

## CAFFEINATED BEVERAGES

# Tea: hydration and other health benefits

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## Peer review

This article has been subject to double blind review and has been checked using antiplagiarism software

## Conflict of interest

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For further information, see [www.teaadvisorypanel.com](http://www.teaadvisorypanel.com). The content reflects the opinions of the author

## Abstract

There is concern in some health profession literature and the wider media that caffeinated beverages may not support normal hydration. To examine this, a systematic review was carried out to identify intervention trials that tested the impact of tea consumption on validated markers of hydration. The six trials, which mostly involved males, confirmed that tea performed in a similar way to plain water up to intakes of six servings daily. Guidelines for safe consumption of caffeine indicate that a caffeine intake of up to 400mg daily (200mg for a single serving) is safe for adults. Average tea consumption in the UK, at two to three servings daily, fits within this. Given the potential benefits of tea for heart health, dental health and cognitive function, tea consumption could rise to eight servings daily and still remain within safe caffeine limits.

## Keywords

caffeine, cardiovascular, diuretic, flavonoid, fluoride, hydration, tea

## Aims and intended learning outcomes

The aim of this article is to critically evaluate evidence on tea, hydration and potential health benefits to provide better patient advice on the role of tea in the diet.

After reading this article and completing the time out activities you should be able to:

- » Correctly identify the caffeine content of various beverages and put them into context with age-appropriate caffeine recommendations.
- » Summarise the contribution of caffeinated beverages such as tea to normal hydration.
- » Critique misinformation associated with caffeinated beverages reported in the media.
- » Outline the wider health benefits of tea, noting where evidence is well-established and where further research is required.
- » Consider the role of caffeinated drinks within hydration guidelines as part of the new Eatwell Guide (Public Health England (PHE) 2016).

## Introduction

The view that caffeinated drinks contribute to dehydration by stimulating excess urine production is less common nowadays but still influences public health advice (NHS Choices 2015, Queen Elizabeth Hospital Birmingham 2015) and information given in some media articles (for example, Allard 2015). Yet there is growing evidence that tea, a caffeinated drink, does not have a net diuretic effect in

certain intakes. The issues of tea, caffeine and hydration, as well as the potential health impact of tea flavonoids (bioactive plant compounds) and fluoride, will be discussed in this article.

## Tea constituents

Regular black tea is the second most consumed beverage in the world after water. Black, green and white teas are all made from the leaves of *Camellia sinensis*, with differences in colour and chemical composition due to the longer aeration of black tea. Tea naturally contains caffeine, flavonoids and fluoride (Ruxton 2014a), with levels varying depending on provenance and brewing time.

Caffeine is a methylxanthine compound also found in coffee, chocolate, cola and mate, a tea made from yerba mate leaves (Ruxton 2008). Black tea contains more caffeine (41.5 to 67.4mg/g dry weight) than green tea (around 32.5mg/g dry weight) (Cabrera et al 2003). An analysis of a standardised black-tea infusion, brewed for 40 seconds with one teabag in 240ml of boiling water, reported a caffeine content of 16.7 to 21.1mg/100ml, with an average of 18.9mg/100ml, equating to 42mg for a mug of tea (Ruxton and Hart 2011). Caffeine levels are lower in green teas (approximately 40mg/serving), and all teas are lower in caffeine than coffee (80 to 100mg/serving).