

The Sweet and the Bitter: *Theobroma cacao*, Chocolate, and Humans



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Chocolate (*Theobroma cacao*)

Chocolate and cocoa comes from the seed of *T. cacao*, a small tree that grows in the understory of tropical forests, native to Central and South America, member of Malvaceae (mallow family)

Cacao tree cultivated by indigenous peoples from southern Mexico to northern South America

Aztec mythology claims the god Quetzalcoatl gave cacao beans to the Aztec people, *Theobroma* means “food of the gods.”

Beans used as currency, and to prepare a spicy (not sweet) beverage often consumed by upper castes

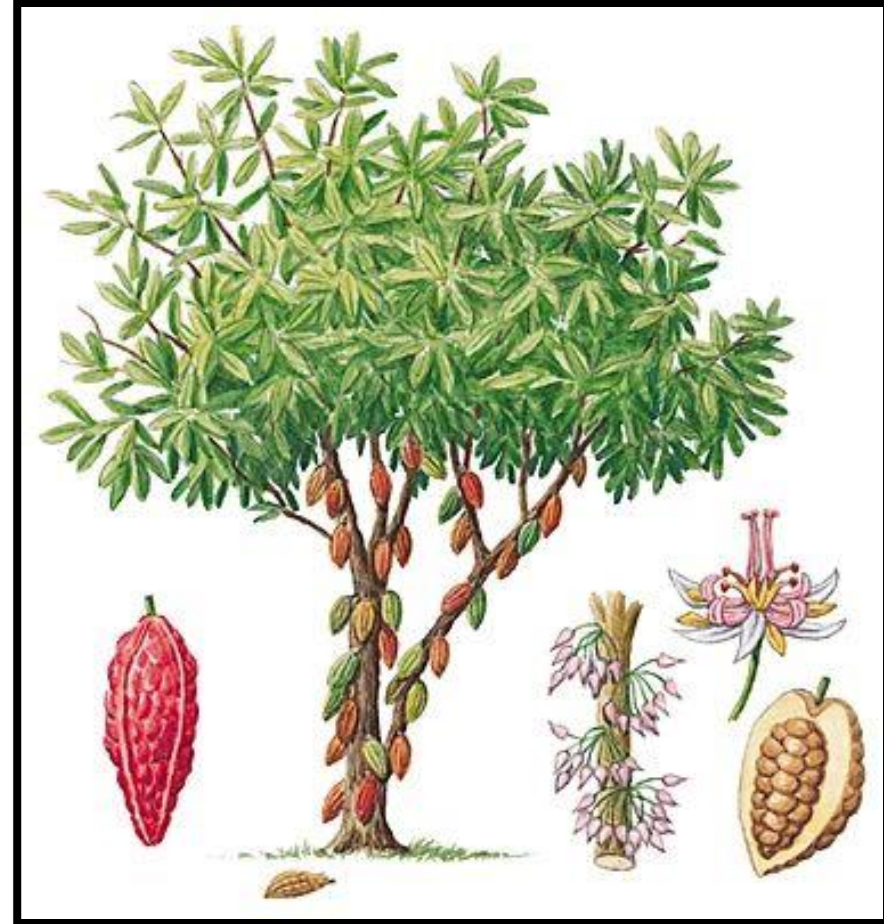


Fig. 16.6

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The Aztec god Quetzalcoatl, envisioned as a plumed serpent

Chocolate Cultivation

Optimum growing conditions require wet & warm conditions; cultivation only possible between 20* N and S latitude

3 varieties: **criollo** (Colombia, Venezuela), **forastero** (Brazil, W. Africa), **trinitario** (hybrid between criollos of Trinidad and Amazon forasteros)

Ivory Coast and Indonesia are largest producers of cacao beans

Tree has football-shaped fruits that form directly on the main trunk from small whitish-pink flowers; fruits mature in 4-6 months; turn yellow, orange or red;

