Black tea and mind benefits

We examine the effects of L-theanine on our mood, alertness and attentiveness

Tea is the most widely consumed beverage especially in Asia after water, and has been historically associated with mind reviving effects, enhancing alertness and mood. These widespread beliefs have been shown to have a scientific basis: Studies indicate that drinking black tea helps to "revive" by improving mental alertness, and that regular consumption of black tea throughout the day helps maintain a consistent level of cognitive performance as well as reducing feelings of fatigue.

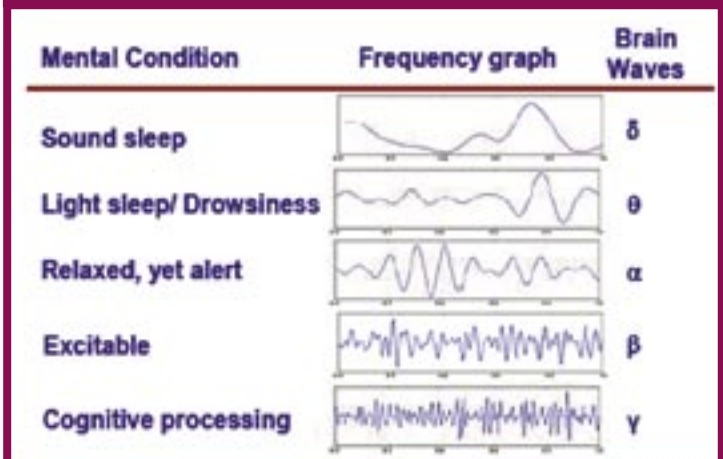
But what in black tea could be responsible for these benefits? For over 10 years, the Lipton Institute of Tea, headquartered just north of London, UK with its mission to promote awareness and understanding of tea from bush to cup, has been conducting studies on the mood and mental performance effects of black tea and its active ingredients. Many studies have explored the psychoactive effects exerted by black tea and its chemical components.

What is black tea?

The difference between different types of tea lies in the way that the tea leaves are processed. Essentially, all teas, whether black, green, white or *oolong* tea, are produced from the same plant, *Camellia sinensis*.

Black tea undergoes substantial oxidation, which changes the colour of the leaves from green to brown, and alters the naturally occurring components of the leaves. Black tea naturally contains many goodies, including flavonoids, caffeine and L-theanine that have been associated with cognitive performance and health benefits.

Figure 1: Mental conditions associated with brain waves



What is theanine?

Theanine is a non-protein amino acid found naturally and almost exclusively in tea, but otherwise rare in nature. There are two isomers of theanine (L and D isomers) with the predominant form in tea being the L-theanine (~98%). Generally, a tea infusion contains around 15- to 17-mg theanine per serving, depending on blend and brewing method.

L-theanine and brain wave activity

Once L-theanine reaches the brain, it has clear effects on its electrical activity. Neurons (nerve cells) in the brain communicate through weak electrical pulses, known as brain waves, which can be measured at the surface of the head by electroencephalography (EEG: Measurement of electrical activity produced by the brain as recorded from electrodes placed on the scalp). There are five kinds of brain waves, namely α (alpha), β (beta), δ (delta), γ (gamma) and θ (theta) waves, according to their frequencies. Each brain wave is associated with a different mental condition (see Figure 1).

Alpha brain waves are associated with being relaxed yet alert during rest as well as with attention when performing a cognitive task. L-theanine has been shown to influence alpha brain waves both at rest and when performing a cognitive task.

Caffeine and cognitive performance

Caffeine is a well-known stimulant and naturally present in black tea, although black tea is not a high caffeine drink, it seems to provide the beneficial effects of caffeine on mental performance. Indeed, doses of caffeine equivalent or lower than those found in a cup of tea (for example, 37.5mg) have been found to have an effect on cognitive performance and have been associated with increases in subjective score for alertness, energy and well being.

How does black tea help with mental alertness?

About 10 years ago, Japanese researchers discovered that

200-mg L-theanine increases alpha brain wave activity which is associated with a relaxed yet alert mental state during rest. Several studies directly support that in individuals at rest, L-theanine increases alpha brain wave activity.

Emerging research is also suggesting that L-theanine may play a role in attention. Activity in the alpha brain wave has been linked with general attentional processes, and recent research has shown that oscillations in the alpha wave are a key component in selective attention. Selective attention is demonstrated when individuals are able to ignore distractions from, for example, auditory stimuli, and focus on another sensory stimulus such as visual stimuli. It is like being able to ignore people talking while being able to focus on the road during driving. This is known as the "alpha attention effect".

To further investigate this, the Lipton Institute of Tea has commissioned studies in conjunction with the University of Oxford (UK) to conduct a series of EEG studies with theanine in healthy volunteers. These studies confirmed that 50-mg L-theanine, which is equivalent to roughly 2 to 3 cups of black tea, increases alpha brain wave activity gradually over time, with apparent effect after 80 minutes of drinking and still apparent 105 minutes later.

Furthermore, two other randomised, double-blind cross-over studies commissioned by the Lipton Institute of Tea have investigated the effects of black tea on focused attention, as assessed by standardised tests on alertness and subjective questionnaires. These studies have shown that consumption of 2 to 3 cups of black tea improves the ability to focus attention and increase alertness. Because L-theanine and caffeine are the two tea components known to influence mental performance, it is thought that their combined natural presence in black tea is responsible for the observed effects.

The regular consumption of black tea throughout the day may therefore help maintain alertness, focus, attention and accuracy.

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In summary

Emerging research on L-theanine may explain the unique effects felt by tea drinkers that are so different to other hot beverages. L-theanine is a natural component found almost exclusively in tea and research has shown that just 50-mg theanine (2 to 3 cups of black tea) naturally stimulates alpha brain waves, which are associated with a relaxed yet alert state of mind.

Investigation into the effects of L-theanine on mood, alertness and attentiveness in humans has brought psychology and nutrition together in an exciting new field of study which will unfold rapidly in the next few years! FBA

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