

CULTURED MEAT: MISSION IMPOSSIBLE?

By Henk Hoogenkamp - Author & Protein Technology Expert

Despite the many optimistic stories about cell-cultivated meat production, the reality in 2024 is that only a small fraction of the grand visions articulated in 2013—when the first \$300,000 Mosa Meat burger was unveiled—have been realized. Even with a massive \$1.6 billion in venture capital investments in 2021 and 2022, the anticipated market breakthroughs have not materialized. Instead, many of the more than 200 global cultured meat startups are facing contraction or even going out of business, casting doubt on the initial dreams of growing meat and fish from cells instead of slaughtering animals. In 2024, and likely in the years to come,

Compared to the venture capital boom of 2021 and 2022, it is estimated that 2024 will generate only a meager \$36 million in new capital. This shift reflects changing sentiments in the world’s food security landscape, which will not be as easily navigable as the founders of cultured meat companies initially preached.



Cultured meat startups are still grappling with the complexities of growing meat in a bioreactor, particularly with overcoming massive technological and engineering challenges. A major issue remains the search to increase cell density per unit of bioreactor volume. Companies like Upside Foods, Eat Just, and Mosa Meat are working on improving the efficiency of growth media and choosing the right engineering systems. These are critical concerns since producing growth media is expensive. Typically, the cell media is composed of energy sources like glucose, amino acids, salts, minerals, and vitamins dissolved in water.

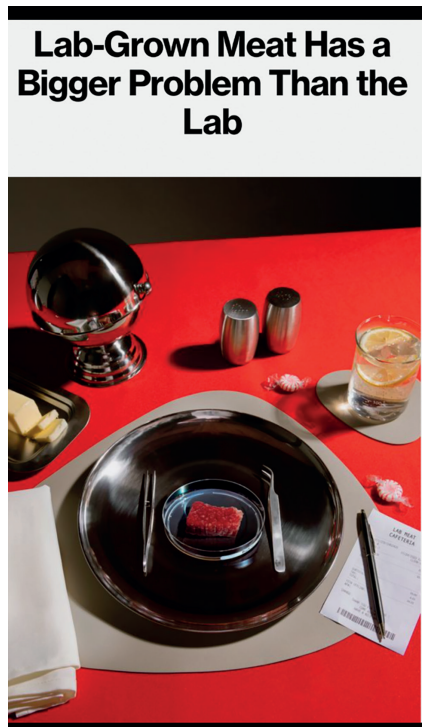
The total global meat market stands at slightly over 50 billion kilograms (as of 2024). Even if all currently available cultured meat production facilities operate at full capacity, they would generate a maximum of 15 million kilograms—an extremely small fraction of what is required.

Disappointing Realities

The first signs of a significant market contraction among startups are not encouraging. SCiFi Foods in San Francisco, CA, permanently closed its doors in June 2024. New Age Meat closed earlier, and Berkeley, CA-based Upside Foods laid off research and equipment specialists. Aleph Farms in Israel also laid off about 30 percent of its workforce. These companies, along with several others, cited the challenging funding environment as the primary reason for their struggles, making it difficult to stay afloat, let alone build a commercial facility for cultured meat production.

Ignoring Reality

Yet, despite the negativity surrounding cultured meat ventures, the global food and meat processing industry is expected to produce 60 to 70 percent more food to feed the projected 10 billion people on Earth by 2050. To achieve this, new technologies such as molecular farming, precision fermentation, and cultured meat production—along with animal-free milk and chicken-free egg proteins—must be given a chance to flourish commercially.



Lab-Grown Meat Has a Bigger Problem Than the Lab

venture capital is not something cultured meat companies can take for granted.

On a broader scale, 2024 is proving to be a tough year for most biotech food startups to raise capital, turning the once-promising dreams into a frustratingly difficult reality.

The current state of startups in 2024 has made it painfully clear that venture capital and investments from legacy food companies will not be sufficient to meet the ambitious goals for future food production. Full-scale commercial manufacturing facilities require massive investments in the billions, with uncertainties surrounding public acceptance, profitability, regulatory approvals, and affordability. Consequently, there are increasing calls to reduce reliance on venture capital and legacy food company support and instead have governments fund the enormous upfront costs needed to build commercial-scale cultured meat facilities. Even non-profit organizations like New Harvest, which continue to support cultured meat development, often encounter significant funding challenges. To make cultivated meat commercially successful, government funding will be essential.

The situation becomes even more precarious when only small amounts of cultured meat are available, and profits are still expected. "It is difficult to make a profit when there is little to sell." The reality is that even if cost parity between slaughtered and

cell-cultured meat is achieved, investors will quickly lose interest if no profits are generated.

Given the potential for mandated government funding, startups should consider changing course

to regularly choose these new food products.

For example, a burger or chicken nugget formulation containing as little as 5 percent cultivated meat can significantly enhance



by outsourcing cell manufacturing rather than each building their own expensive manufacturing facilities.

The Hybrid Solution

For now, the most logical and profitable way forward for cultured meat is to seek assistance from plant protein ingredients. Plant proteins, such as soy and pea proteins, can be a lifeline for cultured meat if the focus shifts to hybrid meat products—a blend of cultured meat and structured plant protein. These hybrid products are not only great tasting but also have a much lower cost structure. The combination of affordability, premium nutrition, and great taste will encourage consumers

all organoleptic properties while boosting the value of plant protein sources beyond what they can achieve alone. These types of hybrid products are already commercially available and are being produced in small quantities by Eat Just at select restaurants in Singapore.

Cultured meat embedded in a blend of plant protein, fat, and water, surrounded by hydrated extruded plant protein, should not be viewed as a compromise of the early cultured meat visionaries. Instead, it represents a significant step forward in marketing hybrid meat products as an essential part of making nutritious, healthy, affordable, and great-tasting food options available and sustainable.

