



TREND DEEP DIVE

ALTERNATIVE PROTEINS

1H 2020

FutureBridge



01

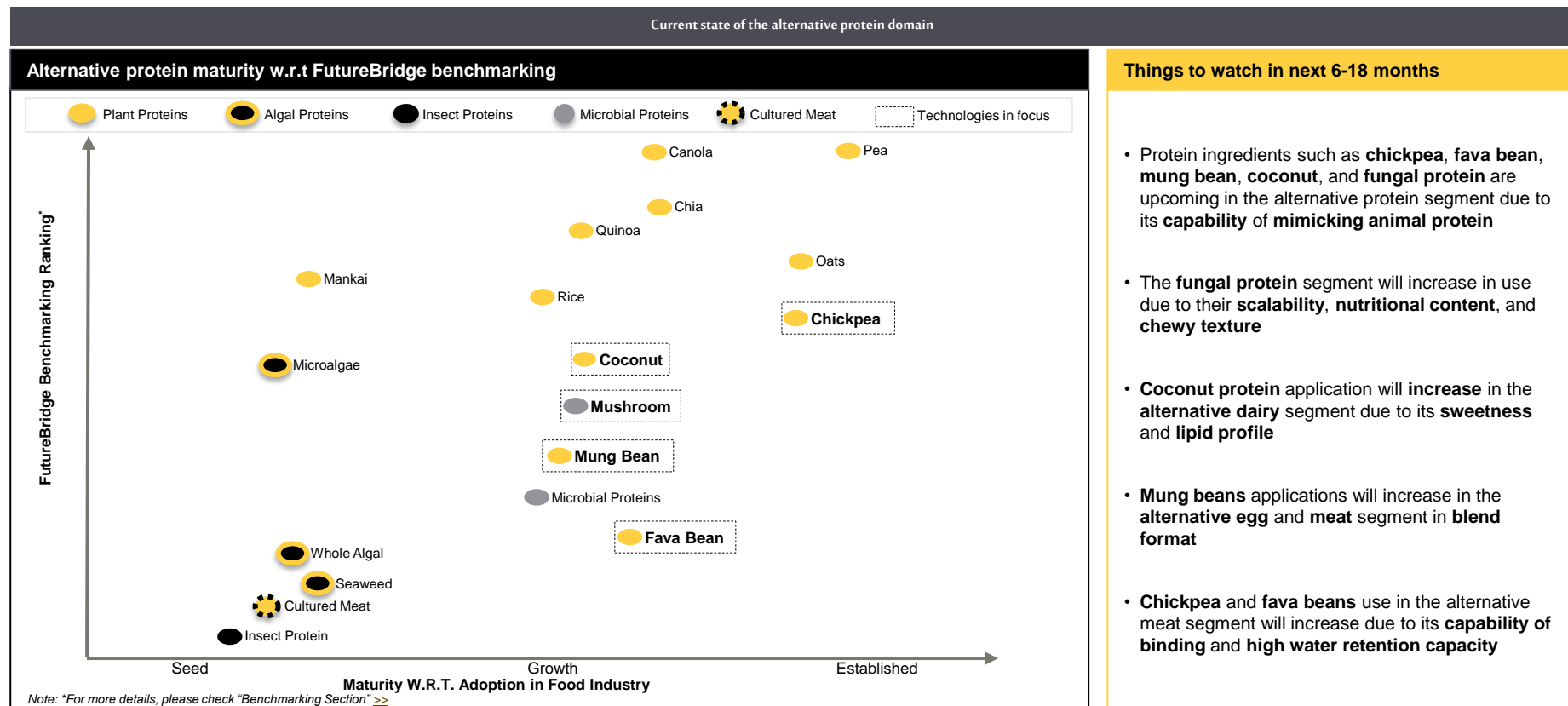
EXECUTIVE LENS

Summarized insights for alternative proteins w.r.t. trends in technology, market, and players



