



# IMAGE AWARENESS

## WELLNESS INSTITUTE

### THE KETOGENIC DIET

1271 HIGH STREET, AUBURN, CA 95603 • PHONE (530) 823-7092 • ORDER LINE (800) 359-6091  
HOURS: TUES. – FRI. 10 A.M. – 4 P.M. • E-MAIL: MAIL@IMAGEAWARENESS.COM WEB: WWW.IMAGEAWARENESS.COM

March 2017

Volume 13: Issue 1

## INTRODUCTION

My graduate dissertation was on the topic of fasting. I did some of my research at the Natural Hygiene School in San Antonio where they had conducted more supervised fasts than anywhere else in the world.

At the time of my research I was most interested in the remarkable cures experienced by those who had undergone long fasts. There was a woman whose asthma cleared up after 5 days of a water fast. She fasted a total of 37 days. Another woman had a swelling of the leg called lymphoedema which cleared up after a fast of 39 days.

During this research in the early 1970's I was introduced to ketone metabolism. The fastest way to achieve ketosis is with a water fast. Ketosis is a metabolic state in which most of the body's energy supply is provided by ketone bodies derived from fat. This is in contrast to glycolysis in which most of the body's energy supply is derived from blood glucose or sugar.

Most cells in the body can use either ketones or glucose for fuel. Ketones are actually easier for many cells to use than is glucose.

Ketosis has been used as a medical intervention for a number of disorders including intractable epilepsy, weight loss, and some diabetic conditions. More recently ketosis has been discussed as a possible treatment modal-

ity for dementia and cancers.

Few people are familiar with the benefits of a mild ketosis, while most are familiar with a condition called ketoacidosis. This is a condition most frequently seen in Type 1 diabetics who do not produce insulin. The lack of insulin leads to increased fat metabolism. Since ketones are acid the diabetic slips into an overly acid condition which can result in a diabetic coma. Alcoholics can also develop ketoacidosis.

#### REFERENCE:

<https://en.wikipedia.org/wiki/Ketosis>

## WHAT ARE KETONES?

The discussion which follows will be meaningless if one does not understand what ketones are. Ketones are substances that are made when the body breaks down fat for energy as when an individual fasts or goes on a low carbohydrate diet.

There are many ketones in nature, but only three are capable of being used by the human body to produce energy: acetone, acetoacetate, and

beta-hydroxybutyrate.

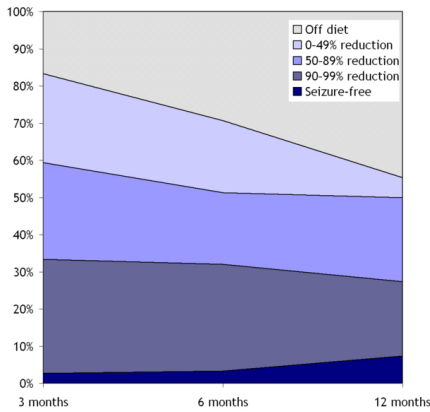
Acetone is the simplest ketone, the same compound found in fingernail polish and paint thinner. The smell of acetone on an individual's breath is an indication that an individual is burning fat for energy. When a diabetic goes into ketoacidosis, one can often detect acetone on the breath.

When fats are broken down in the liver the ketone acetoacetate is produced. This is then converted into acetone and beta-hydroxybutyrate which are used by the mitochondria to produce energy. Beta-hydroxybutyrate is the primary ketone used by the body for energy production. Urine measurement of ketones gives a poor idea of ketogenic status-- breath and blood measurements are more accurate.

Ketone availability can be increased by dietary intake of what are called Medium Chain Triglycerides (MCT's). These fats do not require bile acids for digestion and passively diffuse into the blood stream unlike larger fat molecules. Because of the ease of absorption they have been used as a source of nutrients when individuals have malabsorption problems. MCT products are usually derived from coconut oil. They tend to increase blood levels of ketones higher than coconut oil, but for a shorter period of time.

The richest food sources of ketones are coconut and palm kernel oils, goat and cow butter, and goat cheeses.





Ketones are produced naturally in the body as a result of exercise, sleep, fasting, or a low carbohydrate diet.

REFERENCES:

Newport, Mary T., *Alzheimer's Disease: What if There Was a Cure? The Story of Ketones*. Laguna Beach, CA: Basic Health Publications, Inc. 2011.

