

WAKE UP  
TO COFFEE!



**FIND OUT WHAT IT TAKES TO SATISFY ONE OF THE  
MODERN WORLD'S MOST INCURABLE CRAVINGS**

BY ALLEN ABEL

# THE WORLD'S MOST PRECIOUS

hill of beans fills a warehouse in New Jersey from the pallet to the penthouse. It's your morning coffee—40,000 jute-fiber sacks of unroasted “green” coffee beans, about halfway along their long and fascinating journey from snip to ship to sip.



The beans in this hangar, and at the warehouses of hundreds of other wholesale importers and distributors in the world's busiest ports, are the produce and the pride of some of the planet's poorest nations. Their origins are as far-flung as Rwanda and Honduras, Brazil and Burundi, Costa Rica and Colombia, Ethiopia and Indonesia, Peru and Panama and Papua New Guinea. But the beans will be enjoyed by people in some of the world's richest nations.

Here in South Plainfield, New Jersey, the sacks are imprinted with the exotic names of provinces and plantations thousands of nautical miles from the teeming American docks—Papua New Guinea Kimel Estate Peaberry, Organic Java Taman Dadar, Guatemalan Huehuetenango Limonar. Each sack weighs between 60 and 70 kilograms, or about 145 pounds. At 10 beans per gram, there are approximately 650,000 beans in each bag.

Do the math, and that's a total of 26 billion coffee beans in this one building alone. Every single bean—they form as twins inside a firm, red, edible “cherry”—already has been plucked by hand from its carefully cultivated shrub at what the planter deems to be the peak of ripeness. Then it's been washed to soften and remove the outer pulp and sticky “mucilage” and “parchment,” sun-dried, bagged,

trucked to the nearest harbor and freighted across the sea.

Still to come is the “cupping”—the analysis by experts of the specific flavor, aroma and body of each individual bag—and then the wholesaling, retailing, roasting, grinding, blending and brewing of the beans, be it at home or at a trendy café (see sidebar, “From Crop to Cup” on pages 14 and 15).

The result is a beverage whose history encompasses centuries of ingenuity and invention, slavery and colonialism, marketing and merchandising—all to satisfy one of the modern world's most incurable cravings: a steaming mug of stimulation for the mind and body, packing a powerful jolt of caffeine and a taste that, if everything has gone according to plan along the voyage from crop to cup, is truly good to the last drop.

## A LUXURY YOU CAN AFFORD

“It much quickens the Spirits and makes the heart Lightsome, it will prevent Drowsiness, and make one fit for Business,” declared a broadside for the first coffeeshouse in London, circa 1652. “You are not to drink of it after Supper, unless you intend to be watchful, for it will hinder sleep for 3 or 4 hours.”

Nearly four centuries later, the essence of the experience has hardly changed.

In the United States, where one-half of the nation's adults drink at least one cup of coffee a day, one-third of all the tap water drawn for human consumption is used to brew coffee. In Italy, tiny cups of espresso are served in more than 200,000 shops and stands. Yet more coffee per person is downed in Holland than in any other nation, large or small. Northern Europeans are the world champions of coffee drinking; the colder the climate and the longer the winter nights, apparently, the greater the demand for a jolt of steaming joe.

“It's 99 cents for a plain cup of coffee,” says David Planer, director of marketing and education



“Sack of Coffee” ©iStockphoto.com/LeventKonuk

## HARD TO DIGEST

Some **25 PERCENT** of American coffee drinkers now favor an organically grown brew. But only a very few elitists demand the liquefied essence of beans that have been fermented in the digestive systems of the small, squirrel-like Asian mammals known as palm civets, stuffed down the hatch and retrieved when they come out the other end. Elephant dung coffee from Thailand is coming on market too—for just \$500 dollars a pound. Passage through Jumbo's stomach is said to sweeten flavor and lessen bitterness.



for Royal Coffee New York Inc. “But it’s only a few dollars more for a cup that distills one farmer’s years and years of experience into a cup that is not just acceptable but perfect. Good coffee is a luxury—a luxury you can afford every day. You can get the best coffee in the world, roasted by the best roaster in the world, served in the best café in the world by the best barista in the world for only \$15, maximum. You certainly can’t do that with wine. It’s incredible, but people take it for granted.”

