VEGAN KETO **basics**

WHAT IS A KETOGENIC DIET?

Under typical modern-day dietary conditions, the human body primarily uses carbohydrates, broken down into glucose, as its main source of fuel. However, a ketogenic diet is a dietary approach that significantly restricts carbohydrates, leading to a reduced supply of glucose for energy production. In the absence of sufficient glucose, the body shifts its metabolism to utilize fat, specifically fatty acids, as its primary fuel source. This metabolic state is known as ketosis. When the body is in ketosis, the liver produces molecules called ketones, which are then also used as a source of fuel. It is from this production of ketones that the ketogenic diet derives its name.

MACRONUTRIENTS: CARBOHYDRATES

Carbohydrates, or *carbs*, are one of three main macronutrients, alongside protein and fat. Carbohydrates are found in foods primarily as sugars, starch, and fiber. However, sugar alcohols and allulose are also carbohydrates. Sugar alcohols occur naturally in very small amounts in some plant foods, but are most abundant as sugar substitutes. Allulose is also a sugar substitute. These sweeteners are discussed in more detail on page 8.

Carbohydrates can be broadly categorized as either digestible or indigestible. A ketogenic diet focuses on limiting the consumption of digestible carbohydrates, or *net carbs*. Net carbs are the total carbohydrates minus the indigestible carbohydrates. Indigestible carbohydrates include fiber and allulose, and may include sugar alcohols, in whole or in part. Digestible carbohydrates are sugars, both naturally occurring and added, and starches.

Carbohydrates are abundant in plant foods, making a vegan ketogenic diet uniquely challenging. Limiting the consumption of digestible carbohydrates means avoiding or significantly reducing the consumption of sugars, syrups, grains, pseudograins (e.g. quinoa), most legumes, cashews, high-sugar fruits, and starchy root vegetables (e.g. potatoes). Nutritional needs must be met with the low-sugar low-starch food options that remain, namely vegetables, mushrooms, nuts and seeds (most types), low-sugar fruits, soy and lupini beans (and their derivatives), and products made from pea protein isolate. See the food list on page 14 for further guidance.

The degree of carbohydrate restriction required to maintain ketosis varies from person to person. Typically, maintaining ketosis requires limiting net carb intake to an amount between 20 and 50 grams, an amount referred to as one's *carb limit*. When determining your carb limit, take into consideration not only how restrictive you need to be to maintain ketosis, but also whether it's necessary for you to maintain ketosis consistently throughout the day in order to meet your health goals and what amount of restriction is practical, healthful, and sustainable for you as an individual.

If your priority is to consistently maintain ketosis without testing for ketones, adhering to a net carb limit of 20 to 30 grams is likely to achieve this objective. Some individuals, especially those who lead a highly active lifestyle, may find they are able to maintain ketosis with a higher carb limit. Determining this limit would require ketone testing, which is discussed in more detail on the following page.

Maintaining ketosis each and every moment of the day may not be required to meet your health goals, and an unnecessarily low carb limit may actually hinder your ability to adhere to the diet and to meet your overall nutritional needs. A carb limit at the higher end of the range allows for the consumption of a wider variety of foods, a more abundant vegetable intake, and, in all likelihood, a more enjoyable, well-rounded, and sustainable eating experience.

Significant dietary changes should be discussed with a healthcare professional, and this is especially true if embarking on a new diet for medical purposes. A well-informed registered dietician can provide personalized guidance on whether and how to adopt a vegan ketogenic diet based on your specific circumstances.

MACRONUTRIENTS: PROTEIN

Protein serves numerous functions in the human body and is crucial for overall health. In a non-ketogenic vegan diet or a non-vegan ketogenic diet, obtaining sufficient protein is usually not a concern. However, the limitations of a vegan ketogenic diet present a unique challenge in finding protein-rich food options.

