

# Novel Food – from bovine cells to bioengineered fat for cultivated meat

## Lab-grown meat – eating without killing animals

Cultivated meat holds the potential to revolutionize the meat industry by cutting down on both animal suffering and resource consumption. Since cultured fat plays a key role in replicating the flavor and texture of beef, new strategies are needed for growing and differentiating primary bovine cells in dynamic, antibiotic-free environments.

### What is cultivated meat and how is it produced?

Cultivated meat is an innovative biotechnological approach to producing meat without slaughtering animals. Instead of raising livestock, small tissue biopsies are taken from living animals, and the extracted cells are multiplied in controlled bioreactors with nutrient-rich media. This process forms a cell mass that can be combined with edible carriers to create final products, consisting of individual cells or three-dimensional aggregates like spheroids. A crucial step is guiding the cells to mature into muscle or fat, essential for replicating the taste and texture of conventional meat. Biofabrication technologies further process the cultured cells, using methods like encapsulation in edible hydrogels and 3D bioprinting to shape meat-like products.

### What we did so far

We have developed cultured fat in the form of spheroids, designed to serve as building blocks for future cultivated meat products. The focus was on methods that avoid antibiotics and use only animal-free, edible carrier materials, making the approach suitable for commercial use. We created streamlined protocols for guiding cells to differentiate, forming spheroids, and 3D bioprinting them within carrier materials — steps that could make large-scale production easier. Testing revealed that the fatty acid profile of the lab-grown fat closely mirrors that of native bovine fat, bringing it one step closer to matching the taste and texture of traditional meat.

**Fraunhofer Institute for  
Interfacial Engineering and  
Biotechnology IGB**

Dr. Franziska Albrecht  
Tel. +49 711 970-4402  
[franziska.albrecht@igb.fraunhofer.de](mailto:franziska.albrecht@igb.fraunhofer.de)  
[www.igb.fraunhofer.de](http://www.igb.fraunhofer.de)