

Key components in green tea, such as theanine and catechins, could be linked to health benefits.

# DOES GREEN TEA OFFER COGNITIVE AND SLEEP BENEFITS?

A leading Japanese green tea and matcha company is **FOCUSING RESEARCH EFFORTS ON TACKLING HEALTH CHALLENGES** related to ageing.

**The value of the green tea market globally is soaring** and has been projected to exceed US\$26 billion by 2028. Its rising popularity has been driven in part by a growing number of studies documenting health benefits<sup>1</sup>. One of the world's largest producers of green tea, ITO EN, headquartered in Tokyo, Japan, has been contributing to this research, studying the effects of the beverage on cognitive function and sleep quality.

"ITO EN Group is striving to provide accurate information and disseminate research results on the health benefits of green tea and matcha [tea powder]," says Daisuke Honjo, president and executive officer.

"We're also seeking to combine these results with the food cultures of various countries, and provide advice on compatibility of green tea with meals and how it can improve nutritional balance."

With that goal in mind, ITO EN's researchers have been conducting basic research on the effects of green tea. Honjo points to several studies on diseases that suggest links between tea consumption and health. "Validating these associations through studies holds the potential to contribute to the health of many people," says Takanobu Takihara, director of ITO EN's Central Research Institute, in Shizuoka.

Scientists are especially

intrigued by several key components in green tea — an amino acid called theanine and a group of plant antioxidants known as catechins.

Theanine, which can cross the blood-brain barrier, is associated with inhibiting the stimulant effects of caffeine. In addition, there are indications that it may protect the brain, reduce stress, and improve sleep quality. "It's also one of the ingredients that contributes to green tea's umami flavour," explains Honjo.

Rather than imparting a savoury flavour, catechins are the main components of green tea's astringency, or slight bitterness, and they are present in large quantities, he says.

Catechins have been suggested to have antioxidant, anti-inflammatory, antibacterial and antiviral activities.

ITO EN has contributed to elucidating the effects of catechins on body fat reduction and LDL cholesterol reduction, adds Honjo.

ITO EN's researchers have been studying how caffeine, theanine and catechins individually affect cognition for younger and older adults, and whether there are benefits in this regard.

## EFFECT ON COGNITION

To determine whether reported improvements in brain function for older adults are solely due to caffeine in green tea or

whether other components play a role, ITO EN researchers led a double-blind, randomized, placebo-controlled study, which compared the effects of matcha and caffeine.

Fifty-one healthy Japanese men and women aged 50-69 were assigned to one of three groups, which consumed nine capsules daily for 12 weeks of caffeine, matcha, or a placebo substance. The team found that the group given matcha displayed improved attention and work performance, while faced with psychological stress, than the group given caffeine alone<sup>2</sup>.

Furthermore, to study the effect of theanine and catechins on older Japanese adults, the ITO EN research team conducted two other double-blind, randomized, placebo-controlled studies.

To single out possible effects of L-theanine on the cognitive function of older Japanese adults, the 69 participants in the first study consumed capsules of either L-theanine or a placebo substance daily for 12 weeks.

The researchers found that the group receiving a single dose of L-theanine displayed a shorter reaction time to tasks that required attention. They also gave a larger number of correct answers and made fewer errors. The authors of the resulting study argue that L-theanine may contribute to improved attention, resulting in enhanced working memory and executive function<sup>3</sup>.

In the second study, to narrow in on the effect of catechins, rather than caffeine, on cognitive function, 60 study participants were given capsules of catechins derived from decaffeinated green tea for 12 weeks. The researchers found that the incorrect response rate on another test of cognitive function decreased after just one dose of catechin,



- ▲ 1. Sensory evaluation of green tea at ITO EN headquarters in Japan.
- ▲ 2. Consumption of green tea has been linked to improved cognition and sleep quality.
- ▲ 3. Daisuke Honjo, president and executive officer of ITO EN.

with response times also shortening after 12 weeks. The team argues that these results indicate that regular consumption of green-tea catechins could also enhance working memory<sup>4</sup>.

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## A GOOD SLEEP

Sleep is critical for physical and mental well-being, particularly for young people. This is why a team from ITO EN and Ehime Prefectural University of Health Sciences studied the effect of green tea on sleep in female students aged 21-22. Specifically they looked into whether theanine can balance out the

stimulating effects of caffeine to improve overall sleep quality.

The study used a single-dose, four-treatment, double-blind, crossover design. Nine participants in each group were fitted with sensors and electrodes before drinking one of four test beverages shortly before bed. These drinks contained either 50 milligrams of theanine; 30 milligrams of caffeine; combined doses of theanine and caffeine; or a placebo substance.

The researchers then measured the time it took participants to fall asleep, the length of sleep, and the time until the first time any participants awoke during the night. They also measured wakefulness after sleep onset, which is the amount of time for which participants were awake after initially falling asleep until they woke up for good. Sleep stage was determined using electroencephalograms,

and cerebral blood flow measured using near-infrared spectroscopy<sup>5</sup>.

The researchers found that, in combination with theanine, only the caffeine-induced wakefulness after sleep onset was suppressed, suggesting that theanine can reduce the negative effects of caffeine on sleep quality.

## LOOKING AHEAD

The findings of these studies suggest that green tea may have beneficial effects on cognition and sleep, two areas crucial for health and well-being.

"With the advent of 100-year life expectancy, we believe that it is essential to extend the period of life where you remain in good health for as long as possible in order to make the most of long life," says Honjo.

To achieve these, ITO EN is collaborating with research institutes from various external organizations to clarify the efficacy of green tea and matcha for health issues such as cognitive function, sleep, and frailty. "In particular, we believe that the world is watching how Japan will address the challenges of this super-aged society."

Understanding how green tea and matcha could improve well-being may be one of the ways Japan could shine in this arena. ■

## REFERENCES

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