

The Plant-Based Ketogenic Diet



Vegan
Friendly

A **plant-based (vegan) ketogenic diet** is a high-fat, very low-carb diet that focuses on eating whole, unprocessed, plant-based foods. A ketogenic diet causes the body to burn fat instead of carbs (glucose) for fuel.

As with the vegan diet, all animal products are excluded, but a key difference is that grains and most legumes are off the menu as well, making it more difficult to get enough protein and remain relatively low carb. However, with careful planning, you can reap the benefits of both a ketogenic and a vegan diet.¹

Research shows that this diet is beneficial for those with:^{2,3}

- ✓ Overweightness or obesity.⁴ While a ketogenic diet can help you lose weight without having to count calories,⁵ it is important to remember that the best diet for keeping weight off is one you can adhere to long term.⁶
- ✓ Metabolic syndrome⁷⁻⁹
- ✓ Type 2 diabetes^{7,8}
- ✓ Polycystic ovarian syndrome (PCOS)^{10,11}
- ✓ Intractable epilepsy¹²⁻¹⁴
- ✓ Autism spectrum disorder (ASD)^{15,16}
- ✓ Multiple sclerosis (MS)¹⁷⁻¹⁹
- ✓ Parkinson's disease²⁰
- ✓ Mild cognitive impairment and Alzheimer's disease²¹
- ✓ Migraine headaches²²⁻²⁵
- ✓ Some cancers as a potential adjuvant therapy^{26,27}

This diet may not be suitable for:

- ✗ Pregnant women²⁸⁻³⁰
- ✗ Breastfeeding women³⁰⁻³³
- ✗ Patients taking the following medications: antiseizure medications (valproate, zonisamide, topiramate, lamotrigine, acetazolamide, phenobarbital, carbamazepine, etc.),^{34,35} insulin and other antidiabetic medications including SGLT2 inhibitors,^{30,36} steroids,³⁴ anticoagulants (warfarin),³⁷ and potentially other medications. Check with your doctor.
- ✗ Patients with type 1 diabetes. Self-monitor blood glucose and ketones; and monitor closely with your doctor and healthcare team due to risk of life-threatening diabetic ketoacidosis (distinct from nutritional ketosis), hypoglycaemia and dyslipidaemia.^{30,38,39}
- ✗ Patients with cardiac arrhythmias³⁰
- ✗ Patients with fat metabolism disorders²
- ✗ Patients with carnitine deficiency or similar rare metabolic disorders^{2,30}
- ✗ Patients with pancreatitis²
- ✗ Patients with liver failure^{2,30}
- ✗ Patients with kidney disease or those at risk of kidney stones^{30,40}
- ✗ Patients with excessive urination (polyuria)^{2,30}
- ✗ Frail elderly patients³⁰
- ✗ Patients with severe mental illness³⁰
- ✗ Patients with eating disorders (current or history thereof)³⁰
- ✗ Patients undergoing surgery or recovering from a medical procedure^{30,39}

Researched effects of a ketogenic diet include:

- ✓ Weight loss and appetite control²
- ✓ Lower blood pressure²
- ✓ Regulated blood sugar levels²
- ✓ Improved insulin sensitivity^{2,41}
- ? Reshaped gut microbiome⁴²⁻⁴⁵
- ? Inconclusive effects on bone health,⁴⁶ of particular concern in children with intractable epilepsy⁴⁷⁻⁴⁹
- ? Controversial and inconclusive effects on cholesterol levels and cardiovascular health.⁵⁰⁻⁵⁶ Those at risk of heart disease should avoid trans fats (e.g. margarine), processed meats and fried foods. Swap saturated fats (e.g. butter) for monounsaturated fats (e.g. olive oil).⁵⁴
- ? Controversial and inconclusive effects on athletic performance⁵⁷⁻⁶¹

What is Ketosis?

Ketosis is the aim of the ketogenic diet.

