



Plant-based foods – a growing market



Photo: Wicked Kitchen

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How much is the market worth?

The market for plant-based alternatives is growing in size

- The global plant-based meat market is currently **valued at \$12.1 billion** and is predicted to grow at a CAGR of 15% over the next six years, reaching almost **\$28 billion by 2025**.⁽¹⁾ (5/2019)
- In fact, Barclays analysts predict the meat alternative industry will soar to a value of **\$140 billion by 2029**.⁽²⁾ (4/2019)
- In 2017, globally, **frozen meat alternatives** were more popular than refrigerated or shelf-stable variants, **with a market share of 77.2%**, while TVP, with a market share of 35.8%, was the most popular of the plant-based proteins.⁽³⁾ (9/2019)
- Since 2012, the plant-based **market in Western Europe has doubled** in size, with Europe as a whole accounting for **38.5% of total global revenue** in 2017, and per-capita meat consumption having decreased.^(4,5) (2017) (9/2019)

Plant-based Meat



The market for plant-based alternatives is growing in size

- The **plant-based fish and seafood market** is in its infancy, with **annual sales of only \$10 million in the US**, versus \$800 million for plant-based meat in the same market.⁽¹⁾ (2019)
- However, high-profile investors from the meat industry are betting on plant-based fish and seafood, with **German poultry producer PHW having invested in Good Catch** ⁽²⁾ (8/2019) and **Tyson Foods having recently invested in New Wave Foods** ⁽³⁾ (9/2019), signalling their conviction that this category will be the next big thing.
- Moreover, a growing number of products are appearing in retail locations. For instance, Tesco launched its own-brand plant-based range, which is to include battered fish-free fillets, while Aldi in Germany offer own-brand fish fingers.

Plant-based fish and seafood



The market for plant-based alternatives is growing in size

- According to Research and Markets, revenue from the global **non-dairy milk market** is set to reach **more than \$38 billion by 2024**, growing at a compound rate of more than 14% between 2018 and 2024.^{(1) (3/2019)}
- The **global vegan cheese market** is expected to reach a value of almost **\$4 billion by 2024**, growing at a CAGR of 7.6%.^{(3) (12/2017)}
- Sales of **vegan yogurts are predicted to exceed \$10 billion** by 2029 ^{(4) (11/2019)}, while the **vegan ice cream** sector is expected to reach a value of **\$2.45 billion** within the next decade.^{(5) (7/2017)}
- Food and beverage **launches** with vegan claims have **increased by 21%** (Global CAGR 2015-2019).^{(6) (2/2020)} The dairy category accounts for **one-third of plant-based launches**.^{(6) (2/2020)}
- The **dominance** of the dairy category is driven by the growth in dairy alternative drinks such as soy, nut, coconut and other plant-based milks, as well as non dairy yogurts.^{(6) (2/2020)}