State of the Trend

Plant proteins dominate the alternative protein domain with fungal protein is expected to rise in use

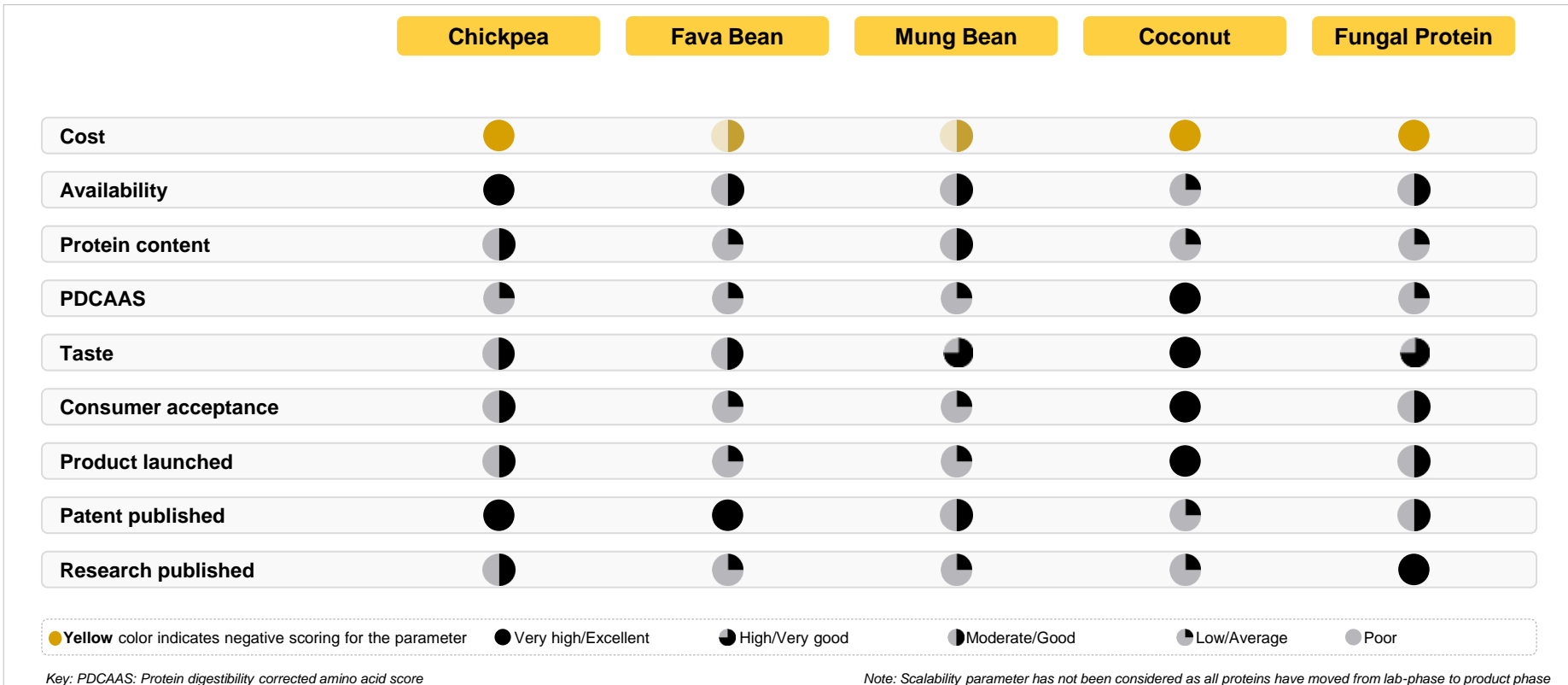


Things to watch in next 6-18 months

- Protein ingredients such as **chickpea, fava bean, mung bean, coconut, and fungal protein** are upcoming in the alternative protein segment due to its **capability of mimicking animal protein**
- The **fungal protein** segment will increase in use due to their **scalability, nutritional content, and chewy texture**
- Coconut protein** application will **increase** in the **alternative dairy** segment due to its **sweetness and lipid profile**
- Mung beans** applications will increase in the **alternative egg and meat** segment in **blend format**
- Chickpea and fava beans** use in the alternative meat segment will increase due to its **capability of binding and high water retention capacity**

