

## Carob Powder Alternative to Cocoa

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### Abstract

The Objective of the study was after looking to consumption of Cocoa by all the age groups and the later on adverse effects of it on human health by number of factors like Caffeine, theobromine, higher sugar and fat content and of course the economical feasibility as carob is cheaper than cocoa. If we see in the case study we can find numerous benefits with better sensory effects if we start the use of carob with Cocoa powder. So, we can consider carob as a great alternative on commercial level.

**Keywords:** Carob Powder; Cocoa

### Introduction

Carob trees are grown from antiquity in the most of the countries that is Mediterranean basin, Greece, Italy, Africa. And further it was spread by British throughout the world including India. In the parts of South India Carob trees are grown exclusively. Carob Tree's botanical name is *Ceratonia siliqua*. Carob is also called as algarroba, locust bean etc. The fruit pod gives after removal of seeds, carob powder which is often used as chocolate substitute as the carob is having benefit over cocoa, that it does not contain Caffeine and Theobromine.

The principle compound of carob is Gallic acid. The pod of carob tree is used for carob powder preparation. Total production of carob is around 310,000 tonnes/Year. It got many benefits onto to the Cocoa so this can be used as an alternative to Cocoa. It is cost effective if we compare to cocoa as cocoa is more costly in all aspects. It is used in many products which are confectionary based like in Chocolates, pastry's, muffins etc. It also contain high amount of sugars due which carob based products requires less external addition of sugar. The different sugars present in Carob powder are Sucrose, Glucose, and Fructose etc.

After harvesting, long bean-like pods from the carob tree are cooked for a short time or roasted and then ground into carob powder (roasting enhance its chocolate-like flavour). The fruit of carob is pod, technically a legume 15 to 30 cm in length and fairly thick broad. Pod are borne on the stems of the plant on short flowers stalks. Interestingly, most carob trees are monoecious, with individual male and female flowers. The dark brown pods are not only edible, but rich in sucrose (almost 48% sugar) and protein (up to 8%) [1-10].

## Nutritional composition of carob powder

Nutrient	Amount
<b>Basic Component</b>	In grams
Protein	4.8g
Water	3.7g
Ash	2.3g
Calories	
Total Calories	229
Calories from Carbohydrate	204
Calories from Fat	6
Calories from Protein	19
<b>Carbohydrates</b>	
Total Carbohydrate	91.6g
Dietary Fiber	41g
Sugars	50.5g
<b>Fats and Fatty Acids</b>	
Total Fat	0.7g
Saturated Fat	0.1g
Monounsaturated	0.2g
Polyunsaturated Fat	0.2g
Total Omega-3 Fatty Acid	4.1 mg
Total Omega-6 Fatty Acid	218 mg
<b>Vitamins</b>	
Vitamin A	14.4 IU
Vitamin C	0.2 mg
Vitamin E (Alpha Tocopherol)	0.6 mg
Thiamin	0.1 mg
Riboflavin	0.5 mg
Niacin	2 mg
Folate	29.9 mcg
Choline	12.3 mg
<b>Mineral</b>	
Calcium	358 mg
Iron	3 mg
Magnesium	55.6 mg
Phosphorus	81.4 mg
Potassium	852 mg
Sodium	36.1 mg
Zinc	0.9 mg
Copper	0.6 mg

*Source: V Mathavi [10].*

## Properties

- There are two main constituents in the carob, pulp (90%) and seeds (10%) chemical composition depends on the origin, harvesting time etc.

- Carob pulp is high in sugar content (48%) which mainly includes (Glucose, Sucrose, and Fructose etc).
- In addition to this it contains cellulose and hemicelluloses.
- The lipid which is found in carob is Saturated and Unsaturated fatty acid.
- It also got five important amino acids (alanine, leucine, glycine, proline, valine).
- The carob also contain good amount of tannins as well.
- The two other important properties of Carob Beans are its high water-binding capacity to form very viscous stable dilution and potential interaction with other polysaccharides, having synergetic effect.
- Protein content is suitable for humans as well as animals.

### Uses

- The carob is one of the most useful crops of Mediterranean. In producing countries, carob pods have been used traditionally as human and animal feed.
- People who are conscious about Caffeine intake may use carob as an alternatives for coffee and baking cocoa.
- Carob after proper drying in the form of powder is used as substitute to cocoa in cakes, bread, sweets, ice cream and drinks as a flavouring.
- The gum of carob or locust bean gum is extracted which is used in food industries as thickeners, stabilizer, binder, gelling or dispersing agent.
- CBG is used is for production of large quantity of ice-cream, soups, cheese, pet food etc.
- Carob is very nutritious it contains Vitamin B1, Niacin, Vitamin A, Vitamin B2, Calcium, Magnesium, Potassium, and trace minerals iron, magnesium, chromium, copper, nickel.
- It also contains approximately 8% protein, good source of fibre and contains three times more calcium, one third less in less in calories and seventeen times fat.
- It has therapeutic uses as it is used for treating diarrhea, nausea, vomiting and upset stomach.

### Benefits of carob powder

- Carob pods contains around 48% of total sugar in it due to which required sugar will be less in any product prepared by using carob, it reduce the cost of sugar.
- Those people who are health conscious as well as chocolate lover for them this fruits from heaven because cocoa contains caffeine in it and regular exposure can cause certain ill effects.
- Carob powder does not contain Theobromine which is very hazardous if regularly comes in consumption and cocoa contains good amount of Theobromine, so again it is beneficial for children and chocolate lovers.
- Carob contains phenolic compound Gallic acid which is approximately 88%, it work as an analgesic, anti-allergic, antibacterial, antioxidant, antiviral and antiseptic.
- It improves digestion and lowers the cholesterol level in blood.
- Regular use of carob can prevent from lung cancer.
- Due to presence of Vitamin E in carob it helps in treating cough, flu, anaemia etc.
- There is study going on as Gallic acid which is present in carob can be used for treating Polio in children.

Processing of carob pod

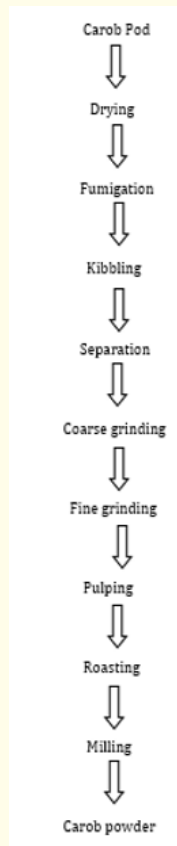


Figure 1: Process Flow-chart of carob powder.

Difference between carob powder and cocoa powder

Carob Powder	Cocoa Powder
It does not contain Caffeine.	It contains Caffeine in good amount.
It does not contain Theobromine	It contains Theobromine.
Good source of phenolic compound that is Gallic acid.	It does not have Gallic Acid.
It contains high amount of natural sugar.	It contains less quantity of natural sugars.
It got lesser calories than that of cocoa.	More calories than that of carob.
Easily available throughout the world.	Restricted to some areas.
Processing is cheaper than cocoa.	Processing cost is higher than carob.
It got many medicinal properties.	It does not have medicinal properties like carob.
Fat content of carob pod is less.	Fat content is high.

### Conclusion

- If we compare carob powder with cocoa powder it has got more benefits over cocoa in many aspects, as it does not contain caffeine or even hazardous theobromine.
- It contains high amount of sugar due to which actual sugar addition is reduced.
- It also contains many medicinal properties.
- So, we consider Carob better alternative to Cocoa.

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