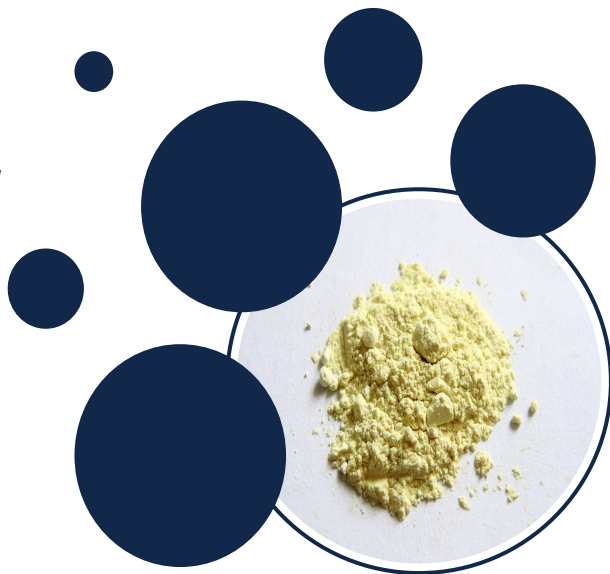
Plant-based Dairy



The market for plant-based alternatives is growing in size

- The global value of the **egg alternative market** is expected to exceed a value of **\$1.62 billion by 2025**, with a CAGR of 5.8%.⁽¹⁾ (2/2019)
- Eggs' versatility, breadth of function, and the frequency with which they are consumed, as well as the comparatively low levels of competition in the plant-based egg space, combine to present an **opportunity for innovative companies** to enjoy strong growth and substantial profit margins.
- In baked system, raw materials such as **Nouravant**, **Alpha-dextrin** and pulses like **chickpeas** and **fava beans** have shown great texture and mouthfeel, living up to an egg's array of functionalities.⁽²⁾ (2/2020)
- Consequently, egg replacements have the potential to disrupt the egg market by providing a great economic alternative and an improved production process.⁽³⁾ (2/2020)
- *JUST Egg* is a prepackaged **wet egg alternative** for omelettes and scrambled eggs. Being available in 22 out of the 23 largest retail stores in the US, it outsells almost half of chicken egg products at a top retailer.⁽⁴⁾ (10/2019)
Just Egg is the **second most bought premixture** among traditional eggs and substitute products.⁽⁵⁾ (6/2019)

Plant-based Egg Alternatives



The market for plant-based alternatives is growing in size

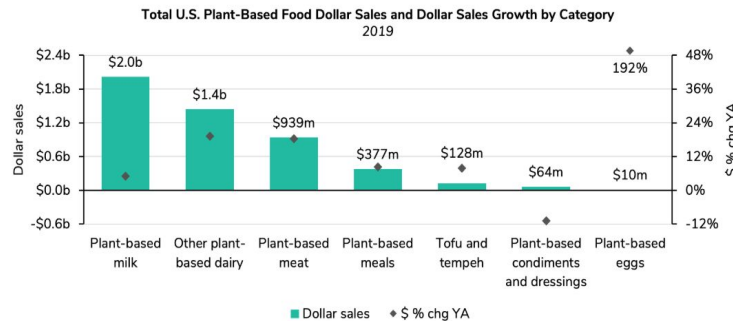
- The **global value of the plant-based snack market** is expected to grow from a value of **\$31.8 billion in 2018** to **\$73 billion by 2028**, at a CAGR of 8.7%.^{(1) (11/18)}
- The **global vegan baking ingredients market** size was valued at **\$1.1 billion in 2018** and is expected to register a CAGR of 5.6% from 2019 to 2025.^{(2) (7/2019)}
- Greggs, the largest bakery chain in the UK, attributes the **58% profit rise** they enjoyed in the first half of 2019 to the **success of their vegan sausage roll**.^{(3) (7/19)}
- A number of food manufacturers and retailers have woken up to the opportunities presented by plant-based baked goods, a hitherto largely underdeveloped category, with Tesco ever expanding its range of sweet and savoury cakes and pastries under its Wicked Kitchen brand, Premier Foods launching its Plantastic brand and Sainsbury's, Waitrose and coffee chain, AMT offering plant-based croissants.

Plant-based
snacks and baked
goods



A closer look at the US market

- Grocery sales of **plant-based foods** that directly replace animal products have **grown by 29% in the past two years** to reach \$5 billion, while **total U.S. retail food dollar sales grew just 4%** over the past two years.
- **Plant-based milk is the most developed** of all plant-based categories, accounting for almost half the total plant-based food market, while **sales of conventional milk were flat** over the past year.
- **Plant-based meat**, which is reminiscent of the plant-based milk category when it was in its early stages of rapid growth, **grew 38% over the last two years**. The **top-selling forms** of plant-based meat are **burgers, followed by sausages, hot dogs and patties**.
- Of all U.S households, **14% purchase plant-based meat compared to 41% who purchase plant-based milk**, underlining the growth potential of the former.
- The popularity of plant-based milk has increased consumer acceptance of other plant-based dairy products, with **plant-based creamer (+93%), yoghurt (+95%), cheese (+51%) and ice cream (+34%)** all experiencing strong growth over the past two years.⁽¹⁾ (3/2020)



Source: SPINSscan Natural and Specialty Gourmet (proprietary), SPINSscan Conventional Multi Outlet (powered by IRI), 52 weeks ending 12-29-2019

