

KETO



THE HEALTHY KETOGENIC DIET

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The Healthy Keto Diet



Until recently, ketosis was viewed with apprehension in the medical world; now current advances in nutritional research have discounted this apprehension and increased public awareness about its favorable effects.

The Ketogenic Diet is not only ideal for people who are suffering from obesity but also from chronic illnesses and also for those who simply want to **optimize their health.**

Benefits of the Keto Diet

- **Weight Loss**-superior to LFD.
- **Prevention of Neurological Diseases**- Epilepsy, Alzheimers and Parkinsons.
- **Increases insulin sensitivity** - lowers blood sugar.
- **Decreases Inflammation** - decreases incidence of chronic degenerative diseases.
- **Protects the genes** -dramatically reduces free radicals.

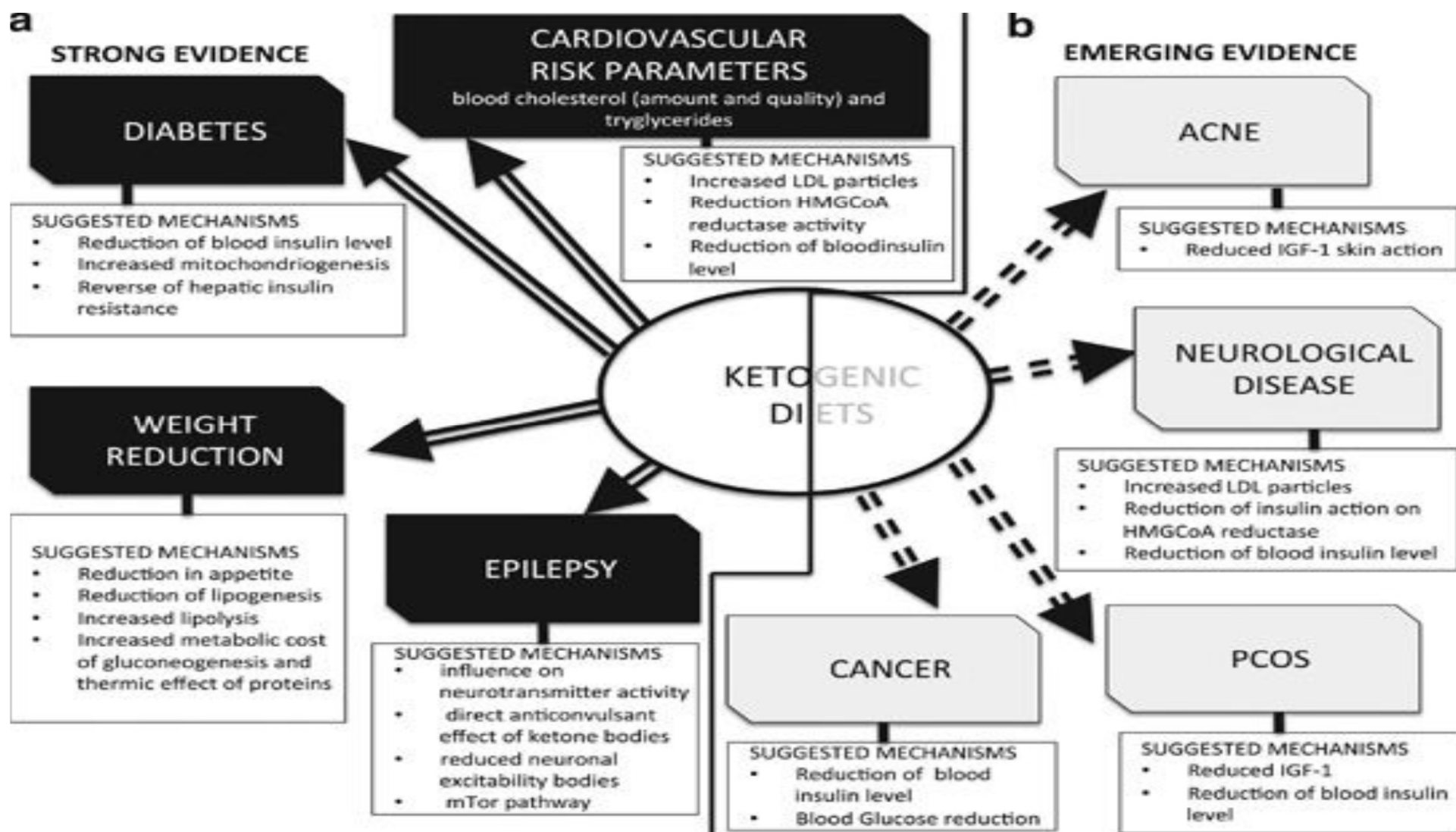
- **Improves Cardiovascular Parameters**

TGs tend to go down.

Small, dense LDL cholesterol goes down.

HDL cholesterol goes up.

- **BP improves significantly**
- **Slows tumor growth in Cancer patients**
- **Balances hormones in PCOD**
- **Decreases Acne**





- The KD has been hailed as the **holy grail of good health. It encourages eating lots of fat and limits carbohydrates. It turns the body into a fat-burning machine.** For this to happen the body has to be in a state of ketosis.
- Mild ketosis is a natural phenomenon that occurs during **fasting** and **lactation** and **post exercise**.
- Native Americans lived their lives in a permanent state of ketosis. Tribes that were at least seasonally on a KD for their entire lives. **There are many people and cultures that go into ketosis and stay there for years and years without any negative effects.**

Safety



In a 24 week study, in 83 obese patients the body weight and **BMI significantly reduced as did the levels of TG, LDL and blood glucose, and the HDL levels increased** in patients on a KD. *

