

Decaf Coffee

Our Point of View

Introduction

Clean Label Project's mission is to raise awareness on the presence of potentially dangerous environmental contaminants and toxins in everyday consumer products. To Clean Label Project, sometimes what's not on the label is what's most important. Clean Label Project believes that when it comes to industrial and environmental contaminants and chemicals of concern, less exposure is better than more. Not only are these compounds potentially toxic, but information currently available on the long-term effects of routine exposure to these contaminants and chemicals of concern is already concerning, and our understanding is still developing. As a result, Clean Label Project believes that a serious conversation needs to be had with brands and regulatory bodies on the presence of these contaminants and chemicals of concern in consumer products. This document examines the results of Clean Label Project's findings on Methylene Chloride (the active ingredient in paint strippers) found in popular decaffeinated coffee. Our goal is to focus on what's inside each product to bring truth to the consumer and change the definition of consumer product safety.

Effects of Caffeine on Those with Heart Disease & Pregnant Women

According to the Centers of Disease Control¹, one person dies every 37 seconds in the United States from cardiovascular disease. About 647,000 Americans die from heart disease each year—that's 1 in every 4 deaths. Heart disease costs the United States about \$219 billion each year. This includes the cost of health care services, medicines, and lost productivity due to

“...whether or not high caffeine intake increases the risk of coronary heart disease is under study.” - The American Heart Association²

health. The American Heart Association² says that whether or not high caffeine intake increases the risk of coronary heart disease is under study. Recent research published in the Journal of American College of Cardiology: Clinical Electrophysiology³ has shown that up to three cups of coffee and tea are safe and can reduce the frequency of some arrhythmias. However, the American College of Cardiology³ also says that for patients with an association between coffee intake and documented AFib episodes should abstain from caffeine accordingly.

And, it's not just those with heart disease that are encouraged to monitor or minimize caffeine intake. According to the American Pregnancy Association⁴, while caffeine is one of the most loved stimulants in America, women may need to forgo caffeine during pregnancy for a few reasons. First, since caffeine is a stimulant, it increases blood pressure and heart rate, both of which are not recommended during pregnancy. Second, caffeine crosses the placenta to the baby. Although the mother may be able to handle the amounts of caffeine, a baby's metabolism is still maturing and may not be able to fully metabolize the caffeine. Overall, due to conflicting conclusions from numerous studies, the March of Dimes⁵ states that until more conclusive studies are done, pregnant women should limit caffeine intake.

“...until more conclusive studies are done, pregnant women should limit caffeine intake.”

- March of Dimes

With caffeine found in staples of the American diet like coffee, tea, soft drinks, chocolate and some nuts, how are those with heart disease or pregnant women to make the switch?

Decaf is Always an Option

According to Reuters⁶, a study commissioned by the National Coffee Association surveyed 3,000 Americans about their coffee drinking habits. The 2018 survey found that 64 percent of Americans drink a cup of coffee every day, up from 62 percent in 2017, and the highest percentage since 2012. For those coffee drinkers needing to cut back on caffeine, decaffeinated coffee is always an option. In fact, according to an article⁷ entitled “Traits of Persons Who Drink Decaffeinated Coffee” published in the scientific journal, *Annals of Epidemiology* and as shown in Table 1, decaffeinated coffee use is related to illness in some persons but to a healthy lifestyle in others.

The Truth Behind Decaffeinated Coffee: Where Decaffeinated Coffee Comes From

Like all coffee, coffee that is destined to become decaffeinated coffee thrives in environments with rich soil, mild temperatures, with lots of rain and shaded sun. As shown in Image 1, the area that spans between the Tropics of Capricorn and Cancer, is known as the bean belt. It includes many developing countries in Latin America, Africa, and Asia.

