

## Does Chocolate Pave the Way to the Future? Research on the Health Benefits of Chocolate

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For years, chocolate has been regarded as a delicious treat and nothing more. However, a relatively new field of research dedicated to exploring the health benefits of chocolate shows that this traditional sweet may hold many keys to solving health problems--as well as offering an almost untapped market potential for businesses specializing in "healthy chocolate." Chocolate could pave the way to a bright future for companies willing to take hold of this knowledge and opportunity have the potential to accomplish two great goals: make millions of dollars in profit and save millions of lives with the benefits of chocolate's natural, healthy components.

We used to believe that the earth was flat. Now, we know that our planet is a globe, not a table that one could topple off of easily if you sailed far enough into the unknown. History has shown us that we should be ready to change our ideas about accepted facts. We never know when we will find out something new that completely revolutionizes the way we think. A relatively new field of research is taking the stage with an impressive promise to improve the health of millions. It claims to be beneficial to your health while delighting your tongue. Surprisingly, this new discovery is actually not "new." This potential cure has been right under our noses for centuries. What is this hidden panacea? Chocolate.

Could this sugary treat really hold the key to solving health problems? Perhaps a more pertinent question for business owners is, "Is there any future in chocolate for businesses?" The answer is simply "yes." Chocolate is a great untapped resource that could mean millions of dollars in profits for a smart company and has the potential to save lives with new research. This vision presents tangible future for chocolate companies willing to lead the way with new ideas.

One of the biggest obstacles to this vision of the future is the current circumstance of chocolate. The status quo remains at a state where chocolate is no more than a delicious indulgence. Hans Vriens, the chief innovation officer at Barry Callebaut, one of the largest chocolate-producing companies, states that most people associate chocolate with feelings of guilt ("European Consumers"). However, chocolate's health benefits are widely unknown. In that same article, it reports a survey done in Europe that showed a little more than 15% of people questioned knew any health benefits of chocolate (8).

However, is chocolate really a health food? What are the benefits that chocolate claims and are they true? The topic of chocolate has only been on the scientific scene for a little more than a decade (Cooper, Donovan, and Waterhouse 1-2). So why is it coming up as an issue of health? Research in the past few years has brought some interesting facts to light, including several health benefits of chocolate's main ingredient-- cocoa. While cocoa contains extremely beneficial components, such as flavonoids and polyphenols, when cocoa is processed into chocolate, the cocoa benefits can be significantly diminished. Perhaps the most common benefit that is discussed is chocolate as a source of antioxidants. Flavonols are a subset of flavonoids and these chemicals working as antioxidants in cocoa. Cocoa containing chocolate includes these flavonols, such as catechin and epicatechin, which prevent the oxidation of LDL (low-density lipoprotein), or bad cholesterol. This, in turn, stops the oxidation of "free radicals" in the blood stream, which prevents stress on tissues and the formation of plaque in blood vessels (Ariefdjohan and Savaiano 427). Furthermore, not only is cocoa a supply of these antioxidants, it is also one of the biggest, having greater levels than other flavonol-containing foods like strawberries, green tea, and wine (Felder and Colman 31).

Cocoa has also been found to have several other benefits, including reduction of inflammation and prevention of blood clotting, which are both factors in heart disease (Ariefdjohan and Savaiano 428). Another advantage is that it can improve insulin sensitivity, which can work against metabolic syndrome, a condition where the body is swamped by fatty acids. This sensitivity can also work against diabetes (Felder and Colman 31). Chocolate is also reported to contain anti-cancerous substances. According to Barry Callebaut, the cocoa bean itself contains more than 200 substances that can be beneficial to a person's health ("European Consumers").