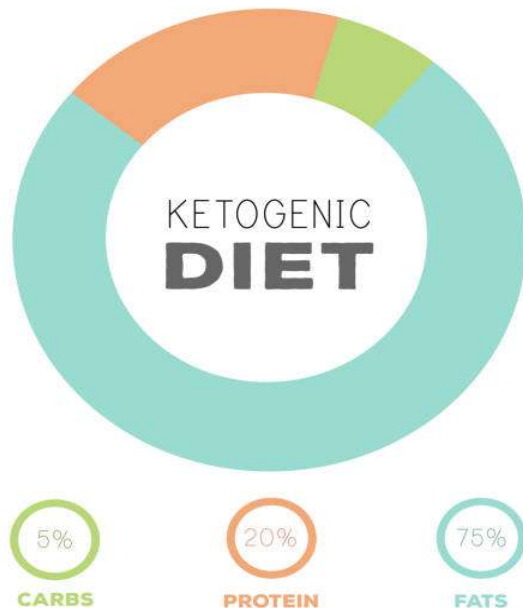
A recently concluded German study, shows **no long-term negative effects for those following a KD for 10 years**. This current study proves that a KD can safely be followed as a lifestyle choice, and not simply as a short-term therapeutic diet.**

*Hussein M Dashti,, Thazhumpal C Mathew, S Al-Zaid, Clinical Cardiology

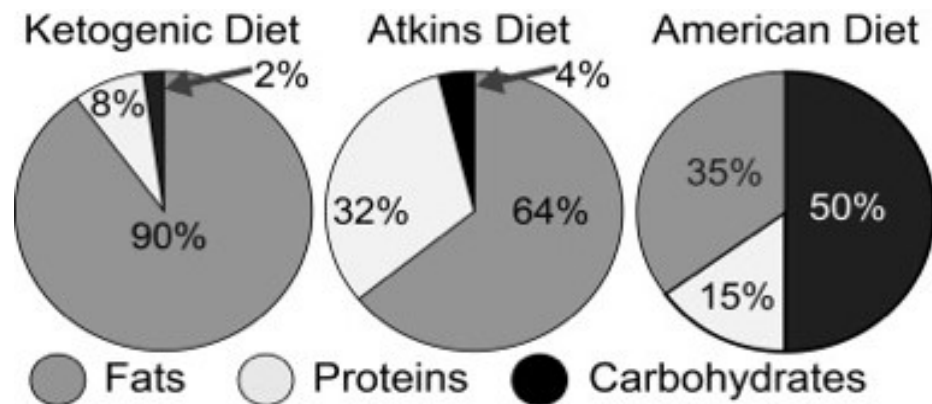
**Clinical Nutrition November 11, 2017

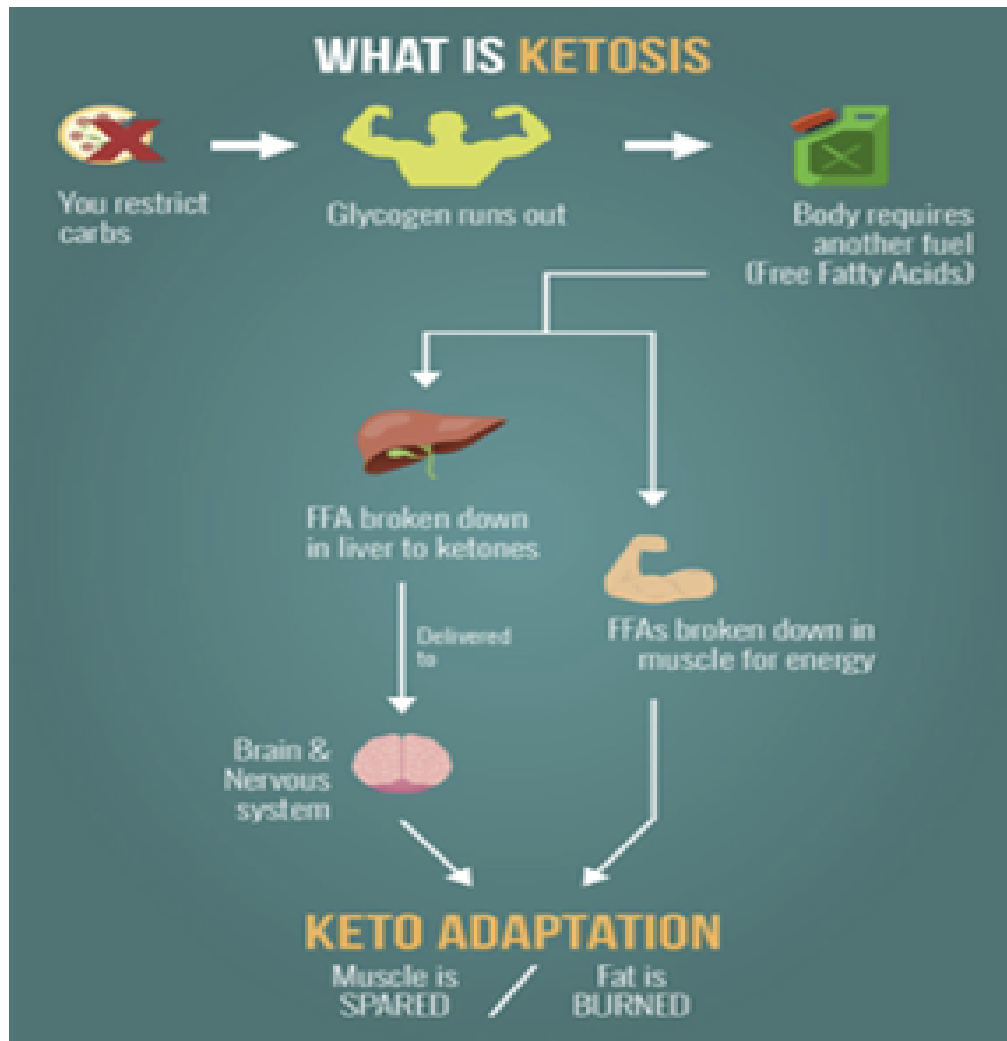
Ketogenic Diet Basics

KETO MACROS



- The KD is very high in fat-75% (of total calorie intake), moderate in protein (20%) and very low in carbs(5%) - 20- 50 grams/ day.
- This Carb reduction forces the body to rely on fats for its main energy source instead of glucose - a process known as ketosis.
- While in ketosis, the body uses ketones -produced in the liver from fats when glucose is limited.