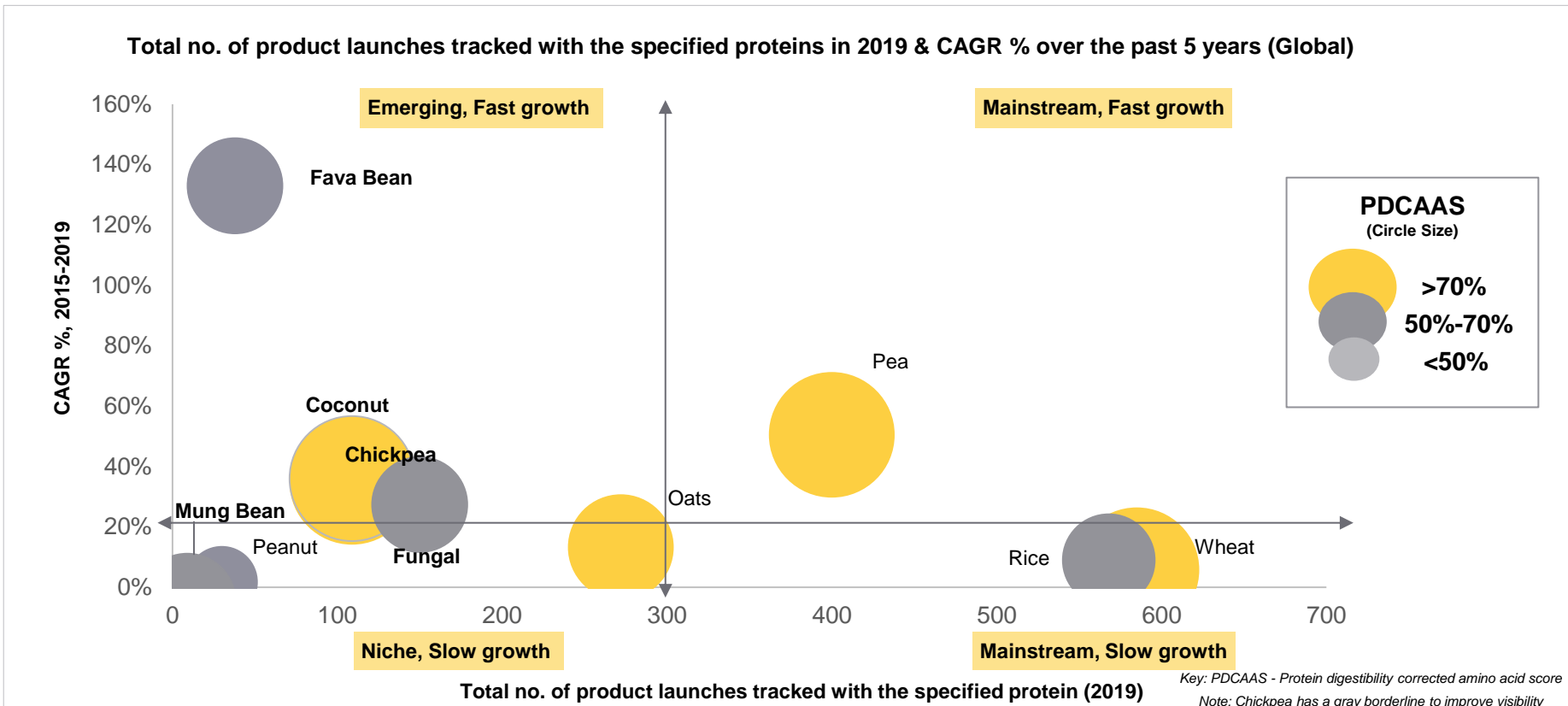
Technology Overview

Ingredients such as chickpea, fava bean, mung bean, coconut, and fungal protein are upcoming in the alternative protein segment due to their functional parameters



