

An evidence-based approach to losing weight, and treating a range of chronic health conditions.



The Ketogenic Diet

Patient Guidelines

HEALTHCARE PRACTITIONER REFERENCE





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Ketone bodies are an alternative energy source easily utilised by the heart, muscle tissues, kidneys and the brain.



What is the ketogenic diet?

The ketogenic diet (KD) is a high fat, moderate protein and low carbohydrate diet that encourages the body to burn fat for energy instead of glucose.

Popular among people wanting to step off the 'sugar rollercoaster', this way of eating can help you feel fuller for longer which may aid weight loss without the need for counting calories.¹

The KD has been recognised in studies as beneficial for a range of health conditions, including epilepsy, type 2 diabetes, dementia, brain injury, acne and cancer.²

The Standard Australian Diet contains approximately 45% carbohydrate, meaning the average Australian adult consumes around 229g of carbohydrates daily.³ By comparison, the KD limits carbohydrate intake to between 20-50g per day which, followed for a period of time, leads to a metabolic state known as nutritional ketosis. In simple terms, ketosis 'tunes' the body's engine to run more efficiently on a slow burning source of fuel: fat. Thus, the KD has a strong focus on healthy dietary fats from both plant and animal sources which make up between 55-60% of total daily calories.²



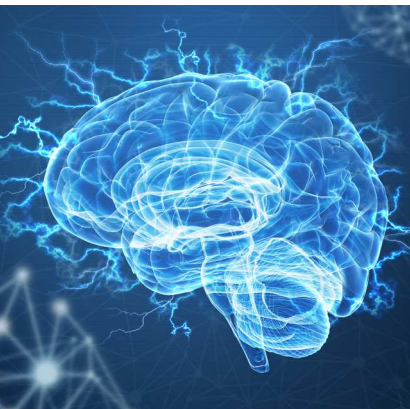
“We are now beginning to realise that ketones have many other beneficial effects beyond simply providing an energy source to replace glucose.” PROF. TIMOTHY NOAKES¹³

The KD has become a popular weight loss approach in recent years, but the diet is by no means a modern fad. In the early 1920s, researchers at the Harvard Medical School noted that seizures subsided in observed patients after two to three days of fasting and concluded that fasting had caused a change in metabolism that forced the body to fuel itself with body fat in the absence of carbohydrates.⁴ In 1921, Dr Russell Wilder concluded that a low carbohydrate, high fat diet could produce similar changes in metabolism, coined the term ‘ketogenic diet’ and began to observe its effects in epilepsy and a range of other chronic health conditions.

Since its inception, studies of the KD have shown beneficial results in the treatment of:

- acne⁵
- autism and other spectrum disorders⁶
- autoimmune disorders⁶
- cancer^{6,7}
- depression, anxiety and other mood disorders⁶
- epilepsy⁹
- metabolic disorders (including polycystic ovarian syndrome (PCOS) and type 2 diabetes)⁶
- neurological and neurodegenerative disorders (including Alzheimer’s disease, dementia, multiple sclerosis and Parkinson’s disease)^{6,8}
- overweight and obesity.¹⁰

The KD is also used by many people who are concerned with longevity, anti-ageing, fitness and optimal cognitive performance.



The 'keto flu'

The first two weeks of transitioning to a keto diet are often the most challenging. It is common to experience some side effects as the body adapts to a reduced intake of carbohydrates. Referred to as the 'keto flu', metabolic transition symptoms usually begin within two to seven days of starting the KD, lasting several days to several weeks. This is not a true form of the flu, is not contagious, and will not cause a fever.²

Symptoms of 'keto flu' include:²

- nausea
- headaches
- fatigue
- dizziness/light headedness
- insomnia
- reduced exercise tolerance, and
- constipation.

How to avoid or reduce the symptoms of 'keto flu':

- Stay well hydrated with plenty of pure water.
- Start slowly and reduce carbohydrate intake gradually over a number of weeks.
- Increase fat intake and exogenous ketones to ensure you're not undereating.
- Replace lost electrolytes and sodium often lost from KD's diuretic effects.
- Temporarily increase healthy carbohydrate-rich foods, such as nuts, berries and non-starchy vegetables.
- Engage in light exercise and physical activity.
- Ensure you're getting an adequate intake of macros and micronutrients.¹¹

If you feel very unwell, please consult your qualified health professional.



