Tea and Caffeine

From the teas.co.uk wiki

> **Caffeine map, in summary:** Tea caffeine is a range you control, not a fixed number. Black, green, white, decaf and herbal levels, the levers that move them, and timing.

Last reviewed by the teas.co.uk team in April 2026.

Caffeine in tea is one of the most misunderstood subjects in British tea drinking. The same plant (*Camellia sinensis*) produces teas with caffeine ranging from 15mg per cup (delicate white tea) to 70mg per cup (strong matcha or builders' brew); the brewing method, water temperature, and brewing time all change the final cup amount. Add the L theanine factor that measurably sets tea caffeine apart from coffee caffeine, and the caffeine picture is more complicated than most people realise.

This guide is the complete caffeine map: the per cup amounts across every tea family, the variables that change those amounts, the L theanine factor, the practical implications for sleep and anxiety, and how to manage caffeine intake intelligently across the day using tea as a primary or supplementary source.

The headline caffeine map

Tea	Caffeine per cup (200ml)	Notes
White tea (silver needle, white peony)	15 to 30mg	Lightest of all true teas
Decaf tea (any family)	1 to 5mg	Decaffeinated, not caffeine free
Standard green tea (sencha, dragonwell, jasmine)	20 to 35mg	L theanine balance produces "smooth focus"
Light oolong	30 to 45mg	Between green and black tea levels
Standard black tea (English Breakfast, Earl Grey)	40 to 60mg	British everyday cup
Strong builders' brew (Yorkshire, PG strong steep)	50 to 70mg	The strong morning hit
Dark oolong (roasted, aged)	50 to 70mg	Similar to strong black tea
Matcha (whisked bowl)	60 to 70mg	Whole leaf consumption; sustained focus
Pu erh tea	60 to 70mg	Full extraction, deep character

Tea	Caffeine per cup (200ml)	Notes
Yerba mate	40 to 80mg	Not Camellia sinensis but functions similarly
Herbal infusions (chamomile, peppermint, ginger, rooibos)	0mg (true zero)	Naturally caffeine free
Coffee (filter, 240ml)	95 to 165mg	For comparison; 2-3x stronger than tea
Espresso (single shot, 30ml)	60 to 80mg	For comparison; concentrated burst

Note that these are typical ranges; actual cup amounts depend on brewing variables covered later in this guide. For the tea vs coffee comparison see the tea vs coffee caffeine guide.

The L theanine factor

The single most important caffeine concept in tea drinking. L theanine is an amino acid found in *Camellia sinensis* (tea) and almost nowhere else in the human diet. It crosses the blood brain barrier and modulates the caffeine effect by:

- Increasing alpha wave activity in the brain (a relaxed but awake state)
- Reducing the anxiety spike component of caffeine response
- Smoothing the caffeine peak and extending the effective focus window
- Reducing the crash component of caffeine elimination

The combination of caffeine and L theanine in their natural tea ratios produces something measurably different in EEG studies than caffeine alone. People describe it as feeling clear headed rather than wired, and the effect is real and replicable.

L theanine content varies by tea type:

- **Highest L theanine:** matcha and shade grown green teas (gyokuro, kabusecha)
- **High L theanine:** standard green tea, white tea
- **Moderate L theanine:** oolong, light black tea
- **Lower L theanine:** dark fully oxidised black tea (some L theanine lost in oxidation)
- **No L theanine:** herbal infusions, rooibos, coffee, yerba mate

The practical implication: green tea and matcha produce the most distinctive "focused but relaxed" effect; standard black tea has a milder version of the same effect; coffee has none of it. For drinkers who want the cleanest sustained focus experience from caffeine, matcha is the most efficient delivery.

Variables that change cup caffeine

The caffeine ranges above are typical, but actual cup amounts depend on multiple brewing variables:

Brewing time. Caffeine extracts in the first 1 to 2 minutes of brewing; longer brewing extracts more caffeine but also more tannins (which produce bitterness). The trade off:

- 2-minute brew of black tea, 30 to 40mg caffeine, lighter character
- 4-minute brew of black tea, 40 to 55mg caffeine, full character
- 6+ minute brew of black tea, 50 to 70mg caffeine, more bitter

For drinkers who want maximum caffeine, longer brewing helps; for drinkers who want lower caffeine, shorter brewing helps. The strongly brewed Yorkshire builders' tea hits 60 to 70mg; the same tea bag in a 2-minute brew is closer to 35 to 40mg.

