Filamentous Fungal Biomass as a Novel Biomaterial for Cultured Meat Production

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OTHER INFORMATION

KEYWORDS

animal cells, cultivated meat, edible microcarriers, filamentous fungus, fungal pellet, inviable fungal scaffold, large-scale bioprocessing, sustainable food production, tissue engineering, viable cell culture

CATEGORIZED AS

- **Agriculture & Animal Science**
  - Animal Science
- **Biotechnology**
  - Food

ABSTRACT

Researchers at the University of California, Davis have developed a scalable and sustainable method using edible fungal pellets as microcarriers to grow animal cells for cultivated meat production.

FULL DESCRIPTION

This technology introduces a novel composition and method involving inviable fungal pellets that serve as edible microcarriers to support the growth of viable animal cells, including mammalian and fish cells, for cultivated meat production. The fungal pellets, derived from filamentous fungi such as Rhizopus, Aspergillus, and Penicillium species, are formed by fungal spore inoculation and subsequent inactivation via heat or chemical treatment. This approach enables animal cells to connect and proliferate on or within the fungal pellets, eliminating the need for complex dissociation or degradation steps used in traditional non-edible microcarriers, thus offering a more efficient and scalable bioprocess.

APPLICATIONS

- Commercial production of cultivated meat products.
- Cell-based seafood manufacturing.
- Biotechnological research in cellular agriculture.
- Development of scalable and sustainable food bioprocessing platforms.
- Alternative protein product development for food industry.

FEATURES/BENEFITS

- Edible and biocompatible microcarriers suitable for direct human consumption.
- Supports growth of various animal cell types, including mammalian and fish cells.
- Eliminates dissociation and degradation steps required by non-edible microcarriers.
- Enhances scalability due to higher surface area to volume ratio and improved bioprocess control.
- Utilizes sustainable fungal biomaterials optimized for cultivated meat production rather than medical use.
- Flexible fungal pellet composition and size for tailored cell culture environments.
- Overcomes scalability challenges associated with planar cell culture systems.
- Reduces complexity and cost of large-scale cultivated meat production.
- Addresses lack of edible microcarriers optimized for muscle stem cell growth.
- Minimizes processing steps that negatively impact cell viability and product quality.
- Supports sustainable food production to meet the needs of a growing global population.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	2024/007447	03/07/2024	2021-909

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Extruded Hydrogel Manufacturing Method for Adherent Cell Culture

- **Materials & Chemicals**
  - Biological

RELATED CASES

2021-909-0

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