

Where does plant-based meat fit in the ultra-processed foods conversation?

This is a summary document, the full detailed guide including additional context and references can be found [here](#).

Find translations of this summary in other languages [here](#).

Plant-based meat and the UPF debate

Plant-based meat is usually considered an ultra-processed food (UPF), but it has a very different nutritional profile from most foods in the category. Most UPF research looks at dietary patterns high in UPF, not individual foods, and is therefore unlikely to tell us much about plant-based meat specifically. In fact, several randomised controlled trials suggest plant-based meat may offer health benefits relative to the conventional processed meat it typically replaces.^{1,2}

Public misunderstanding of UPF and its relationship with plant-based meat currently undermines its considerable potential to support healthier, more sustainable diets. Collaboration among researchers, policymakers, and communicators could help align public perception with evidence, supporting plant-based meat as one of several available tools to make healthier choices more accessible.



Image: Planted

What is the UPF debate?

In recent years, calorie intake from convenient, energy-dense, nutrient-poor foods like sugary drinks, processed meats, and snacks have increased, while intakes of fruits, vegetables, legumes, and whole grains have fallen.

The Nova framework was developed to help explain the causes of this shift, and has linked diets high in UPF to rising rates of diet-related diseases.

While most UPFs are high in calories and low in nutrients, some UPFs have good nutritional profiles, sparking debate over how processing metrics should be used.³

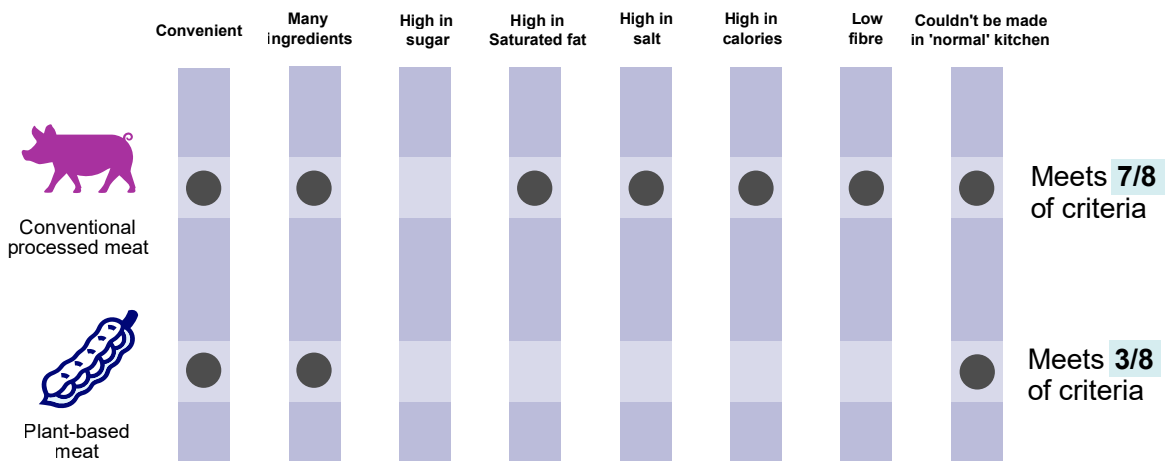
How are UPFs defined?

UPFs are usually defined using the Nova framework. Nova focuses on processing, not nutritional composition, dividing foods into four groups:

- Minimally processed (Nova 1)
- Cooking ingredients (Nova 2)
- Processed foods (Nova 3)
- Ultra-processed foods (Nova 4).

Nova is an epidemiological framework, and research generally explores the different health outcomes of people who eat the most UPF compared to those who eat the least.⁴

Comparison of plant-based meat and conventional processed meat against commonly discussed UPF characteristics



Values based on median data from studies into macronutrient profiles of processed meat and plant-based meat in Spain, the Netherlands, Sweden, the UK and Germany.^{15,16,17,18} Subjective categories of 'convenient' and 'could not be made in a conventional kitchen' were determined based on standard Nova definitions.

What is plant-based meat, and how is it produced?

