

Chapter3: Acid Alkaline Diet

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Breast Cancer Risks Grow With High-Carb Diets

Posted By [Dr. Mercola](#) | April 27 2005 | 7,676 views

Postmenopausal women who have used hormone replacement therapy (HRT) may want to steer their diets clear of high-carb foods that have a high glycemic index.

Why? It may increase their risk of breast cancer.

Uncovering the Link

High glycemic index diets typically incorporate a lot of sugars and refined starches and carbohydrates, which are responsible for a spike in blood glucose levels. Cornflakes, cheerios, and puffed wheat are a few examples of foods with high glycemic index.

In order to examine breast cancer risk in relation to overall glycemic index and dietary carbohydrate and sugar intake, researchers used data from a large group of some 50,000 women. Their dietary habits and other relevant information were surveyed between 1980 and 1985. During a 16-year follow-up period, researchers found:

- About 1,500 women developed breast cancer.
- Breast cancer risk was not related to glycemic index or sugar and total carbohydrate intake in the overall study population.
- In postmenopausal women, the risk of breast cancer was raised by 87 percent; high-carb diets reduced breast cancer risk by 22 percent in premenopausal women.

Moreover, researchers discovered the link between glycemic index and breast cancer risk in postmenopausal women was strengthened among those who reported sedentary behavior, had a history of HRT use, and were of normal weight.

[International Journal of Cancer](#) April 20, 2005;114(4):653-658

Dr. Mercola's Comments:

The relationship between carbohydrate consumption and cancer is no secret, [as I mentioned seven years ago](#).

Whenever you consider retooling your diet -- especially with the goal of preventing cancer and other forms of chronic disease -- one of the most important steps you can take is [limiting your intake of sugar and grains](#).

This study is important, as it further documents the relationship between high carbohydrate intake and cancer. However, I disagree with their emphasis that glycemic index ratings are a good way to determine what foods you should avoid and, in turn, what foods are OK to consume.

The glycemic index (GI) tells you how quickly 50 grams of a particular food gets converted to glucose (blood sugar) after you ingest it, in comparison to white bread (GI 100).

I have found GI values to not be very useful, as they contain far, far too many exceptions to be consistently useful. A classic example is fructose, which has a very low glycemic index yet has been clearly established as [a major reason why many people are overweight](#).

In terms of insulin and chronic disease prevention, you need to look much further than the glycemic index. Many foods like chocolate, cherries, and apple juice have low glycemic indices, but are still high in carbohydrates and can wreak havoc on your insulin levels.

Tips for Preventing Cancer

Eliminating grains and sugars from your diet will go a long way toward preventing cancer, but there are many other things to consider if you want to truly improve your chances of staying cancer-free.

The following are my major recommendations:

1. [Control your insulin levels](#). Make certain that you limit your intake of processed foods and sugars as much as possible.
2. Obtain appropriate amounts of animal-based [omega-3 fats](#) and make sure you use cod liver oil if you don't have regular access to sun exposure.
3. Get appropriate [exercise](#). One of the primary reasons exercise works is that it drives your insulin levels down. Controlling insulin levels is one of the most powerful ways to reduce your cancer risks.
4. Normalize your vitamin D levels with safe amounts of sun exposure. This works primarily by optimizing your vitamin D levels. If you have regular access to sun exposure then you should use fish oil, not cod liver oil, as your primary source of omega-3 fats. Ideally, it would be best to monitor your [vitamin D levels](#).
5. [Eat according to your nutritional type](#). The potent anti-cancer effects of this principle are very much underappreciated. When we treat cancer patients in our clinic this is one of the most powerful anti-cancer strategies we have.
6. Have a tool to permanently erase the neurological short-circuiting that can activate cancer genes. Even the CDC states that [85 percent of disease is caused by emotions](#). It is likely that this factor may be more important than all the other physical ones listed here, so make sure this is addressed. Energy psychology seems to be one of the best approaches and my particular favorite tool, as you may know, is the [Emotional Freedom Technique](#).
7. Only 25 percent of people eat enough vegetables, so by all means [eat as many vegetables as you are comfortable with](#). Ideally, they should be fresh and [organic](#).

However, please understand that, frequently, fresh conventionally grown vegetables are healthier than organic ones that are older and wilted in the grocery store. They are certainly better than no vegetables at all, so don't use that as an excuse. If you are a carb nutritional type you may need up to 300 percent more vegetables than a protein nutritional type.

8. Make sure you are not in the two-thirds of the population who are overweight and [maintain an ideal body weight](#).
9. Get enough [high-quality sleep](#).
10. Reduce your exposure to [environmental toxins](#) like pesticides, household chemical cleaners, [synthetic air fresheners](#) and air pollution.
11. Boil, poach or steam your foods, rather than [frying or charbroiling them](#).

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[Proof That Increased Sugar Causes Cancer](#)

[Cancer's Sweet Tooth](#)

[Sugar and Cancer](#)

Cancer's Sweet Tooth

by Patrick Quillin, PHD, RD, CNS

From The April 2000 Issue of [Nutrition Science News](#)

During the last 10 years I have worked with more than 500 cancer patients as director of nutrition for Cancer Treatment Centers of America in Tulsa, Okla. It puzzles me why the simple concept "sugar feeds cancer" can be so dramatically overlooked as part of a comprehensive cancer treatment plan.

Of the 4 million cancer patients being treated in America today, hardly any are offered any scientifically guided nutrition therapy beyond being told to "just eat good foods." Most patients I work with arrive with a complete lack of nutritional advice. I believe many cancer patients would have a major improvement in their outcome if they controlled the supply of cancer's preferred fuel, glucose. By slowing the cancer's growth, patients allow their immune systems and medical debulking therapies -- chemotherapy, radiation and surgery to reduce the bulk of the tumor mass -- to catch up to the disease. Controlling one's blood-glucose levels through diet, supplements, exercise, meditation and prescription drugs when necessary can be one of the most crucial components to a cancer recovery program. The sound bite -- sugar feeds cancer -- is simple. The explanation is a little more complex.

The 1931 Nobel laureate in medicine, German Otto Warburg, Ph.D., first discovered that cancer cells have a fundamentally different energy metabolism compared to healthy cells. The crux of his Nobel thesis was that malignant tumors frequently exhibit an increase in anaerobic glycolysis -- a process whereby glucose is used as a fuel by cancer cells with lactic acid as an anaerobic byproduct -- compared to normal tissues.¹ The large amount of lactic acid produced by this fermentation of glucose from cancer cells is then transported to the liver. This conversion of glucose to lactate generates a lower, more acidic pH in cancerous tissues as well as overall physical fatigue from lactic acid buildup.^{2,3} Thus, larger tumors tend to exhibit a more acidic pH.⁴

This inefficient pathway for energy metabolism yields only 2 moles of adenosine triphosphate (ATP) energy per mole of glucose, compared to 38 moles of ATP in the complete aerobic oxidation of glucose. By extracting only about 5 percent (2 vs. 38 moles of ATP) of the available energy in the food supply and the body's calorie stores, the cancer is "wasting" energy, and the patient becomes tired and undernourished. This vicious cycle increases body wasting.⁵ It is one reason why 40 percent of cancer patients die from malnutrition, or cachexia.⁶

Hence, cancer therapies should encompass regulating blood-glucose levels via diet, supplements, non-oral solutions for cachectic patients who lose their appetite, medication, exercise, gradual weight loss and stress reduction. Professional guidance and patient self-discipline are crucial at this point in the cancer process. The quest is not to eliminate sugars or carbohydrates from the diet but rather to control blood glucose within a narrow range to help starve the cancer and bolster immune function.

The glycemic index is a measure of how a given food affects blood-glucose levels, with each food assigned a numbered rating. The lower the rating, the slower the digestion and absorption process, which provides a healthier, more gradual infusion of sugars into the bloodstream. Conversely, a high rating means blood-glucose levels are increased quickly, which stimulates the pancreas to secrete insulin to drop blood-sugar levels. This rapid fluctuation of blood-sugar levels is unhealthy because of the stress it places on the body (see glycemic index chart, p. 166).

Sugar in the Body and Diet

Sugar is a generic term used to identify simple carbohydrates, which includes monosaccharides such as fructose, glucose and galactose; and disaccharides such as maltose and sucrose (white table sugar). Think of these sugars as different-shaped bricks in a wall. When fructose is the primary monosaccharide brick in the wall, the glycemic index registers as healthier, since this simple sugar is slowly absorbed in the gut, then converted to glucose in the liver. This makes for "time-release foods," which offer a more gradual rise and fall in blood-glucose levels. If glucose is the primary monosaccharide brick in the wall, the glycemic index will be higher and less healthy for the individual. As the brick wall is torn apart in digestion, the glucose is pumped across the intestinal wall directly into the bloodstream, rapidly raising blood-glucose levels. In other words, there is a "window of efficacy" for glucose in the blood: levels too low make one feel lethargic and can create clinical hypoglycemia; levels too high start creating the rippling effect of diabetic health problems.

The 1997 American Diabetes Association blood-glucose standards consider 126 mg glucose/dL blood or greater to be diabetic; 126 mg/dL is impaired glucose tolerance and less than 110 mg/dL is considered normal. Meanwhile, the Paleolithic diet of our ancestors, which consisted of lean meats, vegetables and small amounts of whole grains, nuts, seeds and fruits, is estimated to have generated blood glucose levels between 60 and 90 mg/dL.⁷ Obviously, today's high-sugar diets are having unhealthy effects as far as blood-sugar is concerned. Excess blood glucose may initiate yeast overgrowth, blood vessel deterioration, heart disease and other health conditions.⁸

Understanding and using the glycemic index is an important aspect of diet modification for cancer patients. However, there is also evidence that sugars may feed cancer more efficiently than starches (comprised of long chains of simple sugars), making the index slightly misleading. A study of rats fed diets with equal calories from sugars and starches, for example, found the animals on the high-sugar diet developed more cases of breast cancer.⁹ The glycemic index is a useful tool in guiding the cancer patient toward a healthier diet, but it is not infallible. By using the glycemic index alone, one could be led to thinking a cup of white sugar is healthier than a baked potato. This is because the glycemic index rating of a sugary food may be lower than that of a starchy food. To be safe, I recommend less fruit, more vegetables, and little to no refined sugars in the diet of cancer patients.

What the Literature Says

A mouse model of human breast cancer demonstrated that tumors are sensitive to blood-glucose levels. Sixty-eight mice were injected with an aggressive strain of breast cancer, then fed diets to induce either high blood-sugar (hyperglycemia), normoglycemia or low blood-sugar

(hypoglycemia). There was a dose-dependent response in which the lower the blood glucose, the greater the survival rate. After 70 days, 8 of 24 hyperglycemic mice survived compared to 16 of 24 normoglycemic and 19 of 20 hypoglycemic.¹⁰ This suggests that regulating sugar intake is key to slowing breast tumor growth (see chart, p. 164).

In a human study, 10 healthy people were assessed for fasting blood-glucose levels and the phagocytic index of neutrophils, which measures immune-cell ability to envelop and destroy invaders such as cancer. Eating 100 g carbohydrates from glucose, sucrose, honey and orange juice all significantly decreased the capacity of neutrophils to engulf bacteria. Starch did not have this effect.¹¹

A four-year study at the National Institute of Public Health and Environmental Protection in the Netherlands compared 111 biliary tract cancer patients with 480 controls. Cancer risk associated with the intake of sugars, independent of other energy sources, more than doubled for the cancer patients.¹² Furthermore, an epidemiological study in 21 modern countries that keep track of morbidity and mortality (Europe, North America, Japan and others) revealed that sugar intake is a strong risk factor that contributes to higher breast cancer rates, particularly in older women.¹³

Limiting sugar consumption may not be the only line of defense. In fact, an interesting botanical extract from the avocado plant (*Persea americana*) is showing promise as a new cancer adjunct. When a purified avocado extract called mannoheptulose was added to a number of tumor cell lines tested in vitro by researchers in the Department of Biochemistry at Oxford University in Britain, they found it inhibited tumor cell glucose uptake by 25 to 75 percent, and it inhibited the enzyme glucokinase responsible for glycolysis. It also inhibited the growth rate of the cultured tumor cell lines. The same researchers gave lab animals a 1.7 mg/g body weight dose of mannoheptulose for five days; it reduced tumors by 65 to 79 percent.¹⁴ Based on these studies, there is good reason to believe that avocado extract could help cancer patients by limiting glucose to the tumor cells.

Since cancer cells derive most of their energy from anaerobic glycolysis, Joseph Gold, M.D., director of the Syracuse (N.Y.) Cancer Research Institute and former U.S. Air Force research physician, surmised that a chemical called hydrazine sulfate, used in rocket fuel, could inhibit the excessive gluconeogenesis (making sugar from amino acids) that occurs in cachectic cancer patients. Gold's work demonstrated hydrazine sulfate's ability to slow and reverse cachexia in advanced cancer patients. A placebo-controlled trial followed 101 cancer patients taking either 6 mg hydrazine sulfate three times/day or placebo. After one month, 83 percent of hydrazine sulfate patients increased their weight, compared to 53 percent on placebo.¹⁵ A similar study by the same principal researchers, partly funded by the National Cancer Institute in Bethesda, Md., followed 65 patients. Those who took hydrazine sulfate and were in good physical condition before the study began lived an average of 17 weeks longer.¹⁶

In 1990, I called the major cancer hospitals in the country looking for some information on the crucial role of total parenteral nutrition (TPN) in cancer patients. Some 40 percent of cancer patients die from cachexia.⁵ Yet many starving cancer patients are offered either no nutritional support or the standard TPN solution developed for intensive care units. The solution provides 70 percent of the calories going into the bloodstream in the form of glucose. All too often, I

believe, these high-glucose solutions for cachectic cancer patients do not help as much as would TPN solutions with lower levels of glucose and higher levels of amino acids and lipids. These solutions would allow the patient to build strength and would not feed the tumor.¹⁷

The medical establishment may be missing the connection between sugar and its role in tumorigenesis. Consider the million-dollar positive emission tomography device, or PET scan, regarded as one of the ultimate cancer-detection tools. PET scans use radioactively labeled glucose to detect sugar-hungry tumor cells. PET scans are used to plot the progress of cancer patients and to assess whether present protocols are effective.¹⁸

In Europe, the "sugar feeds cancer" concept is so well accepted that oncologists, or cancer doctors, use the Systemic Cancer Multistep Therapy (SCMT) protocol. Conceived by Manfred von Ardenne in Germany in 1965, SCMT entails injecting patients with glucose to increase blood-glucose concentrations. This lowers pH values in cancer tissues via lactic acid formation. In turn, this intensifies the thermal sensitivity of the malignant tumors and also induces rapid growth of the cancer. Patients are then given whole-body hyperthermia (42 C core temperature) to further stress the cancer cells, followed by chemotherapy or radiation.¹⁹ SCMT was tested on 103 patients with metastasized cancer or recurrent primary tumors in a clinical phase-I study at the Von Ardenne Institute of Applied Medical Research in Dresden, Germany. Five-year survival rates in SCMT-treated patients increased by 25 to 50 percent, and the complete rate of tumor regression increased by 30 to 50 percent.²⁰ The protocol induces rapid growth of the cancer, then treats the tumor with toxic therapies for a dramatic improvement in outcome.

The irrefutable role of glucose in the growth and metastasis of cancer cells can enhance many therapies. Some of these include diets designed with the glycemic index in mind to regulate increases in blood glucose, hence selectively starving the cancer cells; low-glucose TPN solutions; avocado extract to inhibit glucose uptake in cancer cells; hydrazine sulfate to inhibit gluconeogenesis in cancer cells; and SCMT.

A female patient in her 50s, with lung cancer, came to our clinic, having been given a death sentence by her Florida oncologist. She was cooperative and understood the connection between nutrition and cancer. She changed her diet considerably, leaving out 90 percent of the sugar she used to eat. She found that wheat bread and oat cereal now had their own wild sweetness, even without added sugar. With appropriately restrained medical therapy -- including high-dose radiation targeted to tumor sites and fractionated chemotherapy, a technique that distributes the normal one large weekly chemo dose into a 60-hour infusion lasting days -- a good attitude and an optimal nutrition program, she beat her terminal lung cancer. I saw her the other day, five years later and still disease-free, probably looking better than the doctor who told her there was no hope.

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Cancer's Favorite Food - Found in Everything You Eat?

Posted By [Dr. Mercola](#) | August 27 2010 | 257,680 views

Pancreatic tumor cells use fructose to divide and proliferate, according to a study that challenges the notion that all sugars are the same.

Tumor cells fed both glucose and fructose used the two sugars in two different ways. This could explain why other studies have previously linked fructose intake with pancreatic cancer, one of the deadliest cancer types.

According to MSNBC:

"Americans take in large amounts of fructose, mainly in high fructose corn syrup, a mix of fructose and glucose that is used in soft drinks, bread and a range of other foods. Politicians, regulators, health experts and the industry have debated whether high fructose corn syrup and other ingredients have been helping make Americans fatter and less healthy."

