

# Oil solutions that enable plant-based goodness

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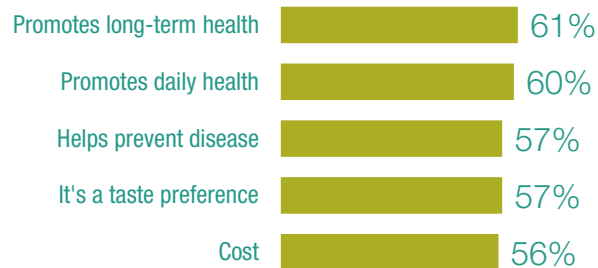
Plant-based  
meat alternatives  
**Insights Report**



Driven by a growing consumer demand for wellness, sustainability and animal welfare, the market for plant-based foods is expanding rapidly. Gone are the days when plant-based alternatives were relegated to niche consumers, warranting little shelf space on grocery aisles. Today, companies are racing to create new products and brands that appeal to a more health-focused consumer. Consumers have been increasing their plant intake for many years now, but recent activity indicates the mainstreaming of this trend, with the Covid pandemic even accelerating it. In 2020, 55% of European consumers confirmed that they increasingly incorporated plant ingredients into their diet (Health Focus International, 2020).

### Importance in driving plant-based food and beverages choice

% extremely/very important EMEA, among respondents who choose plant-based



(HealthFocus International, 2020)

Health is the biggest driver for choosing plant-based, with 61% of EMEA plant-based consumers citing “promotes long-term health” as extremely/very important in them making a plant-based choice. This was closely followed by other health related reasons: “promotes daily health” (60%), and “helps prevent disease” (57%).

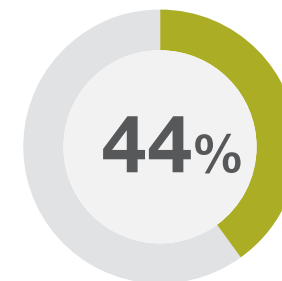
Food and beverage producers are answering this growing consumer demand, with a 44% increase reported in plant-based new product launches between 2016 and 2020 (Innova Market Insights).

Among this growth, plant-based meat alternatives are one of the fastest expanding categories within the entire food & beverage industry right now. This trend is largely driven by growing demand from the newly identified consumer group of “flexitarians” (i.e. flexible vegetarians), rather than by the relatively niche vegan consumer group. Flexitarians are seeking out great tasting alternatives for reasons of health, animal welfare, and especially the environment.

These consumers do not want to give up on meat altogether, but rather they want to reduce their consumption, and increase their intake of plant-based foods, for the benefit of the planet. In fact, **79% of EU consumers say that they have “limited/reduced the number of red meat/poultry they have eaten in the last 6 months”** (Mintel, 2020).



Right now, meat alternatives volumes still only represent 2% of the market for all “meat” in Europe (Euromonitor). However, the value of the segment is strong, with plant-based meat alternatives representing 3% of the entire “meat” market. The long-term trajectory is also one of growth, with Euromonitor forecasting the share to increase to anything between 11-22% of total processed meat volume by 2035.



**EMEA New product launches CAGR% growth between 2016 and 2020**

(Innova Market Insights, 2021)

## Importance in driving plant-based food and beverages choice

% extremely/very important EMEA, among respondents who choose plant-based



Source: HealthFocus International, 2020

However, despite their growing appeal, there are still some consumer hurdles that exist around their full mainstream adoption. A HealthFocus International survey (2020) asked EMEA consumers who are “not interested in alternatives to animal products,” why this was the case. The primary cited reason was cost (24%), but other leading reasons included “I am not sure what is in them” (23%), “I don’t think they taste as good” (22%), and, “I don’t think they are healthy for me” (19%). Concerns around processing levels, texture, and nutritional equivalence to animal-based products, were also cited further down the list.



Fueling widespread adoption will clearly only be achieved by overcoming the innovation challenge of achieving “the promise of parity,” whereby alternative proteins match animal protein in taste, texture, and price. Furthermore, considerations around label-friendliness and nutritional equivalence will need to be taken into account.

This will require considered work in plant-based proteins, and texturizers, when it comes to replicating the structuring, gelling, emulsifying, coloring, flavoring, and nutritional benefits of real meat.