In *The Bonus Years Diet*, a book by Ralph Felder, Ph.D., and Carol Colman, chocolate is listed as a "miracle food" capable of adding years to your life (Felder and Colman 4). This claim is attributed to cocoa's effect on blood pressure. In a recent study done by Dr. Norman Hollenberg, a professor from Harvard Medical School, cocoa was found to be a key factor in lowering blood pressure. Initially, Hollenberg believed that a certain tribe of Kuna Indians living in Panama possessed a gene that protected them from heart disease (Felder and Colman 32). However, his findings were quite surprising. The Indians who remained in their original homeland, the San Blas Archipelago, retained very healthy blood pressure levels. Those who moved to mainland Panama developed dangerously high blood pressure levels. Upon further investigation into this matter, Hollenberg discovered that the Kuna Indians living in San Blas drank at least five cups of cocoa-based drinks a day, as compared to those on the mainland who drank almost none. When the drinks were analyzed, they were found to contain a large source of flavonols, leading the scientists to conclude that cocoa reduces blood pressure and thereby decreases the risk of heart disease (Felder and Colman 33). Additional studies have shown that cocoa products can reduce types of hypertension and further research is being conducted for a more comprehensive study on cocoa's impact on blood pressure (Ried et al. 48-49).

While this research offers some hope in the medical field for prevention of deadly diseases like heart disease, it is important to keep in mind that in all of these studies, cocoa was the factor being evaluated, not chocolate. Cocoa's health benefits can be passed on to the eater through

chocolate, but as stated before, many of the valuable antioxidants are eliminated through processing the cocoa (Ariefdjohan and Savaiano 249). If chocolate is processed less, such as chocolate that contains more than 60% cocoa, the more healthy, natural components will be retained. The sheer amount of evidence shows that some types of chocolate has the potential to become a great boon to the health industry, which could lead to a large profit for chocolate companies seeking this avenue

Chocolate is also unprepared to be marketed as a health food at the moment because of its other key ingredient: sugar. Sugar comes with a host of problems, including fatigue and dehydration (McCord 27). In her book, *Win the Sugar War*, Holly McCord, R.D., details other adverse effects of sugar on the body. A few of these are immune system repression, diabetes, high blood pressure, heart disease, magnesium deficiency, tooth decay, and wrinkled skin (29-31). Clearly, sugar is not meant to play a big role in the healthy diet.

One study conducted in 2008 revealed that high chocolate consumption resulted in lower bone density and strength in older women. Oxalate, another chemical found in chocolate, prevents calcium absorption. Working with sugar, which increases calcium excretion from the body, it leads to a serious reduction of calcium in the bones (Hodgson et al. 175). The study reports fractures are one of the leading causes of death in older women (175).

As it stands currently, it is difficult to market chocolate for health benefits since most of the original healthy components inherent in cocoa are lost during processing. The sugar added to chocolate is harmful in large amounts. Current labeling practices for chocolate at present can be misleading, guiding the public to believe that chocolate is a rich source of antioxidants and other advantages that similar sweet treats do not have. However, milk chocolate and other sweetened cocoa products have only a fraction of those nutrients.

Chocolate products are not a cure-all for many types of ills. While it has been repeatedly proven that cocoa has positive effects on health, it is not a scientific fact that chocolate sweets are beneficial. This confusion could lead to an even bigger epidemic of diabetes and other diet-related chronic diseases, many of which are capable of causing death. Little research has been done on the “correct” amount of flavonoids needed for effectiveness and, as Ariefdjohan and Savaiano admit the long-term usefulness of chocolate is unknown (249). False advertising, such as promoting today’s chocolate as a “health food,” could start a tidal wave of health problems in people who do not understand the facts.

So how does this impact chocolate-making companies? While consumers will continue to eat chocolate as they have done for years, chocolate-making companies have the ability to revolutionize chocolate production to contain less sugar and more less-processed cocoa. It is important to realize that the world has entered into a new stage as far as chocolate is concerned. According to that study done by Barry Callebaut, four out of ten Europeans want chocolate with reduced sugar levels; almost one in three study participants want “functional” chocolate, or chocolate with increased health benefits, and are willing to pay a higher price for it (“European Consumers”).