Keto essentials

Ensuring success on the KD involves a little more than simply eating bacon and eggs for breakfast – although you can do that too!

To achieve and maintain ketosis, it is important to measure your macronutrient intake of fat, protein and carbohydrates, while also ensuring adequate intake of micronutrients, vitamins and minerals.

Macronutrients

Depending on several key health and lifestyle factors, your macronutrients on the KD could range from between 55-90% fat, 5-35% protein and 5-10% carbohydrates. Work with your health professional to find the right balance of macronutrients that bring and keep your body in a state of ketosis.

Micronutrients, vitamins and minerals

Removing or reducing food groups from the diet can result in micronutrient imbalances and deficiencies. While the KD is generally rich in nutrients from wholefoods, it is important to work with your health professional to develop a balanced meal plan and supplement regime suitable for your individual needs.

Some of the most common micronutrient deficiencies that can occur on the KD include:

- **Sodium:** eliminating carbohydrates can have a diuretic, or water loss, effect which can cause your body to lose sodium (salt) and other minerals. You may need to increase your intake by adding good quality sea salt, pink salt or river salt and/or bone broth to your diet.
- **Potassium:** potassium is another electrolyte commonly lost by the body early in a KD. Deficiency can cause constipation, irritability, weakness, loss of muscle mass and irregular heartbeat. High potassium foods include mushroom, kale, avocado, spinach.
- **Magnesium:** magnesium is critical for protein synthesis, energy production and cellular health. Magnesium deficiency may cause muscle cramps, dizziness and fatigue. Magnesium-containing foods include pumpkin seeds, cacao, Swiss chard and spinach.



- **Calcium:** during the early stages of a KD diet, calcium can be flushed from the system. High calcium foods include almonds, cheese, sardines, kale and broccoli.
- **Omega-3 fatty acids:** these support cardiovascular health, reduce blood pressure, reduce inflammation and transport oxygen in the bloodstream. Omega-3 fatty acids can be obtained from fatty fish, hemp seeds, sardines and eggs, and many people choose to also supplement with a high quality, high strength liquid fish oil.
- **Iodine:** a thyroid-regulating mineral, iodine deficiencies can cause weight gain, skin problems and muscle weakness. You can obtain iodine by including seaweeds, cod, egg, tuna and cheese to your daily diet.
- **Vitamin C:** a powerful antioxidant, vitamin C is needed to create collagen and strengthen muscles and blood vessels. The KD restricts many vitamin-C rich fruits, however this important nutrient can also be found in broccoli, spinach, cauliflower, kale and Brussels sprouts.¹²

Supplements

Your health professional may recommend a supplement protocol to help you to achieve and maintain ketosis more easily and support your optimal health.

Some keto-supporting supplements include:

- **Medium chain triglycerides (MCTs):** derived from coconut oil and sustainable palm oil, MCTs can help you to maintain ketosis, avoid 'keto flu' symptoms, control appetite, and support weight loss.¹⁷
- **Low carbohydrate protein powders:** a protein powder that contains a high-quality protein source, like pea protein or grass-fed whey protein, collagen and MCTs will help keep the desire for high carbohydrate snacks at bay while boosting your healthy fat intake. Be sure to check that your protein powder contains no artificial flavours or sweeteners.
- **Keto salts:** exogenous ketones, often referred to as 'keto salts', such as beta-hydroxybutyrate (BHB) may assist in maintaining ketosis, elevating blood ketone levels and reducing blood glucose levels.



Nutritional guidelines

Foods to enjoy on the KD



Avocado

Avocado is high in healthy fats and low in carbohydrates, making it a delicious daily staple on the KD.



Eggs

Containing almost no carbohydrates, eggs are a powerhouse of protein, fat and nutrients that support optimal health.



