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Protein balls and peanut butter are much-loved plant proteins, but are they the complete package? With plant-based eating on the rise, people are wondering if they're getting enough protein and if they need to take a protein supplement.

Words Nicole Murphy & Associate Professor Antigone Kouris

Science reveals that diets rich in plant-based foods with fewer animal foods improves health and wellbeing and benefits the planet.



Plant-based eating patterns have been gaining momentum and attention for some time now. Interestingly, the Google search term saw a spike in October 2019, around a similar time to the release of controversial Netflix documentary *The Game Changers*. It also seems that plant-based consumers are concerned with protein. Global plant protein sales are soaring and it doesn't look like they'll be slowing down anytime soon. Multiple market research reports estimate that the plant protein global market will trend towards \$AU24.3 billion by 2025.

Plant-based wave

There are plenty of reasons why people are looking to plant-based diets (PBD). Science reveals that diets rich in plant-based foods with fewer animal foods improves health and wellbeing and benefits the planet. According to the EAT-Lancet Commission Report on Food, Planet, Health, "Food is the single strongest lever to optimise human health and environmental sustainability on earth."

PBD have been linked with good gut health and with preventing a whole host of health conditions, from diabetes, heart attacks and strokes to certain types of cancers. Transformation in global food systems and changes to what people put on their plates can also provide environmental benefits. A systematic review of 63 studies in 2016 revealed that shifting from a Western diet (high in animal foods) towards a more sustainable plant-based diet could help to reduce greenhouse gas emissions by 70 per cent, and land use and water use by 50 per cent. Those are some amazing statistics!

So, how does a PBD affect protein intake? While you can continue to meet your protein needs from food alone, there are

some plant protein factors to be mindful of and some superior food sources to ensure you've got on hand.

What is a plant-based diet?

There's no clear definition of what constitutes a plant-based diet. This is because a PBD can vary greatly depending on the extent to which a person includes animal products in their diet. The basic principles of a PBD are:

- 1 An abundance of vegetables, fruits, whole grains, legumes, seeds and nuts, which results in a higher intake of plant protein, and;
 - 2 Fewer animal foods like meat, chicken, pork, fish, dairy, eggs, but not complete avoidance of these foods.
- PBD is similar to a Mediterranean diet, flexitarian diet or planetary health diet. Vegan diets exclude all animal foods; some vegans would consider themselves plant-based.

Why you should care about protein

Protein is one of the most important substances in your body. It's a vital component of all cells, especially muscle, skin, connective tissue, hair and nails, and is essential for the production of antibodies, neurotransmitters, digestive enzymes and hormones. It has been shown to play an important role in muscle growth and sports performance, in weight loss and in improving immunity.

How much protein do you need?

Getting "enough" protein will depend on your weight, goals, activity levels, health status and preferences. Healthy adults generally require somewhere between 0.75-1.1 grams



of protein per kilogram of body weight per day. Doses beyond this may be recommended for athletes, highly active adults and those who are trying to change their body composition such as losing or gaining weight or gaining muscle. It's always wise to seek advice from a qualified nutrition professional like Accredited Practising Dietitians (APD) to help you optimise nutrition safely.

Can I get enough "quality" protein from a PBD?

Protein is not just about quantity but also quality. Proteins are made up of smaller molecules called amino acids. Some of these can be produced by your body, while you must get others through your diet. The latter are called essential amino acids.

If you're not eating animal foods regularly, getting all the protein and essential amino acids your body needs from plant foods is a bit more challenging. Plant foods tend to contain less protein than animal foods. And only some plant foods contain "quality" or "complete" protein (all-essential amino acids). Others lack some amino acids or are "incomplete".

Pairing plant foods with missing amino acids, like rice and beans (such as kidney beans) or pita bread with hummus, and eating a diverse array of high-protein plant foods, helps the body to form complete proteins when needed.

Plant foods and digestion

Protein quality also considers how well we digest and absorb plant and animal proteins. And there are some slight differences to be aware of.

It's well known that plant foods are extremely nutrient-rich. They contain plenty of fibre, unique plant compounds called polyphenols and prebiotics that provide wonderful benefits to your gut and overall health.

