

Healthy Chocolate in 2012

A large, dynamic splash of dark chocolate is the central focus of the image. The splash is captured in mid-air, with several droplets and a crown-like top. Numerous small, round chocolate chips are scattered throughout the scene, some floating in the air and others resting on the surface of the chocolate. The background is plain white, which makes the rich brown of the chocolate stand out.

ADAM PAUL GREEN

www.AdamPaulGreen.com® - www.ImAdamGreen.com®

SECTION 1	
Background & History	4
Notable Mentions of Cacao in History	4
Other Historical References	4
Post-Industrial Chocolate: From Good to Bad	5
Modern Living. Modern Diseases	5
SECTION 2	
The Power of Antioxidants	6
Source #1 - Acai Berry	6
Source #2 - Blueberries	7
Source #3 - Unprocessed Dark Chocolate	8
SECTION 3	
An Explanation of Cacao's Ingredients	10
SECTION 4	
Our Chocolate Report Purpose - Six Parts	11
The Chocolate Puzzle	
Part 1 - Flavanol Availability	11
Part 2 - Cacao Positively Affects Health	11
Part 3 - Increases in Antioxidants	11
Part 4 - Recent/Ongoing Dark Cacao Studies	11
Part 5 - Revealing Isoprostane Molecule	12
Part 6 - The Facts Regarding CVD	13
SECTION 5	
The Eight Case Studies	14
#1 - Postmenopausal Woman	14
#2 - Kuna Indian Population	14
#3 - Illinois Study on Blood Pressure	14
#4 - United Kingdom Study on Blood Pressure	14
#5 - University of Utah Study on Blood Pressure	14
#6 - Yale Study on Blood Pressure	15
#7 - Swiss Study on Blood Pressure	15
#8 - UC Davis Study - Cacao Offers	
Protection From Tissue Damage	15
Misled Studies - Quantities & Timing Matters	15

SECTION 6	
The Three Research Studies	16
Study #1 - Tufts University & L'Aquila University	16
Study #2 - Cacao Benefits on Cerebral Blood Flow	16
Study #3 - Cacao Benefits on Parkinson's Disease & Dementia	16
Parkinson's Disease	17
Dementia	17
SECTION 7	
The Three Study Papers Benefits With Inflammation	17
Study #1 - Kare Cooper	17
Study #2 - Italy 2008	17
Study #3 - Baltimore	17
How Does it Work - UC Davis & Italy Studies	18
SECTION 8	
Cacao Benefits with Blood Vessels	18
SECTION 9	
Cacao Benefits Cholesterol Levels (Good and Bad)	18
Study #1 - John Hopkins	18
Study #2 - University of Utah	19
SECTION 10	
Cacao Benefits Memory, Aging & Immunity	19
Study #1 - Finland	19
Depression	19
Immune System	19
Study #2 - Recent European Studies	19
CONCLUSION	20
CONTRIBUTOR BIOGRAPHY	21
WORKS CITED	26

SECTION 1 BACKGROUND & HISTORY

The cacao tree was scientifically named 'Theobroma-Cacao', which literally means, "food of the gods".

"Chocolate is a perfect food, as wholesome as it is delicious..."

- Baron Justus von Liebig

From the ancient, detailed records of the Mesoamericans, we have discovered over 150 documented medicinal uses for cacao.

There is no denying that cocoa has played a major role in the development of both Mesoamerican and European History. Even today, fortunes are won and lost on the price fluctuations of this highly sought-after commodity, as traders bet on the moves of cocoa futures. Cocoa is produced in mass amounts in only a handful of countries around the world, many of which are not always politically or economically stable.

Recent discoveries in Honduras showed traces of cocoa on cups and plates dating back to 2000 B.C. Between 200 and 900 A.D., the Mayan culture celebrated cocoa as a central part of their agriculture, economy, medicine and religion.

Still used today, the word "cacao" is derived from ancient Olmec and subsequent Mayan languages ("kakaw"), while the term "cacahuatl," also related to the root origin of cacao, is from ancient Aztec.

In 1737, Swedish scientist Carolus Linnaeus named the tree that produces these unsightly, yet highly prized cocoa bean pods "Theobroma cacao"—literally meaning "cocoa, food of the gods," in a reference to the mythical history of the tree among ancient Mesoamericans.



While cocoa was a celebrated and valued part of ancient Mesoamerican society, ancient records have also revealed more than 150 uses of cocoa for medicinal purposes.

Europeans were first introduced to cacao by the Spanish conquistadors around 1505 A.D. By the mid-1600's, European healers were "prescribing" cacao as a medicine to stimulate the health function of the spleen and digestive tract, as well as a cure for all manner of ailments and diseases. Cacao was valued as a means to heal colds and coughing attacks, enhance mental acuity, fight inflammation, and improve overall nutrition. In the rest of this paper, we will refer to cacao as cocoa, implying the unprocessed form of this amazing food.

NOTABLE MENTIONS OF CACAO IN HISTORY

Thomas Jefferson: "The superiority of chocolate, both for health and nourishment, will soon give it the preference over tea and coffee in America which it has in Spain" (1).

William Clark (famed explorer): "I felt my Self [sic] very unwell and derected [sic] a little Chocolate which Mr. McClellan gave us, prepared of which I drunk about a pint and found great relief..."

Baron Justus von Liebig (German chemist): "Chocolate is a perfect food, as wholesome as it is delicious, a beneficent restorer of exhausted power. It is the best friend of those engaged in literary pursuits."

Jean Anthelme Brillat-Savarin (lawyer, politician): "It has been shown as proof positive that carefully prepared chocolate is as healthful a food as it is pleasant; that it is nourishing and easily digested... that it is above all helpful to people who must do a great deal of mental work."



OTHER HISTORICAL REFERENCES

Deanna Pucciarelli and Louis Grivetti from the University of California, Davis recently published a paper titled, "The Medicinal Use of Chocolate in Early North America." This paper discussed the long history of medicinal chocolate in North America dating back to the 16th century (2). The paper suggested that medicinal chocolate was very prominent in many of the remedies prescribed for an assortment of illnesses, referring to advertisements of the day, including the following: "Always on hand pure cocoa and Homeopathic Chocolate, without any admixture of spices, are to be had, by the single cake or by the box of 25 pounds each."

In 1849, the Scientific American Journal published the statement, "During last summer, those individuals who were habitually using chocolate or broma, neither had attacks of cholera or dysenteric affections, while other in the same families, taking their daily potations of tea, coffee, or simple cold water, were suffers."

Dr. Albert Bellow suggested that "Cocoa differs from tea and coffee in that it is rich in

The average American consumes 10 to 12 pounds (4.5 kilograms) of chocolate every year.



In the 1800's, chocolate was recommended for gout, yellow fever and many other diseases in that time period.

nutritious food, and having in it no tannin or other deleterious elements, its theobromine, or characteristic property, being connected with albumen – a muscle-making element.”

Cocoa products were considered “well-known [as] valuable foods, since they [act] as respiratory excitants.”

Advertisements in the late 1800's touted cocoa's benefits for patients with asthma, bronchial, and lung trouble.

The famous physician Dr. Benjamin Rush wrote, “Chocolate differs considerably from both [tea and coffee], possessing no exhilarating virtue, or only in a small degree, but is more nutritive, and in South America constitutes a considerable part of the food.”

In his treatment for yellow fever, Dr. Rush recommended, “As soon as the pulse is reduced, I indulge them in weak chocolate.” He recommended chocolate for gout, yellow fever, and many other diseases at the time. Cocoa was a common medicine included in the well-known “house call” medical bags carried about by doctors during the 19th century. One medical book from the time said this about treating whooping cough:

Let the child live on a light diet, little or no meat, cake, pastry, or heavy food, but an abundance of mucilaginous drinks... [such as] chocolate

Cocoa was a mainstay in medical recommendations throughout Europe, North and South America until the third decade of the 19th century.

A copy of Dr. Pucciarelli and Dr. Grivetti's paper can be found at the World Cocoa Foundation website (worldcocoafoundation.org).

POST-INDUSTRIAL CHOCOLATE: FROM GOOD TO BAD

With the coming of the Industrial Revolution, chocolate manufacturers found themselves in regional and global competition for consumers.

At the same time that chocolate was being served in liquid form as a medicine for the sick,

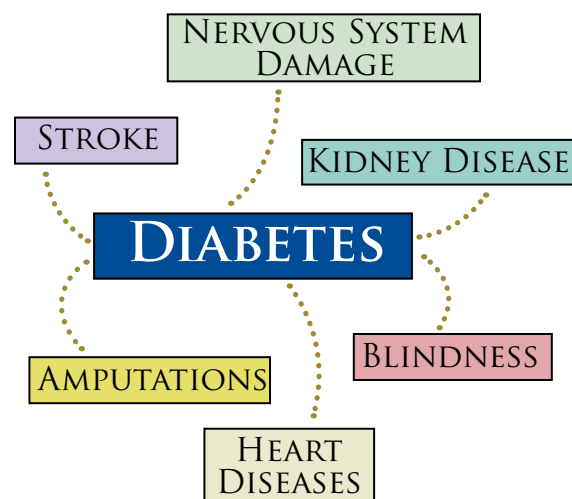
it was also being produced with added fats and sugars as a cheap candy.

The mid- to late-1800s saw the creation of a tremendous market for chocolate penny candy, as well as for fancy boxed chocolates that have since become synonymous with love and courtship.

By the 1950s, chocolate had completely lost its association with health and healing. Many of today's most famous chocolate companies got their start during the Great Depression, known to those in the business as the “hungry thirties” due to the popularity of this cheap diversion from the doldrums of everyday life during the economic crisis. Are we experiencing the “hungry 2000s” today?

MODERN LIVING. MODERN DISEASES.

Pollution. Global Warming. Stress. Lack of sleep. Poor dietary habits. In today's society, we are at greater risk than ever for health problems. In fact, the majority of Americans already suffer from some kind of preventable (or addressable) health problem: obesity, heart disease, diabetes (or “pre-diabetes”).



