

Synthetic imitation of food: Demand trends

Preliminary remarks:

Broad et al. (2022) analyzed ten focus groups questioned about alternative-dairy, the researchers found that respondents were shyly open to the products, consistently raising questions about their technical process of creation and the product's overall safety.

However, 'very few' participants within the 'early adopter' sample expressed strong initial opposition to the concept, while most interviewees were hesitant to consider the product for their own consumption. "Ultimately, the respondents called for transparent communication from all parties involved in developing, regulating, and selling animal-free dairy, and from there believed they could decide as to whether it was something they were interested in consuming", the researchers write.

Moreover, Bryant and Barrent (2020) notice that **consumers tend to perceive meat that is grown in a lab effects on society better than on the individual level (in terms of taste, nutrition, and food safety concerns), resulting in positions that might favor this meat alternative in principle but preferring not to eat it themselves.**

This points should be kept in mind while analysing the market forecasts proposed by different organisations and companies.

As the synthetic copycat of food is allowed nowhere to be placed on market, except in Singapore for some of them, people are reasoning theoretically on products which are far from their daily life. Such situation usually tends to give premium to well marketed concepts as long as they are not questioned in details.

Market forecasts:

Research from Boston Consulting Group and Blue Horizon Corporation projects the market for cultivated foods—including meat, seafood, dairy, and eggs— to reach approximately \$18 billion, or 6 million metric tons, by 2035, corresponding to 0.7% of the 882 million metric tons of overall protein expected to be consumed in 2035.

The projections from different banking institutions and market analyses assume that the sector covers just a fraction of the traditional meat industry (estimated at 328 million tons and worth more than \$1 trillion in 2020) (figure 2).

Nevertheless, cultivated-meat industry spokespersons state that their ambition is to reach 10% of the traditional meat market by 2030. Such a trend would disrupt traditional meat markets and consumption, besides the way consumers perceive food, as well as the cultural attachment that goes along with it.

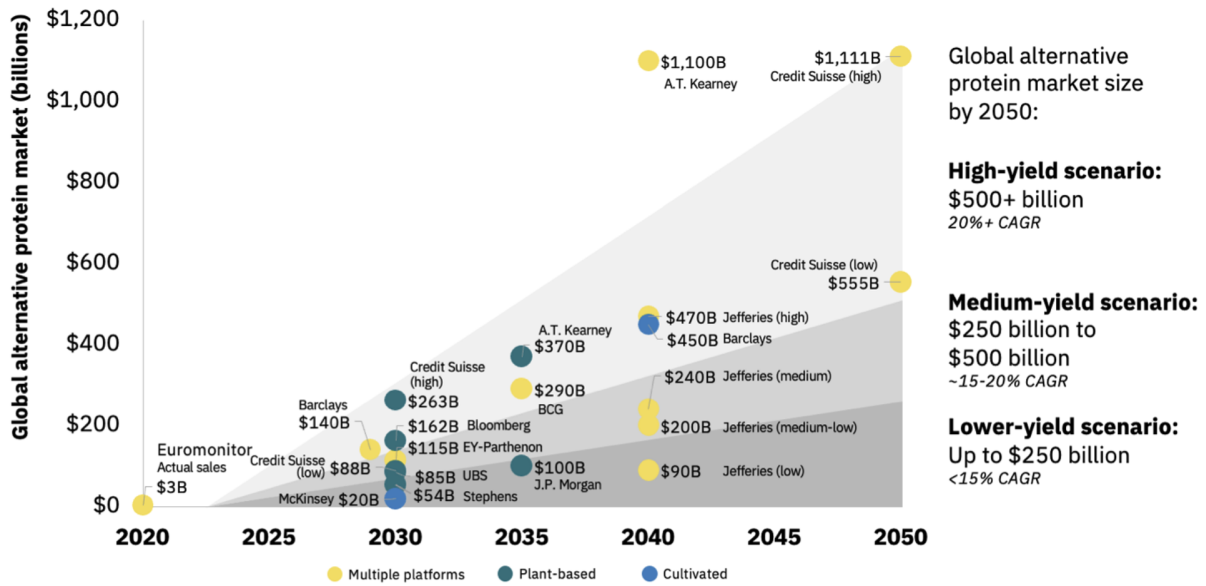


Figure 2: Projections of market size for alternative meat products (2021).
Source: Reports from several banking institutions

Moreover, in recent times, **hybrid products** -plant-based combined with synthetic imitation of meat- are increasingly being tested for the market and represent an attractive product for the industry due to the fact of being less expensive than fully-lab-grown meat products and improving taste and texture. For example, Hoxton Farms developed cultivated animal fat with the aim to integrate it within plant-based ‘meats’ alternatives. Future Meat Technologies and Artemys Foods added plant-based ingredients to synthetic imitation of meat production to lower the costs of production and expand their scaling capabilities.

While consumers may initially be willing to pay more for the novelty of cultivated meats, prices will ultimately need to reach parity with traditional meat products.

For example, startup Future Meat Technologies claims that its production price for 110 grams of cultivated chicken meat is \$4.00—or \$16.49 per pound—while the production price for farm-raised organic chickens may cost anywhere from \$1.50 to \$8.00 per pound.

