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# ESSEN RIVESTA

*ENTWINE WORLD AND NUTRITION*

**DARK CHOCOLATES**



**ESSEN**  
RIVESTA



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For some, there's therapy. For the rest of us, there's CHOCOLATE.

As the above quote says, when we hear the word "chocolate" there will be a huge intensity in our smile. Most of us love chocolates which indulged us to choose this topic. We take immense pleasure in unveiling before you the magazine about dark chocolates.

Chocolate plays a vital role in emotions, in the sense, happiness. Yup, Chocolate remains the sign of happiness. When we share immense love to our beloved one's we handout a bar of chocolate. Chocolate is the most craved food. The researchers hypothesized that the positive effects of having chocolate were due to the immediate sensory pleasure and emotional associations. It elevates your mood and makes you feel calmer. It is the sheer blissful joy of being able to fill one's mouth with rich solid food.

The word which puts smile on every child is chocolates. When we feel a bit too much happy, we would like to take a bite of chocolate, when we feel gloomy, we make ourselves comfortable with a bar of chocolate. In every single emotions of our life chocolate have been our best partner.

This magazine emphasizes the fact that consumers care about what's inside the chocolate as well as what's inside the package. This magazine unravels the history of chocolates, the current updates and social issues regarding chocolates, the newly evolving product which might be the most interesting part for chocolate lovers, secrets about chocolates and many more interesting facts are awaiting to regale you. We sincerely thank every people who took great effort in completing this magazine successfully. We hope this would satisfy all the readers. We expect all the readers to encourage the newly budding writers of this magazine.

Have a great August, and the monsoon is soon to come. Let's celebrate the monsoon with chocolates....

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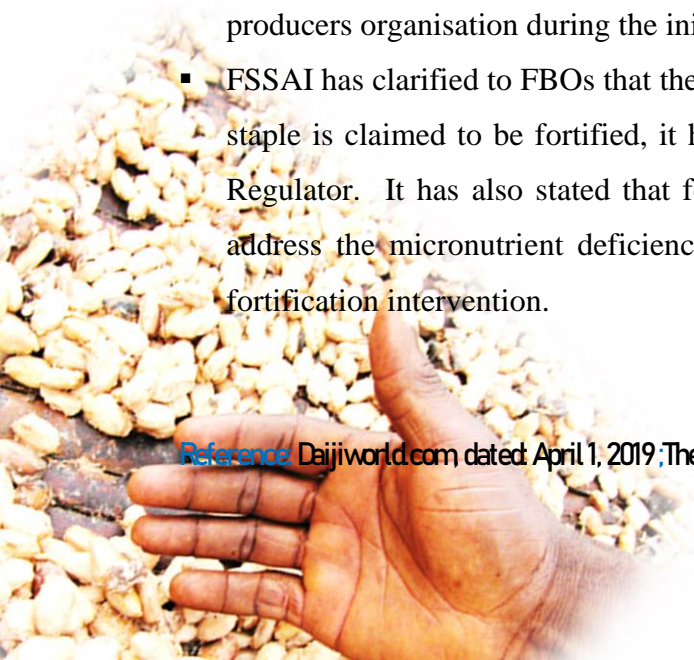


## NATIONAL NEWS

### MohanRaj B

- In Summer, the sale of Ice-cream increases and to ensure the quality, the Food Inspector of Telangana District have picked Ice-cream samples from the locality and sent them to State Food Laboratory at Nacharam to know the percentage of fat and other aspects. The fat content of Ice-cream must have at least 10% of fat. If not, an amount of Rs.3,00,000 is imposed as fine for those who selling these Ice-creams.
- The Department of Food Safety, Delhi directed series of raids at various sweet shops, milk products and even milk samples to ensure the quality. They collected about 113 milk samples from different localities and found 33 samples were sub-standard & 3 samples were misbranded.
- FSSAI issued order not to use calcium carbide or acetylene gas for the ripening of fruits vegetables. They asked all the States and Union Territories to conduct surveillance and enforcement activities.
- FSSAI has issued notice under Food Safety and Standards Act 2006 regarding statutory warning on label of alcoholic beverages. The Ministry of Health and Family Welfare has issued an order that all liquor bottles from 1<sup>st</sup> April, 2019 should contain prominent statutory warning, asking consumers to not drink and drive and outlining how alcohol consumption is harmful for health.
- Jammu and Kashmir's Food Commissioner has banned the sale of McDowell's packaged drinking water in the State after the detecting E. Coli in it. The commissioner described McDowell's No.2 Platinum Packaged Drinking Water as "unsafe".
- The food safety authority has now directed food safety officers to consider the organic food regulations as "Enabling Regulations" and not for prosecution – particularly for small original producers organisation during the initial phase of its implementation till April 1, 2020.
- FSSAI has clarified to FBOs that the fortification of staples is voluntary, saying that only if any staple is claimed to be fortified, it has to confirm to the norms prescribed by the Apex Food Regulator. It has also stated that food fortification was a scientifically – proven strategy to address the micronutrient deficiencies and studies showed improved health conditions after fortification intervention.

Reference [Daijiworld.com](http://Daijiworld.com) dated April 1, 2019; [The Hindu](http://TheHindu.com), dated April 6, 2019; [The Navhind Times](http://TheNavhindTimes.com), dated June 23





## International News



Sownnarubini M S

### **Love Cocoa with Luxury Easter eggs:**

Apr 16,2019

James Cadbury's Love Cocoa joined hands with Gabriella Cugno's British chocolatier and launches an upscale production of luxury easter eggs. Love Cocoa's has gone from strength to strength with annual turnover projected at \$79000 & aiming at \$1.63m within next five years. Chocolatier cugno's hand crafting the Dream eggs from a small production kitchen in London. The 'Yolk and white' is made using finest and freshest ingredients from Broadway Market in Hackney. "I am constantly looking for new ways to excite Love cocoa fans. With 100years anniversary of Cadbury Creme Egg on the horizon and with Easter being one of my favourite times of year. I wanted to create a luxury ethical offering for the British Public", Cadbury said.

Reference:<https://www.confectionarynews.com/Article/2019/04/16/James-Cadbury->

### **Nestle: Milkybar recipe to milk chocolates for the first time**

Mar 6,2019:

Nestle has introduced mix ups, the newly invented Milkybar chocolate buttons will appear in the UK and Ireland shops this week in single packs as well as sharing bags. Along with Milkybar mini eggs, it is the first time that any Milkybar product has been made in Newcastle, away from its more usual home of York. The company said Milkybar mix ups go on sale over the next few weeks in all major

retailers as a single 32.5g pack, a 78g pouch, a 95g sharing bag and a larger 196g 'more to share' bag. Alberto Pisanello, assistant brand manager for Milkybar, said: "We get a lot of requests from Milkybar fans who have been asking us to mix white chocolate with milk chocolate for a long time but it's not something we've done before with original Milkybar".