Vegetables

Many vegetables are low in carbohydrates, high in fibre, and offer a wide range of vitamins and minerals. Keto-friendly vegetables include leafy greens, broccoli, tomato, onions, Brussels sprouts, cauliflower, kale, spinach, eggplant, cucumber, capsicum, asparagus, green beans, mushrooms, cabbage, zucchini and celery.



Dairy

Full fat, high quality dairy products are embraced on the KD, including grass-fed butter, cheese, heavy cream and yoghurt.



Seafood

High in vitamin B12, iodine and omega-3 fatty acids, fatty fish and seafood contain almost no carbohydrates. Keto-friendly options include salmon, trout, sardines, shellfish, tuna and prawns.



Meat

Opt for free range, grass-fed and organic meats including beef, lamb, chicken, pork and turkey.



Nuts and seeds

Low in carbohydrates but high in fat, protein, essential fatty acids, vitamins and minerals, nuts and seeds are a great addition to the KD. Enjoy as a snack, add to meals or grind to use as a grain-free flour alternative. Options include walnuts, almonds, cashews, macadamia, hazelnut, coconut, chia seeds, hemp seeds, flaxseeds, pumpkin seeds, and sunflower seeds. You may like to 'activate' your nuts and seeds by soaking them overnight in lightly salted water, draining and roasting in a slow oven until crisp. The activation process aids in the easy digestion of these foods.



Keto-friendly fruit

Fruit intake is limited on the KD, but you can enjoy limited amounts of raspberries, blackberries, strawberries, plums, blueberries as well as fresh lemons and limes.



Condiments

The flavour and texture of your keto-meals can be enhanced with pure nut butters, cream cheese, guacamole and homemade hot sauce, mayonnaise, hollandaise sauce and pesto.



Fats and oils

Extra virgin olive oil, coconut oil, grass-fed butter, avocado oil, lard and tallow are all high quality, keto-friendly fats.



Drinks

Water, coffee, tea, herbal tea, sparkling water.



Herbs and spices

Experimenting with fresh and dried herbs and spices in your cooking adds exciting flavours and provides extra nutrients.

Foods to avoid on the KD



Grains

Grains are high in carbohydrates which quickly convert to glucose in the blood stream. Whole grains, bread, pasta, cereal, rice, grain-based muesli bars and baked foods, and any other products containing wheat, rice, barley, rye, corn and oats are all to be avoided on the KD.



Sugar

All refined sugars, syrups, nectars, sugary foods (lollies, cakes, ice cream, etc.) and sugar-rich beverages (soft drink, juice, etc.) are to be avoided on the KD.



Beans and legumes

Beans, peas, lentils and chickpeas are high in carbohydrates, and are not recommended on the KD.



Starchy vegetables

High-carbohydrate root vegetables and tubers like potatoes, sweet potatoes, carrots and parsnips need to be replaced with lower carbohydrate vegetables and leafy greens on the KD.



Fruit

The full KD excludes all fruits except small amount of berries, lemons and limes.



Processed vegetable oils

Commonly used vegetable seed oils including canola and grapeseed oil are highly processed and do not offer healthy fats to the KD.



Premade sauces and condiments

Bottled sauces and condiments may contain hidden sugars, colours, flavours and other additives and are best avoided on the KD.



Alcohol

Alcohol is high in carbohydrates and hidden sugars and best avoided to maintain ketosis.



Reduced-fat and 'diet' products

A successful KD relies on high fat intake, so reduced fat products should be avoided.



Artificially sweetened products

Products containing artificial sweeteners are high in sugar alcohols which can adversely affect ketone levels in the blood.



Packaged and processed foods

The KD endorses a real-food eating approach. The best way to know exactly what you're eating is to prepare your own food from fresh ingredients while avoiding packaged and processed products.

Preparing for the KD

“You might be surprised by the many ways you modify your habits and hobbies to support a healthier lifestyle.”

A major dietary shift like the KD can mark the beginning of other positive lifestyle shifts, too. You might be surprised by the many ways you modify your habits and hobbies to support a healthier lifestyle.