Sources:

- » [MSNBC August 2, 2010](#)
- » [Cancer Research August 1, 2010; 70: 6368](#)
- » [Reuters August 2, 2010](#)

Dr. Mercola's Comments:

Are all sugars equal in terms of the health effects they produce?

Sooner or later, science *will* put this debate to rest once and for all. It's already been conclusively shown that fructose, most commonly consumed in the form of high fructose corn syrup (HFCS), is FAR more hazardous to your health than regular sugar, but the [corn industry still vehemently denies such claims](#).

Through successful PR campaigns, industry has managed to pull the wool over your eyes for some time now, but eventually even they will have to surrender to the scientific evidence...

Until then, propaganda machines like the Corn Refiners Association's site, [SweetSurprise.com](#), will continue telling you that "research confirms that high fructose corn syrup is safe and no different from other common sweeteners like table sugar and honey. All three sweeteners are nutritionally the same," and that "though the individual sugars are metabolized by different pathways, this is of little consequence since the body sees the same mix of sugars from caloric sweeteners, regardless of source."

But are these metabolic differences of little consequence? Far from it!

Fructose Speeds Up Cancer Growth

Research just published in the journal [Cancer Research](#) shows that the way the different sugars are metabolized (using different metabolic pathways) is of MAJOR consequence when it comes to feeding cancer and making it proliferate.

According to the authors:

*" Importantly, fructose and glucose metabolism are quite different... These findings show that cancer cells can readily **metabolize fructose to increase proliferation**."*

In this case, the cancer cells used were [pancreatic cancer](#), which is typically regarded as the most deadly and universally rapid-killing form of cancer.

The study confirms the old adage that sugar feeds cancer because they found that tumor cells do thrive on sugar (glucose). However, the cells used *fructose* for cell division, speeding up the growth and spread of the cancer.

If this difference isn't of major consequence, then I don't know what is.

Whether you're simply interested in preventing cancer, or have cancer and want to live longer, you ignore these facts and listen to industry propaganda at your own risk.

How Does Sugar Feed Cancer?

Controlling your blood-glucose and insulin levels through diet, exercise and emotional stress relief can be one of the most crucial components to a cancer recovery program. These factors are also crucial in order to prevent cancer in the first place.

It may surprise you, but the theory that sugar feeds cancer was born nearly 80 years ago. Even more shocking, most conventional cancer programs STILL do not adequately address diet and the need to avoid sugars.

In 1931 the Nobel Prize was awarded to German researcher Dr. Otto Warburg, who first discovered that cancer cells have a fundamentally different energy metabolism compared to healthy cells.

Malignant tumors tend to use a process where glucose is used as a fuel by the cancer cells, creating lactic acid as a byproduct.^{[\[ii\]](#)} The large amount of lactic acid produced by this fermentation of glucose from cancer cells is then transported to your liver. This conversion of glucose to lactic acid generates a lower, more acidic pH in cancerous tissues as well as overall physical fatigue from lactic acid buildup.^{[\[iii\]](#) [\[iii\]](#)}

This is a very inefficient pathway for energy metabolism, which extracts only about 5 percent of the available energy in your food supply. In simplistic terms, the cancer is "wasting" energy, which leads you to become both tired and undernourished, and as the vicious cycle continues, will lead to the body wasting so many cancer patients experience.

Additionally, carbohydrates from glucose and sucrose significantly decreases the capacity of neutrophils to do their job. Neutrophils are a type of white blood cell that help cells to envelop and destroy invaders, such as cancer.

In a nutshell, ALL forms of sugar are detrimental to health in general and promote cancer, but in slightly different ways, and to a different extent. Fructose, however, clearly seems to be one of the overall *most* harmful.

Connecting the Dots: Fructose—Uric Acid—Cancer and Chronic Disease Risk

One particularly interesting tidbit I noticed [in this latest study](#) is the mention of how fructose metabolism leads to increased uric acid production along with cancer cell proliferation.

In [my first interview with Dr. Johnson](#), he explained just how detrimental the impact of fructose is on your uric acid level. Interestingly, ONLY fructose, NOT glucose, drives up uric acid as part of its normal metabolic pathways

And, the connection between fructose, uric acid, hypertension, insulin resistance/diabetes and kidney disease is so clear that your uric acid level can actually be used as a marker for toxicity from fructose -- meaning that if your levels are high, you're at increased risk of all the health hazards associated with fructose consumption and you really need to reduce your fructose intake.

For more information about this topic, please [see this link](#).

Dr. Richard Johnson has written one of the best books on the market on the health dangers of fructose, called [The Sugar Fix](#), which explains how fructose causes [high blood pressure, heart disease, obesity, diabetes and kidney disease](#). As I've mentioned previously, he does promote the use of artificial sweeteners in this book, which I cannot recommend. His research on fructose, however, is unsurpassed in my opinion.

Now it's safe to say that cancer, at least pancreatic cancer, is also definitely on the list of diseases that are directly linked to excessive fructose consumption.

So are Fruits Good or Bad for You?

This recommendation has created much controversy among many who regularly consume fruit and believe this recommendation does not apply to them.

Many who eat large amounts of fruit have no symptoms, just as those with high blood pressure may not have any symptoms. However lack of symptoms is no assurance you are not exposing yourself to some danger.

Please remember that over three-quarters of the population has insulin resistance.

How do you know if you have insulin resistance? If you have any of the following conditions it is a safe bet you have it:

- Diabetes
- High blood pressure
- Overweight
- High Cholesterol
- Cancer

If you have insulin resistance it would be strongly recommended to limit your total grams of fructose from fruit to below 15 grams per day (see the table below). If you believe you are very healthy and are an exception to this recommendation, then you can easily confirm if this is true for you by measuring your uric acid level.

If your uric acid level is greater than 5.5 than you have a risk factor and should limit your fructose consumption. The higher over 5.5, the stronger the risk factor is.

Keep in mind that fruits also contain fructose, although an ameliorating factor is that whole fruits also contain vitamins and other antioxidants that reduce the hazardous effects of fructose.

Juices, on the other hand, are nearly as detrimental as soda, because a glass of juice is loaded with fructose, and a lot of the antioxidants are lost.

It is important to remember that fructose alone isn't evil as fruits are certainly beneficial. But when you consume high levels of fructose it will absolutely devastate your biochemistry and physiology. Remember the AVERAGE fructose dose is 70 grams per day which exceeds the recommend limit by 300 percent.

So please BE CAREFUL with your fruit consumption. You simply MUST understand that because HFCS is so darn cheap, it is added to virtually every processed food. So even if you consumed no soda or fruit, it is very easy to exceed 25 grams of hidden fructose in your diet if you are consuming anything processed.

If you are a raw food advocate, have a pristine diet, and exercise regularly, then you could be the exception that could exceed this limit and stay healthy. But in my experience that is certainly the exception and not the norm.

So please, carefully add up your fruits based on the table below to keep the total fructose from fruit below 15 grams per day.

Fruit	Serving Size	Grams of Fructose
Limes	1 medium	0
Lemons	1 medium	0.6
Cranberries	1 cup	0.7
Passion fruit	1 medium	0.9
Prune	1 medium	1.2
Apricot	1 medium	1.3
Guava	2 medium	2.2
Date (Deglet Noor style)	1 medium	2.6
Cantaloupe	1/8 of med. melon	2.8
Raspberries	1 cup	3.0
Clementine	1 medium	3.4
Kiwifruit	1 medium	3.4
Blackberries	1 cup	3.5
Star fruit	1 medium	3.6
Cherries, sweet	10	3.8
Strawberries	1 cup	3.8
Cherries, sour	1 cup	4.0
Pineapple	1 slice (3.5" x .75")	4.0
Grapefruit, pink or red	1/2 medium	4.3

Restricting Fructose Consumption is Crucial Part of a Comprehensive Cancer Treatment Plan

Reducing (or preferably eliminating) fructose and other added sugars, as well as limiting grain carbohydrates from your diet, is usually a primary priority on [my list of cancer reducing strategies](#), and for good reason.

This dietary strategy should also be part of your comprehensive cancer treatment plan.

By severely reducing your intake of fructose and carbs in your diet, you help stave off any potential cancer growth, and "starve" any tumors you currently have.

It also bolsters your overall immune function, because sugar decreases the function of your immune system almost immediately.

Unfortunately, few cancer patients undergoing conventional cancer care in the US are offered any scientifically guided nutrition therapy beyond being told to "just eat healthy foods." I believe many cancer patients would see major improvement in their outcome if they controlled the supply of cancer's preferred fuel, glucose, and stayed clear of fructose to significantly reduce tumor proliferation.

Starving Cancer – Another Up-and-Coming Strategy

Before I go into further cancer prevention strategies, I'd like to remind you of another recent cancer research development I recently wrote about, namely ['starving' cancer by eating foods that prevent angiogenesis](#).

Angiogenesis (too many blood vessels) is a hallmark of cancer as the tumor actually needs blood in order to grow (this is how it feeds on the glucose in your bloodstream). But angiogenesis appears to be preventable by consuming foods that are natural inhibitors of excessive blood vessel growth.

When you regularly consume these foods, you can effectively starve any microscopic cancerous growths, effectively preventing them from growing further and becoming dangerous.

According to Dr. Li, who is currently leading this research, resveratrol from red grapes, for example, have been shown to inhibit abnormal angiogenesis by 60 percent. Even more potent is the ellagic acid found in strawberries.

Other potent anti-angiogenetic foods include:

Green tea	Berries: strawberries, blackberries, raspberries, blueberries	Cherries
Citrus: oranges, grapefruit, lemons	Kale	Turmeric
Nutmeg	Artichokes	Parsley
Garlic	Tomato	Maitake mushroom

Logically, different foods contain different potencies of anti-angiogenetic compounds. Some foods have even been found to be more potent than current anti-angiogenetic drugs! These include parsley and garlic.

But interestingly, when researchers evaluated a combination of two of the LEAST potent teas, for example, they discovered that this combination tea had greater potency than any given tea by itself.

"There's *synergy*," Li states, which should come as no surprise to those of you who are well-versed in holistic nutrition.

It is this synergy that makes fresh, whole foods so potently nutritious!

The sum is far greater than the individual parts, and this is why it's far more important to focus on eating a diet of whole, organic foods, rather than obsessing about individual nutrients.

Other Cancer Prevention Strategies

Aside from avoiding fructose and other added sugars (which means cutting out not only soda and sugary beverages, but also processed foods since most are loaded with HFCS), and incorporating more anti-angiogenetic fare into your diet, here are several additional strategies you can incorporate to virtually eliminate your cancer risk:

1. [Normalize your vitamin D levels](#) with safe amounts of sun exposure. This is one of the most effective, and least expensive, cancer prevention strategies available to most people. Ideally, you'll want to monitor your [vitamin D levels](#) to make sure your levels stay within a therapeutic range year-round.
2. Get appropriate amounts of animal-based [omega-3 fats](#).

3. [Exercise](#). One of the primary reasons exercise works is that it drives your insulin levels down. Controlling insulin levels is one of the most powerful ways to reduce your cancer risks.
4. Have a tool to permanently erase the neurological short-circuiting that can activate cancer genes. Even the CDC states that [85 percent of disease is caused by emotions](#). It is likely that this factor may be more important than all the other physical ones listed here, so make sure this is addressed. My particular favorite tool for this purpose, as you may know, is the [Emotional Freedom Technique](#).
5. Only 25 percent of people eat enough vegetables, so by all means [eat as many vegetables as you are comfortable with](#), preferably fresh and [organic](#).

Ideally, you'll also want to determine your nutritional type, as some veggies are better than others, depending on your type. In addition, if you are a carb nutritional type, for example, you may need up to 300 percent more vegetables than a protein nutritional type.

6. [Maintain an ideal body weight](#).
7. Get enough [high-quality sleep](#).
8. Reduce your exposure to [environmental toxins](#) like pesticides, household chemical cleaners, [synthetic air fresheners](#) and air pollution.
9. Boil, poach or steam your foods, rather than [frying or charbroiling them](#).

References

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- [\[i\]](#) Warburg O. On the origin of cancer cells. Science 1956 Feb;123:309-14.
 - [\[ii\]](#) Volk T, et al. pH in human tumor xenografts: effect of intravenous administration of glucose. Br J Cancer 1993 Sep;68(3):492-500
 - [\[iii\]](#) Digirolamo M. Diet and cancer: markers, prevention and treatment. New York: Plenum Press; 1994. p 203

Related Links:

- » [Cancer's Sweet Tooth](#)
- » [More Evidence Sugar Feeds Cancer](#)
- » [Cancer Will Kill 13.2 Million a Year by 2030](#)

Processed Foods High in Methanol

Processed foods are another matter, however. When fruits and vegetables are canned, the methanol becomes liberated from the pectin. At room temperature, it only takes one month for 10 percent of the methanol to be released. After about six months, virtually all of the methanol is liberated. Dr. Monte is convinced that methanol and the subsequent conversion to formaldehyde from certain processed foods and foods containing aspartame is a major culprit in a variety of diseases, especially MS.

"Multiple sclerosis behaves sort of a like an autoimmune disease. How can methanol cause this? The formaldehyde is what causes it," he says.

Methyl alcohol can slip through your blood brain barrier, and your brain is one of the areas where you find alcohol dehydrogenase, which converts methyl alcohol to formaldehyde. This causes the destruction of myelin basic protein, which is one of the triggers for MS.

"We know that methyl alcohol is known to be a demyelinating agent," Dr. Monte says. "We don't know why. In general, it's accepted as a demyelinating agent. You have the symptoms associated with the demyelination, and they're identical between multiple sclerosis and methanol poisoning, and people who consume aspartame."

Dr. Monte believes many diseases such as MS can be prevented if we start avoiding methanol, and he offers a methanol-free diet on his website. Items to avoid, especially if you have MS or symptoms of MS, include:

Cigarettes	Tomato sauces, unless first simmered at least 3 hours, no lid on pan
Diet foods and drinks with aspartame	Smoked food of any kind, particularly fish and meat
Fruit and vegetable products and their juices in bottles, cans, or pouches	Chewing gum, most chewing gum in the USA contains aspartame
Jellies, jams, and marmalades not made fresh and kept refrigerated	Slivovitz and other fruit schnapps
Black currant and tomato juice products, fresh or processed	Overly ripe or near rotting fruits or vegetables

More Information

You can learn more by reading Dr. Monte's book *While Science Sleeps*, or by visiting his website, www.WhileScienceSleeps.com.¹ His site contains all the articles referenced in his book, about 600 of them, so that you can read through them and verify the details for yourself.

There, you can also find, free of charge, the Monte Diet,² which will give you more details about the 10 primary sources of methanol mentioned above.

Garlic Could be Used as Cancer Treatment

Posted By [Dr. Mercola](#) | January 17 2004

Researchers have found that allicin, a chemical found in garlic that gives it its flavor, could be used to fight cancer. A previous study also found that allicin can fight MRSA, or staph infection. Although allicin is toxic, it breaks down quickly and harmlessly when eaten. The chemical is not present in unbroken cloves of garlic, but is produced when the clove is broken.

It is through this natural chemical reaction that allicin may be able to fight cancer. Researchers recreated the toxic reaction between alliinase and alliin (the two components that covert to allicin) at tumor sites by using an antibody that had been programmed to recognize tumor cells. The antibody was bound to alliinase and injected into the bloodstream to find cancer cells.

Allicin was also injected, and when the two components come together to form allicin, the reaction penetrates and kills the tumor cells.

Researchers say the finding is encouraging, and believe the method could work for most types of cancers as long as an antibody could be designed to recognize different types of cancer cells.

BBC News December 31, 2003

Dr. Mercola's Comments:

Garlic is one of my favorite foods, and it is one food that you should be eating every day. Previous studies have shown that [garlic may have a potential role in lowering one's cholesterol levels](#) and now more studies prove that [garlic may help prevent cancer](#).

It is important to note that the garlic MUST be fresh. The active ingredient allicin is destroyed within one hour of smashing the garlic. When you use the garlic it will be important to compress the garlic with a spoon prior to swallowing it if you are not going to cook it with food or juice it. If you swallow the clove intact you will not convert the allicin to its active form.

How to Supercharge Your Immune System

Posted By [Dr. Mercola](#) | July 11 2007 | 120,072 views

Gary Null's video "Supercharge Your Immune System" is based on 25 years of clinical [nutrition research](#) and working with thousands of individuals who suffer from immune disease.

In this comprehensive, must-see video, you'll learn the real causes of cancer, [arthritis](#), [multiple sclerosis](#), [allergies](#) and many other forms of immune dysfunction.