[https://commons.wikimedia.org/wiki/Category:Coconuts#/media/File:Coconut\\_drying.jpg](https://commons.wikimedia.org/wiki/Category:Coconuts#/media/File:Coconut_drying.jpg)

EPILEPSY

Early in the 20th century Bernarr Macfadden popularized the idea of fasting as a tool for restoring health. Hugh Conklin, his disciple and an osteopath, introduced the idea of using fasting as a treatment for epilepsy. Conklin believed that epileptic seizures were caused by toxins which accumulated in the digestive tract. A later study of Conklin's results found that 20% of his patients became seizure free and 50% improved. By 1916 fasting therapy was widely accepted by the medical community as a treatment for epilepsy.

In 1921 endocrinologist Rollin Woodyatt noted that three water soluble compounds called ketones (acetone, beta-hydroxybutyrate, and acetoacetate) were produced by the liver as a result of starvation or a diet rich in fat and low in carbohydrates. Russel Wilder from the Mayo clinic called this the "ketogenic diet" and used it as a treatment for epilepsy in 1921.

In the 1960's it was learned that

medium-chain triglycerides (MCT's) produced more units of energy than other fats because they were transported quickly to the liver. In 1971 Peter Huttenlocher devised a modified ketogenic diet for epileptics in which 60% of calories came from MCT's.

Interest in the use of ketones to control epilepsy waned after the introduction of anticonvulsant drugs. Dilantin was discovered in 1938 and sodium valproate in the 1970's. The development of anti-epileptic drugs was the work of Houston Merritt.

Despite the advent of drugs to treat epilepsy, interest in the ketogenic diet to treat epilepsy has never completely died out. One of the characteristics of epilepsy is increasing risk of a subsequent seizure after the first one. One of the properties of a ketogenic diet is that it decreases the chances of subsequent seizures and a normal diet can often be resumed after 2 years on a ketogenic diet.

The ketogenic diet benefits about half the young people who use it, reducing seizures by at least half. A ketogenic diet will often work where anticonvulsant drugs do not. These drugs fail to produce benefit about a third of the time.

Freeman and Vining reported on a study of 600 patients with a history of 20 seizures per day unresponsive to over 6 drugs. The ketogenic diet led to a cessation of seizures in slightly less than a third of subjects and reduced seizure frequency in another third. One third received no benefit.

Renewed interest in the ketogenic diet to treat epilepsy was triggered by Hollywood producer Jim Abrahams whose son Charlie suffered with uncontrollable epileptic seizures until he was treated with a ketogenic diet. The ketogenic diet achieved national exposure in October of 1994 when NBC's Dateline reported the story of Charlie Abrahams. Abrahams followed this up with a made-for-television film

starring Meryl Streep titled *First Do No Harm*.

The ketogenic treatment for epilepsy is best conducted under medical supervision due to the possibility of problems created by the restricted diet. Among the potential problems noted in the literature are increased cholesterol levels, dilated cardiomyopathy, elevated uric acid levels, and increased incidence of kidney stones. Intolerance of a high fat diet is one of the most common causes of failure of a ketogenic diet in treating epilepsy.

REFERENCES:

<http://www.news-medical.net/health/History-of-the-Ketogenic-Diet.aspx>

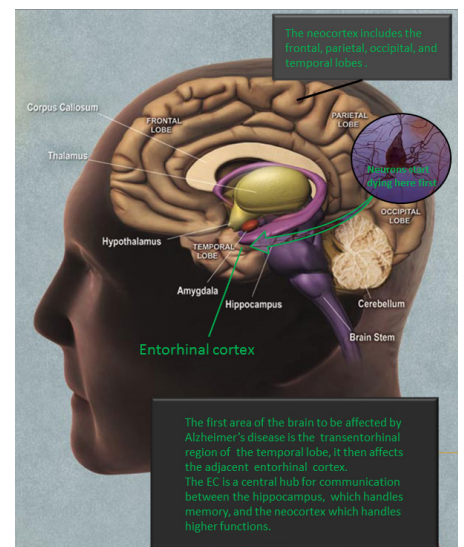
[https://en.wikipedia.org/wiki/Ketogenic\\_diet](https://en.wikipedia.org/wiki/Ketogenic_diet)  
 Veech, Richard L., The therapeutic implications of ketone bodies: the effects of ketone bodies in pathological conditions: ketosis, ketogenic diet, redox states, insulin resistance, and mitochondrial metabolism, *Prostaglandins, Leukotrienes and Essential Fatty Acids*, 2004;70:309-319.