According to the American Heart Association, more than 910,000 Americans will die of heart disease this year. As a matter of fact, by 2010, heart disease will be the number one killer across the world.. More than 70,000,000 Americans live every day with some form of “heart disease” (high blood pressure, cardiovascular disease, stroke, angina (chest pain), heart attack or congenital heart defect).

An epidemic of Type 2 diabetes continues to sweep across the United States; an

With the health of a nation deteriorating, studies are showing that cacao contains interesting health benefits that could reverse the effects of a fast-paced lifestyle.

The myth that chocolate causes pimples and acne still lives on amongst many believers. It's totally false. Likewise, chocolate is also not physically addictive the way other substances are. Both of these facts have been proven through a series of past medical studies.



Notice that the health properties of Unprocessed Dark Chocolate reflect and surpass those of the two leading antioxidant-containing fruits.

estimated 24,000,000 Americans struggle with the disease—up more than 3,000,000 people since only 2005. With Type 2 diabetes, either the body does not produce enough “insulin” or the cells “ignore” the insulin. Insulin (a hormone) is needed by the body in order to absorb blood sugar into the cells (ultimately lowering blood sugar levels) for energy. Lack of exercise can be a key contributor to Type 2 diabetes. Excessive weight can be both a symptom and a contributing cause of diabetes. And, naturally, there is an inevitable wave of illnesses and disabilities that are brought on by diabetes: heart disease, stroke, blindness, limb amputations, kidney disease and nervous system damage, to name several.

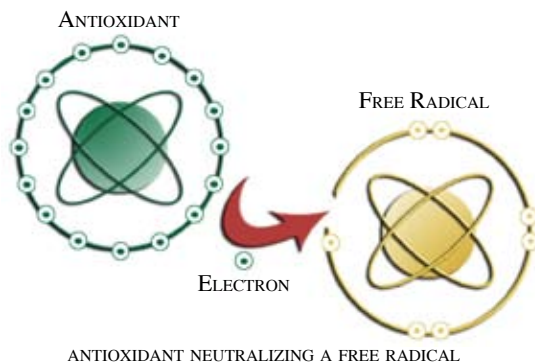
In modern societies, keeping up with a fast-paced lifestyle seems to have taken precedence over healthy living. One simple solution is to pay more attention to what we put in our bodies. Fruits and vegetables are a rarity on fast food menus, yet

they are rich sources of antioxidants—a key to maintaining a healthy body.

Only in the past few years has cocoa been reexamined as a health food and a nutritious source of antioxidants, anti-inflammatories, vitamins and minerals. In 2008 alone, over 50 different studies were conducted on the health benefits of cocoa. There have even been human epidemiological studies and dietary trials with cocoa that have yielded interesting results.

SECTION 2 THE POWER OF ANTIOXIDANTS

We mentioned antioxidants earlier. Antioxidants are chemicals that combat the free radical molecules that are created every day inside our bodies—molecules that damage our systems. Three of the most important and effective sources of antioxidants might surprise you, and products that contain two or three



in combination could very well change many of the commonly held beliefs about nutrition:

1. The Acai Berry
2. Blueberries
3. Unprocessed Cocoa

Most of us have only an improper diet to blame for our obesity, low energy, mood swings and other health problems. Of course, this can be corrected by changing what we eat, and by consuming more of the foods listed above.

ANTIOXIDANT SOURCE #1 ACAI BERRY

The acai (ah-sah-EE) berry is an excellent source of vitamin A, which is vital for good vision, growth, skin health and reproduction. 100 grams, or roughly 3.5 ounces, of acai has an ORAC rating of about 5,500 units. ORAC, (Oxygen Radical Absorbance Capacity) is the unit by which antioxidants are measured. The recommended daily consumption of Antioxidants is between 4,000 and 5,000 ORAC units.

Consuming 5,000 ORAC is the equivalent of eating seven to 10 servings of any combination of fruits and vegetables. . Acai is far ahead of the other fruits in its capacity to absorb free radicals in the human body.

Dr. Nicholas Perricone, a clinical and research dermatologist, named the acai to the top of his famous Superfood List. The unusually high levels of phyto-nutrients (nutrients that are beneficial to your health) and antioxidants are what make the acai berry stand out from all other fruits. Found primarily in the Northern Regions of Brazil, the acai is such an important source of nutrition, that individuals in the region drink almost as much acai juice as they do water. The acai fruit is also a complete protein, which means it contains every essential amino acid.



Jiu-jitsu fighters and soccer players in Brazil often have a large meal of acai berry pulp before a competition. Why? Aside from being a perfect source of nutrition and carbohydrates, the high levels of antioxidants in the acai berry provide significant support to the adrenal function, which increases stamina. Taken on a regular basis, the acai berry strengthens the immune system to the

Acai promotes younger looking skin and helps to retain oil in the skin to improve skin elasticity and overall complexion.

Acai helps people sleep better. Many users of Acai report that the berry helps them to even sleep better at night.

North America is the world's leading blueberry producer, accounting for nearly 90% of world production at the present time.

point where the body easily handles infections and disease. This frees up even more energy for other uses.

The acai berry contains a natural combination of antioxidants, essential fatty acids, amino acids and phytosterols. Amino acids work together to help your body function better, process food more easily, and burn fat more efficiently. It is literally one of the best things you can put into your body to keep it healthy. And when your body is healthy and well-balanced, it is much easier to reach an ideal body weight.

The acai berry contains enzymes and other vital nutrients that aid in the digestion process. A healthy digestive system is not plagued with such challenges as acid reflux and other similar ailments. Acai also contains a significant amount of fiber, which helps your digestive tract process food.

ANTIOXIDANT SOURCE #2 BLUEBERRIES

Packed with antioxidant phyto-nutrients called anthocyanins, blueberries neutralize free radical damage done to the collagen matrix of cells and tissues—unchecked, this damage can lead to cataracts, glaucoma, varicose



veins, hemorrhoids, peptic ulcers, heart disease and cancer. Anthocyanins, the blue-red pigment found in blueberries, improve the integrity of support structures in the veins and the entire vascular system. Anthocyanins have been shown to enhance the effects of vitamin C, improve capillary integrity, and stabilize

the collagen matrix (the ground substance of all body tissues). They work their protective magic by preventing free-radical damage, inhibiting enzymes from clinging to the collagen matrix, and directly cross-linking with collagen fibers to form a stable collagen matrix.

While wine, particularly red wine, is touted as a cardio-protective substance (a good source of antioxidant anthocyanins), a recent study found that blueberries deliver 38% more of these free radical fighters than red wine. In this study, published in the August 2003 issue of the Journal of Agriculture and Food Chemistry, researchers found that a moderate drink (about

4 ounces) of white wine contained .47 mmol of free radical absorbing antioxidants. Red wine provided 2.04 mmol, and a wine made from high-bush blueberries delivered 2.42 mmol of these protective plant compounds. (October 1, 2003).



Pterostilbene, (pronounced TARE-oh-STILL-bean), a powerful antioxidant compound found in blueberries—already known to fight cancer—may also help lower cholesterol.

In a study using rat liver cells, scientists at the USDA Agricultural Research Service compared the cholesterol-lowering effects of pterostilbene to those of ciprofibrate (a lipid-lowering drug) and to those of resveratrol. Resveratrol is an antioxidant found in grapes that has a chemical structure similar to pterostilbene, and has been shown to help fight cancer and heart disease.

The USDA based their comparison on each compound's capacity to activate PPAR-alpha (short for peroxisome proliferator-activated receptor alpha). The PPARs are a family of receptors on cells all throughout the body that are involved in the absorption of compounds into cells for use in energy production. PPAR-alpha is crucial for the metabolism of lipids, including cholesterol. Pterostilbene was as effective as ciprofibrate and outperformed resveratrol in activating PPAR-alpha (January 14, 2005). The take-away message: Turn up your cholesterol burning machinery by eating more blueberries, grapes and cranberries.

In animal studies, researchers have found that blueberries help protect the brain from oxidative stress, and may reduce the effects of age-related conditions such as Alzheimer's disease or dementia. Researchers found that diets rich in blueberries significantly improve both the learning ability and motor skills of aging rats—essentially reversing the cognitive aging process.

In addition to powerful anthocyanins, blueberries contain another antioxidant compound called ellagic acid. Ellagic acid blocks metabolic pathways that can lead to cancer. In a study of 1,271 elderly people in New Jersey, subjects

Unprocessed Dark Chocolate contains fiber, minerals and flavonoids which can lower cholesterol, improve metabolism, increase energy and eliminate free radicals in our body.

Cocoa rates as one of the highest whole foods on the ORAC scale - even higher than most antioxidants.

who ate the most strawberries (another berry that contains ellagic acid) were three times less likely to develop cancer than those who ate few or no strawberries. In addition to containing ellagic acid, blueberries are high in the soluble fiber pectin, which has been shown to lower cholesterol and to prevent bile acid from being transformed into a potentially cancer-causing form.

ANTIOXIDANT SOURCE #2 UNPROCESSED DARK CHOCOLATE

Believe it or not, dark chocolate can be one of the healthiest foods you will ever eat. The key is that it must be processed correctly to be beneficial.

Cocoa powder is rich in the polyphenols, mainly flavonoids—flavan-3-ols, flavonols (epicatechin and catechin), and procyanidins. Cocoa is from the plant *Theobroma cacao*.

Cocoa butter accounts for 50% of the weight of the cocoa bean, with the main fatty acids being stearic and palmitic (saturated fats), oleic (the one in olive oil, a monounsaturated fatty acid) and linoleic acid (polyunsaturated).

Even though we are taught that saturated fats are harmful to the cardiovascular system, the saturated stearic acid fat from the cocoa bean does not elevate blood cholesterol like other saturated fatty acids. Fat from cocoa butter is not absorbed well by the intestinal tract, and is considered “neutral” in terms of its effect on weight gain and impact on cholesterol. Research shows that these cacao fatty acids may modify LDL-C, making it more resistant to oxidation.

