolize longevity. We believe in the longevity of the earth, its creatures, and the people. In the long run, we envision TurtleTree to be on every food product as a renowned label for our nourishing ingredients and sustainable, innovative products."

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