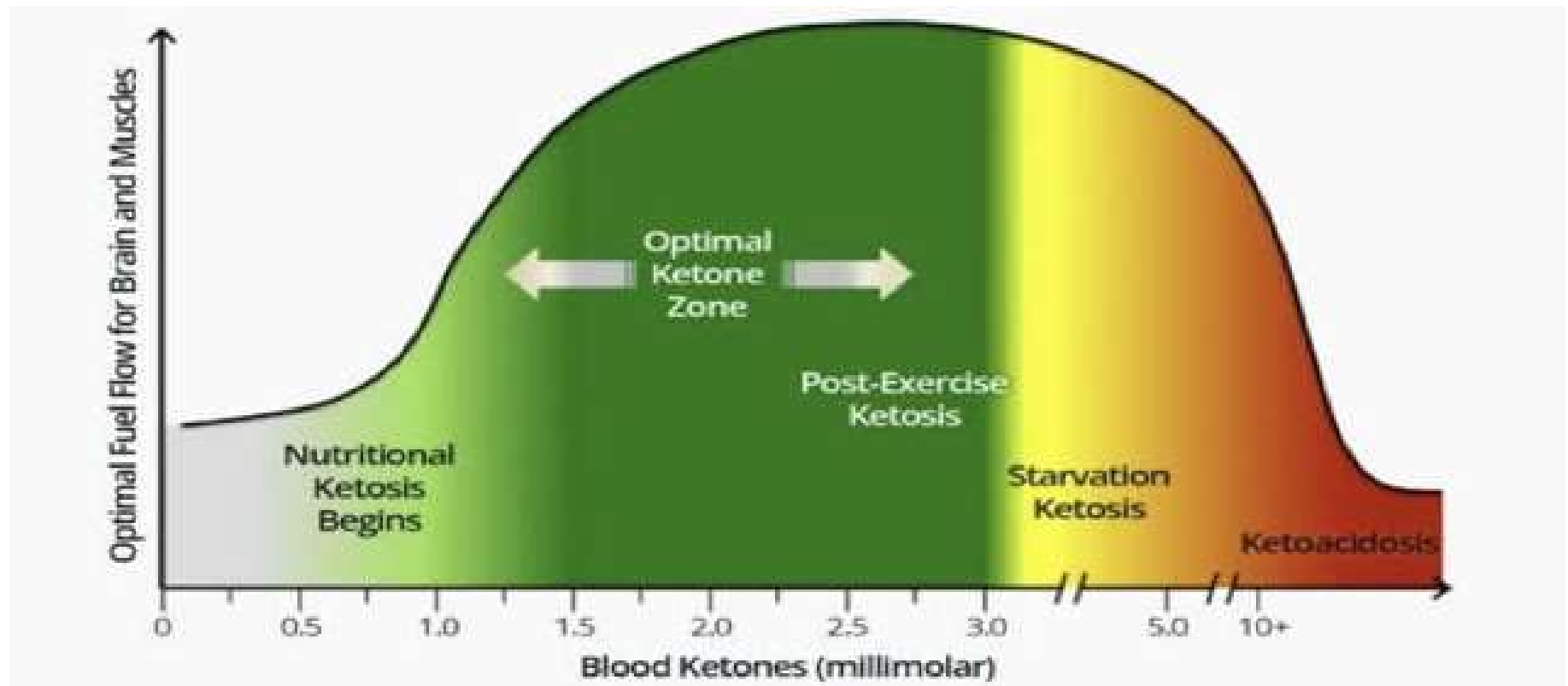


KETONES

- **Acetoacetate** (main produced)
- **β -hydroxybutyric acid** (main circulating)
- **Acetone** (sweet breath)

- KBs are used by tissues as a source of energy by being converted to acetyl CoA (Krebs Cycle).

- Most of the body's cells can use these ketones for energy directly, including most brain cells. Once taken up by the brain, ketones enter the TCA Cycle to generate energy.



Normally, the conc. of KBs is very low (<0.3 mmol/l). Ideal range is 1.5 to 3.0 mM. Over 20 mM- detrimental to the body-ketoacidosis.

Urine strip only measures excess of acetoacetate. Not reliable after a while- check blood ketone levels.