Inside each fruit are 30-40 ivory seeds surrounded by sweet, sticky pulp

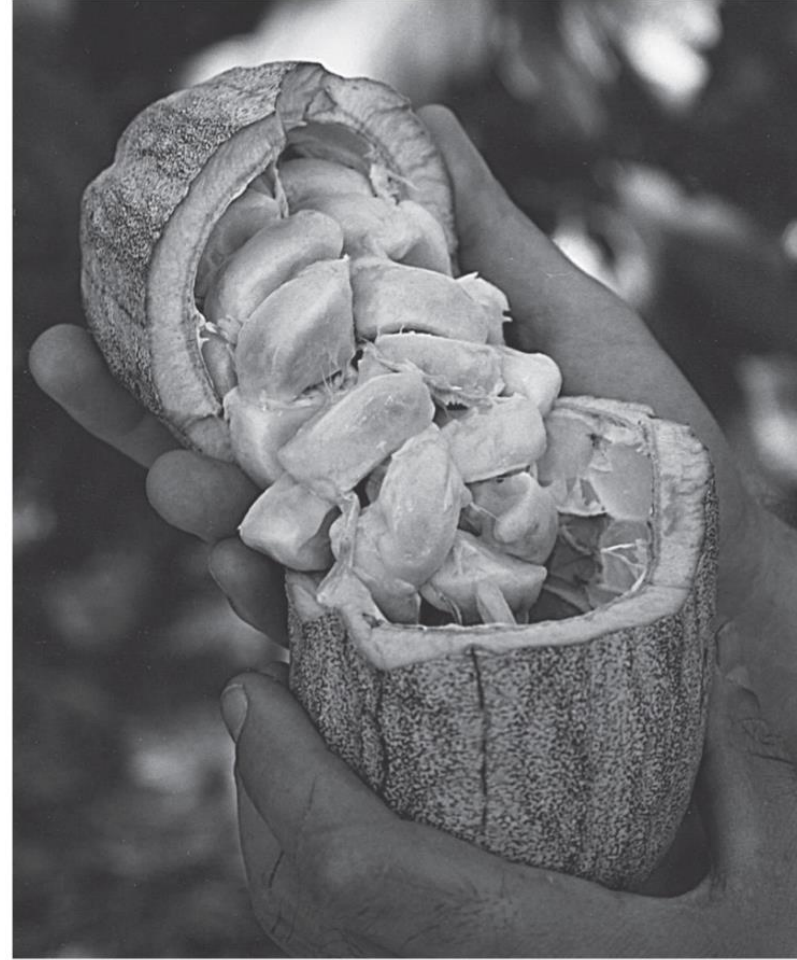


Fig. 16.7

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(a)



(b)

a: Peggy Greb/USDA; b: Courtesy USDA

Chocolate Cultivation

Pulp first attracted human interest; it is delicious and prized by animals such as bats, rats, monkeys, and squirrels.

Animals chew through fruits to eat pulp; the bitter, alkaloid-containing seeds are discarded; Seed dispersal entirely dependent on animals because fruits never fall from tree otherwise

Low rate of fruit production (1-3% of flowers produce fruit) = lack of pollinators; Pollinators are biting midges that live in leaf litter and humid conditions; most cacao now produced in drier regions

Hawaii encourages midge populations by using rotting banner litter for habitat



Chocolate Processing

Cacao pods harvested by machete or mechanized pod opener → pulpy seeds removed and ferment for a week →

chocolate flavor and aroma develops with fermentation → beans dried.

Beans roasted at 120*-140*C (248*-284*F) for 20-50 minutes → seeds cracked open, freeing the cotyledons (nibs) from the seed coat & embryo → Nibs crushed to produce dark brown oily paste (chocolate liquor).

Chocolate liquor solidified into squares of baking chocolate or cocoa butter removed to produce a brown cake →

pulverized into cocoa powder → alkali added to neutralize acidity of cocoa (dutching), also increases solubility.



Chocolate recipe: chocolate liquor, sugar, cocoa butter, vanilla, milk

Chocolate Child Labor & Slavery

On some West African plantations, cacao beans are harvested by children and child slaves (usually boys between 10 – 16 years of age); work as field hands, domestic workers, prostitutes

As much as 40% of the chocolate consumed in 2000 was produced with the help of child slaves.

Companies like Nestle, Cadbury, and Hershey buy beans from traders and processors, not individual farmers.

Estimates of over 1 million children working on farms harvesting cacao beans in Ivory Coast and Ghana



Fair Trade, UTZ Certified, and Certified Organic cacao beans are grown without child labor.

Chocolate Social Justice Concerns

Inside Big Chocolate's Child Labor Problem:

https://www.youtube.com/watch?v=GA6J-03r_oQ

The Story of Chocolate: Unwrapping the Bar:

<https://www.youtube.com/watch?v=-XbP4cn8xhU>

The Bitter Side of Cocoa Production:

<https://www.sapiens.org/culture/cocoa-production/>

Who's Going to Pay for an Ethical Chocolate Bar?

<https://www.politico.eu/article/ghana-ivory-coast-cocoa-farmers-price-eu-supply-chain-cleanup-sustainability/>



Fair Trade, UTZ Certified, and Certified Organic cacao beans are grown without child labor.