On a vegan ketogenic diet, primary sources of protein may include soybeans and soy products like tofu and soymilk, lupini beans and lupin products like lupin flour and ground lupin, products made with pea protein isolate like pea milk and pea-based textured vegetable protein (TVP), nuts and seeds (especially chia, flax, hemp, and pumpkin), peanuts, nutritional yeast flakes, leafy greens (especially spinach), certain non-leafy vegetables like asparagus and broccolini, mushrooms, protein powder, and select low-carb plant-based meats. While nearly all foods contain some protein, most vegetable and fruit intake will make only a limited contribution to meeting your overall protein needs, especially if your carb limit is on the low end of the range. Produce items that are particularly high in protein relative to their net carb content are marked with a pink heart (♥) in the food list on page 14.

Creating a nutritious and sustainable vegan ketogenic diet can be challenging, and those unable or unwilling to consume multiple primary protein sources, may find that embarking on a vegan ketogenic diet is unrealistic and nutritionally ill-advised. Note that individuals not consuming legumes may require a well-formulated protein powder or supplement in order to meet their lysine needs.

MACRONUTRIENTS: FAT

When carbohydrates are restricted, another macronutrient needs to provide the necessary calories in its place. Thus, a ketogenic diet is inherently a high-fat diet unless one's calorie requirement is especially low. Nuts and seeds (including their butters and flours), avocados, and coconut are notably abundant sources of fat. Incorporating these foods into your diet, as well as using oils in dressings, sauces, and for cooking, can easily increase the fat content of your meals.

Dietary fats are a topic of ongoing debate and disagreement within the diet, nutrition, and medical communities. Researchers, medical

professionals, self-appointed experts, influencers, and enthusiasts hold differing opinions on which fats are considered healthful or detrimental. While trans fats are universally regarded as harmful and monounsaturated fats are generally recognized as beneficial, there remains debate around the health effects of high saturated fat consumption and the inclusion of certain oils in the diet. The fats you choose to include in your diet are at your own discretion.

Monounsaturated fats are found in high concentrations in most nuts, pumpkin and sesame seeds, peanuts, avocados, olives, and oils derived from these sources. Canola oil is high in both mono and polyunsaturated fats, and its healthfulness is debated by some.

Polyunsaturated fats exist in walnuts, most seeds, and oils derived from these sources. In addition, they are particularly abundant in corn, cottonseed, safflower, and soybean oils, commonly referred to as *vegetable oils* or *industrial seed oils*. These oils are an area of contention, with some claiming that they are harmful to health.

Saturated fats are prevalent in coconut, coconut oil, palm oil, and cocoa/cacao butter. High saturated fat consumption may be of concern for those with, or at risk of developing, high cholesterol.

Trans fats are found in partially hydrogenated oils, often used in margarines and vegetable shortenings, and are known to affect health negatively. It is advisable to minimize trans fat consumption.

Omega-3s

Omega-3 polyunsaturated fatty acids are essential fatty acids and have been associated with numerous health benefits. There are three main types: eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), and alpha-linolenic acid (ALA). EPA and DHA are primarily animal-based, with limited and variable amounts found only in certain seaweeds and algaes. Conversely, ALA is plant-based and plentiful in chia seeds, flax seeds, hemp hearts, and walnuts. The body must convert ALA to EPA and DHA for use, and the conversion rate is limited, inefficient, and variable. While it is unlikely that one will become Omega-3 deficient if consuming only ALA, taking an algae-oil supplement may provide health benefits.

Testing Ketone Levels

There are three methods for testing ketone levels: urine, breath, and blood. Among these, urine and blood testing are the most common and products are readily available in pharmacies or online. Blood testing is the more accurate, and the more expensive, option.

Urine test strips detect concentrations of excreted excess acetoacetate, a type of ketone. They do not directly measure the amount of ketones circulating within, or utilized by, the body. While urine tests can provide an indication of ketone production, they are imprecise. The results of urine analysis should be taken with a grain of salt as they may not accurately reflect blood ketone levels.