Keto Diet Variations

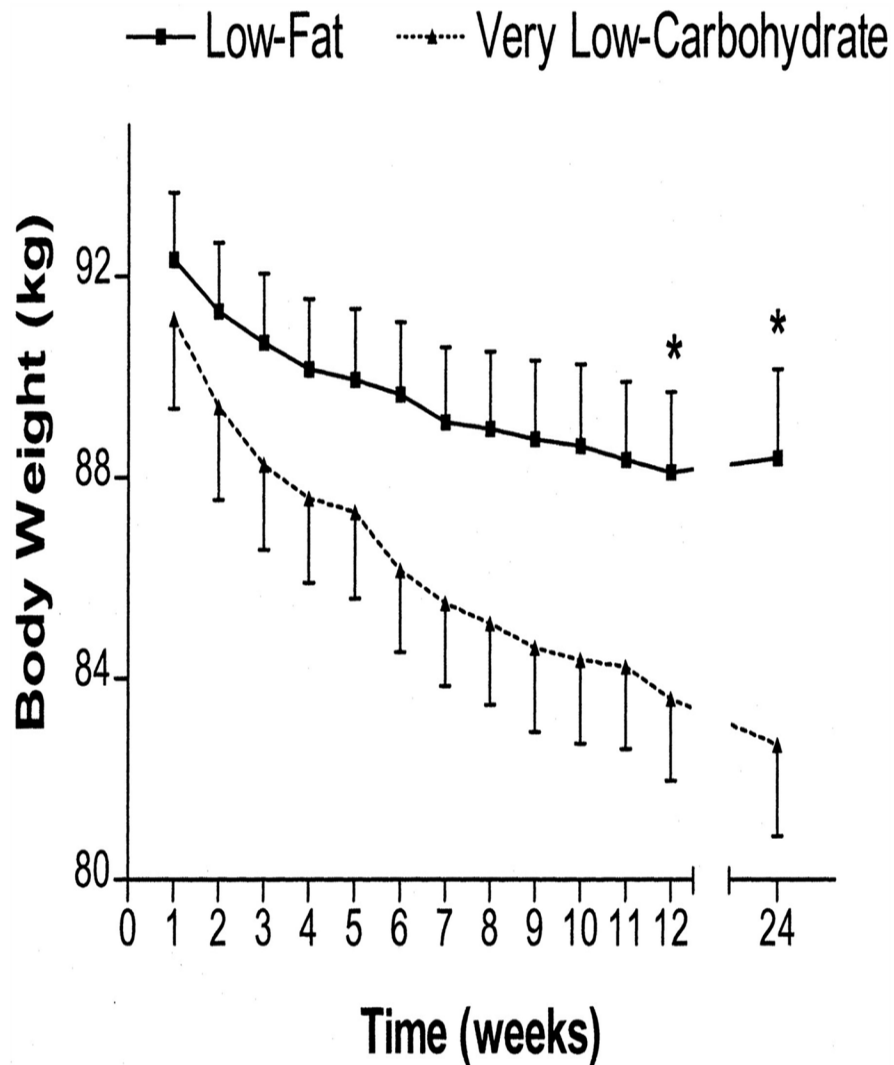
- **Standard ketogenic diet (SKD):** 75% fat, 20% protein, 5% carbs.
- **High-protein ketogenic diet:** This is similar to a standard ketogenic diet but includes more protein- 60% fat, 35% protein, 5% carbs.
- **Cyclical ketogenic diet (CKD):** This diet involves periods of higher-carb refeeds, such as 5 ketogenic days followed by 2 carb days.
- **Targeted ketogenic diet (TKD):** This diet allows you to add carbs around workouts, consuming most carbs before a workout.

Only the Standard and High-protein KDs have been studied extensively.

Cyclical or Targeted KDs primarily used by bodybuilders or athletes.

Weight loss results from

- Reduction in lipogenesis and increased lipolysis.
- Direct appetite-suppressant action of the KBs.
- Reduced caloric intake, due to the increased satiety effect of protein.
- Modifications in levels of hormones, which influence appetite, such as ghrelin and leptin.
- Reduction in the resting respiratory quotient and, therefore, greater metabolic efficiency in consuming fats.
- Increased metabolic costs of gluconeogenesis and the thermic effect of proteins.



- Numerous studies have found KDs ideal for efficient weight loss. KDs can sustain weight loss better than Low-Fat Diets.(2)
- Also those who follow the KD are able lose weight and to keep it off. There is no decline in the metabolic rate either.
- Weight-loss is easier on the Keto diet. That's because proteins and fat signal when you've had enough-highly refined carbohydrate-filled foods don't.

Numerous studies* demonstrate that subjects who follow a VLCKD diet **lose more weight during the first 3–6 months** compared with those who follow balanced diets.

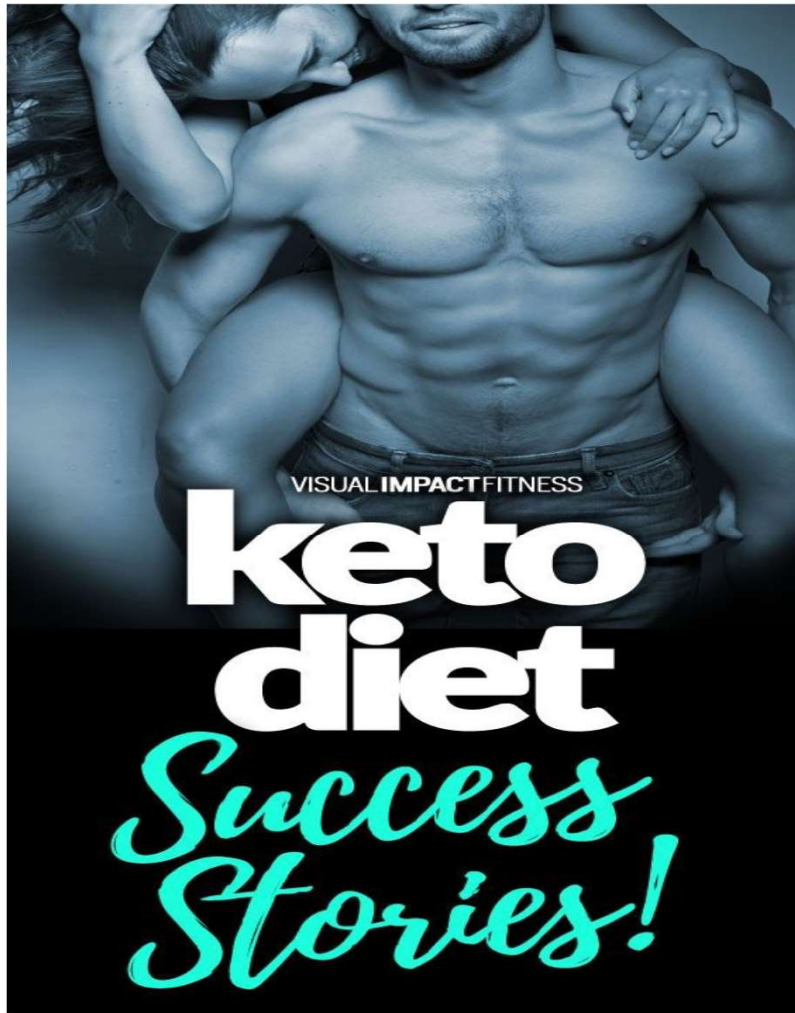
* Brehm BJ, Seeley RJ, Daniels SR, D'Alessio DA. A randomized trial comparing a very low carbohydrate diet and a calorie-restricted low fat diet on body weight in healthy women. **J Clin Endocrinol Metab** 2003; 88: 1617–1623.