Additionally, plant-based oils & fats choice is a key component here too, particularly when it comes to mimicking the visual aspect, and the cooking behavior of meat. **Making the right selection is essential to replicating the juiciness of the meat, and preventing the plant-based meat alternative from becoming dry.**

## The perfect portfolio to achieve perfect balance

Since vegetable oils & fats are essential in plant-based meat alternatives, finding the optimal mix is key to enabling an optimal texture and organoleptic properties, and an improved nutritional profile. The perfect combination of different plant-based oils and fats will let you to get as close as possible to the visual and melting aspects of animal-based fat.

Cargill is the perfect partner to help you succeed within this marketplace, with the portfolio and expertise to enable your success. We offer a broad portfolio including liquids, laurics, palm-based solutions, and blends & specialties that help your products stand out in terms of taste, texture, and visual appeal.

Right now, the vast majority of oils for these applications (approx. 95%) consists of sunflower, rapeseed, coconut and as well as palm.

All of our offerings have been created to serve various nutritional needs – low in saturated fats (SAFA), low in trans fats, and with an optimized Nutri-Score.

### Our solutions

#### The liquids

- Sunflower/rapeseed/linseed/groundnut



#### The laurics

- Coconut: Sustainable certified available
- Palm kernel
- Fully Hydrogenated available



#### The Fats

- Palm based solutions
- Sustainable certified available
- Tailor made solutions



#### The blends or the specialties

- Palm alternatives such as cocoa butter
- Fully hydrogenated available
- Tailor made solutions



### Benefits from our solutions

- Bring excellent sensoric properties and flavour release
- Give lubricity
- Provide juicy mouthfeel
- Solutions for various nutritional profile

- Bring excellent sensoric properties and flavour release
- For extra white colour experience
- Ensure high oxidative stability for long shelf life

- Provide excellent structural properties for the best texture and meat-like appearance
- Ensure high oxidative stability for long shelf life
- Enable increasing succulence

- Support the meat-like appearance and mouthfeel
- Deliver excellent structural properties



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## Rainforest Alliance Certification is available for sustainable coconut oil.

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Among this strategy, **Cargill has committed to a transparent and sustainable coconut oil supply chain that promotes good agricultural and sustainable business practices across the coconut supply chain.**

All solutions in our portfolio represent a direct investment toward a more sustainable coconut oil supply chain, that benefits farmers, their communities, and the environment. This supply chain model supports smallholder coconut farmers to improve their livelihoods, and protects the wellbeing of coconut farming communities. Rainforest Alliance Certification is available for sustainable coconut oil.

Our history in the sustainable coconut space includes delivery of the world's first Rainforest Alliance certified copra (the processed, dried kernel of coconut utilized in the extraction of coconut oil) in the Philippines and Indonesia in 2015, based on a new, sustainable coconut farming culture.

Coconut oil is much more prevalent in plant-based meat alternatives than palm oil, however we are aware that more and more producers are opting to use non-palm solutions. That's why we've developed a "palm-free" product range that's suitable for plant-based meat alternatives. It's a mixture of liquid oils and plant-based fats that meets sustainability requirements, while having similar functionality to palm oil, as well as a better nutritional profile than palm oil. Of course we do offer RSPO certified palm oil, for customers wishing to use this highly functional oil in their plant-based meat alternative products.

### Sustainable solutions are key

Since sustainability is important to flexitarians, there is a growing trend to using sustainable plant-based oils. This is where our solutions come in, by enabling plant-based meat alternative manufacturers to produce solutions that are good for people, and the planet. This is all supported and covered from innovation idea start to production scale up.



## The need for an applications driven approach

The European market for plant-based meat alternatives can be technically categorized into three segments:



**1 Coarse ground & formed meat analogs.**



**2 Emulsified and sliced meat analogs e.g. cold cuts.**



**3 Emulsified meat analogs e.g. hot dogs.**

Each of these categories requires its own technical considerations when making fats & oils selection, so that consumer expectations are met, at both retail shelf level, and ultimately at home in the kitchen.

In the case of plant-based meat alternative sausages or hot dogs, you can directly introduce fats & oils into the mix together with the rest of the recipe, as consumers expect to see a homogenous substance which they can cook up into a delicious sausage.

But when it comes to a hamburger patty, consumers would expect to see a product that consists of red flesh with in a minced structure containing white fat particles, which they associate with the juicy experience. When they go home to prepare their traditional hamburger, they will see that during frying the fat melts and generates juicy “holes” in the meat.



