



Although all chocolate must start with cocoa beans and end up as a consumer product such as a chocolate bar, very few chocolate manufacturers have control of every stage. At Green & Black's we make no compromises with our chocolate and believe it is essential to have a hand in every stage of maintaining the quality of our chocolate.

## ***BEAN TO BAR – THE PROCESS***

### **Cocoa Production – In the Rain Forest**

#### **Origin**

Cocoa beans originate from cocoa pods, which grow from the trunk and larger branches of the cocoa or cacao tree. The trees grow in countries between about 20° north and 20° south of the equator.

#### **Types**

At Green & Black's we use principally Dominican Republic organic cocoa beans. Cocoa beans are classed as 'bulk' or 'ordinary' and 'fine' or 'flavor'. The majority of the world's cocoa is bulk (approximately 96%) and called Foresterio. This is used in conventional chocolates. **At Green & Black's we use only the finest Trinitario beans.**

#### **Growth**

After 5 to 6 months, the pods have grown up to 13 inches in length and up to 2.2 pounds in weight and have turned from green or red to yellow or orange. At this point they are harvested by hand.

#### **Harvesting**

Once picked, they are carefully cut open with a machete, to reveal up to 45 beans, which are actually the seeds of the tree, and removed by hand.

#### **Fermentation**

The next stage is fermentation, where the cocoa flavor precursors are formed. The beans are stacked in wooden boxes, which can be anything from a few pounds to about a ton, covered with banana leaves and left for approximately five days to ferment. The fermentation involves different yeasts and bacteria killing the bean (or seed) and breaking down the sugars into lactic and acetic acid, while various compounds and enzymes react together within the bean to produce the flavor precursors. Some beans are not fermented and used in conventional chocolate blends where the poor taste can be disguised using further processing techniques.

**We do not use unfermented beans for Green & Black's chocolate.**

#### **Drying**

When fermentation is finished, the beans are removed from the box and spread out on mats to dry in the sun and raked over at intervals. It usually takes about a week of sunny weather to dry the beans to the 7 to 8% moisture content needed to prevent mold growth during storage. Some beans are dried using fires, which can produce unpleasant smoky or hammy flavors. **Green & Black's beans are all dried naturally.**

The beans are shipped over to our chocolate factory to begin the transformation from bean to bar.

### **In the Factory**

#### **Sorting and Cleaning**

After strict quality assessment the beans are destoned and cleaned to ensure they are safe to be used for human consumption.

#### **Deshelling and Winnowing**

The beans are then subjected to a brief, intense blast of heat to loosen the shell from the nib. This is followed by winnowing which is the action of breaking the beans and separating the shells from the nibs using sieves and streams of air.

### **Roasting**

The separated nibs are then roasted at over 212°F to develop the rich flavor and the characteristic color of the final products such as cocoa and chocolate.

### **Grinding**

The roasted nibs are then ground to produce cocoa liquor, which is essentially particles of cocoa suspended in about 55% fat (also known as cocoa butter). Cocoa butter has a melting point of between 93-97°F and for this reason melts easily and quickly in the mouth as our body temperature is 98.6°F. The cocoa liquor is kept above its melting point so it can be easily piped about as a viscous, brown, shiny liquid – something like the texture of cream.

At this point, the cocoa liquor takes one of two routes – to be separated into cocoa butter and cocoa powder or to be made into chocolate.

### **Cocoa Butter and Cocoa Powder Production**

The first route is essential as cocoa butter is added to the final chocolate to make it more fluid, easy to melt in the mouth and not too dry by coating all the solid particles in the chocolate.

The cocoa butter is separated from the cocoa liquor using an enormous press that exerts huge forces on to it. The result is liquid cocoa butter and cocoa cakes, varying in a fat content of 10-22%, which are further ground to make cocoa powder.