Reference: [www.confectionarynews.com](http://www.confectionarynews.com)

### **China incorporation of chocolates in local foods sector:**

Apr 5,2019

George Zhang, MD of Barry Callebaut China told Food Navigator says, "Chocolate may be favourite in other markets, but in China, other chocolate bars especially ice-cream was topping the sales chart". "If we were to compare ourselves to the Japanese, they have a per capita consumption of nearly 1kg per year, whereas in China, it is about 200g or 250g. There has been growth overall across different chocolate applications in China, but it has been a single digit growth," Zhang said. So joining the hands of Ruby chocolates for more taste and flavour, it hopes to help the other clients to incorporate chocolates in the Chinese foods such as chocolate bun, which hongkong restaurants already started. Zhang, also the speaker of FBIF 2019, where he will present the details about the company's new creation of Ruby chocolate. The FBIF 2019 will be held in Hangzhou International Expo Centre from April 23 to 25.

Reference:<https://www.foodnavigator-asia.com/Article/2019/04/05/Chocolate-in-China-Use-in-local-food-applications-key-to-category-success-Barry-Callebaut-China-boss>

# THE STORY OF DARK CHOCOLATE – A DEEP DIVE

Gokilavani, Halilur Rahman, Vijayakumar

*When most of us hear the word chocolate, we generally picture a bar, a box of candies, or a bunny. The verb that comes to mind is probably “eat”, not “drink”, and the most apt adjective would seem to be “sweet”. But for about 90 percent of chocolate’s long history, it was strictly a beverage and sugar didn’t have anything to do with it. Dark chocolate is also known as black chocolate, plain chocolate, or sour chocolate. It was a luxurious brown bitter drink that rich people could afford to drink. “I often call chocolate the best-known food that nobody knows anything about”, said Alexandra Leaf, a self-described “chocolate educator” who runs a business called Chocolate Tours of New York City. Eating chocolate not only gives us energy but also makes us feel happy due to a special ingredient which helps endorphines and also the most important reason of eating chocolate is its marvellous taste. If so, then let us look into the bittersweet story of this ancient treat.*

## THE HISTORY OF DARK CHOCOLATES – “FOOD OF THE GODS”

Cocoa was discovered by the Mayan Indians of Mexico and Central America more than 2000 years ago. The cocoa tree’s scientific name, *Theobroma cocoa*, is Greek for “Food of the Gods”. The word Chocolate is said to have come from the Mayan word *Xocoatl* which meant “bitter water”. Cocoa comes from the Aztec word *Cacahuatl*. The Mexican Indian word for chocolate comes from a combination of terms *Choco* (foam), and *atl* (water) because for centuries early chocolate was consumed as a drink.

The earliest evidence for the use of the cacao (also cocoa) plant for chocolate derive from the Olmec culture that populated southern Mexico more 3000-4000 years ago. While no direct evidence exists, such as written records, trace chemicals that include theobromine, found in the

plant, indicate that some ceramic vessels were used in the preparation or direct consumption of chocolate-derived products. Most likely, this early chocolate was roasted and fermented, where cacao seeds would have been first pulverized and grounded in using a mortar and pestle. In fact, for almost all of chocolate’s history, it has been drunk rather than consumed as a solid and often it was an alcoholic beverage.

## A historical treasure

The Mayans harvested the cocoa beans from the rain forest trees then later cleared areas of the forest to make way for the first known cocoa plantation. In fact, Mayan depictions indicate a ritual style consumption and this is suggested by Mayan writings; the cacao plant was later known to Europeans as the plant of the gods. The Aztecs, an ancient nomadic tribe in Mexico were unable to grow the cocoa bean themselves but were able to receive supplies from “tribute”, a form of taxation paid by the tribes they conquered. The Aztecs also used cacao and chocolate, where it also became a religiously important drink that had its own association with the god *Quetzalcoatl*, a feathered serpent deity who protected and held the knowledge of chocolate. Aztec myth states that the gods became angry when humans learned about chocolate. The Aztecs drank chocolate cold, suggesting some differences from the Maya who liked it mostly as a warm fermented drink. Both warm and cold drinks likely existed. The Aztecs, like the Mayans, used cocoa beans for currency. By the time the Spanish invaded Mexico in the 16<sup>th</sup> century, the Aztecs had created a powerful empire. In 1523, they offered the cocoa beans to Don Cortes. He brought this treasure back to Spain

where its formula was kept a secret for almost 100 years and was served only to the wealthy with Spanish nobility.

### **The popularity spreads**

Christopher Columbus was in fact the first European to discover cocoa beans on his 4<sup>th</sup> voyage to America in 1502, but dismissed his findings due to a greater interest in finding a sea route to India.

The arrival of Spanish conquistadors, specifically Hernando Cortes, brought Europeans not only in contact with chocolate, who initially did not like the taste of the drink as it was bitter, but the conquistadors also imported back to Europe. Chocolate, at this time, did not include sugar so it was usually quite bitter. European tastes were not as accustomed to bitter tastes for foods, resulting in Europeans looking for ways to modify the taste. By the 1590s, chocolate was now mixed with honey, vanilla, and sugar, giving it a much sweeter taste and it became more favourable. With the conquest of South America and later West Indies, and beginning of the establishment of sugarcane plantations, soon the production of sugar combined with chocolate revolutionized European tastes. Chocolate was still consumed as a drink, where it became associated with upper class tastes and the nobility in general by the early 17<sup>th</sup> century. Sugar consumption now began to increase in parallel with the importation of chocolate. The desire for chocolate and need for sugar, in part for chocolate, helped also to push the demand for slavery in plantations during the 17<sup>th</sup> and 18<sup>th</sup> centuries. Interestingly, some members of the church had initially potentially considered chocolate drinks as sinful, where some even drank it to divert themselves from long services. However, this changed as the elite and noblemen supported its consumption. The 17<sup>th</sup> century was also a time for experimentation with chocolate, including the first

known attempt to coat almonds with chocolate. Nevertheless, chocolate mostly remained a drink.

Anne of Austria, a Spanish Princess who became wife of the French King Louis XIII, declared chocolate as the drink of the French court in 1615. Chocolate became popular in Italy and England in the early 17<sup>th</sup> century. In 1657, the first Chocolate Shop was opened in London. In 1828, C J Van Houten invented the cocoa Press which extracted cocoa oil. The residue was ground into cocoa powder.