Table 1: Decaffeinated Coffee Drinker

Traits of a Decaffeinated Coffee Drinker	Increased Associations of Decaffeinated Coffee Drinkers
Less likely to be heavy coffee drinkers	Older Age
Less likely to be smokers	Females
Less likely to drink alcohol	African American
Less likely to drink caffeinated soda	Use of special diets
More likely to use medication	Cardiovascular issues
More likely to have an illness	Gastrointestinal issues
	Neuropsychiatric issues

The Decaffeination Process

All coffee beans contain caffeine. They must undergo a process to become decaffeinated. It's important to note that no coffee, including decaffeinated coffee, is entirely caffeine-free. Additionally, there is currently no requirement to identify what decaffeination process is used. The onus is on consumers to do

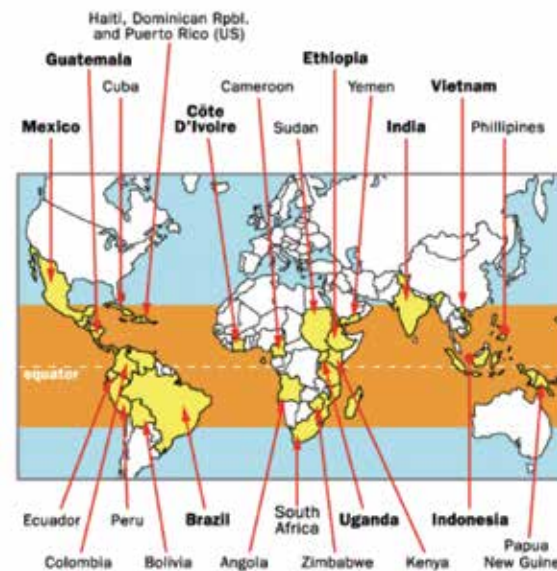


Image 1: Coffee grows best in an area known as the Bean Belt -- the band around the Earth in between the Tropics of Capricorn and Cancer. SOURCE: NATIONAL GEOGRAPHIC

their research. According to the USDA⁸, decaffeinated coffee shall not exceed 0.10 percent caffeine on a dry basis in the package.

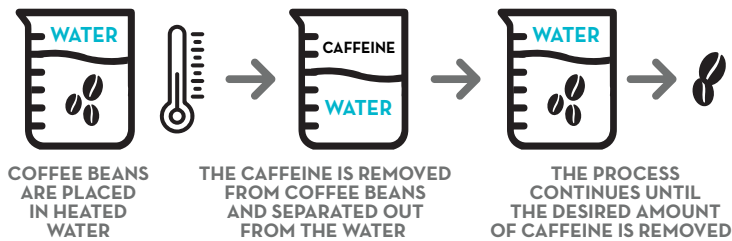
In all cases of decaffeination, the green or roasted beans are first moistened, making the caffeine soluble so that it can be drawn out. The coffee is decaffeinated at moderate temperatures, typically ranging from 70 to 100 degrees Celsius (160 to 210 degrees Fahrenheit).

There are two primary ways to decaffeinate coffee.

Non-solvent based decaffeination processes

The non-solvent based decaffeination process, as outlined in Image 2, typically uses water. Instead of chemicals, non-solvent based decaffeination relies on time and temperature. Non-solvent decaffeination has come under scrutiny because if a solvent lacks specificity⁹, it can contribute to the loss of key flavor components. Recent innovations, including Swiss Water Processing, has minimized this threat.

Image 2: Non-solvent based decaffeination¹⁰



Solvent-based decaffeination processes

Solvent-based decaffeination, as shown in Image 3, uses chemicals or carbon dioxide to remove the caffeine from the beans. In some cases, the coffee beans are directly submerged and soaked in the chemicals.

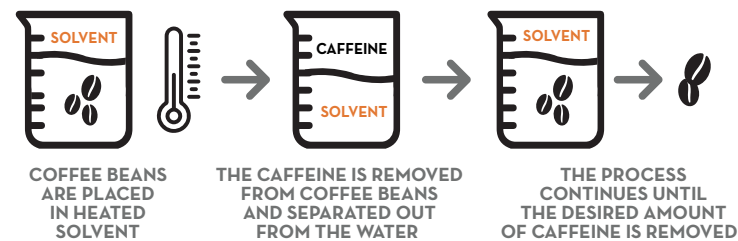
In recent years, the coffee industry has come under increased scrutiny for the use of harsh chemicals to decaffeinate coffee. A

“Toxic chemicals including benzene, trichloroethylene (TCE), and dichloromethane were once used in the decaffeination process. The common solvents used in decaffeination today are methylene chloride and ethyl acetate.”