Nutritional ketosis is a metabolic state in which the body shifts to utilising fat as its main fuel source instead of carbs. In response to **strictly limiting the amount of carbs you consume to less than 20 to 50 g/day**, the body secretes less insulin, becomes more efficient at burning fat and enters ketosis typically within several days. Fat is turned into ketones in the liver, which can supply the brain, heart and muscles with energy.^{2,5,62}

For perspective, ½ a cup of cooked rice contains around 22 g of carbs and 1 medium banana contains around 27 g of carbs, whereas ½ a cup of broccoli contains around 3 g of carbs and ½ a cup of raspberries contains around 7 g of carbs.



Intermittent fasting

Intermittent fasting can help you enter ketosis quicker. The most common method involves limiting food intake to an 8-hour window and fasting for the remaining 16 hours.⁵



Physical activity

Physical activity can deplete your body's carb stores (glycogen), which encourages your liver to increase its production of ketones. Fasted physical activity promotes ketone production.⁶²



'Keto flu'

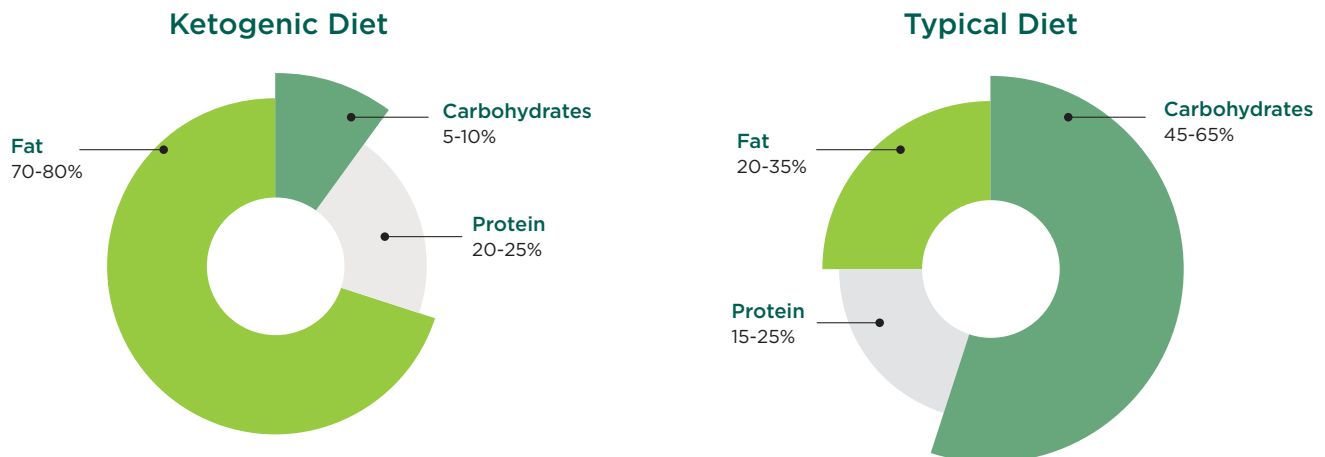
It is common to experience flu-like symptoms typically for a few days when entering ketosis such as headaches, dizziness, nausea, fatigue, weakness, muscle cramps, and diarrhoea or constipation. To minimise this, try going low carb for a week or two before adopting a ketogenic diet to gauge how your body responds. Ensure you also focus on achieving adequate hydration; drink plenty of water and support your electrolyte balance by adding salt to meals or considering mineral supplementation.^{2,5,6,63,64}



How to do the Ketogenic Diet

The pie charts below provide a comparison of the **macronutrient balance** of a ketogenic diet versus a typical diet. As you can see, there is a significant difference in the proportion of carbs and fats consumed between both diets. You must tightly control your carb intake to enter and remain in ketosis.

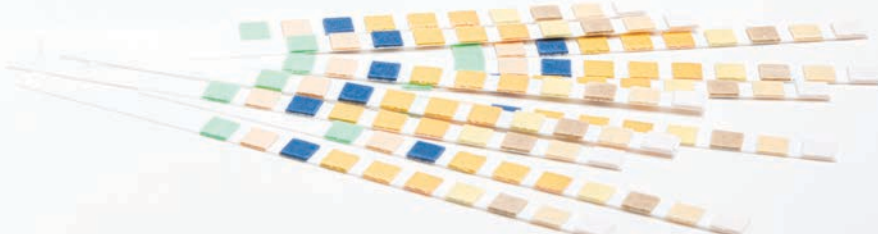
The use of a **macro tracking app** is the most convenient way to help you count how many grams of carbs are in the foods you consume when adopting a ketogenic diet. There are several macro tracking apps available to download on your smartphone to simplify this process. Input your food data and use this tool to adjust your daily intake of carbs, fats and protein to closely match the percentages provided below.



