

The Benefits of Ketogenic Diets

Solving Wellness

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Solving Wellness

Founded by

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We've created this e-book in order to inform and educate about ketogenic diets and their effects on overall health. From injury recovery to chronic pain management, keto diets have a significant and widespread impact on individuals who follow them. We hope you'll enjoy this e-book and we thank you for your support!

- The Solving Wellness Team





Introduction

One of the simplest ways we can become fitter and healthier is through improvements to our metabolic profiles. This aspect of health has special significance given the impact of general fitness on COVID-19 outcomes, but is also relevant to everyday health and quality of life.

In this e-book, we'll talk about the overall benefits of keto diets in terms of weight loss, mood, energy, and their impact on athletic performance and recovery. We will also address some of the concerns and myths often mentioned when it comes to ketogenic diets. Finally, we'll discuss some of the long-term medical impacts of keto diets and their potential to transform healthcare.

“Most people are having orange juice and cereals for their first meal of the day. And it's setting you up for your blood sugar roller coaster to be going all day long.”

- Vanessa Spina



Meet Vanessa Spina

This e-book's contributing expert is Vanessa Spina, the ketogenic girl! She is a sports nutritionist, podcaster, coach, and the author of the Keto Essentials cookbook. Her show Fast Keto with Ketogenic Girl is a great resource, providing the science behind keto diets and intermittent fasting.



Vanessa originally worked in the finance industry but was constantly plagued by poor metabolic health. Every day, she faced a different issue including headaches, back pain and fatigue, and despite exercising every day, couldn't shed extra weight. Since her teen years, she had been following a plant-based diet and made an effort to consume low fat and high carb food, which she had been told were healthiest.

In an effort to regain the energy she lacked, Vanessa switched between vegan, fruitarian and vegetarian diets, but nothing could restore her health to what she felt it should be for someone in their 20s. Exasperated, she began trying new diets to see if anything could help. One technique was intermittent fasting, which quickly made a difference in her life. This consisted of a target window of 8 hours of the day in which she ate, followed by 16 hours of fasting. The addition of ketogenic foods was a natural transition for her, since the switch to a diet less centered on glucose stabilized her energy levels and made fasting an even more natural state.



Vanessa's Journey

After transitioning to a keto diet, one of the biggest changes to Vanessa's life was simply in the amount of energy and freedom of movement she gained. Unbeknownst to her, high levels of sugar, processed fats and refined carbohydrates in previous diets had been promoting inflammation in her body. The development of many chronic diseases is linked with persistent low-grade inflammation and metabolic dysregulation. It's exactly this subtle but persistent inflammation that Vanessa attributes to her past chronic pain.

For most of her life, she had been eating every 2 hours, constantly snacking and thinking about the next meal as her blood sugar spiked and fell accordingly. Along with falling blood sugar came irritability and feelings of discomfort, creating a pattern which was hard to shake. Despite regularly consuming food, the feeling of enduring satiety achieved by meeting essential nutritional requirements never came.

A dependence on a fat-based diet stabilizes blood sugar throughout the day and prevents the dramatic swings characterized by a high carb diet. Along with constant hunger, blood sugar swings destabilize mood and increase irritation. Only when Vanessa switched to a macronutrient-based ketogenic diet was she able to see the root cause of the issues she had been facing for most of her life. She saw a drastic change in the way she felt and looked and a significant boost to her energy levels. It's a pattern she often hears when speaking with people who have made this change; a lifelong struggle with nutrition and then suddenly... everything clicks with a keto diet.