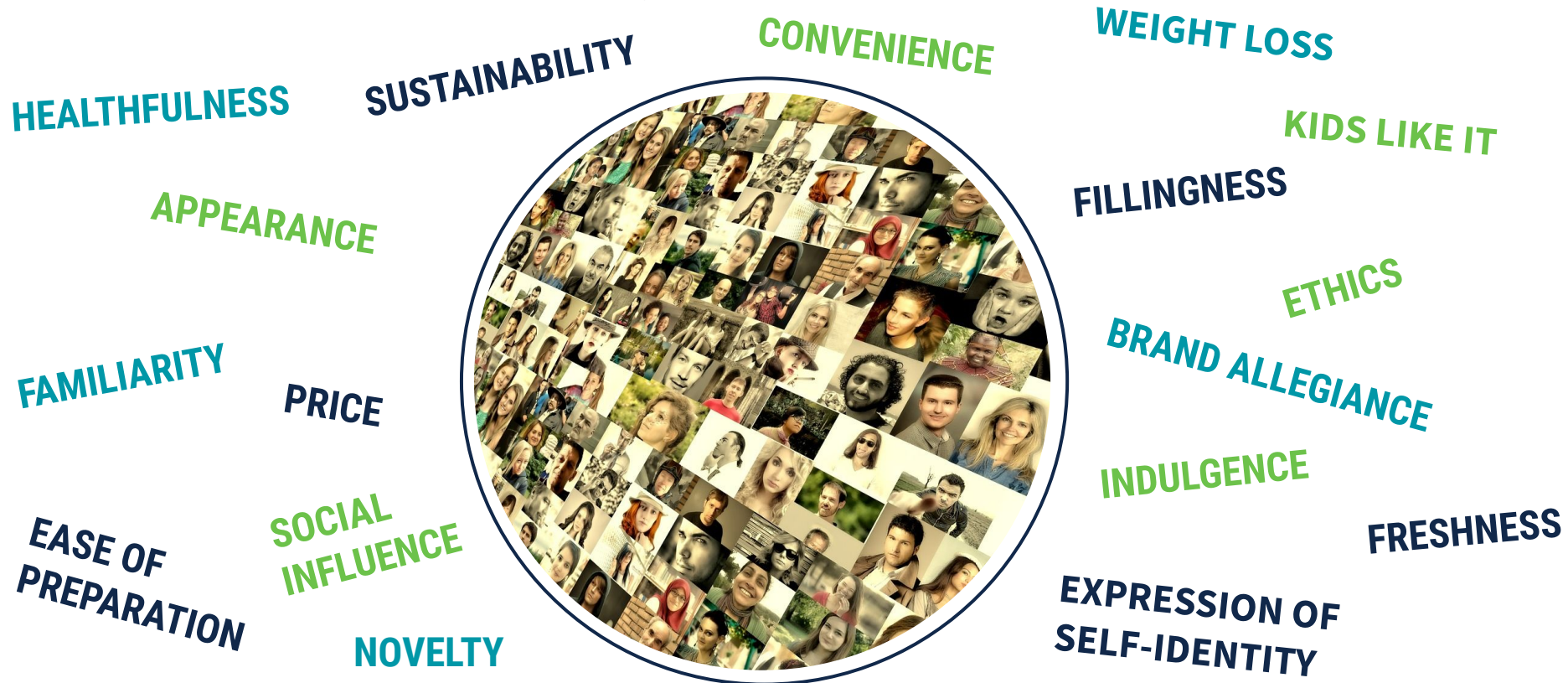
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Who is buying plant-based food?

The **customer base** for plant-based products, as well as their drivers, is increasingly diverse



This means that there is room for a number of different **strategies**,
targeting subsets of this larger group and their varying needs

Let's take plant-based burgers as an example:



Close imitation in terms of both
appearance and taste

Target: meat lovers



Organic, unusual
ingredients

Target: environmentalists



Vegetable-led, emphasis on
seasoning

**Target: health enthusiasts
under time pressure**



What's new in the plant-based market?

