Special Report

Front Runners in Alternative Dairy Fats



Confidential | 2023

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INTRODUCTION

About this report:

- Alternative fats and proteins are seen as a potential means to combat the challenges such as food security and climate change. Dairy and meat segments being the key consumers of animal fats and proteins, have attracted huge investments in this domain. Major sources of producing such fats and proteins are plants, cultivation, and microbial fermentation.
- This report provides a comprehensive overview of the leading players active in developing alternative dairy fats globally. These players can be start-ups or mid-sized companies having focused on their proprietary technology. Established players, conglomerates, research institutions and laboratories have not been captured.
- Each player has been profiled separately by outlining details around its technology, financials, relevant markets and intellectual property. Further, a 15-point assessment based on Aranca 4 Factor Assessment Framework has been provided for each player.

Relevant audience:

- √ Companies already present in the domain or willing to enter
- ✓ Established companies and conglomerates willing to explore and acquire start-ups
- ✓ Venture capitalists (VCs), institutional and individual investors

Customization:

Report contents can be customized based on user requirements. Accordingly, report coverage shall be reduced or expanded to the specific areas of interest.

RESEARCH METHODOLOGY

Methodology

- A comprehensive search was performed on various platforms to map relevant technology developers. Mapped entities were scrutinized for relevancy based on the technology and product offerings.
- Each relevant player was evaluated on five important factors namely intellectual property, technology, financials, ecosystem and organization (refer Aranca 4 Factor Framework for more details).
- Corporate players and diversified entities with partial focus on sustainable material technology were excluded.
- Focused secondary research was conducted for the captured players in order to capture relevant insights. In order to fill the gaps remaining after this, primary research was conducted, wherever necessary.
- Apart from identifying the targeted technologies, Aranca can extend the current study to provide support in:
 - √ Competition assessment
 - ✓ Market assessment and outlook
 - √ IP and commercial product landscapes
 - ✓ Route-to-market intelligence, e.g., key technologies, potential M&A targets, regulatory aspects, etc...

Information Sources

Following paid and public sources of information were referred (not exhaustive):

- Patents on databases such as Thomson Innovation and Questel Orbit
- Scientific literature published on databases such as ScienceDirect, ResearchGate, Scopus, SpringerLink and Wiley Online
- Company websites, product brochures and news/media sections
- Industry associations and Government sources such as European Commission, The European Food Safety Authority (EFSA), and The U.S. Food and Drug Administration (FDA)
- Specific publications/magazines on sustainable dairy products
- Other commercial databases such as Factiva, Bloomberg and EMIS to capture/validate company-specific information
- Aranca internal knowledgebases and industry experts

ARANCA 4 FACTOR ASSESSMENT FRAMEWORK

	Factor	Parameter	Score (1−5); higher is better	Min	Max			
Novelty Scope Scalability Technology Total Funding Funding Rounds Type of Investor No. of Investors Global Presence Employee Size Active Years Scale and factor scores are adjusted accordingly. 4 20 4 20 4 20	Intellectual	Forward Citations		3	15	 For uniform representation, final score 		
Funding Rounds Type of Investor No. of Investors Global Presence Employee Size Active Years Funding Rounds Type of Investor 4 20 4 20	Technology	Scope Scalability		4	20	scale and factor scores		
Employee Size Active Years 4 20	\$ Financials	Funding Rounds Type of Investor		4	20			
	Organization	Employee Size Active Years		4	20			

REPORT OVERVIEW

29 companies actively working in the domain of Alternative Dairy Fats



Inclusion of different technologies such as cell cultivation, microbial fermentation, etc...



Holistic assessment in terms of IP, technology, financial, ecosystem and organization



Entities range from start-ups that could be potential disruptors



In depth analysis and key observations for each entity

Information covered on each company

Company information

- Website, year of establishment, headquarters, key personnel, etc...
- Size (employee count, revenue, funding, etc...)
- Awards and recognition

Technology

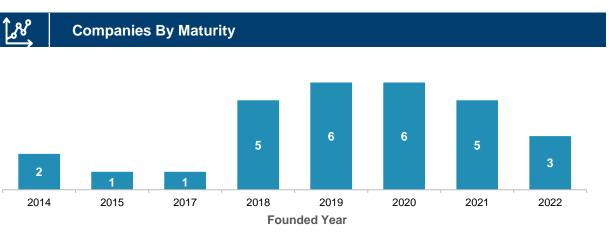
- Technology readiness level (TRL)
- Feedstock, conversion process and output
- Patents and research collaborations

Commercialization

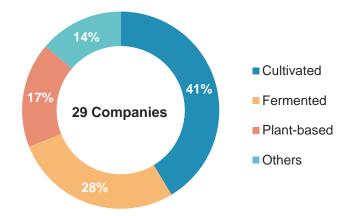
- Applications and markets
- Product details (form, chemistry, trade name, etc...)
- Business partnerships, investments, etc.