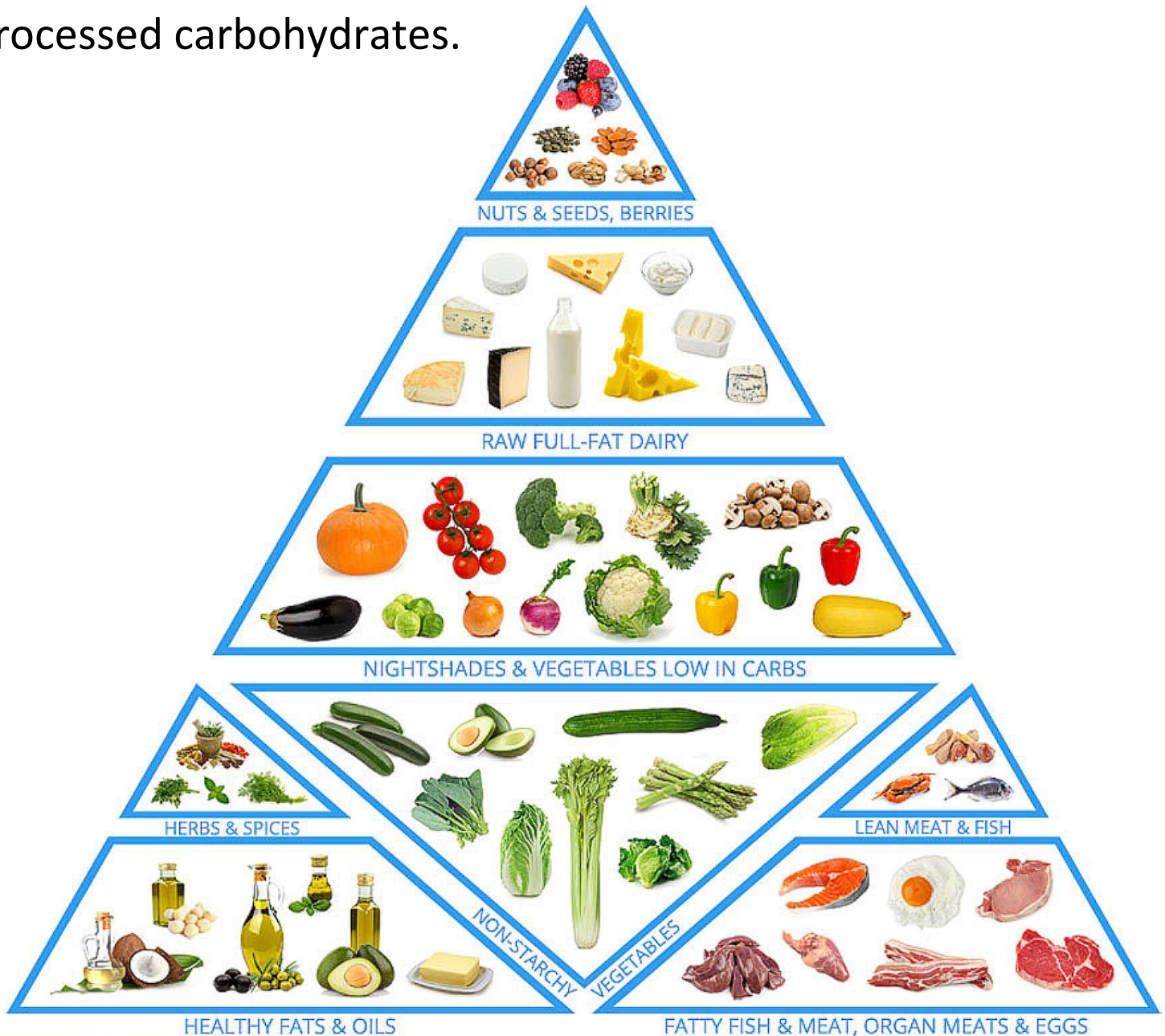
After her transition to a ketogenic diet, Vanessa experienced a stabilization in both her metabolic and emotional profiles. Instead of constantly seeking her next carb fueled energy boost, her body began to adapt and tap into natural fat stores, resulting in a slower release of energy more aligned with her metabolic needs. Previously, the constant influx of carbs and sugar provided an easily exhaustible energy source, with insulin being secreted frequently to help utilize it.