Tracking Ketosis

The most accurate way to tell whether you're in ketosis is to test your body's ketone levels. Ketones can be detected and measured via your urine, breath and blood. Urine test strips are the cheapest and simplest method; however, these are less precise than the other two methods that involve the use of special devices.^{62,65} Urine test strips are especially inaccurate if you are dehydrated.

You may want to use urine test strips daily for the first few days after commencing a ketogenic diet to ensure you reach ketosis, and then once a week or so while on the diet to check if you are still in ketosis. You could test daily if you want but this is not necessary unless you want to see how your body responds to certain foods or a change in carb intake.⁶⁶



Foods to Include and to Avoid

	Foods to Include	Foods to Avoid
Meat	None	All
Fish and seafood	None	All
Dairy and other animal products	None	All
Vegetables (preferably organic)	• Artichokes, asparagus, bok choy, broccoli, Brussels sprouts, cabbage (sauerkraut and kimchi), capsicum and other peppers, cauliflower, celery, cucumber (pickles), eggplant, kale, mushrooms, okra, onions (in moderation), radishes, rhubarb, spinach, spring onion, and zucchini • All lettuces (iceberg, radicchio, cos, romaine, butterhead, etc.) • Carrot, beetroot, rutabaga/swede, turnips, and celeriac (in moderation) • Konjac/shirataki noodles (drink plenty of water if consuming) • Pumpkin and squash varieties (in moderation)	• All other starchy root vegetables including potatoes (including chips), sweet potatoes, parsnips, cassava (flour and tapioca), and taro • Leeks
Fruits (preferably organic)	• Berries (blueberries [in moderation], strawberries, raspberries, and blackberries) • Coconut (milk, cream, yoghurt, oil including MCT oil, flour, and unsweetened water [in moderation]) • Avocados, lemon, limes, olives (whole olives and oil), and tomatoes	• All other fruits including apples, bananas, grapes, guava, jackfruit, kiwifruit, lychees, papaya, passionfruit, pears, pineapple, pomegranate, etc. • All other citrus fruit (oranges, grapefruit, etc.) • Melons (watermelon, honeydew and rockmelon) • Stone fruits (mangoes, peaches, plums, nectarines, apricots, cherries, etc.) • Dried fruits (dates, figs, prunes, sultanas, raisins, currants, etc.) • Canned fruits
Grains (preferably organic)	• Seitan NB: seitan is not suitable for those with gluten sensitivity but is an alternative to soy-based products, meaning that it can be a source of protein for those with a soy allergy.	• All other grains including wheat (flour, bread, pasta, noodles, pizza, cake, pastries, chips, cereal, biscuits, cookies, crackers, pretzels, semolina, etc.), rice (paper rolls, milk and malt syrup), oats (porridge, muesli and milk), corn (tortillas, popcorn and polenta), spelt, rye, barley, millet, and sorghum
Legumes (preferably organic)	• Tofu and tempeh (in moderation) • Lupini beans (in moderation) • Green beans, snow peas and sugar snap peas (in moderation)	• All other legumes including soy products (edamame, soy milk, etc.) and green peas