## **Chocolate Production**

### **Mixing and Refining**

The second route is the actual chocolate production. In our 70% dark chocolate this begins by mixing together organic cocoa liquor, organic raw cane sugar and organic Bourbon vanilla to our own special recipe. This mixture is then refined through a series of rollers that perform a series of tasks. They grind the particles of cocoa, sugar and vanilla to such a degree that they cannot be felt on the tongue in the best chocolates.

**Conventional chocolates are not refined to such an extent which makes them less expensive to produce. However, the particles can feel unpleasantly gritty on the tongue.**

### **Conching**

The next stage in making chocolate is called conching. It is called this because in the past this was carried out in vessels that looked a bit like a conch shell, using one roller that slapped the chocolate back and forth over a number of days. These days much larger vessels with a series of paddles that stir and heat the chocolate are used, driving off the volatile acids, developing the fine flavor of the chocolate and making it more homogenous.

Some chocolates are conched for very short periods; less than an hour in some cases. This can be due to most of the flavor development being done earlier in the process, especially with certain low cocoa solid milk chocolates. Alternatively, in the case of dark chocolate which needs to be conched for many hours, the manufacturers may just conch for less time to save money despite the chocolate not being conched properly.

**All Green & Black's chocolate is conched for the optimum time which varies depending on the type of chocolate.**

The complex flavor of chocolate is due to the huge number of flavor compounds in cocoa. More than 400 of them have been found in cocoa following fermentation, drying, roasting and conching, which is far greater than most other foods.

Once the conching has been completed, extra cocoa butter is added to ensure all the particles are coated with fat and the chocolate will flow properly, as chocolate is essentially just particles of cocoa, sugar, milk powder (in milk chocolate) and flavoring (real vanilla usually in good chocolate, vanillin in conventional chocolate) surrounded in fat (just cocoa butter in good chocolate, also some cocoa butter replacers in the form of vegetable fats in conventional chocolates). **At Green & Black's we use only organic Bourbon vanilla and organic cocoa butter.**

### **Tempering**

The final step before molding into our bars is tempering. This must be done to ensure that the chocolate is shiny without any grey streaks (known as blooming), has a good clean snap and does not melt at too low a temperature, i.e., in your hands. Cocoa butter can set with both stable and unstable fat crystals. To ensure the chocolate is properly tempered, all the fat crystals must be of the stable variety. First the chocolate is heated to approximately 118°F to melt all the fat crystals. It is then cooled to 81°F to set the correct amount of stable fat crystals to provide the beginning of a structure. Unfortunately, some unstable fat crystals are formed at the same time, so the temperature has to be increased to 90°F which is warm enough to melt the unstable fat crystals, but not warm enough to melt the stable ones.

### **Molding**

The chocolate can now be molded into our bars, with enough stable fat crystals in the correct structure to ensure the rest of the crystals will follow the pattern and therefore, the bar will be properly tempered.

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### **About Green & Black's**

Launched in London in 1991 by Craig Sams and Josephine Fairley, Green & Black's entered the U.S. market in 2003 and has become one of the best selling chocolates in the natural food channel. The name reveals Green & Black's key strengths – Green for sustainable and Black to symbolize the premium quality of the product and its status as a luxury indulgence. Green & Black's buys only the very best organic cocoa beans grown under the shade of indigenous rainforest trees and alongside other crops. All Green & Black's products meet the National Organic Program (NOP) standards set by the USDA, thus giving consumers of organic products an assurance that the product is from a trusted source and matches the high standards of production. Green & Black's believes that in order to secure the best cocoa beans, a sustainable relationship must be developed directly with the farmers. The company's dedication to fair trade practices has provided it with the distinction of being the only global organic and Fair Trade Certified chocolate brand. For more information, visit [www.greenandblacks.com](http://www.greenandblacks.com).

### **CONTACT:**

Nadine Niznik  
PainePR  
212-613-4944  
[Nadine.niznik@painepr.com](mailto:Nadine.niznik@painepr.com)