Greater raw material diversity



Only an estimated 10% of plant protein sources are currently being utilised. With the rise in demand for plant protein, along with the move towards allergen-friendly ingredients, it's likely that a greater variety of plant sources will be used.

| Hemp | Chickpea | Duckweed/ Lemna | Algae | Fonio | Okara |
|---|--|--|---|---|--|
| Cambridge Commodities Ltd | Innovopro, Artesa | Plantible | Duplaco | OBA | Renewal Mill |
| <ul style="list-style-type: none"> Particularly popular in sports nutrition applications due to its complete amino acid profile. | <ul style="list-style-type: none"> Innovopro's product is clean label and can be used in meat and dairy alternatives, plant-based mayonnaises, and baked goods. It creates a firm and stable emulsion. As such, carrageenan and modified starches are not required. Artesa can match dairy proteins in terms of taste, texture, mouthfeel, and formulation functionality. | <ul style="list-style-type: none"> Duckweed possesses unique functionalities. It is more digestible than soya, pea, or algae, and can be used in meat alternatives, dairy alternatives, and snacks | <ul style="list-style-type: none"> Chlorella supplied by Duplaco is used in meat alternatives. Algae is finding its way into other categories too, e.g. mayonnaise. | <ul style="list-style-type: none"> Fonio is an ancient West African grain which has recently been approved for use in the EU. Among other applications, it can be used as an egg replacer in vegan burgers. | <ul style="list-style-type: none"> Renewal Mill uses soy pulp (a by-product from tofu production) to make flour which can be used in plant-based applications. In the future, Renewal hopes to do the same with by-products from pea-based and oat-based food production. |

Greater category **transcendence** of raw materials



We are starting to see commonly-used raw materials **no longer being confined to a specific product category**. For example, **oats** have long been used for milk and are accepted in this category, but are now being used in plant-based meat from Finnish brand, Gold & Green.

Pea protein, on the other hand, has mainly been used in meat alternatives thus far (e.g. in Beyond Meat burgers) but is now **increasingly finding its way into plant-based dairy** applications. Vly is a Berlin-based startup comprising nutritionists, scientists, and management consultants that uses yellow pea protein as a base for milk and yoghurt. Ripple uses pea protein to create plant-based Greek yoghurt.

Fava beans have so far mainly been used in meat alternatives but are now also **used in low-fat ice cream**.

We predict that this will continue to happen with all kinds of raw materials. Off flavours are often a key issue when using peas as a product base, and this is a problem, to varying degrees, for pea protein in many applications. There are already some good solutions in the market but we expect that in the future companies will make use of **economies of scale** and **ensure return on R&D investment** by finding as many applications as possible.

| Oats | Peas | Fava beans |
|-----------------|----------------|----------------|
| Typically dairy | Typically meat | Typically meat |
| ↓ | ↓ | ↓ |
| meat | dairy | dairy |

New category **penetration**: sweet baked goods



Plant-based pastries and cakes are just **taking off in retail and foodservice locations**. Now is the time for companies to enter and secure a large piece of the pie. **Retailers in the UK are waking up to the opportunity**, with Waitrose and Sainsbury's now stocking vegan croissants and Tesco's Wicked Kitchen boasting indulgent vegan brownies. Meanwhile, cafe chains such as Starbucks and Pret a Manger are also **responding to the demand** for vegan everything with compelling offerings.

Volatility in the egg market, coupled with demand from consumers with allergies and consumers who are vegan, etc., makes **plant-based baked goods an excellent business choice**.

Similar observations can also be made with regards to savoury baked goods, with UK bakery chain Greggs having launched a vegan sausage roll with great success.

Ulrick & Short, with its product Ovaprox, offers a great clean-label solution to replace eggs in baked goods and sauces. The product has been developed to provide the same volume, texture, mouthfeel, and overall function of eggs. Additionally, in 2017, Austrian food company **Agrana** launched AgenOVUM®BIO, an organic egg replacement.

