

Low Carb Redux:

Whom do we believe?

By

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1. **The Media tells you that you need to eat grains because they are recommended on the FDA food pyramid.**

What does the research say?

6-11 servings per day! It is interesting to note that as the carbohydrates increased in our diets (209 g/day in 1988-1990 to 241 g/day in 2003-2004)(12), so too did our waist sizes, bodyfat percentages, obesity rates, use of cholesterol lowering drugs, rate of type II diabetes as well as increased rates in metabolic syndrome. “To many nutritional experts, the 1992 pyramid did not reflect the latest research on dietetics (1).” There is much controversy surrounding the role of food lobbyists and their role in the development of recommended portion sizes for their respective clients (ie; the companies with the highest profits have the most lobbyists, therefore the most servings.)

A 2004 study drew direct parallels between the increased consumption of refined carbohydrates and the increasing rates of type II diabetes. In this study the researchers concluded “Increasing intakes of refined carbohydrate (corn syrup) concomitant with decreasing intakes of fiber paralleled the upward trend in the prevalence of type 2 diabetes observed in the United States during the 20th century (11).” A similar study showed “subjects in the highest quintile of energy-adjusted fructose intake had 13.9% higher C-peptide concentrations (P for trend = 0.01) than did subjects in the lowest quintile (12).” In other words C-peptide concentrations (which are reflective of insulin resistance and the development of type II diabetes) were much higher in those consuming larger quantities of refined carbohydrates.

Perhaps Bell and Sears (2003) were on track when they proposed “a science-based diet approach (13)” based on research and independent scientific studies, free of financial ties and political agendas.

Did you know?

- Did you know that the average dress size of women has increased to size 14(2)

- Did you know that in the past 25 years prevalence of obesity in children aged 2–5 years, has more than doubled (5.0% to 12.4%), nearly triple for those aged 6–11 years (6.5% to 17.0%), and more than tripled for those aged 12–19 years (5.0% to 17.6%)(3,4).
- Did you know that as of 2005-2006, 34% of Americans are now obese, 32.7% are overweight, and just under 6% are considered morbidly obese.(5), compared to 33% overweight, 22.9% obese and 2.9% morbidly obese between the years 1988-1994.
- Did you know that “new diagnoses of type 2 diabetes nearly doubled as it rose from 4.8 per 1,000 people (1995 to 1997) to 9.1 per 1,000 people (2005 to 2007) (6).

References

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2. Mullins A. **Average dress size of a woman increases to 14.** *The Independent, UK.*, June 26, 2000.
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4. 46. Ogden CL, Carroll MD, Flegal KM. **High Body Mass Index for Age Among US Children and Adolescents**, 2003–2006. *JAMA* 2008;299:2401–2405.
5. Reuters. **Obese Americans now outweigh the merely overweight.** January 9, 2009.
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11. Gross L, Li L, Ford E, Liu S. **Food pyramid increased consumption of refined carbohydrates and the epidemic of type 2 diabetes in the United States: an ecologic assessment.** *American Journal of Clinical Nutrition.* 79(5); Pp 774-779. 2004

“corn syrup was positively associated with the prevalence of type 2 diabetes (beta = 0.0132, P = 0.038). Fiber (beta = -13.86, P < 0.01) was negatively associated with the prevalence of type 2 diabetes. In contrast, protein (P = 0.084) and fat (P = 0.79) were not associated with the prevalence of type 2 diabetes when total energy was controlled for.”
12. Oza Frank R, Cheng Y, Naravan K, Gregg E. **Trends in nutrient intake among adults with diabetes in the United States: 1988-2004.** *J Am Diet Assoc.* 109(7); Pp 1173-1178. 2009.
13. Wu T, Giovannucci E, Pischon T, Hankinson S, Ma J, Rifai N, Rimm E. **Fructose, glycemic load, and quantity and quality of carbohydrates in relation to plasma C-peptide concentrations in US women.** *American Journal of Clinical Nutrition.* 80(4); Pp 1043-1049. 2004.
14. Bell S, Sears B. **A proposal for a new national diet: a low glycemic load diet with a unique macronutrient composition.** *Metab Syndr Relat Disord.* 1(3); Pp 199-2008. 2003.