The cocoa bean also contains some insoluble and soluble fiber, which contributed to lower cholesterol levels. Fiber is extremely beneficial in lowering colon cancer rates and preventing constipation. Fiber also slows intestinal absorption of glucose, helping to regulate blood sugar levels towards normal.

The cocoa bean contains several minerals and vitamins which are useful. Dark chocolate contains magnesium, which is necessary for muscle relaxation, nerve conduction, energy production and bone and teeth development and overall health. Magnesium deficiencies intensify the effects of PMS (premenstrual syndrome). Copper—found in rich supply in dark cocoa—is involved in many of the chemical processes in the body. Dark cocoa also contains high levels of potassium, which is vital for cardiovascular health.

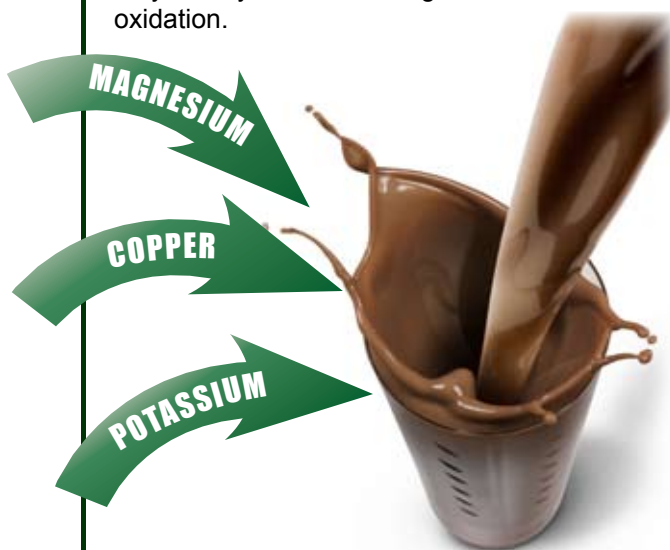
The flavonoids in cocoa are the flavan-3-ols, flavonols (catechin and epicatechin; procyanides), and proanthocyanidins. Pound-for-pound, dark chocolate has the highest concentration of these flavonoids of any food—even more than acai or blueberries. Cocoa is loaded with a variety of phyto-nutrients, making it very high in antioxidants.

Cocoa rates as one of the highest whole foods on the ORAC scale—even higher than green tea, acai, blueberry and red wine, which have all been shown to be very effective antioxidants.

Cocoa can stop the oxidation of the LDL-C cholesterol as discussed previously, resulting in reduced cardiovascular damage. Cocoa flavonoids can also increase the production of good cholesterol (HDL), which mops up the harmful fats from the blood vessels. Cocoa flavonoids discourage platelets from forming harmful clots and damaging heart muscle blood vessels. The flavonoids in cocoa help the blood vessels dilate more easily, allowing more blood flow to the heart (nitric oxide (NO) activation). This same principle is applicable to insulin-stimulated blood sugar uptake, resulting in improved diabetic control. Cocoa has been found to have anti-inflammatory properties, stopping the inflammatory process (cytokines) from damaging the body.

In several studies, dark chocolate has been shown to decrease blood pressure, which in turn decreases the damage to heart vessels. Cocoa is thought to be a renin-angiotension enzyme inhibitor, which is the same principle on which many blood pressure pills work (ACE inhibitors).

Several studies have shown that dark chocolate decreases blood pressure.



Believe it or not, healthy chocolate can reduce dental cavities, decrease plaque and prevent gum disease.

Red wine and dark chocolate... might seem decadent...but these guilty pleasures also might help us live longer...and healthier lives. Red wine and dark chocolate contain resveratrol which lowers blood sugar.

A study led by Professor Ian Macdonald found that consumption of a cocoa drink rich in flavanols — a key ingredient of dark chocolate — boosts blood flow to key areas of the brain for two to three hours.

There have also been studies showing that dark cocoa can help reduce dental cavities, decrease the plaque on teeth, and prevent gum disease.

Research in dementia has shown that the progression of the condition can be combated by the same antioxidant principles we have been discussing. Several vitamins, particularly vitamin E and certain B-vitamins, have been used to help with dementia. As noted previously, cocoa has the same capacity to decrease free-radical damage, limiting dementia and improving memory.

Dark chocolate improves the body's ability to use insulin, and improves insulin resistance, a condition that can lead to diabetes. Cocoa can increase nitric oxide levels to help with insulin-stimulated uptake of blood sugars. The increase in nitric oxide also improves the health of the blood vessels, limiting the damage of diabetes on the small vessels.

Cocoa has been found to help with liver damage, and can help repair liver cells after long term exposure to alcohol.

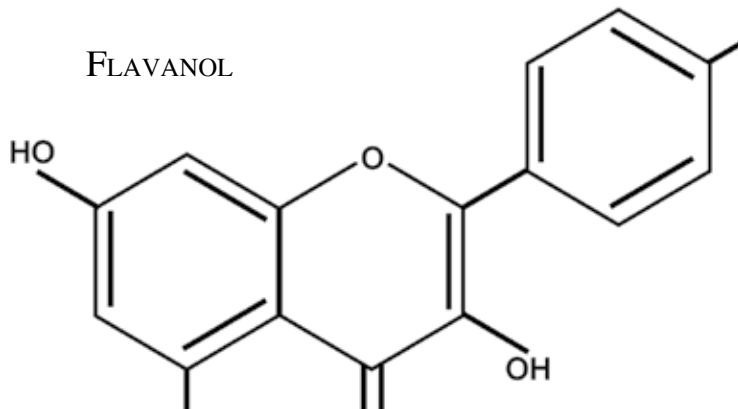


Cacao isn't candy. It becomes a candy only when fats and sugars are added, and unfortunately the 'candy chocolate' is the only form of chocolate many people know of.

Cocoa is comprised of more than 300 different chemical components - the combination of which makes cocoa incredibly versatile when it comes to good health.

SECTION 3 AN EXPLANATION OF CACAO'S INGREDIENTS

What exactly is in cocoa that provides so many benefits? To hear one tout its benefits, cocoa almost sounds like "snake oil" sold in traveling caravans. The truth is that cocoa is a complex food. There are over 300 different chemical components found in cocoa. The cocoa bean is the fruit of the *Theobroma cacao* tree, and the beneficial effects are wholly determined by how it is grown, handled, and processed.



In general, cocoa contains Cocoa butter (a neutral fat consisting of oleic, stearic, and palmitic fatty acids), minerals (copper, magnesium, potassium, iron, zinc, and calcium), theobromine and trace amounts of caffeine, and mood-enhancing chemicals (PEA, tyramine,

tryptophan, and serotonin). This is just an abbreviated list of the chemicals found in cocoa. In addition to the main chemicals which provide a majority of the health benefits, cocoa also contains polyphenols. Polyphenols are a large class of compounds that provide the antioxidant and anti-inflammatory benefits of fruits and vegetables. One of the most important classes of polyphenols are flavonoids. Flavonoids can be further broken down into smaller families –flavanones, flavones, flavonols, flavanols (flavan-3-ols), anthocyanins and isoflavones.

Within the flavanol family exist powerful stand-alone ("monomeric") chemicals known as epicatechins and catechins, as well as compound chemicals ("oligomeric") known as procyanidins. These substances are the true backbone of the health properties derived from cocoa.

Epicatechin is the predominant polyphenol in cocoa, and accounts for a majority of the health benefits that scientists attribute to this wonderful food. Cocoa is one of the most polyphenol-rich foods available on Mother Earth. However, the processing and manufacturing of the cocoa bean has an enormous impact on the levels of these substances that are actually contained in the final product.

Polyphenols provide both antioxidant and anti-inflammatory benefits. Cacao is one of the most polyphenol-rich foods available on Earth!



When processed improperly, Cocoa powder can lose more than 60% of the total flavonoid capacity along with the beneficial properties.

The valuable compounds found in cocoa can continue to work in your body for up to 12 hours!

More health benefits from eating properly processed cocoa are consistently being found with new reseach and testing.

SECTION 4 OUR CHOCOLATE REPORT PURPOSE (THE 6 PARTS)

In this report, I will examine the influence of manufacturing on the availability of the flavanols, as well as present the most recent research conducted in 2008 on cocoa, and cocoa's effects on health. I will also relate the University of Utah results on Xocai™ products with other pertinent studies.

PART #1 OF THE CHOCOLATE PUZZLE FLAVANOL AVAILABILITY



A 2008 study completed by researchers in Spain examined the impact of manufacturing processes on cocoa powder. The researchers found that "dutching" (or alkalization) of cocoa powder resulted in a 60% loss of total flavonoid capacity. While dutching might make cocoa more palatable by removing the natural bitterness, it also robs cocoa of most of the beneficial properties associated with flavonoids.

Even the process of fermenting cocoa beans contributes to the loss of potent flavonoids. This study also showed a 67% loss of the (-)-epicatechin, which is the main powerhouse flavonoid in cocoa.

Need more convincing? The researchers also discovered that dutching contributes to an 86% loss of the other important flavonol in cocoa—quercetin. Quercetin is a very potent antioxidant and free-radical scavenger that was not even reported to be found in cocoa before. Pound-for-pound, unprocessed cocoa contains as much quercetin as broccoli, apples, or red grapes.

Conclusion: How cocoa is manufactured has a significant effect on the health benefits contained in the final product.

PART #2 OF THE CHOCOLATE PUZZLE CACAO POSITIVELY AFFECTS HEALTH



As recently as August 2008, a study reported the discovery of dietary resveratrol in cocoa powder (about half as much as an average California red wine), further bolstering the argument of cocoa as a beneficial food.

Why is the preservation (or even enhancement) of cocoa polyphenols of such great importance? The answer is two-fold: the obvious biological activity of polyphenols, combined with the limited absorption of polyphenols in the gut. This means the more potent the cocoa, the more beneficial to the consumer. Epicatechin demonstrates the highest absorption in the blood, which is why it is important to maximize the amount available in the product.

Conclusion: Research is continuing to uncover new findings support the many dynamic health benefits of cocoa.