Category **expansion**: yoghurts in convenient formats, with diverse positioning



The plant-based yoghurt market is expanding, with more types of yoghurt appearing, from low-fat to Greek, and with more convenient pack sizes becoming more commonplace. Increasingly, there's a plant-based something for everyone (for the time-pressed, the foodie, the health freak, the busy mom, etc.), and, as long as the products are well-marketed, visible, and taste good, they tend to do well.

| Ehrmann | Freaks | Ripple | Good Plants | Califia |
|-------------------------|----------------------------|----------------------|------------------------|--|
| Decadent dessert | Thick & natural | Greek yoghurt | Low in calories | Drinkable yoghurts with live cultures |

Layering of multiple **consumer** trends



Increasingly, we're seeing plant-based innovations satisfying multiple consumer needs and reflecting a number of wider consumer trends.

**clean
label**

**allergen
free**

**protein
claims**

**indulgent
snacks**

fermentation

fiber



What will the future bring?

Many elements of plant-based meat and other **alternatives** can be further optimised

FLAVOUR



Now: Crops such as **soy and pea**, used in plant-based meats, tend to have **off-flavours**.

Future: Develop a mechanism to **remove or mask off-flavours** for better-tasting products.

NUTRITIONAL PROFILE



Now: Apart from omega-3s, very **few companies have attempted to replicate animal-based fats** using plant, fungal, or algal sources, in terms of **taste, functionality, and nutritional profile**.

Future: Produce plant-based fats that mimic animal fats, e.g. by **using underutilised crops** as fat sources or producing **plant-based fats from by-product streams**.

MOUTHFEEL



Now: Plant-based meats **do not have the same mouthfeel** as animal-based meats.

Future: Develop **encapsulated plant-based fats** for improved **mouthfeel** of plant-based meats.

TRENDS TOWARDS NATURE



Now: There is evidence that consumers are **increasingly choosing freshly prepared foods** and seeking **clean-label products**, yet most plant-based meats and meals are frozen and very few are clean label.

Future: Develop **refrigerated prepared meals and meats** that are centred around **whole-food ingredients** that **naturally** resemble meat, such as mushrooms and jackfruit.

Translating unmet consumer needs into profits

There are very few market segments, especially in the food and beverage industry, that present the opportunity for companies to be up against so little competition or where demand is so much higher than supply.

PRICE: more affordable options in any product category

NATURAL: whole-food ingredients, clean-label products

PROTEIN: protein-rich products that are soy- and gluten-free

SNACKS: healthier options for snacking

CONVENIENCE: tasty and easy ready-meals

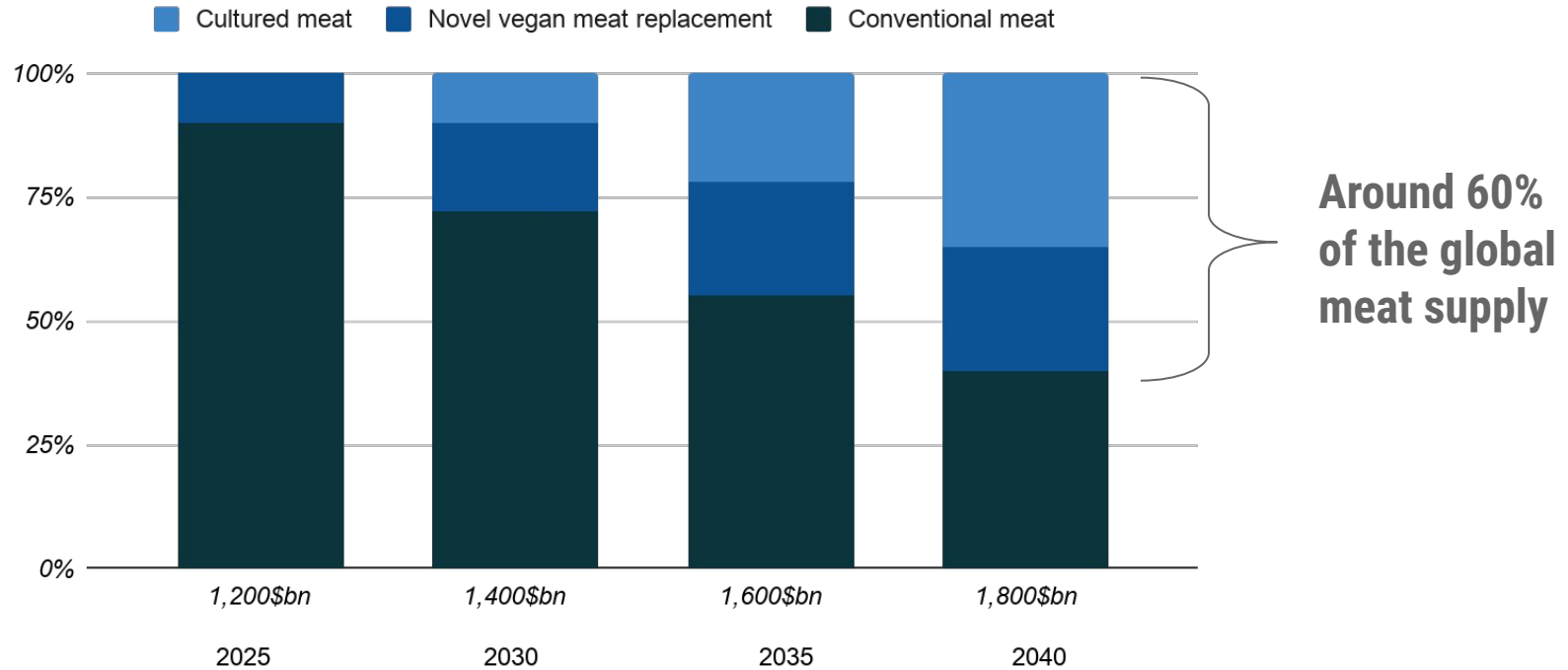
SENSORY EXPERIENCE: improved flavours and mouthfeel

