

THE CACAO-POWERED FACILITATOR



Cacao Science Resources

Theobromine vs. Caffeine

"Recent studies have highlighted the potential of theobromine, which may act as antitumoral, anti-inflammatory or cardiovascular protector molecule without the undesirable side effects described for caffeine."

From a 2015 study: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4335269/>

What are Polyphenols?

"Polyphenols... can act as antioxidants, meaning they can neutralize harmful free radicals that would otherwise damage your cells and increase your risk of conditions like cancer, diabetes, and heart disease. Polyphenols are also thought to reduce inflammation, which is thought to be the root cause of many chronic illnesses."

Flavonoids "account for around 60% of all polyphenols."

(undated) <https://www.healthline.com/nutrition/polyphenols#what-they-are>

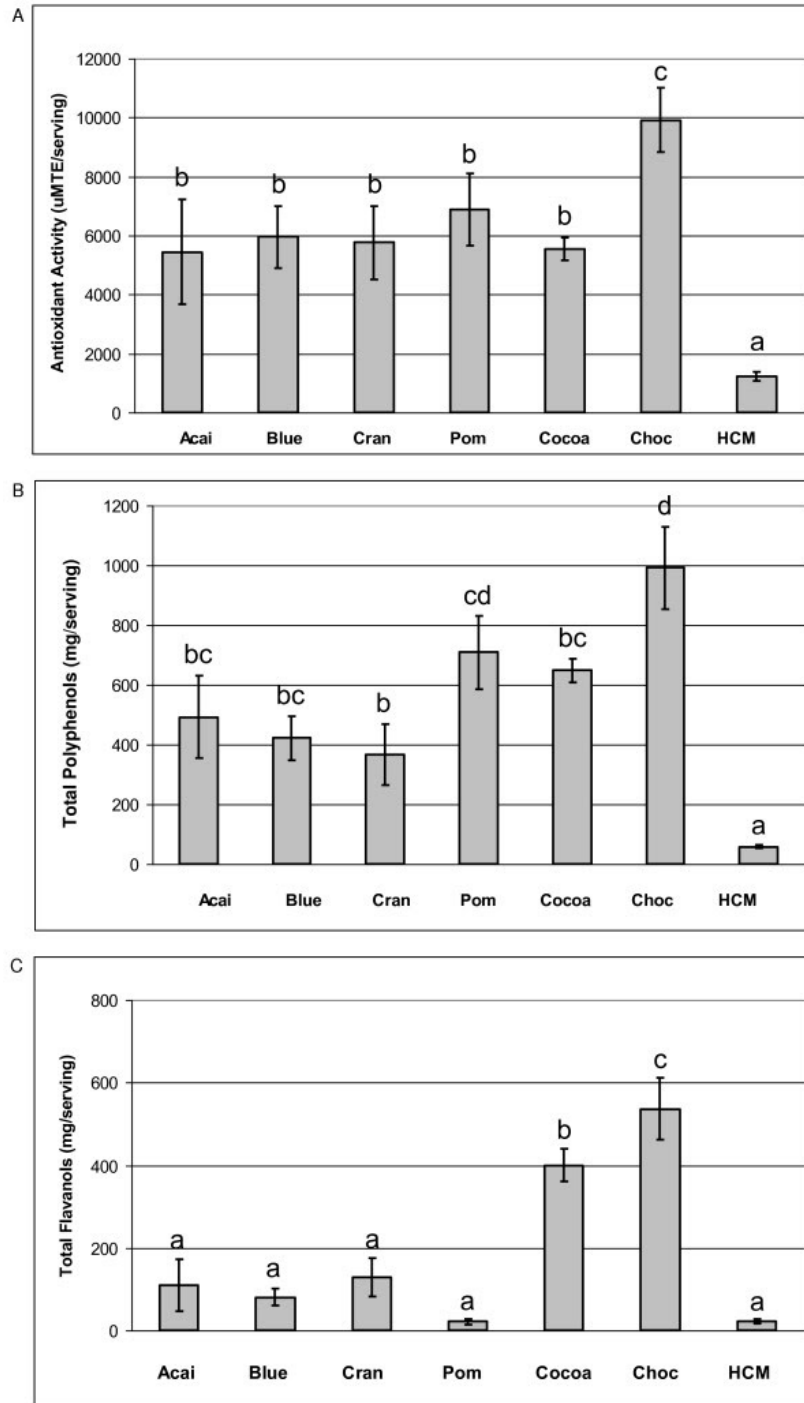
Antioxidant Levels: Cacao vs Other Fruits

"Cocoa powder and dark chocolate had equivalent or significantly greater [antioxidant capacity, polyphenol, and flavonoid] values compared to the other fruit powders and juices tested, respectively. Cacao seeds thus provide nutritive value beyond that derived from their macronutrient composition and appear to meet the popular media's definition of a 'Super Fruit.'"

"Analysis of the fruit powders demonstrated that the antioxidant capacity was significantly greater than blueberry, cranberry, and pomegranate powder on a per gram basis. The total polyphenol content of cocoa powder appeared to be greater than acai, blueberry, and

cranberry powder; however these differences did not reach statistical significance. The total flavanol content of cocoa powder was significantly greater than all of the other fruit powders tested.”

From a 2011 study: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3038885/>



Neurological Effects of Flavonoids (Polyphenols)

“Flavonoids preserve cognitive abilities during ageing in rats, lower the risk for developing Alzheimer's disease and decrease the risk of stroke in humans.”

From a 2013 study: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3575938/>

Cardiovascular Effects of Polyphenols

“Cocoa polyphenols exert blood pressure lowering activity, antiplatelet, anti-inflammatory, metabolic and anti-atherosclerotic effects, and also improve endothelial function.”

The endothelium consists of cells that line the interior of blood vessels. From a 2016 study: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5456324/>

Important Mineral Composition of Cacao

“Dark chocolates are confirmed as an excellent source of magnesium and iron: in chocolate containing 90% cocoa, their content corresponds to, respectively, 67.0% and 80.3 [%] of Nutrient Reference Values (NRV) in the European Union. The chocolate containing 90% cocoa is also a good source of zinc, which is important for the immune system, and selenium.”

From a 2016 study: <https://pubmed.ncbi.nlm.nih.gov/27346251/>

Is it possible to die from eating too much chocolate?

Someone would have to eat about 10 lbs of pure cacao paste in order to reach fatal theobromine toxicity.

Calculation: 75,000 mg toxic theobromine level for average human weight (175lbs) / 16 mg theobromine per g of "bakers chocolate" / 454 g per lb of pure cacao = 10.32lbs of pure cacao to reach theobromine toxicity.

In other words, it would be physically impossible to eat enough cacao to have a fatal "dose." Someone would definitely vomit before that happened.

If there's suspicion about a death involving cacao, most likely the person combined it with dangerous drugs and/or had a serious pre-existing heart condition.

Based on this *Popular Science* article: <https://www.popsci.com/chocolate-theobromine-toxic-amount/>