**Chocolate comes to Pennsylvania** Due to religious persecution that the Quakers faced in England, thousands migrated to America and settled in the colony of Pennsylvania founded in 1682 by William Penn. During the industrial revolution, it was the Quakers who were credited with investing in cocoa as a commodity and further developing it into a business. Through their efforts, cocoa became more affordable to the masses. One of the Quaker's aim was to persuade the poor to give up alcohol in favor of a healthier chocolate drink.

By the second half of the 18<sup>th</sup> century, with the introduction of industrialization in the UK, the first chocolate factories were being created that used hydraulic machinery. In subsequent decades, the entrepreneurs began to experiment with different machinery to facilitate the process of separating cacao butter from cacao seeds and making chocolate not only easier but also with new tastes. The 1730s also began to break the Spanish monopoly, mostly in Central and South America, of cacao, where it was soon spread to other parts of the Americas and Africa for production. Gradually, Africa became the leading producer of cacao, but this took some time to develop. In the colonies in the United States in 1765, in the state of Massachusetts, the first chocolate factory was built.



By the 1820, new machines were invented that separated cacao solids and butter. Soon, cacao powder was produced. Chocolate now became more mass produced. The German chocolate manufacturer, still producing chocolates today, also established its first factories and helped to bring chocolate to a larger market, although it was still a product for the upper classes.

In 1828, a Dutch chemist found a way to make powdered chocolate by removing about half the natural fat (cacao butter) from chocolate liquor, pulverizing what remained and treating the mixture with alkaline salts to cut the bitter taste. His product became known as “Dutch cocoa”, and it soon led to the creation of solid chocolate.

The creation of the first modern chocolate bar is credited to Joseph Fry, who in 1847 discovered that he could make a moldable chocolate paste by adding melted cacao butter back into Dutch cocoa. Finally, in 1848, the realization was made that adding cacao butter, sugar, and cacao liquor allowed the creation of what would be edible, solid chocolate, which proved to be a revolutionizing moment for chocolate consumption that allowed it to become a more diverse food product.

By 1868, a little company called Cadbury was marketing boxes of chocolate candies in England. Milk chocolate hit the market a few years later, pioneered by another name that may ring a bell-Nestle. In Dorchester Massachusetts, milk chocolate was invented in 1875 by Daniel Peter. In 1879, cocoa butter was reintroduced back into chocolate to form the chocolate bar as we know it today.

World war 1 really brought attention to chocolate. The US Army commissioned various American chocolate manufacturers to provide 20 to

40-pound blocks of chocolate to be shipped overseas to our troops on the battle line. The blocks were chopped up into smaller pieces and distributed to Doughboys in Europe. When the soldiers returned from war, they created a greater demand for the chocolate that they became so fond of in the battlefield.

### **Nestle Chocolate Bars**

Chocolate had come a long way during the 19th century, but it was still hard and difficult to chew. In 1879, another Swiss chocolatier, Rudolf Lindt, invented the conch machine which mixed aerated chocolate giving it a smooth, melt-in-your-mouth consistency that blended well with other ingredients with a good taste.

By the late 19th century and early 20th century, family chocolate companies such as Cadbury, Mars, Nestle and Hershey were mass-producing a variety of chocolate confections to meet the growing demand for the sweet treat.

By the 1840s, the notion of Valentine’s Day as a holiday to celebrate romantic love had taken over most of the English-speaking world. It was Cupid’s golden age: The prudish Victorians adored the notion of courtly love and showered each other with elaborate cards and gifts. Into this love-crazed fray came Richard Cadbury, scion of a British chocolate manufacturing family and responsible for sales at a crucial point in his company’s history. Cadbury had recently improved its chocolate making technique so as to extract pure cocoa butter from whole beans, producing a more palatable drinking chocolate than most Britons had ever tasted. This process resulted in an excess amount of cocoa butter, which Cadbury used to produce many more varieties of what was then called “eating chocolate.” Richard recognized a great marketing



opportunity for the new chocolates and started selling them in beautifully designed boxes. From that point, it was a quick jump to take the familiar images of Cupids and roses and putting them on heart-shaped boxes. While Richard Cadbury didn't actually patent the heart-shaped box, it's widely believed that he was the first to produce one. Cadbury marketed the boxes as having a dual purpose: When the chocolates had all been eaten, the box itself was so pretty that it could be used again and again to store mementos, from locks of hair to love letters. The boxes grew increasingly elaborate until the outbreak of World War II, when sugar was rationed and Valentine's Day celebrations were scaled down. But Victorian-era Cadbury boxes still exist, and many are treasured family heirlooms or valuable items prized by collectors.

### **Fair Trade chocolate**

Modern-day chocolate production comes at a cost. As many cocoa farmers struggle to make ends meet, some turn to low-wage or slave labour to stay competitive.

This has prompted grass roots efforts for large chocolate companies to reconsider how they get their cocoa supply. It's also resulted in appeals for more "fair trade" chocolate which is created in an ethical and sustainable way.

### **Chocolate Today**

Most modern chocolate is highly-refined and mass-produced, although some chocolatiers still make their chocolate creations by hand and keep the ingredients as pure as possible. Chocolate is available to drink, but is more often enjoyed as an edible confection or in desserts and baked goods. While your average chocolate bar isn't considered healthy, dark chocolate has earned its place as a heart-healthy, antioxidant-rich treat.

## **RECENT INNOVATIONS**

A good deal of recent research has focused on novel fermentation and drying methods for chocolate. An example of this is the development of custom yeast starter cultures for fermentation. In addition, Mars patented the use of airtight bags to avoid off-flavor development during fermentation. The use of special polyethylene sheets is being developed to convert the sun's ultraviolet rays to infrared, heating the beans to 50°C–60°C during sun drying and allowing the beans to reach the final 7% moisture content faster than regular sun drying. Research on optimization of processing conditions to enhance the nutritional properties of dark chocolate is also underway.

Dark chocolate is loaded with nutrients that can positively affect the health. Made from the seed of the cocoa tree, it is one of the best sources of antioxidants on the planet. Studies show that dark chocolate (not the sugary crap) can improve the health and lower the risk of heart diseases. Some of its benefits are as follows:

- Very nutritious
- Powerful source of antioxidants
- May improve blood flow and lower blood pressure
- Raises HDL and protects LDL from oxidation
- May reduce heart disease risk
- May protect your skin from the sun
- Could improve Brain function

Dark chocolates typically contain some sugar, but the amounts are usually small and the darker the chocolate, the less sugar it will contain. Chocolate is one of the few foods that taste awesome while providing significant health benefits.