APPEAL: improved messaging



On the cusp of food disruption

Global **meat** market forecast



“[...] novel **vegan meat replacements** and **cultured meat** have the **potential to disrupt** the \$1,000 billion conventional meat industry”

The transformation of beef and dairy in the US

1. **By 2030** the production volumes of US beef and dairy products is predicted to to **decline by more than 50%**, by 2035 nearly 90%.
2. **By 2030** the demand for cow products will have **shrunk by 70%** , by 2035 around 80%-90%. The livestock market such as for pig, chicken and fish will follow a similar path.
3. **Modern food** is predicted to be **cheaper** (at least 50%) and **superior to animal-based foods**. The reduction in food cost has various economic benefits: individuals save food costs and modern food technologies will create a bigger industry.
4. **Half of the 1.2 million jobs** related to the production of beef and dairy **will be lost by 2030**, reaching about 90% by 2035.
5. The rising **modern food technology industry** (precision fermentation industry) will **create 700,000 jobs by 2030**, climbing towards one million jobs by 2035.

Impossible Burger shortages hit restaurants as the meat-free firm races rivals *Los Angeles Times*

KFC Beyond Chicken Sells Out In 5 Hours: Described As 'Kentucky Fried Miracle'

Beyond Meat rockets in early trading on Nasdaq, reaching a valuation of over \$3 billion

UK: Vegan KFC Sold Out in Four Days

Consumer research plant-based proteins (US)

1. 46% of Americans agree that **plant-based proteins are better** for you than animal-based options and 76% claim that plant-based foods are **healthy**.
2. Top reasons of US adults to consume plant-based proteins are **taste** (52%), **health** (39%), **the environment** (13%) and **animal protection** (11%).
3. Less than half (46 %) of Americans say they trust the functional claims made by plant-based foods
4. 67% agree that meat is essential to a balanced diet, although vegetarian, vegan and free-from foods have grown to be **regarded as the healthier option**.

Consumer research

1. International

The **number of people** around the world who have completely switched to plant-based alternatives for sustainability reasons **grew by 44%** between 2014 and 2017

2. Europe

39% of consumers across Europe **buy plant-based products**. These products are asked for due to climate and health reasons.

3. UK

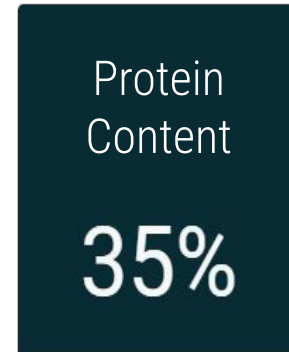
41% of UK processed meat consumers **agree to reduce the amount of processed meat** because they want to increase their sense of well-being.