Retrospectively, Vanessa recognizes the cyclical nature of this way of eating. When you're constantly seeking the next source of rapid energy, your body is never required to access the huge reserves of stable energy stored as bodily fat. Insulin and blood sugar levels are dramatically fluctuating, and your mood and energy levels along with them.



What is a ketogenic diet?

Ketogenic, or low carb, diets are part of a wide spectrum and there is a lot of variation depending on what works best for the individual and their body. They are characterized by the production of ketones by the body, which can be made from either dietary or bodily fat. This metabolic process is only active in a low glucose state, when the body is looking to make energy using alternative sources. It's for this reason that keto diets are characterized by both high fat consumption *and* low carbohydrate consumption. Keto diets consist of roughly 70% fats, 25% proteins and 5% minimally processed carbohydrates.






**How many carbs
can be consumed
while on a
ketogenic diet?**

One of the largest variations between individuals with keto diets is in the amount of carbohydrates which can be consumed while remaining in a ketogenic state. For some very active individuals, up to 100g of carbs can be eaten daily while maintaining ketones as the main source of metabolic energy. However, less active individuals and those new to keto diets are recommended to consume under 20g of carbs daily in order to maintain ketosis. During the transition into a keto diet, keeping low levels of carbohydrates help to deplete glycogen, the storage form of glucose, and in the long term leads to the production of ketones as the main bodily energy source.

Another important aspect determining ideal carbohydrate consumption is the current metabolic state of the body. When beginning a keto diet, it takes three to five days for the body to deplete glycogen (stored glucose) and begin making ketones. Especially in these first days, keeping carbohydrate consumption below 20g daily will facilitate the body's entry into ketosis. A slightly higher than average level of protein consumption will also facilitate this, as well as increased fat consumption, especially in bodies with lower than average fat stores.

People experience various benefits from ketones because they are signaling molecules which activate different pathways in the body, just like other hormones. Some of those pathways are similar to those seen in calorie reduction, calorie restriction and fasting and all can be activated by these ketones.



**What does a
ketogenic meal
look like?**

Breakfast is easy on keto! It's as simple as bacon and eggs, or even steak and eggs. Eggs Benedict is another keto staple, with the traditional English muffin replaced by keto bread or another alternative to carbs. A general guide Vanessa uses for her meals centers around a healthy protein such as beef, salmon or turkey. She then typically adds in a low starch veggie or incorporates her protein into a salad with some tasty dressing. As a general rule of thumb, the vegetables lowest in starch and best for keto diets are green and grow above ground, such as broccoli, cauliflower and kale.

Vanessa recommends choosing selectively which meals to include any carbs in. For example, having a sweet potato for lunch might mean trying to keep dinner carb-free, or vice versa. Generally, other foods to avoid are those containing unsaturated fats, such as the canola oil found in some mayonnaise. A great alternative is mayo with avocado oil, a saturated fat. There are plenty of dessert options as well, including a dairy-free vanilla ice cream developed by Vanessa (website linked below).

You can find some more guidelines and recipes to get you started in our recipe index at the end of the e-book.



Adapting to Keto

Vanessa's Transition to Keto

For Vanessa, the transition away from carbohydrates to a fat-based diet was not as jarring as expected. Fundamentally, carbs and fats are just different forms of hydrocarbons, and each contains the energy needed to sustain the body's needs. However, the rush of energy felt after consuming foods from a high-carb diet is replaced by the slower release of energy from fats, which requires an adjustment.

Another important consideration is that ketogenic diets are not carbohydrate prohibitive, and consuming low amounts of minimally processed carbohydrates is perfectly fine. Even in terms of the types of fats consumed, there's a spectrum. Generally, saturated fats derived directly from animals, such as eggs, meat and fish, are healthier than products like seed oils, which tend to be pro-inflammatory. Overall, there is a place for carbs in a ketogenic diet, but moderation and selectivity are key.