Dr. Mercola's Comments:

A research scientist at the Institute of Applied Biology for over 27 years, Gary Null, Ph.D., has spent his career investigating health issues and searching for the truth. Null is a New York Times best-selling author, the host of the talk radio program, "The Gary Null Show," and a producer of documentary films, DVDs and PBS television programs. Null empowers all who will listen with life-changing facts that promote wellness. Gary has interviewed me for several of his films. He is an awesome leader in the health freedom and education movement and we are fortunate to have his courageous example.

Here are my recommendations to supplement his excellent video for keeping your immune system in top shape, many of which coincide or dovetail with Null's suggestions: Of course these are just a summary, but if you want a more comprehensive review please consider my new book [Take Control of Your Health](#), which is loaded with key insights to improve your health and immune system.

Avoid Sugar

Sugar decreases the function of your immune system almost immediately. It is especially imperative to avoid sugar if you feel you are coming down with something, but keeping sugar out of your diet for the long haul will do wonders for your health and make your body stronger. Be aware that sugar is present in foods you may not suspect like ketchup and fruit juice.

Get Enough Rest

Just like it becomes harder for you to get your daily tasks done if you're tired, if your body is overly fatigued it will be harder for it to fight off disease. Regular rest will keep you strong and ensure that your body has the strength to fight off any potential invaders. Be sure to check out my article on [Secrets to a Good Night's Sleep](#).

Eat Garlic Regularly

Garlic is a triple-whammy: it's antibacterial, antiviral and anti-fungal. Garlic is one food that you should be eating every day. It is important to note that the garlic must be fresh to give you optimal health benefits. The active ingredient is destroyed within one hour of smashing the garlic, so garlic pills are virtually worthless and should not be used. When you use the garlic, compress it

with a spoon prior to swallowing it, or put it through your juicer to add to your [vegetable juice](#). If you swallow the clove intact you will not convert the active ingredient, allicin, to its active form.

Don't Let Stress Become Overwhelming

We all face some stress everyday, but if stress becomes overwhelming then your body will be less able to fight off illnesses. It has been estimated that up to 90 percent of illness and disease is stress-related. If you feel that stress is taking a toll on your health, consider using [Emotional Freedom Technique \(EFT\)](#), a type of psychological acupuncture. EFT is remarkably effective in relieving stress associated with all kinds of events, from work to family to trauma.

Exercise

When you exercise you increase your circulation and your blood flow throughout your body. The components of your immune system are also better circulated, which means your immune system has a better chance of finding an illness before it has a chance to spread. In a sense, exercising helps your immune system to be more efficient in weeding out and acting upon viruses and diseases. You can review my [exercise guidelines](#) for some great tips to get started.

Wash Your Hands

Washing your hands will decrease your likelihood of spreading a virus to your nose, mouth or other people. If your immune system is strong, it should be able to fight off the virus if it does enter your body, but washing your hands provides a bit of extra protection. Be sure you don't use antibacterial soap for this -- antibacterial soaps are completely unnecessary, and they cause far more harm than good. You can read my article on [hygiene mistakes](#) for more information.

Low Grain and Carbohydrate Diets Treat Hypoglycemia, Heart Disease, Diabetes Cancer and Nearly ALL Chronic Illness

by Joseph Brasco, MD

Unfortunately, the debate over the validity of this concept has primarily been waged in the media and lay publications and not in the scientific journals. Many of the popular books which support this position are gimmicky, and often, lack adequate scientific referencing. Yet, at their core is very important concept -- limiting the intake of carbohydrates, (especially as cereal grains and starches), will improve human health.

Some critics claim that reduced carbohydrate diets are a fashion trend. Well, this so called trend actually dates back some time. Anthropological study of early hominids has concluded that they lived as hunters-gathers. While nuts, seeds, vegetation and fruit made up an important part of the hunter- gather's diet, his mainstay was hunted or scavenged animal prey.

More recent evaluations of early man's nutritional patterns by Dr. Loren Cordain, estimate that as much as 65 percent of his calories were derived from animal products. Granted, early man was not eating corn fed Angus beef from Jewel, but he was eating the meat, the organs and the bones of his prey. Essentially, a high protein/fat diet. It was a mere 10,000 years ago (or less) that man began exploiting an agricultural niche.

This transition was made due to decreasing population of large game prey and an increasing population of humans. While undeniable good has transcended this dietary shift, i.e., growth of the human population, establishment of permanent settlements, the inception of civilization itself - man's health may have suffered in the transition.

Generally, in most parts of the world, whenever cereal-based diets were first adopted as a staple food replacing the primarily animal-based diets of hunter-gatherers, there was a characteristic reduction in stature, a reduction in life span, an increase in infant mortality, an increased incidence of infectious disease, an increase in diseases of nutritional deficiencies (i.e., iron deficiency, pellagra), and an increase in the number of dental caries and enamel defects.

In a review of 51 references examining human populations from around the earth and from differing chronologies, as they transitioned from hunter-gathers to farmers, one investigator concluded that there was an overall decline in both the quality and quantity of life.

There is now substantial empirical and clinical evidence to indicate that many of these deleterious changes are directly related to the predominately cereal-based diets of these early farmers. Since 99.99% of our genes were formed before the development of agriculture, from a biological perspective, we are still hunter-gathers.

Thus, our diet should reflect the sensibilities of this nutritional niche: lean meats; fish; seafood; low glycemic vegetables and fruit, (modern agriculture has significantly increased the sugar and starch

content of vegetables and fruits over their Paleolithic counterparts), nuts and seeds - the evolutionary diet.

Glycemic Index

The term glycemic index, (GI) (a qualitative indicator of carbohydrate's ability to raise blood glucose levels), has seen a lot of mileage among the many non-ketogenic low carbohydrate diets. Most of these diets attribute the rise in obesity to the over consumption of high glycemic carbohydrates, and the subsequent over production of insulin.

While this may be an oversimplification, there is growing evidence to support a relationship between GI and non-insulin dependent diabetes (NIDDM), and obesity. In a prospective study of 65,000 US women, researchers were able to demonstrate that the dietary GI was positively associated with the risk of NIDDM.

The authors concluded that diets with a high GI increase insulin demand and thus cause hyperinsulinemia among patients with NIDDM, as well as in normal subjects. If chronic, this hyperinsulinemia can increase the risk for, as well as exacerbate NIDDM.

The issue of carbohydrates and insulin has more recently been addressed in a review article by Grundy. Grundy states that because secretion by pancreatic beta-cells is glucose sensitive, a high intake of carbohydrates has been reported to produce higher post prandial insulin levels. Moreover, it is possible that repeated stimulation of a high insulin output by high-carbohydrate diets could hasten an age-related decline in insulin secretion and lead to an earlier onset of NIDDM.

However, chronic hyperinsulinemia is not only associated with NIDDM, but is also related to a host of other medical conditions jointly known as Syndrome X. The constellation of disorders comprising Syndrome X include hypertriglyceridemia, increased LDL cholesterol, decreased HDL cholesterol, hypertension, hyperuricemia and obesity.

If high GI carbohydrates in fact contribute to chronic hyperinsulinemia as multiple studies suggest, they are likely to be causative of these other conditions as well. In addition to their role in hyperinsulinemia, studies have also linked high GI foods with overeating.

One study found an inverse relationship between satiety and both glycemic and insulin index. In another study, it was found that voluntary energy intake after a high GI meal was 53% greater than after a medium GI meal and was 81% greater than after the low GI meal. The authors concluded that a high GI meal promotes excessive food intake in obese subjects. The literature clearly points to a role of high GI carbohydrates in the development of insulin resistance and its subsequent disorders.

However, GI is obviously not the whole story. One researcher examined the insulin demand generated by isoenergetic portions of common foods. While some of the results were predictable, i.e., the fact that glucose and insulin sources were highly correlated, some were unexpected, i.e., some protein-based foods induced as much insulin secretion as did some carbohydrate rich foods. At first glance, these results seem confounding. However, if one looks at the broader function of insulin, they are consistent.

Insulin is not just responsible for glucose disposal, but for storage and uptake of multiple nutrients. Whether these other nutrients can result in a chronic hyperinsulinemic state, as seen with high GI diets, is not known; it is unlikely due to their compensatory effect on glucagon. The other major difference between the insulin response of other nutrients versus carbohydrate is their effect on blood glucose.

While protein and fat stimulate insulin response, their effect on glucose is minimal. This lack of effect on blood sugar is more than trivial difference. It actually may be the glycosylation of end organs (especially the pancreatic beta-cells) that ultimately leads to NIDDM and its associated conditions. Thus, while a hyperinsulinemic state is not desirable for human health under any circumstance, the combination of hyperinsulinemia with impaired glucose homeostasis is likely to prove even more deleterious.

While the current literature would support limiting the consumption of high GI foods, GI certainly does not provide the final answer. If one was to follow this concept literally (as some popular books suggest) one could argue that potato chips at a GI of 50-59% were more beneficial than carrots at a GIU of 90-99%.

A better way of looking at carbohydrates is to return to the principles of the "evolutionary diet." Robert Crayhon, M.S., author and champion of the "Paleolithic diet", divides carbohydrates into two basic groups, paleocarbs and neocarbs. Paleocarbs include vegetables, fruits and perhaps tubers. Neocarbs (carbohydrates introduced within the last 10,000 years or less), include grains, legumes, and especially flour products, which did not exist for most of human history.

The worst of the neocarbs include sugar and white flour products. If we follow the simple guidelines of restricting ourselves to paleocarbs, we will in general be eating fiber rich, nutrient dense, low glycemic carbohydrates, the best nature has to offer.

Epidemiological Data

Another argument against carbohydrate restriction is based on epidemiological evidence, and the Pima Indians are frequently cited. The Arizona Pima Indians have received the attention of the medical community because of their prodigious rates of obesity, which is nearly 70% among the adult population. Along with the reputation of being one of the most obese people known, the Arizona Pima has a rate of diabetes 8 times the national average with nearly 50% of the adult population over 35 afflicted with this condition.

In spite of innumerable studies, examining the Pima from every imaginable vantage point, there has been no defining discovery explaining the Pima's plight. One hypothesis favored by Eric Ravussin, Ph. D, is that after generations of living in the desert, the only Pima who survived famine and drought were those highly adept at storing fat in times of plenty. These "thrifty" genes which once ensured the Pima's survival are now at the root of his demise.

Although it is not known for certain what metabolic processes these "thrifty" genes control, insulin resistance and glucose homeostasis are thought to be at the heart of the matter. Since preagricultural, man's diet was primarily derived from animal sources (protein/fat), an insulin resistant genotype would have minimized glucose utilization and thus, proven to be of an evolutionary advantage.

As primitive peoples have become acculturated and have assumed a modern diet, the constant supply of highly refined, high glycemic index carbohydrates has resulted in postprandial hyperinsulinemia and the subsequent diseases associated with this condition i.e. obesity, diabetes, cardiovascular disease, etc.

The Arizona Pima's diet prior to acculturation was essentially that of a hunter-gather with some subsistence farming: (chollacatus buds, honey mesquite, poverty weed, prickly pears, mule deer, white-winged dove, black-tailed jackrabbit, squawfish, and they raised wheat, squash and beans). However, by the end of the second World War, the Pima had almost entirely left their traditional lifestyle and adopted the typical American diet.

There are many problems with the typical American diet, and to blame the Pima's situation on just one element of that diet would be disingenuous. However, given the current scientific and anthropological studies, one could suggest that the high availability of sugar and highly refined, high glycemic carbohydrates (i.e. neocarbs), are at the core of the Pima's health crisis. It could also be extrapolated that, while the Pima's "thrifty" genes may work at a more accelerated pace, it is the same set of genes interacting with the same diet and producing the same results in the average American.

In 1991, the Pima's story became even more interesting. Peter Bennett FRCP, the lead epidemiologist studying the Arizona Pima, discovered in Sierra Madre, Mexico, the remnants of a tribe that once comprised the Southern half of the Pima Nation. However, unlike their Northern brothers, the Mexican Pima remained, in general, unacculturated and living a traditional lifestyle.

Also, unlike their northern counterparts, the Mexican Pimas were not obese, nor did they share in the Arizona Pima's high rate of diabetes and degenerative diseases. This dichotomy has been termed the "Pima Paradox." Since the Mexican Pima consume a diet comprised mostly of beans, potatoes, corn tortillas and the occasional animal product, (i.e. chicken) , this has often been used as the epidemiological case study for the benefit of high carbohydrate diets in obesity management.

However, two issues confound this example. First, on average, the Mexican Pima's have 23 to 26 hours/week of occupational physical activity versus the Arizona Pima's 5 hours or less. Certainly, such high levels of activity could mitigate the hyperinsulinemic effects of the Mexican Pima's diet.

The second issue is the "Enigma" within the "Paradox". Although the Mexican Pima does not have the health issues of the Arizona Pima, they still have a prevalence rate of diabetes at 6.4% (approximately 1.5x greater than the non Pima Mexicans), and a 13% incidence of obesity among the adult population.

While these numbers are impressive compared to the US population, and stellar compared to the Pima population, the question remains why should an essentially unacculturated population performing on average 23-26 hours of physical labor per week have any incidence of diabetes or obesity.

When modern day hunter-gatherers were studied by anthropologists, incidence of these conditions were non-existent, even among the eldest members of tribe. The "evolutionary diet" model would thus suggest, in spite of their improved health over the Arizona Pimas, the Mexican Pimas are still consuming a less than optimal diet.

Although conclusions drawn from epidemiological data can sometimes be misleading, the real message that can be taken from the Pimas is that as a species we have proclivity towards obesity, a proclivity that will vary based on our genetic stock.

This genetic predisposition, while multifactorial in nature, probably centers around insulin resistance and glucose homeostasis. Since our preagricultural ancestors did not have ready access to simple carbohydrates, fats were the preferred source of caloric energy, and glucose conservation was evolutionarily advantageous.

In modern times, the detrimental combination of low physical activity, hypercaloric intake, and over consumption of neocarbs is at the root of our obesity crisis. A return to an evolutionary based diet - lean meats, seafood, fish, vegetables, fruits, (raw) nuts and seeds and moderate physical activity, will ultimately be the cure.

Health Risk Associated with reduced Carbohydrate Intake

Another argument against carbohydrate restriction focuses on the purported health risk of this dietary approach. Of the three macronutrients, protein, fat and carbohydrate, it is only carbohydrate that is nonessential to the human diet. Humans can exist for extraordinarily long periods of time without carbohydrate consumption as long as essential protein and fat needs are met. It is thus perplexing why nutritional dogma ascribes so many risks to the restriction of this non-essential nutrient.

Ketosis

Ketosis is a natural physiologic state induced during prolonged states of decreased glucose availability. It is triggered by severe caloric restriction or when carbohydrate intake falls below 20-30 grams, (most of the current low carbohydrate diets are nowhere near this level of restriction).

In ketosis, a set of elaborate metabolic processes occur which have the net result of decreasing insulin secretion, increasing glucagon secretion, switching off glycolysis, turning on lipolysis, switching muscles from glucose to almost entirely fatty acids for fuel, and ultimately providing ketone bodies (produced in the liver), markedly diminishing the need for glucose by the brain in particular and the body in general.

Ketosis was an absolutely vital survival mechanism for early man. It allowed him to survive periods of starvation as well as long periods of carbohydrate deprivation. Despite the role ketosis plays in normal human physiology, its' modern application has often been portrayed with multiple negative health connotations.

However, both scientific and epidemiological data has failed to justify these concerns. The ketogenic diet has been used for nearly 70 years to treat refractory seizures in the pediatric population. Multiple recent studies have described nutritionally balanced, food varied versions of this diet.

One investigator looked at the health profiles of adults who had been treated during childhood with ketogenic diet. He found no evidence of adverse effects on cardiovascular function, including arteriosclerosis, hypertension or cardiac abnormalities. Blood cholesterol determinations were

performed on these adults and all were normal. These studies thus fail to reveal any short term complication or long term sequelae associated with ketogenic diets.

In the mid twenties to late thirties, the famed anthropologist V. Stefansson chronicled the life and culture of the Eskimo in a series of books and journal articles. Of the many observations made by Stefansson, he was most intrigued with their diet and health. In spite of a nearly 100% animal based diet, the Eskimo people enjoyed an excellent state of well being and a freedom from many western diseases.

This observation was greeted with a high degree of skepticism in a scientific community that was becoming increasingly hostile toward the role of protein and fat in the American diet. To silence his critics, Stefansson devised a study whereby he would consume an all meat diet for one year.

Under observation at Bellvue Hospital in New York City, Stefansson and a colleague did in fact consume for one year an all meat diet. At years end, to the surprise of the scientific community, both investigators were in excellent health. They demonstrated weight loss with reduction in body fat, normal kidney and liver function, and improvement in blood lipids (within the limits of diagnostic testing of the time).

The "Bellvue ward study" created quite a stir in the scientific community and was detailed in numerous articles appearing both in popular and professional literature. Although long term commentary cannot be made, this remarkable study certainly speaks to the short term safety of a ketogenic diet. Ample scientific, epidemiologic and anthropological data exists to support the general safety of a ketogenic diet. However, this data does not exonerate all the modern inceptions of this diet.