Foods to Include		Foods to Avoid
Nuts and Seeds (preferably organic)	• Nuts (almonds, Brazil nuts, hazelnuts, macadamias, peanuts, pecans, pine nuts, and walnuts) [whole nuts, nut meal, flour, no added sugar nut butters, unsweetened milk, and cheese] and seeds (chia seeds, flaxseeds/linseeds, hemp seeds, pepitas/pumpkin seeds, poppy seeds, sesame seeds, and sunflower seeds) [whole seeds, oil {except sunflower oil} and tahini]	• Cashews • Pistachios • Quinoa
Beverages (preferably organic)	• Water (plain, mineral water, soda water, and sparkling water) • Coffee • Tea (black, green and herbal) • Most kombucha (in moderation) • Miso soup • Cacao (powder, butter, nibs, and vegan sugar free ≥70% dark chocolate) • Carob (in moderation) • Hemp, pea, brown rice, and chickpea protein powder • Pure spirits (vodka, tequila, gin, whiskey, and rum) without mixers, dry red and white wines and low carb beer (in moderation) NB: alcohol is controversial on a ketogenic diet as it is a source of 'empty calories', can slow ketosis, and can hinder fat burning and weight loss. Ketosis also decreases alcohol tolerance.^{67,68} Monitor your urinary ketones closely if consuming alcohol to observe the effects on ketosis.	• All other alcohol including beer and cocktails • Soft drinks • Fruit juice • Cordial • Protein powders from animal sources (whey, egg white, etc.) and collagen • Non-keto-friendly pre-workout powders • Non-keto-friendly electrolyte powders
Condiments and Sauces	• All oils (preferably cold pressed, non-GMO and not vegetable oil) • Salt • Most vinegars • Vinaigrettes and vinegar-based hot sauces • No added sugar mustards • No added sugar soy sauce and tamari NB: traditional soy sauce contains gluten. • Seaweed (kelp, dulse, arame, hijiki, nori, wakame, kombu, etc.) • Nutritional yeast	• Non-keto-friendly tomato sauce, barbecue sauce, sweet chilli sauce, and teriyaki sauce • Mayonnaise • Margarine • Caramelised balsamic vinegar • Honey mustard
Herbs and Spices (preferably organic)	All	
Sweeteners	• Stevia • Monk fruit • Erythritol and xylitol (in moderation)	• Aspartame • Sucralose • Sugar (all varieties and lollies), coconut sugar, coconut nectar, maple syrup, honey, and agave

Plant-Based (Vegan) Ketogenic Diet Meal Ideas

Breakfast

- Scrambled tofu made with tahini, sesame oil, turmeric, smoked paprika, and nutritional yeast
- Almond meal, coconut flour and flaxseed/linseed meal porridge made with coconut milk and topped with pecans, toasted coconut flakes and cinnamon
- Lemon and poppy seed muffins made with almond flour
- Berry smoothie bowl made with frozen raspberries and strawberries, coconut milk, coconut yoghurt, chia seeds, and keto granola
- Overnight chia pudding made with coconut milk and coconut yoghurt topped with toasted coconut chips and crushed nuts

Lunch

- Cabbage and cucumber salad drizzled with creamy peanut sauce made with peanut butter, sesame oil, soy sauce, and rice vinegar, garnished with toasted sesame seeds and crushed peanuts **Tip: try kimchi in this salad. Kimchi is spicy fermented cabbage, a traditional dish from Korea, that can support digestion and beneficial bacteria in the gut.⁶⁹**
- Grilled eggplant with garlic, mint, tahini, and coconut yoghurt sauce
- Onion, pine nuts, almond flour, and nutritional yeast-stuffed portobello mushrooms dressed in chilli infused olive oil
- Nut burger made with keto-friendly bread, lettuce, tomato, beetroot, onion and pickles
- Lupini bean falafel served with tabbouleh **Tip: replace cracked wheat (bulgar) with hemp seeds to make tabbouleh keto friendly.**
- Tacos made with an almond flour tortilla, air-fried cauliflower, red cabbage, jalapeño, avocado, lime, and coriander

Dinner

- Stir-fry made with tofu, zucchini noodles (zoodles), broccoli, cabbage, capsicum, carrot, ginger, garlic, spring onion, and sesame oil, sprinkled with sesame seeds
- Roasted Brussels sprouts, garlic cloves and pine nuts
- Baked breaded cauliflower made with a psyllium husk, almond meal, nutritional yeast, paprika, and garlic powder crumb served with salad **Did you know? Psyllium husks are a prebiotic food that support healthy bowel habits and the gut microbiome, especially of those experiencing constipation.⁷⁰ Psyllium husks can also be used as a keto-friendly substitute for breadcrumbs together with almond meal.**