Cocoa Farming Village in Okotokrom, Ghana



Discussion with the farmers
and families in Okotokrom

Cocoa Farming Village in Okotokrom, Ghana

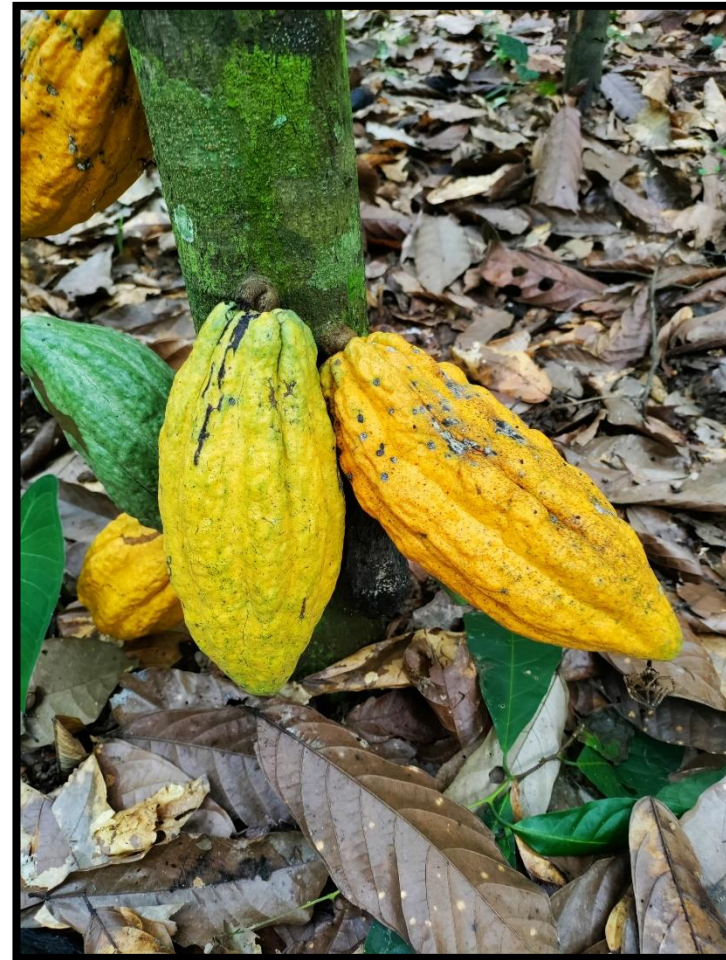
- In 2008, a **union** was formed to help the farmers increase their yields, earn more money, and support each other through **communal labor and shared information and techniques**.
- The union started with 25 small communities in the region, it now unites **40 communities and over 1,500 families** in central-eastern Ghana.
- Some positions in union leadership are **reserved for women**.
- The production union's products are now **Fair Trade Certified**.
- They receive about **\$2000 per ton** under the certification program.



Cacao (Cocoa) Tree growing in Okotokrom

Cocoa Farming Village in Okotokrom, Ghana

- **Communal Labor System:** men organize together to go to different farms to break pods when they are ready and then the collective labor is rotated and reciprocated.
- Cacao is grown **all year round**.
- They **plant** seeds, **tend and prune** trees, **hand-pollinate** (sometimes), **harvest and break pods**, **ferment the seeds** for 7 days, and then **send them to a buyer** in Tema, Ghana (Cadbury) for processing.
- Spent pods are processed into **soap and detergent**.



Cacao (Cocoa) Pods ripening on the tree trunk in Okotokrom

Cocoa Farming Village in Okotokrom, Ghana

Challenges:

- The **Ghana Cocoa Board** controls the sale of cocoa and farmers can't sell to other entities outside of that regulatory board.
- **Illegal mining** can lead to their farms being bulldozed without recourse or enforcement of existing property laws.
- Some of the **chiefs and politicians** enable the illegal mining.
- **Access to loans** is very difficult as traditional loans are only given to salaried workers in Ghana.
- **Payments to farmers** can be delayed up to a month and **cash flow** becomes a problem.



Cacao (Cocoa) Flower growing directly on the tree trunk in Okotokrom

Cocoa Farming Village in Okotokrom, Ghana

Advantages of the Union:

- Communal labor allows for **more production and higher yields**.
- Information on **sustainable and best practices** is more easily shared about pruning techniques/timing, water management, and pesticide/chemical use.
- **Buffer vegetation zones** have been planted along streams near farms to protect the local water supply.
- **Cooperative financial institutions** such as a **mutual support fund** (4,000 farmers in 40 societies) and a **co-op bank** to provide self-organized and funded loans for the community for better cash flow and capital investment.



Ripe Cacao (Cocoa) pod growing directly on the tree trunk in Okotokrom

Cocoa Farming Village in Okotokrom, Ghana