Blood ketone measurements require specific ketone testing strips and a corresponding reading device called a ketone meter or ketone monitor. This testing method is similar to the one used by diabetics to test blood glucose levels. By pricking your finger, you can measure the level of beta-hydroxybutyrate (BHB), another type of ketone, in your blood. Levels between 0.5 and 3.0 mmol are typically considered indicative of nutritional ketosis. Levels above 3.0 mmol may occur during prolonged fasting or when employing a ketogenic diet for specific therapeutic/medical purposes, but excessively high blood ketone levels are not required for nutritional ketosis and, if sustained, may be cause for concern.

Ketone breath analyzers, which can be purchased online, measure the levels of acetone, a third type of ketone, in your breath. These devices operate by simply blowing into them. While convenient and non-invasive, breath analysis is generally considered less accurate and precise than blood analysis. Breath acetone levels are an indirect measure of the amount of ketones circulating in the body and may not directly correlate with the concentration in the blood.

Unless using a ketogenic diet for therapeutic purposes, testing ketones is not a requirement. It can be costly, and a fixation on ketone levels can impact one's overall well-being. If you are strictly adhering to a ketogenic diet, you are likely in ketosis. However, there are a few other signs you could look for to indicate you are in, or entering, ketosis. During the initial adaptation period, you may notice a significant loss of water weight (5 to 10 pounds [2 to 5 kg]) and subsequent increased urination. You may also experience symptoms of keto flu, which is described in more detail on page 11. Other changes that may present in the early stages, and may endure, are reduced hunger and appetite, increased energy levels, heightened mental clarity, reduced water retention, less bloating, and changes in breath and body odor.

Finding and Tracking Your Macros

Macros is short for macronutrients. *Your macros* typically refers to your personal calorie requirement and the breakdown of protein, fat, and net carbs that you intend to consume in order to meet this requirement. Individual macros will vary depending on factors such as gender, age, activity level, and health and fitness goals.

Various online calculators can help you determine your ideal macros. The Keto Calculator at www.ruled.me/keto-calculator/ is one such option. Web or app-based tracking programs, like Cronometer, usually include their own calculators. For those who prefer to use data calculated elsewhere, these programs often allow for manual input of calorie and macronutrient targets.

Tracking your macros involves recording the macronutrient and calorie content of the foods you consume. This allows you to assess whether you are meeting your targets, or staying within certain limitations, and make adjustments to your diet if needed. While tracking is not essential, it can provide valuable insights and help you meet your nutritional needs and objectives. It's important to be mindful of the time commitment and possible impact on mental health that tracking can have. Striking a balance between helpful tracking and potential drawbacks is integral to overall well-being.

While tracking can be accomplished through various methods, purpose-built tracking programs are a great tool. These specialized programs offer the convenience of setting up a personal profile with personalized calorie and macronutrient targets, and come

equipped with a comprehensive database of foods from which you can select items to add to your daily diary. Once selected, the program automatically calculates the total calories and nutrients consumed, allowing you to easily compare your intake with your targets. Users can add new food items to the database, and many programs allow users to build and save custom recipes.

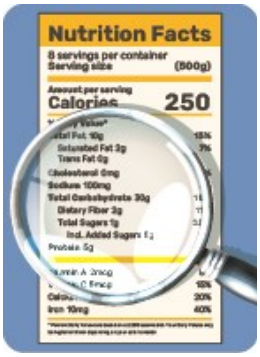
Food data in tracking programs typically comes from two sources: national databases, such as the NCCDB (Nutrition Coordinating Center Food & Nutrient Database) or the USDA (United States Food and Drug Administration), and product labels. Data from the former is derived from lab analyses and research papers, and tends to be the most comprehensive, while data from the latter is much more limited, less precise, and for the most part added to the database by program users. Label data is typically rounded, and in some countries, the use of small serving sizes may paint an inaccurate picture of a food's actual macronutrient content. Despite this, label data may be more accurate for processed items, especially condiments, sauces, and ingredient-dense products.