Product Launches Overview

Ingredients such as chickpea, fava bean, mung bean, coconut, and fungal protein are upcoming in the alternative protein segment due to their functional parameters that mimic animal proteins nutritional profile and texture



Market Overview

Ingredient technologies such as chickpea, fava beans, mung beans, fungal protein, and coconut have increased presence in the Asian, European, and North American region with a focus on resolving challenges such as improving texture and nutritional quality

Chickpea

- **Chickpea protein** is utilized in the **meat segment** with **increasing product launches** from **major companies** in **Europe**
- The protein is mainly utilized in **blend format** to **reduce** the **anti-nutritional** and **bitterness** aspects of the protein
- **Majority patents published** in the chickpea segment are from **established companies** such as **Unilever** and **Hershey**. The patents published are **increasing** and in the **Asian** and the **US** regions
- **Steadily rising research** is observed in the **Asian** and **European** region with a **focus** on **developing sustainable processing techniques**

Fava Bean

- Fava bean protein is utilized in the **meat** and **dairy segment** and its **adoption** has **increased drastically** in **2017-2018**.
- **Product launches** are increased in the **North American** and **European** regions with companies such as startups and established companies utilizing the ingredient in blend format. The **European region** is in the forefront for utilizing fava bean as it is a **local crop** and is **sustainable**
- A **rising number of patents** are **published** in the segment with focus the **US** and **China** as **product launches** in these regions increase
- **Research** in the segment is focused in **Asian** and **Middle-east** region and increased **product launches** with the **fava beans** can be expected in the **Middle-East**

Mung Bean

- The mung bean protein is majorly utilized in **meat** and **dairy segment** **due to its gelation and emulsification property**. **Product launches** are observed in the **Asian** region due to mung being a local crop
- **Research peaked in 2017-2018** to **improve** the **nutritional quality** of products and **ingredient stability**
- **Majority patents published** are observed in the **Asian** and the **US** regions with major filings being for established and start-up companies, which indicate these territories to be **higher in product launches** in the **future**

Fungal Protein






- The fungal protein is majorly utilized in **meat segment** due to its **chewy** and **fibrous texture**. **Product launches** are observed in the **European** region due to the region being the **hub of alternative protein activity**
- Growth in **product launches** is observed from **2017**, which can be due to the **higher patent published from 2016**
- **Majority patents published** are observed in the **Asian** and the **US** segment, which indicates these territories to be **higher in product launches in the future**
- The research segment is steady from **2015** to **2019** and major research in observed in the **US** and **China** region due to expected **higher product launches**

Coconut

- The coconut protein segment has grown with a **CAGR of 28%** and a **high focus** in the **dairy substitutes** segment. The launches have **steadily risen from 2015** with **established** as well as **startup players** introducing **products** mainly in the **European** region
- **Patent activity** in the **coconut protein segment** **peaked in 2017** with a focus in **China** and the **US** and are **focused on improving** the **functionality of coconut** in the **plant-based dairy segment**
- **Research analysis** in the segment indicates a **steady increase from 2017** as **Asian** countries such as **Thailand, India, and Malaysia** focus on increasing the utilization of coconut and benefit from its **large crop production** in the **Asian region**