Traditional cultures who consumed a largely animal based diet, derived a great deal of their vitamins and nutrients by consuming the organs, eyes, glands and gonads of their prey. Modern ketotic diets are primarily based on common American foods, i.e. meats, eggs and cheeses. They do not qualify the source of animal products (i.e. salmon versus bacon), and are usually overloaded with salt. In general, these diets are only concerned about limiting carbohydrate intake without overall regard to food quality.

In the most popular version of the ketogenic diet, Dr. Atkins New Diet Revolution, Dr. Atkin's writes "at the other end of the spectrum is a convenience food that sounds terrible fatty, but in fact, contains nearly none. Those are the maximizers of crispness - fried pork rinds - the zero carbohydrate consolation prize for corn or potato chip addicts. Virtually all the fat has been rendered off, leaving you with the protein matrix that held the pork fat together. Your pate, sour-cream based dips and guacamole find an exceedingly crisp and comfortable home atop a fried pork rind.

In spite of their potential physiologic benefits, the modern ketogenic diets with their unbalanced, nutrient poor and often absurd dietary suggestion are difficult to support. However, ketogenic diet based on evolutionary appropriate foods would be interesting to pursue in clinical practice.

Lack of fruits, vegetables and grains Aside from the ketogenic diets, most other reduced carbohydrate programs allow for the ample consumption of vegetables and the modest consumption of low glycemic fruit, (the best sources of nutrients and phytonutrients available to man).

Of the major carbohydrate sources mentioned, only grain is heavily restricted. Although present diet dogma portrays grain as the quintessential food source, (it is at the base of the food pyramid after all), many nutritional scientist have called this assertion into question. In a work of prodigious proportions (342 literature citations), Dr. Loren Cordain examines mans double edged relationship with grain.

On one hand man is utterly dependent upon grain as a primary caloric source and yet grain may be at the core of many of our common maladies. As would be predicted by the evolutionary diet model, Dr. Cordain concludes that grain is biologically novel to the diet of mankind as it was introduced as a staple food only 10,000 years (or less) ago. Due to its relatively recent introduction, our species has not fully adapted physiologically to its digestion and metabolism.

In spite of the impressive nutrient profiles of grain, the vitamins and minerals often occur in forms that have low bioavaildality to the human digestive tract. In addition to these poorly utilizable nutrients, grain contains many secondary metabolic components commonly categorized as anti-nutrients.

Anti-nutrients are chemical compounds naturally occurring in grains, which evolved to protect the plants from predators. Processing and cooking does not not fully rid the grain of these elements, thus making them prominent in our diet. Recent scientific study has linked these anti-nutrients to a number of negative biological consequences which include: allergen based disorders; pancreatic hypertrophy and disruption of the gut cell wall tight junctions (thus exposing the systemic circulation to food allergens and gut flora).

One of the most curious of these negative processors associated with grain anti-nutrients is a phenomenon known as molecular mimicry. Molecular mimicry is when a similarity of structure is shared by products of dissimilar genes. When this phenomenon occurs within the human body, the potential for developing an autoimmune reaction is created.

The main body of evidence implicates viral and bacterial pathogens as initiators of cross-reactivity and autoimmunity. However, there is an emerging body of literature supporting the view that dietary antigens including cereal grains may also induce cross-reactivity and hence autoimmunity by virtue of peptide structures homologous to those in the host.

The diseases that may share this common origin are numerous and varied. They may include everything from aphthous ulcers (canker sores), to rheumatoid arthritis to non-insulin dependent diabetes to multiple sclerosis. While many of these assertions may seem preposterous to a society reared on grain, evolutionary pressures would suggest otherwise. The primate gut was initially adapted to both the nutritive and defensive components of dicotyledonous plants rather than the nutritive and defense components of mono- cotyledons cereal grains.

Consequently, humans, like other primates, have had little evolutionary experience in developing a physiology that can both fully utilize and defend against the compounds which naturally occur in cereal grains. So, while the motives for limiting grains may be completely unrelated, many of the popular incarnations of reduced carbohydrate diets may be paying their readers a great - albeit - indirect service.

Increased Saturated Fats

Of all our nutritional mantras, the one most widely and emphatically proclaimed is the relationship between saturated fats and coronary artery disease. One would think a "fact" so ingrained in our social psyche would be supported by mountains of evidence.

However, the reality is the data to support the "diet-heart hypothesis" is flimsy at best - non-existent at worst. In an extensive review of existing studies, Ravnskov came to the conclusion that, "Few observations agree with the diet-heart idea, but a large number have falsified most effectively.

Man's diet possibly includes factors of importance to the vessels or the heart, but there is little evidence that saturated fatty acids as a group are harmful or that polyunsaturated fatty acids as a group are beneficial." In a similar review, Dr. Mary Enig was also unable to find a solid relationship between saturated fat consumption and coronary artery disease. She instead came to the conclusion that the inordinate increase in trans fatty acid consumption was more likely the causative factor.

When discussing the "dietary heart hypothesis", the work of Dean Ornish, M.D., is often cited as clinical evidence for the efficacy of dietary fat reduction. However, while Ornish is a major proponent of the "low fat diet", in his studies a number of coronary artery risk factors are addressed, in addition to the dietary changes.

In Ornish's work, study participants underwent vigorous lifestyle changes, which included smoking cessation, stress management, exercise and a low-fat (near vegan) diet (the only animal products allowed were egg whites and one cup of non-fat milk or yogurt per day).

After following these changes for one year, the experimental group did show an overall regression of atherosclerotic plaque, Ornish's study is extraordinarily important because he was able to demonstrate, in quantifiable terms to the medical community, that lifestyle changes could be as powerful as drugs in managing a serious disease. However, to extrapolate that this study proves the value of the low fat diet is fallacious.

Ornish manipulates four separate variables in his study, all of which have purported association with cardiovascular disease. To suggest that any one variable or combination of variables is more important than the other cannot be concluded from Ornish's data.

Even if diet alone is examined, there are multiple variables within the diet, that in and of themselves could have significance. Was it the omission of trans fatty acids (which have been linked to cardiovascular disease)? Was it the increase of antioxidants provided by the intake of fresh fruits and vegetables? Was it the fact that the experimental group experienced an average loss of 22 lbs?

Again, to conclude that it was the "low fat diet" which was primarily responsible for the experimental group's success (as the study is often interpreted), is quite disingenuous. A factor often overlooked in Ornish's work is the effect of low fat/high carbohydrate diets on lipid profiles. While it is true, the experimental group had an overall reduction in cholesterol, there was a concomitant reduction in HDL cholesterol with an increase in triglycerides.

Numerous recent studies have verified this dietary effect. Of these current studies, Berglund specifically looked at the response of the reduction in dietary total and saturated fats and HDL cholesterol subtypes. The study demonstrated a decrease in dietary total and saturated fat resulted in a significant decrease in HDL2 and HDL2b cholesterol concentrations. The authors concluded that the dietary changes suggested to be prudent for a large segment of the population will primarily affect the concentrations of the most prominent antiatherogenic HDL subpopulations.

Although definitive conclusions for the general population may be premature, in individuals demonstrating evidence of hyperinsulinemia and dyslipidemia (i.e. - Syndrome X) carbohydrate restriction is imperative for improved lipid profiles. In nutrition, as well as in life, balance is always the key. Nowhere is balance more crucial than in the discussion of dietary fats.

ANY diet, whether it be high fat - low fat (or anything in-between), if it promotes imbalances in fatty acid profiles, will in the long run have negative health consequences. In the mid '50s, the biochemist, anthropologist, and explorer Hugh Sinclair suggested an alternative explanation for the relationship between dietary fat and cardiovascular disease.

Sinclair noted that several people groups existed that consumed relatively high amounts of fat and yet were free of heart disease. Sinclair detailed the dietary habits of the Eskimos (previously discussed); the Masai people of Kenya who ate large quantities of ruminant milk and meat; and Jamaicans who ate large amounts of saturated fat in the form of coconut oil. All three groups, all consuming high fat diets, were relatively free from heart disease.

Sinclair suggested that the polyunsaturated profiles of these diets were protective, and concluded that the rise in cardiovascular disease was more related to their exclusion from the diet rather than the inclusion of saturated fats or cholesterol. Since Sinclair's day, our biochemical understanding of fat has increased exponentially. We now realize it is not just the polyunsaturated content of the diet, but the ratio of N-6 to N-3 polyunsaturates that may ultimately determine health.

Both dietary extremes discussed fail to introduce balance in this ratio. High carbohydrate diet due to their high grain and plant content will ultimately be low in N-3 fats (especially long chain N-3 fats - i.e. EPA/DHA), thus unbalancing the N-6/N-3 ratio. Low carbohydrate diets, in their popular form, rely heavily on commercially raised grain-fed meats and poultry (the fatty acid profile of the meat from wild game, free range beef and poultry have a significantly higher N-3 to N-6 ratio), eggs (free range hens also make better eggs) and cheeses.

A diet based on these foods will also greatly unbalance the N6/N3 ratio. Although the precise ratio remains controversial, the N6/N3 ratio should probably be in the range of 4-3/1 to optimize human health, western diets rich in vegetable oils, cereal grains and grain fed live stock, drive this ratio to an unprecedented 50-10:1. This imbalance may have implications in a host of diseases, including hyperinsulinemia, arteriosclerosis and tumorigenesis.

When the diets of hunter-gatherer populations are studied, authors have concluded that their N6/N3 ratio varied between 4:1 to 1:1. This ratio appears to be biologically optimal. Based on these considerations, investigators, have advocated a return to dietary ratios of ancestral humans. A diet based on lean meats (wild game or free range livestock), fish, raw nuts and seed, vegetables, low glycemic fruit (paleocarbs)

- "an evolutionary diet" - not only will be helpful in the management of obesity, but in a host of other common western diseases, including cardiovascular disease.

Dietary Protein and Cardiovascular Disease

Multiple recent studies have demonstrated the benefit of dietary fats (especially N-3 polyunsaturates and monounsaturates) in cardiovascular disease and in the reduction of cardiovascular risk factors. A more recent study trend has examined the possible beneficial role of dietary protein.

Wolfe has published numerous articles demonstrating the positive effects of the isocaloric substitution of protein for carbohydrate on lipid profiles. His studies have demonstrated a decreased LDL-C, an increased HDL-C, and reduction of triglycerides, thus reversing the dietary effects of increased carbohydrates. Wolfe states that substitution of carbohydrate for fat in the diet results in a reduction in HDL apoprotein transport rates along with increased catabolism of apolipoprotein A-1.

The decreases in plasma VLDL and LDL resulting from substitution of protein for carbohydrate in the diet may relate to either increased catabolism or decreased production. Thus, according to Wolfe's work, the simple dietary substitution of protein for carbohydrate could have profound health benefits.

Wolfe's data has recently been validated by Hu. In this study the dietary habits of over 80,000 women were examined. After controlling for variables, high protein intakes were associated with lowered risk of ischemic heart disease. Both animal and vegetable protein sources were protective. This inverse association was noted in women on both low fat or high fat diets. Wolfe's and Hu's work both indicate that dietary protein has cardioprotective properties independent of those of dietary fat.

Given the multiple health benefits ascribed to N-3 polyunsaturates and the evolving data regarding dietary protein - fish may be one of the best foods for human consumption. In a fascinating piece of epidemiological work, Marcovina compared 2 racially homogenous Bantu populations from Tanzania. The only appreciable difference between the groups was their dietary habits.

The Bantu living closer to the shore had a predominantly fish based diet, while the inland Bantu consumed an essentially vegan diet (a diet devoid of animal products). When plasma lipoprotein (a) (an independent cardiovascular risk factor) levels were compared, those among the fish eating population were 40% lower. This suggests another cardioprotective aspect of fish consumption.

In a recent study by Mori, he demonstrated the inclusion of fish in a weight loss program yielded greater results than either fish consumption or weight loss alone in their obese subjects. The experimental group in their study demonstrated improved glucose, insulin and lipid metabolism, as well as greater reductions in blood pressure, heart rate and weight loss versus controls. This study suggests a novel approach to the dietary management of obesity and NIDDM.

Perhaps the most influential of the studies looking at the benefits of fish, was the Diet and Reinfarction Trial (also known as the DART trial). In this study, the authors demonstrated that the addition of a modest amount of fish (2-3g of EPA per week or the equivalent of 300g of fatty fish per week) reduced post myocardial infarction mortality by about 29% when compared to controls.

One of the more interesting aspects of the study was that the control group was instructed on the standard fat reduction diet and on average had lower cholesterol levels than did the experimental group. The authors theorized that the fish oils had a favorable effect on clotting mechanisms and blood platelets, as well as a potential anti-arrhythmic effect on the ischemic heart. The results of this study are profound, especially given the modest and otherwise innocuous interventions undertaken.

Given the evidence of the benefit of N-3 polyunsaturates, coupled with the potential benefits of dietary protein, fish clearly is a biologically superior food source. The isocaloric substitution of fish for dietary carbohydrates is not only evolutionary appropriate, but may have untoward health benefits from weight control to improved glucose homeostasis to cardiovascular disease prevention.

Risk of Osteoporosis

Of all the potential negative side effects of dietary protein, the issue of osteoporosis is perhaps the most difficult to resolve. The literature is greatly divided on the topic, and clear recommendations are hard to find. In a recent study, Munger found that the intake of dietary protein, specifically from animal sources was associated with a reduced incidence of hip fractures in post menopausal women.

In the articles' discussion, a brief review of protein's controversial role in osteoporosis was undertaken. In the studies showing a potential benefit (as in the author's paper), it has been theorized that dietary protein may strengthen bone by its effect on the structure and function of bone-related proteins.

In studies demonstrating a negative effect, it has been argued that dietary protein (especially in the form of animal based protein) is a primary source of acid ash, which results in the acidification of urine. In order to buffer the urine and maintain acid-base homeostasis, calcium salts are mobilized from the skeleton, resulting in a net calciuria. Over time, this buffering of endogenous acids may contribute to a progressive decline in skeletal mass and, ultimately, lead to osteoporosis.

However, Wachman and Bernstein, the two authors who originally postulated this mechanism for osteoporosis, theorized that by increasing the dietary alkaline ash this process could be halted.

In a study by Sebastian., he was able to reduce calciuria and improve overall calcium/phosphorous balance by the administration of potassium bicarbonate as a buffering agent to postmenopausal women consuming an acid promoting diet. The authors suggest that potassium bicarbonate could be administered long-term as a novel means of preventing and treating postmenopausal osteoporosis.

In a 4-year longitudinal study by Tucker, he was able to demonstrate that a greater bone mineral density was associated with increased dietary potassium and magnesium levels, as well as increased consumption of fruits and vegetables. The authors concluded that this positive association was due to the beneficial effects of potassium and magnesium on calcium balance and bone metabolism, as well as the buffering properties of increased alkaline ash in the form of fruits and vegetables.

Given the divergent nature of the theories, it is highly probable that both have merit. With respect to protein's beneficial effects, protein is certainly necessary for proper bone matrix formation and metabolism. It is likely a chronic suboptimal intake will jeopardize this function. One could conjecture that the studies finding a negative association between protein and osteoporosis have somehow

highlighted this aspect of the equation. Those studies finding a positive association between protein and osteoporosis are probably looking at the endogenous acid production issue.

In an article by Remer, he calculated the potential renal acid load (PRAL) of frequently consumed foods in order to help dietitians design diets of varying urinary pH. On their list, animal protein sources (as expected) were calculated to increase PRAL.

However, grain products, legumes and dairy products (especially hard cheeses) also increased PRAL. In fact, according to Remer's data brown rice had a greater PRAL than any of the meat products examined (with the exception of canned corned beef - if you want to call that meat).

Perhaps the most ironic of all, was Remer's finding that cheeses had the highest of the calculated PRALs. Parmesan, cheddar, and processed American cheese had PRALs almost 2 times any meat product. In light of Remer's data, the relationship of protein and osteoporosis cannot fully be determined without addressing the total dietary PRAL. The type of protein being consumed (lean meats vs. Processed meats vs. Cheese) and the other foods in the diet are likely to significantly affect the study's outcome.

The protein osteoporosis controversy was addressed in a review article by Spencer. According to the author, numerous studies have been published on the calcium-losing effect of protein. However, several aspects of the study conditions have to be considered in the interpretation of the results.

Some of these are the type of protein, such as purified proteins (which seem not to promote calciuria); the duration of the study (there may be a transient increase in calciuria followed by a normalization or reduction); whether the phosphorous (which has an independent calcium sparing effect) intake remained the same, was increased, or decreased; whether the diets were under strict control or with outpatient volunteers; whether the protein intake was changed from a low to a high protein intake or was changed from a normal to a high protein intake; and whether excessively high protein intakes were used.