“Coffee has become the quintessential item to establish yourself as a tasteful person,” says professor Denise Gigante, who teaches a course in the history of coffee and European coffeehouses at Stanford University in California. “I think it’s because it has been mass-marketed so well. If you want to make your place as an art connoisseur, it’s going to take serious money. But anybody can buy a cup of coffee.”

Gigante calls coffee “an acquired taste and a manufactured product associated with culture.” Millions of field hands in developing nations

call it a route out of dire poverty. Environmentalists and human rights activists see the chance to leverage the beverage’s popularity into increased concern for indigenous workers, degraded landscapes and nesting birds. Dozens of nations—coffee is grown in 80 countries—see it as a major export and the means to the favorable “branding” of an entire country on the basis of a dime-sized bean.

On commodity exchanges, coffee is the world’s second most valuable export by total dollar volume, trailing only oil. Its price can fluctuate dramatically according to each sack’s country and region of origin, the speculative whims of investors who purchase and hedge futures contracts months in advance, and the unpredictable vagaries of weather on three continents. (Predictions of a rare frost in the Brazilian uplands can have an especially unsettling effect on the markets.) Yet many of the world’s biggest countries—China, Russia, India, the United States, Canada, Japan, Australia, Western Europe—produce only a minuscule fraction of the global supply.

The *Coffea* tree thrives in the zone between the tropics of Cancer and Capricorn and, nearest the Equator, does best at altitudes from 3,000 to 6,000 feet. Two principal varieties are grown—arabica, the higher-priced and more delicately flavored bean preferred by gourmets, and robusta, which gives its gusto



### BOSS PRODUCTS USED IN COFFEE MANUFACTURING:

- Sanitary ball valves
- Cam and groove couplings
- Washdown nozzles
- Hot and cold washdown stations
- Sanitary fittings



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Costa Rica coffee plantation

to pure Italian espresso and, being less expensive, is the main ingredient in many mass-produced instants, freeze-dried granules and discount supermarket brands.

caffeine. (Vietnam is the No. 2 exporter, most of it robusta.) Millions of trees in locations as scattered as Martinique, Timor, Madagascar, Jamaica, Hawaii's Big Island and Bali all are said to trace their



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Unlike other fruit-bearing trees, such as apples, peaches or pears, some coffee trees can simultaneously bear flowers, unripe fruits and ripe cherries, making mechanical harvesting impractical and necessitating careful, manual picking every day for six months or more.

One-third of the world's coffee is shipped from Brazil, where huge swaths of tropical forest were cut down early in the 18th century to make way for coffee plantations, and where legions of slaves labored in appalling conditions to satisfy the world's growing craving for

ancestry to a single sapling that was smuggled to the Caribbean aboard a French naval vessel in 1720 by a clever salt named Gabriel de Clieu.

But it all began—at least in legend—with a goat.

A pleasant and persistent myth maintains that, 1,000 years or more ago, an Ethiopian goatherd named Kaldi spied his usually listless flock chewing on little red berries and cavorting  
*(Continued on page 16)*



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# FROM CROP TO CUP

1. Coffee shrubs are cultivated on plantations that circle the globe, mostly between latitudes 25 degrees north and south.

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2. Clusters of red “cherries” are harvested, usually by hand, at the peak of ripeness.

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3. The cherries are dried in the sun until the outer husks shrivel. Then the inner beans are separated from the husks by hand or by machine; *OR*  
The cherries are washed and left to ferment for 18 to 35 hours, then rinsed, dried in the sun or in ovens, and mechanically hulled, a process that removes the glutinous mucilage and the thin outer parchment.

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4. The beans are sorted on conveyor belts for consistency and size.



5. The sorted “green” beans are bagged in sacks made from jute fibers, about 60 to 70 kilograms of beans to each bag.

6. The sacks are trucked to port and loaded into containers for export, and the containers are shipped to the destination country or region.

