



CHEMICAL COMPOSITION AND MEDICINAL USES OF CHOCOLATES

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Abstract

Chocolate, a sugar ingredient exists in both Solid and liquid states with composed of 300 chemical compounds. Caffeine, an essential composite of chocolates naturally found in cocoa beans acts as a stimulant. Caffeine-free chocolate does not exist. Theobromine is a bitter alkaloid of a cacao plant which boosts up the physical and mental energy. Along with sugars, chocolates also have trace amounts of salt contents that including Mg, K, Ca and Fe etc. Tryptophan, an important chemical moiety produces serotonin, a neurotransmitter responsible for onset of euphoria. Flavinoids present in chocolates act as antioxidants which in turn promote cardiac health. Phenethylamine, natural alkaloid stimulates the central nervous system further averting depression. This article provides the information on the chemical composition of chocolates and their medicinal values.

Keywords:Caffeine, Theobromine, Stimulant, Relaxant, Tryptophan.

1. Introduction

Early history reveals that Chocolate has been prepared as drink for consumption. Currently Chocolates are one of the most famous nutritious food and flavors in the universe. Chocolate, a sugar ingredient available both in solid and liquid form consists of more than 300 chemicals¹. Several varieties of chocolates are well known such as Pure, Unsweetened, Dark, Milk and white chocolates etc. Chocolate production involves processes such as Blending, conching, tempering and storage. Well known stimulants, Caffeine and Theobromine, are present in chocolate, but only in little amounts. Chocolates are sensitive to temperatures and humidity and hence needs to stored properly. Chocolate industry is one among top growing business worldwide. Chocolate though nutritious also have adverse effects when consumed excessively.

1.1 Caffeine in Chocolates

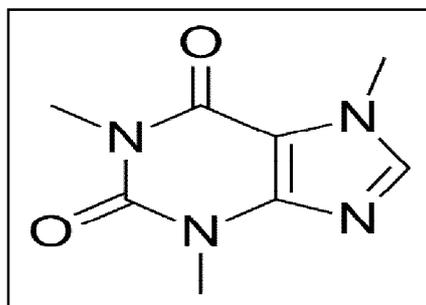


Figure 1: Structure of Caffeine

The molecular formula of caffeine is $C_8H_{10}N_4O_2 \cdot H_2O$, which is a bicyclic molecule, derived from the purine ring system². The other name for caffeine is theine methyl theobromine. The chemical composition is 1,3,7-trimethyl-1H-purine-2,6-dione. Caffeine found naturally in cocoa beans, so any chocolate has a little bit of the Caffeine is stimulant. True caffeine-free chocolate doesn't exist. The darker the chocolate, the higher the caffeine content.

The amount of caffeine in chocolate is virtually always less than that of caffeine in drinks like coffee or tea.

1.2 Theobromine in Chocolates

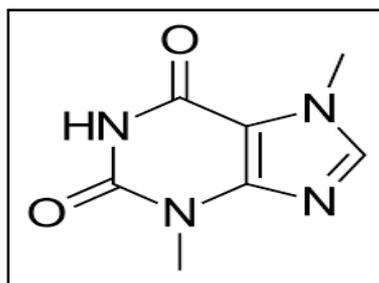


Figure 2: Structure of Theobromine

The earlier name for Theobromine is Xantheose, a bitter alkaloid of a cacao plant³. Which chemical formula is $C_7H_8N_4O_2$. Both the physical and mental energy will boost up by consuming of theobromine.

1.3 Salts in Chocolates

Chocolates are not only sugar ingredients but also contains a trace amounts of salts of metals such as magnesium, potassium, calcium and iron.

1.4 Chocolate Stimulates Happy Smiles

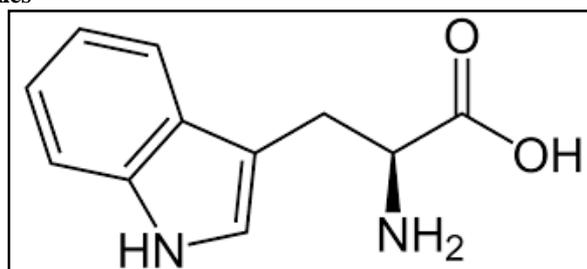


Figure 3: Structure of Tryptophan

The chemical tryptophan which is present in trace quantities in chocolates, which is an amino acid used by the brain to make serotonin. This serotonin is a neuro transmitter that can produce feelings of happiness⁴.

1.5 Flavanoids in Chocolates:

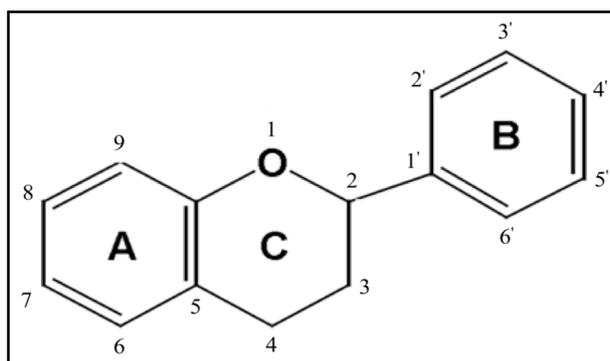


Figure 4: Structure of Flavanoids

Flavonoids are the anti-oxidants present in the dark chocolates. The antioxidants of dark chocolates protect blood vessels, promote cardiac health and also prevents from the cancer⁵. Further studies revealed that it also reduces hypertension.

1.6 Phenylethylamine in Chocolates

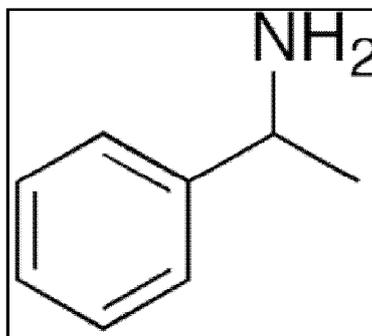


Figure 5: Structure of Phenylethylamine



Chocolates contain phenylethylamine, which stimulates the body to produce chemicals that play a role in depression⁶. Persons who have a defect in producing phenylethylamine naturally can take it as a supplement. It is an organic compound, a natural alkaloid, and acts as a central nervous system stimulant.

1.7 Health benefits of a good Chocolates

- Prevents diabetes
- Good for mothers and babies
- Reduces cholesterol
- Prevent memory decline
- Good for skin

2. Conclusion

Chocolates contain more theobromine than caffeine. Fifty grams of dark chocolate has 19 milligrams of caffeine and 250 milligrams of theobromine.

Similarly, like caffeine, theobromine is also a diuretic. Anyhow, it mainly acts as a smooth muscle relaxant and stimulant. However, these two stimulants have similar effects, the noted main difference is that caffeine affects the central nervous system, whereas theobromine affects smooth muscle.

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