Vining, Eileen, P.G., et al., A multicenter study of the efficacy of the ketogenic diet, *Arch Neurol.*, 1998;55(11):1433-1437.

[https://commons.wikimedia.org/wiki/File:Ketogenic\\_diet\\_over\\_12\\_months.png](https://commons.wikimedia.org/wiki/File:Ketogenic_diet_over_12_months.png)

ALZHEIMER'S DISEASE

The use of ketones to treat Alzheimer's and dementia was recently popularized by physician Mary T. Newport. Steve Newport suffered with Alzheimer's for seven years before Mary stumbled upon research which suggested that ketones might be of benefit for the disease. Steve be-





gan using a ketone rich diet in 2008. He improved dramatically.

In 2005 Suzanne de la Monte described Alzheimer's as "type 3 diabetes." She observed, "the accumulating evidence that reduced glucose utilization and deficient energy metabolism occur early in the course of the disease, suggests a role for impaired insulin signaling in the pathogenesis of AD." This researcher found that insulin functioning and glucose delivery to brain cells was severely compromised in Alzheimer's Disease.

William Klein has elaborated a possible mechanism whereby faulty insulin functioning sets the stage for accumulation of toxic substances in the brain leading to Alzheimer's.

Mary Newport became interested in approaching Alzheimer's from a ketogenic perspective when she saw a press release on a promising new drug for the condition called AC-1202. The press release pointed out that glucose is the primary energy source for brain cells. Those with Alzheimer's have been found to have a dramatic decrease in glucose use in certain brain areas ten to twenty years before visible symptoms of the disease appear. Deprived of energy, brain cells experience irreparable damage.

The concept behind AC-1202 developed by Accera pharmaceutical

company was to provide the brain cells with an alternative fuel source, ketones.

Half of those with Alzheimer's have a genetic marker called ApoE4. The study with AC-1202 was not very promising for those with this marker which Steve Newport carried.

Nevertheless, Mary's curiosity was aroused when she learned that the ketones from AC-1202 now known as Axona consisted of medium-chain triglycerides (MCT). These are usually derived from coconut oil. MCT has been available over the counter for decades. It has been used by athletes to increase energy and improve fitness.

Coconut oil is almost 60% medium-chain fatty acids. Newport calculated that she could provide her husband with about the same amount of MCT as the medication (20 grams) if she gave her husband about two tablespoons of coconut oil. She began with this level of intake, but increased it over time.

Steve began to improve almost immediately. His improvement continued for a prolonged period of time.

Why would ketones benefit Alzheimer's? Ketones provide an alternative source of fuel for brain cells when glucose utilization fails. Without energy production, brain cells can not function properly. They lose the ability to take in nutrients and they lose the ability to detoxify. The result is the gradual progression of the death of brain cells.

Veech reports that studies have shown that ketone intake can increase the efficiency of the heart by 28%. Much of this improvement was attributed to improved production of ATP, the body's energy currency.

Veech writes, "The metabolic effects of ketone bodies are of particular relevance to brain metabolism, where Cahill and his colleagues have established that over 60% of the metabolic

energy needs of brain can be supplied by ketone bodies, rather than glucose." The brain uses 20% of the body's oxygen consumption. Switching metabolism from glucose to ketones reduces the demands on neurons to produce energy. Veech notes that utilization of ketones by the brain cells is "the only practical mechanism for increasing the efficiency of oxidation ATP generation in that organ. One of the side benefits of utilizing ketones of energy is that their metabolism actually reduces the production of free radical oxygen which has the ability to damage brain and nerve cells. Ketones can actually be likened to "superfuel" for brain cells.

Veech tested ketones in a rat model of Alzheimer's disease and found that the ketones protected from the toxic metabolism characteristic of the disease.

#### REFERENCES:

Newport, Mary T., *Alzheimer's Disease: What if There Was a Cure? The Story of Ketones*, Laguna Beach, CA: Basic Health Publications, Inc.2011.

de la Monte, Suzanne M., et al., Impaired insulin and insulin-like growth factor expression and signaling mechanisms in Alzheimer's disease -- is this type 3 diabetes? *Journal of Alzheimer's Disease*, 2005; 7:63-80.