7. The containers are imported and trucked to a wholesale importer’s warehouse, or to the roasting plants of large coffeehouse and supermarket companies.

8. Samples of each sack are selected, roasted in small batches, brewed and cupped by experts to determine quality, profile and tasting notes.

9. Sacks of select varieties are purchased by cafés, manufacturers and retailers.

10. The “green” beans are roasted to a temperature of approximately 440 degrees Fahrenheit (225 degrees Celsius) by a forced-hot-air process in industrial-sized cylinders; in smaller roasters in cafés, restaurants and specialty markets; or at home in a frying pan; **OR**

The beans are decaffeinated by treatment with methylene chloride or by steaming them until the caffeine rises to the surface.

11. The roasted beans are cooled in vats exposed to cold air.

12. The cooled beans are ground in-store, at home, at a café or in large-scale manufacturing facilities, then packaged in bags or cans for retail sale.

13. The ground coffee is brewed and enjoyed.

“Sampling procedure” Tim Pannell Mint Images/Newscom; “Green Coffee Beans” ©iStockphoto.com/EdgarNormal; “Coffee roaster” ©iStockphoto.com/minemero; “Coffee Beans Cooling” ©iStockphoto.com/BanksPhotos; “Ground Coffee” ©iStockphoto.com/tycoon751; “Brewing Coffee” ©iStockphoto.com/sergio\_kumer





Left to right: Coffee flowers on tree. Farmer in Rwanda holding shelled and unshelled coffee beans. Coffee farmer drying beans at a plantation in Alfenas, Brazil.

*(Continued from page 13)*

like kids. Curious as to the source of this manic behavior, he plucked a few coffee cherries himself, chewed them and thereby got the first java jolt in human history.

“Like most legends, it probably has some basis in truth,” says Gigante. “Most accounts have coffee production originating in either Ethiopia or Yemen, and there was probably some observation of how the coffee bean affected animals.” (The Yemeni port of Mocha was an early center of the trade.)

“The route that coffee takes goes up through Syria, and then it winds up having quite an active life in Constantinople,” Gigante explains. “Turkish coffee really was the origin of coffee’s trajectory to Europe—it went with the Ottoman armies through the Middle East to Egypt, and from Cairo it went north across the Mediterranean to Italy and to France.

“Originally, it was valued for its medicinal purposes—in 17th-century England, coffee was thought to cure everything from menstrual problems

to scurvy. Around 1800, during the Enlightenment, it began to be used to stimulate the mind and enliven conversation, the same way we use it today. After the French Revolution, with the rise of gastronomy, we had the beginnings of food being taken seriously as an art form. When that happened, coffee joined food as something that could be appreciated for its own taste.”

### DAINGEROUS IDEAS?

“The history of coffee is the history of globalization,” says professor Robert Nemes of Colgate University in Hamilton, New York. “Coffee is one of the earliest of crops to globalize, along with tobacco—and like tobacco, it becomes an incredibly popular drug supply system [due to its caffeine]. The big question among academics is whether its spread is due to cultural and economic forces, or whether it’s the caffeine itself that drives it forward.

“If you look at the pathways it has taken, the resistance that coffee meets in a lot of different countries is really





Wayne Hutchinson/ELPA image BROKER/News.com



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interesting. You have sultans trying to crack down on it and intense debates within Islam about whether or not this is sanctioned by the teaching of the prophet. The coffeehouse is one of the first places that people can go to that is not work or home or the mosque. And it is a place where people of all social classes come together to talk about dangerous ideas.”

