

World's first high-oleic palm oil alternative produced through microalgae fermentation

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Checkerspot, a pioneering biotechnology company has developed the world's first high-oleic palm oil alternative produced entirely through microalgae fermentation.

Utilizing the microalga *Prototheca moriformis*, Checkerspot employed classical strain improvement techniques to enhance oil yield and composition. The result is an oil that closely matches the fatty acid profile of conventional high-oleic palm oil, offering over 55% oleic acid and 32% palmitic acid. Notably, this achievement was accomplished without genetic engineering, aligning with growing consumer demand for non-GMO ingredients.

"This milestone underscores our commitment to developing domestically produced, sustainable, high-performance alternatives to conventional oils," said Scott Franklin, Chief Scientific Officer and Co-founder of Checkerspot. "By leveraging microalgae fermentation, we've created a scalable solution that addresses both environmental concerns and the supply chain vulnerabilities associated with the production of tropical fats such as high-oleic palm oil."

A Commercially-Viable High-Oleic Palm Oil Alternative

The fermentation process demonstrated scalability from laboratory to industrial levels, achieving oil titers up to 145 grams per liter and oil content comprising approximately 70% of the dry cell weight. This positions Checkerspot's microalgae-derived

oil as a viable alternative for various applications, including food, nutrition and personal care where high oleic palm oil is widely relied upon as a key ingredient.

Using the same underlying platform and technology, Checkerspot has already scaled the production of several other alternative oils developed in its lab. With that proof of concept in hand, Checkerspot's approach to producing a high-oleic palm oil alternative is moving towards commercial viability with work already underway alongside partners in the palm oil alternatives market. Earlier in 2024, Checkerspot announced that it had successfully developed an analog of human breast milk fat.

A Sustainable Solution to an Ailing Supply Chain

Traditionally, high-oleic palm oil is cultivated in Latin America, particularly in Colombia and Ecuador, where reliance on hybrid pollination systems poses challenges due to high costs, labor intensity, and environmental impact, including deforestation and greenhouse gas emissions.

Bypassing conventional agriculture and producing oil directly at the molecular level, Checkerspot's microalgae-based platform offers a clean, consistent, and scalable alternative.

Jim Kim of Builders VC and Checkerspot board member says "This technology answers a critical market demand for domestically produced and reliable alternatives to unreliable existing global supply chains. These systems are ailing and with proven technology to address the gap, we're confident that Checkerspot's products will play a significant role in improving global nutrition."

The innovation not only mitigates environmental degradation, but also shows the versatility of microalgae as a production system capable of generating tailored oil compositions to meet changing market demands.

The development aligns with Checkerspot's broader mission to harness biotechnology for creating renewable, high-performance ingredients. The company's platform enables the production of tailored oils and fats, meeting specific functional and nutritional requirements across multiple industries.

Checkerspot develops high value triglyceride fats and oils not easily or sustainably sourced from nature, at commercially relevant scale & cost, providing market-ready ingredients.