Some tips to prepare for and ease your transition into the ketogenic lifestyle include:

Kitchen clean up

Clean out your fridge, freezer and pantry and remove non-ketogenic foods. You might like to donate goods, or gradually phase them out before going 'full keto'. After making the switch to the KD, you will notice most of your food consists of fresh refrigerated ingredients rather than packaged pantry products.

Health checks

Consult your health professional to guide your pathway to the KD. Now is a good time to undergo pathology testing to get a base reading of your nutrient levels and other health parameters. Then, you can monitor changes and track your progress.

Exercise

Being active and exercising regularly is part of a healthy lifestyle and may help reduce the symptoms of 'keto flu'. Consult a health professional before commencing any new or strenuous fitness regimes, keeping in mind your energy levels may feel low in the early days of the KD.



Hydrate

Regardless of the diet you eat, staying well hydrated is essential for good health and organ function. Most adults should aim to drink 2 litres of pure water daily.

Measure ketones

Not sure if you're reaching ketosis? You can measure ketones at home using a personal ketone meter. You will find a range of blood and breath meters on the market and your health professional will be able to help select the right tools for you.

Seek support

You don't have to do this alone! A major dietary change can leave you feeling isolated if you're no longer able to join in the afternoon tea at work or Friday night drinks with friends. But there is a large and growing keto community and you can find support and networking opportunities both online (eg. www.ketogenicforums.com) and in your local area.

Sleep and stress management

Adequate sleep is just as important as healthy food and regular exercise when it comes to optimising your health. Consider meditation, yoga and mindfulness activities to help calm your mind and support restful sleep, and speak to your health professional about sleep-supporting supplements.

Let technology do the work

There are a number of apps available that allow you to input your daily food intake and estimate your macronutrient totals (eg. MyFitnessPal). Once you've input a few of your favourite meals and food items, your diet will be even easier to track.



The 'phase-in' KD approach

“For an in-depth understanding of the benefits of the keto diet visit www.fxmedicine.com.au to listen to the podcast episode ‘Understanding therapeutic ketosis with A/Prof. Dominic D’Agostino.’”

While some people adopt the full KD straight away, most prefer a gradually staged approach. The plan below offers suggestions for a slower, gentler introduction to the full KD:

Week	Dietary Eliminations	Dietary Goal	Macronutrient Tracking	Lifestyle Factors
1	<ul style="list-style-type: none"> Added sugars (eg. table sugar, honey, maple syrup, coconut nectar, molasses) Dried fruit High sugar dairy (eg. milk, flavoured or sweetened yoghurts, milk, icecream, custard) 	<ul style="list-style-type: none"> Aim for 4 cups of keto-friendly vegetables per day Ensure a high quality fat source with each meal and snack 	None	Increase water intake to 2 litres per day
2	Processed carbohydrates (eg. bread, pasta, cereal, muesli bars)	<ul style="list-style-type: none"> Begin restricting high-starch foods to before exercise only Begin increasing the amount of fat in your meals, relative to the reduction in carbohydrates 	Reduce net carbohydrates to under 50% of daily caloric intake	Aim to hit 8-10K steps daily
3	<ul style="list-style-type: none"> Grains (eg. rice, quinoa, buckwheat, millet) Legumes (eg. chickpeas, lentils, beans) 	Reduce fruit intake to less than 2 pieces per day	Reduce net carbohydrates to under 20% of daily caloric intake	Aim to get 7-9 hours of sleep per night

7 day KD meal plan

Are you wondering what a week of KD eating looks like? Here's a sneak peak!

Feel free to experiment with different combinations of keto-friendly ingredients to keep your meals varied and exciting. Try to avoid repeating the same meals every day, regularly rotating the foods you consume to ensure a balanced intake of nutrients.

Remember: fresh is best, keep it simple, and consult with your health professional for ongoing support and keto-friendly meal ideas.



Monday

Breakfast

Pan-fried bacon and eggs, with mushrooms and wilted spinach drizzled with extra virgin olive oil.

Lunch

Goat's cheese and grilled Mediterranean vegetable plate with olive oil and balsamic dressing.

Dinner

Salmon with asparagus, cooked in butter.

