

2023 STATE OF THE INDUSTRY REPORT

Cultivated meat and seafood



The background is a solid blue color with a complex geometric pattern. It features large, rounded rectangular shapes that overlap each other. These shapes are set against a background of smaller, solid blue squares. Some of these squares are further divided by diagonal lines. Overlaid on these geometric elements are various halftone patterns, consisting of small, light blue dots arranged in different densities and orientations, creating a textured effect. The overall composition is abstract and modern.

Executive summary

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In 2023, cultivated meat arrived in U.S. restaurants for the very first time. The year also delivered advances in cultivated meat across science, innovation, talent, and public and private sector support. Yet this still-early-stage industry faced obstacles in 2023, including distorted media coverage questioning the technology. Despite headwinds, cultivated meat has the potential to transform protein production.

More than 170 cultivated meat companies and a rapidly growing number of scientists are hard at work innovating and optimizing cultivated meat products so consumers can enjoy the foods they love without sacrifice. For the first time ever, U.S. restaurants served cultivated chicken, brought to Americans' plates by two world-renowned chefs. Fresh consumer insights and market analysis pointed to growing international interest in cultivated meat. New partnerships and global alliances formed to advance the science and scaling of cultivated meat. In a challenging private funding environment, cultivated meat and seafood companies still raised \$225.9 million in 2023. And with the January 2024 milestone of Israel advancing the approval of cultivated beef, the industry took another significant leap forward in reimagining how meat is made.

Cultivated meat and seafood, part of our 2023 State of the Industry Report series, takes a field-wide view of the progress made over the past year.

Commercial landscape

Major path-to-market milestones

- In the United States, cultivated chicken products from **UPSIDE Foods** and **GOOD Meat** debuted at two restaurants.
- The June approval of cultivated meat for sale in the United States sparked major media coverage in outlets like *The New York Times*, NPR, *TIME*, *CBS Sunday Morning*, and more.
- **Huber's Butchery** in Singapore became the world's first butchery to sell cultivated meat when it began carrying **GOOD Meat's** cultivated chicken in its bistro.
- In January 2024, Israel became the third country in the world to advance the approval of cultivated meat (**Aleph Farms'** cultivated beef product) and the first country to advance the approval of cultivated beef.

Company landscape

- Around the world, the number of publicly announced cultivated meat companies (focused primarily on cultivated meat inputs or end products) rose to 174 in 2023, up from 166 in 2022.
- An increasing number of companies are focusing on the cultivated meat value chain beyond end-product manufacturing. At least 50 companies identify bioprocess design, cell line development, and cell culture media as focus areas.

Large food company involvement

- **ADM** partnered with **Believer Meats** to refine and expand the cultivated meat production process.
- Large company involvement in cultivated meat deepened, and **Danone** and **Central Bottling Co.**—which owns **Coca-Cola Israel**—both invested in cultivated milk.

