



Alt-Protein Outlook to 2031

The US

Proposal for a Multi-client Study

April 2022

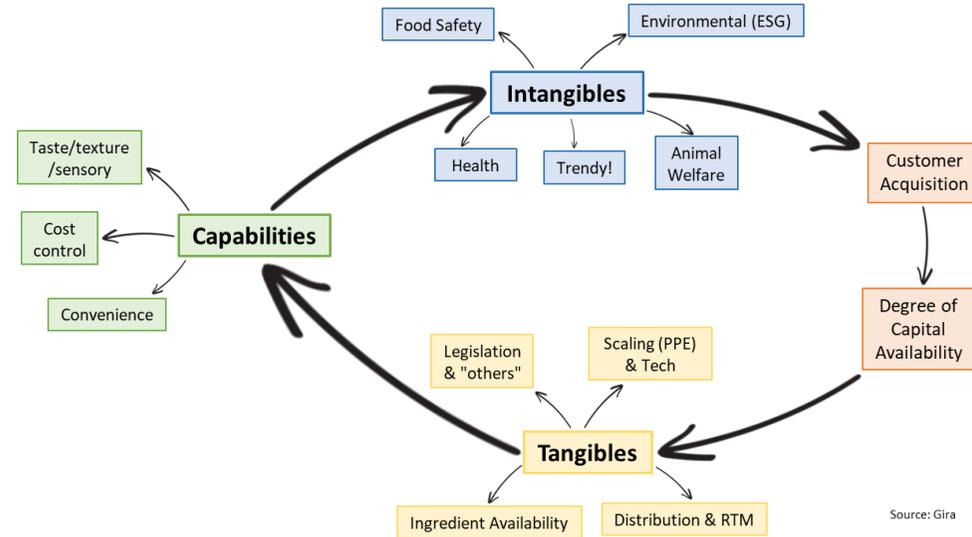
The alt-protein industry has been gathering steam, with 2020 a year of major growth.

- Whilst intangibles such as health, sustainability and animal welfare are cited as key drivers for alt-protein purchases, consumers in the larger flexitarian group make purchasing decisions based primarily on product fundamentals of taste, price, and convenience.
 - These demand intangibles will gain importance, but for the coming years it will be the tangible factors of ingredient supply product scaling and distribution that remain the impediment to alternative protein growth.
- A key challenge will come from the availability of ingredients.
 - How are these products going to be produced at sufficient scale and quality to meet demand?
 - This creates investment opportunities with a potentially lower risk profile than those associated with branded consumer products.
- Two core capabilities of price and quality will be the area of focus, looking at how products can compete with incumbent meat and dairy products to increase the total addressable market (TAM) for alt-protein products.
 - These will remain a barrier to growth for the coming years, although the drag from this is already easing. The TAM for alternative protein producers will increase markedly when more products arrive that are on parity with meat or dairy counterparts for taste, texture and sensory characteristics and/or reach an equal or more competitive price point.
- The growth across both meat and dairy alternatives is expected to be more heavily weighted towards the 2025-30 rather than 2020-25 period.
 - Whilst nuanced, this will be the period during which a major expansion of the asset base capable of producing alt-protein products that compete on taste and price takes place; the economic viability of some incumbent meat and dairy business models will also start to become more challenged, and the introduction of legislation could accentuate margin pressure.
 - However, the current understanding of the drivers for this progression, as well as the barriers to growth remains relatively superficial at present.

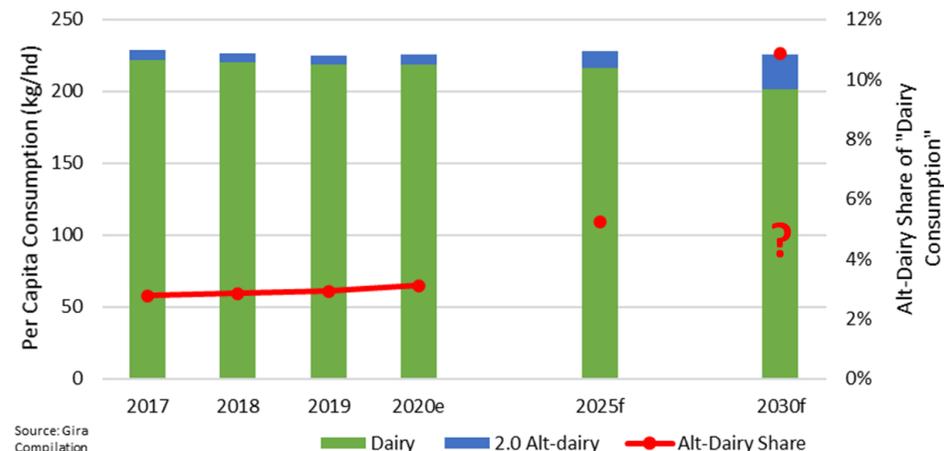
There is a vast array of commentary on the alt-protein market, particularly in the US.