*Gardner CD, Kiazand A, Alhassan S, Kim S, Stafford RS, Balise RR et al. The A TO Z weight loss study: a randomized trial. **JAMA** 2007

*Shai I, Schwarzfuchs D, Henkin Y, Shahar DR, Witkow S, Greenberg I et al. Weight loss with a low-carbohydrate, mediterranean, or low-fat diet.; N Engl J Med 2008

- In one study, obese test subjects were given either a VLCKD or a low-fat diet. After 24 weeks, researchers noted that the **VLCKD group lost more weight (9.4 kilograms) compared to the low-fat group (4.8 kilograms).***
- A report published in the January 2018 issue of the Journal of American Medical Association said that participants of studies on KDs have reported **more satiety and lesser hunger pangs than people who follow other diets with similar calorific intake.**

*Halton TL, Hu FB. The effects of high protein diets on thermogenesis, satiety and weight loss: a critical review. J Am Coll Nutr 2004; 23: 373–385.



TIME TO
KILL
SOME FAT.













Side Effects

- Keto flu / Keto rash
- Hairfall
- Cramps
- Indigestion /Constipation
- Increase in TG counts- will subside as weight loss normalizes.
- Raised LDL- in a small percent of people. However on a KD the dangerous smaller sized LDL decreases whereas the larger sized LDL increases.
- Gall Stones/ Kidney Stones

Preventing side effects

- **Staying Hydrated:** 3-3.5 l of water a day.
- **Eating More Salt:** at least 2 tsps. of salt per day, if not more.
- **Increasing Meal Frequency:** every 3-4 hours will ease the hypoglycemic stress on the body.
- **Use Organic Broths-** throughout the day is a great way to stay hydrated while also getting additional minerals and amino acids into your system.
- **Mineral-Rich Foods:** Consuming mineral-rich foods will help maintain proper hydration and support the HPA axis e.g celery, cucumber, and seaweeds.
- **Fat With Every Meal:** Every meal should have at least one source of healthy fats.
- **Supplemental Magnesium:** During changes in blood sugar, magnesium is used up quickly.

The human body is a miraculous self-healing machine, but those self-repair systems require a nutrient-dense diet.