Regardless of source, data in tracking programs may contain discrepancies. It is prudent to compare your labels to database entries when making selections, particularly for user-added or brand-specific data. For whole foods and foods with minimal and primarily whole-food ingredients, using national lab-analyzed data will provide you with a better picture of your overall nutrient intake.

In my experience, there are some common whole-food items for which the national data consistently and significantly differs from product label data. In such cases, using label data, or a combination of label and national data, may be preferable. Notable items are agar agar, canned tomatoes, canned coconut milk, chia seeds, hemp hearts, pumpkin seeds, soymilk, sunflower seed butter, and tofu. Other common items that less consistently show significant discrepancies are bullion cubes, mayonnaise, oil-roasted peanuts, soy sauce, tahini, and tamari. There is no national lab-analyzed data for brined lupini beans, though data for cooked beans does exist.

To combine the benefits of label and national data, some programs, like Cronometer, allow users to save a copy of, and edit, a database entry. This enables the user to replace applicable fields in a national database entry with the data from a product label, thus creating a custom entry that is both product specific and comprehensive.

Tracking can be burdensome. However, there are several ways to make the process more manageable. Possibilities include batch cooking, eating the same meals frequently, following a meal plan, in-advance tracking, and periodic tracking. In-advance tracking entails dedicating a short period of time each day or week to planning out and inputting the foods you will consume in the day or week ahead. In-advance tracking saves time while also ensuring your daily nutrition targets will be met. Periodic tracking refers to tracking initially to get a feel for the parameters of your new diet and then only every now and then when you wish to introduce new foods or feel you may have veered off course.



Reading labels

Label formats vary by country, but some generalizations can be made. In Canada and the US, labels list total carbohydrates, with dietary fiber, sugars, and sugar alcohols indented on separate lines directly underneath. The food's net carbs are determined by subtracting the fiber and sugar alcohols (if applicable) from the total carbohydrates. For example, if a product has 10g total carbohydrates, 5g fiber, and 2g sugar alcohols, it has 3g net carbs. Not all products contain sugar alcohols, so they will not appear on all labels.

In other parts of the world, labels typically list carbohydrates with the fiber already deducted. The carbohydrates and fiber will be listed on separate lines, and the fiber will not be indented. If the product does not contain any sugar alcohols (aka polyols), then the carbohydrate number given is the net carbs. When polyols are present, how they are listed may vary. If polyols are given on an indented line directly beneath the carbohydrates, subtract this number from the carbohydrate number to determine the net carbs. However, if the polyols are listed on a separate line and not indented, they have already been subtracted and the carbohydrate number provided is the net carbohydrates.

Allulose, a newer sweetener discussed in more detail in the next section, is an indigestible carbohydrate that can be fully deducted from the total carbohydrate value. At present, labelling protocol for products containing allulose is inconsistent. The carbohydrates allulose contributes to the total carbohydrate value may not appear on the nutritional label itself, in which case you may have to search the product packaging to find the applicable deduction.

Keto-friendly sweeteners

Traditional natural sweeteners such as sugars, syrups, fruit juices, and dates are carbohydrate-rich and typically avoided on a ketogenic diet. Luckily, several keto-friendly sweeteners are available, including stevia, monk fruit, erythritol, xylitol, and allulose, which come in standalone forms or in blends.

Stevia and monk fruit are highly concentrated carbohydrate and calorie-free sweeteners. In their pure liquid or powdered form, only a small amount is needed to achieve desired sweetness. Though sweet, stevia and monk fruit do not taste like sugar, and, on their own, are not a structural substitute for sugar in recipes.

Erythritol, xylitol, and allulose are bulkier sweeteners and come in various sugar-like and syrup forms. They may be blended with one of the aforementioned sweeteners to boost their sweetness to sugar-like levels, and are often touted as 1:1 substitutes for sugar.

Erythritol and xylitol are sugar alcohols, which are neither sugars nor alcohols, but structurally similar to both. While quite sugar-like, sugar alcohols have a slightly different taste profile to that of sugar and can create a cooling sensation in the mouth. Sugar alcohols can cause digestive upset in some, especially if consumed in large amounts. Pet owners should be aware that xylitol is toxic to dogs.