2. The nutritionist tells you that the human body requires grainy carbohydrates.

What does the research say?

Let's look at this one from an evolutionary perspective. In his groundbreaking book on Paleolithic nutrition, Dr. Loren Cordain states "What do Paleolithic people have to do with us? Actually, quite a lot: DNA evidence shows that genetically, humans have hardly changed at all (to be specific, the human genome has changed less than .02 percent) in 40,000 years. This means that the genetic makeup of Paleolithic people is virtually identical to our own. Literally, we are Stone Agers living in the Space Age; our dietary needs are the same as theirs. Our genes are well adapted to a world in which all the food eaten daily had to be hunted, fished, or gathered from the natural environment—a world that no longer exists. Nature determined what our bodies needed thousands of years before civilization developed, before people started farming and raising domesticated livestock (1)."

"In other words, built into our genes is a blueprint for optimal nutrition—a plan that spells out foods that make us healthy, lean and fit." He goes on to explain 'we need to give our bodies the foods we were originally designed to eat (1)."

Dr. Cordain simplifies human nutrition by drawing parallels to the fuels needed for automobiles. He explains "your car is designed to run on gasoline. When you put diesel fuel into its tank, the results are disastrous for the engine. The same principle is true for us: we are designed to run best on the wild plant and animal foods that all humans gathered and hunted just 500 generations ago. The staples of today's diet—cereal, dairy products, refined sugars, fatty meats, and salted, processed foods—are like diesel fuel to our body's metabolic machinery. These foods clog our engines, make us fat, and cause disease and ill health(1)."

Studies on our ancestral eating patterns echo similar findings.

- O'Keefe J, Cordain L. **Cardiovascular disease resulting from a diet and lifestyle at odds with our Paleolithic genome: how to become a 21st-century hunter-gatherer.** *Mayo Clin Proc.* 79(1); Pp 101-108. 2004.

"Accumulating evidence suggests that this mismatch between our modern diet and lifestyle and our Paleolithic genome is playing a substantial role in the ongoing epidemics of obesity, hypertension, diabetes, and atherosclerotic cardiovascular disease."

- Cordain L, Eaton S, Miller J, Mann N, Hill K. **The paradoxical nature of hunter-gatherer diets: meat based, yet non-atherogenic.** *Eur J Clin Nutr.* 56; Pp 42-52. 2002

“The high reliance upon animal-based foods would not have necessarily elicited unfavorable blood lipid profiles because of the hypolipidemic effects of high dietary protein (19-35% energy) and the relatively low level of dietary carbohydrate (22-40% energy).”

- Cordain L, Eaton S, Sebastian A, Mann N, Lindeberg S, Watkins B, Okeefe J, Brand-Miller J. **Origins and evolution of the western diet: health implications for the 21st century.** *American Journal of Clinical Nutrition.* 81(2); 341-354. 2005.

“food staples and food-processing procedures introduced during the Neolithic and Industrial Periods have fundamentally altered 7 crucial nutritional characteristics of ancestral hominin diets: 1) glycemic load, 2) fatty acid composition, 3) macronutrient composition, 4) micronutrient density, 5) acid-base balance, 6) sodium-potassium ratio, and 7) fiber content.”

“The evolutionary collision of our ancient genome with the nutritional qualities of recently introduced foods may underlie many of the chronic diseases of Western civilization.”

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2. Samuel D. **Cereal foods and nutrition in Ancient Egypt.** *Nutrition.* 13(6); Pp 579-580. 1997.
3. Cordain L. **Cereal grains: humanity’s double edged sword.** *World Rev Nutri Diet.* 84; Pp 19-73. 1999.
4. Bogin B. **From caveman cuisine to fast food: the evolution of human nutrition.** *Growth Horm IGF Res.* 8B; Pp 79-86. 1998.