## CACAO Vs COCOA

Karnicka K

I have noticed that some packages say, they contain “CACAO” and while others “COCOA”. Let’s take a look at the differences between cacao and cocoa. Chocolate is made up of cacao beans or seeds from *Theobroma cacao* tree. Cacao and Cocoa arises from the same place but the processing makes all differences.

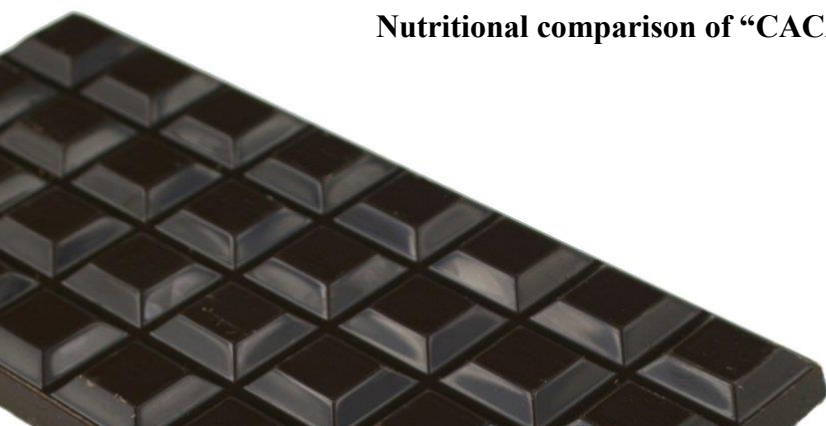
In Cacao, once the beans are dried, they are heated at low temperature. The heat separates the fatty part of the bean. Cocoa starts the same way however; it’s heated at higher temperature. This results in sweet flavour. The heat actually affects the bean at molecular level, changing the structure and degrading the nutrient content. Cacao which is less processed has more antioxidant and health benefits.

“Cacao”- the pods, beans and ground up contents,” cocoa”- the powder left after pressing the fat out of ground beans.

“Cacao” is the bean and the pod before they’re fermented; “cocoa” is the bean after fermentation. “Cocoa” is mainly used for baking. Cacao contains essential vitamins and minerals while **cocoa** often contains sugar, fat, hydrogenated oils, artificial flavouring. Cacao is mainly used in chocolates. It is the pure form of chocolate. Cocoa mainly refers to powder that are stirred into beverages.

|               | UNSWEETENED<br>COCOA POWDER | UNSWEETENED<br>CACAO NIBS | SEMI- SWEET<br>CHOCOLATE<br>CHIPS | DARK CHOCOLATE<br>70%-COCOA |
|---------------|-----------------------------|---------------------------|-----------------------------------|-----------------------------|
| CALORIES      | 64                          | 160                       | 140                               | 160                         |
| FAT           | 3.5g                        | 11g                       | 8g                                | 13g                         |
| SATURATED FAT | 2g                          | 2.5g                      | 5g                                | 8g                          |
| PROTEIN       | 5g                          | 9g                        | 1g                                | 2g                          |
| CARBS         | 16g                         | 6g                        | 20g                               | 14g                         |
| ADDED SUGAR   | 0g                          | 0g                        | 18g                               | 9g                          |
| FIBER         | 9g                          | 3g                        | 1g                                | 3g                          |

**Nutritional comparison of “CACAO” and “COCOA” products:**



## Health benefits of “CACAO” and “COCOA”:

1. Cacao has been known to suppress coughing and may reduce the risk of type 2 diabetes.
2. Flavanols are anti-inflammatory and heart protective antioxidants present in cocoa. Hence, they can protect against cardiovascular disease, reduce the risk of stroke, and improve blood circulation.
3. Cocoa consumption gives relief from high blood pressure, cholesterol, obesity, bronchial asthma, cancer and various neurodegenerative diseases.
4. Cocoa is beneficial for quick wound healing, skin care and helps to improve brain health
5. Cocoa also helps in treating copper deficiency.



## THE DARK SIDE OF DARK CHOCOLATE

Shalini S

Dark chocolate is a form of chocolate containing cocoa solids, cocoa butter and sugar without milk. The healthiest dark chocolate containing a cocoa percentage of 70% or higher provides antioxidants and health benefits. Dark chocolates also have its negative side.

Dark chocolates have higher caffeine content than milk chocolates. Consuming large amounts can lead to an increased heart rate, diarrhoea, anxiety, irritability, nervousness and dehydration. Caffeine increases blood pressure. Since caffeine causes insomnia, we should avoid eating dark chocolates before going to sleep.

Dark chocolates may trigger the symptoms of migraine. Dark chocolates contain a natural chemical compound called tyramine, which causes

migraine. Dark chocolates are also high in sugar which can raise the blood sugar level. Hyperglycaemia can trigger migraine headaches.

Dark chocolates can also cause kidney stones. Dark chocolates contain oxalates which results in increasing urinary oxalate excretion which gradually increases the rate of kidney stones.

**“TOO MUCH OF ANYTHING IS GOOD FOR NOTHING”**





## **CHOCOLATE IS NOT AN ADDICTION; IT IS SIMPLY A REAL NECESSITY.**

Priyadharshini R

The one and only thing people enjoy each and every day is chocolate. It always holds the top most position in the wish list of young ones to adults. However, dark chocolate, unlike the other type of chocolates are truly a healthy choice if the right brand is chosen.

The main content of the dark chocolate is cocoa. Cocoa contains a variety of chemicals, including antioxidants called “flavonoids”. Although it isn’t clear how effective they are on our body, but they appear to cause relaxation of veins, which could lead to lower blood pressure. These might also reduce the activity of chemicals in the body that promote inflammation or blockage of blood vessels. Let us have a deep discussion about the effects of dark chocolates on our body.