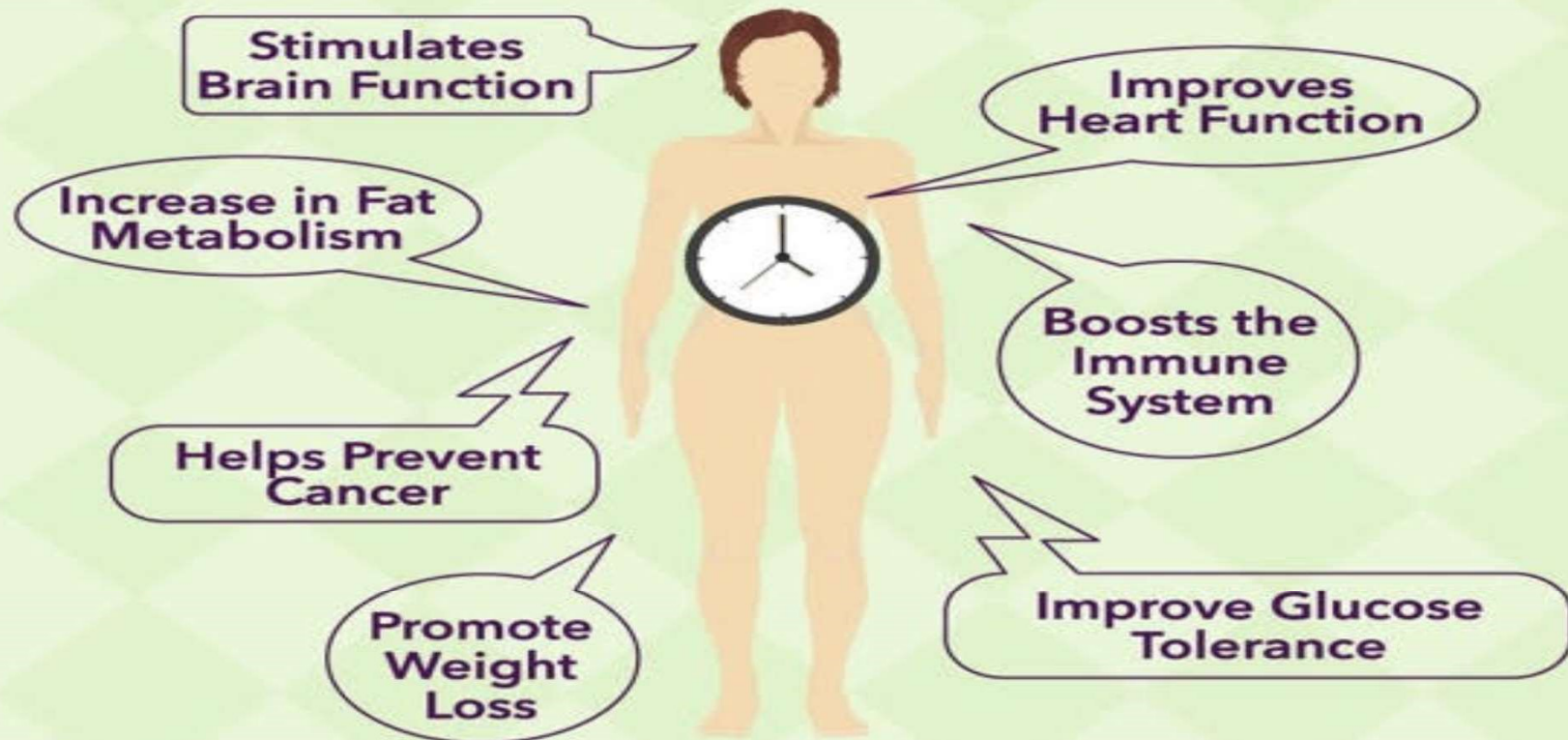
Joel Fuhrman

How To Build A Clean Ketogenic Diet

A properly formulated KD can and should be sustained over the long term.

- **Consuming whole, nutrient dense foods that feed the microbiome**, are anti-inflammatory, improve autophagy, remove cellular senescence and enhance energy production.
- It **should primarily be rich in alkaline-rich plant based foods i.e. eating a large amount of vegetables** and then layering appropriate fat and protein on top of that. Plants, fats, protein. In that order. Ditch the acidic foods.
- **Focusing on alkalinizing lifestyle practices** like meditation, Tai Chi yoga etc all of which lower the stress hormone Cortisol's effects on the body
- When **Intermittent Fasting (IF)** is added to it the KD can be taken to another level.

The Benefits of Intermittent Fasting



Sample Plate- Healthy Keto Diet

- A generalized example of a healthy keto plate would be **half vegetables** (mainly green leafy vegs) **a fourth protein**, and **a fourth healthy fats** (with more fats incorporated throughout). Keto-friendly fruit, like berries, to be reserved for the occasional dessert.
- The plate should stay consistent for all meals, since the macros are the same. Even when IF is being practiced.





Healthy Fats

Most healthy fats contain zero net carbs- to be included in high amounts with every meal. Healthy Keto fats- saturated, monounsaturated, certain types of polyunsaturated fats (PUFAs), especially omega-3 fatty acids.

- Olive oil ,Coconut oil (extra virgin and cold-pressed) palm fruit, flaxseed, macadamia and avocado oil- 0 net carbs per tbsp.
- Ghee or butter (grass-fed), and pastured animal fats (Lard, chicken fat or duck fat — 0 net carbs per tbsp.
- Avocados, coconut, olives, nuts, seeds, salmon.

Saturated Fa(c)ts



- **Saturated Fats Don't Increase Chances of Heart Diseases**

- raise concentration of HDL
- improve HDL/LDL ratio
- increase concentration of larger fluffy LDL
- Several studies have shown that a high saturated fat intake increases large LDL concentrations & potentially lowers small LDL concentrations.

KETO DIET CRAZE

GOOD FATS VS. BAD FATS

■ **Good fats: Avocado, Nuts, Salmon**

■ **Bad fats: Vegetable Oil, Processed Meat, Processed Cheese**



Oils high in MCTs

The fatty acid groups of MCTs include caproic acid, caprylic acid, capric acid, and lauric acid.

- Coconut oil: 15%
- Palm kernel oil: 7.9%
- Cheese: 7.3%
- Butter: 6.8%
- Milk: 6.9%
- Yogurt: 6.6%

Keto Diet Proteins

Animal proteins (meat, fish, etc.) have very little, if any, carbs- **should be high quality meat, non-processed, non-GMO and antibiotic and hormone free.**

- Grass-fed lamb, goat, beef, veal, venison - 0 grams net carbs per 5 oz.
- Organ meats including liver — around 3 grams net carbs per 5 oz.
- Poultry- turkey, chicken, quail, hen, goose, duck - 0 grams net carbs per 5 oz.
- Cage-free eggs and egg yolks — 1 gram net carb each.
- Fish- tuna, trout, bass, mackerel, salmon, sardines - 0 grams net carbs per 5 oz.
- Tahini, almond butter, mayonaise, egg yolk, nuts- macademia, almonds. Brazilian, pecans, walnuts and sunflower seeds good. Avoid cashewnuts.
- Whey protein- very insulinogenic- in and out of ketosis.

Proteins

- In one study, 25% of daily calories as protein reduced obsessive thoughts about food by 60% and cut the desire for late-night snacking by 50% *
- Studies show that protein increases metabolic rate and helps curb appetite**
- Excess protein consumption is Insulinergic, just as carbohydrates are. The excess protein is converted into glucose, thereby raising insulin levels, and fat storage.
- Protein also has the double edge sword of also activating mTOR — a pathway that is involved in aging, cancer, and brain cell dysregulation, increased cell proliferation, cell division, and it inhibits autophagy.

*The effects of consuming frequent, higher protein meals on appetite and satiety during weight loss in overweight/obese men.

[Leidy HJ](#)¹, [Tang M](#), [Armstrong CL](#), [Martin CB](#), [Campbell WW](#). 2011 Apr;19. Epub 2010 Sep 16.

** Protein intake and energy balance. [Westerterp-Plantenga MS](#)¹. 2008 Aug 7. Epub 2008 Mar 25.

Carbohydrates

Carbs intake should be restricted to less than 50 grams daily.