3. The doctor tells you that your heart health will be negatively impacted without grains in your diet.

What does the research say?

No wonder Lipitor has been one of, if not the best selling drug of all time (with 2006 sales of US\$12.9 billion, Lipitor was the largest-selling drug in the world (1)). In this day in age we have grainy carbohydrate cereals claiming to be “heart healthy” (ie: Kashi Heart to Heart, Kellogg’s Smart Start, and Cheerios), grainy carbohydrate snackbars claiming the same (“Powerbar Harvest Whole Grain heart healthy bars”), and even soy milk has information on the internet regarding it’s beneficial effects on heart health. Perhaps one or two of the ingredients in the cereals and snackbars have been found to be beneficial to one’s heart health, but what happens to the healthy benefits during the refining (not to mention the addition of additives and preservatives) process.

So which has been shown to have a more positive impact on our health, fats or carbs? I am sure there are plenty of studies which have shown both, but here are a few eye openers which for some reason the results have not made their way into the Saturday morning and

weekday afternoon TV commercial time slots. (I can see it now, commercials for avocados and grass fed organic beef!)

- Aude Y, Agatston A, Lopez-Jiminez F, Lieberman E, Marie A, Hansen M, Rojas G, Lamas G, Hennekens C. **The National cholesterol education program diet vs a diet lower in carbohydrates and higher in protein and monounsaturated fat: a randomized trial.** *Arch Intern Med.* 164(19); Pp 2141-2146. 2004

“There were significantly favorable changes in all lipid levels within the MLC but not within the NCEP group.”

- Manninen A. **High protein weight loss diets and purported adverse effects: Where is the evidence?** *J Int Soc Sports Nutr.* 1(1); Pp 45-51. 2004.

“Recent findings by Hu et al. suggests that replacing carbohydrates with protein may be associated with a lower risk of ischemic heart disease.[25] This result is consistent with evidence from metabolic studies that replacement of dietary carbohydrate with protein has favorable effect on plasma lipoprotein and lipid concentrations”

“Simply stated, there is no scientific evidence whatsoever that high-protein intake has adverse effects on liver function. Relative to renal function, there are no data in the scientific literature demonstrating that healthy kidneys are damaged by the increased demands of protein consumed in quantities 2–3 times above the Recommended Dietary Allowance (RDA).”

- Yancy W, Olsen M, Guyton J, Bakst R, Westman E. **A low carbohydrate, ketogenic diet versus a low fat diet to treat obesity and hyperlipidemia: a randomized, controlled trial.** *Ann Intern Med.* 140(10); Pp 836-837. 2004.

“During active weight loss, serum triglyceride levels decreased more and high-density lipoprotein cholesterol level increased more with the low-carbohydrate diet than with the low-fat diet.”

- Yancy W, Foy M, Chalecki A, Vernon M, Westman E. **A low carbohydrate, ketogenic diet to treat type 2 diabetes.** *Nutr Metab.* 2; Pp 34. 2005.

“Fasting serum triglyceride decreased 42%”

- Sondike S, Copperman N, Jacobson M. **Effects of a low carbohydrate diet on weight loss and cardiovascular risk factor in overweight adolescents.** *J Pediatr.* 142(3); Pp 253-258. 2003.

“The LC group lost more weight (mean, 9.9 +/- 9.3 kg vs 4.1 +/- 4.9 kg, P <.05) and had improvement in non-HDL cholesterol levels”

- Volek J, Sharman M, Gomez A, Distasquale C, Roti M, Pumerantz A, Kraemer W. **Comparison of a very low carbohydrate and low fat diet on fasting lipids, LDL subclasses, insulin resistance, and postprandial lipemic responses in overweight women.** *J Am Coll Nutr.* 23(2); Pp 177-184. 2004.

“the very low-carbohydrate diet, fasting total cholesterol, LDL-C, and HDL-C were significantly (p < or = 0.05) lower, whereas fasting glucose, insulin, and insulin resistance (calculated using the homeostatic model assessment) were significantly higher after the low-fat diet.”