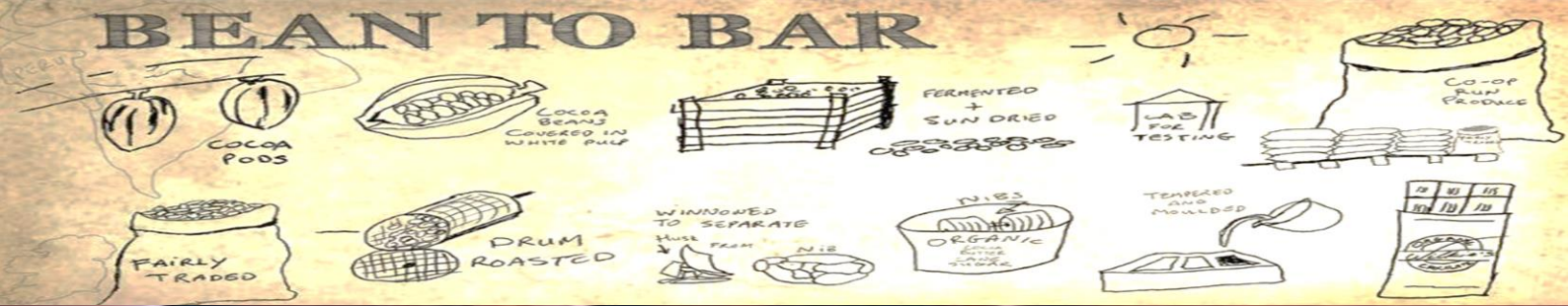
As a cardiologist, Dr.Suzanne Steinbaum of Lenox hill hospital in New York city says, “*When looking for a sweet snack, a square of dark chocolate might in fact be your healthiest choice*”. Even though, chocolates have lots of benefits, diabetes people hesitate to consume it but fortunately, a recent study by the American Diabetes Association has listed 25 food for diabetes that help ward off heart diseases, stroke, dementia, high blood pressure and obesity. What tops this list is dark chocolate. Consuming dark chocolate is said to reduce insulin levels and help to control cravings. Their studies also show that people who consume dark chocolate craved less for salty, sweet and fatty foods. Eating chocolate is often associated with happiness and celebrations. Studies have proved that chocolate can help to improve our mood, making us feel calmer. Dark chocolate contains Serotonin which is an antidepressant. Despite the mood boosting effects, it is important not to fall into the habit of finding comfort.

Like the double-edged sword, there are some negative impacts on consuming dark chocolate. Cocoa contains Caffeine and related chemicals. If you are sensitive to Caffeine it is important to know there are measurable amounts of caffeine in dark chocolate. Eating chocolate containing large amounts of caffeine causes side effects such as: nervousness, sleeplessness and fast heartbeat. If you are allergic or have an intolerance to dairy products, be extra careful before choosing your dark chocolate as milk is legally permitted to be put into dark chocolate, and it’s one of the 8 major food allergens. Another possible allergen in dark chocolate is soy lecithin which is commonly added as emulsifying agent. Soy lecithin does contain trace amounts of soy proteins and these have been found to include soy allergens. Hydrogenated oils, another term for Trans fats, is one ingredient to especially steer clear from as they are linked to heart disease, stroke and diabetes.

Now the final question in our mind is, “*Are dark chocolates actually good for our health?*” The answer is most probably a *Yes*, as you choose the right product. When you choose the best and healthiest option there are so many awesome benefits of dark chocolate.



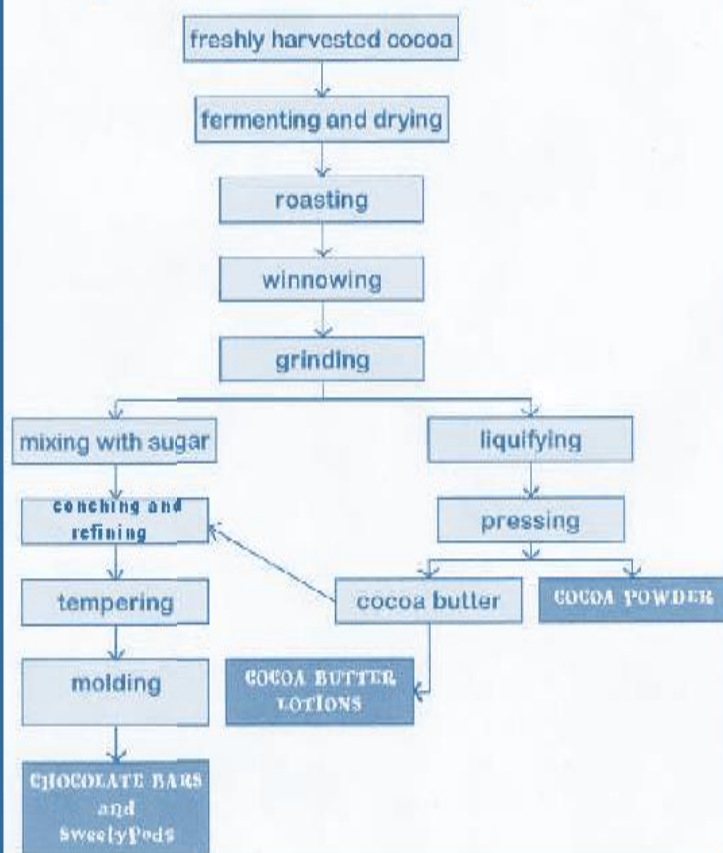
# BEAN TO BAR



Monica V , Nanda B

The journey from cocoa tree to chocolate bar is not complex, but it requires several steps, each of which require careful treatment to get the best from the finished product. This guide shows how “BEAN TO BAR” chocolate is made.

## The Process Flow-Chart



### HARVESTING

After the pods are ripened, they are harvested at 2 harvest seasons the main harvest and the mid harvest.

### REMOVING COCOA

After harvesting, cocoa is removed from pods using a heavy knife. The beans are piled on the tops of large banana leaves

### FERMENTING

Fermenting is done to remove the mucilage, stop the cocoa beans from germinating and for high quality cocoa bean development

### DRYING

The humidity of beans is brought below 10% by drying under sun and stored for 4 to 5 days.

### ROASTING AND WINNOWING

Depending upon the humidity, size of beans and the desired flavor to darken the colour, roasting is done.

Roasting is followed by winnowing in which shells of beans are removed.

### GRINDING

Cocoa nib/ cocoa core is ground into a paste called chocolate liquor with no alcoholic content.

### CONCHING

Conching derived from Spanish word is used in making chocolate. The characteristic taste, smell and texture are developed.

### TEMPERING AND MOLDING

At this stage, desired shape and size of chocolates are achieved.

## SCIENCE DATA

Sownnarubini M S

### THEOBROMINE:

A mild stimulant that causes mood elevating effects.

### ANANDAMIDE:

A messenger molecule associated with natural highs similar to the effects of cannabis.

### TRYPTOPHAN:

A raw material that helps the brain make serotonin which promotes feelings of well being

### CAFFINE:

The well-known stimulant that acts on the central nervous system.

### PHENETHYLAMINE:

A substance popularly dubbed the “love chemical” associated with feelings of attraction and excitement

[Reference](https://Periodic-graphics-chocolate-chemistry.html) <https://Periodic-graphics-chocolate-chemistry.html>

## WHO AM I?

Madhubala K

Hello everybody! I am a small evergreen tree in the family Malvacea, distributed from south eastern Mexico to amazon basin. My flowers are produced in clusters directly on the trunk known as cauliflory and pollinated by tiny flies, forcipomyia midges. My botanical name is *Theobroma cacao* which means ‘god food’. I generally reap fruits after 3 years and proudly say that I can live up to 100 years after maturity. The Olmecs civilization were the first to find that my fruits are edible. My fruits look like small melons and the pulp contains 20 to 50 seeds or beans, for which I am familiar. I am celebrated nationally on December 13<sup>th</sup> every year. Guess who I am?

