



NEWTREE

The Science Of Chocolate

Savoring NEWTREE chocolate means engaging the senses while fully immersing yourself in the experience. It's a journey that invites harmony. Our delectable creations empower you to enjoy moments of pure sensory pleasure, but it's also important to understand the origins of our chocolate and its biological effects on the human body. Because recognizing the science behind NEWTREE chocolate makes every bite that much sweeter.

Unearthing chocolate's rich history

Chocolate is a nutritional treasure with a rich history dating as far back as the Early Formative period of 1900 BC¹. Archaeological evidence shows the Mokaya people on the Pacific Coast of Mexico first consuming chocolate as a beverage. From the beginning, chocolate has been a natural delicacy containing all three of the body's basic nutrients – carbohydrates, fats, proteins – in balanced proportions. Chocolate is a source of numerous micronutrients including vitamins, minerals, and essential amino acids. It also contains a multitude of phytonutrients offering a variety of beneficial properties. Chocolate has prevailed through the ages, and with history as a guide, is destined to continue as one of life's simple pleasures.



Cacao benefits over the ages

Theobroma cacao – the botanical name, in Greek, means “food of the gods”. In fact, cacao is a fruit extremely rich in a wide range of micronutrients. Cacao has been credited with many important physiological effects known to pre-Columbian civilizations. Today, we know that these effects are due to the over 800 different chemical molecules present in cacao.

Transforming cacao into chocolate

Before becoming chocolate, cacao undergoes a number of alterations, usually including the addition of sugar, lecithin and sometimes milk or vanilla. This process modifies the initial content of substances that are beneficial to the equilibrium of the body. Not surprisingly, the higher the cacao content of chocolate, the higher the content of these valuable molecules.

Dark Chocolate – containing the largest quantity of cacao, dark chocolate is a mixture of cocoa mass, cocoa butter, cocoa powder, sugar and lecithin. Most of its nutritional value is derived from the beneficial properties of cacao.

Milk Chocolate – with the addition of powdered milk and vanilla, milk chocolate contains proportionally less cacao than dark chocolate. This means that milk chocolate contains fewer cacao solids than dark chocolate.

White Chocolate – prepared solely with cocoa butter, sugar and milk powder (plus lecithin and vanilla), white chocolate can hardly be called chocolate at all.

Understanding fatty acids

One of the problems with contemporary nutrition is the over-consumption of fats, and in particular, the imbalance between saturated and unsaturated fats. The unfortunate result: an excessive amount of saturated fatty acids in our diet.

NEWTREE dark chocolate helps you maintain a positive balance between saturated and unsaturated fats. That's because cocoa butter, the sole source of fat in NEWTREE dark chocolate, is mainly composed of three fatty acids in identical proportions: palmitic acid, stearic acid, and oleic acid.

Palmitic acid (C16:0)

Stearic acid (C18:0)

Oleic acid (C18:1)

Oleic acid is well known for its beneficial effects on the cardiovascular system. It is also used as a lipid base in the Mediterranean diet, the benefits of which have been proven by scientific research². Among other things, this fatty acid has been shown to help lower LDL cholesterol ("bad" cholesterol) while increasing HDL cholesterol

("good" cholesterol). Stearic acid plays a significant role in saturated fatty acids, since it has no atherogenic or cholesterogenic effect. This is because it is rapidly desaturated in the body and transformed into oleic acid (C18:0 > C18:1). This means that palmitic acid is the only "real" saturated fatty acid. The balance between unsaturated and saturated fatty acids in cocoa butter is therefore positive (two thirds/ one third). As a result, the consumption of dark chocolate does not increase the imbalance between unsaturated and saturated fats in the contemporary diet. NEWTREE works to ensure this balance is maintained for the beneficial properties to prevail.

