

# Cellular Agriculture

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## History of Cellular Agriculture

The origin of cell culture may be traced back to the late 19th century when Claude Bernard (1878) proposed that physiological systems of an organism can be maintained even after the death of the organism. This was quickly followed by the proof of the concept when Roux (1885) demonstrated maintenance of embryonic chick cells in saline culture

## What is cellular agriculture?

- It refers to the production of animal-sourced foods from cell culture.
- In other words, Cellular Agriculture is a multi-disciplinary branch of science encompassing biotechnology, medicine, and farming. It is a nascent technology that allows meat and other agricultural products to be cultured from cells in a fermentor or a bioreactor rather than harvested from livestock on a farm.
- It designs new mechanisms to produce existing agriculture products especially animal products from cell cultures rather than the bodies of living organisms.
- **Example:** Cellular meat is the most well known cellular agriculture concept

## Types

There are two kinds of agricultural products derived from cell culture: acellular products and cellular products.

- Acellular products are made of organic molecules like proteins and fats and contain no cellular or living material in the final product.

- Cellular products are made of living or once-living cells.

## **Uses of Cellular agriculture**

The main use of this technology has been for food applications, particularly in vitro or cultured meat, called 'clean meat', cellular agriculture can be used to create any kind of agricultural product, including those that never involved animals, to begin with, eggs, leather, milk, fragrances, gelatin and silk

Cell-based meat, also called clean meat or cultured meat, is nutritionally equivalent to conventional animal meat, and tastes, smells, looks and feels exactly the same. Its only difference lies in the method of production.

## **Promotion of clean meat in India**

The Union Department of Biotechnology has decided to fund the Hyderabad-based Centre for Cellular and Molecular Biology (CCMB) and National Research Centre on Meat for research on cell-based meat.

In 2018, the Atal Incubation Centre at CCMB partnered with HSI/India, one of the largest animal protection organisations in the country, to promote and develop the clean meat sector, and has been working closely with GFI, a global expert organisation that advances research and commercialisation of the plant-based and clean meat sector, and provides input and support to entrepreneurs, regulators, scientists and others.

In August 2018, the three institutions co-hosted the first event to discuss clean meat in India, the Future of Protein Summit.

**World's first cellular agriculture research center:** The Institute of Chemical Technology Mumbai and GFI India are partnering to set up the world's first government research

center for the development of clean meat.