

## CHAPTER 2

# Cocoa beans: from tree to factory

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## 2.1 Introduction

The earliest evidence of consumption of cocoa is from 1900 to 1750 BC by the Mokaya people, a pre-Olmec culture from what is nowadays the southern part of Mexico and Guatemala (Powis, 2007). Later, cocoa was first cultivated and domesticated by the Mayan and Aztec peoples. It was consumed in various forms: as fresh beans for its sweet pulp or as a cocoa drink after roasting. Beans were also used as a currency until the Spanish conquest (Wood and Lass, 1985). The Spaniards introduced cocoa to Europe where it was first consumed by royals, before becoming a popular beverage by the mid-seventeenth century.

Cocoa is the essential ingredient of chocolate, responsible for its unique flavour and melt in the mouth properties. A manufacturer needs a reliable and sustainable supply of good quality cocoa at reasonable prices. This chapter examines how the growing of cocoa and the fermentation, drying, storage and transport can influence cocoa quality prior to arrival at the factory. Also discussed are the operations of the cocoa markets, quality assessment, sustainability and environmental issues. Finally, the chapter explores the use of different types or origins of cocoa for chocolate.

Cocoa has a long supply chain extending from smallholders, often in remote, less well-developed tropical regions of the world, to factories and consumers mainly in developed industrial countries. Like any crop, it is susceptible to changes in the weather, to pests and diseases and to social and economic factors. The supply of cocoa has continued to grow throughout the past 30 years despite low prices on the world markets since 1990. At the same time, demand for cocoa has kept pace with supply and is growing steadily. About two-thirds of the cocoa crop ends up in chocolate products, with the remainder going mainly into beverage, ice cream and bakery products.

## 2.2 Growing cocoa

### 2.2.1 Where cocoa is grown

Cocoa is grown commercially between 20° north and 20° south of the equator, in areas with a suitable environment for cocoa (e.g. rainfall, soil type). There are three main growing areas: West Africa, South East Asia and South America (see Figure 2.1). The seven largest cocoa producing countries are Côte d'Ivoire (Ivory Coast), Ghana, Indonesia, Nigeria, Cameroon, Brazil and Ecuador, and between them they account for 90% of the world crop (see Figure 2.2). Côte d'Ivoire alone produces over one-third of the world crop. The fortunes of the various countries have changed significantly in recent decades. A main feature of the current pattern of production is the huge concentration (nearly two-thirds) within West Africa. This concentration means that future supply is vulnerable to a number of factors, such as the spread of pests and diseases, weather or climatic variations, political or social change. In many areas, cocoa faces competition from other crops such as palm oil, coffee, rubber, citrus and cloves. About 90% of the world's cocoa is grown by smallholders (Smith, 1994), usually on farms with mixed cropping systems.

### 2.2.2 Varieties of cocoa: Criollo, Forastero, Trinitario and Nacional

The cocoa or cacao tree (*Theobroma cacao*, L.) originates from South and Central America. It is a small tree up to 15m height (50ft; Mossu, 1992) that grows naturally in the lower storey of the evergreen rain forest in the Amazon basin. The leaves are evergreen and are up to about 300mm (12 in) long. The flowers and hence the fruits (cocoa pods) grow from the trunk and thicker branches (see Figure 2.3).

In the sixteenth and seventeenth centuries cocoa was introduced into Asia. These early movements of cocoa were of a type called Criollo. Criollo cocoa beans have a white or light brown appearance when cut open and a mild, nutty cocoa flavour. The trees are susceptible to diseases and produce low yields. This type is now very rare and only found in old plantations in Venezuela, Central America, Mexico, Madagascar, Sri Lanka and Samoa.

The main type of cocoa is called Forastero and, in the eighteenth century, a Forastero variety of cocoa from the Lower Amazon was introduced into Bahia in Brazil. This variety of cocoa is called Amelonado, named after the melon shape of the pods. From Bahia, cocoa cultivation spread to West Africa in the nineteenth century (Wood, 1991). The Amelonado variety was well suited to West African smallholder cultivation. More recent planting material is based on cocoa collected from the Upper Amazon rainforest and these maybe crossed (hybridised) with the Amelonado or between themselves (called Upper Amazon hybrids). Fresh Forastero cocoa beans have a purple appearance when cut open and generally develop strong cocoa notes after fermentation and roasting.