– Consumer Reports

2017 study by Consumer Reports¹¹ highlighted that today, coffee manufacturers have switched to safer decaffeination methods, though many still use potent chemicals to strip away caffeine. Toxic chemicals including benzene, trichloroethylene (TCE), and dichloromethane were once used in the decaffeination process. The common solvents used in decaffeination today are methylene chloride and ethyl acetate.

Image 3: Solvent based decaffeination¹⁰



The Problem with Methylene Chloride

Methylene chloride or dichloromethane is a colorless, nonflammable, and volatile liquid chlorinated hydrocarbon. It is commonly used as a solvent in paint removers, a solvent in the manufacture of pharmaceuticals, and as a degreasing and blowing agent for industrial use.

The History of Methylene Chloride & Risks to Workers and Consumers

In 1987, Washington Post¹² detailed the storm that has been the history on the use of methylene chloride to decaffeinate coffee.

Back in 1982, methylene chloride, the chemical used by most US manufacturers to decaffeinate coffee brands, stirred up a controversy. The cause was a study by the National Toxicology Program indicating that methylene chloride fed to rats and mice caused cancer of the liver and other organs. At that time, consumers called on the FDA to ban the chemical's use for decaffeinating, and some manufacturers started to look into switching to other methods.

“The FDA concluded that methylene chloride is carcinogenic to animals when inhaled, and may be carcinogenic to humans.”

The National Toxicology Program's study was later withdrawn because of serious problems in the way it was conducted. However, in 1985 the FDA evaluated other research on the chemicals effects on animals. It concluded that methylene chloride is carcinogenic to animals when inhaled, and may be carcinogenic to humans. The agency subsequently banned the use of methylene chloride in cosmetics.

The FDA continued to allow the use of methylene chloride to decaffeinate coffee, because the amount of the chemical present in the finished product was extremely low. At that time, data submitted to the FDA by manufacturers using methylene chloride show that the chemicals was present in decaffeinated coffee at levels of .1 parts per million or less. Clean Label Project's investigation revealed some product tested exceeded this level.

“The State of California evaluation included that during pregnancy methylene chloride can pass from mother to baby.”

More recently, the California Environmental Health Hazard Assessment¹⁸ added it to its Prop 65 list. The State of California evaluation included that during pregnancy methylene chloride can pass from mother to baby.

In March of 2019, Methylene Chloride was banned for consumer use by the U.S. Environmental Protection Agency¹³ following controversial deaths linked to its use. Consumers and workers can be exposed to methylene chloride by being inhaled and absorbed by the skin. Inhalation of this chemical can cause instant dizziness, loss of consciousness, and irritation of the nose and throat. Acute exposure can cause death due to nervous system depression. In the coffee decaffeination process, workers are exposed to these chemicals during the production process. According to the US Department of Labor Occupational Safety and Health Administration¹⁴, employees exposed to methylene chloride are at increased risk of developing cancer, adverse effects on the heart, central nervous system and liver, and skin or eye irritation. According to the World Health Organization¹⁵, an inhalation study in mice provided conclusive evidence of carcinogenicity. Similarly, a drinking-water study provided suggestive evidence of carcinogenicity.

In 2018, efforts taken by the consumer advocacy organization Safer Chemicals. Heathy Families spearheaded efforts to remove Methylene Chloride based paint thinners from home improvement stores shelves. In November 2019, Safer Chemicals Healthy Families¹⁶ was joined by 18 state, local, and national organizations in sending a letter to EPA Administrator Andrew Wheeler sounding the alarm over EPA's recently released draft risk evaluation for the chemical. The draft evaluation identifies 15 additional consumer products that contain methylene chloride, presenting acute risks similar in nature and magnitude to the paint remover risks on which EPA based its consumer use ban.

“The methylene chloride tolerance in decaffeinated coffee has not been federally re-evaluated in 35 years.”

Presently, the Food and Drug Administration Secondary Direct Food Additives Permitted in Food for Human Consumption¹⁷ states, *“In coffee as a residue from its use as a solvent in the extraction of caffeine from green coffee beans, at a level not to exceed 10 parts per million (0.001 percent) in decaffeinated roasted coffee and in decaffeinated soluble coffee extract (instant coffee).”* The methylene chloride tolerance in decaffeinated coffee has not been federally re-evaluated in 35 years.

