

UNIVERSITY STUDIES ON DARK CHOCOLATE

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.

NORTHUMBRIA
UNIVERSITY IN
ENGLAND



Studies on the health benefits of cacao have been conducted over the last 10 years with a major focus in the last 3-4 years. Each year more human studies are being conducted on cacao with more delineated mechanisms of actions for cacao found. The studies have focused not only on the antioxidant effects of cacao, but also the anti-inflammatory, mood and other beneficial properties. In 2008 alone, there have been over 50 different studies conducted on the health benefits of cacao. There have even been human epidemiological studies and dietary trials with cacao that have yielded interesting results.

Let's reference the newest international studies on dark cacao (which were finalized this year) while comparing and contrasting those interesting findings with the results derived from the University of Utah, Cardiovascular study.

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.

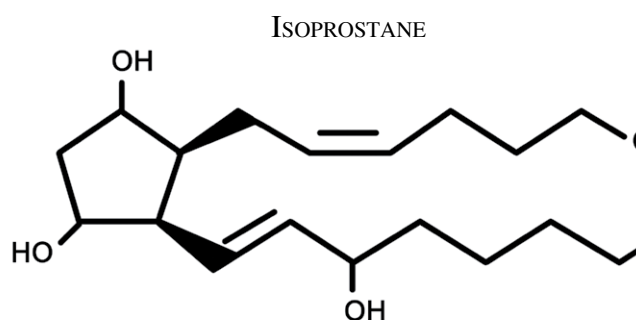
UNIVERSITY OF UTAH - THE REVEALING ISOPROSTANE MOLECULE



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 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.



UNIVERSITY OF ILLINOIS - BLOOD PRESSURE



A study conducted this year by the University of Illinois found that the consumption of flavonol-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.

UNIVERSITY OF UTAH 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.

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.

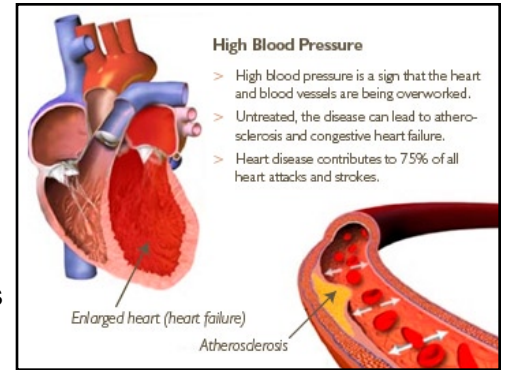
YALE UNIVERSITY - BLOOD PRESSURE



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: Cocoa lowers blood pressure through stimulation of nitric oxide levels in the body.



UC DAVIS - 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.

TUFTS UNIVERSITY & L'AQUILA UNIVERSITY STUDIES



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 I κ B kinase, and downregulate nuclear factor- κ B (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.

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-kappa β (NK- $\kappa\beta$) 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- $\kappa\beta$ activation, and consequently reduce inflammation cytokines.

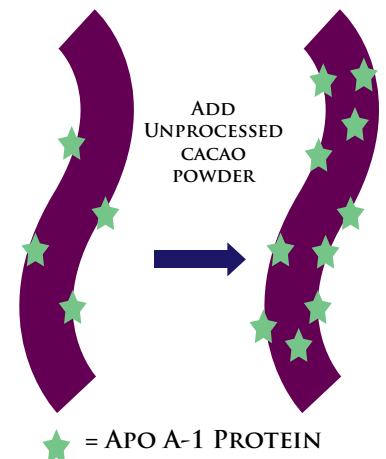
Cocoa also demonstrates a significant effect on TNF α (tumor growth factor) which increases the body's anti-inflammatory ability. Cocoa flavanols also inhibit the formation of other inflammatory chemicals like IL-2 (interleukin).

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 lipoxygenase, which is a contributor to asthma.

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.

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.



UC DAVIS & ITALY STUDIES - HOW DOES IT WORK?



UNIVERSITY OF UTAH CHOLESTEROL LEVELS