Even before they have actually tasted the burger, that cooking experience will determine whether the consumer will ultimately like the product or not. So, **when preparing a plant-based meat alternative patty, it's important that the visual appeal, baking behavior and melting of the fat, remains similar to the real thing.** Doing this can be achieved by introducing powders into the plant-based meat alternative mix. In this way, you do not melt the fat completely, but instead include tiny pieces, and achieve the marbling effect in patties that consumers expect.

## A holistic approach to plant-based meat alternatives

But competence in plant-based oils is just one aspect of the formulation conundrum. Other important components of a plant-based meat alternative solution are protein, blended solutions, and salt.

**Understanding how each of the components works and how they interact can “make or break” the success of the final product.** Let’s take proteins for example. Protein powders, even if from the same botanical source, can vary in their performance. A textured protein lays the base for plant based patty or minced meat alternative. It can come in different shapes, sizes and composition which will all impact the eating properties. Furthermore, vegetable oils & fats can be tailored to meet texture and nutritional needs. Finally, the blended ingredient solutions play a crucial role in boosting certain functionalities that are missing for example emulsification, gelling and water binding.

In short, the building blocks may vary for different meat alternatives applications, but the expertise to get the best from the ingredients is key. As Cargill, is a “one solution provider” with a wide range of solutions from plant proteins to fats, texturizers etc., we can take a holistic approach to address specific challenges:



### Protein:

Enrichment & functional solutions (vital wheat gluten, hydrolyzed wheat protein, pea protein isolates, hydrolyzed pea protein and coming soon; textured vegetable protein for the best meat-like experience.



### Oils & fats:

Mix of vegetable oils & fats are required to enable an optimal texture and improved nutritional profile.



### Texturizers:

Compensate for a lesser texture profile of the plant-based protein, by using texturizers like starch, carrageenan, and lecithin.



### Blends:

INFUSE by Cargill™ tailor-made blended solutions leveraging Cargill’s complete portfolio of plant-based proteins, texturizers, emulsifiers, fats and oils.

Effectively working with these building blocks demands an understanding of the complexity, linked to the interaction between multiple ingredients, rather than just focusing on one specific part of the formulation.

The new INFUSE by Cargill™ service offering model is the perfect example of where our knowhow and application expertise comes into play, to help your product stand out in taste, texture and visual appeal. It offers customers a way to reformulate their products enabling them to stay ahead, by offering a blend of ingredients which simplifies and speeds up product development through to launch much quicker than a traditional innovation cycle. For example, we have already developed several new

functional binding systems under our Flanogen® brand that are suitable for a wide range of plant protein products. These systems are made using the best functional ingredients like texturizers, fibers and starches to deliver on the core requirements for plant-based meat alternatives: processability, sliceability, texture authenticity and storage stability.

In summary, Cargill has the extensive technical & ingredient knowledge about texturizers, proteins and fats behavior and interaction. **With our holistic approach we understand the complexity, linked to the multiple ingredients rather than just focus on one specific part of the formulation.**

**As Cargill, is a “one solution provider” with a wide range of solutions from plant proteins to fats, texturizers etc., we can take a holistic approach to address specific challenges**

## Next-generation plant-based protein

Looking further still down our development roadmap there are exciting avenues in the pipeline to respond to flexitarian consumers' growing appetite for plant-based products.

In April 2021, Cargill announced an investment in Netherlands-based **Bflike**, a start-up created by BOX NV that is poised to be a **new technology leader in the rapidly evolving alternative protein categories**. The partnership combines Cargill's extensive food ingredient solutions with Bflike's recipes and technology, to give food manufacturers and retailers the opportunity to bring tasty plant-based products to market quickly and affordably. Bflike has a robust product pipeline of alternative protein formulations, ready to hit the market this year, next to the vegetarian burger and minced meat options that are already available.

Key to Bflike's innovation is its patent-pending vegan fat and blood platforms. This groundbreaking technology results in plant-based protein alternative products that

are virtually indistinguishable from their animal-based counterparts, with similar visual appearance (both raw and cooked), texture, mouthfeel, melting behavior and cooking performance.

Equally important, the Cargill-Bflike collaboration will position customers to move **seamlessly from pilot to commercialization** and allow them to **scale up** quickly, using their own production process and machinery, while being supported by Cargill's secure supply of critical ingredients.