- However, what little there is on the future evolution of the industry is often based on an incomplete picture of the underlying meat and dairy industries, and usually overlooks many of the impediments scaling these industries face.
- Through this study, Gira will aim to lay out more robust and transparent projections for how this industry is expected to evolve in the coming years.
 - This will be based on variables from capital and asset requirements to scale, through to government policy and investor appetite, and will aim to highlight the key opportunities and threats for operators throughout the alt-protein value chain.

Positive Feedback Loop for Alt-protein



Estimated US Dairy & Alt-Dairy Per Capita Consumption, 2017-30f



Introduction & Definitions

- Alt-protein product definitions will be laid out, clearly differentiating the products that will fall into the analysis and categorising them.
 - Differentiation between first and second generation products will be key, as well as clearly articulating the different technologies that are present in the market, and how these have evolved.
- US protein market coverage, detailing the size of domestic production and consumption across all proteins, meat and dairy.
 - A fundamental gap in most alt-protein market analysis is an incomplete understanding of the size, evolution and techno-economic position of the incumbent meat and dairy industries. As a result, most analysis in the field offers up unrealistic or inaccurate projections based on a lack of supply chain understanding. This is an area Gira has 50 years of specialising in.

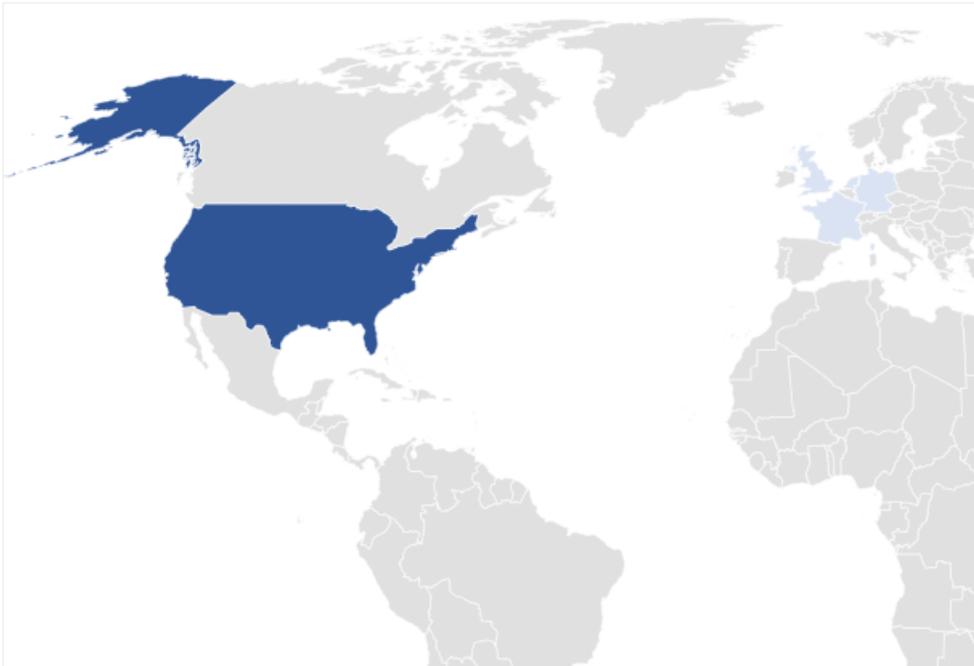
Current Alt-Protein Market

- Broad consumer drivers: understanding the perception and position of alternatives is key.
 - What is it that is driving the consumer demand for these products, from health to the environment and animal welfare. Conversely, how much of a brake are current prices and product quality.
 - There is a vast disconnection between consumer sentiment and final purchasing behaviour. Understanding how willing consumers are to sacrifice on price and quality is a key factor that must be understood to build out market projections. As we are seeing, sales of alt-meat products are slowing in the US; whilst part of this relates to the poor strategies employed by many pure-play companies, are we perhaps starting to see the consumer tranche that is willing to sacrifice on eating quality or price? This has important implications for when or if these products will take off, and importantly, the type of technology that is most likely to drive future gains.
- Building on the introduction, analysis will be conducted into the current technology used in the manufacture of protein alternatives.
 - What are the positives and shortcomings of these technologies, particularly from price, quality and convenience perspectives. How are these technologies advancing, and what is the potential for these technologies to make improvements in the future? What will be the cost, and how long will these gains take to achieve?
- Regulatory control & the US government position on alternative proteins. How these variables evolve will have an important impact on the pace of growth of alternative proteins.
 - We will examine the impact of direct legislation and policy on the alt-protein industry, as well as how legislation changes for incumbent industries may or may not impact meat and dairy growth.
- The small size of the alt-protein industry at present means the supply chain model has limited impact on the business, particularly upstream. However, in the coming years as the industry expands, how companies can build out a larger and more robust supply chain will be a KSF, particularly with regards to ingredient procurement.
 - Gira will look at the challenges companies are likely to face from ingredient procurement through to GTM strategies, and quantify the current and future size of the ingredient requirements

Alt-protein Market Outlook

- A fundamental part of the report will focus on our expectations for the evolution of the alt-protein market in the US.
 - Outlining our base case assumptions will be key enabling us to build out a range of cases depending on how major drivers and brakes to the industry expansion evolve.