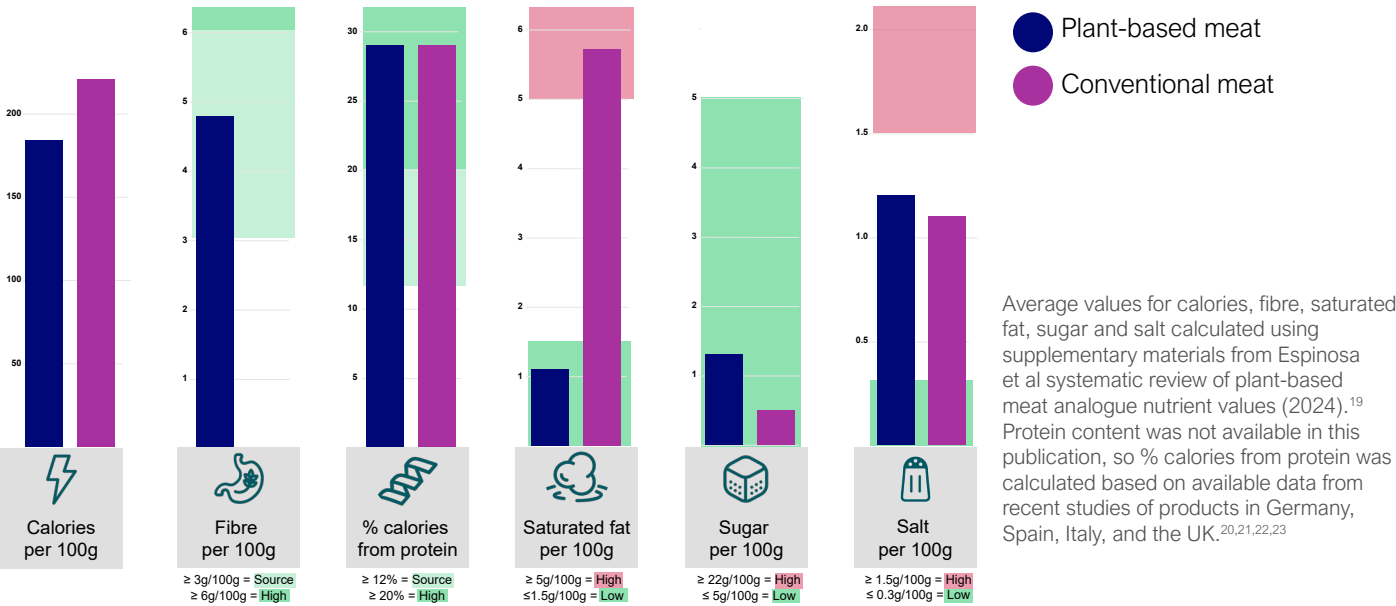
Plant-based meat is designed to replicate the taste and texture of animal meat using plant-based ingredients. There are three primary areas where food processing is used in the production of plant-based meat: making the protein base, texturisation, and adding additional ingredients. Several approaches to each of these exist, some using higher and some using lower levels of processing.

What is the nutritional makeup of plant-based meat?

The nutritional profile of plant-based meat varies across products and countries. However, on average, plant-based meat is a source of fibre, high in protein, low in saturated fat and low in sugar, unlike most UPFs. There are still opportunities for further improvement however:

- More consistent fortification with essential nutrients such as vitamins
- Reduction of salt content

Comparison of nutritional composition of plant-based meat and conventional meat relative to EU and UK health claim thresholds.



What does existing research find on the effect of swapping conventional meat for plant-based meat?

A small but growing body of evidence suggests helping people reduce current over consumption of conventional processed meat using plant-based meat could benefit public health.