Additional Risks to the Environment

According to an analysis by the European Commission¹⁸, virtually all of the methylene chloride used in the decaffeination process is ultimately emitted to the air. According to the World Health Organization¹⁵, methylene chloride can persist in air for up to 500 days, but is rapidly biodegraded in water. In soil, it undergoes only slight biodegradation and is highly mobile, being leached from subsurface soil into groundwater. Given the proximity of coffee growing regions to critical wildlife habitats, this exposure is especially concerning.

The Clean Label Project Study Overview

According to the studies⁷, 13% of coffee drinkers drink exclusively decaffeinated coffee; 27% of coffee drinkers consumer both caffeinated and decaffeinated. Given the sensitive populations that are the primary consumers of decaffeinated coffee, Clean Label

Project wanted to take a closer look to find out if the chemical methylene chloride was present in America’s best-selling decaffeinated coffee.

Selecting the Samples

Clean Label Project wanted to select the decaffeinated coffees that were the most representative of the decaffeinated coffees in pantries across America. Clean Label Project used the Amazon.com, Walmart.com, and Target.com best-sellers lists in order to create a targeted shopping list.

The samples were procured using Clean Label Project’s Consumer Chain of Custody Sampling & Testing Process. Clean Label Project visited local co-ops, national retailers, and brand websites and purchased the products just as any consumer would to replicate the consumer shopping experience.

Testing the Samples

Clean Label Project had the products tested by an accredited analytical chemistry laboratory for methylene chloride. Clean Label Project utilized blind testing to fully protect impartiality. All decaffeinated coffee samples were sampled out into conical tubes and numbered. The product name and corresponding number was maintained exclusively by Clean Label Project to protect independence and confidentiality.

The numbered samples were submitted to an accredited analytical chemistry lab for testing.

The Laboratory Preparation

The standards and samples were prepared for analysis using the following approach:

- An internal standard (IS) solution containing chloroform (CAS No.: 4536-23-6) and fluorobenzene (CAS No.: 462-06-6) were purchased at a working concentration.

- A stock standard solution of methylene chloride was also purchased at a working concentration.
- The standard stock solution was spiked into 5mL of water at various levels with the internal standard being added at the same level throughout the calibration range.
- The calibration curve was analyzed by Gas Chromatography Mass Spectroscopy with Purge and Trap (GSMS/P&T).
- The samples were prepared by adding 0.5grams of ground coffee to a vial, along with 5ml of water, stir bar, and internal standard.
- The level of quantification was 50 parts per billion (ppb).

Findings

See Image 4 for a summary of the findings.

What Can You Do

1. Recognize that decaffeinated coffee has many important qualities. In fact, coffee is the biggest source of antioxidants in the American diet¹⁷. Drinking two or more cups of decaf coffee per day has also been linked with up to a 48% lower risk of developing rectal cancer¹⁸. Remember, there are many great-tasting decaffeinated coffees across all price points that don't use this chemical. Find a decaffeinated coffee that best represents your health and environmental priorities.
2. Look for claims on product packaging such as solvent-free, chemical-free, Swiss-water, or certified organic. These decaffeination approaches don't use harsh chemicals like methylene chloride.
3. Listen, we know that you have your personal favorites when it comes to your morning coffee. Did your favorite decaf product test positive for methylene chloride? Call, email, or message them on

social media and demand better. We've provided the contact information for you.

4. Didn't see your favorite decaf coffee on the list? Go to the brand's website and call, email, or message them on social media and demand to know more about their decaffeination process. You deserve to know what's in the food and consumer products you purchase and provide for your family.

5. If you are concerned about your exposure to methylene chloride or have questions about your caffeine exposure, always speak with your doctor.