- Samaha F, Foster G, Makris A. **Low carbohydrate diets, obesity, and metabolic risk factors for cardiovascular disease.** *Curr Atheroscler Rep.* 9(6); Pp 441-447. 2007.

“Low-carbohydrate diets have more favorable effects on metabolic abnormalities found in insulin resistance syndromes, including serum triglyceride levels, high-density lipoprotein cholesterol levels, and small, dense low-density lipoprotein particles.”
- Foster G, et al. **A randomized trial of a low carbohydrate diet for obesity.** *New England Journal of Medicine.* 348(21); Pp 2082-2090. 2003.

“The increase in high-density lipoprotein cholesterol concentrations and the decrease in triglyceride concentrations were greater among subjects on the low-carbohydrate diet”
- Stern L, Igbal N, Seshadri P, Chicano K, Daily D, McGory J, Williams M, Gracely E, Samaha F. **The effects of low carbohydrate versus conventional weight loss diets in severely obese adults: one year follow up of a randomized trial.** *Ann Intern Med.* 140(10); Pp 778-785. 2004.

“For persons on the low-carbohydrate diet, triglyceride levels decreased more (P = 0.044) and high-density lipoprotein cholesterol levels decreased less”
- Volek J, Sharman M, Forsythe C. **Modification of lipoproteins by very low carbohydrate diets.** *Nutr.* 135(6); Pp 1339-1342. 2005.

“VLCDs (very low carbohydrate diets) consistently improve postabsorptive and postprandial triacylglycerols (TAGs), HDL cholesterol (HDL-C), and the distribution of LDL-C subfractions to a greater extent than low-fat diets. VLCs also improve proinflammatory markers when associated with weight loss”
- Al sarraj T, Saadi H, Calle M, Volek J, Fernandez M. **Carbohydrate restriction , as a first line dietary intervention, effectively reduces biomarkers of metabolic syndrome in Emirati Adults.** *J Nutr.* Jul 8, 2009.

“Results from this study suggest that a 6-wk CRD (carbohydrate restriction diet) can effectively be used as a first-line diet therapy to rapidly improve features of Metabolic Syndrome and cardiovascular risk”
- Volek J, Phinney S, Forsythe C, Quann E, Wood R, Puglisi M, Kraemer W, Bibus D, Fernandez M, Feinman R. **Carbohydrate restriction has a more favorable impact on the metabolic syndrome than a low fat diet.** *Lipids.* 44(4); Pp 297-309. 2009.

“subjects following the CRD (carbohydrate restricted diet) had consistently reduced glucose (-12%) and insulin (-50%) concentrations, insulin sensitivity (-55%), weight loss (-10%), decreased adiposity (-14%), and more favorable triacylglycerol (TAG) (-51%), HDL-C (13%) and total cholesterol/HDL-C ratio (-14%) responses.”
- Wood R, Volek J, Liu Y, Schacter N, Contois J, Fernandez M. **Carbohydrate restriction alters lipoprotein metabolism by modifying VLDL, LDL, and HDL subfraction distribution and size in overweight men.** *J Nutr.* 136(2); Pp 384-389. 2006.

“After 12 wk, subjects had a mean weight loss of 7.5 kg (P<0.001), and abdominal fat was reduced by 20% (P<0.001). Plasma LDL cholesterol and triglycerides (TG) were significantly reduced by 8.9 and 38.6%, respectively. Similarly, apolipoproteins C-I (-13.8%), C-III (-21.2%) and E (-12.5%) were significantly lower after the intervention. In contrast plasma HDL-cholesterol concentrations were increased by 12%.”

“weight loss induced by CR favorably alters the secretion and processing of plasma lipoproteins, rendering VLDL, LDL, and HDL particles associated with decreased risk for atherosclerosis and coronary heart disease.”

References

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4. Your family (whom thinks you're crazy 😊) tells you that cannot eliminate an entire food source.

What does the research say?