Water temperature. Higher temperatures extract more caffeine. Boiling water on green tea extracts more caffeine than the recommended 70 to 80°C, but also more bitterness. Practical implication: cool water brewed green tea is slightly lower in caffeine than boiling water brewed green tea, alongside being better tasting.

Leaf to water ratio. Two tea bags in one cup roughly doubles the caffeine vs one tea bag. Strong brewed mug of double bagged tea can hit 80 to 100mg, comparable to a small coffee.

Cup size. The numbers above are for 200ml cups. Larger British mugs (300 to 350ml) brewed with proportional leaf increase the per cup caffeine accordingly. A "big mug" of strong tea can deliver 70 to 90mg.

Multiple infusions. Re brewing the same leaves extracts less caffeine each round, typically 60 to 70 percent of the first cup on the second infusion, declining further on subsequent infusions. For multiple infusion drinkers (oolong, pu erh, premium green), the cup by cup caffeine declines steadily across the session.

Caffeine half life and timing

Caffeine has a half life of 5 to 6 hours in most adults; some people metabolise faster (3 to 4 hours), some slower (7 to 9 hours), based on genetic variation. The half life is what determines when caffeine still affects sleep:

Time of cup	50mg caffeine remaining at 9pm	Sleep impact for sensitive drinkers
8am cup	3mg (negligible)	None
11am cup	6mg	None
2pm cup	12 to 15mg	None for most adults
4pm cup	20 to 25mg	Possible sleep impact for sensitive drinkers
6pm cup	30 to 35mg	Likely sleep impact
8pm cup	40 to 45mg	Significant sleep impact

The general guidance is to avoid caffeine after 2pm if you have any sleep difficulties. For most adults this means switching from caffeinated tea to herbal infusions, decaf tea, or rooibos for late afternoon and evening cups. See the best tea for sleep guide.

NHS caffeine guidance

Caffeine guidance for different groups:

- **Healthy adults:** the European Food Safety Authority found that intakes up to 400mg a day raise no safety concerns for healthy adults who are not pregnant
- **Pregnancy:** the NHS caps total caffeine at 200mg a day and herbal tea at 4 cups daily, and advises against teas containing liquorice root (NHS pregnancy guidance)
- **Children:** the NHS says tea and coffee are not suitable for babies or young children (NHS drinks guidance for young children); for caffeine and young children we leave ages and amounts to a pharmacist, health visitor or GP
- **Adults with anxiety, sleep, or heart rhythm conditions** may benefit from significantly lower intake; consult GP

We don't convert the 200mg pregnancy limit into a number of cups: caffeine per cup varies with the tea, the dose and the brew, so count every source, including decaf.

Caffeine sensitivity and tolerance

Individual caffeine sensitivity varies dramatically. Genetic variation in the CYP1A2 enzyme (which metabolises caffeine in the liver) means some people are "fast metabolisers" (caffeine effects are short lived, less pronounced) and some are "slow metabolisers" (caffeine effects last longer, more pronounced).

Practical implications:

- Some adults can drink coffee at 8pm and sleep fine; others can't tolerate caffeine after 2pm
- Some adults experience anxiety from one cup of coffee; others tolerate 5+ cups daily
- Heavy daily intake builds tolerance, blunting both the wake up effect and the effect on sleep and jitters
- Tolerance development is real but limited; the pharmacological effects don't completely disappear with regular use

For drinkers building a sensible caffeine strategy, the best approach is to learn your own sensitivity through experimentation rather than following generic guidance. Some questions to ask yourself:

- What's the latest time I can have caffeine without affecting sleep?
- How many caffeinated drinks per day before anxiety kicks in?
- Do I notice a 3pm crash from morning caffeine, or does the energy taper smoothly?
- How does my response to coffee compare to my response to strong tea?

The answers vary significantly by individual; what works for someone else may not work for you.