All these factors affect urinary calcium excretion during high protein consumption. After reviewing the available data, based on the aforementioned criteria, the authors concluded, "to our knowledge, no convincing data have been published showing that a high protein diet, using complex proteins for prolonged periods of time under strictly controlled dietary conditions, causes calcium loss."

It is quite obvious that the role of dietary protein in calcium homeostasis is complex and multifactorial in nature. However, given the work of Remer, it may actually be the net PRAL of the diet that is most important in influencing the development of osteoporosis, rather than the diet's absolute protein content. Since most of the current low carbohydrate diets encourage the ample consumption of vegetables, this is likely to offset any potential acidifying effects of increased dietary protein.

In fact, given most individuals do not consume enough vegetables and fruits, these diets are likely to promote better acid-base balance than the average American diet. Unlike the more modified low carbohydrate diets, modern ketogenic diets may pose a risk for calciuria since they rely heavily on animal protein, cheeses, and cured meats, and are usually not salt restricted (the Cl ion- not the Nat ion - can also cause a renal acid load and subsequently calciuria).

However, since most people are in ketosis for only a short period of time (after which they are theoretically supposed to transition into a modified low carbohydrate diet), it is unlikely that these diets will significantly contribute to an individual's overall risk for osteoporosis.

Kidney and Liver Damage

While it is generally accepted that people with pre existing kidney and liver disease will benefit from some level of protein restriction there is no data to support proposition that increased dietary protein will actually cause kidney or liver damage.

In a study by Blum, he examined the kidney function of a group of healthy individuals consuming an ad lib. high-protein diet, as compared to a group of healthy vegetarians (Isn't that an oxymoron?). At the study's end, the authors concluded that protein does not affect kidney function in normal kidneys, and it does not influence the deterioration of kidney function with age.

The relationship of protein and the liver is somewhat more complex. Although there is no evidence that increased dietary protein will cause permanent liver damage, there is an actual dietary "protein ceiling". According to Rudman there is a lever at which dietary protein intake can exceed the liver's ability to metabolize it to the urea, thus leading to a build up of intermediary metabolites. These metabolites can subsequently lead to a toxic state in the affected individual.

The level of protein at which this will occur varies, but it is thought to be possible when protein makes up 30-40% of the calories in an eucaloric diet (the percent calories from protein can be higher in a hypocaloric diet).

"Rabbit Starvation" (a term coined by V. Stefansson to describe the phenomenon of excessive dietary protein) often occurred among explorers who would live for long periods of time on extremely low fat small game animals (i.e. rabbits). The condition was marked by nausea, vomiting, weight loss and fatigue. "Rabbit Starvation" was reversible when the percentage of daily calories from protein began to drop. Although the "Rabbit Starvation" phenomenon could effect an individual consuming a ketogenic diet, it is highly improbable.

In general, if one is consuming commercially available meats (even chicken), the percentage of calories from fat would be too high to induce this condition. In the modified low carbohydrate diets, due to the varied food sources, the risk of protein toxicity, for all practical purposes, is non-existent.

Conclusion

A critical reading of the current literature certainly supports the dietary trends of decreased carbohydrate intake (especially of neocarbs), increased protein intake, and increased fat intake (especially of monounsaturates and N-3 polyunsaturates). The data that supports these contentions comes from a wide spectrum of disciplines, including the basic sciences, medical science, epidemiology, and anthropology.

The one dietary program that addresses these principles in full, is the so called "evolutionary diet." The modern inception of this prehistoric lifestyle would favor the consumption of lean meats (preferably wild game or non-grain fed, free-range domesticated animals), fish, seafood, vegetables, fruits, raw nuts,

and seed. Notably absent from this dietary genre are dairy products, cereal grains, beans, legumes and concentrated sweets (except for perhaps the occasional foray into raw honey!).

Adherence to these dietary guidelines will not only address obesity, but may also prove helpful in the management of everything from NIDDM to diseases of autoimmunity to cardiovascular illnesses. The guidelines are broad, but can be made quite specific depending on the goals, lean body mass, activity level, and overall health of the patient.

In the last few years, there has been a literal explosion of data in the nutritional sciences. Sometimes when addressing this data, we are put in the uncomfortable situation of realizing that today's facts are rapidly becoming tomorrow's fiction. However, by keeping an open mind and always questioning what we think we know, we will be able to provide our patients with the best and most innovative care possible.

Dr. Mercola's Comment:

My congratulations to Dr. Brasco for compiling such an outstanding review of the concerns that some have when confronted with the "low carb" diet. Dr. Brasco is a close personal friend and is also the physician who covers for me when I go out of town.

He is an internist and gastroenterologist and I believe one of the best in the country. It is a strange paradox of medicine that most GI specialist know virtually nothing about nutrition. That is certainly not true of Dr. Brasco who is clearly one of the leading nutritional GI specialists in the country.

I typically warn my patients that the diet recommended is NOT low carbohydrate but full of vegetables which are the good carbohydrates. Dr. Brasco provides an incredible review of the literature and some very sound scientific support for what appears to be the diet most of us were designed to eat.

I frequently explain to patients that part of the reason for the confusion on the carbohydrate issue is the fact that not all carbohydrates are created equal. The glycemic index mentioned above is one science tool that is used to explain this, but most patients have a hard time with this concept.

I give them an analogy to think of grains and most below ground vegetables as a simple train. Each car in the train represents a simple sugar molecule which is easily broken down once it reaches the digestive system.

I then ask them to visualize that same train but this time stacked 20 to 50 high with other trains and each train car interconnected to the cars above them. This is an accurate representation of the much more highly complexed and branched sugar molecules that are present in most above ground vegetables.

They have multiple bonds connecting each of the sugar molecules and take the body a long time to break them down. The extra time allows the body to slowly use the sugar and thus not have to secrete large amount of insulin to store the excess.

By Joseph Brasco, MD

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Lower Your Grains & Lower Your Insulin Levels! A Novel Way To Treat Hypoglycemia, by Dr.Mercola

Most of the above information is abstracted from books by Dr. Sears: *Enter the Zone*, and Dr. Maffetone *In Fitness and in Health*

Hypoglycemia is a common problem. Over the past fifteen years, our dietary establishment has made a virtual industry of extolling the virtues of carbohydrates.

We're constantly told that carbohydrates are the good guys of nutrition, and that, if we eat large amounts of them, the world should be a better place. In such a world, the experts tell us, there will be no heart disease and no obesity.

Under such guidance, Americans are gobbling breads, cereals, and pastas as if there were no tomorrow, trying desperately to reach that 80 to 85 percent of total calories advocated by the high-carb extremists.

This creates a terrible paradox: people are eating less fat and getting fatter! No medical authority will tell you that excess body fat makes you healthier. There is but one alarming conclusion to reach: a high-carbohydrate, low-fat diet may be dangerous to your health.

Overeating carbohydrate foods can prevent a higher percentage of fats from being used for energy, and lead to a decrease in endurance and an increase in fat storage.

Eating fat does not make you fat. It's your body's response to excess carbohydrates in your diet that makes you fat. Your body has a limited capacity to store excess carbohydrates, but it can easily convert those excess carbohydrates into excess body fat.

It's hard to lose weight by simply restricting calories. Eating less and losing excess body fat do not automatically go hand in hand.

Low-calorie, high-carbohydrate diets generate a series of biochemical signals in your body that will take you out of the balance, making it more difficult to access stored body fat for energy. Result: you'll reach a weight-loss plateau, beyond which you simply can't lose any more weight.

Diets based on choice restriction and calorie limits usually fail. People on restrictive diets get tired of feeling hungry and deprived. They go off their diets, put the weight back on (primarily as increased body fat), and then feel bad about themselves for not having enough will power, discipline, or motivation.

Weight loss has little to do with willpower. You need information, not will power. If you change what you eat, you don't have to be overly concerned about how much you eat. Adhering to a diet of low carbohydrate meals, you can eat enough to feel satisfied and still wind up losing fat-without obsessively counting calories or fat grams.

Food Can Be Good or Bad

The ratio of macronutrients protein, carbohydrate, and fat-in the meals you eat is the key to permanent weight loss and optimal health. Unless you understand the rules that control the powerful biochemical responses generated by food, you will never achieve optimal wellness.

Unfortunately, many people don't really know what a carbohydrate is. Most people will say carbohydrates are sweets and pasta. Ask them what a vegetable or fruit is, and they'll probably reply that it's a vegetable or fruit-as if that were a food type all its own, a food type that they can eat in unlimited amounts without gaining weight.

Well, this may come as a surprise, but all of the above-sweets and pasta, vegetables and fruits-are carbohydrates. Carbohydrates are merely different forms of simple sugars linked together in polymers-something like edible plastic.

Of course, we all need a certain amount of carbohydrates in our diet. The body requires a continual intake of carbohydrates to feed the brain, which uses glucose (a form of sugar) as its primary energy source.

In fact, the brain is a virtual glucose hog, gobbling more than two thirds of the circulating carbohydrates in the bloodstream while you are at rest. To feed this glucose hog, the body continually takes carbohydrates and converts them to glucose.

It's actually a bit more complicated than that. Any carbohydrates not immediately used by the body will be stored in the form of glycogen (a long string of glucose molecules linked together).

The body has two storage sites for glycogen: the liver and the muscles. The glycogen stored in the muscles is inaccessible to the brain. Only the glycogen stored in the liver can be broken down and sent back to the bloodstream so as to maintain adequate blood sugar levels for proper brain function.

The liver's capacity to store carbohydrates in the form of glycogen is very limited and can be easily depleted within ten to twelve hours. So the liver's glycogen reserves must be maintained on a continual basis. That's why we eat carbohydrates.

The question no one has bothered to ask until now is this: what happens when you eat too much carbohydrate? Here's the answer: whether it's being stored in the liver or the muscles, the total storage capacity of the body for carbohydrate is really quite limited.

If you're an average person, you can store about three hundred to four hundred grams of carbohydrate in your muscles, but you can't get at that carbohydrate. In the liver, where carbohydrates are accessible for glucose conversion, you can store only about sixty to ninety grams.

This is equivalent to about two cups of cooked pasta or three typical candy bars, and it represents your total reserve capacity to keep the brain working properly.

Once the glycogen levels are filled in both the liver and the muscles, excess carbohydrates have just one fate: to be converted into fat and stored in the adipose, that is, fatty, tissue.

In a nutshell, even though carbohydrates themselves are fat-free, excess carbohydrates ends up as excess fat. That's not the worst of it. Any meal or snack high in carbohydrates will generate a rapid rise in blood glucose. To adjust for this rapid rise, the pancreas secretes the hormone insulin into the bloodstream. Insulin then lowers the levels of blood glucose.

The problem is that insulin is essentially a storage hormone, evolved to put aside excess carbohydrate calories in the form of fat in case of future famine. So the insulin that's stimulated by excess carbohydrates aggressively promotes the accumulation of body fat.

In other words, when we eat too much carbohydrate, we're essentially sending a hormonal message, via insulin, to the body (actually, to the adipose cells). The message: "Store fat."

Hold on; it gets even worse. Not only do increased insulin levels tell the body to store carbohydrates as fat, they also tell it not to release any stored fat. This makes it impossible for you to use your own stored body fat for energy.

So the excess carbohydrates in your diet not only make you fat, they make sure you stay fat. It's a double whammy, and it can be lethal.

Insulin is released by the pancreas after you eat carbohydrates. This causes a rise in blood sugar. Insulin assures your cells receive some blood sugar necessary for life, and increases glycogen storage.

However, it also drives your body to use more carbohydrate, and less fat, as fuel. And, insulin converts almost half of your dietary carbohydrate to fat for storage. If you want to use more fats for energy, the insulin response must be moderated.

Diets high in refined sugars release more insulin thereby allowing less stored fat to be burned. High insulin levels also suppress two important hormones: glucagon and growth hormone. Glucagon promotes the burning of fat and sugar. Growth hormone is used for muscle development and building new muscle mass.

Insulin also causes hunger. As blood sugar increases following a carbohydrate meal, insulin rises with the eventual result of lower blood sugar. This results in hunger, often only a couple of hours (or less) after the meal.

Cravings, usually for sweets, are frequently part of this cycle, leading you to resort to snacking, often on more carbohydrates. Not eating makes you feel ravenous shaky, moody and ready to "crash." If the problem is chronic, you never get rid of that extra stored fat, and your energy is adversely affected.

Does this sound like you? The best suggestion for anyone wanting to utilize more fats is to moderate the insulin response by limiting (ideally, eliminating) the intake of refined sugars, and

keeping all other carbohydrate intake to about 40% of the diet. Generally, non-carbohydrate foods-proteins and fats-don't produce much insulin.

Insulin responses can vary greatly from person to person. But generally, more refined foods evoke a stronger and/or more rapid insulin reaction. One reason for this is refined carbohydrates lack the natural fiber which helps minimize the carbohydrate/insulin response.

Consumption of natural fiber with carbohydrates can reduce the extreme blood sugar reactions described above. Low-fat diets cause quicker digestion and absorption of carbohydrates in the form of sugar. By adding some fats to the diet, digestion and absorption is slower, and the insulin reaction is moderated.

Recommendations for them include long-term restriction of carbohydrates and an increase in dietary fats. For some of these people, it means lowering carbohydrate intake to below 40%, sometimes even as low as 20%. By moderating carbohydrate intake you can increase your fat burning as an optimal and efficient source of almost unlimited energy.

Perhaps a third to a half or more of our population is unable to process carbohydrates-sugars and starches efficiently. In many people it's due to genetics, with lifestyle contributing to the condition.

This can be termed insulin resistance or IR. Like many problems, IR is an individual one, affecting different people different ways. You must determine if you are carbohydrate intolerant, and if so, to what degree. Blood tests will only diagnose the problem in the later stages, but the symptoms may have begun years earlier.

As we now know, insulin has many functions. While it can't get glucose into the cells efficiently when they're in a state of insulin resistance, insulin still performs its other tasks, including converting carbohydrates to fat and inhibiting stored fat from being burned.

In a normal person, 40% of the carbohydrates eaten is converted to fat. In the IR person, that number may be much higher. Many people with IR have a family history of diabetes.

Don't think of IR itself as a disease, although left unchecked, it can create problems that lead to disease. It may be quite normal for some humans to be unable to eat large or even moderate amounts of carbohydrates.

As a matter of fact, we evolved for hundreds of thousands of years from the so-called cave man's diet," which consisted solely of meat and vegetables.

With the onset of modern civilization about 5,000 years ago, our physiology suddenly was asked to digest and metabolize larger amounts of sugar and starch especially refined sugars. But if we are unable to utilize the amount of carbohydrates we eat, certain symptoms will develop.

Below is a list of some of the most common complaints of people with IR. Many symptoms occur immediately following a meal of carbohydrates, and others are constant. Keep in mind that these symptoms may also be related to other problems.

1. Fatigue. Whether you call it fatigue or exhaustion, the most common feature of IR is that it wears people out. Some are tired just in the morning or afternoon; others are exhausted all day.

2. Brain fogginess. Sometimes the fatigue of IR is physical, but often it's mental (as opposed to psychological); the inability to concentrate is the most evident symptom. Loss of creativity, poor memory, failing or poor grades in school often accompany IR, as do various forms of "learning disabilities."

3. Low blood sugar. Brief, mild periods of low blood sugar are normal during the day, especially if meals are not eaten on a regular schedule. But prolonged periods of this "hypoglycemia," accompanied by many of the symptoms listed here, especially mental and physical fatigue, are not normal.

Feeling jittery, agitated and moody is common in IR, with an almost immediate relief once food is eaten. Dizziness is also common, as is the craving for sweets, chocolate or caffeine.

These bouts occur more frequently before meals or first thing in the morning. The old hypoglycemic diet, still in use today, recommends frequent snacks, and individuals with IR usually know to eat often. However, the hypoglycemic diet contains too much carbohydrate for most IR people.

4. Intestinal bloating. Most intestinal gas is produced from dietary carbohydrates. IR sufferers who eat carbohydrates suffer from gas, lots of it. Antacids or other remedies for symptomatic relief, are not very successful in dealing with the problem.

Sometimes the intestinal distress becomes quite severe, resulting in a diagnosis of "colitis" or "ileitis," although this is usually not a true disease state. However, IR is often associated with true gastrointestinal disease, which must be differentiated from simple intestinal bloating.

5. Sleepiness. Many people with IR get sleepy immediately after meals containing more than 20% or 30% carbohydrates. This is typically a pasta meal, or even a meat meal which includes bread or potatoes and a sweet dessert.

6. Increased fat storage and weight. For most people, too much weight is too much fat. In males, a large abdomen is the more evident and earliest sign of IR. In females, it's prominent buttocks, frequently accompanied by "chipmunk cheeks."

7. Increased triglycerides. High triglycerides in the blood are often seen in overweight persons. But even those who are not too fat may have stores of fat in their arteries as a result of IR.

These triglycerides are the direct result of carbohydrates from the diet being converted by insulin. In my experience, fasting triglyceride levels over 100 may be an indication of a carbohydrate problem, even though 100 is in the so-called "normal" range.