This is quite a blanket statement that seems to be thrown out there quite often by many of those giving us nutritional advice. Does the same go for adding an entire food source, as many as many, if not most populations seem to have done with the addition of grainy carbohydrates to their diets? Paleolithic diets consisted of food sources that could be picked, fished, or hunted. Looking at more modern times, Eskimos lived off of high protein/fat diets, with little or no consumption of grainy carbohydrates, as their environment is a difficult one to cultivate any sort of grains. Another population is the aborigines of Western Australia, whom were the subjects of scantily publicized but very important studies on the Westernized diet and the development of diabetes.

The addition of a food source came in the form of the Westernized diet, known for its rather large consumption of processed foods and refined carbohydrates. “In the summer of 1982, a group of 10 middle aged, overweight, and diabetic aborigines living in settlements near the town of Derby, Western Australia, agreed to participate in an experiment to see if temporarily reversing the process of westernization they had undergone might also reverse their health problems. Since leaving the bush some years before, all ten had developed type 2 diabetes; they also showed signs of insulin resistance and elevated levels of triglycerides in the blood—a risk factor for heart disease.”

The subtraction of a food source came when “the ten Aborigines returned to their traditional homeland, an isolated region of northwest Australia more than a day's drive by off-road vehicle from the nearest town. From the moment they left civilization, the men and women

in the group had no access to store food or beverages; the idea was for them to rely exclusively on foods they hunted and gathered themselves. “

The results of the study were astounding. “After seven weeks in the bush, O’Dea drew blood from the Aborigines and found striking improvements in virtually every measure of their health. All had lost weight (an average of 17.9 lbs) and seen their blood pressure drop. Their triglyceride levels had fallen into the normal range. The proportion of omega 3 fatty acids in their tissues increased dramatically. “In summary,” O’Dea concluded, “all of the metabolic abnormalities of type II diabetes were either greatly improved or completely normalized in a group of diabetic Aborigines by a relatively short (seven week) reversion to traditional hunter-gatherer lifestyle (1).”

- O’Dea K. **Westernization, insulin resistance and diabetes in Australian aborigines.** *The Medical Journal of Australia.* 1991 Aug 19;155(4):258-64.

“The traditional hunter-gatherer lifestyle of Australian Aborigines, characterised by high physical activity and a diet of low energy density (low fat, high fibre), promoted the maintenance of a very lean body weight and minimised insulin resistance.”

“When they make the transition from their traditional hunter-gatherer lifestyle to a westernised lifestyle, Aborigines develop high prevalence rates for obesity (with an android pattern of fat distribution), non-insulin dependent diabetes, impaired glucose tolerance, hypertriglyceridaemia, hypertension and hyperinsulinaemia.”

“The striking improvements in carbohydrate and lipid metabolism in diabetic and non-diabetic Aborigines after a temporary reversion to a traditional hunter-gatherer lifestyle highlight the potentially reversible nature of the detrimental effects of lifestyle change”

- O’Dea K. **Cardiovascular disease risk factors in Australian aborigines.** *Clinical and Experimental Pharmacology and Physiology.* 1991 Feb;18(2):85-8.

“When Westernized diabetic Aborigines reverted temporarily to a traditional hunter-gatherer diet and lifestyle, all of the metabolic abnormalities of diabetes were greatly ameliorated (fasting glucose and triglyceride levels fell markedly and glucose tolerance and insulin secretion improved). In addition, they lost weight and there was a reduction in the major risk factors for cardiovascular disease (reduction in hypertriglyceridaemia and blood pressure, increase in bleeding time).”

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4. O'Dea K. **Obesity and diabetes in "the land of milk and honey"**. *Diabetes/Metabolism Reviews*. 1992 Dec;8(4):373-88.
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6. O'Dea K. **Marked improvement in carbohydrate and lipid metabolism in diabetic Australian aborigines after temporary reversion to traditional lifestyle**. *Diabetes*. 1984 Jun;33(6):596-603.

5. You're friends and fellow dieters tell you that will "pack on the pounds" if you eat a high fat/low carbohydrate diet.

