CASE STUDY: COFFEE

Summary

For decades, the International Agency for Research on Cancer (IARC) warned coffee drinkers that their favorite beverage might cause cancer. Finally, the agency updated its assessment in June 2016 and downgraded coffee to Group 3 or "not classifiable as carcinogenic to humans." While this decision is a step in the right direction, it raises new questions and concerns.

First, IARC did not categorize coffee as Group 4, "probably not carcinogenic to humans," even though there is considerable evidence supporting the health benefits of coffee consumption, including protection against Parkinson disease, liver disease, type 2 diabetes and liver cancer. Second, IARC's decision to classify coffee in Group 3 rather than Group 4 represents a pattern of ignoring scientific evidence that supports certainty and the safety of products and behaviors. In fact, IARC has examined almost 1,000 agents over the past 30 years, only once classifying a substance as Group 4. IARC has explained this by saying that to be downgraded to Group 4, science would have to "prove a negative," a statement that is neither reasonable nor useful to the goal of providing meaningful information to the public. In the end, IARC's treatment of coffee provides another example of the urgent need to reform both the Agency and its processes.

Coffee is Delicious, but is it Safe?

Coffee has been a consumer favorite and commodity staple for centuries, with widespread production and consumption beginning in the 17th century. Coffee houses, the first of which was established in London in 1652, became a major institution in Europe. Serving as an alternative social setting to taverns and pubs, they quickly became the focal point of the intellectual and business communities across the continent. The coffee shop in the U.S. plays a similar role, notably featured as the central hangout for America's favorite "Friends."

Coffee is the second most widely consumed beverage, behind only water. Its popularity has led to an explosion in production in Europe and the Americas. Today, an estimated 3.5 billion cups of coffee are consumed worldwide every day, making it an extremely valuable agricultural commodity. Coffee as a trade commodity is particularly important to developing countries, such as top producers Brazil, Vietnam, Indonesia, Colombia and India. Coffee is also a major driver of small businesses, with coffee shops and chains supporting entrepreneurs and workers around the world.

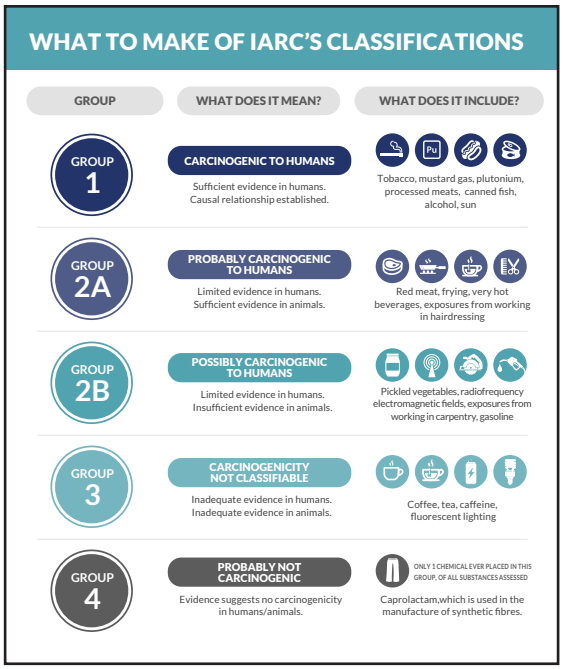
In addition to its overwhelming popularity, studies on the health impacts of coffee are favorable. Scientists have found that coffee positively impacts brain function, and poses no risk of gastric cancer and malignant melanoma for its millions of loyal consumers.

IARC's (Initial) Classification

Despite this impressive history, since 1991 coffee consumption has occurred under a cloud of suspicion. In that year, IARC classified the popular beverage as "possibly carcinogenic" (Group 2B). IARC claimed the data was "consistent with a weak positive relationship between coffee consumption and the occurrence of bladder cancer." The conclusion generated widespread confusion and media attention over coffee's safety.

IARC relied on case-control studies that were interpreted as showing an association between coffee consumption and bladder cancer. Its conclusion relied on the limited evidence available at that time, and no other cancer associations were found. However, IARC concluded that there was enough evidence to categorize coffee as a Group 2B substance (possibly carcinogenic).

Since 1991, numerous scientific evaluations of coffee have not only contradicted this finding, but determined that it might actually be good for our health. Evidence suggests, for example, that your daily "cup of joe" can protect against several common ailments and chronic diseases, including Alzheimer's, Parkinson disease, type 2 diabetes, and liver disease.