The First Week: Adapting to Keto

Some individuals may experience “ketogenic flu” for the first week, as the body adapts to a new nutritional profile. The kidneys must adapt to decreases in basal insulin levels, and during this phase, there is reduced reabsorption of minerals and electrolytes, which may slow people down.

Sodium levels require readjustment, as people generally obtain most of their sodium from processed food. When this source is removed, there is a period of transition where people are encouraged to supplement with sodium. This ensures normal cellular activities are still optimal and maintains proper water volume in the body. Interestingly, sodium deficiencies can be just as detrimental as sodium excesses. 2 ½ tsp of salt daily is associated with the lowest mortality, and altering consumption in either direction has risks, so a balance is key. Magnesium is another ion which may need adjustment to account for excess loss through reduced kidney absorption. Food is generally magnesium deficient, so supplements are an excellent way to ensure needs are met. It is vital for many bodily processes, from DNA replication to regular bowel movements. Potassium is something which definitely does not need to be supplemented on a keto diet, since it is present in high levels in staple keto foods such as beef and salmon.

After the first week of transition, electrolytes begin to balance as the kidneys adapt and the body begins to mobilize the energy stored in fat.

Are there any people who should not go on a ketogenic diet?

With any major diet or lifestyle change, it's always recommended to explore different sources of information, do your due diligence and make sure you're approaching it the correct way, and in a way that's sustainable for you. One common issue occurs when people switch to a keto diet, but focus on convenient keto foods, which have been highly processed. When doing this, some benefits may be seen, but a consuming large amount of processed fats also has detrimental consequences.

The main ethos of keto diets is consuming real proteins, vegetables and avoiding processed foods; and it's difficult to imagine that following these guidelines would have detrimental effects to anyone. In any situation where you're removing products such as refined sugars, seed oils and processed grains, there are automatically going to be health benefits observed, since these types of foods are incredibly pro-inflammatory. The subsequent reduction in insulin in the body can have some dramatic effects, as the kidneys begin to release more sodium, decreasing blood volume and with it blood pressure. It's here where individuals who are taking medications to reduce blood pressure should consult their doctors and proceed caution to avoid becoming hypotensive or hypoglycemic. When approached in a controlled manner, individuals have been able to come off their diabetic and antihypertensive medications within weeks.



Keto Myths

Are there any detrimental effects from a primarily fat and protein-based diet?

Contrary to popular belief, animal products are very nutrient dense food sources. Compared with traditional superfoods such as blueberries and kale, animal products far exceed them in both nutrient levels and in ease of absorption. It's this energy density which causes the energy boost felt by many individuals after going keto. Animal products also have higher levels of micronutrients compared to most plant foods. An increasing focus has been placed on the benefits of zinc in the diet, which is abundant in animal products such as oysters and liver. Vitamin A levels are far higher in beef than in any of the foods traditionally considered rich, such as blueberries, kale and carrots. While these are antioxidants, the main antioxidant in the body is glutathione, made of three amino acids obtained from consuming animal foods, especially those rich in collagen.

For Vanessa, these findings have reframed the way she structures her meals. While she includes vegetables for variety and flavour, she no longer counts on them as essential nutrient sources, shifting towards animal products to meet these needs. The largest misconception, in her opinion, is in the consumption of fruits as go-to sources of nutrients. While they contain vitamins, they are also high in fructose, and to obtain adequate levels of beneficial vitamins, many servings are required. While this isn't a problem for active individuals who can balance this sugar uptake, it does become problematic when this becomes a default method of nutrient gain.

Does cholesterol increase on a ketogenic diet?

Cholesterol is a molecule which acts as a transporter in the body, helping to move the insoluble fat molecules from locations of storage into organs where they can be used for energy. Cholesterol is also the base molecule from which steroid hormones are produced, including the vital hormones estrogen and testosterone. One common concern surrounding ketogenic diets is an increase in cholesterol due to increased fat consumption.