THE ANSWER FOR THE PREVIOUS EDITION WHO AM I?

**STEVIA**



## PREPARATION OF CANDIED WATERMELON RIND

Kiruthiga

Candied watermelon rind was prepared by osmotic dehydration that involves slow impregnation of syrup. From the study, it can be seen that drying time significantly affected the moisture content of the watermelon rind dehydrated candy. Moisture content was significantly decreased with drying time. Watermelon rind dehydrated candy that dried for 6 hours was preferred as sample by panellists as it received good comments about texture, taste and overall acceptability attributes. It can be concluded that 14 hours of drying time is the most appropriate to dry the candied watermelon rind.



Watermelon, *Citrullus lenatus* is a tropical fruit which grows in almost all the parts of Africa and South East Asia. The skin is smooth, with dark green rind or sometimes pale green stripes then turn into yellowish green when ripe. Watermelon can be categorized into three main components i.e. the flesh, seed and rind. Watermelon rind has 95% of water content that making it susceptible to deterioration. Therefore, pre drying treatment such as osmotic dehydration is commonly used in order to minimize adverse changes occurring during drying. Osmo-air drying is the combined approach of drying method in which osmotic dehydration and hot air drying is carried out simultaneously one after another. This drying

process is an economical method of drying for fruits or vegetables containing more than 70% moisture content. Candied products were predicted to have a longer shelf life with no microbial growth as they contain 65-70% of sugar with water activity values at 0.6-0.8.

### MATERIALS REQUIRED:

- 2 cups of sugar
- 1 lemon (peel only)
- ¼ cups salt for brine making
- 4 cups of watermelon rind
- Peelers
- Knife

### PROCEDURE:

STEP1: Prepping the rinds.

First is peeling all the green off of your rinds. The rind should contain little amount of green color and pink on the rind.



STEP2: Preboiling

Put the rinds into warm water and boil them for 5 minutes. After 5 minutes, drain them and allow them to cool.





### STEP3: Brine

Mix 1 quart of water and  $\frac{1}{4}$  cup of salt

Add the rinds to the brine mixture and to soak for at least 6 hours.



### STEP4: More boiling

Drain the rinds – cover them with water gently mix them around, then drain them again. Repeat 3 more times.



After all rinds are rinsed, add them to the pot and cover them with water again. Bring to a boil and cook until tender. Drain and set aside.

### STEP5: Candying time

Now, combine 2 cups of sugar,  $\frac{1}{4}$  cup of water and peel of 1 lemon. Cook until this reaches the “soft ball stage”.



Cook until the liquid forms a squishing ball when dropped into cold water. Once sugar reaches the correct temperature, add your watermelon rinds. Make sure to stir this to keep them from burning.

### STEP6: Drying and waiting.

Once the sugar syrup gets thick and starts to form long, sticky threads –transfer the rinds to sunlight drying.

Let the rinds dry until rinds still tacky to the touch, but not wet. Let them be for more than 6 hours in sunlight.

### STEP7: Pour some sugar.

Carefully coat each piece in sugar. Only do a few pieces at a time or the rinds will stick together.



### CONCLUSION:

The physical characteristics and sensory acceptance of the dehydrated watermelon rind candies as influenced by the drying time have been conducted. The drying time significantly affected the moisture content of the dehydrated watermelon rind candies. These results showed that longer drying time will result in a significant decrease in the moisture content of the dehydrated candies. This showed that drying time affect the sensorial characteristics of the dehydrated watermelon rind candies.

## HYDRATING FOODS

Venkatsubramaniam

As summer is up, it is necessary for all of us to stay hydrated during the summer. The most essential nutrient to stay hydrated is water. Water is also considered as one of the most important nutrients. 72-75% of the whole body contains water. Drinking water makes your heart to pump the blood into the blood vessels easily. According to WHO, a person should drink at least 2-3 litres of water per day to stay healthy. Besides, drinking water is the only best way to stay hydrated and healthy, you can also get your water from foods that have a high water content, mainly from fruits and vegetables. Especially when exercising or participating in outdoor activities overheating and dehydration can quickly occur. For persons who hesitate drinking water often they can get their water input from food containing high water content. Also, they may get additional nutrients present in those foods which makes them healthier. Some of the hydrated foods are Cucumber, Watermelon, Muskmelon, Star fruit, Tomatoes, Radishes, Strawberry, Coconut water etc. Cucumber leads among all the fruits as it contains 96% of water content. Next comes the watermelon having 91% of water content. Cucumber may also be taken with yogurt or ice cubes to increase its water content. It is a good snack as it can be taken like a salad or sandwich having a slice between 2 bread slices. Watermelon can be taken as such or it can be taken as a juice. Iceberg lettuce has 95% water content in it. It also gives iron as a major nutrient. So, to avoid fatty food like burger or sandwich, a munch on the crispy veggie can be taken with iceberg lettuce. Strawberries contain water content upto 92%. It is capable of giving required amount of water and minerals. It also has antioxidant properties in it which prevents the damaging of cells caused by free radicals that the body produces as a reaction to stress or other environmental pressures. Strawberries are juicy and mostly used to get flavours in ice cream, milk shakes and salads. To get the required amounts of water and minerals, it can be taken before workout or exercise as a snack. Next one is tomato which contains 94% water content. Most South Indian foods has parts of tomato into it as it is basic flavour adding substance and as antioxidant properties. It can also be taken as direct slices in sandwich or burger etc., in different forms. Tomato sauce is also a good one as it is taken for burgers and snacks as a side dish. There is an important fact that those who hesitate to take one full tomato must drink 2 glasses of water to balance the nutrient. It can also help