However, plant proteins from whole plant foods are slightly less bioavailable

(digested and absorbed less easily) than animal proteins and isolated proteins found in some supplements. This is due to the high fibre content of plants and antinutritional properties that can interfere with the absorption of protein and other nutrients and minerals.

There's no need to be alarmed; antinutrients won't be a concern for most people. A variety of dietary and food preparation strategies like processing, soaking, sprouting, fermenting, baking and cooking help to reduce the impact of antinutrients like tannins, phytates and lectins to varying degrees. For those consuming minimal animal foods, adding an additional 10 per cent of protein to your daily protein goals by eating quality and diverse sources of protein can help compensate for differences in protein digestibility.

Why Lupin is an essential part of a PBD

Lupins are beans and belong to the legume family (along with lentils and chickpeas) yet are nutritionally superior to other legumes.

With 40 per cent protein, lupins are one of the world's richest source of "quality complete" plant protein. They're super sources of fibre and they're very low in carbohydrate compared to other legumes.

Because lupins don't contain any antinutritional properties, the nutrients are easily digested and absorbed by the body. Lupins are natural appetite suppressants and may help to lower cholesterol, blood pressure and improve



Where do I find quality plant-protein?

Protein is found in a wide variety of plant-based foods, with some having the complete set of amino acids (see bolded foods):

- ✔ Grains such as **amaranth**, **quinoa**, oats, **buckwheat**, spelt, wheat, rice
- ✔ Legumes like lentils, **soybeans**, chickpeas, butter beans, black beans and split peas, **lupins**, **pea protein** from yellow peas (is complete but is low in methionine)
- ✔ Nuts
- ✔ Seeds like **hemp** (is complete but low in lysine), pumpkin seeds, sunflower seeds, **chia seeds**
- ✔ Soy derivatives like **tempeh**, **tofu** and **soy milk**
- ✔ Some vegetables like broccoli, spinach, asparagus, artichokes, potatoes, sweet potatoes and Brussels sprouts
- ✔ **Spirulina**
- ✔ **Nutritional yeast**
- ✔ **Mycoprotein** e.g. Quorn

Choose wholefoods over more processed alternatives like soy sausages and burgers. These products will have differing degrees of processing and can contain added salt, sugar, fats and/or other additives. Check the food labels or opt for homemade versions so you know exactly what's gone into them.

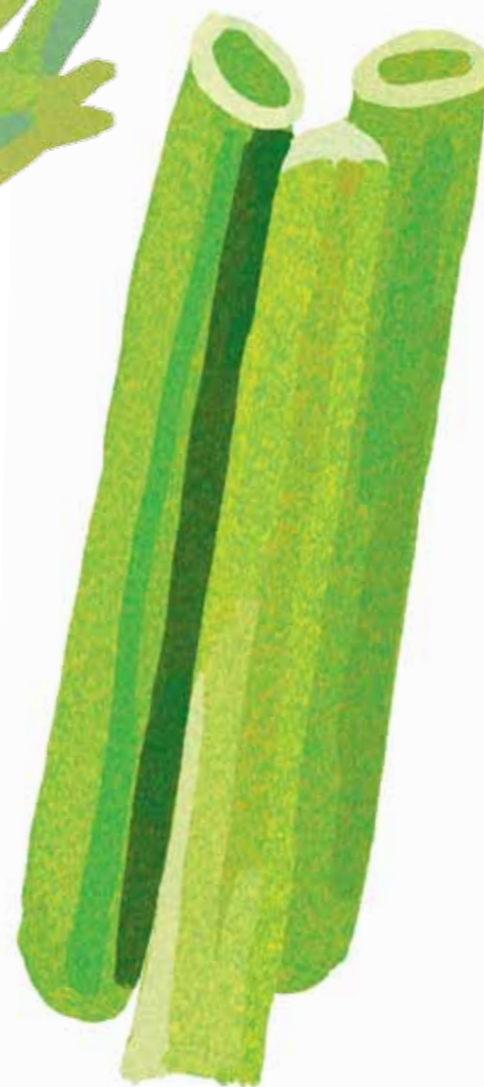
Illustration: Creative Market

With 40 per cent protein, lupins are the world's richest source of quality plant protein.

Soy: good or bad?

Soy foods have been part of the traditional Asian diet for thousands of years but are often controversial in the Western world, mainly due to fears around isoflavones that are like phytoestrogens (they have estrogen-like effects in the body).