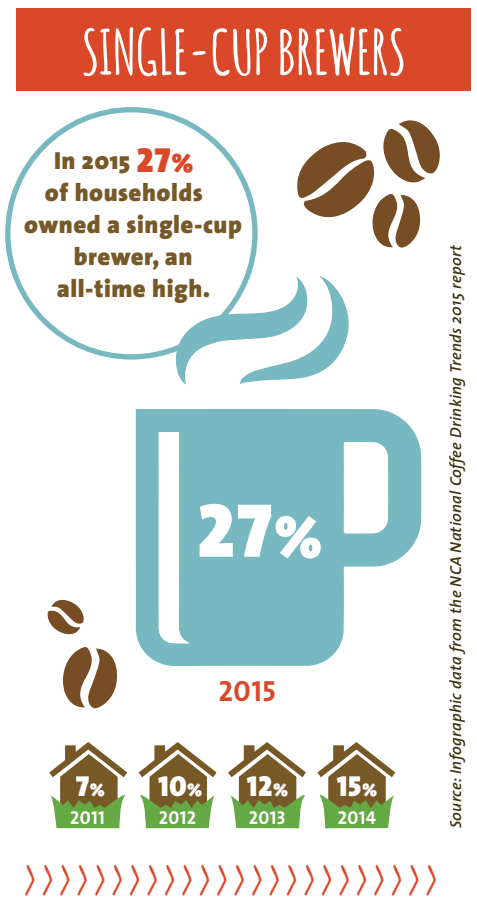
In 17th-century London, coffee was hailed as “a simple, innocent thing, composed into a Drink by being dried in an Oven, and ground to Powder, and boiled up with Spring water.” But King Charles II saw the coffeehouses as a breeding ground for sedition and ordered them shut down. The royal prohibition was shouted down by the wide-awake masses and never took effect.

Across the Atlantic, popular history holds that the anti-British anger that culminated in the Boston Tea Party flipped colonists’ taste from tea to coffee. This belief has at least some basis in fact, as witnessed by a famous letter written by Founding Father John Adams

to his wife, Abigail, in 1774: “Tea must be universally renounced. I must be weaned, and the sooner, the better.”

During the Civil War, soldiers on both sides roasted their own beans over bivouac campfires and brewed their coffee in the same pots that they used to wash their laundry. (But the boiling of putrid pond and river water undoubtedly saved lives.) Then came a wave of innovations in vacuum-sealed preservation, industrial-scale processing, dehydrated “instant” coffee, decaffeination, supermarket branding and mass marketing that has never ended.

In 1958, a brilliant advertising campaign for coffee from the Colombian highlands made a fictional farmer named Juan Valdez and his trusty mule an icon of quality and launched a craze for country-of-origin roasts. By the time a Dutch immigrant named Alfred Peet opened his first café in Berkeley, California, in 1966 and offered a darker, richer brew, North America was ripe for turning coffee from a cup of dishwater at the local





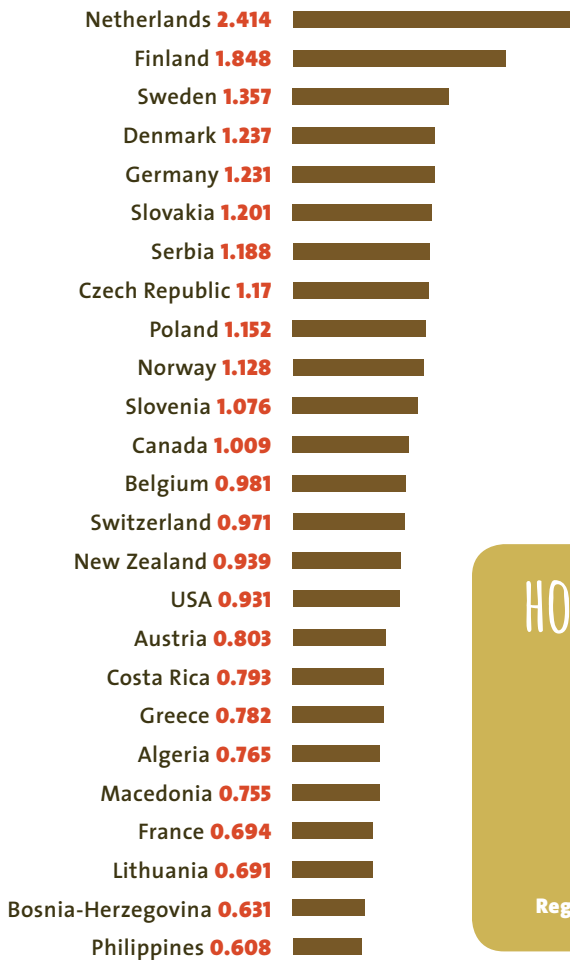
# COFFEE BY THE NUMBERS

All coffee is grown in a region found between the Tropics of Cancer and Capricorn, otherwise known as "The Bean Belt."



