SAMPLE

Does coffee dehydrate you?

THE CLAIM

"Coffee dehydrates you, so it doesn't count as water."

RATING **Holds up** **Partly** **✓ Doesn't hold up**

EVIDENCE
Moderate

Why moderate: 12 sources point the same way, and two official reviews agree. But most trials are small and short, most were in young men, and two used caffeine pills, not coffee (04, 05).

THE SHORT ANSWER

For people who drink coffee regularly, normal amounts hydrate about as well as the same amount of water. Caffeine does make you pee a little more, but mostly after a big dose in one go (300 mg or more, about three cups at once), especially in people who aren't used to it, and only for a few hours. The US Institute of Medicine says caffeinated drinks count toward your daily fluids, and Europe's food safety agency says caffeine's effect on urine is unlikely to harm healthy people.

SAFE TO SAY

- In normal amounts, coffee counts toward your daily fluids.
- A very strong coffee can make you pee more for a few hours.
- Coffee before exercise isn't a hydration problem for healthy people.

NOT SAFE TO SAY

- "Coffee dehydrates you."
- "Drink a glass of water for every cup." No study here tested it.
- "Caffeine has no effect on urine at all." Big doses do.
- That it's the same for everyone: most trials were in men.

WHAT THE STUDIES FOUND

51.5 vs 51.4 kg

Total body water on 3 days of four mugs of coffee a day, vs 3 days of the same amount of water. 50 men who drink coffee every day. No difference.

Killer et al. 2014 (01)

Same as water

Urine over 4 hours after a litre of coffee, compared with a litre of water. 72 men tried 13 drinks between them; 17 had coffee.

Maughan et al. 2016 (02)

613 vs 356 mL

Urine in 3 hours after one very strong coffee (about 540 mg caffeine) vs water. Half that dose made no difference.

Seal et al. 2017 (06)

> "These data suggest that coffee, when consumed in moderation by caffeine habituated males provides similar hydrating qualities to water."
>
> KILLER ET AL. 2014, ABSTRACT. CHECKED WORD FOR WORD.

WHERE THE LINE IS

HOW MUCH CAFFEINE	WHAT HAPPENED	SOURCE
Up to 200 mg	Unlikely to change hydration in any meaningful way, whether or not you're used to caffeine.	EFSA 2015 (09)
About 270 mg	No more urine than water over 3 hours, in regular coffee drinkers.	Seal et al. 2017 (06)
250 to 300 mg and up, in one go	A short rise in urine, mostly in people who've gone days without caffeine. Regular drinkers build up a tolerance.	Maughan & Griffin 2003 (08)
360 mg, after a day off	Urine rose. 180 mg and less did not. 8 men.	Passmore et al. 1987 (11)
About 540 mg	613 mL of urine in 3 hours vs 356 mL for water, even in regular drinkers.	Seal et al. 2017 (06)
642 mg over a day (6 cups), after 5 days off	753 mL more urine over 24 hours; the one study here that measured a drop in body water.	Neuhauser-Berthold et al. 1997 (12)

Spread across a day, 4 to 6 mg per kg of body weight (about 280 to 420 mg for a 70 kg adult) showed no dehydration in three trials: regular coffee drinkers (01), caffeine-adapted men (04) and men who rarely have caffeine (05). Pooled over 16 studies, caffeine added about 109 mL of urine on average; the effect showed up at rest, not during exercise (07).

THE STUDIES

01	**Killer, Blannin & Jeukendrup (2014).** No evidence of dehydration with moderate daily coffee intake. *PLoS One* 9(1): e84154.	doi.org/10.1371/journal.pone.0084154
02	**Maughan et al. (2016).** A randomized trial to assess the potential of different beverages to affect hydration status: development of a beverage hydration index. *Am J Clin Nutr* 103(3): 717-723.	doi.org/10.3945/ajcn.115.114769
03	**Grandjean et al. (2000).** The effect of caffeinated, non-caffeinated, caloric and non-caloric beverages on hydration. *J Am Coll Nutr* 19(5): 591-600.	doi.org/10.1080/07315724.2000.10718956
04	**Armstrong et al. (2005).** Fluid, electrolyte, and renal indices of hydration during 11 days of controlled caffeine consumption. *Int J Sport Nutr Exerc Metab* 15(3): 252-265.	doi.org/10.1123/ijsnem.15.3.252
05	**Silva et al. (2013).** Total body water and its compartments are not affected by ingesting a moderate dose of caffeine in healthy young adult males. *Appl Physiol Nutr Metab* 38(6): 626-632.	doi.org/10.1139/apnm-2012-0253
06	**Seal et al. (2017).** Coffee with high but not low caffeine content augments fluid and electrolyte excretion at rest. *Front Nutr* 4: 40.	doi.org/10.3389/fnut.2017.00040
07	**Zhang et al. (2015).** Caffeine and diuresis during rest and exercise: a meta-analysis. *J Sci Med Sport* 18(5): 569-574.	doi.org/10.1016/j.jsams.2014.07.017
08	**Maughan & Griffin (2003).** Caffeine ingestion and fluid balance: a review. *J Hum Nutr Diet* 16(6): 411-420.	doi.org/10.1046/j.1365-277x.2003.00477.x
09	**EFSA (2015).** Scientific opinion on the safety of caffeine. *EFSA Journal* 13(5): 4102.	doi.org/10.2903/j.efsa.2015.4102
10	**Institute of Medicine (2005).** Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate, pp. 133-134.	doi.org/10.17226/10925
11	**Passmore et al. (1987).** Renal and cardiovascular effects of caffeine: a dose-response study. *Clin Sci* 72(6): 749-756.	doi.org/10.1042/cs0720749
12	**Neuhauser-Berthold et al. (1997).** Coffee consumption and total body water homeostasis. *Ann Nutr Metab* 41(1): 29-36.	doi.org/10.1159/000177975

WORTH KNOWING

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