While there is a big variety in the types of soy foods consumed today, research suggests that for adults, moderate amounts of soy foods are unlikely to have adverse effects, especially organic non-GMO whole or fermented soy, and may even benefit cardiovascular health and reduce cancer risk. Some studies have linked soy protein to a slight increase in menstrual cycle length (by about one day on average) in premenopausal women, however the effects on fertility are unknown.



your gut microbiome. They contain a special protein, gamma conglutin, not found in other legumes, that can help regulate blood glucose and insulin.

In Australia, you can purchase lupin flour, an excellent pantry staple to help you optimise the nutrition of your baked goods. A recent Australian study conducted by Professor Antigone Kouris revealed that having as little as one tablespoon of lupin flour was able to improve blood glucose levels in people with diabetes.

It should be noted that those with a peanut allergy should avoid lupins.

What foods have the most plant protein?

The amount of protein in food will vary. Here are some notable sources of plant protein that can help you meet your protein needs on a PBD.

High plant protein sources

(above 10 grams protein/serve)

- Most legumes and beans (1 cup cooked)
- Pea protein powder (2 scoops)
- Tempeh (½ cup)
- Tofu (½ cup)
- Hemp protein powder (¼ cup)
- Lupin flour (2 tbsp)
- Hemp seeds (3 tbsp)
- Rice and beans (1 cup)
- Spelt pasta (1 cup)

Moderate-high plant protein sources

(4-9 grams protein/serve)

- Quinoa (1 cup cooked)
- Wheat pasta (1 cup cooked)
- Brown rice (1 cup cooked)
- Amaranth (1 cup cooked)
- Soy milk (1 cup)
- Nutritional yeast (¼ cup)
- Linseed, pumpkin seeds, sesame seeds, sunflower seeds (approx. 2-3 tbsp)
- Nuts (1 handful, approx. 30g — 25 almonds, 14 cashews, 17 walnuts)
- Corn on the cob (1 large corn)
- Buckwheat (1 cup cooked)
- Russet potato (1 medium)
- Vegetables (1 cup — mushrooms, broccoli, Brussels sprouts, asparagus)
- Chia seeds (2 tbsp)
- Hemp seeds (3 tbsp)
- Spirulina (1 tbsp)
- Peanut butter (2 tbsp)

Protein supplements: healthy or hypocrisy?

Not all protein powders are created equal. Most people will be able to meet their protein needs with wholefoods, however protein supplements can provide a convenient and measured source of protein.

If you're looking to build muscle or change your body composition and are neither lactose intolerant nor vegan, then consider whey protein. Whey protein is considered the gold standard for building muscle.

Plant-based powders tend to be lacking in one or more essential amino acids, but



pea and rice combination protein powders (vegan) are complementary. Soy and hemp protein are considered complete proteins, although hemp is low in the amino acid lysine (important for building muscle), so pairing with pea protein is another option. Collagen (not vegan) is lacking in tryptophan and is generally not recommended as a muscle builder.

It's important to note that adding extra protein to your diet without working out is not likely to have any effect on your muscles — it must be paired with consistent exercise. In fact, excess protein will simply be converted to glucose and can contribute to weight gain.

The pitfall of some products

Protein powder on its own can be quite bitter, so formulators will likely add sugar to products. Read the labels to understand how much salt and sugar, as well as what types of sugar, are added. Try to avoid products with long ingredient lists and be aware of added vitamins and minerals if you're taking other nutrition supplements or medications.

People with kidney or liver concerns should not supplement with protein without medical advice and support.

Nicole Murphy is an Accredited Practising Dietitian (APD). Having worked as both a dietitian and on health projects in research settings, Nicole is passionate about sharing the science on nutrition so that it helps to optimise health and wellbeing and the planet.

Associate Professor Antigone Kouris is an Accredited Practising Dietitian (APD) with over 30 years' experience as a clinical dietitian in private practice in Melbourne. She is also the Director of Skinnybik biscuits Pty Ltd. Antigone led pioneering research into the Mediterranean diet and legumes in the 1990s. She has co-authored seven nutrition textbooks and is an Adjunct Associate Professor at La Trobe University, teaching dietitians and supervising nutrition research.