The value of fiber

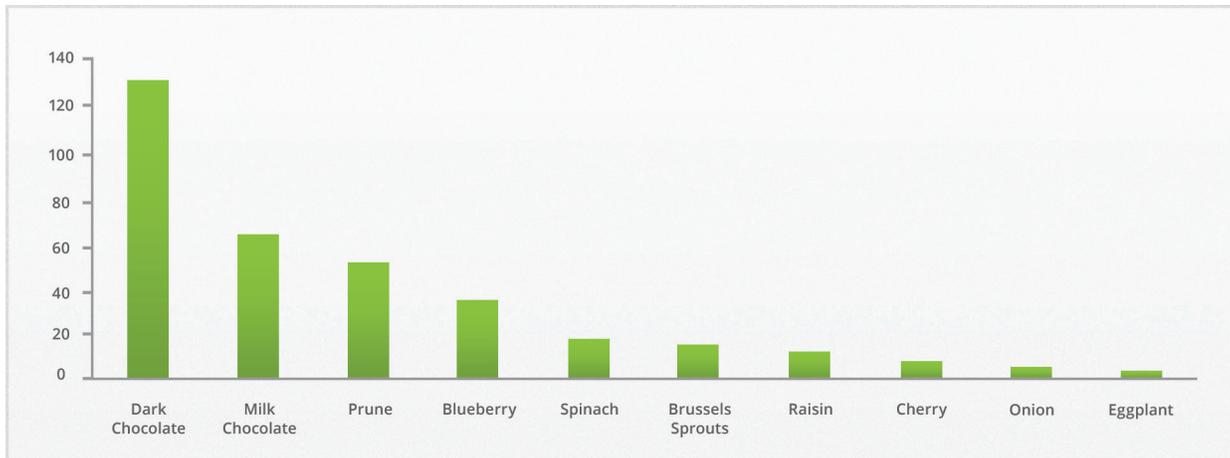
Physicians and scholars alike have touted the health benefits of fiber, including a lowered risk of diabetes and heart disease. The natural properties in cacao make it rich in fiber. According to various scientific sources, 100g of cocoa powder contains 20g to 33g of fiber. It's important to understand that chocolate containing ingredients other than cacao have a lower fiber content, proportional to the content of cacao solids. NEWTREE dark chocolates are crated with added fiber to replace some of the sugar content, and contain approximately 22g of fiber per 100g, which is 2 to 5 times more fiber than comparable chocolate.



Amazing antioxidants

Antioxidants are substances capable of neutralizing or reducing the damage caused by free radicals in the body, thus working to protect the body from disease. Free radicals are responsible for cell oxidation, an important phenomenon in the aging process.

The ORAC scale is one of the most reliable tools to measure the antioxidant capacity of a food. Both dark and milk chocolate rank high in comparison to commonly consumed fruits and vegetables.



Natural restorative properties

Cacao and dark chocolate with a high cacao content, contain a variety of components that provide restorative effects on both mind and body: theobromine, caffeine and theophylline. These three related compounds belong to the methylxanthines family. All produce similar physiological effects.

Theobromine, the “natural cacao caffeine”, is assimilated more slowly than caffeine. Its action is therefore more gentle and more evenly spread out over time.

Caffeine is a physical, digestive and cerebral stimulant.

Theophylline, present in cacao in small quantities, is a mild stimulant that also participates in cell stimulation.

Nerve cell activity is regulated, among other things, by adenosine. When it binds to the nerve cell receptors, adenosine reduces the activity of the target cell, which is not the case with caffeine, theobromine or theophylline. These compounds stimulate the central nervous system, acting directly on the brain without diminishing the activity of the target cells, which results in increased levels of nervous activity and causes the secretion and release of adrenaline, a hormone with several effects:

- Increased cardiac rhythm
- Increased heart contractility
- Increased arterial pressure
- Channeling of the blood flow to the muscles to the detriment of the peripheral organs, which require less energy at this time
- Liberation of glucose by the liver

The stimulants in chocolate also inhibit the intracellular destruction of AMPc, a “second messenger,” which reinforces all the effects described above. Dark chocolate contains an average of 460 mg per 100g of theobromine and 65 mg per 100g of caffeine. Theophylline is present in much lower quantities. For purposes of comparison, coffee contains an average of 55mg of caffeine per 100 ml.

Endorphins promote happiness

When you eat chocolate you feel happier. That’s because its phenylalanine content causes a wave of “happiness hormones” to surge through the body. Serotonin, dopamine and endorphins are all released in the brain, creating a decidedly positive influence on well-being. Chocolate also contains several substances that contribute to our emotional balance, such as magnesium and anandamide.

Essential vitamins and minerals

MAGNESIUM

Essential during the formation of nerves, magnesium plays a role in synaptic transmission (communication between neurons). A good magnesium balance contributes to the equilibrium of the central nervous system.

ANANDAMIDE

This fatty acid derivative belongs to the cannabinoid family, which is found in cannabis, but in such insignificant quantities that one would have to eat several dozen kilograms of chocolate to feel any effect whatsoever.

Chocolate contains more than 800 different chemical molecules, including numerous vitamins and minerals that are once again derived from cacao. Here are the main elements found in chocolate.

CALCIUM

A constituent element of bone, calcium (along with phosphorous, magnesium and proteins) provides bone rigidity. It also plays a particularly important role in the maintenance of the integrity of the nervous system, muscle contraction and the regulation of cardiac rhythm and cell membrane permeability.

Sources other than chocolate: Dairy products (milk, cheese, yogurt), green vegetables (broccoli), tofu.
 NEWTREE Dark Chocolate (100g): 33.8 mg
 NEWTREE Milk Chocolate (100g): 161.4 mg
 DV*: 800 mg

IRON

Iron is indispensable to cell “respiration” and contributes to the composition of hemoglobin (blood) and myoglobin (muscle), two molecules which transport and store oxygen.

