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RECEIVED 23 July 2024  
ACCEPTED 13 August 2024  
PUBLISHED 02 September 2024

## CITATION

Ali S, Rahaman A, Badra O, Ahmad K and Choi I (2024) Editorial: Research and developments in cultured meat production. *Front. Sustain. Food Syst.* 8:1469145. doi: 10.3389/fsufs.2024.1469145

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# Editorial: Research and developments in cultured meat production

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## KEYWORDS

muscle satellite cells, cultured meat, food technology, meat alternatives, cell culture media, scaffold, stem cells

## Editorial on the Research Topic

### Research and developments in cultured meat production

The current system of meat production is highly resource-intensive, leading to significant environmental impacts, animal suffering, and several public health issues, including pandemics transmitted from animals and antibiotic resistance. Despite these challenges, global meat demand is expected to rise rapidly as the world population grows. Cultured meat, however, offers a promising alternative by eliminating the need for animal slaughter and significantly reducing environmental damage, including lower greenhouse gas emissions and reduced land and water use.

Research has extensively examined the viability of cultured meat as an alternative to traditional meat. While advancements in biology and engineering are important, the primary focus is on cultural, environmental, and regulatory considerations. Expertise in muscle and cell biology, physiology, and meat science, mainly from animal scientists, has been crucial in developing cultured meat and will continue to shape its future. Interestingly, cultured meat that can mimic the taste and appearance of traditional meat at competitive prices has the potential to both replace and complement conventional meat in the market. Due to economies of scale, cultured meat production offers substantial benefits, including significant reductions in greenhouse gas emissions, resource conservation, and reduced deforestation.

Researchers were interested in this Research Topic, and numerous publications were submitted. Four original research articles describing *Research and developments in cultured meat production* have been published as a result of these submissions. A basic overview of the articles that have been published is provided below:

Grosplik et al. described a sustainable way of using alternative proteins in which they presented an overview of prominent stakeholders in the Israeli food industries and provided an investigation report of “The Good Food Institute-Israel and Israel Innovation Authority” on states of protein substitute and its social, cultural, technological, and nutritional sides. It was stated that cultured meat can provide a variety of products with socio-economic and political probabilities to assist distinct sectors of the same area. Furthermore, the alternative proteins could be a sustainable food system by developing cost-effective processing methods.

Cantarero-Rivera et al. have focused on biomass growth in the bioreactor and its implications in cultivated meat industries and further discussed crucial challenges such as effective cost and cell culture media. The authors designed a computational model that combined agent-based modeling and computation fluid dynamics and investigated the growth of biomass in a controlled environment of a stirred-tank bioreactor. It was reported that under high mechanical stresses, rotor speeds decrease cell growth rates and prompt cell death.

Begum et al. examined the bone protein and its implications as antioxidant peptides. It is a byproduct of meat industries that can be hydrolyzed using an enzymatic method to produce peptides. In this study, they have used Flavourzyme and Protamex enzymes to hydrolyze bovine extract and produce peptide after purification using an ultrafiltration membrane, which showed antioxidant properties determined by radical scavenging activities such as “1,1-diphenyl-2-picrylhydrazyl (DPPH),” “2,2’-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS),” metal chelating activity (MCA), reducing power (RP), and thiobarbituric acid assay (TBA). Peptides having 1 kDa exhibit significant antioxidant activities. Furthermore, RP-HPLC analysis provided six different fragments of peptides based on molecular weight. Furthermore, LC-MS/MS analysis of sub-Fra-III-6 reported two different peptides such as Ala-Pro-Phe (333.12 Da) and Asp-his-Val (369.14 Da). In conclusion, these two newly reported peptides having excellent antioxidant activities can be used as natural antioxidants in food products and pharmaceuticals. Moreover, this study needs further *in vivo* investigation to determine their physicochemical properties.

Hibino et al. described the properties of cultured meat in the public domain. The differences between emerging cellular agriculture methodologies and cultural practices were highlighted. They stated that cultured meat needs a comprehensive bottom-up method. It was reported that the method of cultured meat is different from conventional meat. It also differs from the whole-body part of meat. A tentative and hypothetical awareness can revise the socio-ethical and legal problems of cultured meat based on cellular agriculture techniques.

Finally, we hope that the articles published on this Research Topic will highlight advancements in the *Research and developments in cultured meat production*. Cultured meat is becoming more popular as an alternative meat and a sustainable food in the coming times. However, more in-depth research is needed in terms of sensory, storage, and texture to commercialize cultured meat and promote it in the public sphere.

## Author contributions

SA: Writing – original draft, Writing – review & editing. AR: Writing – original draft, Writing – review & editing. OB: Writing – original draft, Writing – review & editing. KA: Writing – original draft, Writing – review & editing. IC: Writing – original draft, Writing – review & editing.

## Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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