8. Increased blood pressure. It is well known that most people with hypertension have too much insulin and are IR. It is often possible to show a direct relationship between the level of insulin and the level of blood pressure: as insulin levels elevate, so does blood pressure.

9. Depression. Because carbohydrates are a natural "downer," depressing the brain, it is not uncommon to see many depressed persons also having IR.

Carbohydrates do this by changing the brain chemistry. Carbohydrates increase serotonin, which produces a depressing or sleepy feeling. This is the reason nice hotels place candy on your pillow in the evening; it literally helps you sleep. (Protein, on the other hand, is a brain stimulant, picking you up mentally.

Here's another example of how trends distort the real picture: many people have been taught that sugar is stimulating. This is a significant consideration for those trying to learn, whether at school, home or work.)

10. Insulin Resistance is also prevalent in persons addicted to alcohol, caffeine, cigarettes or other drugs. Often, the drug is the secondary problem, with IR being the primary one. Treating this primary problem should obviously be a major focus of any therapy.

IR sufferers may have other symptoms as well. However, when a person with this problem finally lowers carbohydrate intake to tolerable levels, many if not most of the other symptoms may disappear.

With the stress of IR eliminated, the body is finally able to correct many of its own problems. It is possible, although unlikely, that so many of these symptoms can be found in someone who tolerates carbohydrates quite well.

RULES OF THE ROAD TO REACH BALANCE

1. Protein. Know how much protein your body needs. Never consume more protein than your body requires. And never consume less. For precise measurements our nurse can determine that for you.

You can also perform the calculations reviewed in The Zone. Generally adult protein requirements range from a low of 35 grams per day or a sedentary 250 pound obese individual to as much as 200 grams per day for a lean heavily exercising 100 pound athlete.

You should have protein at EVERY meal and the total per day should equal your daily requirement. For every three grams of protein at a meal you need to have four grams of carbohydrate and 1.5 grams of fat.

You can multiply protein by 1.25 to obtain the amount of carbohydrate and by 0.5 to obtain the amount of fat. This is a rough estimate and you should not become overwhelmed trying to get this absolutely precise. It is important though to be in the general area.

Corrinne Netzer wrote a book *The Complete Book of Food Counts* that can help you make this calculation. You might also want to make an appointment with our diet counsellor Anne to help you with this process.

Choose your protein based on those recommended for your blood type. This can be found in Dr. D'Adamo's book *Eat Right For Your Type*. If you are seriously ill you should have your blood subtyped so we can provide an even more accurate recommendation for you.

2. Carbohydrate. You should also choose your carbohydrates from Dr. D'Adamo's book. If you are insulin resistant, (have high blood pressure, high cholesterol, high blood pressure or are overweight) then you need to specifically restrict your carbohydrates based on the Heller's book *The Carbohydrate Addict's Lifespan Program*.

Combining all three authors is the most powerful method we know to lower your insulin levels and produce optimum health.

If you find yourself hungry and craving sugar or sweets two to three hours after a meal, you probably consumed too many carbohydrates that last meal. Whenever you have a problem with hunger or carbohydrate cravings, look to your last meal for a clue to the reason why.

No matter how consistently you follow this dietary strategy, you are bound to make mistakes. This is especially true at parties or when traveling. Remember, if you're only unbalanced for a short period of time, you're only one meal away from rebalancing. It's like falling off a bike-you just get back up and continue your journey.

3. Fat. Choose your fats based on Dr. D'Adamo's recommendations. Most people can tolerate olive oil and it is the oil of choice. It is best purchased in small glass bottles. Fish is a good source of EPA which is beneficial fat that will help balance out your hormone levels and decrease inflammation.

4. Water. Try to drink at least 64 ounces of pure water per day. If you are a heavy caffeine user, gradually reduce caffeine intake to zero whenever possible as the breakdown products of caffeine will tend to increase insulin levels.

5. Exercise. Try to get 30 to 60 minutes of walking in four to five days a week if the weather permits. If you are seriously debilitated you will have to wait until your health improves. As you are healthier and if you are blood type O or B you can shift to more aggressive exercises.

Powerful Spices Block Cancer Development

Posted By [Dr. Mercola](#) | July 30 2005 | 11,780 views

The antioxidant, anti-inflammatory and anti-carcinogenic properties of curcumin, the powerful yellow spice found in both turmeric and curry powders, have been undergoing intense research in various parts of the world.

According to researchers from the University of Texas M.D. Anderson Cancer Center, curcumin blocks a key biological pathway needed for development of melanoma and other cancers.

The spice stops laboratory strains of melanoma from proliferating and pushes the cancer cells to commit suicide by shutting down nuclear factor-kappa B (NF-kB), a powerful protein known to induce an abnormal inflammatory response that leads to an assortment of disorders such as arthritis and cancer.

Flavorable Findings

Researchers treated three different melanoma cell lines with curcumin and evaluated the activity of NF-kB, as well as IKK, a protein that triggers NF-kB. Results showed that despite how much curcumin was used, the spice still:

- Prohibited both proteins from being activated
- Worked to stop the growth of melanoma
- Induced cell suicide

More on Curcumin

Curcumin has long been utilized in India and other Asian nations for multiple uses, including a food preservative, a coloring agent, a folk medicine to cleanse the body and as a spice to flavor food.

What's telling, however, is that in India (where the spice is widely used) the prevalence of the top four U.S. cancers -- colon, breast, prostate and lung -- is 10 times lower.

[Cancer](#) July 11, 2005

[Science Daily](#) July 14, 2005

Dr. Mercola's Comments:

Wouldn't life be boring without spice?

Spices are absolutely wonderful and make quite a dramatic difference in the flavor of food. I also find it amazing that not only do we get a flavor boost, but many of the spices will actually improve our health.

Some of my favorite spices are the hot spices, and I love Thai food. I am not as attracted as much to the curries, though.

That brings up a point, as you really do want to honor what your body tells you. If any food or spice does not taste good or "feel right," stay away from it -- no matter who is telling you how good it is for you. Your body is a far better judge of that than anything you will ever read. In other words:

Listen to your body.

Your body is designed to give you all the feedback you need to make the right food and lifestyle choices. Unfortunately, most of you do not tune in to this important feedback system and do not fully utilize the benefits it can bring you.

It can even cure cancer.

Cancer is a big deal. It's estimated that nearly 1.5 million new cancer cases and nearly 600,000 cancer deaths will occur in the United States this year. Cancer has recently unseated heart disease as [America's number one killer of people under the age of 85.](#)

So if you like curry, then by all means use it regularly in your diet, as the evidence is very compelling that it will prevent cancer. But if you don't like it, then don't worry, as there are no "magic bullets" for cancer. Just incorporate the other approaches to avoiding cancer into your life:

- [A healthy diet](#)
- [Exercise](#)
- [Sleep](#)
- [Stress reduction](#)
- [Limit toxin exposure](#)

Your Immune System Can Keep Cancer Dormant

Posted By [Dr. Mercola](#) | December 13 2007 | 71,806 views

New research has shown for the first time that the human immune system can stop the growth of a cancerous tumor without actually killing it. These results help explain why some tumors suddenly stop growing and go into a long period of dormancy.

The study's authors call this cancer-suppressing state "equilibrium." During equilibrium, the immune system decreases the cancer's ability to grow, and kills some cancerous cells, although not enough to eliminate or shrink the tumor.

Researchers injected mice with small doses of a chemical carcinogen and observed those who developed small, stable masses at the site of the injections. When certain components of the animals' immune systems were disabled, the growths became full-blown cancers. This suggests that the immune system had been holding the tumors in check.

"We may one day be able to use immunotherapy to artificially induce equilibrium and convert cancer into a chronic but controllable disease," suggests co-author Mark J. Smyth, Ph.D., professor of the Cancer Immunology Program at the Peter McCallum Cancer Centre in Melbourne, Australia.

"Proper immune function is now appreciated as another important factor in preventing the development of some cancers. Further research and clinical validation of this process may also turn established cancers into a chronic condition, similar to other serious diseases that are controlled long-term by taking a medicine," he added.

According to a scientific theory called cancer immuno-surveillance, your immune system can discern malignant cells, and attack tumors with the same weapons it uses to eliminate invading microorganisms. Current immunotherapy efforts use pharmaceutical agents to increase the chances that the immune system will recognize and attack tumor cells.

The cancer immuno-surveillance theory however fell out of favour, and in 2001 a new model known as cancer immuno-editing was established.

The cancer immuno-editing theory suggests that conflict between cancers and the immune system takes place naturally, but with three different potential outcomes.

1. Your immune system can eliminate cancer, destroying it completely
2. Your immune system can form a balance with cancer, by checking its growth but not destroying it
3. The cancer can escape from your immune system, and become more malignant

Sources:

» [Nature November 18, 2007 \[Epub ahead of print\]](#)

» [DailyIndia.com November 19, 2007](#)

Dr. Mercola's Comments:

After my recent interview with Dr. David Holt about the concepts inherent in [German New Medicine](#), this article shows how sometimes scientists can be oh-so-close, yet still so far off the mark.

First of all, the statement, "We may one day be able to use immunotherapy to artificially induce equilibrium and convert cancer into a chronic but controllable disease," is a sad testament to the fundamental difference between conventional medicine and real healing.

What Vital Components are Conventional Cancer Researchers Missing?

According to Dr. Geerd Hamer, who re-discovered the natural laws of what he now calls the German New Medicine, [cancer is NOT a disease state](#), but rather a phase during your physical, mental and emotional healing process.

WHOA! That's a radical statement!

Hope you were sitting down when you read that because I nearly fell out of my chair when I first heard it, because I realized the profound implications of this concept.

But please don't let the shock value lead you to dismiss it before looking into it further, as there's simply not enough space for me to do it justice in this article.

But [what Hamer discovered](#) is that cancer (as well as ALL other disease) is the temporary outgrowth of a serious emotional trauma – your body's brilliant way of helping you resolve the issue – and once you've reached a resolution in your psyche (your mind), your brain directs your body to re-establish its original balance, i.e. go in and remove the cell growths it created in defense to the trauma.

Certain [breast cancers](#), for example, can occur after traumatic events related to the potential, or actual loss of a child. Your body responds to the acute emotional crisis by increasing cell proliferation in your milk ducts, because your **biological solution** to saving your child's life is to make sure you have plenty of milk to nurse your child back to health, and in so doing resolve the emotional crisis, which is "my child is hurt, or dying."

Depending on the emotional trauma, different parts of your brain is affected, which in turn determines which part of your body may start proliferating cells (conventional medicine calls this cancer), and it also determines whether your [tumor is created](#) during the active stage of your emotional crisis, or if it's created during the healing phase, in response to lesions or cell necrosis.

This explains how tumors go into remission, and/or disappear completely.

The most tragic part of standard cancer treatment is that when you receive the shocking news that you now have cancer and may die, your body re-enters a state of shock, often leading to additional cancers. Conventional medicine calls this metastasis – that your cancer is spreading. According to German New Medicine, you were healing, but the “death-fright shock” launched another set of tumors. Between the intense fear created by being diagnosed with cancer, and the deadly cancer treatments offered, death is unfortunately more common than healing.

Dr. Hamer has more than 40,000 case studies backing up his new science, and his cancer cure rate is over 95 percent. “Cure” being defined by conventional medicine as still being alive five years after the onset of cancer.

Compare that to conventional chemotherapy, which comes in at a dismal 2.5 percent cure rate, and you may grasp the vital implications of this information.

Consider also the fact that Dr. Hamer, as a reward by his conventional peers for his incredible success rates, has served time in jail for “inciting the public” and refusing to disavow his medical beliefs, and is currently in exile, seeking asylum from persecution.

Does That Mean It's All in Your Head?

Certainly not. But it does mean that your psyche/mind and body are intricately connected, and that you cannot separate the two without dire consequences.

However, [maintaining a strong healthy immune system](#) is a mandatory step in maintaining robust health and creating an environment where your body has everything it needs to heal at its disposal.

I am a firm believer in that you can virtually eliminate your cancer risk, and radically improve your chances of full recovery from cancer if you currently have it, by following the following all-natural strategies to optimize your health and innate regenerative power.

And, by refocusing on the importance that your mental and emotional state has on your physical body, and learning to resolve your emotional conflicts rather than deaden them with toxic mind-numbing antidepressant drugs (see # 11 below), your chances of leading a long, healthy life seems almost inevitable.

True Cancer Prevention – Giving Your Body a Fighting Chance to Heal

These are my 12 risk reduction strategies that can optimize your health and aid in your natural self-healing process.

1. [Reduce your processed food, sugar and grain carbohydrate intake](#) Yes, this is even true for whole unprocessed organic grains as they tend to rapidly break down and drive your

insulin and leptin levels up, which is the last thing you need to have happening if you are seeking to resolve a cancer.

2. [Control your fasting insulin and leptin levels](#): This is the end result, and can be easily monitored with the use of simple and relatively inexpensive blood tests.
3. [Normalize your ratio of omega-3 to omega-6 fats](#) by taking a high-quality krill oil or fish oil and reducing your intake of most processed vegetable oils.
4. Get regular [exercise](#). One of the primary reasons exercise works is that it drives your insulin levels down. Controlling insulin levels is one of the most powerful ways to reduce your cancer risks.
5. Normalize your [vitamin D levels](#) and [vitamin A levels](#) by getting plenty of [sunlight exposure](#) and consider careful supplementation when this is not possible. If you take oral vitamin D and have a cancer it would be very prudent to monitor your vitamin D blood levels regularly.
6. Get a [good night's sleep](#).
7. [Eat according to your nutritional type](#). The potent anti-cancer effects of this principle are very much underappreciated. When we treat cancer patients in our clinic this is one of the most powerful anti-cancer strategies we have.
8. Reduce your exposure to [environmental toxins](#) like pesticides, household chemical cleaners, [synthetic air fresheners](#) and air pollution.
9. Limit your exposure and provide protection for yourself from information carrying radio waves produced by cell phone towers, base stations, phones and WiFi stations.
10. Avoid [frying or charbroiling your food](#). Boil, poach or steam your foods instead .
11. Have a tool to permanently reprogram the [neurological short-circuiting that can activate cancer genes](#). Even the CDC states that 85 percent of [disease is caused by emotions](#). It is likely that this factor may be more important than all the other physical ones listed here, so make sure this is addressed. Energy psychology seems to be one of the best approaches and my particular favorite tool, as you may know, is the [Emotional Freedom Technique](#). [German New Medicine](#) is another powerful tool.
12. [Use broccoli sprouts](#) as an adjunct to everything above unless you simply do not like broccoli.

Related Links:

- » [A New View of Cancer -- German New Medicine](#)
- » [How to Supercharge Your Immune System](#)
- » [Immune System Used to Fight Cancer](#)

Alkaline Food List

by Susan M. Lark M.D. | Last Reviewed 04/17/2012

Discover which foods can have an alkalinizing effect on your body

To maintain an optimal [slightly alkaline pH level](#), let the following foods be the cornerstones of your everyday meals.

Fruits

Fruits are a treasure trove of vitamins A and C, numerous minerals, natural sugars, fiber, and water. Stick with fresh, dried, or frozen fruits, if possible. Try to eat locally grown fruits in season, as they'll be fresher and riper, and eat fruits whole or thinly peeled so you retain the nutrients in the skin.

Stay away from fruit juices or only drink them in very small amounts. Also avoid highly acidic citrus fruits such as lemons, limes, grapefruits, and oranges.

Vegetables

Like fruits, vegetables are an outstanding source of many essential vitamins and minerals, while also adding bulk and fiber to your diet. Raw vegetables contain the highest levels of vitamins. However, quick-frozen vegetables also preserve nutrients fairly well. Wash vegetables well, and leave the skin intact or pare it thinly, because this is where large amounts of nutrients are stored.

Legumes

Think beans—baked, dried, and frozen. Legumes are excellent sources of fiber and low-fat protein, particularly when combined with whole grains. You can eat a variety of legumes: black beans, black-eyed peas, green beans, peas, kidney beans, lima beans, soybeans, mung beans, split peas, Great Northern beans, and garbanzo beans. Ready-to-eat products include hummus and soy-based foods such as tofu and tempeh.

Nuts and Seeds

Nuts and seeds provide valuable nutrients, including protein, B complex vitamins, vitamins A, D, and E, and numerous minerals. The essential fatty acids found in many seeds and nuts are also extremely important. Some excellent examples include flaxseeds, walnuts, almonds, hazelnuts, pecans, poppy seeds, pumpkin seeds, sesame seeds, and sunflower seeds.

Fish and Poultry

If you feel you must have animal protein in your diet, stick with fish and poultry. Both are excellent sources of high-quality protein and many types of fish are good sources of omega-3 fatty acids. But use poultry and fish sparingly. Make them the side dish, keeping grains and vegetables as your main dish. Be sure to avoid acidic meats like red and processed meats.