Vanessa acknowledges that cholesterol levels do increase in ketogenic diets, since more fat transport is needed to mobilize this energy source. However, this is not necessarily a negative or abnormal process. Of the roughly 1300 milligrams of cholesterol produced by the body daily, only 20% of this is derived from food intake. This means that an increase in dietary cholesterol intake will naturally balance as the body slightly decreases other methods of cholesterol production. As the medical and nutrition community begins to recognize the essential and beneficial role of controlled cholesterol, Vanessa sees a positive change in the messaging to the public.



Long Term Benefits

Regarding long term effects, most evidence has been anecdotal, with historical and evolutionary evidence to support it. For most of human history, diets were essentially low carb and ketogenic, with most caloric intake composed of animal products and small supplementation with plant foods. It's only in the last 150 years where humans have transitioned to a diet of extreme convenience based on processed foods. It's from this switch that many of the lifestyle and metabolic issues we are now observing originate. A low carb, high protein diet has sustained us throughout evolutionary history and it's in fact a dangerous myth that exclusively plant based diets are the only option for a healthy life.

Reviewing nutritional theory, it's simple to make connections and understand the potential benefits of reverting back to our dietary origins. Initial long term rigorous scientific studies on a carnivore diet are currently being conducted, and it will be fascinating to see the results. There is, justifiably, a high requirement for this type of empirical evidence in the scientific community, and it unfortunately it has impeded the adoption of ketogenic diets into the repertoire of common physician recommendations. One key review article performed a meta-analysis on 22 studies comparing low-carb and low-fat diets. In 21 of the 22 studies, there was strong evidence that individuals following low carb diets had better health markers, increased fat loss and decreased metabolic risk factors. As research continues, more empirical evidence will only strengthen the anecdotal benefits already being seen.



Impact of Ketogenic Diets on Sports Performance

Athletic Benefits

Benefits vary depending on the type of activity done. In endurance sports, definite benefits will be seen, as the body will be more adapted to fat as an energy source. Generally, athletes “hit a wall” when they deplete their glycogen stores and begin the transition to fat oxidation as an energy source. For most people, about 2000 calories is the maximum amount of energy which can be stored as glycogen in the liver, and after this is gone, there is an abrupt transition into ketosis. One method to mitigate this is through carb loading, but for ketogenic individuals who are adapted to fat mobilization, there is a large, stable store of energy immediately available. Ketogenic benefits for activities such as sprinting are more nuanced, as these individuals generally rely more on rapid glucose metabolism, but the metabolic flexibility from a keto diet means that there are several sources of energy available to be burned.

A high protein diet coupled with strength training encourages the development of lean mass. Protein is every bodybuilder’s go to, and the same principles can be applied to everyday nutrition. In Vanessa’s case, weight gained is generally in the form of lean mass, attributed to her keto diet. She has seen similar lean mass gains in more recent years, complementing this diet with strength training. One of the most beneficial effects of increasing lean muscle mass is an increased metabolic rate, which has widespread benefits on health.

Athletic Benefits

An interesting testament to the benefits of ketogenic diets in endurance sports is the South African keto cyclist Sean Sakinofsky. He recently did a nine hour, 200km ride to raise money for the Tim Noakes foundation in South Africa. During the ride, he didn't refuel or pre fuel, he just used his body's natural fat stores for a sustained energy release. While performing endurance activities, people generally tend to turn towards glucose rich energy gels and sports drinks, thinking that the quick rush of energy is what will serve them best during an endurance activity. If you're a fat adapted or low carb athlete, you don't need to rely on any of that.