PART #3 OF THE CHOCOLATE PUZZLE INCREASES IN ANTIOXIDANTS



Several international studies have examined the absorption of flavanols into the bloodstream ("bioavailability"). These studies found that the gastric environment has little-to-no effect on polyphenols. Epicatechins and catechins are readily absorbed by the upper intestinal gut into the bloodstream. Epicatechin metabolites (glucuronide, sulfate, and methyl) are found in blood plasma very soon after being after hitting the intestinal gut. The larger molecules of flavanols not absorbed in the small intestine travel to, and are metabolized by, bacteria in the large intestine, producing other beneficial polyphenols. These valuable compounds can be found even up to six or 12 hours after the cocoa product has been ingested.

These studies also discovered epicatechin metabolites and quercetin in the brain bloodstream soon after the ingestion of cocoa.

Conclusion: Cocoa's workhorse molecules are absorbed effectively in the body.

PART #4 OF THE CHOCOLATE PUZZLE RECENT/ONGOING DARK CACAO STUDIES



Another important factor to consider is whether an increase of polyphenols increase antioxidant levels in the blood. Studies have found definite increases in blood ORAC levels associated with cocoa consumption, indicating that the flavonoids are being utilized by the body. The ORAC (oxygen-radical absorbance capacity) test measures the capacity of a compound to absorb or neutralize oxygen-free radicals, which

Tests have shown that eating chocolate before solving math problems can increase your test scores.



are harmful to the body. An increased presence of antioxidants gives the body another weapon to fight damaging molecules that are created inside the body every day.

An increase of total serum glutathione, also shown in these studies, indicates that the flavonol molecules are actually doing their jobs inside the living body. Glutathione (a protein found inside cells) is essential for the function of immune cells and disease-fighting. Another interesting and informative test determines whether the metabolites, or breakdown products, of the flavonoids are found in the urine. Presence of metabolites in urine indicates that the molecules are being used by the body.

Conclusion: Research proves that flavonoids from ingested cocoa are being utilized by the body, and positively affect the body's immune system.

Now, let's take a look at the newest international studies on cocoa while comparing and contrasting these interesting findings with the results obtained from a cardiovascular study performed at the University of Utah.

Professor David Kennedy is the director of Brain, Performance and Nutrition Research Center at Northumbria University in England. He recently led a group of researchers in exploring the effects of cocoa on the human brain ability to perform mathematical equations. Professor Kennedy, co-author of the study, concluded from the study that consuming chocolate could benefit people when performing mentally challenging tasks.

"For things that are difficult to do, mentally demanding things that maybe crop up in your work, [consuming cocoa] could help," Professor Kennedy said.

The researchers gave a flavanol-rich hot cocoa drink to 30 individuals, and then had them answer various mathematical questions. The cocoa used in the study contained 500 milligrams of flavanols—more than would normally be found in fruits and vegetables. Dark chocolate, as one of the three major sources of flavanols discussed above, contains

higher quantities of flavanols than the highly processed chocolate we see in the candy aisle of the grocery store. Flavanols, as previously discussed, are part of a group of chemicals called polyphenols. They increase the level of cerebral blood flow, among many other health benefits.

After consuming the cocoa drink, the volunteers in this study were asked to count backwards in groups of three, beginning with a random number between 800 and 999 (generated by computer). The study showed that the subjects' mathematical performance was clearly affected by the drink, and suggests that students who binge on chocolate while studying for exams may actually benefit from doing so—at least in terms of mental acuity. Subjects accomplished the calculations more quickly and more accurately than the control group. The findings were presented at the British Psychological Society annual conference at Brighton, and also showed that subjects were inclined to feel less tired and less mentally drained after answering the questions.

In the interest of full disclosure, the study also found that the same test subjects did struggle with more complex mathematical tasks.

Professor Kennedy stated, "The amount [of flavanols given in the study] is more than in the [normal] diet, but there is quite a lot of evidence that general amounts are protective against declining function. The more [foods you eat that are] high in polyphenols, the better it is for your brain in the long run."

Conclusion: High levels of flavanols found in chocolate can improve mental acuity when taken in the proper amounts.

PART #5 OF THE
CHOCOLATE PUZZLE
THE REVEALING
ISOPROSTANE
MOLECULE



One of the easiest molecules to check in urine is isoprostane—a molecule that damages the body. If antioxidants are absorbed and functioning correctly, there should be a reduced level of isoprostane found in urine. High levels of isoprostane are associated with increased risk for dementia.

The study performed in 2008 by the University of Utah showed statistically significant increases of ORAC levels in blood plasma, increases of

The cacao tree produces pods all year long, so a typical tree would have pods in every stage of ripeness. Because of this, most harvesting is done by hand, with machetes.

The cacao tree is a tropical plant that grows only within 20 degrees latitude of the equator. The main cacao-producing countries are the Ivory Coast and Ghana, although there are numerous smaller markets in South America and Africa.

Anti-oxidants found in cocoa can lower the levels of isoprostane in your urine, a molecule that damages your body.

Cocoa can actually work with your body's natural defenses against illness.

glutathione levels in plasma, and decreases in isoprostane levels found in urine. University of Utah researchers found these results using both a standard dose of Xocai Active™ (one ounce, three times per day), as well as an increased dose (three ounces, three times per day). These findings confirmed other reports of increased serum ORAC levels, increased glutathione levels, and decreased isoprostane levels found in other "in-vivo" tests (tests performed in the human body) with dark cocoa powder.

Conclusion: Cocoa, specifically Xocai Activ™, contributes to decreased isoprostane levels in the body, proving the absorption of cocoa antioxidants.

PART #6 OF THE CHOCOLATE PUZZLE THE FACTS REGARDING CVD



It's no secret that cardiovascular diseases ("CVD") are the leading cause of death in the United States and many other countries around the world. Some projections have cardiovascular disease becoming the number one cause of death everywhere in the world by 2010.

It's also no secret that dietary changes and intake of flavonol-containing foods have been associated with improvements in cardiovascular diseases. The flavonoids and other compounds of cocoa have been clearly shown to reduce the risk of cardiovascular disease in humans. Many such studies have shown an improved endothelial (blood vessel) function, platelet function, insulin sensitivity, blood pressure, and decreases in chemicals causing inflammation in the body.

Conclusion: Conclusion: Flavonols and other compounds of cocoa improve the body's natural ability to fight CVD.



Here are some of the latest CVD statistics:

- Cardiovascular disease (CVD), principally heart disease and stroke, is the Nation's leading killer for both men and women among all racial and ethnic groups.
- Almost 1 million Americans die of CVD each year, constituting 42% of all deaths.
- Heart disease is the leading cause of death for ALL Americans aged 35 and older.
- One out of every four Americans has some form of CVD; that works out to about 57 million people in the United States.

-Heart disease and stroke account for almost 6 million hospitalizations each year and cause disability in almost 10 million Americans aged 65 years and older.

-CVD costs America \$274 billion each year when including health expenditures and lost productivity.

-A number of health-related behaviors contribute significantly to cardiovascular disease (e.g. tobacco use, lack of physical exercise, poor nutrition).

Sources:
National Center for Health Statistics,
National Center for Chronic Disease Prevention and Health Promotion,
Center for Disease Control and Prevention.



www.AdamPaulGreen.com

Cacao contains the highest concentration of antioxidants of any food in the world, along with a full spectrum of nutrients found naturally in different fruits and vegetables.

Cocoa can increase dilation of your blood vessels, promoting good heart health and reducing the effects of hypertension.

SECTION 5 THE 8 CASE STUDIES

CASE STUDY #1 POSTMENOPAUSAL WOMEN

A study performed last year examined postmenopausal women, the total flavonoids consumed by that population, and their cardiovascular mortality. The study found that only a limited number of foods improved their condition: apples, pears, strawberries...and chocolate. There was no measurable reduction in cardiovascular mortality with any other fruits or vegetables.

Conclusion: Unprocessed cocoa can improve cardiovascular mortality rates.

CASE STUDY #2 KUNA INDIAN POPULATION

In past reports, I discussed two large studies that showed the benefits of cocoa in reducing cardiovascular mortality—a major study in the Netherlands on elderly men and a study conducted on the Kuna Indian population of the San Blas Islands in Panama. These studies involved long-term observations that indicated improved cardiovascular benefit of cocoa consumption.

Conclusion: Ongoing consumption of cocoa promotes cardiovascular health.



CASE STUDY #3 THE ILLINOIS STUDY ON BLOOD PRESSURE

A study conducted this year by the University of Illinois found that the consumption of flavanol-enriched cocoa bars resulted in significant reduction in systolic blood pressure (8.2% decrease) and diastolic blood pressure (8.2% decrease) compared to a placebo group. The improvement occurred within a four-week period, and continued throughout the entire study. These findings were very interesting, especially considering the fact that study participants had no pre-existing hypertension.

Conclusion: Eating cocoa daily can lower blood pressure.

CASE STUDY #4 UNITED KINGDOM STUDY ON BLOOD PRESSURE

A group of researchers from the United Kingdom reported in the American Journal of Clinical Nutrition regarding a meta-analysis of numerous studies completed on cocoa flavanols and blood pressure.

These researchers found forty-three different studies regarding the effect of chronic intake of flavonoids on blood pressure, and seven studies regarding the effect of acute intake. Black tea, red wine and grape juice demonstrated no significant effects on blood pressure. Cocoa, however, presented a 5.88mm reduction in systolic blood pressure, and a 3.33mm reduction in diastolic blood pressure—statistically significant findings.

Conclusion: Cocoa appears to be more effective than black tea, wine and grape juices in helping reduce high blood pressure.



Cocoa studies conducted this year found that cocoa increases vasorelaxation (dilates the blood vessel walls) in healthy subjects. Effects were also positive for patients with hypertension, coronary heart disease, the elderly, post-transplant heart patients, and patients with high cardiovascular risk.

Conclusion: Consuming cocoa can dilate blood vessels, allowing better blood flow throughout the body.

