NEW APPROACHES IN ALTERNATIVE PROTEIN PRODUCTION

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ABSTRACT

The alternative protein industry is bringing new challenges into conventional food processing field. New nutritional composition, longer shelf-life, different production presses are only a few of discussed differences of this fast-evolving food industry sector.

Cultivated meat is one of today's key trends in sustainable food sourcing with major positive environmental impacts such as dramatic reductions in water, arable land, and CO_2 consumption per kg of meat compared to traditional livestock farming; dozens of companies around the world are engaged in research in this area.

Mewery is a biotechnology startup based in Brno, Czech Republic (est. 2020) with the ambition to bring cultivated pork meat to the global market, i.e., meat grown from cells in a controlled environment without the need to slaughter the animal. Its vision is to contribute to tackling global climate change by disrupting preconceived ideas about the need for complex farming of domestic animals for slaughter and food.

Keywords: alternative protein, cultivated meat, pork, microalgae

INTRODUCTION

Cultivated meat is known to be the product of *in vitro* cultivated cells of farm animals (including sea food and organ meat). Cell types used for *in vitro* meat cultivation are the same as are present in animal tissue – in similar structure and replicating the sensory and nutritional profiles as conventional meat (GFI, 2024).

Bioprocess of cultivated meat production is starting with the cell isolation, continuing with cell line development, growing media optimization and biomass scale up (Yang et al., 2017). Each step is held under sterile conditions and needs to be optimized for specific cell line to mimic physiology of animal organism (Kumar et al., 2021). Final product is than harvested and packed or processed into final meat products – meat nuggets, meat balls, burgers, sausages.

Alternative protein industry is focusing on new advantages of *in vitro* meat cultivation using new strategies for animal component replacement in entire bioprocess. Fetal bovine serum (FBS) is an important supplement for culture media in cellular biology research but needs to be replaced for culture meat production for mainly ethical and economical reasons (Kolkmann et al., 2020).

Additionally, growth factors (GF) presented in FBS are already produced recombinantly with a high yield and quality. Cost of growth media is dependent on cell type and stability of GFs.

Mewery as a cultivated meat company is focusing on *in vitro* pork production on microalgae base. This alternative approach of meat cultivation is beneficiated in several factors – FBS replacement, microcarrier and GF production.

CONCLUSIONS

In conclusion the alternative protein industry and cultivated meat approaches will be introduced to conventional food science experts. Mewery will shortly introduce its unique technology of cultivation pork on microalgae base.

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