- A range of market drivers and brakes will be considered with our base case projections detailed to arrive at our market projections.
 - Expected evolution of technology that will enable price parity to be achieved. What is the expected timescale for this to be achieved across the three core technologies?
 - Across the different technologies, will companies reach a point where their product quality difference with incumbent products is minimal? Which specific products is this likely to be achieved in?
 - Which companies will be the major drivers of the alt-protein industry? Pure-play start-ups, CPG conglomerates, incumbent meat and dairy companies, or a combination of the above?
 - Consumer acceptance of alternative proteins: how will this evolve, and what impact will this have on the ability of companies with different technologies to bring products to market?
- This chapter will be broken in separate outlooks for meat and dairy alternatives, and how we expect these industries to expand from a volume and value perspective.
 - What will be the market volume and value across alt-dairy and alt-meat categories in 2025 and 2030? How will this sit v's incumbent consumption?
 - The evolution of the different technologies and their role in the growth of these industries will also be noted.

Geographic Focus



This study will be entirely focussed on the US market.

- For select companies and products where relevant, detail will be provided on some of the international expansion of US companies.
 - This coverage would highlight the main points of international expansion, particularly when assets are developed
- Simultaneously, a study examining the potential in select Western European markets will also be running.
 - The markets covered will be the UK, Germany, and France, with a small profile completed on the Netherlands.
 - A subscription to this will be available at a discount for clients buying the US report.

This study will look at the potential evolution of the alt-meat and alt-dairy markets in the US.

- Whilst it is understood that very few of the companies are heavily involved in both the meat and dairy sectors, the positioning of protein alternatives in both these markets share many parallels, which are relevant to each other.
 - There will be several chapters on legislation and government support where alt-meat and alt-dairy products will be covered together.
 - However, other chapters such as those examining the current alt-protein market situation as well as the market projections will be split between the two categories.

Technology coverage

- With nuances between meat and dairy, this study will look at the development of plant based, fermentation (traditional, biomass and precision) and cell-based technologies.
 - We will also be careful to focus on the 2.0 generation of products, discounting some of the low quality 1.0 generation products which will not be key to the industry evolution.
- Market projections will be split between these technologies, although this will be hampered to some degree by the increasing blended approach by companies, utilising plant based and cell based technology in products (Mission Barns), or using fermentation to produce specific ingredients (Impossible & Heme).

Product category coverage

- Within the alt-meat industry, products within all five proteins will be covered: beef, poultry, pork, lamb and fish.
 - This will include the production of both processed products such as burgers, as well as efforts to emulate muscle cuts.
- For alt-dairy, there will be an additional degree of complexity derived from the increased fractionation of dairy fats and proteins.
 - Standard dairy product and commodities from milk and yogurts through to cheese and ice cream will be examined.
 - We will also focus on the growth of technical ingredients and proteins, including those used as an ingredient (Perfect Day) as well as those producing finished products such as alt-protein powders and bars (NoCow), and potentially infant formula (Turtle Tree Labs).
- Within ingredients, we will analyse and quantify the major protein sources used in alt-protein products, as well as document other key inputs used in products.

Methodology

Gira will have access to the major databanks derived from our two annual protein research projects, the Gira Meat Club and Gira Dairy Club.