My recommendations include:

- **Poultry:** Free-range chicken and turkey, duck, goose, and guinea hen
- **Freshwater fish:** Trout, perch, pike, whitefish, catfish, bass, bluegill, crappie, crayfish, and carp
- **Saltwater fish:** Salmon, tuna, swordfish, shark, mackerel, sole, bluefish, flounder, red snapper, sardine, herring, and smelt
- **Shellfish:** Crab, lobster, shrimp, scallops, abalone, oysters, mussels, and clams

Whole Grains

Whole grains are the seeds of various grasses and are often referred to as “cereals.” They contain fiber, protein, carbohydrates, fats, vitamins such as B-complex and E, and numerous minerals, including calcium, magnesium, potassium, iron, copper, and manganese. My favorite alkaline whole grains include brown rice, barley, oats, rye, millet, quinoa, amaranth, and hominy grits. I recommend staying away from wheat-based grains, as they tend to be a common source of allergies.

Beverages

Water is always your best bet. Stick with spring, distilled, purified water, or you can even make your own [alkaline water](#). As for other liquids, substitute almond or rice milk for acidifying cow’s milk. For a hot beverage, drink herbal or green tea. If you can’t live without coffee, I recommend trying an herbal caffeine-free coffee substitute called [Teeccino](#).

Sweeteners

Sweeteners provide concentrated flavor to foods and beverages. But the typical American diet has too much refined sugar. There are sweeteners, however, that actually provide nutritional value. Molasses, for instance, contains calcium, magnesium, and iron, and is rich in B-complex and E vitamins. You can also try stevia and xylitol—both of which are made by nature, not in a lab. Xylitol actually raises the pH of your mouth, making it more alkaline, and reducing the likelihood that bacteria will metabolize and grow.

My alkaline sweetener recommendations are molasses, honey, brown rice syrup, maple syrup, stevia, and xylitol.

Are You Overly Acidic?

by Susan M. Lark M.D. | Last Reviewed 04/17/2012

Learn the characteristics of overly acidic and high alkaline-producing women

How do you know if you're overly acidic? Here are some general clues:

- You don't tolerate acidic condiments like vinegar and lemon juice very well.
- You are susceptible to heartburn and canker sores.
- You suffer from digestive troubles after drinking moderate amounts of alcohol.
- You often experience fatigue and lack of stamina.
- You are subject to frequent colds, flu, bronchitis, or sinusitis.
- You feel bloated and gassy after drinking sodas.
- You feel tired and lethargic after eating red meat.
- You feel energized after eating carbohydrates and vegetables.
- You have a history of osteoporosis, low bone density, arthritis, gout, lung disease, and/or frequent bladder infections.

In contrast, if you tend toward alkalinity (which is only about 8 percent of the population), it's likely that you:

- Have great physical endurance.
- Have few, if any, allergies.
- Rarely get sick, such as a cold or the flu.
- Are always on the go and full of energy.
- Need just 5 to 6 hours of sleep each night.
- Prefer highly active sports and gravitate toward high-stress activities.
- Feel bright and energized after a protein-based meal.
- Feel de-energized after a low-protein, high-carbohydrate meal.
- Are able to digest a wide variety of foods without issues.
- Typically have lots of energy in the midst of intense situations.
- Are able to do deskwork for long hours at a time without becoming tired or losing mental clarity.

If you're not sure of your body type, there's a simple test you can take to determine whether you tend to be overly acidic or a high alkaline producer. I call it the "Baking Soda Measure."

At least two hours before or after a meal, take ½ teaspoon sodium bicarbonate (baking soda) dissolved in four or more ounces of water. If you are overly acidic, you won't feel a difference, and you may even feel better. If you are a high alkaline producer, you may notice you have less energy or feel digestive upset.

Read more: <http://www.healthdirections.com/are-you-overly-acidic#ixzz2H3QJisUP>

Balancing Act: Athletic Performance and pH Health

Why elite and endurance sport athletes need to understand and maintain pH balance

By Robert Burns, PhD

Elite and endurance sport athletes continually push at the boundaries of physics, trying to compress time into ever-smaller increments or beat gravity at its own game. In the process, they often redefine what is “humanly possible,” not only for themselves but, in some cases, for all of us.

As every athlete knows, in the sports world a millisecond or the slightest internal or external physical advantage can mean the difference between victory and defeat, a repeat performance or a new world record or personal best. And, unfortunately, sometimes it is a world where athletes destroy their careers, health or reputations trying to dope their way to new physical feats.

Life in the balance

Currently, athletes competing in elite, endurance, individual and team sports are breaking performance barriers at a record pace. There are a number of reasons for this: advancements in training, athletic equipment, sports medicine and physical therapy, as well as a deeper understanding among coaches and athletes of human body chemistry and the role nutrition plays in athletic performance. For the purpose of this paper, we will focus on one particular—and often overlooked—physiological and nutritional aspect of maintaining health and athletic performance: pH balance.

Athletes who are committed to legal, healthful ways of increasing performance, reducing fatigue, and compressing recovery time need to understand pH balance and the negative impact of pH imbalance. Endurance and elite sport athletes should be particularly concerned with maintaining a healthy pH balance, as they regularly place themselves under physical and dietary stresses that can lead to pH imbalances, most commonly lactic acid which indicates hydrogen ion buildup. Whatever your level of athletic intensity, a healthy pH balance can mean the difference between greater athletic achievement and being brought up short by muscle “burn.”

A pH primer ~ or ~ what every athlete needs to know about pH balance

Proper pH balance is a key component of good health and it is absolutely essential to athletic performance. pH is measured on a 14-point scale, with 7 being neutral. The lower the pH value, the higher the acidity; the higher the pH value, the more alkaline. pH values vary throughout systems in the human body. So, as you might imagine, stomach acid has a very low pH value, ranging from 1.0 to 3.0. Pancreatic excretions are very high in pH value, ranging from 8.0 to 8.3. The pH value of arterial blood in a healthy human is balanced around the middle of the 14-point scale at a narrow range of 7.35 to 7.45, or just slightly alkaline.

As the body metabolizes fuel (i.e. food), acid wastes are created. To sustain a healthy blood pH balance, acid wastes must be removed from the body or neutralized. The body has numerous ways to flush acid waste out of the system: the lungs vent carbon dioxide; our kidneys filter blood and excrete acids through urine (urine pH value can be as low as 4.5); skin sweats acids out of the system. In addition to its various acid-flushing functions, the human body also has built-in chemical buffers that help to neutralize pH imbalances, including calcium, phosphorus, bicarbonate, hemoglobin, and phosphate cycles. When, because of diet, prolonged aerobic exercise, and/or aging, we exceed the body’s ability to flush out or neutralize acid wastes, acid buildup—or *acidosis*—occurs.

Crossing the threshold, managing the “burn”

Most serious athletes are familiar with the phenomenon known as “muscle burn.” Muscle burn is largely the result of lactic acid which indicates hydrogen ion buildup in the system. Acid concentration increases when an athlete exceeds what is called the “lactate threshold,” the point at which the body can no longer flush or neutralize acid wastes as fast as they are being produced. When an athlete crosses the lactate threshold for a sustained time, acid accumulates in the muscles and can lead to cramping, severely compromising athletic performance. Contrary to

popular belief, lactic acid is not, in and of itself, the cause of acidosis. However, elevated levels of lactic acid in the system are an indicator of acidic pH imbalance.

Prolonged aerobic exercise is not the only contributing factor to acidosis. Diet and aging also play key roles. As we age, the systems that rid the body of acid waste don't work as efficiently. Furthermore, the western world's diet, with its overemphasis on animal protein, fats, processed sugar and flours, is likely a contributing factor in acidosis. Because elite and endurance athletes often burn through exponentially more calories than the average person does in a day (a 175-pound athlete can burn approximately 6,000-8,000 calories in the course of a 60-mile bike race alone), they should be particularly concerned with pH balance and dietary health. Also, the endurance athlete's often-accelerated intake of protein and carbohydrates can produce surplus acids.

Prevention is the best medicine

So, how can athletes protect themselves from pH imbalance? A healthy diet is the best place to start. Cutting back on acid-producing foods and beverages such as animal protein, coffee and wine, can help. But remember: just because a food is chemically acidic doesn't automatically mean it's an acid *producing* food. (So, for example, citrus fruits actually have an alkalizing effect on the body, as do most fruits and vegetables.) To maintain a healthy pH balance, many natural medicine practitioners recommend a diet comprised of anywhere from a 60/40 to as much as an 80/20 ratio in favor of alkalizing foods over acid-producing foods. However, that's not always easy to achieve—especially for people who don't want to pay obsessive attention to their diet. And, as we discussed earlier, even with the best diet, human beings naturally become more acidic as we age and our metabolic functions slow.

Supplemental solutions?

Can supplements help maintain a healthy pH balance and bolster the body's natural chemical buffers? Can they help athletes improve their performance by raising their lactate threshold? We know that calcium, magnesium and potassium minerals can help combat low-grade acidosis, but simple carbonate forms of these minerals are not alkaline enough to be effective on most organic acids. However, there have been some very interesting—if not yet conclusive—pilot test initiated by TAMER Laboratories using a compound (Alka-Plex®) comprised of potassium hydroxide, magnesium hydroxide and calcium carbonate to buffer both organic and inorganic acids. Two pilot tests conducted by the Seattle-based supplement company Tamer Laboratories found that subjects who used TAMERS new product Acid Zapper™ for five days experienced an average decline in urinary acidity of 53 percent. Another Tamer Laboratories pilot test conducted at Seattle Performance Medicine showed using Acid Zapper significantly reduced muscle burn, increased time to fatigue, lowered lactate levels in the blood, and increased muscle strength and recovery in cyclists who participated in the test pilot. It will be interesting to see what future clinical studies will reveal in this area of inquiry. For more information on Acid Zapper visit www.acidzapper.com

Simon Butterworth, Certified USA Triathlon Level 1 Coach comments on his experience with Acid Zapper at IronMan Hawaii. “The very short summary is that IronMan Hawaii was the best race of my life. There are a lot of things that go into a successful race and race season. This year I can say with certainty that Acid Zapper was an important part of that success. As I have said before I have not suffered any delayed onset muscle soreness this season after any race or hard workout. During the Ironman, I used Acid Zapper for the first time while racing. I took a total of 4 tablets during the race, three on the bike and 1 on the run. My fuel intake was not much different from earlier IronMan races; my energy level on the run was very different. The results probably say it best. A marathon PR (Personal Record) 14 minutes better than my previous PR (IM Arizona in the spring without Acid Zapper) and 45 minutes better than my best marathon in Hawaii (I have raced here 4 times before). My overall race result was a PR for Hawaii by 10 minutes and my best placing, 7th. I had not done better than 14th before.”

Robert Burns Ph.D. is President of Tamer Laboratories, a Seattle-based supplement company dedicated to pH health.. Dr. Burns can be contacted directly at rburns@tamer.com.

How Your pH Level Affects Your Health

by Susan M. Lark M.D. | Last Reviewed 05/07/2012

Learn why maintaining an alkaline pH is so important for your health

What sets peak-performing women apart from their peers?

It's their ability to maintain a slightly alkaline pH level well into their senior years. Women who maintain this alkaline pH rarely fall victim to conditions like arthritis, osteoporosis, and chronic fatigue. They remain more vibrant than their overly acidic peers and are able to live more active, fulfilling lives.

Why Your pH Level Matters

Each of the trillions of cells in your body contain many alkaline substances—minerals such as calcium, magnesium, potassium, and sodium, as well as oxygen and bicarbonate. The combination of all these substances produces a slightly alkaline pH within your cells. Your body's internal functions—including energy production, immunity, and much of your digestive process—work most efficiently in this alkaline environment.

In addition to your cells, your blood must also maintain a slightly alkaline state (ranging from 7.35 to 7.45) in order for your body to function efficiently. Unfortunately, you—and your blood and cells—are constantly exposed to a variety of acidic substances, including environmental pollutants, acidic or acid-forming foods, illness and injury, and even stress.

To help neutralize the acidity caused by these daily offenders, your body has a complex buffering system that works hard to maintain alkalinity. As most women age, however, this buffering system weakens, causing excess acid to be neutralized less effectively.

Your pH-regulating system uses, in part, the mineral reserves within your bones. Your bones are composed of at least 18 nutrients, including alkalizing minerals such as calcium, magnesium, potassium, and sodium. Your bones are constantly releasing these minerals to neutralize the acids that you are constantly producing within your body or ingesting in food. The greater the acidity of your body, the more your bones will be called upon to donate their minerals to keep your body alkaline. When depletion of the bone's mineral reserves occurs over many decades, it can lead to osteoporosis.

Fortunately, it is possible to [achieve that optimal alkaline pH](#) by making a few lifestyle changes, such as eating a diet rich in [alkaline foods](#) and even drinking [alkaline water](#).

[Am J Clin Nutr.](#) 2010 Sep;92(3):620-5. Epub 2010 Jul 14.

Conformity to traditional Mediterranean diet and breast cancer risk in the Greek EPIC (European Prospective Investigation into Cancer and Nutrition) cohort.

[Trichopoulou A](#), [Bamia C](#), [Lagiou P](#), [Trichopoulos D](#).

WHO Collaborating Center for Food and Nutrition Policies, Department of Hygiene, Epidemiology and Medical Statistics, Athens, Greece.

Abstract

BACKGROUND: Studies in the United States report inverse associations of the Mediterranean dietary pattern with breast cancer risk, and several studies in Mediterranean countries indicate inverse associations of breast cancer risk with intake of olive oil, a constitutional component of this diet. No study, however, has evaluated the association of the traditional Mediterranean diet with breast cancer in a Mediterranean country.

OBJECTIVE: We studied the relation of conformity to the Mediterranean diet with breast cancer risk in the context of the European Prospective Investigation into Cancer and Nutrition cohort in Greece.

DESIGN: We followed up 14,807 women for an average of 9.8 y and identified 240 incident breast cancer cases. Diet was assessed through a validated food-frequency questionnaire, and conformity to the Mediterranean diet was evaluated through a score (range = 0-9 points) incorporating the characteristics of this diet.

RESULTS: Increasing conformity to the Mediterranean diet was not associated with lower breast cancer risk in the entire cohort [hazard ratio (HR) = 0.88 for every 2 points; 95% CI: 0.75, 1.03] or in premenopausal women (HR = 1.01 for every 2 points; 95% CI: 0.80, 1.28), but there was a marginally significant inverse association among postmenopausal women (HR = 0.78 for every 2 points; 95% CI: 0.62, 0.98; P for interaction by menopausal status = 0.05).

CONCLUSIONS: Conformity to the traditional Mediterranean diet may be associated with lower breast cancer risk among postmenopausal women and could explain, in part, the lower incidence of this disease in Mediterranean countries.

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Publication Types, MeSH Terms

Publication Types:

- [Research Support, Non-U.S. Gov't](#)

MeSH Terms:

- [Adult](#)
- [Aged](#)
- [Breast Neoplasms/epidemiology](#)
- [Breast Neoplasms/prevention & control*](#)
- [Diet Surveys](#)
- [Diet, Mediterranean*](#)
- [Female](#)
- [Greece/epidemiology](#)
- [Humans](#)
- [Incidence](#)
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- [Postmenopause*](#)
- [Prospective Studies](#)
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- [Risk Factors](#)

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Full Text Sources:

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- [EBSCO](#)

Medical:

- [Breast Cancer - MedlinePlus Health Information](#)
- [Diets - MedlinePlus Health Information](#)

Top 10 Health Benefits and Reasons people use Chia Seeds

As mentioned by diet and food expert Joy Bauer on the MSNBC Today Show, March 2010

10. [1 ounce of Chia uses 2.8% of the calories in a 2000 calorie diet.](#) The full daily servings only add up to 139 calories and 1 ounce of Chia Seeds has a Glycemic Index of 1.

9. [Chia seeds have many benefits for vegetarians](#) Chia seeds are great for vegetarians because unlike flaxseed, chia can be stored for long periods without becoming rancid and don't require grinding. The oil they contain does not go *rancid* because of the high level of antioxidants. In a October 20th, 2009 Cleveland Plain Dealer [health fit article by Kate Spector](#), Cleveland Clinic's Dr. Michael Roizen and Dr. Andrew Weil of the University of Arizona - are saying it is a good idea to include the tiny black seed in your diet they contain omega 3 fatty acids, essential fats your body does not make but needs to function properly. The last reason is it is a raw food, which means you do not have to cook it. See [Vegan Running Dad](#) blog.

8. [Chia Seeds fill you up](#) - When they come in contact with water, pudding, juice, yogurt etc. they grow to 9x their size and they slow down the absorbtion of carbs to control the appetite.

Name: Tracy:

Comments: Love the **CHIA!!!!** I cannot recommend it enough!!!!!! I noticed a fabulous difference in my weight in 1 week and it is helping me tremendously to prepare for my upcoming wedding.