in other heart diseases and cancer. Capsicum is also one of the important hydrating foods as it contains 93% water content in it. The capsicum or green pepper used in household's also has antioxidant properties. It can be taken in food as small amount. In addition, it can be taken as a dip with your chips or snacks. Muskmelon is a fruit that contains more than 90% water content. It is a perfect food during summer. It contains high amounts of  $\beta$ -carotene and Vitamin A. It regulates blood pressure and hypertension and provides nutrient to stay healthy and keeps away from heat related problems. It contains very less amount of fat, so that adults and children can take it as a juice or fruit daily. Grapes contains 82% water content in it. It can be taken as a fruit or juice or can be taken as toppings over yoghurt or salad. It is also great for people who needs to gain weight. It is also best known for its antioxidant or anti-inflammatory properties. Coconut water keeps us better hydrated. It is healthier than plain water and has more beneficial effects. It is low in calories, low in sodium, but contains high amounts of potassium. So sports person can take this to stay hydrated because it contains less sugar than other sport drink and lighter than normal water. It contains about 94% of water content. The science behind the fact that coconut water keeps you more hydrated than normal water is actually lacking. Many researchers have different opinions. Besides fruits and vegetables, millet meals are traditional foods in Tamil Nadu which are good hydrating foods during summer. Kambu koozh is a cooler drink consumed during summer. It is a very good meal and it can also be taken as breakfast. Most of the field working persons take this as a breakfast or may be as a brunch. It keeps our stomach full and also provide much nutrient that keeps us healthy. Benefits of pearl millet, ragi and bajra takes a very long list. Doctors also suggest this for all the youngsters and adults to take them in their diets. It also helps in weight loss and is suggested for people having obesity. In general, citrus fruits also have high water content (Oranges-87%, Grapeps-88%, Lemon-82.6%). Citrus fruit also helps as it has antibacterial properties, antioxidant properties and helps to build up immune system. As citrus fruits contain citric acid in them after eating or drinking goggle your mouth with plain water because the acid may cause erosion to the tooth enamel and it may also affect the stomach causing irritation or ache. Water is very much essential for a healthy life to sustain. A healthy person needs 30 to 50 ounces of fluid per day. They can be given to our body not only by means of water but also by fruits and vegetables. Eating healthy and keeping hydrated does wonders; it centres our mood and helps one keep a sharp mind.

## Nestle ALPINO 71% Cocoa – Intensively Dark Chocolate

Shanmugadevi

Nestle introduces the new variety of Dark Chocolate Which is ALPINO 71% Cocoa – Intensively Dark Chocolate. This one of the European Product since 1959. This Dark Chocolate variety was approved by **Food Safety and Security Authority of India (FSSAI)**.



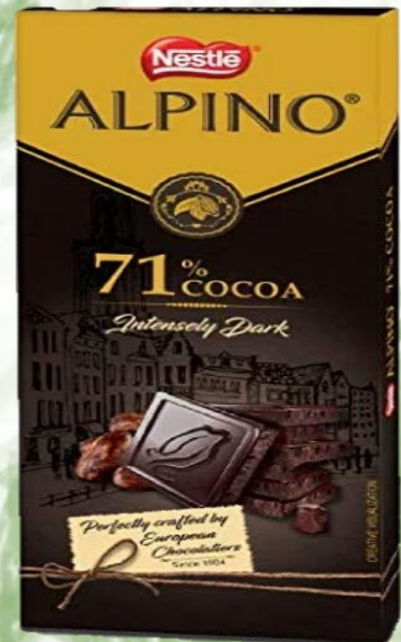
### Ingredients:

- Cocoa Solids - 64 %
- Cocoa Butter - 7%
- Emulsifier - 322 & 476
- Sugar

### Nutrition Information:

Nutritional information for 100 g of the Dark Chocolate

- Energy - 353 Kcal
- Protein - 6.8 g
- Carbohydrate - 20.9 g
- Total Sugars - 19.3 g
- Sugar (Sucrose) - 19.1 g
- Fibre - 2.3 g
- Total fat - 26.9 g
- Saturated fat - 26.1 g
- Trans fat - 0.39 g
- Sodium - 14.3 mg



### Features and Details:

- It contains added natural and natural identical flavouring substances
- It may contain Gluten, Milk, Nuts, Peanuts and Soybean





## DARK CHOCOLATES

Bharath J

Dark chocolates industries are witnessing its tremendous growth in India. Since it is a matter of healthy treat, Indian consumers have developed a good exposure to premium chocolates apart from traditional sugar mixed chocolates. The dark chocolates have its own uniqueness over milk and white chocolates, as dark chocolates are rich in polyphenols and antioxidants.

### Mondelez India foods

Mondelez India foods popularly known as Cadbury has introduced its first dark chocolate variety in the name of Cadbury **Dark milk** in Australia in 2017. Cadbury which is popularly known for its milk chocolates had introduced its first dark milk bar with rich cocoa content owing to its customer demand taking the privilege as first US confectionary to add a standard dark milk option. The Company has increased the cocoa content from 23% (in diary milk) to 40% (chocolate diary) which offers a “more grown up taste” said Cadbury owner, Mondelez International.

### Nestle India foods

Nestle one of the swiss multinational food and drink company which popularly brands its dark chocolate in the name of KitKat dark chocolates. It had made its uniqueness in every part

of Chocolate processing. It has introduced NIR spectroscopy as evaluation system in cocoa nib preparation. Nestle research has found that energy can be saved upto 32% by using a multirole extruder, in addition to a conch.

### Hershey India Pvt. Ltd.

Hershey, an US based company is one of the largest producers of chocolates in the world. One of its recent establishment was Hershey kisses, a value-added product to increase its brand value in which it had introduced **Hershey kisses special dark**. “India is particularly interesting to me, it is one of the most vibrant economies, it is a young company and most vibrant economies” said Michele buck, CEO of the Hershey in her recent interview. It shows that Hershey had good plans over extending its wide market in India in alliance with godrej.

### Gujarat Cooperative Milk Marketing Federation

GCMMF which is famous for milk and milk products had created a dark chocolate revolution by making its ‘**single origin dark chocolates**’ with rich cocoa content chocolate variants. The Amul marketer GCMMF is getting new recognition as India’s “dark chocolate maker” as it

offers nutritionally rich cocoa with maximum quantity in a chocolate bite making the chocolate consumption a healthy affair. Having chocolates upto 75% cocoa content, Amul now plans to launch 100% cocoa chocolates setting new rules for the chocolate industry. “The aim is to upgrade the existing chocolate consumers from sugar rich to cocoa rich experience. We are the only players to have cocoa content upto 75% in our dark chocolates. Soon we will be launching chocolates with 90% cocoa content and going upto 100%. Amul chocolates have created a new niche in the chocolate industry” said R S Sodhi, Managing director, GCMMF.

Amul has invested Rs300 crore to upgrade its chocolate facility at Mogar on national highway-8 from 200 tonnes per month to 1000 tonnes with an excess room for doubling the capacity at same premises. From the current turnover of approximately Rs150 crores it is expected likely to touch 1000 to 2000 crores by the year of 2020 as awareness and acceptance arises for the dark chocolates. In mid 2016, Amul revamped its chocolate branding and introduced dark chocolates on different varieties.