HIGHLIGHTS

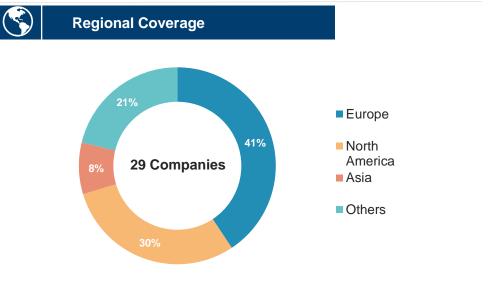
O _O	Summary					
Companies covered		29				
Geogra	phic focus	Global				
Year of establishment		2014 onwards				
Major P	roducts	Fats, Oils, Cheese, Meats (Pork, Poultry, Beef)				



Technology Focus



Others include: 3D Tissue Engineering, Fruit-Pits, etc...



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COMPANY LIST

Rating Snapshot

Sr. No	Company Name*	IP Score (max 15)	Technology Score (max 20)	Financial Score (max 20)	Organization Score (max 20)	Overall Score (max 100)	Overall Rating (max 5 star)
1	Perfect Day	13	17	19	12	81	5
2	xxx	11	15	13	11	67	4
3	xxx	8	14	17	10	65	4
4	xxx	6	13	18	10	63	4
5	Nourish Ingredients	12	14	10	11	63	4
6	xxx	9	13	14	8	59	4
7	xxx	10	16	10	8	59	4
8	xxx	7	14	13	0		
q	xxx	7	15				

* Legend: Fermented Cultivated Plant-based Other



PERFECT DAY

Website: Link Est.: 2014 HQ: USA

Producer of animal-free milk substitutes, fats (animal-free, flora-made), and proteins using yeast fermentation of plant-based sugars. It also includes ingredients that are sustainable, vegan, and devoid of antibiotics.



Technology

 Uses microbes (fungi, yeast, or bacteria) and adds DNA sequences (which can be 3D printed using synthetic biology techniques) which effectively instruct the microbes to produce the proteins and fats found in milk.



Financials

- Funding Received: US\$ 711.48M
- Investors: 39 (B Capital Group, Cambium Grove Capital, etc...)
- Business Status: Generating Revenue



Operations

- Employees: 250
- Location(s): 1 (USA)



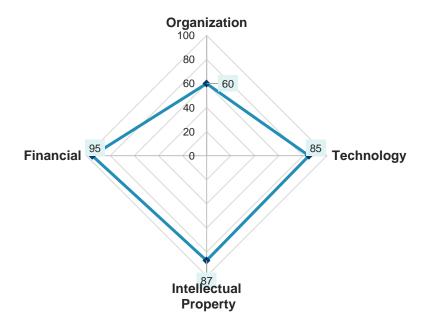
Applications

Food Products (Dairy)



Aranca 4 Factor Assessment

81/100



Note: Factor scores have been normalized on a 0-100 scale. Detailed analysis has been provided in the next slide.



- > Most of the patent filled in Cocoa, compositions of macromolecular compounds, dairy products, foods, foodstuffs, or non-alcoholic beverages, Protein compositions for foodstuffs.
- > Partnered with Nestlé to produce animal-free dairy beverages, Bel Brands etc...







Aranca 4 Factor Assessment



Intellectual Property	• 11	rong IP portfolio with total 14 patents. I patents are pending, 1 is granted and 2 are psed.	Criteria No. of Patents Forward Citations Patent Status	Low 1	2	Score 3	4	High 5	Total
Technology	pri ■ Ex	ses synthetic biology techniques via 3D inting. cpanding capabilities into animal-free, flora-ade fats	Novelty Scope Scalability TRL						17
\$ Financial	an ■ rai ve	as raised US\$ 711.48M of funding, maximum nong all companies in 10 rounds. ised funding of US\$ 350M in Series D1 enture deal led by Temasek Holdings and anada Pension Plan Investment Board.	Total Funding Funding Rounds Type of Investor No. of Investors						19
Organization	(fo	dest company among all the companies bunded in 2014) and has 250 employee count econd highest among all companies)	Global Presence Workforce Size Active Years Awards/Recognition						12

PERFECT DAY

The company has a strong financial backing along with noteworthy brand partnerships and IP portfolio, making it a strong contender in the alt-fats space

Patents



- Total **14 patents**, with 11 pending, 1 granted and 2 Lapsed.
- Patents mainly focus on Cocoa, Compositions of macromolecular compounds, dairy products, Foods, foodstuffs, or non-alcoholic beverages, Protein compositions for foodstuffs
- First patent was filed in 2000, while maximum number of patents were filed in 2019, 2020 and 2021 (3 each year).

Financial



- The company has completed total 10 rounds of funding, the latest being privatization.
- In 2021, the company raised funding of US \$350M in Series D1 venture deal led by Temasek Holdings and Canada Pension Plan Investment Board.
- Continental Grain Company sold a stake in the company to an undisclosed buyer on November 15, 2022.

Research and Development



- The company has been <u>building a team</u> to expand their capabilities into animal-free, flora-made fats starting with milk fat.
- The company aims to use the funds to fuel its expanded focus across biological engineering, ingredient innovation, and consumer products.

Collaborations and Partners



- In 2022, Nestlé partnered with Perfect Day to produce animal-free dairy beverages.
- In 2022, Bel Brands got into animal-free cheese with Perfect Day partnership.
- Perfect Day has acquired pharma-grade solutions manufacturer Sterling Biotech Limited, including three manufacturing facilities that will help the US firm to scale up the production of its precision-fermented protein.



Our work

500+

Market & Business Advisory Projects 100+

Procurement & Supply Chain Projects

150+

Projects & Technology Assessments

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