What does the research say?

There is an easy do-it yourself method to determine if this statement has any validity to it. No carbs for 2 weeks vs low fat for 2 weeks. Which had the greater weight/fat loss? Let's look at what the science says.

- Ludwig D. **Novel treatments for obesity**. *Am Pac J Clin Nutr*. 12; Pp 8. 2003

"A recent study from our group found significantly greater weight and fat mass decrease among obese adolescents consuming a reduced GL compared to a reduced fat diet for 12 months."
- Manninen A. **Is a calorie really a calorie? Metabolic advantage of low carbohydrate diets**. *J Int Soc Sports Nutr*. 1(2); Pp 21-26. 2004.

"Well-controlled studies suggest that calorie content may not be as predictive of fat loss as is reduced carbohydrate consumption. Biologically speaking, a calorie is certainly not a calorie. The ideal weight loss diet, if it even exists, remains to be determined, but a high-carbohydrate/low-protein diet may be unsatisfactory for many obese individuals"
- Willet W, Leibel R. **Dietary fat is not a major determinant of body fat**. *Am J Med*. 113(9B); Pp 47-59. 2002.

"in randomized trials lasting >or=1 year, fat consumption within the range of 18% to 40% of energy appears to have little if any effect on body fatness."

"Diets high in fat do not appear to be the primary cause of the high prevalence of excess body fat in our society, and reductions in fat will not be a solution."
- Willet W. **Dietary fat plays a major role in obesity: no**. *Obes Rev*. 3(2); Pp 59-68. 2002.

"Diets high in fat do not account for the high prevalence of excess body fat in Western countries; reductions in the percentage of energy from fat will have no important benefits and could further exacerbate this problem. The emphasis on total fat reduction has been a serious distraction in efforts to control obesity and improve health in general."

- Westman E, Mavropoulos J, Yancy W, Volek J. **A review of low-carbohydrate ketogenic diets.** *Curr Atheroscler Rep.* 5(6); Pp 476-483. 2003.

“Recent research has demonstrated that low-carbohydrate ketogenic diets can lead to weight loss and favorable changes in serum triglycerides and high-density lipoprotein cholesterol.”

- Aude Y, Agatston A, Lopez-Jiminez F, Lieberman E, Marie A, Hansen M, Rojas G, Lamas G, Hennekens C. **The National cholesterol education program diet vs a diet lower in carbohydrates and higher in protein and monounsaturated fat: a randomized trial.** *Arch Intern Med.* 164(19); Pp 2141-2146. 2004

“Weight loss was significantly greater in the MLC (13.6 lb) than in the NCEP group (7.5 lb), a difference of 6.1 lb (P = .02).”

- Foster G, et al. **A randomized trial of a low carbohydrate diet for obesity.** *New England Journal of Medicine.* 348(21); Pp 2082-2090. 2003.

“Subjects on the low-carbohydrate diet had lost more weight than subjects on the conventional diet at 3 months (mean [±SD], -6.8±5.0 vs. -2.7±3.7 percent of body weight; P=0.001) and 6 months (-7.0±6.5 vs. -3.2±5.6 percent of body weight, P=0.02)”

6. The exercise people at your gym are telling you that you need the carbs for energy.

What does the research say?

Acetoacetate (AcAc), Beta-hydroxybutyrate (BHB) and acetone, as well Free Fatty Acids. “**Ketone bodies** are three water-soluble compounds that are produced as by-products when fatty acids are broken down for energy in the liver and kidney. They are used as a source of energy in the heart and brain (1).” After about 3 days of low carbing it, your body will shift toward the utilization of ketones as a fuel source, known as dietary ketosis (which has been shown “to be a harmless physiological state (4)”) prior to shifting further to the use of Free fatty Acids as a primary fuel source when on a low carbohydrate diet. In other words, you will be mobilizing and utilizing fat as a fuel source. Besides their role as a source of energy for the brain and heart, ketones have also been shown to have much potential for therapeutic purposes.