CASE STUDY #5 UNIVERSITY OF UTAH STUDY ON BLOOD PRESSURE

The University of Utah study found that basically healthy patients experienced a decrease in systolic and diastolic blood pressure by 5mm within two weeks of a program eating unprocessed cocoa (a product produced under the Xocai™ brand). These findings corroborated other studies, and delivered the same success you would find with weight loss, dieting, and even some blood pressure medications.

Dark chocolate (65 percent or higher cocoa content) has far more antioxidants than milk or white chocolate.



Chocolate also contains high amounts amino acids from which the body builds protein and also dopamine (which scientists believe stimulates the brain's pleasure receptors) and adrenaline.



Dozens of clinical studies have been conducted to evaluate the health benefits of dark chocolate — and the results are overwhelmingly positive. These include benefits for your cardiovascular system, prevention of osteoporosis, and cancer prevention.

It is widely accepted among medical professionals that even a small drop in blood pressure translates to a marked reduction in heart attacks, strokes, and other cardiovascular diseases.

Conclusion: Consuming unprocessed cocoa can lower blood pressure and contribute to weight loss.

CASE STUDY #6 YALE STUDY ON BLOOD PRESSURE

This year, a group of researchers from Yale found that acute ingestion of both solid dark chocolate and liquid cocoa improved the blood vessel function and lowered blood pressure in overweight adults. Sugar-free or low glycemic products aided in further improvements in blood pressure.

Research has uncovered the fact that the dilation of blood vessels is achieved via an NO-dependent (nitric oxide) mechanism. A decrease in NO is associated with increases in arteriosclerosis and cardiovascular risk. After consuming a flavanol-rich beverage, test subjects experienced an increase in NO, generated by NO synthase. Cocoa stimulates this mechanism to create even higher levels of NO in test subjects.

Conclusion: Stimulation of nitric oxide levels in the body helps counteract high blood pressure. (Cocoa is also one of the richest natural sources of magnesium, which is known to relax arteries and help prevent or decrease high blood pressure.)

CASE STUDY #7 SWISS STUDY ON BLOOD PRESSURE

We also see some notable evidence that cocoa also acts like an angiotensin converting enzyme (ACE) inhibitor, further lowering blood pressure.

Researchers in Switzerland found that within two hours of consumption of flavanol-enriched cocoa, subjects experienced a significant reduction of serum oxidative stress, improved coronary vessel function, and decreased platelet adhesion. Researchers also noted an increase in serum epicatechin levels at the same time.

Conclusion: Yet another way cocoa lowers blood pressure is by decreasing oxidative stress.

CASE STUDY #8 UC DAVIS STUDY - CACAO OFFERS PROTECTION FROM TISSUE DAMAGE

This year, a group of researchers from the University of California, Davis found that flavonoids can protect myocardial (heart) tissues during damaging events. They found that epicatechins confer cardioprotection to the heart muscle during short- and long-term ischemia reperfusion myocardial injury. In lay terms, the epicatechins protected the heart muscles after a heart attack caused decreased blood flow to the heart.

Conclusion: The epicatechins in cocoa can protect the heart muscles after a heart attacks.

MISLED STUDIES QUANTITY & TIMING MATTERS

Within the last year, two other studies found minimum results using dark cocoa. However, a review of the studies found that the first used only approximately 300mg of total flavonoids per day, which is far below the therapeutic amount of 600mg to 900mg to total flavonoids. The second study used 900mg of total flavonoids, but only administered twice per day, which the researchers themselves thought may have contributed to decreased results. Cocoa molecules are short-lived in the blood stream; at least three times per day appears to be the necessary frequency to enjoy continued results.

A second range of studies examined the conditions of insulin resistance related to impaired glucose tolerance, or “prediabetes,” which increases the risk of cardiovascular events, diabetes, decreased endothelial NO (level of nitric oxide in the blood vessels) bioavailability, and increased oxidative stress.



Chocolate comes from the seed of a tropical tree, which means it inherently has many of the health benefits of other plant seeds.

Antioxidants, sometimes referred to as phytonutrients, protect the body from free radical damage and can help to prevent premature aging and chronic diseases.



Dark chocolate contains important antioxidants called phenols. These phenols can decrease blood pressure, improve your cholesterol ratio, and increase your insulin sensitivity.

SECTION 6 THE THREE RESEARCH STUDIES

Several studies this year examined the impact of flavanol-enriched cocoa ingestion on the oral glucose tolerance test (OGTT), endothelium-dependent vasorelaxation (TK), blood pressure, and serum C-reactive protein (CRP—a measure of inflammation) in adults with hypertension and impaired glucose tolerance.

STUDY #1 TUFTS UNIVERSITY AND L'AQUILLA UNIVERSITY

A study by researchers at Tufts University and the University of L'Aquila used 1008mg of total flavonoid cocoa product divided into 3 daily doses, compared to a flavonoid-free cocoa product.

These researchers found that flavonols increased the bioavailability of NO and decreased the formation of oxygen- and nitrogen-free radicals. They also found that flavonols and resveratrol inhibit IκB kinase, and downregulate nuclear factor-κB (an oxidation pathway that causes blood vessel damage and increases fat-

induced insulin resistance). This study confirmed other research that flavanol-rich cocoa improved the dilation capacity of blood vessels, and reversed the dysfunction of blood vessels in prediabetics and smokers.

These scientists concluded that high-dose flavanol cocoa improved insulin sensitivity, increased B-cell function (cells that produce insulin), decreased blood pressure, and increased the flexibility of the blood vessel walls. They also found an increase in the QUICKI (quantitative insulin sensitivity check index), which correlates to improved insulin sensitivity, as well as improved scores in the oral glucose tolerance test.

In their study, the University of Utah also found a statistically significant increase in QUICKI, as well as improved two-hour glucose tolerance test scores. U of U scientists also found that unprocessed cocoa powder did improve the

function of the pancreas, and lowered diabetic risk. Cocoa was found to be as effective in increasing insulin sensitivity as weight loss, exercise, medications and other dietary supplements.

Conclusion: Research points to the fact that unprocessed cocoa powder improves the function of the pancreas and lowers diabetic risk. Cocoa has also been observed to be as effective as weight loss, exercise, medications and other dietary supplements in increasing insulin sensitivity.

STUDY #2 CACAO BENEFITS ON CEREBRAL BLOOD FLOW

A 2008 study examined the effects of flavonoid-rich cocoa on the cerebral (brain) blood flow in healthy elderly humans. The study used 900mg of flavanols, and measured blood flow in the middle of the cerebral artery (one of the main arteries in the brain) after cocoa ingestion. As the researchers hypothesized, they found a significant increase in cerebral blood flow for those subjects ingesting the cocoa. They also noted that nitric oxide (NO), a critical regulator of brain perfusion, was more available. More nitric oxide (NO) pathways were activated after consuming the Cocoa. Researchers did not an initial, momentary decrease in (NO), but they attributed this to trace levels of natural caffeine (theobromide) in the cocoa powder. NO levels stabilized immediately thereafter.

Other studies have found that flavonoids improve spatial memory, and decrease brain edema, as well as neuronal death in the hippocampus—a part of the brain that controls mood.

Conclusion: Ingestion of cocoa leads to an increase in cerebral blood flow up to four hours after ingestion. Increased brain blood flow can contribute to decreased risk of dementia, stroke, or other vascular cognitive impairment.

STUDY #3 CACAO BENEFITS ON PARKINSON'S DISEASE & DEMENTIA

Oxidative stress, inflammation, and accumulation of iron and protein aggregates all increase the risk of neuro-degenerative diseases such as dementia and Parkinson's. These conditions lead to neuronal (brain cell) death. The neuro-protective components in cocoa,

Flavonoid compounds in dark chocolate exert strong anti-inflammatory effects by inhibiting the same enzyme that is the target of over-the-counter drugs such as ibuprofen and naproxen.

Women who consume greater amounts of antioxidants like those in dark chocolate have higher bone mineral density levels than those who consume lower levels.

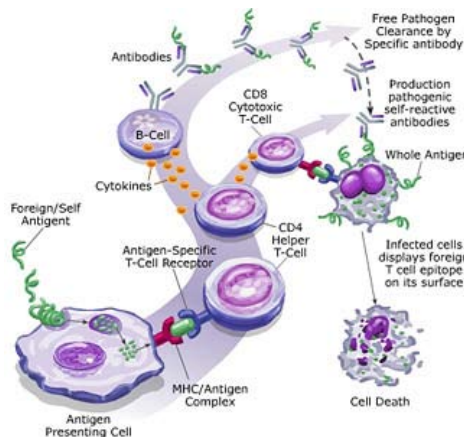
categorized into three activities below, can reduce these risks:

- 1 - Antioxidant activities
- 2 - Anti-inflammatory activities
- 3 - Potent iron-chelating activities

PARKINSON'S DISEASE

The antioxidant activity, anti-inflammatory activity and potent iron-chelating activity of cocoa provides a neuroprotective component. Researchers have found that epicatechin reduces the toxic effects of amyloid-C, a component of the senile plaques in the brain associated with dementia. We have even come across some information showing that cocoa can slow down nigrostriatal dopaminergic cell loss in Parkinson's disease. The mechanism seems to be connected to mitogen-activated protein kinase signaling pathways that are involved in brain cell survival, regeneration and cell death.

Conclusion: Cocoa can help slow the effects of Parkinson's.



DEMENTIA

Epidemiological studies suggest that consuming flavonoid-rich foods such as cocoa can delay the onset of dementia and Alzheimer's dementia. Researchers have found that epicatechin reduces the toxic effects of amyloid-C, a component of the senile plaques in the brain associated with dementia. We have even come across some information showing that cocoa can slow down nigrostriatal dopaminergic cell loss in Parkinson's disease. The mechanism seems to be connected to mitogen-activated protein kinase signaling pathways that are involved in brain cell survival, regeneration and cell death.

Conclusion: Cocoa may delay, or even prevent, dementia.

SECTION 7 THREE STUDY PAPERS BENEFITS WITH INFLAMMATION

Another important area of health benefits from unprocessed cocoa is the reduction of inflammation.