However, consumers might have trouble recognizing today’s cultivated products which hardly resemble anything close to a steak.

In fact, current cultivated meat products are a conglomerate of one cell type, such as muscle fiber, that has to be combined with other ingredients to form a processed meat product, such as sausage or meat patties.

Due to technological limitations, fully formed, cultivated steak products may still be years away. As a result, consumer demand will likely remain low until cultivated products better replicate the taste, texture, and aroma of animal meat (more information on the ‘synthetic imitation of food definition’ paper of this series).

Some plant-based products are more popular with consumers because it is more difficult to distinguish between them and meat burgers.

3D bioprinting technology may allow nonetheless to develop cultivated steaks by adding structure and marbling. A cultivated ribeye steak was “printed” in February 2021.

Despite the figures that depict a possible growing future market, facts assure that not all that shines is gold.

To be noted that the 2022 financial year looks grim for some companies producing veggie substitutes of meat. The veggie-burger producer Beyond Meat lost nearly 80% of its market value due to the overestimation of demand trends. At the same time, meat-giant JBS also announced that it will shut down its US plant-based food businesses, together with Maple Leaf Foods, which scaled back as well (Sharon Lam, Reuters Breakingviews, 5/10/2022).

Sources:

- Bryant, Barnett, “Consumers acceptance of cultured meat: an updated review (2018-2020)”. *Applied Sciences*, 10(15):5201, 2020. DOI: [10.3390/app10155201](https://doi.org/10.3390/app10155201)
- Bryant, Christopher, van Nek, Rolland, "European Markets for Cultured Meat: A Comparison of Germany and France". *Foods* 9, no. 9: 1152, 2020. <https://doi.org/10.3390/foods9091152>
- Bryant, Sanctorum, “Alternative proteins, evolving attitudes: comparing consumer attitudes to plant-based and cultured meat in Belgium in two consecutive years”. *Appetite* 161 (11):105161. <https://doi.org/10.1016/j.appet.2021.105161>
- Bryant, Szejda, Parekh, Deshpande, Tse, “A survey of consumers perceptions of plant-based and clean meat in the USA, India, and China”. *Frontiers in sustainable food systems*, 2019. <https://doi.org/10.3389/fsufs.2019.00011>
- Bryant, Krelling, “Alternative proteins in Brazil: nomenclature for plant based & cultured meat”. 2020. DOI: [10.31219/osf.io/zp79k](https://doi.org/10.31219/osf.io/zp79k)
- Broad, Zollman Thomas, Dillard, Bowman, Le Roy, ‘Framing the futures of animal-free dairy: using focus groups to explore early-adopter perceptions of the precision fermentation process’, *Frontiers on nutrition*, Nutrition and sustainable diets, 2022. <https://doi.org/10.3389/fnut.2022.997632>
- Eurobarometer, ‘Social values, science & technology’, 2005. Online source, consulted on October 11th, 2022: <https://europa.eu/eurobarometer/surveys/detail/448>
- Franceković, García-Torralba, Sakoulogeorga, Vučković, Perez-Cueto, “How Do Consumers Perceive Cultured Meat in Croatia, Greece, and Spain?”. *Nutrients* 13, no. 4: 1284, 2021. <https://doi.org/10.3390/nu13041284>
- Gómez-Luciano, Kluwe de Aguiar, Vriesekoop, Urbano, “Consumers’ willingness to purchase three alternatives to meat proteins in the United Kingdom, Spain, Brazil and the Dominican Republic”, *Food Quality and Preference*, Volume 78, 2019, 103732, ISSN 0950-3293, <https://doi.org/10.1016/j.foodqual.2019.103732>.

- Hocquette et al., “Educate consumers don’t believe artificial meat is the solution to the problems with the meat industry”. *Journal of Integrative Agriculture*, 2015, 14(2): 273-284. [doi: 10.1016/S2095-3119\(14\)60886-8](https://doi.org/10.1016/S2095-3119(14)60886-8)
- Mancini, Antonioli, “Exploring consumers' attitude towards cultured meat in Italy”. *Meat Sci*, 150:101-110, 2019. [doi: 10.1016/j.meatsci.2018.12.014](https://doi.org/10.1016/j.meatsci.2018.12.014). Epub 2018 Dec 28. PMID: 30616073.
- Milfont, Zubielevitch, Milojev *et al.*, “Ten-year panel data confirm generation gap but climate beliefs increase at similar rates across ages”. *Nat Commun* 12, 4038 (2021). <https://doi.org/10.1038/s41467-021-24245-y>
- Liu, Jingjing, E. Hocquette, Ellies-Oury, Chriki, J-F Hocquette, "Chinese Consumers' Attitudes and Potential Acceptance toward Artificial Meat". *Foods* 10, no. 2: 353, 2021. <https://doi.org/10.3390/foods10020353>
- Shaw, Mac Con Iomaire, “A comparative analysis of the attitudes of rural and urban consumers towards cultured meat”. *British Food journal*, 2019, ISSN: 0007-070X.
- Szejda, Stumpe, Raal, Tapscott, “South African consumers adoption of plant-based and cultivated meat: a segmentation study”. *Frontiers in sustainable food systems*, 2021. <https://doi.org/10.3389/fsufs.2021.744199>