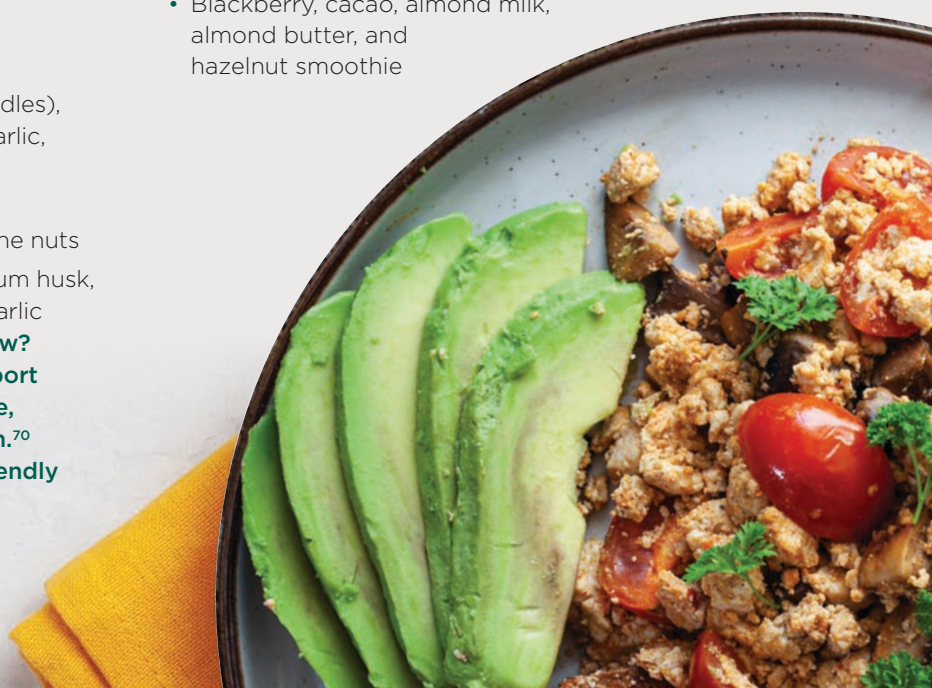
- Tofu and spinach pie made with coconut flour and coconut cream
- Broccoli soup made with coconut cream, coconut oil and nutritional yeast
- Tempeh skewers with ginger, peanut and sesame oil sauce sprinkled with crushed peanuts and sesame seeds served with Asian slaw and a lime wedge

Snacks

- Celery sticks or cucumber slices with nut butter, macadamia cheese, lupini bean hummus, baba ganoush, tapenade, or guacamole
- Almond flour and coconut flour lemon and blueberry cupcakes topped with lemon zest dusted homemade buttercream icing
- Coffee and cacao doughnuts made with psyllium husk and almond meal coated in melted vegan sugar free dark chocolate
- Cacao butter keto blondies
- Almond butter, peanut butter and chia seed fat bombs with vegan sugar free dark chocolate chips and sea salt
- Coconut yoghurt with mixed berries and chopped nuts

Drinks

- Green tea
- Bulletproof matcha latte made with coconut milk and MCT oil
- Bulletproof coffee made with MCT oil
- Lemon, ginger and turmeric shot with MCT oil
- Iced peanut butter latte made with cold brewed coffee, almond milk and keto coffee creamer
- Coconut key lime pie smoothie made with frozen avocado, spinach, coconut milk, macadamia nuts, lime juice, and lime zest. **Tip: add MCT oil to make this smoothie even more satiating!⁷¹**
- Blackberry, cacao, almond milk, almond butter, and hazelnut smoothie