Snack

Protein shake using keto-friendly protein powder, full-fat milk or dairy-free milk alternative and ice.



Tuesday

Breakfast

Protein shake using keto-friendly protein powder.

Ingredients:

- 1 serving keto-friendly protein powder
- ½ cup raspberries
- 2 tbs full fat yoghurt
- Full fat milk or dairy free alternative
- Ice

Instructions:

Blend together until creamy.

Tuesday (continued)

Lunch

Sautéed spinach and broccoli salad with poached chicken, dressed with extra virgin olive oil and pumpkin seeds.

Dinner

Mushroom and asparagus frittata with cheddar, full fat milk and simple green salad.

Snack

Fat coffee.

Ingredients:

Espresso or French press coffee with full fat milk or dairy alternative
1 tsp MCT oil
1 tsp grass-fed butter
Pinch of cinnamon

Instructions:

Blend together until creamy.



Wednesday

Breakfast

Chicken, cheese and spinach omelette with mashed avocado.

Lunch

Beef meatballs with zucchini ribbon 'zoodles', grilled tomatoes and drizzle of macadamia oil.

Dinner

Gluten-free cream cheese and cauliflower soup with side of crispy pancetta.

Snack

Chocolate fat bombs.

Ingredients:

½ cup nut butter
¼ cup cacao
¼ cup Stevia or monk fruit to taste
Pinch of sea salt

Instructions:

1. Mix ingredients together over low heat until combined.
2. Pour into mini moulds and freeze to set.



Thursday

Breakfast

Pork sausages with sauerkraut.

Lunch

Boiled eggs with asparagus spears sautéed in butter.

Dinner

Steak, fried eggs and green salad with olive oil and vinegar dressing.

Snack

½ cup thickened cream with ¼ cup berries.



Friday

Breakfast

Smoked salmon, poached egg and avocado.

Lunch

Keto beef burger patties with cos lettuce, sliced tomato, avocado, cheddar, mayo and mustard.

Dinner

Creamy bacon carbonara sauce with zucchini 'zoodles'.

Snack

Guacamole with cucumber and radish crudités.



Saturday

Breakfast

Spinach and goat's cheese omelette.

Lunch

Haloumi, avocado and rocket salad with macadamia oil and balsamic dressing.

Dinner

Steak, pan-fried in butter, with sautéed kale and mushrooms.

Snack

Small cheese, olive and mixed nut platter.



Sunday

Breakfast

Full cream Greek yoghurt with small handful of nuts and strawberries.

Lunch

Chicken and baby spinach salad with avocado, olives and full-fat feta cheese.

Dinner

Lamb chops with herb butter, and vegetable stir fry.

Snack

Herby cream cheese dip with cucumber and carrot 'crackers'.

Swap it out

Easy keto-friendly alternatives to foods and condiments that can cause a sneaky increase in carbohydrate intake.

Store-bought tomato pasta sauce	Pure tomato passata with garlic and herbs
Low-fat dairy	Full fat dairy
Wheat flour	Almond or coconut flour
Cornflour	Tapioca starch
Sugar	Stevia , monk fruit, xylitol
Pasta	Spiralised zucchini 'zoodles'
Rice	Cauliflower rice
Mashed potatoes	Cauliflower mash
Potato chips	Kale chips, seaweed snacks
Dairy milk (if allergic/lactose intolerant)	Coconut milk, almond milk

Further resources

For further information on the ketogenic diet including how it works, who it's for, and fun keto recipes to try, check out the following resources:

'Understanding therapeutic ketosis' with A/Prof. Dominic D'Agostino – www.fxmedicine.com.au

Diet Doctor – www.dietdoctor.com/low-carb/keto/recipes

Keto Clarity: Your Definitive Guide to the Benefits of a Low-Carb, High-Fat Diet by Eric C Westman MD. Victory Belt Publishing, 2014.

The Ketogenic Cookbook: Nutritious Low-Carb, High-Fat Paleo Meals to Heal Your Body by Jimmy Moore and Maria Emmerich. Victory Belt Publishing, 2015.

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