- Carbs should come from vegetables and on rare occasion from low-sugar fruits like blackberries, raspberries, strawberries etc.
- Low –carb junk food to be completely avoided-may contain poor quality ingredients, (artificial colors and sucralose) and foods containing gluten might cause sensitivities. These are
 - bad for the gut and overall health
 - increase inflammation,
 - trigger leaky gut,
 - cause insulin resistance, and other issues
- Insoluble fibre- does not count. Soluble fibre-counts -half gram of carbs.
- Net carbs- final carbohydrate count after subtracting fiber and sugar alcohols.

Low Carb Vegetables

- Lettuce
- Asparagus
- Mushrooms
- Kale
- Zucchini
- Tomatoes
- Garlic
- Cucumbers
- Spinach
- Coriander, Mint
- Broccoli
- Bell peppers
- Brussels Sprouts
- Onions
- Eggplant
- Artichoke
- Cabbage
- Celery
- Avocadoes
- Cauliflower
- Radish
- Green beans
- Bok Choi

- All leafy greens, including beet greens, collards, mustard, turnip, spinach, kale — 0.5–5 gms net carbs/ 1 cup
- Celery, cucumber, zucchini, chives and leeks -2–4 gms net carbs/ 1 cup
- Cruciferous veggies like broccoli, cabbage, and cauliflower -3–6 gms net carbs/ 1 cup
- Fermented foods like sauerkraut, kimchi, dairy or coconut kefir - 1–2 gms net carbs/ 1/2 cup
- Fresh herbs — close to 0 gms net carbs /1–2 tablespoons
- Veggies i.e asparagus, mushrooms, bamboo shoots, bean sprouts, bell pepper, peas, water chestnuts, radishes, green beans, , tomatoes – have 3-7 gms net carbs/ 1 cup raw
- **Fat-Based Fruit**
- Avocado-3.7 gms net carbs/ half cup
- **Fruits**
- Berries, including blueberries, strawberries, blackberries, raspberries - 3–9 gms net carbs / 1/2 cup
- Asian pears - 8–9 net carbs/ pear

What 20 GMS of Carbs look like



20
grams of carbs
on each plate



What 50 GMS of Carbs look like



50

grams of carbs
on each plate



Sugars

Sugars allowed

- Monk fruit
- Stevia-might have a insulin response
- Sucralose- kills gut bacteria
- Equal ok in keto diet- but not healthy
- Erythritol- causes an upset stomach

Sugars not allowed

- Xylitol
- Corn syrup
- Honey
- Agave
- Apple nectar
- Regular sugar
- Maltitol

Condiments

- No sugar added ketchup or salsa
- Sour cream
- Mustard, hot sauces-0 gms net carbs
- Spices and herbs — 0 gms net carbs
- Apple cider vinegar — 0–1 gms net carbs
- Unsweetened mustards — 0–1 gms net carbs
- Poppy seeds — 0 gms net carbs
- Lemon/ lime juice
- Soy sauce
- Salad dressing
- Pickles

Snacks

- Snacking between meals can help moderate hunger and keep one following a KD on track.
- 1-2 snacks per day will suffice, depending on activity level
- Keto bullet coffee is a meal. Coffee is good as it mobilizes FA- liver-ketones polyphenols-recycling stimulates autophagy
- Many snacks contain poor-quality ingredients, including **artificial colors and sucralose**-adversely affecting gut microbiome and **increasing Insulin Resistance**.
- Many people have issues with gluten, dairy, soy, eggs, and peanuts as well as junk oils, like soybean. All these can cause inflammation, trigger leaky gut, insulin resistance, and other issues that will eventually prevent fat loss as they sabotage health.

Snacks

- **Bone broth** — 0 grams net carbs per serving
- **Beef or turkey jerky** — 0 grams net carbs
- **Hard-boiled eggs** — 1 gram net carb
- **Extra veggies with homemade dressing** — 0–5 grams net carbs
- **1/2 avocado with sliced salmon/chicken** — 3–4 grams net carbs
- **Minced meat wrapped in lettuce** — 0–1 grams net carbs
- **Shirataki noodles** — 0–1 grams net carbs
- **Nut butter(1 tablespoon) or MCT oil in a smoothie-** 4 net carbs per 2 tablespoons
- **Cheese roll-ups/Parmesan crisps**
- **Chia Seeds/Flax seeds-** 4 net carbs per 2 tablespoons
- **Macadamia nuts/ almonds-** 1.5–4 grams net carbs per 1 ounce
- **Greens with high-fat dressing and avocado**
- **Keto smoothie made with coconut milk, cocoa and avocado**
- **7–10 olives**
- **Veggies with melted cheese**
- **Guacamole with low-carb veggies**
- **Coconut chips, Kale chips**
- **Olives and sliced salami**
- **Celery and peppers with herbed cream cheese dip**
- **Berries with heavy whipping cream**

Supplements

- Omega 3- 3-5 grams (meats increase Omega 6)
- Vit A, Vit K2, Vit C, Vit D Vit B12 and Vit B6
- Probiotics
- MCT
- Turmeric
- Minerals: Sodium, Potassium, Magnesium. 3,000–4,000 mg of Sodium, 1,000 mg of Potassium and 300 mg of Magnesium per day and Zinc.
- Calcium, Melatonin, GABA
- Caffeine & Green tea extract

Drinks

- Water, Sparkling water, Unsweetened coffee, Unsweetened green tea
- Fresh vegetable juice - 8 ounces daily at most
- Unsweetened coconut or almond milk
- Light broth
- Water with lemon and lime juice

The above should be consumed moderately just 1–2 small servings per day. Contain between 1–7 net carb grams per serving.