Start-up Overview





































Start-ups such as Chick.P, Nature's Fynd, Karana, Michroma, and Hooked are active 2020 with products catering to the alternative meat seafood, and colorant segment

| Concept | Production of chickpea protein with lower bitterness | Produces plant, algae, seaweed blended alternative seafood | Minimally processed jackfruit used to produce plant-based pork and chicken | Sustainable, plant-based, and fungi-based colorants production | Protein produced by non-GMO micro-organisms to produce rebaudioside |
|--------------------|---|---|--|--|---|
| Entity |  |  |  |  |  |
| Description | Chick.P produces a chickpea-based protein that has developed a protein extraction process that reduces the bitterness in chickpea protein | Hooked company is develops vegan tuna and vegan shredded salmon from soy protein isolate, sea algae and seaweed | Karana utilizes minimally processed jackfruit to produce plant-based pork or chicken . Jackfruit is high in fibre, vitamins, and potassium . | Michroma provides plant-based and insect-based dyes, which are healthy and sustainable | Nature's Fynd utilizes Fusarium yellowstonensis for producing protein by fermentation . The protein is a rich source of fibers, vitamin B12, vitamin D, iron, and calcium |
| Funding | Undisclosed | Undisclosed | > USD 1.7 Mn | USD 0.45 Mn | USD 113 Mn |
| Geographical Reach | Middle East | Europe | Asia | North America South America | North America Asia Africa Middle East |
| Additional Notes | <ul style="list-style-type: none"> • Raised funding to expand geographical presence and increase portfolio • Produces chickpea proteins with lower bitterness | <ul style="list-style-type: none"> • Utilizes soy, sea algae, and seaweed to provide umami flavor to alternative seafood • Plans to provide products in the foodservice and ready meal industry | <ul style="list-style-type: none"> • Jackfruit mimics meat due to its stringy texture • The recent funding round will help the company in commercializing and scaling-up its production | <ul style="list-style-type: none"> • Expanding its portfolio to produce fungi-based food colors • Utilizes CRISPR technology to produce food colors | <ul style="list-style-type: none"> • The products are non-GMO • Funding is utilized to commercialize its products |
| Commercialized | Products commercialized | Products commercialized | Products commercialized | Products commercialized | Products in pipeline |

Protein Ecosystem

The plant-based ingredients are the most utilized sources in the alternative protein segment as they are easily sourced and have known usage in food materials

- The alternative protein segment is rapidly evolving and utilizing a wide variety of ingredients to **mimic** the **nutritional profile** of animal protein
- The **plant**, **algae**, and the **fungal** segments are the **foremost** in producing alternative protein products due to their **relatively extensive use** in the **food and beverage industry** as well as their **regulatory approvals** for use in food products

| Pulses & Legumes | | Cereals | | Seeds | | Fruit & Nuts | | Algae, Fungi & Aquatic plants | | Others | |
|---|-----------|---|----------|---|----------------------|--|-----------|---|-------------|---|-------------------|
|  | Peas |  | Wheat |  | Canola/ Rape seed |  | Almond |  | Mycoprotein |  | Insect Protein |
|  | Soy Bean |  | Rice |  | Hemp seed |  | Coconut |  | Seaweed |  | Sugar Beet |
|  | Fava Bean |  | Oat |  | Chia seed |  | Cashew |  | Duckweed |  | Microbial Protein |
|  | Chickpea |  | Quinoa |  | Flax seed |  | Peanut |  | Spirulina |  | Wool |
|  | Mung Bean |  | Barley |  | Pumpkin seed |  | Pistachio |  | Chlorella |  | Leaf Protein |
|  | Lupine |  | Amaranth |  | Watermelon seed |  | Jackfruit | | | | |
|  | Lentil |  | Corn | | | | | | | | |

Source: FutureBridge Analysis

North America

55 Madison Ave, Suite 400
Morristown, NJ 07960
USA
T: +1 212 835 1590

Europe

Stadsplateau 7
3521 AZ Utrecht
The Netherlands
T: +31 30 298 2108

United Kingdom

5 Chancery Lane
London EC4A 1BL
United Kingdom
T: +44 207 406 7548

Asia Pacific

Millennium Business Park
Sector 3, Building # 4, Mahape
Navi Mumbai 400 710
India
T: +91 22 6772 5700