Allulose is not a sugar alcohol, has a taste profile very similar to that of sugar, and is unlikely to cause digestive upset, making it my sweetener of choice. It also retains moisture and caramelizes like sugar. Unfortunately, allulose is not currently available worldwide.

Allulose and erythritol are indigestible and are thus typically not included in net carb count. However, there is some debate when it comes to other sugar alcohols, which are caloric and digestible to varying degrees and at varying rates. This includes xylitol. If not avoiding these sugar alcohols entirely, some choose to only

partially deduct the carbohydrates they contribute from the total carbohydrate value. Other sugar alcohols that can often be found in keto-friendly or diabetic products, and that may impact ketosis, are glycerin/glycerol, inositol, maltitol, and sorbitol. Of these, maltitol has the most potential to be problematic to maintaining ketosis.

Sweeteners need not be included in a ketogenic diet, and some choose to avoid both traditional and keto-friendly sweeteners altogether. Whether physiological or psychological, individual responses to the use of sweeteners may vary. Anecdotally, some have reported that including sweeteners in their diet has hindered their progress when it comes to reaching weight loss goals.

MICRONUTRIENTS

Vitamins and minerals are essential nutrients that the body requires in small amounts for proper functioning and overall health. A well-planned and diverse vegan ketogenic diet rich in whole foods can meet most, but not all, nutritional needs. Supplementation and/or the use of fortified foods will be required to meet certain needs.

Attention should be paid to ensuring micronutrient needs are being met, and adjustments made to correct insufficiencies. The following list may be helpful in making dietary adjustments. Suggestions are tailored to a ketogenic diet, taking into account a food's net carb content. As a result, certain foods are not featured or highlighted.

B VITAMINS, with the exception of B12, are naturally present in a variety of plant foods. Additionally, some foods are commonly fortified with certain B vitamins, including B12. Plant milks and nutritional yeast are popular fortified foods that can easily be included in a vegan ketogenic diet. Without fortification, nutritional yeast remains a good source of B1, B2, B5, and B6, though amounts vary by brand and processing method. Check product labels for accurate B vitamin content of fortified foods and nutritional yeast.

- **VITAMIN B1** (THIAMIN) is most prevalent in nuts and seeds, including chia seeds, flax seeds, hemp hearts, and sunflower seeds. Edamame and soybeans are also good sources.
- **VITAMIN B2** (RIBOFLAVIN) content is high in almonds, edamame, mushrooms, soybeans, and spinach. Alfalfa sprouts, avocados, broccoli, and kale also contain reasonable amounts.
- **VITAMIN B3** (NIACIN) is most notable in avocados, chia seeds, hemp hearts, mushrooms, peanuts, and sunflower seeds.
- **VITAMIN B5** (PANTOTHENIC ACID) content is significant in avocados and mushrooms, and noteworthy in alfalfa sprouts and broccoli.
- **VITAMIN B6** (PYRIDOXINE) is abundant in avocados, chia seeds, hemp hearts, kale, pistachios, soybeans, spinach, and sunflower seeds. It is also reasonably high in bok choy, broccoli, flax seeds, hazelnuts, sesame seeds, walnuts, and zucchini.
- **VITAMIN B9** (FOLATE) content is substantial in most leafy greens, particularly kale, Romaine lettuce, and spinach. Avocados, beets, broccoli, edamame, and leafy green herbs also contain high amounts. Quantities in soybeans and sunflower seeds are notable.
- **VITAMIN B12** (COBALAMIN) is generally not found in unfortified plant-based foods, apart from unpredictable and negligible amounts that may be present in seaweed and certain mushrooms. Consume foods fortified with B12 and/or supplement. Monitoring B12 levels via regular bloodwork is advisable.