Sample of Macros in a Day

Breakfast		
Scrambled tofu made with tahini, sesame oil, turmeric, smoked paprika, and nutritional yeast		
 Fat 42 g	 Protein 27 g	 Carbohydrates 6 g
Lunch		
Cabbage and cucumber salad drizzled with creamy peanut sauce made with peanut butter, sesame oil, soy sauce, and rice vinegar, garnished with toasted sesame seeds and crushed peanuts		
 Fat 47 g	 Protein 10 g	 Carbohydrates 7 g
Snack		
Celery sticks with nut butter		
 Fat 22 g	 Protein 8 g	 Carbohydrates 5 g
Dinner		
Broccoli soup made with coconut cream, coconut oil and nutritional yeast		
 Fat 33 g	 Protein 6 g	 Carbohydrates 3 g
Drink		
Bulletproof coffee made with MCT oil / coconut oil, spirulina and pea protein powder (2 serves/day)		
 Fat 15 g	 Protein 51 g	 Carbohydrates 8 g
Total		
 Fat 70% 159 g	 Protein 20% 102 g	 Carbohydrates 10% Net carbs 29 g Fibre 20 g
Total energy 1954 kcal (8176 kJ)		

NB: this table serves as a rough guide and estimate only. Grams and percentages of macronutrients will vary depending on the recipe used, exact quantity of each ingredient, brand of ingredient, portion size, etc.⁷²





Tips for Making Ketogenic Recipes Vegan

Many of the keto-friendly recipes you find on websites, food blogs, cookbooks, and apps will contain meat, fish and seafood, dairy, and eggs. Here is a quick list of substitutes to make vegan-friendly versions of some of those recipes:

- Replace cream with **coconut cream**.
- Use **coconut oil** instead of butter.
- Swap dairy cheese for **macadamia cheese** or **nutritional yeast**.
- Use **coconut yogurt** instead of dairy yoghurt.
- Replace eggs in baking for **flaxseed/linseed meal and water** in a 1:3 ratio.
- Make **scrambled tofu** instead of scrambled eggs.
- Try **wheat gluten (seitan)** in place of meat so long as you do not have gluten sensitivity, coeliac disease or other gluten-related disorder. Note that while seitan is low carb, low fat, high in protein, and contains all nine

essential amino acids, it is low in the amino acid lysine.⁷³ Be sure to also incorporate sources of lysine (e.g. pea protein, tofu, tempeh, and spirulina)⁷⁴ into your diet.

- Swap whey-, egg-white- and collagen-based protein powders for **pea protein-based powders**. Try to find one that contains MCT oil powder to help satisfy your fat intake. If using in a smoothie, add nuts and seeds.

It is also advised to eat as much real food as possible. **Avoid fake meats**, overly processed soy products, vegan junk food, etc.

Mastering the Plant-Based Ketogenic Diet

It can be challenging to get started and stick to a plant-based ketogenic diet. Here are several tips and tricks that you can use to make things easier:^{5,62,75}

- **Familiarise yourself with food labels.** Check the amount of carbs, fats and protein to determine which foods can fit into your diet. This includes being aware of hidden carbs in sauces and dressings.
- **Plan out and prep your meals in advance.** This is helpful for saving extra time shopping for ingredients and deciding what to cook for weekday dinners.
- **Browse through websites,** food blogs, cookbooks, and apps that offer keto-friendly recipes and meal ideas to help you build and customise your menu.
- **Look for meal delivery services** or frozen keto meals that serve as a quick and convenient way to stick to eating keto-friendly foods when you're short on time.
- **Bring a vegan keto-friendly dish** to eat and share at social gatherings or when visiting family and friends.
- **If dining out at restaurants, take a look at the menu in advance.** Order a tofu-based dish and replace any high carb foods (e.g. mash potatoes or fries) with an extra serve of veggies.
- **You cannot have cheat days or cheat meals** on a ketogenic diet! Suddenly reintroducing high carb meals and overeating can kick you out of ketosis. Re-entering ketosis could take several days or a week, depending on your carb intake, metabolism and activity levels. Try practicing mindfulness to help resist cravings and emotional eating. Find keto-friendly meals that are easy to make and enjoyable to eat. Keep tempting treats out of the house, and consider having an accountability partner to keep you on track. These strategies can help you to avoid cheating on your diet and kicking yourself out of ketosis.

Potential Nutrient Deficiencies

Since a ketogenic diet restricts carbs, it may be difficult to meet your daily **fibre** needs as some of the richest sources are high carb fruits, starchy vegetables, whole grains, and legumes.