- “Other beneficial effects from betaOHB include an increased energy of ATP hydrolysis (deltaG') and its linked ionic gradients. This may be significant in drug-resistant epilepsy and in injury and anoxic states (2).”
- “The ability of betaOHB to oxidize co-enzyme Q and reduce NADP+ may also be important in decreasing free radical damage (2).”
- “The ketogenic diet is a valuable therapeutic approach for epilepsy(3)” (“the ketone body acetone has anticonvulsant activity and could play a role in the seizure protection afforded by the diet”(3))

- Studies performed on rats whom were administered a ketogenic diet even found potential effects on the growth of cancerous tumors (5,6,7). “KetoCal administered in restricted amounts significantly decreased the intracerebral growth of the CT-2A and U87-MG tumors by about 65% and 35%, respectively, and significantly enhanced health and survival relative to that of the control groups receiving the standard low fat/high carbohydrate diet (5).” “This preclinical study indicates that restricted KetoCal is a safe and effective diet therapy and should be considered as an alternative therapeutic option for malignant brain cancer (5).”
- “there is evidence from uncontrolled clinical trials and studies in animal models that the ketogenic diet can provide symptomatic and disease-modifying activity in a broad range of neurodegenerative disorders including Alzheimer's disease and Parkinson's disease, and may also be protective in traumatic brain injury and stroke. These observations are supported by studies in animal models and isolated cells that show that ketone bodies, especially beta-hydroxybutyrate, confer neuroprotection against diverse types of cellular injury (8)”

Okay, but what about weight gain and heart health with such high fat intake in the diet?

Let's see what research from around the globe has to say as to prevent any biases.

- Westman E, Mavropoulos J, Yancy W, Volek J. **A review of low-carbohydrate ketogenic diets.** *Curr Atheroscler Rep.* 5(6); Pp 476-483. 2003.

“Recent research has demonstrated that low-carbohydrate ketogenic diets can lead to weight loss and favorable changes in serum triglycerides and high-density lipoprotein cholesterol.”

- Perez-Guisado J. **Ketogenic diets and weight loss: basis and effectiveness.** *Arch Latinoam Nutr.* 58(2); 126-131. 2008.

“ketogenic diets are, from a physiological, biochemical and practical point of view, a much more effective way of losing weight, since such diets provide metabolic advantages such as the capacity to preserve muscle mass, reduce appetite, to have a lower metabolic efficiency, produce a metabolic activation of thermogenesis and favour a greater fat loss even with a greater number of calories.”

- Sorvacheva T, Peterkova V, Titova L, Vitebskaia A, Pvr'eva E. **Efficacy of low-carbohydrate diet in the treatment of obesity in adolescents.** *Vopr Pitan.* 76(3); Pp 29-34. 2007.

“The obtained data support that this type of diet is well tolerated by children; it normalizes cholesterol, triglyceride, and beta-lipoprotein serum values; reduces indices of insulin resistance while effective weight and appetite loss.”

- Dashti H, Mathew T, Khadada M, Al-Mousawi M, Talib H, Asfar S, Behbahani A, Al-Zaid N. **Beneficial effects of ketogenic diet in obese diabetic subjects.** *Mol Cell Biochem.* 302(1-2); Pp 249-256. 2007.

“This study shows the beneficial effects of ketogenic diet in obese diabetic subjects following its long-term administration. Furthermore, it demonstrates that in addition to its therapeutic value, low carbohydrate diet is safe to use for a longer period of time in obese diabetic subjects.”

- Wesman E, Mavropoulos J, Yancy W, Volek J. **A review of low carbohydrate ketogenic diets.** *Curr Atheroscler Rep.* 5(6); Pp 476-483. 2003.

“Recent research has demonstrated that low-carbohydrate ketogenic diets can lead to weight loss and favorable changes in serum triglycerides and high-density lipoprotein cholesterol.”

******If you do attempt to a low/carb ketogenic diet, just be sure to eat your veggies (and alkalinizing greens for optimal health benefits) and do some research on Cyclical Ketogenic Diets.******

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