As you can see, there is a market arising quickly in Europe in this new era of chocolate. Additionally studies could take place in the United States to show other potential markets. There is great potential for profit for a company willing to take the lead by making chocolate into a health food. Chocolate-making companies have the power to change the image of chocolate and demonstrates its ability as a health food. Obviously, alterations to the production of chocolate would have to be made to retain the healthy components of the cocoa bean. Research into this area by Barry Callebaut is already underway and is showing considerable success (Benson 1).

Another modification would be to change the recipe of the chocolate itself to reduce the amount of sugar and thereby reduce the risks it entails. A European Community directive now allows a wider use of various sugars and ingredients to be used (Bolenz, Amtsberg, and Schäpe 55). This means that various additives are now available to make chocolate not only have less sugar, but less fat as well (53-54). One article from the Candy Industry journal reports that it is possible to reduce the levels of fat and sugar in chocolate by almost 30% (Benson 48). Barry Callebaut has recently launched a kind of chocolate called Articoa, which is the biggest source of polyphenols, some of the healthy components of cocoa, and this chocolate has its sugar reduced by 40% (“European Consumers”).

Other research has gone forward to enhance the cocoa bean’s natural nourishing qualities. For example, substances called “prebiotics,” such as dietary fibers, are now being used to promote a healthy digestive system and reduce sugar. This kind of chocolate is of high interest to consumers as it can have a good impact on the glycemic index (Benson 46). Similarly, chocolate designed to carry “probiotics,” or healthy microorganisms, for improving digestion is also being researched (47). Chocolate also multiplies its effectiveness when it is combined with so-called “super fruits” like pomegranates or blueberries. This kind of chocolate is beneficial because it contains a high amount of dried fruit. The benefits from “super-fruit” chocolate and other designed health-conscience chocolates are tremendous.

As you can see, there are several ways that chocolate can be transformed into a health food. The remaining issue then becomes a financial matter. How can companies afford to revised and implement more healthy processing of cocoa? With a relatively untapped markets for this new type of chocolate, companies have the ability to generate revenue to meet this new demand. As surveys have shown, people are looking for functional chocolate that contains health benefits. By providing chocolate that can help with high blood pressure and various other ailments in addition to tasting good, companies can make a huge profit.

A 2000 European Community directive simplified previous legislation opening up new possibilities for chocolate makes to try new ingredients. This directive “can be used to create new products beneficial to consumer and industry” (Bolenz, Amtsberg, and Schäpe 55). It also mentions that the new freedom chocolate producers have regarding the ingredients of their chocolate which “opens up interesting possibilities for reducing percentages of expensive cocoa and milk ingredients” (46). Since chocolate’s ingredient possibilities have increased, manufacturers have an opportunity to cut costs on expensive elements while increasing the health benefit by adding other ingredients such as those “super-fruits.”

Another key way to reduce cost is to store raw materials on site. Consolidating a business that relied on trucks coming in with raw materials from various locations that were sometimes over 50 miles away, Barry Callebaut purchased a storage system by Bito that resulted in a wave of advantages. By making the raw material more available, the company was better prepared to meet the demands of its customers. This new system has also promoted safety and efficiency for the company's workers. In the first year, the new system paid for itself, saving the company about 215,000 pounds, or roughly \$430,000 in U.S. dollars ("Chocolatier").

Many of these improvements are being made by other companies as we speak. These companies are investing in the new knowledge about chocolate. The cocoa bean has been made into many different products over time, but now we have the technology to bring out its innermost qualities for the benefit of the consuming public. Research is going forward and consumers are eager for the results of a functional food. With the new knowledge about chocolate, there is the possibility for a great change to be made, for improving the health benefits of chocolate and for businesses as well. Chocolate could pave the way to a bright future for companies willing to take hold of this knowledge.

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