- This provides Gira with a unique, extensive and detailed meat and dairy database; this will be used throughout the study to provide background data and market information where required.
- An understanding of the incumbent meat and dairy industries is fundamental to give more nuanced and robust projections in the alt-protein space, something many commentators lack.

Gira will utilise a range of research methodologies during this project.

- Documentary research will be used to validate certain figures: national and customs statistics, published studies, trade press, corporate and other websites etc.
- Interviews will also be conducted with a wide range of operators through the value chain. These will include but not be limited to:
 - Alt-protein start-ups,
 - Incumbent meat and dairy companies,
 - Ingredient suppliers to the alt-protein industry,
 - Government organisations and officials,
 - Investors in the alt-protein space,
 - Industry experts.
- On a confidential basis, Gira will also look to organise interviews and questionnaires with project clients to discuss their views on the development of key markets.
 - This will help Gira attain a range of views from the core dairy markets and the operators within them.

This study will naturally have to be flexible, and we will adapt the study depending on the findings of the research.

- We will be completely transparent with our projections, clearly laying out all assumptions underpinning these forecasts.
- Scenario analysis will play a fundamental role in providing different viewpoints depending on how markets and drivers will evolve.

Project Forecast Time Frame

Historical data will be provided from **2015-20** when feasible, with estimates also made for 2021.

The forecast period will focus on **2031**, with interim data for **2026** shown in places.

- Understanding the evolution of markets and industries in these two five-year increments will be important given the time certain changes will take to materialise.

The Report

1 x Main Country Report: USA

- Country report will be 35-45 pages
- Major Chapter headings:
 - The size of the traditional domestic protein market - production and consumption by proteins group: meat and dairy – this is the potential market space for Alt-protein products.
 - Current Alt-Protein Market in each country:
 - Broad consumer drivers for Alternative Protein consumption.
 - The current technology types used in the manufacture of protein alternatives; Dairy and Meat.
 - Current and developing product types, separated by dairy and meat/fish based:
 - Meat – processed products and efforts to replicate whole muscle cuts.
 - Dairy – standard dairy products, as well as the developing market for fractionated dairy ingredients.
 - Projections for the development of alternative protein technologies, scale, sophistication and placement.
 - The Current Alt-Protein supply chain, its limitations and potential for the future.
 - Legislation and support on Alternative Proteins in the US market:
 - Regulatory control & the government position on alternative proteins.
 - Government support for Alternative Protein technology and companies.
 - The Outlook for Alternative Proteins in each country:
 - A range of market drivers and brakes.
 - Technology evolution and its impact on demand.
 - Corporate strategy and its impact on creating demand for Alternative proteins.
 - Consumer attitudes to Alternative proteins, and the role in shaping future demand.
 - Go to market strategy for Alternative Protein companies in these core markets.
 - How are different companies representing and positioning themselves.
 - Case studies.

The Webinar

2-hour webinar of the key findings presented by the key team members, including Q&A.

- The webinar will be available to stream after the event to share with you wider teams.
- All clients of the study have access for up to 5 members of their team to the live broadcast.

Draft Report Contents

Gira		Report contents
1.	Executive Summary	?
2.	Alt-protein Product Definitions	?
3.	US Protein Market	?
4.	Current Technology & Market for Protein Alternatives	?
5.	GTM Strategy for Companies	?
6.	Regulatory Control	?
7.	Future Supply Chain for Protein Alternatives	?
8.	The Outlook	?

US Alt-Protein Opportunities © Gira 2022 3

Project Deliverables

This work will be delivered as a report. A webinar will also be given to clients on completion of the project.

- The report and presentation will be delivered in English in a searchable PDF format.

Timing

Assuming sufficient founder client support is received in **April 2022**, we propose a 3-month work period for this and will aim to deliver the report by **July 2022**.

- The Webinar will be presented 2 weeks after the release of the reports.

Project Fees

The fee for the project will be **EUR 8,000** (before any relevant tax) for Gira Dairy Club & Gira Meat Club members.

- For non-members the fee will be **EUR 10,000** (before any relevant tax).
- We will request payment from clients of 50% of the fee upfront, and the remainder on delivery of the final report and presentation with 30-day payment term.
- Payment can be made by clients in USD if required, with a spot exchange rate used.

Gira

Gira is an international management consultancy and strategic market research firm founded in 1970, operating throughout the food and drink value chain. We have a vast experience in animal protein and dairy going back 50 years, working across a range of levels from macroeconomic trade analyses through strategy to new market evaluations and market due diligence.

