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Method for the production of a biological material composition having an animal origin

Key words: 3D cell aggregates, animal cells, food, feed

The production of biomass as feed is one of the biggest challenges of modern animal husbandry. Important problems during conventional feed production from animal sources, especially for pets and productive livestock, are on the one hand the availability of biological raw material, whose production and allocation pose an economic effort and causes ethical problems, and on the other hand the risk to introduce pathogens into the food cycle that might be transmitted onto humans. Similar problems arise when producing food from animal sources for human nutrition. The so called meat production (including breeding and slaughter) is nowadays being conducted under conditions that are, especially for the wellbeing of the animals, ethically highly problematic.

However, there is a strong demand for the production of feed and food from animal raw material, in order to meet the requirements of a growing population or to ensure the proper nutrition in regions suffering from undernourishment. Neither enhanced animal production nor increased fish catches will provide a solution to this problem at long sight.

The Invention

The invention relates to a method for isolating animal (non-human) stem cells from differentiated exocrine gland tissue, forming 3-dimensional aggregates thereof and using these aggregates for producing a biological material composition that can be used as food or feed. The cells are isolated from the glandular tissue by mechanical and enzymatic digestion, including several washing steps and filtered through a ~250 µm nylon mesh. Cells are first cultivated in cell culture dishes and can be passaged several times. For the preparation of 3-dimensional aggregates - so called organoid bodies - small droplets containing a defined number of cells are being placed onto the lid of a petri dish, then the lid is turned and put onto a petri dish filled with medium and the cells are cultivated for approx. 4 days. Cells can be first differentiated into different cell types (muscle cells, fat cells, connective tissue cells, etc.) and then induced to form organoid bodies or the other way around. Thereafter, the organoid bodies are collected and further cultivated in culture dishes coated with 0.1% gelatine. They fuse and further grow to form tissue bodies that have a size of up to several millimeters. Thereafter, tissue bodies containing differentiated cells of diverse types can be mixed to obtain a defined composition and will then be put together by mechanical forces, ultrasound or mechanical vibration. The integration of the tissue bodies can be supported by using e.g. collagen, gel, flavours or food colorants. A high number of these composites can be combined to form food or feed of the desired size.

Market potential

- In vitro Meat
- Substitute for animal feed, as for example dog and cat food or feed pellets for aquaculture
- Alternative for vegetarians

State of Development

Organoid bodies from animal cells can be reproduced on demand. Tissue bodies were cultured until they grew to a size of up to ~ 1cm.

Branch

Food industry, feed industry, pet food industry

Patent situation

Patent granted (EP, DE)

Offer

Co-operation, Contract research, License, Sale

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