

# About Decaf Coffee

by Ruth Ann Church



## What does it take to create a great-tasting decaf coffee?

- Start with the very **best beans**. Transparency of the supply chain is one indicator that care and quality beans have been used. Ask your barista/roaster/importer if they can tell you the country of origin of your decaf coffee. If they give you a blank stare, look at the bag and shrug their shoulders, it's not a good sign.
- Use a reputable decaffeination process – most of them are. While some have enough marketing muscle to imply the other processes are trying to kill you, that is not the case.
- Storage after decaffeination must be air-tight and for a limited amount of time.
- Talented and timely roasting. Roasting should be within 2 weeks of brewing and there is a craft to roasting great decaf beans. Generally roasters say decaf is trickier than roasting regular beans. They typically roast faster, for example. Industrial roasters 10 states away are less likely to be giving the care and freshness required.
- Grind the beans just before brewing.
- Don't let the brewed coffee sit. Remove from a hot burner within a couple minutes. Transfer to a thermal carafe.

There are at least **4 decaffeination processes** for coffee. All are complex – more complex than the brief summaries below. We hope these summaries give you a “glimpse” into the science of decaffeination. For all decaffeinated coffee, the FDA requires caffeine to be 97% removed (see more on this below). The FDA also requires any residues of solvents (like methylene chloride) to be below 10 ppm in the dried green bean. In practice, the concentration is almost always < 1ppm, in other words 1/10 the “safe” level.

**1. Water Process** – there are two “water processes”. Both are all natural and certified organic. The Swiss Water Process is done in Vancouver, BC, Canada and the “Mountain Water Process” is in Veracruz, Mexico. Both use gradient pressure on the caffeine to decaffeinate, which means it is not an “extractive” process. Water and flavor particles from coffee are used to create a kind of natural ‘solvent’. Beans with caffeine are introduced to tanks filled with the solvent and then via gradient pressure, the caffeine gradually migrates out of the beans and into the solution. The solution is circulated through a carbon filter which removes the caffeine and the solvent solution can then be re-used to decaffeinate more beans. The extracted caffeine is not re-sold which explains at least some of why this process is more expensive than the “traditional” or “precision” method. Well-controlled, the water process takes about 10 hours, then two and a half more hours for drying.

**2. Traditional or Precision process** – about seven plants in the world use a process that uses methylene chloride to extract the caffeine molecules from coffee. This process achieves decaffeination with minimal disturbance to the flavor particles and other structures of the bean. It can also be done at lower temperatures, which preserves bean quality. The extracted caffeine can be re-sold to companies that use it, like soft drinks and pharmaceutical companies, which keeps the cost of decaffeination down. Obviously, this process is not an option for organic coffee.

**3. CO2 process** – uses “super critical” CO2, in other words CO2 gas compressed to its liquid state. The CO2 solvent extracts only the caffeine from the beans, none of the flavor particles. It is a costly process, because the equipment is expensive, and like the water process, the caffeine from this process is not sold. The process takes longer than with the “traditional” process, but is faster than the non-pressurized water processes, but still certified organic.

**4. Ethyl Acetate process** – sometimes called “naturally decaffeinated”, because ethyl acetate is found naturally in fruits and it is a common food additive. It uses mechanical processes that are similar to the “traditional” method, but uses ethyl acetate instead of MC for the solvent. The extracted caffeine can be re-sold

to companies that use it, like soft drinks and pharmaceutical companies, which keeps the cost of decaffeination down.

## Which Decaf Process is Best?

There is much debate about which decaffeination process is best. One fact on which everyone agrees – if you start with low quality, poorly sorted, or old coffee beans, no matter what process you use, the result will be bad-tasting coffee. (See “What does it take..” above.)

**If you want an organically certified, 100% natural process**, either of the “water process” coffees or the CO2 process will be needed. “Water process” coffees are easier to find than CO2. While the water process is more expensive than the traditional process, the CO2 process is expensive, too, and requires very large batches.

**If your first criteria is coffee taste**, cup samples first! There is so much low quality decaf coffee out there, it is impossible to know if a company has chosen high quality beans to go into the decaf process without cupping. Many big coffee companies intentionally throw their worst beans into the decaf truckloads.

## DECAF – Did you know?

How do regulators define “decaffeinated”?

US guidelines:	Final product must be 99.95% caffeine free. (0.051% residual caffeine by weight.)
International guidelines:	Final product must be 99.90% caffeine free. (0.10% residual caffeine by weight.)

The “best” coffees (Arabica beans) have lower caffeine. Ever wonder why cheap coffee gives you a headache?

Caffeine Content	
By Agricultural Product	Caffeine (% by dry weight)
Arabica coffee beans	1.2%
Robusta coffee beans	2.2%

How much caffeine is in a “regular” cup?

- Regular: 60-180 mg caffeine
- Decaf: 2 – 5 mg caffeine

Did you know a 1oz. espresso has less caffeine than an 8oz cup of coffee?

“ I think we make a grave mistake alienating decaf coffee drinkers with tons of nasty coffee brewed without much care. These are people *Buying coffee because they like the taste.* ”

- James Hoffman  
2007 World Barista Champion

## Common Beverages Caffeine Content (mg)

8oz coffee drip brewed	65-120
8oz coffee instant	60-85
8oz decaf instant	1-4
8oz decaf drip brewed	2-4
1oz espresso	30-50
1oz decaf espresso	2-4
8oz Tea (instant)	12-28
8oz Coca-Cola	46

Did you know...?

- Decaffeination typically happens outside the U.S.? There are decaf plants in Houston, TX and New Orleans, LA, but the other 10 or so are all elsewhere in the world – Canada, Mexico, Germany, Italy, Colombia. Most of the decaf coffee in N. America is decaffeinated outside the US.

- Myth: More roasting increases caffeine content. Roasting does not increase the caffeine level, given a certain weight of beans before roasting. The caffeine level is the same between a dark and a light roast, if the pre-roast weight of the coffee is the same. By *cubic* volume, you might fit more dark roasted coffee into a cup or porta-filter (because more of the bean substance is burned away), but tests show that the difference in caffeine even in this case is tiny.