Alcohol

Though alcohol should be restricted, enjoying a low-carb drink is perfectly fine on occasion.

- Vodka/Gin/ Tequila mixed with soda water - ok
- Wine, Brandy - Not too good
- Beer - to be completely avoided

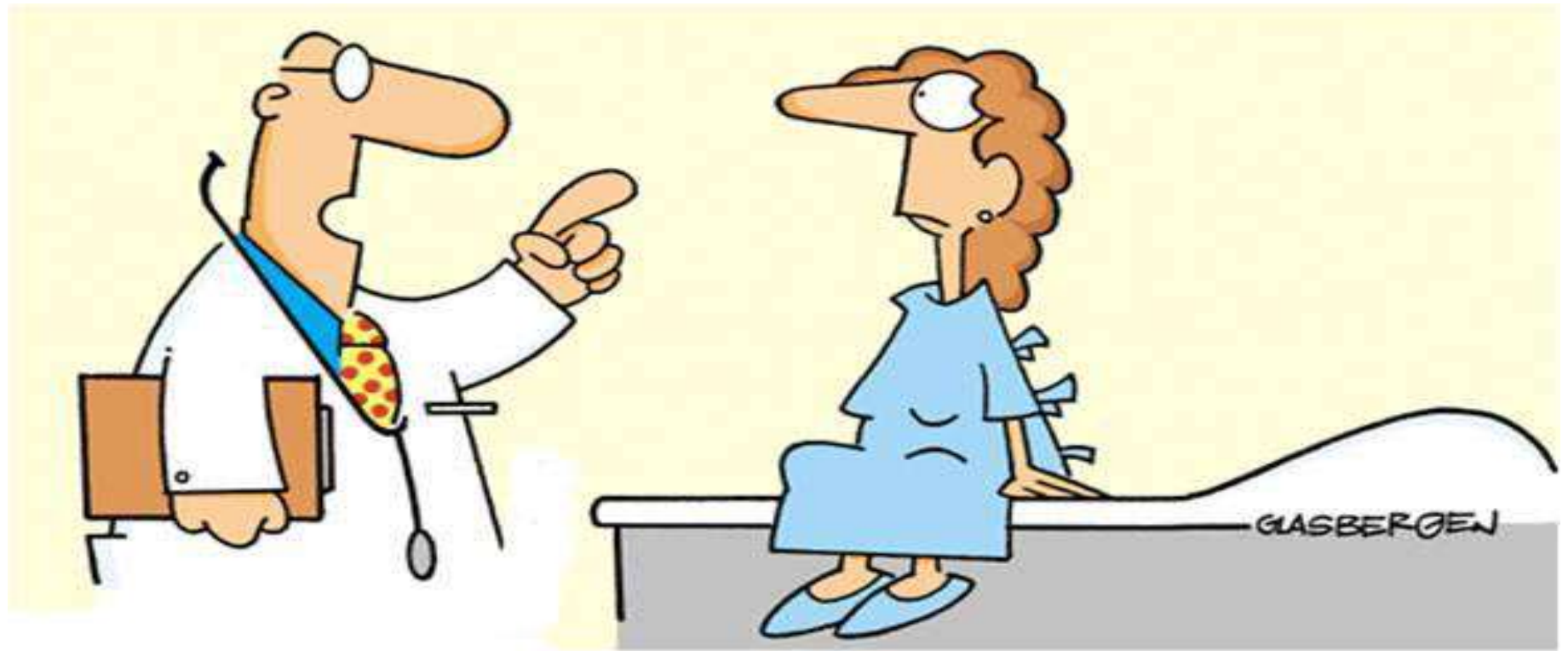
Exercise

- **Best to do resistance training like weight lifting 3 times per week after a warm up.**
- By lifting weights, lots of calories are burnt -prevents metabolism from slowing down, which is a common side effect of losing weight.
- **If lifting weights not an option, then cardio workouts like walking, jogging, running, cycling or swimming suffice.**

Studies on low-carb diets show that there could be gain of a bit of muscle while losing significant amounts of body fat by weight-lifting.

The New Healthy Ketogenic Diet

- **Focus on quality fats.** Excess fat -inflammation. Eating processed and conventional meats. Consume Quality MCT Oil.
- **Choose Carbohydrates wisely.** Don't waste the carbs. Eat real plant-based food. Avoid low-carb junk food.
- **Don't Over Consume Protein.** Avoid Dairy.
- **Pay attention to micronutrients.** Consume enough water and salts.
- **Supplement.**
- **Practice Intermittent Fasting,**
- **Focus on more than food.** Limit Stress, Get Quality Sleep, Exercise Regularly.
- **Be flexible.** Get cyclical.



“You went on low-carb..., lost 90 pounds, lowered your cholesterol, cured your high blood pressure, and now you’re walking five miles a day. But I’m warning you, a low-carb diet is bad for your health!”

Cyclical Ketosis

To add carbs back- start with small amounts (15 to 25 grams) of high- fiber carbs. Add it before exercise-for five to ten days. Then add a second portion after the workout. Then add a little more to the pre-workout and then to the post-workout meal. Add a little bit more to another meal of the day.

It's a very slow process. If you don't slowly transition out of the KD gradually, the weight will shoot up.

Then get cyclical. Become flexible.

Cyclical ketosis means the patient sometimes is in ketosis and sometimes not. This is also called ***flexible ketosis***, which creates ***metabolic flexibility***—the holy grail of metabolism management. Along with intermittent fasting, this provides a win-win strategy to achieve health goals.



- Ketosis “unlocks” keto’s main potential health benefits, from effective weight management to balanced blood sugar, reduced inflammation, and increased mental clarity.
- Going into nutritional ketosis by following a Ketogenic Diet is one of the most radical but highly beneficial lifestyle changes you can make to improve your health.



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