Image From: <http://thenoakesfoundation.org/news/ketogenic-cyclist-on-rollers-for-9-hours>

Injury Recovery

One of the biggest impacts of ketogenic diets in sports relates to the high levels of protein intake, which are an absolute requirement concerning the healing of sustained injuries and reducing the risk of new ones. This promotes rapid recovery, provided the protein intake is coming from a good source. Consuming high levels of meat and animal-based products, especially the protein and antioxidants from collagen, will help support the body in its recovery. Antioxidants specifically can help to buffer the DNA damage that can happen during exercise.

One of the potential issues with following a plant-based diet is that the amino acids found in these foods are those required to grow plants, so amino acid intake is never going to be optimized for muscle synthesis and repair. Another concern is in obtaining the fat-soluble vitamins and nutrients while on a plant-based diet. Vegetarians and pescatarians can consume fish and eggs as sources of proteins and B vitamins, but vegan diets specifically present a real challenge.



Impact of Ketogenic Diets on Medicine

One of the biggest gaps in health is in proper nutrition, especially in elderly populations. Aside from chronic inflammatory disease prevention, keto diets can have a positive effect on those already chronically ill or hospitalized. As individuals age, they begin to lose muscle mass, and require more protein to maintain muscles. Improper nutrition exacerbates this, resulting in muscle deterioration in elderly individuals when nutritional needs are not met. However, there is an apparent aversion to consuming high levels of protein due to the fats which naturally accompany them. This is another instance of conventional wisdom contrasting nutritional realities, causing harm in elderly populations. An example of this is diet supplementation drinks like Boost and Ensure in frail and hospitalized patients. These products do contain fats and protein, but most calories still come from added sugar, with the three main ingredients being water, glucose syrup and sugar.

To trigger muscle synthesis, a certain amount of the amino acid leucine must be consumed. To hit that threshold, about 30 grams of protein are required at each meal. If this isn't met, protein synthesis simply isn't occurring. This is extremely pronounced in elderly ICU patients, who lose muscle mass after only a few days in hospital. Foods rich in leucine include milk, chicken and fish, whereas 3 Boost drinks are required per meal to hit this threshold. Bones are also largely composed of mineralized proteins, presenting additional consequences to frail individuals who are not consuming sufficient protein.



Recipe Index

Ketogenic Meal Formula

Healthy Fat



Protein



Vegetable

TRY...

- Salmon
- Steak
- Full fat yogurt
- Cheddar cheese
- Goat cheese
- Nut butters
- Avocado

TRY...

- Eggs
- Lean fish
- Chicken

TRY...

- Kale
- Spinach
- Broccoli
- Tomatoes
- Mushrooms
- Peppers



Images from: <https://www.delicious.com.au/recipes/collections/gallery/keto-recipes/i0r61tgz?page=5>
<https://www.bonappetit.com/recipe/one-skillet-steak-and-spring-veg-with-spicy-mustard>
<https://www.tasteofhome.com/collection/keto-diet-recipes/>
<https://lifemadeketo.com/low-carb-chicken-cobb-salad/>

Spaghetti Squash Noodles

If you're a pasta lover, we've got you covered! Spaghetti squash is an amazing pasta substitute. It's low carb and low in calories, and is packed with nutrition. It takes on the flavours of any sauce, and leaves you feeling light and energized. This recipe makes it easier to pack in more veggies into your meals. Try out this fast and easy recipe for spaghetti squash noodles- a great weeknight meal to try out!



Recipe @aspoonfulofscience on IG

½ a spaghetti squash serves 1, to serve 4 people, use 2 squash

1. Preheat oven to 400F.
2. Wash and slice the spaghetti squash lengthwise.
3. Remove the seeds and stringy surface with a spoon.
4. Coat the inside with oil, salt and pepper, and place each half face down on a baking sheet.
5. Bake for 30 mins.
6. Once cooled, scrape the inside of each half with a fork, and you'll see little strings of squash begin to form. These are your "noodles".
7. Transfer the noodles to a plate, and top with your favourite sauce, protein and cheese of choice.

