

- **Potassium** - important for nerve and muscle function.
- **Iron** - essential for energy and immune functions.
- **Zinc** - 300 enzymes systems need zinc that are used in repair, growth and immune functions.

Antioxidants & Heart Health

- The non-fat portion of the cocoa bean contains the antioxidant polyphenols (found in wine), which include the flavonoids - catechins, epicatechins and procyanidins.
- These, plus theobromine are thought to have a protective effect on cardiovascular health through their ability to alter a number of pathological processes that include:
 - Inhibiting the oxidation of LDL cholesterol ('bad' cholesterol) by free radicals, an important initial step in the formation of atherosclerotic plaque.
 - Suppressing the tendency for platelets to clump together and form blood clots.
 - Regulating proper inflammatory and immune responses in blood vessel walls.
 - Stimulates the heart, regulates vascular tone, dilates blood vessels, helping lowering blood pressure and reduces the risk of stroke.

Brain Function and Blood Sugar Regulation

- The flavonoids increase blood flow to the brain improving cognitive function.
- Chocolate contains other chemical compounds that have a positive effect on your mood, notably serotonin, dopamine and:
 - Anandamide (a cannabinoid) that produces a global feeling of euphoria.
 - Phenylethylamine (PEA) the same chemical your brain creates when you feel like you are falling in love, and triggers the release of endorphins.
- The flavonoids also help reduce insulin resistance by helping your cells to function normally and regain the ability to use your body's insulin efficiently.
- It has a low glycaemic index, meaning it won't cause huge spikes in blood sugar levels.

The Bottom Line:

Is chocolate fattening? Yes! Even the darkest chocolate contains a lot of calories because of the high fat content, most of which is saturated. Lighter chocolates have additional high sugar (carbohydrate) levels, which has a greater negative effect on health and potential for weight gain etc. High % cocoa, dark chocolate, does have good health benefits, but most of its health compounds can be found in healthier foods in greater quantities - so only eat in strict moderation. If you really can't do without it, then eat a few pieces of plain, dark (70-85%) chocolate - to get the antioxidants, while limiting the carbohydrates! And avoid milk and white chocolates!



FOOD *in* FOCUS

CHOCOLATE

Each month our nutritionist **Gary Baverstock** provides some basic science and unbiased information, to help demystify certain popular foods in our diet.

Chocolate

- Chocolate comes from the seeds (cocoa bean) of the Theobroma Cacao tree.
- It is typically a sweet preparation of the seeds that are roasted, ground and flavoured with vanilla.
- It is made in the form of a liquid, paste or in a block, or used as a flavouring ingredient.
- The seeds of the cacao tree have an intense bitter taste and must be fermented to develop the flavour.
- After fermentation, the beans are dried, cleaned, and roasted – the shell is removed to produce cacao nibs and then ground to cocoa mass – pure chocolate in rough form.
- Because the cocoa mass is usually liquefied before being moulded with or without other ingredients, it is called chocolate liquor.
- The liquor may be processed into two components: cocoa solids and cocoa butter.
- Cocoa solids, when sold as an end product, may also be called cocoa powder or cocoa.
- Cocoa butter is 50% to 57% of the weight of cocoa beans and gives chocolate its characteristic melting properties.
- Bitter chocolate contains cocoa solids and cocoa butter in varying proportions, without any added sugars.
- Much of the chocolate consumed today is in the form of sweet chocolate, a combination of cocoa solids, cocoa butter or added vegetable oils, and sugar.

Chocolate Nutrition

Chocolate	Cocoa Solids	Calories	Fat / Saturates	Carbs	Sugars	Dietary Fibre	Protein
Drinking Chocolate*	25%	380kcal	5.9g / 3.7g	75.1g	72.2g	3.3g	6.3g
Cocoa Powder-Bitter	Unknown	345kcal	22.6g / 13.2g	12.5g	0.4g	30.5g	22.5g
White Chocolate	30%	580kcal	38.5g / 23g	51g	51g	0.1g	7.9g
Milk Chocolate	25%	544kcal	33g / 19g	56g	55g	2g	7g
70% Dark Chocolate	70%	580kcal	42g / 25g	36.5g	28.5g	10g	9.1g
85% Dark Chocolate	85%	630kcal	53.5g / 32g	22.5g	13.5g	11.5g	9.4g

Based on 100g Values. All Green & Blacks, except the Milk Chocolate (Galaxy) and Cadbury's Drinking Chocolate*.

Dark Chocolate

- Consisting mainly of cocoa bean mass, cocoa butter, sugar, lecithin and vanillin – that is used for highlighting the flavour.
- The depth of the colour and bitterness of the flavour of the chocolate depend on the ratio between the bean mass and sugar.
- Semi-sweet dark chocolate with a 50% cocoa content is often used commercially.
- The cocoa content of certain brands of dark chocolate can go up to 100%.
- This chocolate is deemed the healthiest, which is mainly due to its higher cocoa content.

Milk Chocolate

- Part of the dry cocoa is substituted with powdered, liquid, or condensed milks.
- This gives the chocolate a sweeter flavour, lighter colour and also softer structure.
- It is extremely sensitive to heat – using it for hot desserts is more complicated.
- However, it is very suitable for decorating, offering variation to the dark chocolate in terms of smell, flavour as well as colour.

White Chocolate

- The ingredients are similar to those of the regular chocolate, except for one important difference: no cocoa bean mass or powder is used; only the cocoa butter.
- Compared to regular chocolate it also contains much more milk.
- White chocolate is sweeter than others and is very suitable for making desserts.
- Melting white chocolate requires special care, as it may become grainy or burn.

Fat Content

- Cocoa beans contain up to 50% fat, mainly comprised of two saturated fatty acids (Palmitic and Stearic acids) and one mono-unsaturated acid fatty acid (Oleic acid).
- Palmitic acid [27%] tends to raise low-density lipoprotein (LDL) cholesterol.
- Stearic acid [33%] does not increase or decrease cholesterol levels.
- Oleic acid [34%] is associated with decreases in (LDL) cholesterol.

Theobromine

- Theobromine is the primary bitter alkaloid (similar to caffeine) present in cocoa/chocolate.
- Cocoa beans contain 1%, whereas cocoa powder contains 2% - 10% theobromine.
- 25g of milk chocolate yields 60mg of theobromine, whereas 25g of dark chocolate contains up to 200mg.
- It is less addictive than caffeine, but may be the reason for chocolate addiction.
- Like caffeine, theobromine can cause sleeplessness, tremors, restlessness and anxiety.
- Additional side effects include; loss of appetite, nausea and withdrawal headaches.
- However, the amount of theobromine found in chocolate is small enough meaning it can be safely consumed by humans.
- Theobromine poisoning may result from the chronic or acute consumption of large quantities, especially in the elderly.

Dark Chocolate – how much can it benefit health?

- Cocoa is a good source of the following nutrients with some of their corresponding health benefits:
- **Magnesium** – promotes a healthy heart and arteries and aids in energy production.
- **Manganese** – antioxidant, enzyme activator, haemoglobin synthesis.
- **Copper** – helps to control free radicals and is important in iron absorption.
- **Phosphorus** – part of many enzymes involved in energy and present in bones.