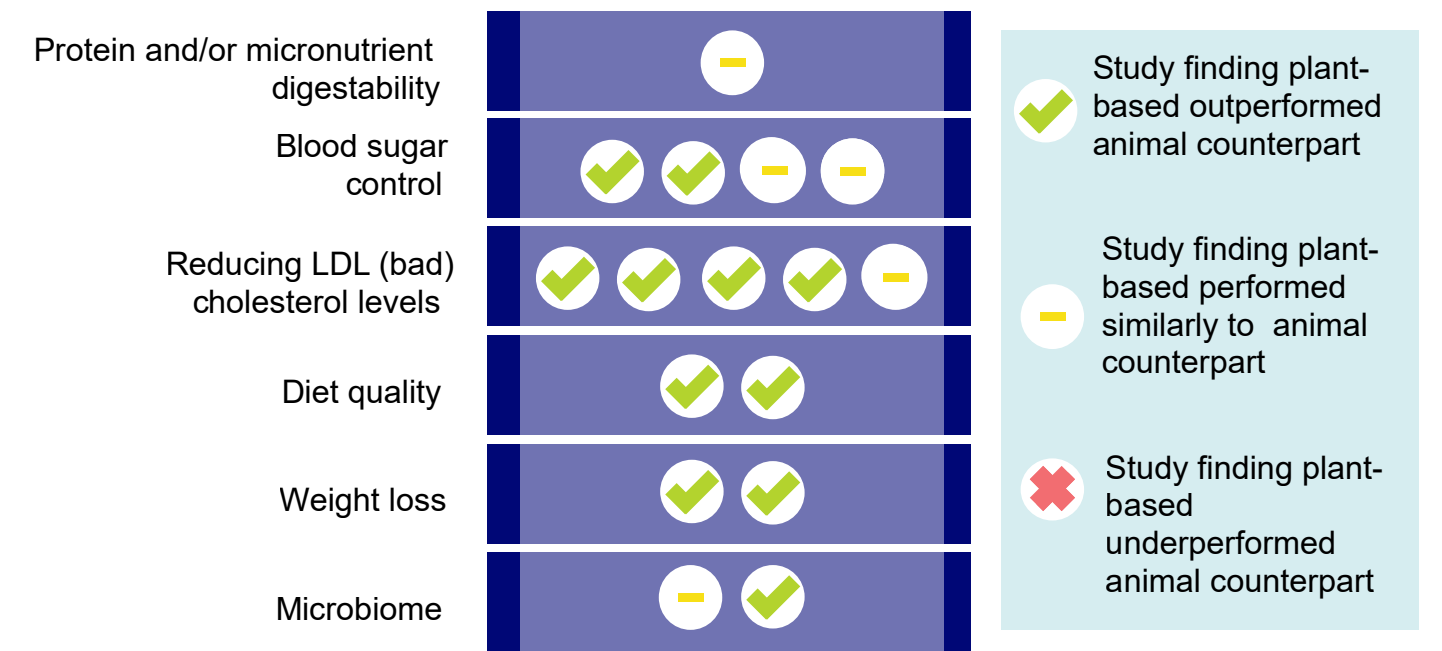
A systematic review and meta-analysis of randomised controlled trials found this swap led to a significant drop in bad cholesterol and body weight in trials up to 8 weeks. Other studies have found positive outcomes in diet quality, microbiome and gut health.^{5,6}

These findings match what we would expect based on the nutritional profile of plant-based meat compared to conventional meat, in particular its higher fibre content and lower saturated fat.

Future studies should explore:

- Comparisons of impact by protein ingredient base, fibre content, protein density, or fat used.
- More studies into the relative bioavailability of protein and key micronutrients in plant-based versus conventional meat.
- The effectiveness of plant-based meat as a tool to help people adopt and maintain healthier eating habits.
- If effects are consistent in more diverse populations and demographic groups.
- Opportunities in populations with specific dietary needs like older people or athletes.

Key findings from randomised controlled trials exploring the health impacts of replacing animal meat with plant-based meat



Sources: S. Nájera Espinosa, et al., Nutrition reviews, (2024). R. Fernández-Rodríguez et al., American Journal of Clinical Nutrition (2024)

Is UPF research applicable to plant-based meat?