STUDY #1 - KAREN COOPER

In her review article this year, Karen Cooper examined the last 10 years of research on cocoa and health. She believes that a simple antioxidant mechanism driving the benefits of cocoa is not likely. Rather, it is the inhibition of inflammatory pathways that lead to the reduced risk of chronic diseases.

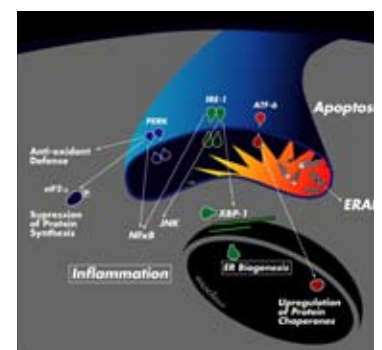
STUDY #2 - ITALY

A 2008 study performed in Italy examined the connection between inflammation and regular consumption of dark chocolate. Like Cooper, the researchers here concluded that cocoa's capacity to decrease inflammation is what provides most of the health benefits to the body. They hypothesized that dark chocolate consumption is inversely related to the level of C-reactive protein (CRP), a marker of inflammation that is considered an independent indicator of coronary heart disease.

Inflammation and nitric oxide (NO) production play a major role in the development of arterosclerotic plaque. The Italian scientists found that flavonoid-enriched cocoa did indeed decrease serum CRP in a large population of Italian patients.

STUDY #3 - BALTIMORE

Other groups have returned with similar results after monitoring the effects of a flavonoid rich cocoa on inflammation. A Baltimore group studied women who consumed approximately 700mg of flavonoids each day. Similar to the Italian group, these test subjects also experienced a reduction in CRP, and a decrease in inflammation.



Dark chocolate may also increase happiness. When dark chocolate is consumed, it triggers the production of endorphins in the body, which create a feeling of happiness.

When you're choosing a dark chocolate bar, the higher percentage of cacao, the better. If you're accustomed to milk chocolate, you may want to start with a dark chocolate bar that's lower in cacao, and gradually switch to bars with a higher cacao content. Again, the higher the better.

Cacao reduces inflammation and repairs injured blood vessel walls.

www.AdamPaulGreen.com

Cacao is similar and comparable to Aspirin in reducing the formation of blood clots.

HOW DOES IT WORK? UC DAVIS & ITALY STUDIES

Recently, a group of researchers from the University of California, Davis and Italy examined the anti-inflammatory impact of cocoa flavanols. This group discussed how the production of inflammatory chemicals (cytokines) increases the risk of heart disease, such as hardening of the arteries and congestive heart failure. If the inflammatory pathways can be altered, they argued, then there would be a reduction in heart disease.

Nuclear factor-kappaβ (NK-κβ) is one of the factors that control inflammatory response, cellular proliferation (growth), and cellular adhesion. Studies have shown that epicatechin and catechin molecules reduce NK-κβ activation, and consequently reduce inflammation cytokines.

Cocoa also demonstrates a significant effect on TNFα (tumor growth factor) which increases the body's anti-inflammatory ability. Cocoa flavanols also inhibit the formation of other inflammatory chemicals like IL-2 (interleukin).

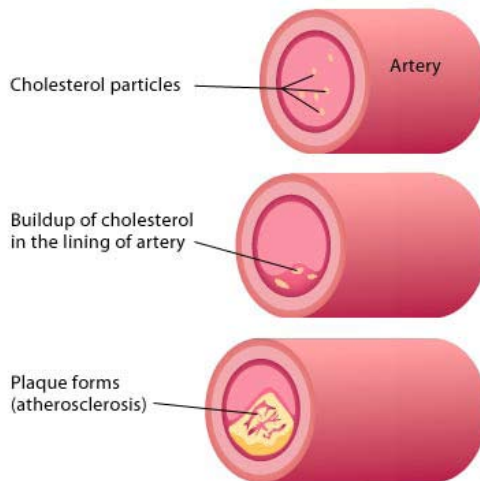
Another chemical group, eicosanoids, which is produced through the arachidonic acid pathway, is another contributor to inflammation. Some of these chemicals promote platelet aggregation, and can vasoconstrict blood vessels. Cocoa Flavanols block the arachidonic pathway similar to COX-1 and COX-2 inhibitors. These flavanols also block the production of lipoxigenase, which is a contributor to asthma.

SECTION 8 CACAO BENEFITS WITH BLOOD VESSELS

As discussed earlier, when the blood vessel wall is damaged, the body produces a chemical that causes platelets to aggregate. This action only serves to further damage the blood vessel. Cocoa flavanols have been very effective in inhibiting the chemicals that activate the platelets, reducing the formation of clots. This action is comparable to aspirin in the reduction of blood clots.



Researchers also found that the cocoa flavanols positively influence the immune system and decrease inflammation, promoting healing in the body.

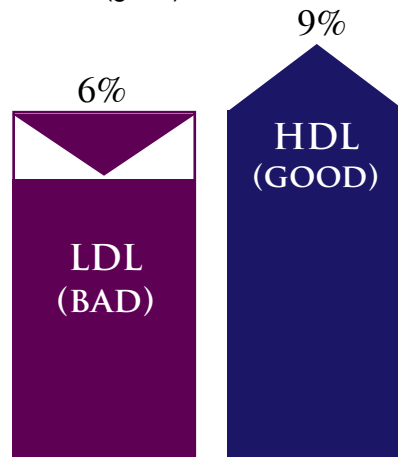


SECTION 9 CACAO BENEFITS CHOLESTEROL LEVELS (GOOD & BAD)

Cocoa flavanols also protect the blood vessels by reducing the damage done by oxidized LDL (bad) cholesterol. Basically, flavanols prevent LDL cholesterol from becoming oxidized.

STUDY #1 - JOHN HOPKINS

A group from Johns Hopkins found that after two weeks of taking highly flavanol-enriched cocoa, subjects experienced LDL level decreases of 6%, while HDL (good) cholesterol rose by 9%.



Another cholesterol factor important to examine is the production of Apo A-1 protein. Apo A-1 protein, a good cholesterol marker, helps clear cholesterol from arteries.



“There is overwhelming scientific evidence demonstrating that people who eat a diet rich in antioxidants... will live longer, healthier lives.”

— Dr. Lester Packer, PhD,

What all healthy diets have in common is an abundance and variety of unprocessed, antioxidant-rich foods.

STUDY #2 - UNIVERSITY OF UTAH

The University of Utah study found that unprocessed cocoa powder significantly increased the amount of Apo A-1 in the body. They also found that the cocoa flavanols increased the good cholesterol antioxidant (PON-paraoxanase), which is an HDL-associated enzyme that confers antioxidant activity on HDL-C, and also helps protect against atherosclerosis.

Interestingly, the University of Utah also discovered that cocoa flavanols increased lean body mass, which helps the body burn more calories and increases the function of muscles, bones, brain, liver and kidneys. The university researchers also found that flavanols increased adiponectin—a protein hormone that regulates blood sugar, breaks down fat, and suppresses the development of diabetes, obesity, atherosclerosis, and non-alcoholic fatty liver disease.



SECTION 10 CACAO BENEFITS MEMORY, AGING & IMMUNITY

STUDY #1 - FINLAND

Cocoa flavanols are also important in many other areas. A Finnish study recently found that chocolate preference and consumption in elderly men was associated with better health, optimism, and better psychological well-being.

Medical professionals accept that oxidative stress and inflammation are major contributors

to the behavioral and cognitive declines associated with aging. Cocoa flavanols, as discussed earlier, limit oxidative stress, and block inflammation, apparently helping improve memory and slowing down the aging process.

DEPRESSION

Depression is also a very common problem in our world. A recent study found that the addition of high-flavanol cocoa extract given to rats in a forced swimming test indicated that cocoa decreased depression. We know that tryptophan from cocoa is broken down into serotonin and other compounds that fight depression and elevates mood.

IMMUNE SYSTEM

Other studies have shown that cocoa flavanols improve the overall immune system. Studying rats, one group of researchers found that the cocoa-fed rats experienced an improved Th1 immune system (this system helps kill bacteria and helps cells fight off infections).

Another related rat study found that cocoa intake improved intestinal immune response by increasing those antibodies that prevent bacteria from entering the body by fighting them in the gut.

STUDY #2 - RECENT EUROPEAN STUDIES

A study conducted in November 2008 researched the benefits of cocoa flavanols on dioxins—lethal poison compounds. The researchers found that the intake of cocoa definitely suppressed the toxicological effects of dioxins in the body. In effect, the cocoa stopped the damage that this environmental poison does to the body by interfering with different pathways.



An improper diet can cause issues with from bad health to obesity... and a good diet can contribute to good health and physical well being.

Cocoa is the "long-lost secret" that represents a solution to so many health problems that the world's population faces today.

Each day is a new opportunity to choose to eat right - knowing the foods to support that decision is half the battle.

CONCLUSION

A surprising number of issues of obesity, low energy, mood swings and other health problems can be traced to an improper diet. We can correct these problems by changing our dietary habits, and incorporating more flavanol-rich foods—acai berries, blueberries and unprocessed cocoa, in particular—into our daily routine.

Flavanol-rich cocoa demonstrates impressive antioxidant and anti-atherosclerotic effects, increases HDL, improves insulin sensitivity and anti-platelet effects, increases nitric oxide production and vascular relaxation, exhibits anti-inflammatory effects, increases immune response and helps overall mood elevation.

Remember that to achieve these beneficial effects, unprocessed cocoa with low glycemic sweeteners and at least 1,000 total milligrams of flavonoids must be taken at least three times a day for maximum benefits.

Cocoa has indeed come full circle from a Mesoamerican medicinal drink to a modern-day functional food that provides significant health benefits. Reports continue to come in regarding the wide range of benefits from cocoa, including powerful protection against cardiovascular disease, diabetes, and neurodegenerative diseases.