This is why a ketogenic diet can be associated with digestive discomfort and constipation. Be sure to load up on keto-friendly foods that are rich in fibre such as flaxseeds/linseeds, chia seeds, coconut, broccoli, cauliflower, dark leafy greens (e.g. spinach and kale), and artichoke.⁶³ Consider adding a keto-friendly fibre supplement, like psyllium husk, into your diet.

Some sources report that the following micronutrients may be lacking from a ketogenic diet: vitamin A; B group vitamins;⁷⁶ vitamin D;⁷⁷ vitamin E; iron; potassium; calcium; magnesium; phytonutrients from fruits, vegetables and whole grains; and potentially others.⁷⁶ However, the nutritional adequacy of any diet depends on the specific foods you eat⁶³ and some of the best sources of these nutrients easily fit into a ketogenic diet. Aim to eat the foods listed below.

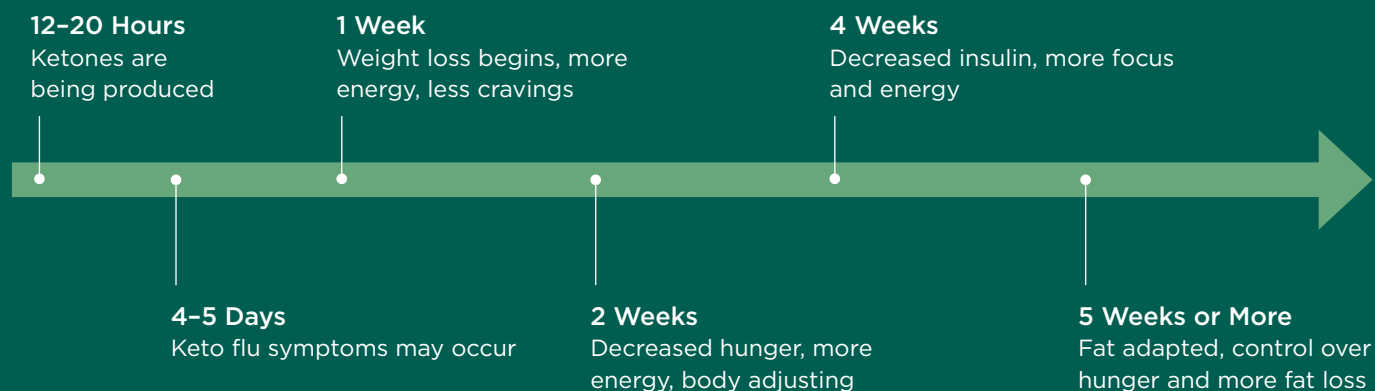
Vitamin A⁷⁸ • Spinach • Carrots (in moderation)	B group vitamins⁷⁹ • Fortified nutritional yeast • Tofu (in moderation)	Vitamin D⁸⁰ • Sun exposure • Mushrooms (sunned with gills facing up)
Vitamin E⁸¹ • Sunflower seeds • Almonds • Hazelnuts	Iron⁸² • Tofu (in moderation) • Spinach	Potassium^{83,84} • Spinach • Avocados
Calcium⁸⁵ • Tofu (in moderation) • Spinach	Magnesium^{86,87} • Pepitas/pumpkin seeds • Chia seeds • Vegan sugar free dark chocolate	Phytonutrients⁸⁸ • Broccoli • Blueberries (in moderation) • Vegan sugar free dark chocolate • Green tea • Coffee

In addition to the nutritional deficiencies above, it is also important to acknowledge that a vegan ketogenic diet is a more restrictive version of a regular vegan diet. As such, it is critical that you consider supplementing with nutrients including protein, vitamin B12, vitamin D, omega-3 fatty acids, zinc, iron, calcium, and iodine^{89,90} depending on your levels and needs as these nutrients are often deficient in a vegan diet. Consult a qualified healthcare professional for more information on deficiencies and discuss supplementation.



How Long Should You Continue on the Ketogenic Diet?

The duration of following a ketogenic diet can range from a minimum of several weeks up to 6 or possibly even 12 months. The transition away from a ketogenic diet should be gradual and well controlled.²



A ketogenic diet and a vegan diet are not suitable for everybody. For further guidance and support, seek the help of a qualified healthcare professional who can tailor a meal plan to your specific needs.



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