## *Will consuming chocolate gain calories?*

Sri Vasu Prada

*“Chocolate is cheaper than therapy and you don’t need an appointment”-Catherine Aitken*

Cholesterol is a fatty and waxy substance that does not dissolve in blood. We need it because our cells use it to form the membrane, a critical part of the cell. We get concerned about cholesterol when there is too much of it, particularly when there is too much low-density lipoprotein or LDL cholesterol.

Chocolate contains a chemical often referred to as flavonoids, which are the same chemicals found **in red wine**. This has been found to lower LDL cholesterol as well as to exert a protective effect against heart disease. Dark chocolates contain higher amounts of flavonoids and therefore may be more beneficial.

High quality chocolate contains a large amount of cocoa butter, which does not contain cholesterol because it is extracted from the cocoa bean. Cocoa butter contains three kinds of fatty acids:

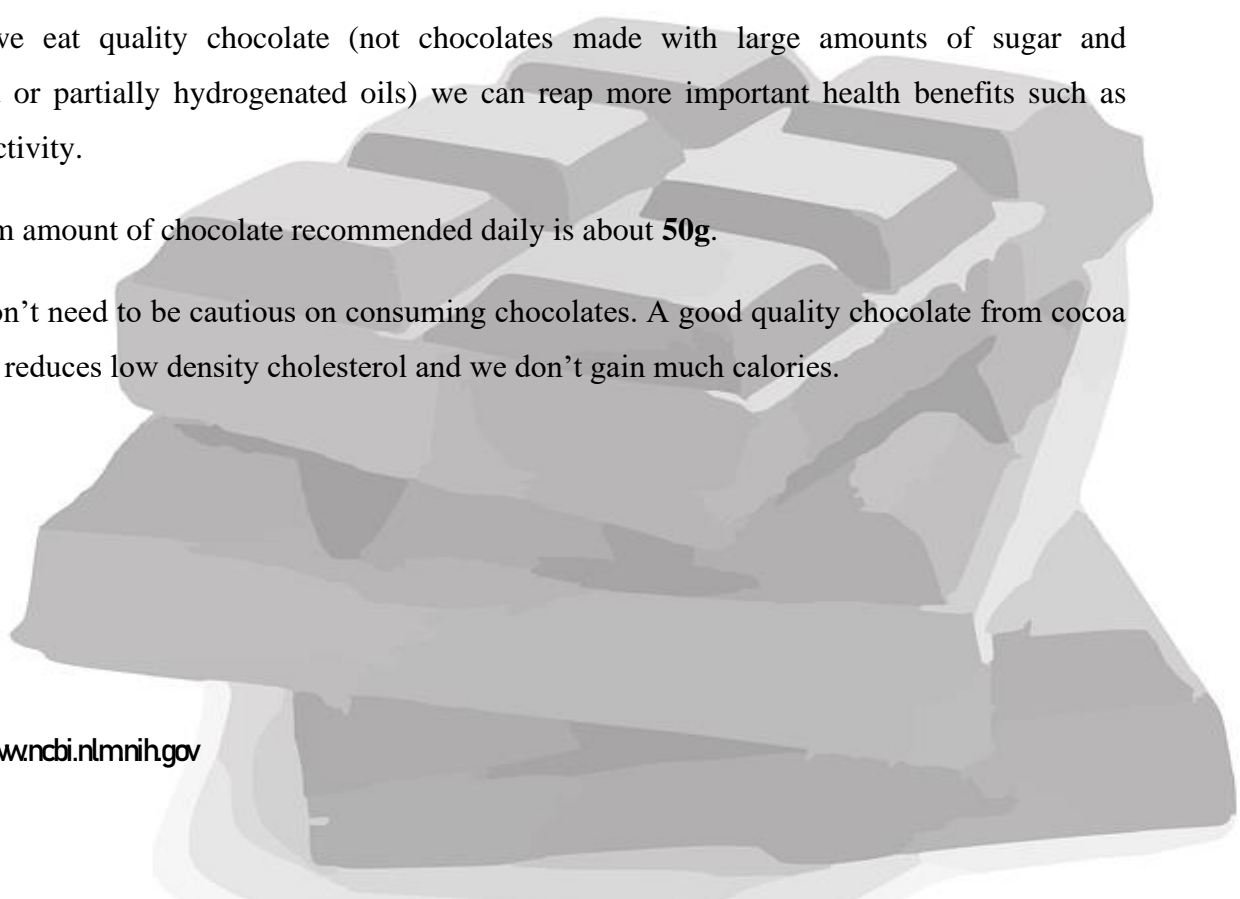
- ♣ Palmitic fat: a saturated fat in small amounts.
- ♣ Stearic fat: a saturated fat that does not affect cholesterol levels.
- ♣ Oleic fat: a mono saturated fat that can protect us from many ailments including cardiovascular disease.

If we eat quality chocolate (not chocolates made with large amounts of sugar and hydrogenated or partially hydrogenated oils) we can reap more important health benefits such as antioxidant activity.

The maximum amount of chocolate recommended daily is about **50g**.

Hence, we don’t need to be cautious on consuming chocolates. A good quality chocolate from cocoa bean actually reduces low density cholesterol and we don’t gain much calories.

Reference: [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)



## SECRETS THAT YOU DONT KNOW

Prithiv Atharash S, Varun Surya

- The smell of chocolate increases Theta brain waves, which trigger Relaxation
- There are 6 kinds of brain waves in which theta is referred as sleep waves
- Eating dark chocolate every day reduces the risk of heart disease by 1/3.
- Dark chocolate widens arteries and promotes healthy blood flow that can prevent the build-up of plaque that can block arteries
- Chocolate can cause headaches and is not recommended in large doses for people who suffer from migraines or chronic headaches.
- Because chocolate contains high doses of caffeine and sugar, chocolate products are largely to blame for ADHD (Attention Deficit Hyperactivity Disorder) in children
- Dark chocolate is 1% water, 46% carbohydrates, 43% fat, and 8% protein.
- 100 grams of dark chocolate supplies several dietary minerals, such as iron at 92% of the Daily Value (DV), vitamin B6 at 29% DV, Calories -599kcal, D.F(Dietary Fiber)-10.9g.
- Dark chocolate contains 70-100% cocoa solids,Eating cocoa solids can help a person improves more copper and magnesium content.



## DATA CARD

Devipreethi

| DIFFERENT BRANDS OF DARK CHOCOLATE | COCOA CONTENT (%) |
|------------------------------------|-------------------|
| Endangered Species                 | 72                |
| Lindt                              | 85                |
| Green & Black                      | 70                |
| Ghirardelli Intense Dark           | 86                |
| Godiva                             | 72                |
| Ritter Sport                       | 73                |
| Loving Earth                       | 72                |

### DIFFERENT BRANDS AND COCOA CONTENT (%)