Cauliflower Rice

We love this rice substitute! Cauliflower rice is such an amazing low-carb staple. This is a recipe for a basic cauliflower rice. Add this to bowls, salads, or eat as a side. Top with your protein of choice and avocado slices for a complete meal.



Recipe @aspoonfulofscience on IG

1. Wash 1 head of cauliflower, and cut into large wedges. Use a box grater to grate the cauliflower into “rice” (you can also use a food processor).
2. Heat up about 1 tbsp of oil in a skillet, and add in the riced cauliflower. Add in salt, pepper, and garlic powder to taste.
3. Stir and cook until cauliflower softens, about 5-7 minutes. Cover the skillet while you cook.
4. Serve and enjoy.

Herb Tahini Dressing

Tahini is a sesame seed paste, and it's a staple in many Mediterranean dishes. This refreshing dressing is creamy and flavourful- perfect for summer bbqs! This goes well as a dip for veggies, as a dressing for salads and wraps, and as a sauce for chicken or fish dishes. Try this out!



Recipe: @aspoonfulofscience on IG

Ingredients:

4 tbsp tahini

4 tbsp water

Salt, pepper to taste

1 small clove garlic

Juice of ½ lime

1 big handful of fresh basil

Blend all of the above ingredients together until smooth. Store in refrigerator... if there's any left!

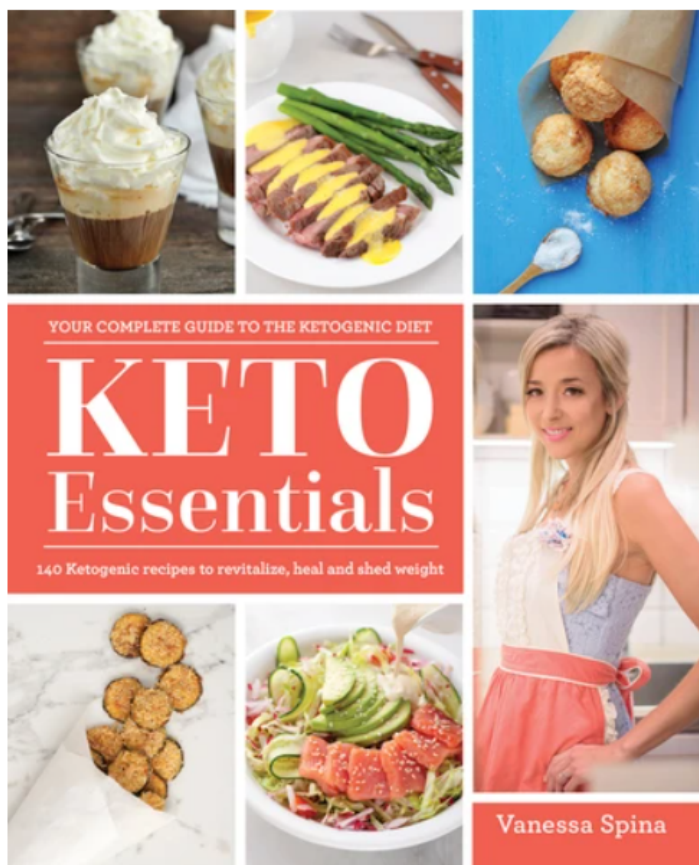


Additional Resources

Hear more from Vanessa Spina

Vanessa's weekly podcast, Fast Keto, can be found on Apple Podcasts, Spotify, and through her website. There, she interviews scientists and doctors from all over the world on topics including protein dynamics, ketogenic diets and metabolic dynamics. Through her YouTube channel, Ketogenic Girl, you can find fitness routines, recipe ideas and many more interesting topics. Another source of meal inspiration is her book Keto Essentials, which break down the keto diet and makes it far more approachable.

Website: <https://www.ketogenicgirl.com/>
@ketogenicgirl



Resources

**Visit our Solving Healthcare website:
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