Source: Compound Interest

- The Journal of the American Medical Association (2000): "Our findings indicate that higher coffee and caffeine intake is associated with a significantly lower incidence of [Parkinson disease]...The data suggest that the mechanism is related to caffeine intake and not to other nutrients contained in coffee."
- National Center for Biotechnology Information (2010): "These results indicate a surprising ability of moderate caffeine intake (the human equivalent of 500 mg caffeine or 5 cups of coffee per day) to protect against or treat AD [Alzheimer's Disease] in a mouse model for the disease and a therapeutic potential for caffeine against AD in humans."
- American Diabetes Association (2006): "This study confirms a striking protective effect of caffeinated coffee against incident diabetes and extends these findings to incident diabetes based on oral glucose tolerance test independent of multiple plausible confounders."
- US National Library of Medicine, National Institutes of Health (2014): "In chronic liver disease patients who consume coffee, a decreased risk of progression to cirrhosis, a lowered mortality rate in cirrhosis patients, and a lowered rate of hepatocellular carcinoma development were observed. In chronic hepatitis C patients, coffee was associated with improved virologic responses to antiviral therapy. Moreover, coffee consumption was inversely related to the severity of steatohepatitis in patients with non-alcoholic fatty liver disease. Therefore, in patients with chronic liver disease, daily coffee consumption should be encouraged."
- National Institutes of Health (2012): "We found coffee consumption to be associated with lower risk of death overall, and of death from a number of different causes. Although we cannot infer a causal relationship between coffee drinking and lower risk of death, we believe these results do provide some reassurance that coffee drinking does not adversely affect health."

IARC's Revised Classification

Since 1991, the weight of the evidence supporting the health benefits of coffee has grown exponentially. Studies overwhelmingly demonstrate that there is no evidence of an association between coffee and cancer — bladder cancer included. Moreover, a number of studies suggest that coffee consumption is linked to a reduced risk of several cancers, including endometrial, colorectal, liver, and postmenopausal breast cancer.

Confronted with the overwhelming evidence, in June 2016, IARC updated its coffee assessment, reclassifying coffee as a Group 3 carcinogen. According to IARC, Group 3 classification means that coffee is "unclassifiable as to carcinogenicity to humans." While a concession of sorts, IARC still refuses to sound the all clear and label coffee as "probably not carcinogenic," despite all evidence supporting this determination. IARC explained "We can't say that it's completely safe because proving a negative is very difficult, but it has moved down a step in terms of the hierarchy of concern."

IARC's puzzling re-classification of coffee received immediate criticism from the academic and scientific communities:

- Donald Hensrud, Ph.D., director of the Mayo Clinic's Healthy Living Program (2016): "If you look at the data, it's actually quite clear that coffee is beneficial."
- Geoffrey Kabat, Ph.D., M.S., cancer epidemiologist at the Albert Einstein College of Medicine in the United States (2016): "The main thing is that, given the large amount of new and much larger and better studies that have accumulated in the past 25 years, why would one say 'not classifiable?' This makes no sense. It points [out] that IARC is willing to say there is a 'possible' risk based on very flimsy studies, but when there is much more evidence of a higher caliber that seems to point to the absence of a risk, IARC declares coffee 'not classifiable.' IARC's initial classification of coffee as a possible carcinogen and its failure to update its assessment in the light of the extensive evidence that has accumulated over the past 25 years highlight a larger problem with the Agency's scheme for classifying carcinogens."
- Timothy Caulfield, Canada Research Chair in Health Law and Policy at the University of Alberta (2016): "If you look at the body of evidence out there about coffee, it's probably not bad for you, and may be good for you. So drink up."

Note: If you drink your coffee piping hot, or enjoy hot tea – IARC says you are still in danger as it has classified "very hot beverages" as "probably carcinogenic" (a 2A carcinogen) along with red meat and working as a hairdresser.

Additional Links and Resources

- IARC Monographs evaluate drinking coffee, maté, and very hot beverages, (IARC, June 15, 2016)
- Deluge of studies leaves coffee lovers dizzy (CBC News, June 18, 2016)
- IARC reverses itself on link between coffee and cancer (Legal News Line, July 8, 2016)
- IARC lets coffee off the hook but only deepens the confusion (Forbes, June 18, 2016)
- How coffee became a carcinogen (Slate, Oct. 30, 2015)
- High-profile cancer reviews trigger controversy (Science Magazine, June 24, 2016)