Klein, William L., et al., Amyloid beta oligomers induce impairment of neuronal insulin receptors, *FASEB Journal*, 2008;22:246-260.

Veech, Richard L., The therapeutic implications of ketone bodies: the effects of ketone bodies in pathological conditions: ketosis, ketogenic diet, redox states, insulin resistance, and mitochondrial metabolism, *Prostaglandins, Leukotrienes and Essential Fatty Acids*, 2004;70:309-319.

[https://commons.wikimedia.org/wiki/Category:Alzheimer%27s\\_disease#/media/File:Alzheimers\\_entorhinal\\_cortex.PNG](https://commons.wikimedia.org/wiki/Category:Alzheimer%27s_disease#/media/File:Alzheimers_entorhinal_cortex.PNG) [https://commons.wikimedia.org/wiki/Category:Fitness\\_training#/media/File:Body\\_Pump\\_\(291411556\).jpg](https://commons.wikimedia.org/wiki/Category:Fitness_training#/media/File:Body_Pump_(291411556).jpg)

#### OTHER USES FOR





## IMAGE AWARENESS WELLNESS INSTITUTE

1271 HIGH STREET, AUBURN, CA 95603  
PHONE (530) 823-7092 ORDER LINE (800) 359-6091  
E-MAIL: MAIL@IMAGEAWARENESS.COM  
VISIT OUR WEBSITE! [WWW.IMAGEAWARENESS.COM](http://WWW.IMAGEAWARENESS.COM)

### KETONES

Ketones offer promise for a number of other conditions as well. This is particularly true in conditions where glucose utilization is poor and tissues are faced with energy depletion.

#### Type I Diabetes

One of the problems experienced by Type I diabetics is the risk of hypoglycemia leading to cognitive impairment or convulsions. Utilization of ketones makes it possible to maintain a tighter control on blood sugar without the risk of brain impairment, since ketones can provide most of the energy necessary for healthy brain function.

#### Strenuous Exertion

Extreme exertion as experienced by high performance athletes, military troops on mission, and emergency personnel during disasters can lead to cognitive impaired motor skills and brain function. Mild ketosis can improve stamina and functioning under these conditions.

#### Parkinson's Disease

Parkinson's is caused by destruction of brain cells rich in oxygen and thus susceptible to production of free radical oxygen. A toxin similar to

the herbicide paraquat induces Parkinsonism in rats and primates. The ketone beta-hydroxybutyrate protects susceptible cells in cultures suggesting that ketones would benefit Parkinson's victims. The flavonoid nobiletin found in citrus has also been shown to protect brain cells from MPP+.

#### REFERENCES:

Veech, Richard, 316,  
<https://en.wikipedia.org/wiki/MPP%2B>

#### Weight Loss

The ketogenic Atkins diet resulted in successful weight loss for a great many people. The high protein intake and the quality of the fats many consumed on this diet were not necessarily healthy, but a properly constructed ketogenic diet can be an aid to successful weight loss.

A head to head comparison of a low fat and a high fat diet found that the high fat diet was more effective for weight loss: "...the subjects on the very low carbohydrate diet experienced significantly more weight loss than the low fat group and maintained comparable levels of plasma lipids and other cardiovascular risk factors while consuming more than 50% of their calories as fat and 20% as saturated fat."

#### REFERENCE:

D'Alessio, David A., et al., A randomized trial comparing a very low carbohydrate diet and a calorie-restricted low fat diet on body weight and cardiovascular risk factors in healthy women, *The Journal of Clinical Endocrinology and Metabolism*, 2003;88(4):1617-1623.

### WEB RESOURCES

[www.imageawareness.com](http://www.imageawareness.com)  
[www.yourbodyssignlanguage.com](http://www.yourbodyssignlanguage.com)  
[www.jimmcafee.com](http://www.jimmcafee.com)

### DISCLAIMER

This publication contains the opinions and ideas of its author. It is intended to provide helpful and informative material on the subjects addressed in the publication. It is provided with the understanding that the author and publisher are not engaged in rendering medical, health, or any other kind of personal professional services in this newsletter. The reader should consult his or her medical, health or other competent professional before adopting any of the suggestions in this newsletter or drawing inferences from it.

The author and publisher specifically disclaim all responsibility for any liability, loss, or risk, personal or otherwise, which is incurred as a consequence, directly or indirectly, of use and application of any of the contents of this newsletter.