- Gira knows all the main operators in the supply chain and has worked for a large number of them: input suppliers, processors (coops, public and private companies), logistics operators, traders, retailers, caterers, administrations – as well as consumers.
- Gira's extensive network of international experts, contacts and clients through the entire animal protein value chain means that it is highly qualified to carry out this research.

The Gira Team

This assignment will be undertaken by a Gira advisory team with the mix of research skills and protein industry knowledge & experience.



Christophe Lafougere is CEO of Gira, and directly responsible for all Gira assignments in the worldwide dairy sector. He has been directing all Gira's consulting and research activities in the dairy sector for over 25 years covering all aspects of production, collecting, processing and marketing, in all the major dairy producing and consuming regions of the world.



Rupert Claxton, Gira Meat Director, with over 17 years of experience in world meat markets. He is responsible for a wide range of meat sector assignments, including Gira's annual Asian Meat Club, and has run a variety of meat industry studies, including managing Gira's European Meat Company Panorama.



Mylène Potier is a Senior Consultant within Gira responsible for all the work done on technical dairy ingredients. She has strong knowledge of the technical ingredients sector and will be responsible for examining the key opportunities for technical ingredient alternatives.



Laurène Bajard is a Consultant within Gira and has been involved in several projects examining the alt-protein industry and the growth opportunities for companies.



James Caffyn, a Gira Advisor. He is a Partner for Lever VC, a leading fund investing in the alt-protein and agfoodtech space and is an advisor and mentor for food and ag-tech companies in the IndieBio and FoodX accelerator programs. He has previously been responsible for managing Gira's strategy and due diligence projects throughout the food value chain in emerging and developed markets, and managed Gira's recent study examining the potential for alt-protein in China.

Other Gira Team Members will be used as needed. Gira's team of country and regional specialists are based in markets around the world. They will support Gira's central strategic and analytical team with up-to-date local insight.

Dairy-Sector Clients

- Agropur
- Agrial/Eurial
- ALIC
- Alpma
- Arla Foods
- CHR Hansen
- Coveris
- Dairygold
- DanTrade (Danone)
- DSM
- Dupont (IFF)
- Emmi
- EU Commission
- Eucolait
- Fedegan
- FIT
- Fonterra
- Friesland Campina
- Glanbia
- Kerry
- Lactalis
- Laïta
- Mondelez
- Mueller
- Meggle
- Nestlé
- DMK
- Rupp
- Savushkin
- Sealed Air
- Sodiaal
- Unilever
- USDEC
- Valio
- Yili

Members of Gira Dairy Club 2021

- Agropur
- Arla Foods
- Bel
- BordBia
- CHr Hansen
- Dantrade
- DMK
- DSM
- Emmi
- Eurial
- The EU Commission
- Ferrero
- FIT
- Fonterra
- Glanbia
- IFC World Bank
- Land'OLakes
- Meggle
- Sodiaal
- USDEC
- Valio

As well as Retailers, Caterers, Banks and Investment Funds

- Abbott Laboratories
- ABF
- ABP
- Agri Ranch
- Agroeco
- AHDB
- Alic
- AMIC
- Animex (Smithfield)
- Asoporcultores
- Australian Pork Ltd.
- AVEC (European Poultry Association)
- Aviagen
- Bain
- Bemis
- BRF
- Bunge
- Canada Beef
- Canada Pork
- Canadian Cattleman's Assoc
- Cargill Inc
- Cargill Meats Europe
- Cobb
- CP Foods
- CFG (Campofrio Food Group)
- COV
- Danish Crown
- Danish Farmers Abroad
- Dawn Meats
- DSM Nutritional Products
- DuPont
- Elanco
- European Commission
- FAO
- FECIC (Catalan Meat Industry Association)
- Fedegan
- Fenavi
- Foss
- HCC
- Hilton Food Group
- H.K. Scan
- IFC (World Bank)
- I.M.S.
- INAC
- Inalca/Cremonini
- Inaporc
- Interbev
- Irish Food Board
- JAPFA
- JBS
- Kemin
- Landbrug & Fødevarer
- LMC
- McDonald's
- Meat & Livestock Australia
- Meat Industry Association NZ
- Minerva
- Multivac
- National Pork Board
- Nutreco
- O.E.C.D.
- Pfizer
- Rabobank
- Rusagro
- Scottish Assoc'n of Meat Wholesalers
- Sealed Air
- Silver Fern Farms
- Smithfield (WH Group)
- UECBV
- Unic
- Unigrains
- USMEF
- Vion
- VLAM
- Westbridge Foods (CP Foods)

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