References

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¹³<https://www.techtimes.com/articles/239802/20190318/epa-bans-household-use-of-toxic-paint-stripping-chemical-methylene-chloride.htm>

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¹⁵https://www.who.int/water_sanitation_health/dwq/chemicals/dichloromethane.pdf

¹⁶<https://saferchemicals.org/2019/11/22/consumer-sales-of-deadly-paint-strippers-banned-but-americans-still-at-risk/>

¹⁷<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=173.255>

¹⁸<https://www.p65warnings.ca.gov/fact-sheets/methylene-chloride-dichloromethane>

¹⁹Methylene chloride: Advantages and Drawbacks of Possible Market Restrictions in the EU

²⁰<https://www.healthline.com/nutrition/decaf-coffee-good-or-bad#section6>

Image 4:

Clean Label Project The Truth Behind Decaffeinated Coffee

THE BOTTOM LINE:

Methylene Chloride is an active ingredient in paint stripper that was recently banned by the EPA. However, the FDA currently allows methylene chloride to be **used in the coffee decaffeination process**. This federal allowance hasn't been reevaluated in over 35 years. While this chemical is currently considered acceptable to the FDA, is the presence of a banned active ingredient in paint stripper in your decaf coffee acceptable to you? While vulnerable populations like pregnant women, the elderly, and people with heart disease are exposed to low levels of this chemical, non-chemical decaffeination processes exist. The truth of the matter is that brands are not required to disclose the decaffeination process on their label. Consumers have a right to know what's in the product they purchase for themselves and their families.

Check out our findings below, chose your decaf coffee carefully, and make your opinion known.

BRANDS TESTED INCLUDE:



NON DETECT: LEVEL OF DETECTION IS 50 PARTS PER BILLION (PPB)

Allegro Coffee	Decaffeinated Organic French Roast
Archer Farms	Decaffeinated House Blend
Caribou Coffee	Decaffeinated Caribou Blend
Community Coffee	Decaffeinated Café Special
DAZBOG Coffee	Decaffeinated French Roast (12 oz)
Dunkin' Donuts	Decaffeinated Medium Roast
Folgers	Decaffeinated Classic
Illy	Decaffeinated Illy Blend
Kicking Horse Coffee	Decaffeinated Dark
Nescafe	Decaffeinated House Blend
Peet's Coffee	Decaffeinated Major Dickason's Blend
Starbucks	Decaffeinated House Blend
Starbucks	Decaffeinated Caffè Verona
The Organic Coffee Co.	Decaffeinated Organic Gorilla
Tim Hortons	Decaffeinated Medium Roast

METHYLENE CHLORIDE DETECTED: RESULTS RANGE FROM 50-89 PPB

Kirkland Signature	Decaffeinated Dark Roast
Maxwell House	Decaffeinated The Original Roast
Peet's Coffee	Decaffeinated House Blend
Seattle's Best	Decaffeinated Portside Blend

METHYLENE CHLORIDE DETECTED: RESULTS ABOVE 90 PPB

AmazonFresh	Decaffeinated Colombia
Café Bustelo	Decaffeinated Café Molido
Gevalia Kaffe	Decaffeinated House Blend
Great Value	Decaffeinated Classic Roast
Green Mountain Coffee Roasters	Decaffeinated Breakfast Blend
Kroger	Decaffeinated Classic



Have your opinion heard!
Reach out to brands and tell them you expect better or let them know you appreciate them for choosing a chemical-free decaffeination process.

Is your favorite product missing from our list?
Contact the brand and demand to know more about their decaffeination process.

Allegro Coffee	303-444-4844
Archer Farms (Target)	800-440-0680
Caribou Coffee	1-888-227-4268
Community Coffee	800-884-5282
DAZBOG Coffee	1-888-932-9264
Dunkin' Donuts	800-447-0013
Folgers	800-937-9745
Illy	1-877-469-4559
Kicking Horse Coffee	1-888-287-5282
Nescafe	800-637-8531
Peet's Coffee	800-999-2132
Starbucks	800-782-7282
The Organic Coffee Co.	800-829-1300
Tim Hortons	1-888-601-1616

Kirkland (Costco)	800-774-2678
Maxwell House	800-432-6333
Peet's Coffee	800-999-2132
Seattle's Best	800-611-7793

AmazonFresh (Amazon)	1-888-280-4331
Café Bustelo	800-990-9039
Gevalia Kaffe	800-438-2542
Great Value (Amazon)	800-925-6278
Green Mountain Coffee Roasters	1-866-901-2739
Kroger	800-576-4377