Strategy: using tea for sustainable daily caffeine

For drinkers who want a sustainable caffeinated tea daily routine, the principles:

1. **Start with the strongest cup at the start of the day** when caffeine has maximum time to clear before sleep. Matcha or strong builders' brew at breakfast; modest morning hit at maximum efficacy

2. **Mid morning, gentler caffeinated tea:** standard black tea or green tea at 11am
3. **Early afternoon, lighter caffeinated tea:** green tea or white tea at 1 to 2pm
4. **Cut off caffeine by 2pm:** for sleep sensitive drinkers
5. **Late afternoon onwards, herbal or rooibos:** true caffeine free for the rest of the day
6. **Stay hydrated alongside caffeine:** tea is hydrating but having water alongside caffeine sources is sensible

This pattern keeps most drinkers under 200mg of caffeine a day (inside the pregnancy cap and well within the 400mg general adult guidance) while spreading the wake up effect across the working part of the day.

The decaf option

Decaf tea retains 1 to 5mg of caffeine per cup, effectively negligible for most drinkers. For people who like the tea drinking habit but not the caffeine, decaf is the natural choice. The decaffeination process removes 95 to 99 percent of caffeine while preserving most of the flavour.

Decaf is functionally different from "caffeine free":

- **Decaf:** started as caffeinated tea, processed to remove caffeine; small residual amount
- **Caffeine free:** drinks made from plants that never had caffeine (rooibos, herbal infusions, fruit teas); true zero

For drinkers who specifically need true zero caffeine (severe sensitivity, certain medical contexts), caffeine free herbals are the only zero caffeine option. For most adults the residual decaf caffeine is functionally negligible. See the decaf vs caffeine free comparison.

Reducing caffeine intake gradually

For drinkers wanting to reduce caffeine for anxiety, sleep, or other reasons, gradual reduction works better than cold turkey:

1. **Week 1:** replace one daily caffeinated drink with herbal or decaf
2. **Week 2:** replace second caffeinated drink
3. **Week 3-4:** continue gradual reduction
4. **Maintain a sustainable level:** most drinkers find their best level around 100 to 200mg daily

Cold turkey caffeine reduction typically produces 3 to 5 days of withdrawal symptoms (headache, fatigue, irritability) followed by full adjustment. Gradual reduction usually avoids the worst withdrawal symptoms.

What we stock

Browse the full black tea range, green tea range, decaf range, and herbal range.

For high caffeine tea (60mg+ per cup):

- Yorkshire Tea Original, the strong builders' brew baseline
- Pukka Organic Supreme Matcha Green, matcha style high caffeine sustained focus

For moderate caffeine tea (30 to 50mg per cup):

- Twinings English Breakfast
- Twinings Pure Green Tea

For low caffeine and caffeine free options:

- Yorkshire Tea Decaf
- Dragonfly Organic Rooibos, naturally caffeine free
- Twinings Pure Camomile, true caffeine free for evening

The caffeine verdict

Tea is a flexible caffeine source that can be tuned across a wide range from 0mg (caffeine free herbal) to 70mg+ (strong matcha or builders' brew). The L theanine factor that distinguishes tea caffeine from coffee caffeine is real and meaningful, producing measurably different cognitive effects in EEG studies and noticeable subjective differences for most drinkers.

For sustainable daily caffeine intake, tea is generally a better choice than coffee because of the smaller per cup doses, the smoother onset and taper, the L theanine modulation, and the easy switch to caffeine free options for the late afternoon and evening. For maximum intensity caffeine hits, coffee remains the more efficient delivery.

Most adults benefit from understanding their own caffeine sensitivity and structuring their daily intake around it: stronger cups in the morning when caffeine has maximum time to clear, lighter cups in the afternoon, and herbal or rooibos for the evening. This pattern uses tea's flexibility to keep you steadily awake without disturbing sleep or piling on jitters.

For the wider context see the tea vs coffee caffeine comparison, the decaf vs caffeine free comparison, the best tea for sleep guide, the best tea for energy guide, the matcha overview, and the green tea overview.

Sources cited

- EFSA Scientific Opinion on the Safety of Caffeine (2015)
- NHS guidance on caffeine

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