CHOLINE is present in a wide range of plant foods, although the levels are not particularly high. Above average amounts can be found in artichokes, edamame, certain mushrooms (enoki, maitake, and oyster), and soybeans. Broccoli, cauliflower, chia seeds, flax seeds, heart of palm, hemp hearts, other mushrooms, pumpkin seeds, and spinach provide lower but notable amounts.

VITAMIN A, or more specifically provitamin A carotenoids, are abundant in dark green, orange, and red vegetables. Carrots, chard, kale, leaf lettuce, Romaine lettuce, and spinach are particularly rich sources. For use, the body converts provitamin A carotenoids into retinol, the bioavailable form of vitamin A. The conversion rate varies by type of carotenoid. Vitamin A intake should be measured in retinol activity equivalents (RAE) to account for the conversion of provitamin A carotenoids to retinol.

VITAMIN C content is reasonably high in most vegetables, and particularly plentiful in bell peppers, broccoli, and kale. Quantities are also quite high in Brussels sprouts, cabbages (especially bok choy), chard, leafy green herbs, snow peas, and spinach. Low-sugar berries, lemons, and limes can also contribute to vitamin C intake.

VITAMIN D is not naturally found in most foods. Mushrooms may contain small amounts, and some foods are fortified with vitamin D. However, vitamin D is derived mainly from sun exposure. Those with limited sun exposure, darker skin tone, or certain medical conditions may need to supplement to ensure adequate levels.

VITAMIN E is not abundant in most plant foods. However, significant amounts exist in almonds, avocados, hazelnuts, olives, pine nuts, sunflower seeds, and oils derived from these items. Chard, cilantro, kale, radicchio, and spinach are noteworthy vegetable sources. Vitamin E also exists in soybean oil and some other vegetable oils.

VITAMIN K content is high in most green vegetables, especially leafy greens like chard, kale, and spinach. It is also found in avocados, edamame, leafy green herbs, and soybeans. With the exception of chia seeds and pistachios, nuts and seeds contain little vitamin K.

CALCIUM is minimal in most plant foods. Arugula, bok choy, collards, kale, and flax seeds contain reasonable amounts. Almonds, chia seeds, poppy seeds, sesame seeds, spinach, soybeans, and tahini are high in calcium, but also high in calcium-binding oxalates, reducing absorption. Plant-based milks are often fortified with calcium, and tofu is calcium-rich when calcium sulfate is used as a coagulant.

COPPER is abundant in alfalfa sprouts, avocados, chard, edamame, kale, leafy green herbs, nuts, olives, radicchio, seeds, and soybeans. Meeting your copper needs is unlikely to be a challenge.

IRON content is not high in most plant foods. Plant-based foods containing decent amounts include basil, chia seeds, edamame, flax seeds, hemp hearts, parsley, poppy seeds, pumpkin seeds, sesame seeds, soybeans, spinach, tahini, and tofu. Some plant-based milks and meats are fortified with iron. The iron in plant-based foods is non-heme iron, which the body absorbs less easily than heme iron. Rates of absorption vary by circumstance. Monitoring iron levels via regular bloodwork is advisable. Supplementation may be required.

MAGNESIUM is most prevalent in nuts and seeds, with the exception of cashews, macadamia nuts, pecans, and pistachios. Arugula, basil, chard, edamame, soybeans, and spinach are also good sources.

Manganese is plentiful in most nuts and seeds, as well as in arugula, beets, blackberries, chard, coconut, collards, edamame, heart of palm, kale, peanuts, raspberries, soybeans, and spinach. Consuming adequate manganese is unlikely to present a challenge.

Phosphorus content is high in most nuts and seeds, especially chia seeds, flax seeds, hemp hearts, and pumpkin seeds, as well as in edamame, peanuts, and soybeans. Good amounts also exist in alfalfa sprouts, artichokes, celeriac, kale, and mushrooms.

Potassium, an electrolyte, is found in almost all plant foods, yet can be challenging to consume in sufficient quantities. Items especially high in potassium include avocados, cilantro, edamame, hemp hearts, kale, soybeans, and spinach. Arugula, broccoli, chard, flax seeds, and mushrooms have lower, but substantial, amounts.