*Virtually indistinguishable from their animal-based counterparts.  
Images: Bflike*

## The applications knowhow to succeed

Having the ingredients that can provide a solution for plant-based meat alternatives is of course important. But equally crucial is ensuring that the **lab and pilot capabilities are in place** to build tailor-made solutions, as well as the technical knowledge to come up with different formulation options.

After all, if a customer wants to achieve a specific melting behavior, you really need to get to a very specific combination of different liquids and fats in the right proportion. That simply requires formulation experience in oils & fats.

This is where the competencies of our applications teams at our European R&D headquarters in Vilvoorde are so important in matching the best oils & fats blend (whether liquid or powder) for each individual application. For

example, they understand whether you should first mix the oil with the proteins, or with the binders.

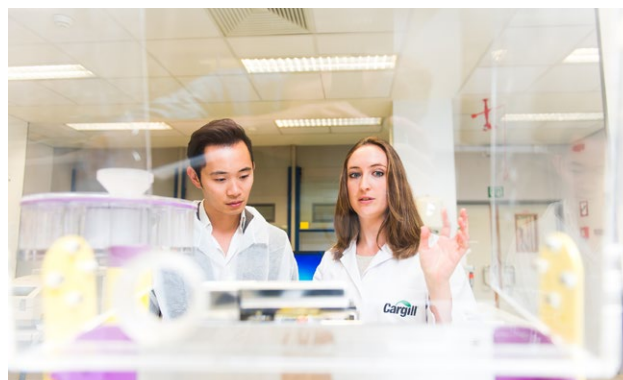
Once the preliminary applications work has been conducted, we then work together with our customers on further addressing aspects around juiciness, texture, and mouthfeel. By integrating our application knowledge together with insights from our work into proteins, starches, and blends, we are capable of adjusting the required oils & fats to the desired customer protein, as well as in helping them to adjust the recipe to the customer production process.

Our expertise and knowledge in applications is crucial to your success, as is our approach to risk management, and of course our unparalleled portfolio of solutions. Cargill has the extensive technical advice & ingredient knowledge in house to develop ideal plant-based meat-alternative products.

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## The right solutions for your next product winner

Changing from one animal-based fat source to another is easier said than done. You really need a lot of formulation experience to understand how the choice of the alternative plant-based protein is going to impact the interaction with all the other ingredients.

Responding to consumers' growing appetite for plant-based products that deliver a "meat-like" experience, Cargill is helping our customers offer a new generation of plant-based meat alternative products that truly mirror the sensory experiences of traditional animal-based counterparts.

We are enabling plant-based alternatives that exceed consumer expectations and enrich consumer diets with responsible, sustainable, and affordable options. Our ingredients, formulations, and knowhow enable our customers to deliver the product quality they desire, and processing efficiency. Our understanding of the complexity linked to the multiple ingredients is the key to find the right solution together.

Let's help you create next generation plant-based meat alternative products that truly mirror the sensory experiences of traditional animal-based counterparts. Connect with our oils & fats experts today to access reliable supply of plant-based meat alternatives at the standards you expect.



### Solutions that help goodness

- 100% plant-based.
- Certified-sustainable sourced raw materials.
- Transparency & traceability in supply chains.
- Cargill's externally audited processes and food safety standards.
- Solutions to improve nutritional profile.



### No compromise on sensory properties

- No compromise on mouthfeel.
- Texture improvement.
- Animal-fat-like appearance.
- Juicy and tasty meat-like experience.
- The same cooking experience as meat.



### Growing together

- Extensive oils & fats portfolio and in-depth ingredient expertise.
- Deep formulation & application knowledge.
- Global regulatory & nutrition capabilities.
- Strong expertise in ingredient development & processing.
- Supply chain management to meet growing needs.
- Better & easy processing: can be directly useable on existing processing lines.
- Fast innovation cycles, flexible and capable to grow together.

**Connect to our experts to help you create next generation plant-based meat alternative products that truly mirror the sensory experiences of traditional animal-based counterparts!**

**[cargill.com/emea/edible-oil-solutions](https://cargill.com/emea/edible-oil-solutions)**

## Oil solutions that enable plant-based goodness



100%  
plant-based



Juicy and tasty  
meat-like experience



No compromise  
on sensory properties



**Cargill**® Helping the world thrive