Cocoa is the "long-lost secret" that represents a solution to so many health problems that the world's population faces today.



www.AdamPaulGreen.com

AUTHOR: ADAM PAUL GREEN

During his formative years, Adam Paul Green worked for his entrepreneurial father learning managerial skills, venture capitalism, sales and negotiation techniques in addition to international business finance, investing and entrepreneurialism (www.ImAdamGreen.com).

Mr. Green is an entrepreneur. Not only has Adam Green had the privilege of working with and for Fortune 100 companies, he's also learned from the best international business minds in the world; which is a distinct honor for him (www.g3-Development.co). Since 2000, Mr. Green has been involved in the Health and Wellness Industry as a successful Entrepreneur, Product Developer and Manufacturer of Anti-Aging Skin Care and Juice Products (www.WasatchContractManufacturing.com). During his career, Adam has helped the most recognizable retail businesses and the dozens of the top 200 Network Marketing companies obtain incredible success through innovative Product Development and Customized Manufacturing Adam's lifetime sales are over \$407,000,000 (www.AdamPaulGreen.com/about).



Adam takes action. In April of 2005, Adam and his wife Melannie Hutchinson Green met the Brooks family (Owners and Founders of Mxi Corp (Xocai Healthy Chocolate), and they discovered a unique chocolate that was healthy, then caught the business vision and joined the company as one of the founders of the revolution. In the space of just a few years, they have seen the growth of this fantastic company from its "grass roots" infancy to the multi-million dollar powerhouse it is today. The Green's can only describe it as, "Unbelievable" (www.YouTube.com/user/AdamPaulGreen). Although neither Adam nor his wife Melannie had been a distributor for another Network Marketing Company that did not stop them from believing that they would succeed; they took immediate action (www.MyChocolatePod.com). Adam and Melannie are one of the original 11 distributors to hear the very first Xocai presentation and are ruthlessly committed to making sure everyone has a positive experience with Xocai.



- Lifetime sales over \$407,000,000
 - Earned over \$3,000,000 in commissions with Xocai
 - Build a team of over 60,000 worldwide distributors (MXI Corp)
 - Elected as Second Xocai Ambassador (www.AdamPaulGreen.com/about)
 - Top International Income Earner for Xocai (#2)
-
- 2005 Founding Distributor Xocai (MXI Corp)
 - 2005 Inaugural "Top Influencer Award" Recipient
 - 2005 Top 10 Xocai Income Earner (#9)
-
- 2006 Received "Most Valuable Player" Award (MVP)
 - 2006 Voted Top Sales Representative
 - 2006 Top 10 Xocai Income Earner (#7)
-
- 2007 International Xocai Team Lead (Japan/Australia/Canada) (4 Countries)
 - 2007 Awarded "Top Influencer Award" (Xocai)
 - 2007 Top 10 Xocai Income Earner (#3)
-
- 2008 Received "Most Valuable Player" Award (MVP)
 - 2008 Recognized as 2nd Xocai Ambassador
 - 2008 Million Dollar Earner (\$1,000,000)
 - 2008 International Xocai Team Lead (UK/EU) (6 Countries)
 - 2008 Top 10 Xocai Income Earner (#3)
-
- 2009 Awarded "Innovator of the Year" (Xocai Blog Network)
 - 2009 Xocai Multi-Million Dollar Earner (\$2,000,000)
 - 2009 Received MXI Corp "Most Valuable Player" Award (MVP)
 - 2009 International Xocai Team Lead (Sweden/Denmark/Ireland/South Africa/New Zealand)
 - 2009 EU International MXI Corp Team Lead (Hungary/Belgium/Hong Kong/Netherlands) (14 Countries)
 - 2009 Top 10 Xocai Income Earner (#3)
-
- 2010 Awarded "Innovator of the Year" (Xocai YouTube Optimization)
 - 2010 International Expansion Team Lead (Agent) (23 Countries)
 - 2010 Top 10 Xocai Income Earner (#2)
-
- 2011 International Team Lead (MXI Corp) (36 Countries)
 - 2011 Received "Most Valuable Player" Award (MVP)
 - 2011 Multi-Million Dollar Earner (\$3,000,000)
 - 2011 Top Technology Innovator (Xocai Blog Network 2.0)
 - 2011 Top 10 Xocai Income Earner (#2)

Melannie wants everyone to know, "If we can do it, so can you. Get committed. Get going!" Adam is a leader. Adam and Melannie Green were the second distributorship to reach the level of "Xocai Ambassador" and are the 3rd highest money earners in company history. Just this year, Adam and Melannie became Xocai's 2nd highest monthly income earners and they are proud of their team for helping them reach this massive achievement. You can find Adam supporting and training team members every day at www.ChocolateMeeting.com or simply reach out to him by clicking here: www.AdamPaulGreen.com/Partnership.

"I am a product of perseverance. I used to fail and fail and fail and I did not understand why. I finally cracked the "business-success-code" and started pulling in a large income. After every one of my business failures, I make critical refinements and timely adjustments; it's the key! I could, if I wanted to, never work a job again. However, it is my hope that I will be able to help you achieve the same financial freedom and time independence that I enjoy every day."

MICHIEL N. KENNEDY, MD (EXPERT RESOURCE)



Michiel N. Kennedy, M.D. is a licensed medical doctor who specializes in family practice and bariatric medicine (weight loss). He has more than 30 years of experience in private practice, wellness programs, weight management, preventive medicine, medical motivation, and patient education. Dr. Kennedy speaks for different companies and conducts seminars on weight loss and healthy lifestyles.

Dr. Kennedy takes a holistic approach to weight loss and health that begins by focusing on the inner you. Dr. Kennedy invites you to see yourself as a whole person—physically, emotionally, mentally, and spiritually, and to make an inner commitment to health and well being. Take charge of your life: set reasonable goals, stay motivated, be accountable for your actions, eat healthy foods in moderation, get plenty of physical activity and exercise, avoid junk food, attend to your spiritual growth, get enough sleep, breathe deeply, relax, have fun, and stay true to your goal to be forever fit.

EDUCATION

- B.S., Central State University, Edmond, Oklahoma: Biology, Magna Cum Laude
- M.D. Indiana University School of Medicine
- Residency, St. Joseph Medical Center, South Bend, Indiana

MEMBERSHIPS/HONORS

- American Board of Family Practice, Diplomate
- American Board of Bariatric Medicine, Diplomate
- Member American Society of Bariatric Physicians
- Florida Medical Licensing Board #ME 84709
- American Medical Association
- Advanced Cardiac Life Support—Basic Life Support

PROFESSIONAL PRACTICE EXPERIENCES

- Chief Medical Officer and co-founder Harmonic Health, Inc.
- St. Anthony's Hospital, Carillon outpatient services 2004-2006
- Chief Medical Officer and co-founder Monarch Health Sciences 2003-2006
- Urgent Care, Occupational Medicine, and Family Practice 2003-2004
- Cape Coral Wellness, Inc., Weight Loss systems in Florida 2002-2003
- Private practice Bariatrics, Anderson, IN, 1998-2002
- Care Point Urgent Care, Riverview Hospital, Fishers, IN, 2001-2002
- Urgent Care and Occupational Medicine - Anderson, Indiana – 1992-2002
- American Physical Medicine and Rehabilitation, (APMR) Physical medicine and Independent Medical Examinations - 1998 - 2002
- Part Time Occupational Medicine, St. Vincent's Hospital, Indiana 1991-1992
- Private Family Practice – Indianapolis, IN, 1989-1991
- Private Family Practice - South Bend, IN, 1977-1989
- Medical Director of Optifast Weight Loss Clinic in South Bend, IN 1984-1989



DR. GORDON PEDERSEN (EXPERT RESOURCE)

Top Utah Nutritional Supplement Product Developer and Anti-Aging Master Formulator, Gordon Pedersen, Ph.D., Joins Forces with MXI Corp (Jeanette Brooks, Martin Brooks, Andrew Brooks) to Develop New Highly Effective Xocai Product Lines.

Ph.D., Gordon Pedersen Unites with Xocai - Xocai added yet another NEW MD Consultant, Gordon Pedersen: Gordon Pedersen, graduated with a Ph.D. from the Toxicology Program at Utah State University. He has a Master's Degree in Cardiac Rehabilitation and Wellness. He has served as the director of the Institute of Alternative Medicine and was nominated to chair the United States Pharmacopoeia Review Board Natural Products Committee.
<http://www.gordonpedersen.org/>



Ph.D. Gordon Pedersen is an international bestselling author and is the host of the radio show, "Common Sense Medicine." Gordon Pedersen is also the author of "A Fighting Chance." With a doctorate in Medical Toxicology, Gordon Pedersen is recognized as a world expert on Nutritional Supplements and Alternative Medicine. He has a wide variety of experience in both research and development and public speaking, having formulated over 150 nutritional products and given lectures worldwide. Gordon Pedersen Ph.D. is a noted author and radio personality. Gordon Pedersen's qualifications:

- M.S., Cardiac Rehabilitation Therapy B.S., Biology and Chemistry
- Program Director and Natural Products Committee Director for the Inter-American Society of Chemotherapy
- Formulator of over 150 nutritional products
- Director of the Institute of Alternative Medicine
- Ph.D., Medical Toxicology
- B.S., Biology and Chemistry
- Director of the Institute of Alternative Medicine

Here's a brief look at Dr. Gordon Pedersen, PhD, one of the world's foremost experts on silver. Gordon Pedersen has work experience with the world's largest pharmaceutical company (Ciba / Novartis), the world's largest sports nutrition company (Weider), dynamic biotechnology companies like Nikken, has co-authored Chicken Soup for the Enriching Soul, developed and published the mouse model for Influenza, and was an expert research and development author for the highly popular Muscle and Fitness magazine. Gordon Pedersen is an internationally renowned scientist, author, corporate officer, product formulator, and technical instructor. He formulates world-class products, expertly documents their benefits, credibly communicates through scientific journals, has created international best-selling scientific tools and has been a top executive for the past 11 years. Gordon Pedersen Ph.D. received his doctorate degree from the Toxicology Program at Utah State University where he received two distinguished service awards and constructed two space shuttle experiments. In addition, he has formulated over 150 nutritional supplements/personal care products. Gordon Pedersen was one of the first to publish a double blind placebo controlled study on the benefits of protein supplementation in body builders, where he worked with Arnold Schwarzenegger. He was nominated to Chair the United States Pharmacopoeia Review Board (Natural Products Committee), and hosted the radio show, "Common Sense Medicine" with Gordon Pedersen.