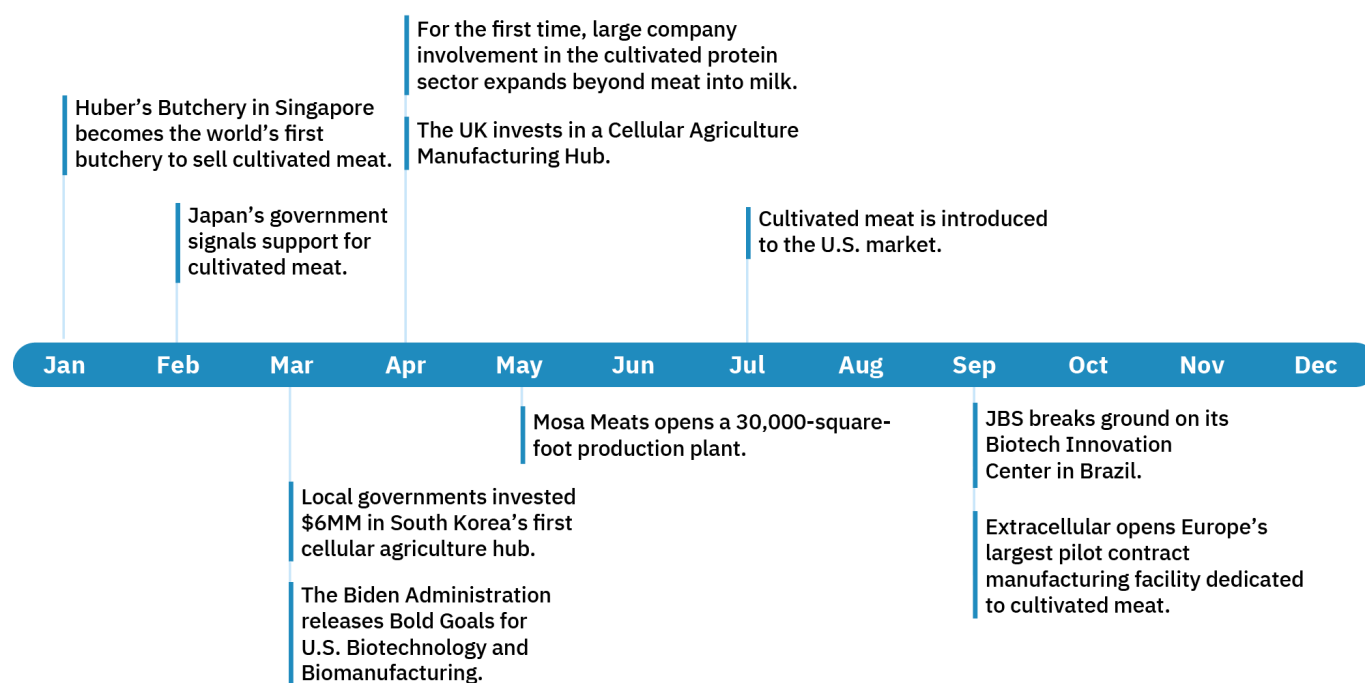
Power of partnerships

- **JBS** partnered with the **Federal University of Santa Catarina** on cultivated meat research and development.
- **Aleph Farms** partnered with chef Marcus Samuelsson to serve the company's Aleph Cuts steaks in the United States once they receive regulatory approval. This follows the trends of other cultivated meat companies, like **UPSIDE Foods** and **GOOD Meat**, partnering with chefs to bring their products to the U.S. market.

Infrastructure momentum

- In 2023, 10 new cultivated meat facilities opened across Asia, Australia, Europe, North America, and the Middle East. Two large-scale plants—**Mosa Meat**'s 30,000-square-foot facility in the Netherlands and **CellIX**'s factory in Shanghai—opened in 2023.
- At least seven other cultivated meat facilities were announced in 2023.

Figure 1: Timeline of key cultivated meat updates in 2023



Investments

Cultivated meat and seafood companies raised \$225.9 million globally in 2023, bringing the total for the industry (since 2013) to \$3.1 billion—a fraction of the investments flowing into other technologies and innovations, like renewable energy, with the potential to reduce emissions and address climate goals. While the 2023 raises represent a sizable decrease from the \$922.3 million raised in 2022, this mirrors the broader tepid private funding environment.

In 2023, companies and investors alike faced elevated inflation, rising interest rates, and a mixed economic outlook. As a result, global venture funding fell 42 percent year-over-year (YOY) in 2023 to its lowest levels since 2017 (for context, investments in foodtech startups declined by 61 percent YOY). The largest deal raised in 2023 was **Meatable's** \$35 million Series B round. Meanwhile, the number of unique investors in cultivated meat and seafood totaled 111 in 2023 compared to 204 in 2022.

Table 1: Invested capital in cultivated meat

Category	2023	2022	All-time (since 2013)	2023 highlights
Total invested capital	\$226MM	\$922MM	\$3.1B	83% of cultivated meat investment occurred in the last three years alone.
Invested capital deal count	53	72	416	2023's largest investment was \$35MM (Meatable).
Unique investors	111	204	590	The number of all-time unique investors grew by 13%.
Growth stage deals (Series B and above)	2	2	13	These included Meatable and BlueNalu.

Source: GFI analysis of data obtained from Net Zero Insights platform

Science and technology

New studies expanded the industry's capacity to reduce costs, increase production scale, and improve the quality of future products, while the research ecosystem continued to expand at universities around the world, bolstering the long-term viability of the cultivated meat sector.

- Breakthrough research showed promising improvements to the taste, texture, and nutritional composition of cultivated meat, bringing it ever closer to product parity with conventional meat.
- The examination of scalability and bioprocess design included one notable study that highlighted several scenarios to bring cultivated meat to mainstream markets at price parity with conventional meat by reducing media costs, improving biomass yields, utilizing significantly larger bioreactors, and exploring hybrid product approaches.
- Multiple studies demonstrated that cell culture media can be produced at a much lower cost and with much less environmental impact using non-animal ingredients and food-grade components. Many of these media can be manufactured using agricultural crop by-products, thereby contributing to a more robust circular bioeconomy.
- There were exciting advancements in the development of plant-, fungal-, and algae-based scaffolds.
- The **Alt Protein Project** (APP) welcomed 24 new chapters (including expansions into countries where APP was not previously represented, such as Brazil, Japan, Malaysia, Portugal, Switzerland, and Turkey) and **Tufts University** became the first in the United States to offer an undergraduate minor in cellular agriculture.

Government and regulation

Governments around the world supported cultivated meat in notable ways, from significant public investment across several regions to the introduction and adoption of public policies favorable to cultivated meat to the U.S. Department of Agriculture's (USDA) approval for cultivated chicken in the United States.



UPSIDE Foods' cultivated chicken. Photo credit: UPSIDE Foods

- For the first time, the COP28 climate conference in Dubai spotlighted food system transformation as a major climate solution.
- China, Israel, Japan, the United Kingdom, the United States, and more supported the creation of new cultivated meat infrastructure and market development.
- A report from the United Nations Environment Programme (UNEP) focused on alternative proteins, including cultivated meat's potential to benefit the environment and public health.
- The United Kingdom led 2023 cultivated meat funding announcements with an allocation of £12 million (\$15 million) for a new research hub at the University of Bath followed by an estimated £3.4 million (\$4.3 million) for seven research projects on cultivated meat.