Sources other than chocolate: Meat, whole grain products, green vegetables, dried beans.
 NEWTREE Dark Chocolate (100g): 12.7 mg
 NEWTREE Milk Chocolate (100g): 3.4 mg
 DV*: 14 mg



MAGNESIUM

Together with calcium and phosphorous, magnesium is indispensable to bone formation and plays an essential role in the equilibrium of the central nervous system, nerve cell construction and the transmission of nervous influx.

Sources other than chocolate: Whole grain products, vegetables, dried beans, nuts.
NEWTREE Dark Chocolate (100g): 112.5 mg
NEWTREE Milk Chocolate (100g): 45.5 mg
DV*: 300 mg

POTASSIUM

Together with sodium, potassium contributes to cell homeostasis, i.e. the balance between water and elements in solution. Potassium is also essential to proper cardiac function (contraction) and neuromuscular function (transmission of nerve influx).

Sources other than chocolate: Bread, grain products, raw green vegetables, fresh and dried fruits, fruit juice, milk, nuts.
NEWTREE Dark Chocolate (100g): 507.5 mg
NEWTREE Milk Chocolate (100g): 365.7 mg
DV*: 4700 mg

ZINC

Zinc is essential to the formation of many enzymes, and is indirectly involved in the formation of proteins, the metabolism of polyunsaturated fatty acids and the formation of certain hormones.

Sources other than chocolate: Grain products, cheese, nuts, eggs, meat, seafood.
NEWTREE Dark Chocolate (100g): 1.5 mg
NEWTREE Milk Chocolate (100g): 0.9 mg
DV*: 15 mg

PHOSPHORUS

A component of DNA and bone as well as cell membranes and nuclei, phosphorous is essential to the transport of energy within the body, along with the metabolism of glucids and lipids.

Sources other than chocolate: Milk, cheese, wheat germ, sesame seeds, bulgur.
NEWTREE Dark Chocolate (100g): 178.8 mg
NEWTREE Milk Chocolate (100g): 178.1 mg
DV*: 800 mg

VITAMIN D

Vitamin D is indispensable in calcium metabolism (from the absorption to excretion, through fixation by the bones) and is beneficial to reproduction and the immune system.

Sources other than chocolate: Butter, egg yolk, liver, fatty fish and cod liver oil. Most vitamin D is synthesized in the body through exposure of the skin to sunshine.
NEWTREE Dark Chocolate (100g): 1.6 mg
NEWTREE Milk Chocolate (100g): 1.6 mg
DV*: 5 mg

VITAMIN E

Vitamin E plays an important role as an antioxidant protecting the phospholipids, the cell membranes throughout the body.

Sources other than chocolate: Nuts, grains, whole grain products, egg yolk, green leafy vegetables, and certain vegetable oils.
NEWTREE Dark Chocolate (100g): 4.4 mg
NEWTREE Milk Chocolate (100g): 0 mg
DV*: 10 mg



VITAMIN B12

A very important co-enzyme, Vitamin B12 plays a role in the formation of nucleic acids, red blood cells and the entire nervous system.

Sources other than chocolate: Dairy products, eggs, meat, poultry and fish.

NEWTREE Dark Chocolate (100g): 0 µg

NEWTREE Milk Chocolate (100g): 0.4 µg

DV*: 1 µg

*DV: Daily values based on a 2,000 calorie intake for adults

Sugar absorption and the glycemic index

When we speak of sugar, a distinction is usually made between simple carbohydrates, which are rapidly digested, and complex carbohydrates, which are assimilated more slowly. However, several studies have stressed that this distinction does not correspond to reality.

For this reason, scientists have defined a more reliable reference method, the glycemic index (GI). This index describes the rate at which a sugar is absorbed by the body. The lower the glycemic index, the more gradual the dissemination of glucose throughout the body, i.e., the longer it takes to be absorbed. Inversely, the higher the index, the faster the increase in glycemia; this level then falls off very rapidly.

The consumption of chocolate has only a moderate effect on the blood sugar level. This has many advantages, such as the improvement of the blood lipid profile (i.e., it reduces the levels of triglycerides and LDL cholesterol). Dark chocolate usually has a glycemic index of 49, compared to 100 for glucose. This relatively low glycemic index makes chocolate an ideal sweet treat that can be enjoyed with greater peace-of-mind.

The glycemic index is particularly important to diabetics, since it permits more effective control of their blood sugar level.

References:

1. Antiquity Vol 81 Issue 314 December 2007
2. Lyon Diet Heart Study: Benefits of a Mediterranean-Style, National Cholesterol Education Program/American Heart Association Step I Dietary Pattern on Cardiovascular Disease Penny Kris-Etherton, PhD, RD; Robert H. Eckel, MD; Barbara V. Howard, PhD; Sachiko St. Jeor, PhD, RD; Terry L. Bazzarre, PhD; for the Nutrition Committee Population Science Committee and Clinical Science Committee of the American Heart Association