- Dr. Gordon Pedersen loves Xovita (www.mxicorp.com/Xovita)
- Dr. Gordon Pedersen loves XoService (www.mxicorp.com/Xoservice)
- Dr. Gordon Pedersen loves Jeanette Brooks and Martin J. Brooks (www.mxicorp.com/Founders)
- Dr. Gordon Pedersen loves Xocai Peanut Butter Cups (<http://www.mxicorp.com/peanutbuttercups/>)
- Dr. Gordon Pedersen loves MXI Corps Future (<http://www.mxicorp.com/Fab/>)



- Andres-Lacueva, C. et.al., "Flavanol and Flavonol Contents of Cocoa Powder Products: Influence of the Manufacturing Process." *Journal of Agricultural and Food Chemistry*. (2008).
- Balzer, Jan, et.al., "Sustained Benefits in Vascular Function Through Flavanol-Containing Cocoa in Medicated Diabetic Patients." *Journal of the American College of Cardiology*. 51 (2008):2141-2149.
- Bordeaux, B. et.al., "Causal Chocolate Consumption and Inhibition of Platelet Function." *Preventive Cardiology*. 10(4)(2007): 175-180.
- Cho, ES, KW Lee, and HJ Lee. "Cocoa Procyanidins Protect PC12 Cells from Hydrogen-peroxide-induced Apoptosis by Inhibiting Activation of p38 MAPK and JNK." *Mutation Research*. 640(1-2)(2008): 123-130.
- Cooper, Kare, et.al., "Cocoa and Health: A Decade of Research." *British Journal of Nutrition*. 99(2008):1-11.
- Crews, David, et.al., "A Double-Blind, Placebo-Controlled, Randomized Trial of the Effects of Dark Chocolate and Cocoa on Variables Associated with Neuropsychological Functioning and Cardiovascular Health: Clinical Findings from a Sample of Healthy, Cognitively Intact Older Adults." *American Journal of Clinical Nutrition*. 87(2008): 872-880.
- Davison, K et al., "Effect of Cocoa Flavanols and exercise on Cardiometabolic Risk Factors in Overweight and Obese Subjects." *International Journal of Obesity*. 32(8)(2008):1289-96.
- Di Giuseppe, Romina, et.al., "Regular Consumption of Dark Chocolate is Associated with Low Serum Concentrations of C-Reactive Protein in a Healthy Italian Population." *The Journal of Nutrition*. 138(10): 1939-1945.
- Erdman, John, et.al., "Effects of Cocoa Flavanols on Risk Factors for Cardiovascular Disease." *Asia Pacific Journal of Clinical Nutrition*. 17(81)(2008): 284-287.
- Flammer, Andreas, et.al., "Dark Chocolate Improves Coronary Vasomotion and Reduces Platelet Reactivity." *Circulation*. 116(2007):2376-2382.
- Grassi, Davide, et.al., "Blood Pressure is Reduced and Insulin Sensitivity Increase in Glucose -Intolerant, Hypertensive Subjects After 15 Days of Consuming High-Polyphenol Dark Chocolate." *The Journal of Nutrition*. 138(9)(2008): 1671-1676.
- Hamed M.S., et.al., "Dark Chocolate Effect on Platelet Activity, C-Reactive Protein and Lipid Profile: A Pilot Study." *Southern Medical Journal*. (2008).
- Hooper, Lee, et.al., "Flavonoids, Flavonoid-Rich Foods, and Cardiovascular Risk: A Meta-analysis of Randomized Controlled Trials." *The American Journal of Clinical Nutrition*. 88(1)(2008):38-50.
- Hurst, Jeff., et.al., "Survey of the trans-Resveratrol and trans-Piccid Content of Cocoa-Containing and Chocolate Products." *Journal of Agricultural and Food Chemistry*. 56(18)(2008):8374-8378.
- Jalil, Abbe and Amin Ismail "Polyphenols in Cocoa and Cocoa Products: Is There a Link between Antioxidant Properties and Health?" *Molecules*, 13 (2008): 2190-2219.
- Kwik-Urbe, C. and Roger Bektash. "Cocoa Flavanols: Measurement, Bioavailability, and Bioactivity." *Asia Pacific Journal of Clinical Nutrition*. 17(S1) (2008): 280-283.
- McShea, Andrew et.al., "Clinical Benefit and Preservation of Flavanols in Dark Chocolate Manufacturing." *Nutrition Reviews* 66 (1)(2008):630-641.



- Mehrinfar, Ramona and William Frishman. "Flavanol-Rich Cocoa: A Cardioprotective Nutraceutical." *Cardiology in Review*. 16(3)(2008):109-115.
- Messaoudi, Michael et.al., "Antidepressant-like Effects of a Cocoa Polyphenolic Extract in Wistar-Unilever Rats." *Nutritional Neuroscience*. 11(6)(2008):269-276.
- Mukai, R, et.al., "Cacao Polyphenol Extract Suppresses Transformation of an Aryl Hydrocarbon Receptor in C57BL/6 Mice." *Journal of Agricultural and Food Chemistry*. 56(21)(2008):10399-10405.
- Muniyappa, R. et.al., "Cocoa Consumption for 2 weeks Enhances Insulin-Mediated Vasodilation Without Improving Blood Pressure or Insulin Resistance in Essential Hypertension." *The American Journal of Clinical Nutrition*. 88(6)(2008):1685-1696.
- Perez-Berezo, T, et.al., "Influence of a Cocoa-enriched Diet on Specific Immune response in Ovalbumin-sensitized Rats." *Molecular Nutrition and Food Research*. (2008).
- Pucciarelli, D. and L. Grivetti. "The Medicinal Use of Chocolate in Early North America." *Molecular Nutrition and Food Research*. (2008).
- Ramiro-Puig, E. et.al., "Intestinal Immune System of Young Rats Influenced by Cocoa-enriched Diet." *Journal of Nutritional Biochemistry*. 19(8)(2008):555-565.
- Schnorr, O., et.al., "Cocoa Flavanols Lower Vascular Arginase Activity in Human Endothelial Cells in Vitro and in Erythrocytes in Vivo," *Archives of Biochemistry and Biophysics*. 476(2)(2008): 211-215.
- Schewe, T. et.al., "How Do Dietary Flavanols Improve Vascular Function? A Position Paper." *Archives of Biochemistry and Biophysics*. 476 (2)(2008): 102-106.
- Selmi, Carlo, et.al., "Chocolate at Heart:The Anti-Inflammatory Impact of Cocoa Flavanols." *Molecular Nutrition and Food Research*. 52(2008): 1340-1348.
- Stranberg, TE, et.al., "Chocolate, Well-Being and Health Among Elderly Men." *European Journal Of Clinical Nutrition*. (2007):1-7.
- Sorond, Farzaneh. "Cerebral Blood Flow Response to Flavanol-Rich Cocoa in Healthy Elderly Humans." *Neuropsychiatric Disease and Treatment*. 4(2)(2008):433-440.
- Srikanth, R et al., "Chocolate Mouth Rinse:Effect on Plaque Accumulation and Mutans Streptococci Counts When Used by Children." *Journal of Indian Society of Pedodontics and Preventive Dentistry*. (2008):67-74.
- Tomaru, M. et.al., "Dietary Supplementation with Cacao Liquor Proanthocyanidins Prevents Elevation of Blood Glucose Levels in Diabetic Obese Mice." *Nutrition*. (2007).
- Yamazaki, K. et.al., "Short- and Long-Term Effects of (-)-Epicatechin on Myocardial Ischemia-Reperfusion Injury." *American Journal of Heart and Circulatory Physiology*. 295(2008):H761-H767.



STEVEN E. WARREN, MD, DPA, (EXPERT RESOURCE)

Dr. Warren has extensive experience in family medicine. He is board-certified in family medicine, as well as in hospice and palliative medicine. He is also a Fellow of the American Professional Wound Care Association and is involved in wound care research. He is the founder of the Foundation for Flavonoid Research. Dr. Warren is committed to improving quality of life through nutrition and fitness. He is currently the Medical Director of ten different nursing homes. Dr. Warren is married with seven children.

**EDUCATION**

- B.A., University of Utah: Chemistry, magna cum laude
- M.S., University of Utah: Health Education, Public Health, Community Medicine
- Finished coursework for a M.S. in Exercise Physiology
- D.P.A., George Washington University: Health Care Policy Analysis and Administration
- M.D. George Washington University
- Internship and Residency, University of Utah: Preventive Medicine and Nutrition Boards
- American Board of Family Practice
- American Board of Hospice and Palliative Medicine
- Fellow of the American Academy of Family Practice
- Fellow of the American Academy of Wound Care Professionals

WORK EXPERIENCE

- Consultant for DHEW (Department of Health, Education, and Welfare) Health Resource
- Administration Office of Planning, Evaluation, and Legislation
- Private Practice: National Health Corp
- Internal Medicine, Obstetrics, Surgery
- Wasatch Family Medicine Holy Cross/ HCA family practice
- Medical Clinic family practice
- Medical Director of 10 different Nursing Homes and a Hospice Group
- Full-time Geriatrics in Nursing Homes, Home Visits for Hospice patients
- Board of Trustees: Utah Medical Association

MEMBERSHIPS/HONORS

- American Medical Directors Association (AMDA)
- Phi Kappa Phi • Phi Beta Kappa
- Pi Alpha Alpha (Honors Public Administration Society)
- Outstanding NHSC Rural Physician
- Featured in 3 PBS specials:
 - CODE Blue Frontier Medicine 1992
 - The Atomic Stampede 1994
 - The Journey Home—Hospice Story 2001