7. [Gluten free Chia Seeds are very good for a Raw Food Diet](#) because they are high in protein, calcium, omega 3 and 6 and don't need to be cooked. Unlike Flax Seed, you do not have to ground up Chia Seeds when you make a smoothie.

6. [Chia Seeds are great for workouts.](#) Prior to a run or athletic event which you need to hydrate, Chia Seeds in a bottle of water will help you hydrate. They will also help with protein to do the event without cramping up. [Chia](#) is good for the digestive system because it is a hydrophillic colloid.

"As a seasoned long-distance runner of thirteen marathons I have used **Chia Seeds** on the past three with good results. I use the chia seeds to keep my body hydrated on the longer runs and as a result I have transitioned into using water stops less frequently. The chia seeds keep me well hydrated during the race and they allow me to focus on obtaining my PR without wasting valuable time at water stops. I will continue to use chia seeds on my longer runs."

Brian Daniels
Long-Distance Runner

5. [Chia Seeds are high in Omega 3](#) - 1 oz of Chia Seeds has 4915mg of Omega 3. Omega 3 fatty acids are loaded with protein which is great for healthy skin, hair, and nails Chia Seeds are high in calcium and naturally have Boron in them which transfers the calcium into your bones.

4. [Chia Seeds are good for a Diabetic](#) - 1 oz of Chia Seeds has a Glycemic Index of 1. Chia seed supplies fiber in 2 forms: insoluble (won't dissolve in water) from its outer coat and soluble fiber (will dissolve in water) from its inner shell. Soluble fiber has been found helpful in lowering cholesterol and [diabetes](#)

3. [Chia Seeds are high in fiber and help digestion.](#)

Name: Renee D'Amico

"Thanks for the delivery of **chia seeds**. I had not renewed my prescription for prilosec and I was starting to get acid reflux. When I got my chia seeds-all the symptoms went away! This just like the remi-teas website says, and I did not even know that! I don't have all the info, but Omega 3 is also supposed to be good for people like me who have Bipolar Disorder (formerly called Manic Depression) It may be another selling point.

2. [Chia Seeds are good for your Thyroid](#) - They are known to help deal with thyroid medication symptoms like lack of energy, dry skin and hair, [thyroid weight](#) problems, and colon issues.

1. [Chia Seeds are good for lowering cholesterol](#) - Chia seed supplies fiber in 2 forms: insoluble (won't dissolve in water) from its outer coat and soluble fiber (will dissolve in water) from its inner shell. Soluble fiber has been found helpful in lowering cholesterol and [diabetes](#). Also the omega 3 and 6 has been shown to help.

What if there was a natural food which would slow down the conversion of carbohydrates into sugar while adding protein?



There is, it is called **Chia**.

Chia's hydrophilic structure holds water, so when mixed with sauces, drinks, yogurt, salad, dressings, cream cheese, jellies and preserves, salsa, hot/cold cereal, dips, puddings, soups, etc. It displaces calories and fat without diluting flavor. In addition to extending foods by 50% - 75% calories and fat have been reduced without compromising flavor, with an ingredient that is 90% water. **Chia** gel is also a great fat replacer for baked goods and special qualities for sugar control and weight loss.

Chia Seeds can be easily incorporated in any Diet

can be easily incorporated into one's diet and can be used with many other foods and beverages. I myself have Gerd (Gastro Esophagus Reflux Disease), acute gastritis, and a gastric ulcer and IBS. [Learn more](#).

[Chia sample packs](#) which can easily fit in a pocket, wallet and purse.

In the last twenty-five years, there has been a resurrection in the definition of medicine, a resurrection that amplifies the significance of our eating habits and our lifestyle. Medicine is not only defined as a treatment for illness and disease, it is now understood to be for the prevention of illness and disease. That would mean, for example, laughter is a medicine because research found it to boost the immune system.

Exercise is good medicine for its cardio-vascular stimulation, muscle toning and flexibility and expelling toxins and for giving you a feeling of well being

all immune boosters. To express a positive attitude towards life is not only good medicine for you, it is good medicine for those in contact with you.

But the most important medicine, especially for the prevention of illness and disease, is our diet. It only needs our cooperation in supplying proper hydration and the needed nutrients to effectively maintain a state of well being.

Research has revealed that more than two thirds of all deaths in the United States are diet related. More than 50% of all deaths are caused from coronary occlusion, blockage of the blood flow to the heart and/or the brain.

These are all preventable deaths according to the Journal of American Medical Association which published in 1961 that, "All coronary occlusion can be eliminated by 97% through a vegetarian diet." Fourteen hundred American's are dying of cancer every day. In the prestigious advances in Cancer Research, they concluded, "At present, we have overwhelming evidence...

(That) none of the risk factors for cancer is... more significant than diet and nutrition." Because the question of what might be the optimum diet can, at times, be emotionally charged for many people, having had a significant emotional commitment in believing they know what's best, I would like to suspend the issues of diet and introduce you to a "super" food that all would agree on.

It is once valued so much that it was used as currency, this unique little seed has exceptional nutritive and structural benefits. Chia is familiar to most of us as a seed used for the novelty of the Chia Pet™, clay animals with sprouted Chia seeds covering their bodies.

Little is known, however, of the chia seeds tremendous nutritional value and medicinal properties. For centuries the Indians of the southwest and Mexico used this tiny little seed as a staple food. Known as the running food, its use as a high-energy endurance food has been recorded as far back as the ancient Aztecs. It was said the Aztec warriors subsisted on the Chia seeds during the conquests.

The Indians of the southwest would eat as little as a teaspoon full when going on a 24hr. forced march. Indians running from the Colorado River to the California coast to trade turquoise for seashells would only bring the **Chia seeds** for their nourishment.

*Buy **Chia seeds** [for as little as \\$4 a bag](#) 100% natural, pesticide free, and no pesticides used in growing, so simple yet so beneficial to all who use it.*

If you try mixing a spoonful of Chia Seeds in a glass of water and leaving it for approximately 30 minutes or so, when you return the glass will appear to contain not seeds or water, but an almost solid gelatin. This gel-forming reaction is due to the soluble fiber in the Chia Seeds.

Research believes this same gel-forming phenomenon takes place in the stomach when foods containing these gummy fibers, known as mucilage's, are eaten. The gel that is formed in the stomach creates a physical barrier between carbohydrates and the digestive enzymes that break them down, thus slowing the conversion of carbohydrates into sugar.

In addition to the obvious benefits for diabetics sugar levels, this conversion of carbohydrates into sugar offers the ability for creating endurance. Carbohydrates are the fuel for energy in our bodies. Prolonging their conversion into sugar stabilizes metabolic changes, diminishing the surges of highs and lows creating a longer duration in their fueling effects.

One of the exceptional qualities of the **Chia** seed is its hydrophilic properties, having the ability to absorb more than 12 times its weight in water. Its ability to hold on to water offers the ability to prolong hydration. Fluids and electrolytes provide the environment that supports the life of all the body's cells. Their concentration and composition are regulated to remain as constant as possible.

With Chia seeds, you retain moisture; regulate, more efficiently, the body's absorption of nutrients and body fluids. Because there is a greater efficiency in the utilization of body fluids, the electrolyte balance is maintained. Example: Fluid and electrolyte imbalances occur when large amounts of fluids are lost resulting from vomiting, diarrhea, high fever, or more commonly from sweating?

The loss of extra cellular fluid occurs in these conditions. Inter cellular fluid then shifts out of cells to compensate, causing abnormal distribution of electrolytes across cell membranes resulting in cellular malfunction. So. Retaining and efficiently utilizing body fluids maintains the integrity of extra cellular fluids, protecting inter cellular fluid balance. The results of which ensure normal electrolyte dispersion across cell membranes, maintaining fluid balances, resulting in normal cellular function.

Chia seeds are the definitive hydrophilic colloid for the 21-century diet. Hydrophilic colloids, a watery, gelatinous, glue-like substance form the

underlying elements of all living cells. They possess the property of readily taking up and giving off the substances essential to cell life. The precipitation of the hydrophilic colloids cause cell death. The foods we eat, in the raw state, consist largely of hydrophilic colloids.

When cooked on the other hand, precipitates its colloidal integrity. This change in the colloidal state alters the hydration capacity of our foods so as to interfere with their ability to absorb digestive juices. If we were to eat a raw diet we wouldn't need to introduce the addition of any hydrophilic colloid to our diet.

Uncooked foods contain sufficient hydrophilic colloid to keep gastric mucus in the proper condition. But even with raw foods, they must first be partially broken down by the digestive juices, beginning in the mouth and continuing through the upper tract, to allow the gelatinous reaction to take place.

Because of this upper tract digestive process, those who suffer from slow digestion, gas formation, relaxed cardiac and heartburn in which the burning is due to organic acids instead of an excess of the normal hydrochloric acid, which frequently accompanies chronic inflammation disease affecting such organs as the heart, lungs, gall bladder and appendix, are usually restricted from eating raw foods.

A hydrophilic colloid incorporated with these foods may be used either in connection with the patient's regular food or with whatever diet the physician feels is best suited for his patient.

The patient with gastric atony or nervous indigestion who complains of heartburn and/or vomiting four to five hours after eating is often helped. There is a lessening of emptying time if the stomach and an improvement in gastric tone. A strict dietary regimen is at as necessary when the hydrophilic. Chia seeds may be used in conjunction with almost any diet your doctor or nutritionist feels is necessary for your condition.

The Chia's hydrophilic colloidal properties aid the digestion of any foods contributing to the patients suffering as a result of a Even if you have sensitivity to certain foods, they may be tolerated with slight discomfort or none at all if a hydrophilic colloid is made a part of your diet.

The positive effects on the digestion in the upper portion of the gastrointestinal tract often leads to puree their foods may find benefits from hydrophilic colloids which may lead to eliminating the necessity for pureeing. Even raw vegetables, green salads and fruits, which are largely restricted,

may often be given to these patients with little or no discomfort after a short time.

There are several hydrophilic foods available that offer these natural benefits. Cactus juice, beet juice, agar, the edible seaweeds, and many proprietary preparations, which include the silica gels, mucilaginous substance of vegetables origin, are among colloids that prove effective. Each one of the above mentioned substances have one or more drawbacks. They are either too expensive, they may produce toxic side effects, bad tasting, not readily available, insufficient hydration capability, or it is indigestible.

Chia seed, a muscle and tissue builder and an energizer of endurance with extensive hydration properties, possesses none of the above disadvantage, and because of its physiochemical properties, supports effective treatment in immediate problems of digestion.

Exactly why this should be true may be puzzling at first. However, if we consider the effect of unusual irritation upon the nerves of the gastrointestinal canal, it is reasonable to think that a less violent and more balanced digestion might quiet the activity of the otherwise hyperactive gut. Inasmuch as the same foods, which formerly produced irritation, may frequently be continued without harm when hydrophilic colloids are used.

The relief to nerve irritation seems to offer a logical explanation. The change, in the lower gastrointestinal tract, is due to the effect of the hydrophilic colloid and to a more complete digestion-taking place along the entire tract due to physiochemical alterations. Both factors are important, as there is undoubtedly a better assimilation of food that supports enhanced nutritional absorption while significantly extending necessary hydration as well as encouraging proper elimination.

As a source of protein, Chia Seeds, after ingestion, is digested and absorbed very easily. This results in rapid transport to the tissue and utilization by the cells. This efficient assimilation makes the Chia Seed very effective when rapid development of tissue takes place, primarily during growth periods of children and adolescents. Also for the growth and regeneration of tissue during pregnancy and lactation, and this would also include regeneration of muscle tissue for conditioning, athletes, weight lifters, etc.

Another unique quality of the Chia seeds is its high oil content, and the richest vegetable source for the essential omega 3 fatty acid. It has approximately three to ten times the oil concentrations of most grains and one and a half to two times the protein concentrations of other grains. These

oils, unsaturated fatty acids, are the essential oils your body needs to help emulsify and absorb the fat soluble vitamins.

Chia seeds are rich in the unsaturated fatty acid, linoleic, which the body cannot manufacture. When there are rich amounts of linoleic acid sufficiently supplied to the body through diet, linoleic and arachidonic acids can be synthesized; from linoleic acid.

Unsaturated fatty acids are important for respiration of vital organs and make it easier for oxygen to be transported by the blood stream to all cells, tissues, and organs. They also help maintain resilience and lubrication of all cells and combine with protein and cholesterol to form living membranes that hold the body cells together.

Unsaturated fatty acids are essential for normal glandular activity, especially of the adrenal glands and the thyroid gland. They nourish the skin cells and are essential for healthy mucus membranes and nerves.

The unsaturated fatty acids function in the body by cooperating with vitamin D in making calcium available to the tissues, assisting in the assimilation of phosphorus, and stimulating the conversion of carotene into vitamin A. Fatty acids are related to normal functioning of the reproductive system. Chia seeds contain beneficial long-chain triglycerides (LCT) in the right proportion to reduce cholesterol on arterial walls.

The **Chia** seed is also a rich source of calcium as it contains the important mineral boron, which acts as catalyst for the absorption and utilization of the calcium by the body.

The seed's hydrophilic (water absorbing) saturated cells hold the water, so when it is mixed with foods, it displaces calories and fat without diluting flavor. In fact, I have found that because Chia gel displaces rather than dilutes, it creates more surface area and can actually enhance the flavor rather than dilute it. Chia gel also works as a fat replacer for many recipes.

Top your favorite bread dough before baking with Chia gel (for topping on baked goods, breads, cookies, piecrust, etc., reduce the water ration to 8 parts water to 1 part Chia seed) for added shelf life. There are additional benefits from Chia seeds aside from the nutritive enhancements when used as an ingredient. The Indians and missionaries as a poultice for gunshot wounds and other serious injuries also used it. They would pack the wounds with Chia seeds to avoid infections and promote healing.

If you place a seed or two in your eyes it will clean your eyes and will also help to clear up any infections. There is a wealth of benefits beyond the information outlined in this article and treasure-trove of benefits yet to be discovered. Chia seeds have a qualitatively unique situational richness along with a profound nutritive profile is one of man's most useful and beneficial foods and is destined to be the Ancient Food of the Future By: William Anderson.

Sustained by the Chia Seed the Tarahumara Indians of Mexico hunted their prey to exhaustion. In 1997, a 52-year-old Tarahumara Indian, Cirildo Chacarito won the Nike sponsored 100 mile run in California. He completed this astonishing feat in a time of 19 hours, 37 minutes and three seconds. He beat a field of hundreds of competitors with more than an half-hour lead, wearing only his home-made tire tread shoes. When asked how he did this his response was taking the Chia seed before and during the race.

James F. Sheer wrote the book " The Magic Of Chia" Revival Of An Ancient Wonder Food. In his book he interviews Bill Anderson and Hal Neiman whom have done extensive research on Chia Seeds. I suggest reading this book as it holds a lot of information about different studies being preformed.

In an interview with body builder Milos Sarcev (world famous body builder) Milos told James Sheer " I had never heard of chia seeds until a year ago. Then Bob Anderson gave me a manuscript copy of this book, and I was impressed. He also gave me samples of chia seeds. These are a real blessing. I train daily for at least two hours, and these seeds turn out to be a perfect food for bodybuilders—any athletics, for that matter—and people in general.

Chia seeds are truly a renaissance food. I take it every day, and my energy and endurance levels are sky-high. He goes on to recommend it to anyone who works out in the gym. Recent studies have shown the seeds help with cancer, ADD, AIDS, Diabetes, thyroid disorders, digestive problems, menopause, and a long list of other ailments.

Whether you are interested in chia seeds for weight loss, hydration during physical activities, nutritional values or to control diabetics sugar levels it is truly an amazing food.

100% natural and 99% organic, so simple yet so beneficial to all who use it. I have watched my customer's response and it is overwhelming. The fact that you can add to any beverage or food without changing the taste is a bonus. I take the chia seeds myself and have noticed a difference in my

energy levels and digestive tract. When you buy our bulk chia seeds there will be instructions and a list of the nutrients in the package.

I first learned about Chia Seeds on the about thyroid site. The guide was recommending them for weight loss and energy and I am glad I brought them into my store and I do hope you try them. They will speak for themselves.

One pound of chia seeds would make 24 cups of gel once hydrated which if you took the recommended dose of three tablespoons three times a day of the gel it would last you over a month. I recommend to my customers to just use 1/3 cups of seeds and put in two cups of water and whisk to hydrate then place in fridge. It will last three weeks.

Chia seeds are available in [black](#) and [white](#), [ground white chia seed](#), and in [Chia Acai Energy Bars](#).

Acid – Alkaline - Resources

Books:

The pH Miracle: Balance Your Diet, Reclaim Your Health, by Robert Young, PhD, and Shelly Redford-Young

The Acid Alkaline Diet for Optimum Health: Restore Your Health By Changing pH Balance In Your Diet, by Christopher Vasey, Naturopathic Physician.