4. Germany

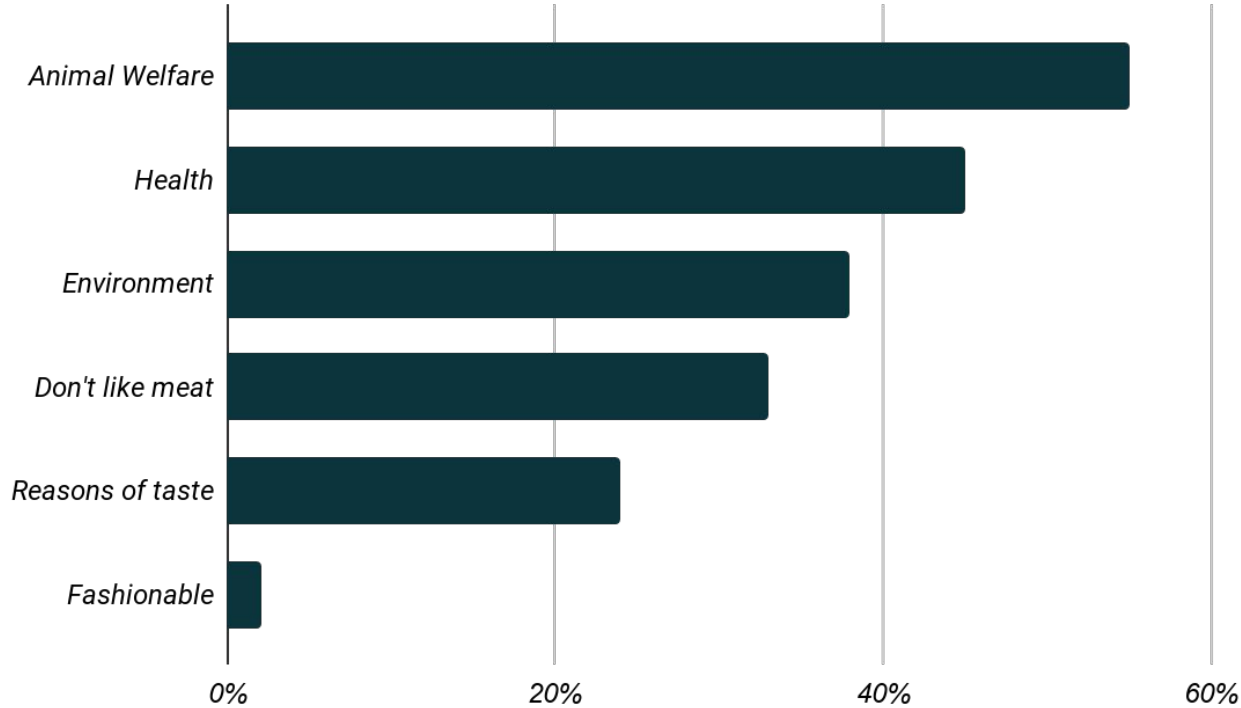
29% of Germans **eat less meat to help the environment and climate**.



What are the most important **factors** for consumers buying plant-based proteins?



Most first time eaters of plant-based alternatives decide to try a product again because of **taste**, close behind comes **naturalness** and **protein content**.



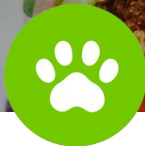
**What motivates
UK consumers to
choose a
vegetarian/vegan
diet?**

About us





**PRO
HEALTH**



**PRO
ANIMALS**



**PRO
ENVIRONMENT**



**PRO
JUSTICE**



**PRO
TASTE**

ProVeg is an international food awareness organisation working to transform the global food system by replacing conventional animal products with plant-based and cultivated alternatives.

ProVeg helps food producers, retailers, and caterers to develop more plant-based products and make them more accessible. In turn, this allows organisations to financially benefit from the growing demand for plant-based options.

Get in touch!



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