The datasets commonly used in UPF research have several limitations that undermine their relevance to plant-based meat:

- Most use food diaries taken over 10 years ago, before most modern plant-based meat products existed.
- These food diaries also often lack detail to separate plant-based meat from other plant-based foods like tofu.
- Plant-based meat makes up a tiny proportion of food eaten in these datasets, and outcomes seen are likely caused by the most widely eaten UPFs (which have very different nutritional profiles) such as cakes, pastries, sugary drinks and processed meat.
- UPF research using these datasets finds people who eat the most UPF have a higher risk of several diseases compared to those who eat the least, but

can't tell us how much is caused by processing, and how much by nutritional factors we already understand.

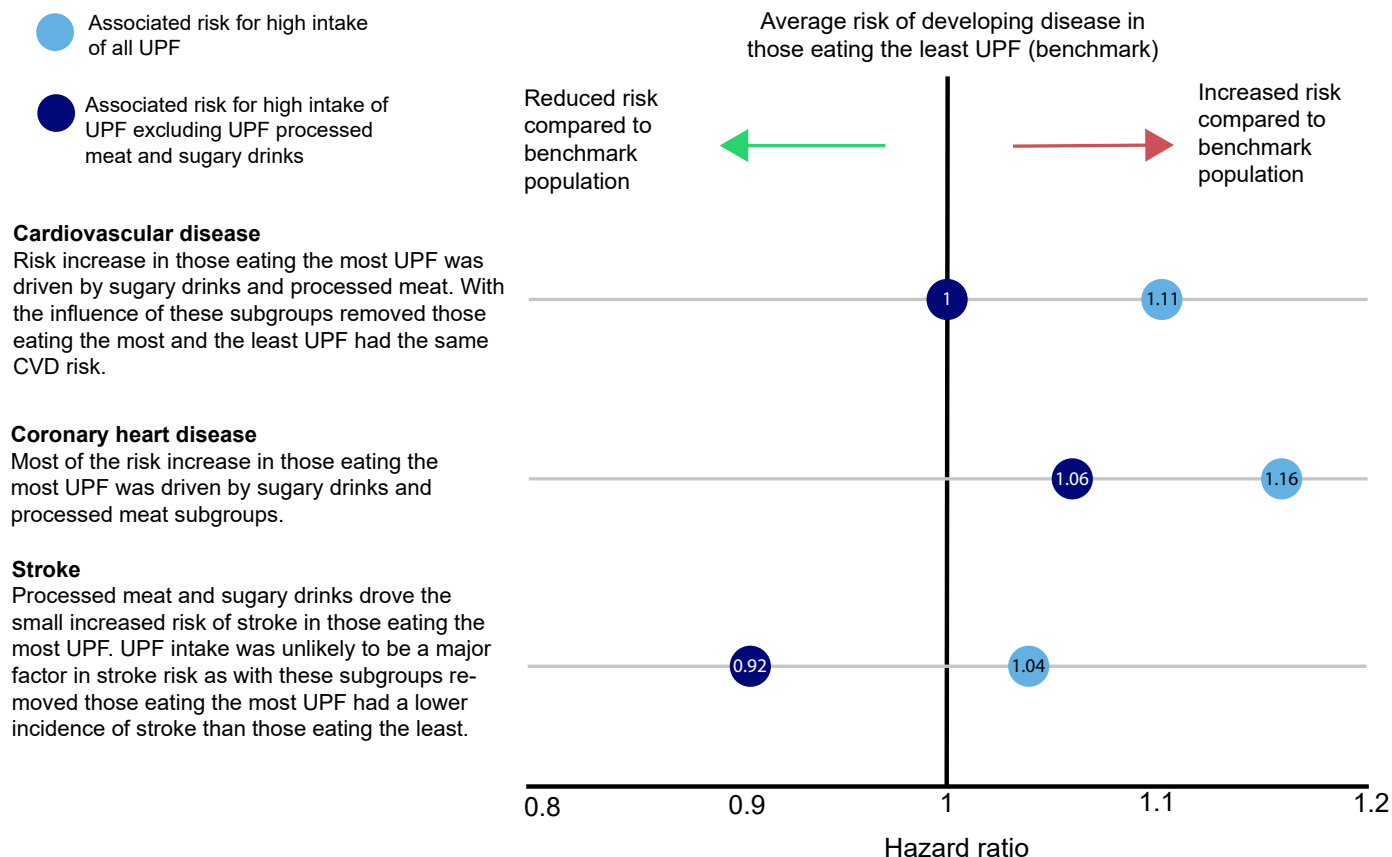
Some of these studies also highlight that certain subgroups of UPF play a larger role than others.^{7,8}