Adequate intake of potassium can be of particular concern on a ketogenic diet due to certain inherent changes that take place within the body when carbohydrate intake is severely restricted. Insufficient potassium intake can lead to muscle cramps, fatigue, weakness, and heart palpitations, which are associated with electrolyte imbalance. Severe electrolyte imbalance can lead to serious health consequences. For those who are unable to meet their potassium needs through diet alone, supplementing with a carb-free potassium-rich electrolyte powder or a potassium salt (e.g. potassium chloride or potassium citrate) may be beneficial. However, be aware that excessive potassium supplementation, especially in concentrated doses, can also cause electrolyte imbalance and so is not without risk. Supplement responsibly.

Selenium content is negligible in most plant foods. However, a single Brazil nut will supply you with the daily recommended intake. Other notable sources of selenium are chia seeds, flax seeds, hemp hearts, mushrooms, sesame seeds, soybeans, and sunflower seeds.

Sodium content is minimal in unprocessed whole foods and most sodium in the diet comes from processed or packaged foods that contain added sodium, or when salt is added to dishes. In addition to salting your foods, good sources of sodium are salted nuts and seeds, kimchi, olives, pickles, sauerkraut, and vegetable broths.

Like potassium, sodium is an electrolyte and plays a crucial role in maintaining the body's electrolyte balance, and, like potassium, sufficient intake can be of particular concern due to certain inherent changes that occur when carbohydrate intake is severely restricted. On a carb-rich diet, sodium is typically retained. Conversely, on a ketogenic diet, sodium excretion is comparably high. Problems maintaining electrolyte balance may arise if sodium intake is limited or insufficient. If prescribed a low-sodium diet, discuss the implications of adopting a ketogenic diet with your physician.

Zinc content is particularly high in nuts and seeds, especially chia seeds, flax seeds, hemp hearts, pine nuts, poppy seeds, pumpkin seeds, and sesame seeds, and in alfalfa sprouts, basil, and soybeans.

Iodine is found mainly in seaweed, and can also be incorporate into the diet by using iodized salt. Iodine supplementation is an option for those unable to meet their needs via dietary sources alone.

Supplementation can be helpful in ensuring adequate vitamin and mineral intake and in preventing/addressing deficiencies. However, it is important to supplement sensibly. Excessive or unregulated supplementation can lead to imbalances or toxicity and should be discussed with a healthcare professional to ensure appropriate, safe, and effective dosage levels for your individual needs.

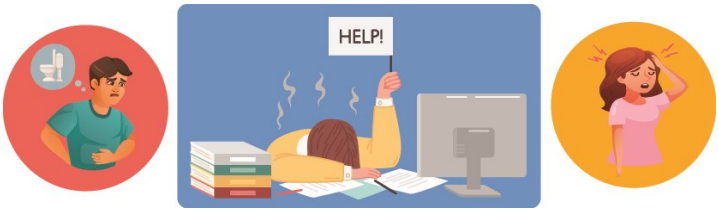
Vegan keto superfoods

Because of their nutrient profile, certain foods could be considered *super* in the context of a vegan ketogenic diet. I've divided what I deem to be vegan keto superfoods into three categories: primary superfoods, secondary superfoods, and super helpful foods.

Primary superfoods have a very low net carb content and so can be consumed in large quantities. In this category I've placed alfalfa sprouts, avocados, broccolini, chia seeds, flax seeds, hemp hearts, leafy green vegetables (especially spinach) and leafy green herbs, mushrooms, nutritional yeast, pumpkin seeds, soybeans, and tofu.

Secondary superfoods are somewhat higher in net carbs and so, depending on one's carb limit, quantities one can consume may be more limited. This category includes almonds, asparagus, broccoli, edamame, peanuts, sesame seeds, sunflower seeds, and tahini.