## WORLD'S BIGGEST COFFEE DRINKERS

(cups per day/person)



## TOP PRODUCERS

(2014)

1. Brazil **2.72 BILLION kg**
2. Vietnam **1.65 BILLION kg**
3. Colombia **750 MILLION kg**
4. Indonesia **540 MILLION kg**
5. Ethiopia **397.5 MILLION kg**



## TOP IMPORTERS

(2013)

- America **\$5.5 BILLION**
- Germany **\$3.6 BILLION**
- France **\$2.4 BILLION**
- Italy and Japan **\$1.6 BILLION**



## HOW MUCH CAFFEINE IS IN COFFEE?



**AVERAGE**  
**95 mg**

Regular brewed coffee (8 oz)



**AVERAGE**  
**2 mg**

Decaf brewed coffee (8 oz)

Sources: NCA National Coffee "The Influence of Coffee Around the World Facts 'N' Stats" Infographic and <http://www.theatlantic.com/business/archive/2014/01/here-are-the-countries-that-drink-the-most-coffee-the-us-isnt-in-the-top-10/283100/>

"Coffee Map" ©iStockphoto.com/studiocasper

diner into a multisensory experience of connoisseurship and taste.

Starbucks took it from there, adding global standardization, a range of more than 80,000 combinations of flavors, frappés and foams, the elevation of the barista-as-artiste, and an inviting ambiance of soft lighting, comfortable chairs and social awareness.

Now, a millennium after a lucky goat happened upon a cherry with a kick, a rich, nutty fragrance wafts through a back room in Baltimore, Maryland, where a squadron of hipsters have come for a complimentary “cupping” at an upscale roastery called Ceremony. “Try to get a nice inhale,” encourages customer service representative Erissa Mann.

This is the summit of coffee’s 21st-century ascendance as an object of high culture and mystique. In front of the tasters are samples that range from Jaguar Ocotique from Honduras to a Colombian El Cedro “washed,”

## DECAF DECONSTRUCTED

Today there are a variety of processes used to remove caffeine from coffee, but all begin by treating the coffee beans in their green, unroasted state. In the most common **direct solvent method**, the beans are steamed to open their pores and then soaked in an organic solvent—most commonly methylene chloride or ethyl acetate—that selectively unites with the caffeine. Then the beans are steamed again to remove the solvent residues, dried and roasted like any other green coffee.

Other decaffeination methods include the **indirect solvent method** (in which water boiled from the beans is treated with solvent rather than the beans themselves); the water-only **Swiss water process** (which strips caffeine by percolation through activated charcoal); and the more recent **carbon dioxide method** (which uses compressed CO<sub>2</sub> and charcoal filtering to remove the caffeine).

SOURCE: *Coffee Review*



in Mann’s description, “to our espresso profile.” Tasting notes on each package highlight “almond butter aromatics ... dark chocolate ... apple pie in a sugary shot ...”

“Get really, really close to your coffee,” Mann advises. “Stir gently in the top half and you’ll get a nice big puff of aroma.”



# Wafer Ball Valves: the Butterfly Valve Alternative

## Applications:

- Used in various industrial applications that require space saving technology including water, oil and gas

## Sizes:

- 1" to 4"

## Materials:

- Body – CF8M stainless
- Ball seats – 25% carbon PTFE
- Ball & end connection – 316 stainless steel
- Elastomers – FKM
- Stem seal – PTFE

## Features:

- Full port
- Blow out proof stem
- Ideal alternative to high performance butterflies
- Space saving design
- Antistatic stem

## Approval:

- ANSI Class 150 wafer style ball valve

## Dixon Sanitary

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The Right Connection®