A systematic review and meta-analysis of real-world studies on UPF and heart risk found that two subgroups of UPF: sugary drinks and processed meat, drove most of the increased risk linked with the group as a whole.⁹

Randomised controlled trials comparing high and low UPF diets matched for key nutrients are beginning to explore what features of high UPF diets cause harm. Initial findings suggest nutritional factors do play a role, particularly calorie density and low fibre alongside more processing-related considerations such as texture and 'hyper-palatability'.

Independent, publicly funded bodies in France,¹⁰ Germany,¹¹ the Nordic Council,¹² Spain,¹³ and the UK¹⁴ have independently found insufficient evidence to support the implementation of policy targeting processing level independent of nutritional profile.

Association between UPF and risk of cardiovascular disease, coronary heart disease and stroke with and without the influence of processed meat and sugary drinks.



Conclusions

Research on ultra-processed foods has broadened understanding of the importance of dietary patterns and food environments in driving diet-related ill health, unlocking political will to drive much-needed change in our food system. However, caution is needed when using it to evaluate individual foods.

Plant-based meat has a very different nutritional profile from most other UPFs, and research suggests it could offer meaningful health benefits when used to replace processed conventional meat – one of the UPF subcategories most strongly associated with increased health risks.

With current meat consumption in Europe above recommendations for both public and planetary health, a diverse range of strategies are likely required to support the necessary shift towards healthier, more sustainable diets.

There is no single path to achieving this, and many approaches that can cater to different preferences and lifestyles are needed.

Support to scale tasty, nutritious, affordable plant-based meat options and encouraging greater uptake of whole plant foods are two, likely complementary, approaches.

Recommendations:

Public health professionals should challenge misconceptions about processing and plant-based meat. UPF research is often misunderstood, and awareness of plant-based meat's nutritional profile is limited. Clear, accurate communication is needed to counter sensationalism and improve understanding.

Researchers should focus on diversifying the evidence base on UPF and plant-based meat. More trials are needed to understand which features of high UPF diets drive negative outcomes, and how to maximise the beneficial features of plant-based meat. Behavioural studies can also help understand how effective different strategies are in driving lasting dietary improvements, and which strategies work best for different groups.

National bodies should create guidelines to help people select healthier options based on nutrient profile and increase consistency across products. Standards on fortification, fibre, saturated fat and salt can improve consistency in plant-based meats. Products meeting these should be included in dietary guidelines, as in the Netherlands, to promote sustainable healthy diets.



Image: Vegfather

Glossary

Ultra-processed foods (UPF) – Industrially produced foods with many ingredients, made using many steps.

Nova framework – The most commonly used categorisation system to define the processing level of foods.

Epidemiology – The study of how often diseases occur in different groups of people and why.

Randomised controlled trial – The most robust design for experimental studies, where researchers randomly put the study population into two groups, introduce a change in one group but not the other, keeping everything else the same, and compare the differences between the two.

Systematic review and meta analysis – A kind of study that methodically combines and analyses the results from all studies on a similar topic, to understand the overall strength of the available evidence on that topic.

Hyper-palatable – Foods containing high levels of at least two nutrients of concern (salt, fat, sugar).

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About this resource

This document was co-created by the Good Food Institute Europe (GFI Europe) and the Physicians Association for Nutrition (PAN), two non-profit organisations working to support the transition towards healthier, more sustainable diets.

This is a short summary of a longer resource, developed as a guide to the current discourse on UPF and plant-based meat for stakeholders in protein diversification, including healthcare professionals, policymakers, researchers, health and sustainability NGOs and patient organisations. For more detail, please see the [full guide](#). This document is not intended to offer individual health guidance.

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