The super helpful foods category includes lupini beans, pea-based TVP, protein powder, and soy and pea milks (preferably fortified), all of which are great sources of protein. Also in this category are Brazil nuts (for selenium), cauliflower (as a substitute for rice or potatoes), nori (for iodine), olive oil (for healthy fats and vitamin E), and fermented foods (for gut-friendly probiotics).



Keto concerns

While research has shown potential benefits to adopting a ketogenic diet, especially for conditions related to overweight or obesity, neurological disorders, and inflammatory diseases, critics have valid concerns. The diet has been associated with an increased risk of developing nutrient deficiencies, cardiac disease, and cancer. Some argue that these risks could be mitigated with a nutritionally well-formulated and less animal-based approach. However, it needs to be acknowledged that there is currently insufficient evidence to suggest that a well-formulated vegan or plant-based ketogenic diet is entirely risk-free or healthful in the long term. Any concerns about adopting a vegan ketogenic diet should be discussed with a qualified healthcare professional. Now, let's explore some possible struggles you may encounter when adopting a ketogenic diet.

Keto flu is one of the most common short-term negative side effects of a ketogenic diet and is often experienced in the initial stages of adopting the diet, while the body is adapting. Keto flu typically involves headaches, brain fog, low energy levels, and an overall feeling of malaise. Feelings of thirst and dehydration may also be experienced. The severity and duration of keto flu varies among individuals. Increasing one's intake of fluids, salt/sodium, and of potassium and magnesium-rich foods may help minimize symptoms. Supplementing with the aforementioned minerals may

also be helpful, but should be approached sensibly. Please read the information about potassium and sodium given on the previous page. Gradually easing into a ketogenic diet may also help lessen the severity of keto flu, although some argue that this may extend the overall adaptation period, and thus could be counterproductive.

Keto rash is relatively rare. The exact cause of keto rash, also known as prurigo pigmentosa or ketosis-associated dermatitis, is not fully understood, but may be related to the metabolic changes induced by a ketogenic diet. With any rash, maintaining good hygiene is essential. Keep the affected area clean and dry. If the rash persists, see a healthcare professional for an accurate diagnosis and treatment. Anecdotally, some individuals have reported that increasing their net carb intake, while still following a low-carb or ketogenic diet, has helped alleviate the rash. If you've developed a rash, keep in mind that it may not be keto-related. Infections or allergies, including food allergies, may be the culprit.

Digestive complications can occur when making significant dietary changes, such as markedly increasing legume, fiber, or fat intake. Consumption of sugar alcohols, prebiotic fibers such as inulin, and certain obscure keto-friendly ingredients can cause bloating, gas, and digestive distress. Pay attention to how your body responds to unfamiliar foods/ingredients and adjust accordingly. Constipation may be related to inadequate sodium and potassium intake. Digestive complications may resolve over time as the body adapts, but some may find it beneficial to make dietary changes gradually.

Hair loss has been anecdotally reported as a side effect of a ketogenic diet. Hair loss can also be related to insufficient nutrition, including inadequate protein intake, severe calorie restriction, and sustained rapid weight loss. Ensure your nutritional needs are being fully met, and if restricting calories, take a moderate approach.

Insomnia can be a side effect of a ketogenic diet for some individuals. Insomnia can also result from severe calorie restriction as well as other factors unrelated to diet. Anecdotally, some have found relief by eating their most carbohydrate and/or calorie-heavy meal in the evening or by having a higher-carb snack before bed.

Exercise performance may suffer, in the short term, while the body adapts to the use of fat as its primary fuel source. Don't overexert yourself. Your performance should rebound over time and may even reach new heights once fully adapted.

Elevated LDL cholesterol levels are experienced by some who adopt a ketogenic diet, and may be cause for concern. Seek the advice of a healthcare professional on this matter. Limiting the consumption of saturated fat may serve to prevent an increase in, or reduce, LDL cholesterol levels in some individuals.

Conclusion

Adopting a vegan ketogenic diet can be both rewarding and challenging. However, armed with the basics and a mind open to culinary adventure, you are well on your way to vegan keto success!
