

2025



お茶の体験講座

~JAPANESE CULTURE AND TEA~

2025年9月25日(木)

**茶学総合研究センター
国際交流室**

今日の内容

Today's Agenda

- 1 お茶の話
All About Tea
- 2 急須で煎茶を淹れてみよう
Let's try Sencha in a Kyusu!
- 3 抹茶を自分で淹れてみよう
Let's try Matcha!



講師

Speakers

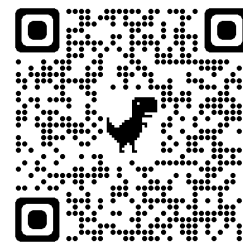
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What is tea ?

Tea is made from *Camellia sinensis*

►Originally, tea is a **medicine**.



Shen
Nong



The oldest medicinal book

Tea have different chemical components from other plants

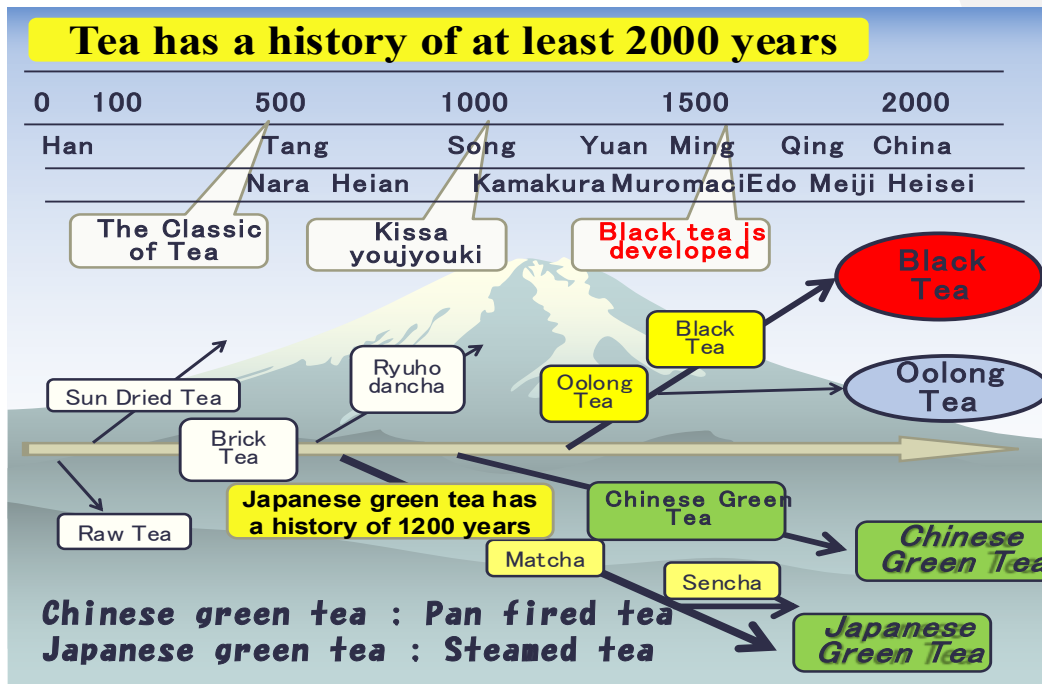
- ★ Caffeine
- ★ Catechins of Gallate type
- ★ Theanine (Free Amino Acid)
- ★ Others (Fluorine, Aluminum etc.)

The story of tea began in ancient china, before the Christian era.

Shen Nong was an early emperor, scholar, herbalist and agriculture of god in posterior.

He is famous for the discovery of the efficacy of tea, which acts as an antidote against the poisonous effects of some seventy herbs. Also, he found that tea is a drink to be so exciting and exhilarating.

Tea has a history of at least 2,000



The Classic of Tea; Written by Lu Yu in the Tang Dynasty of China, the Classic of Tea is an encyclopedia of tea that is still read today even though it was written more than 1,200 years ago.

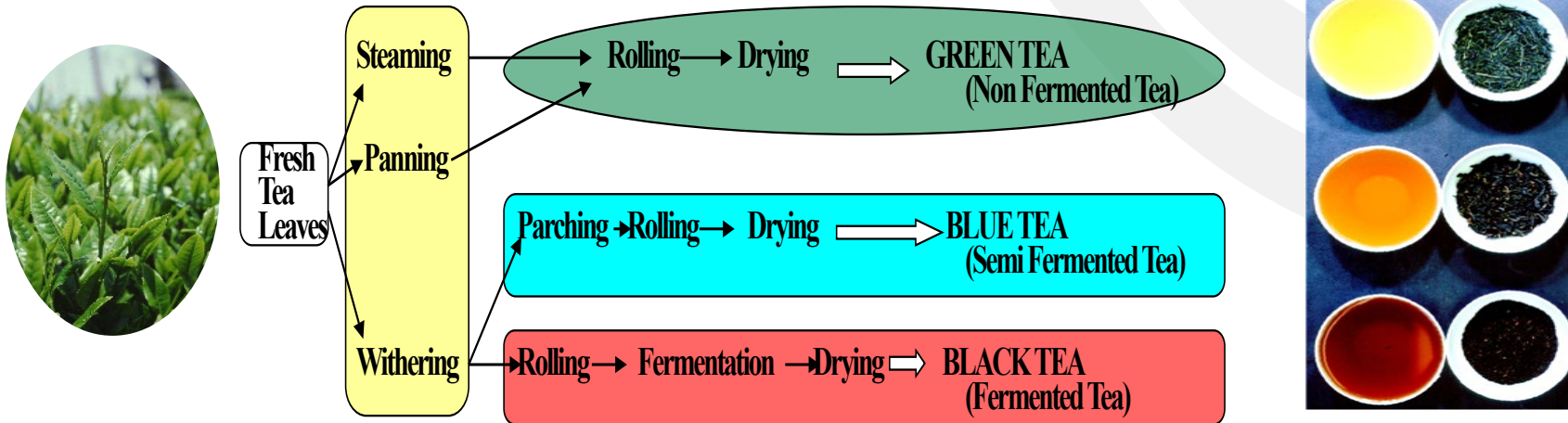
The origin of tea drinking is unknown; in China it has begun to drink at least over 2000 years ago.

Tea preparation and serving methods were first introduced in Japan from China almost 1200 years ago. **Steaming or boiling** was only tea way to prepare tea at that time, and the methods still practicing in Japan.

However, in China, steaming and boiling process were changed into the **pan fired method** from the age of Song. Alongside, oolong tea was introduced around the 15th century, and black tea was developed from oolong tea in the 17th century. A new tea blossomed in the world from 18th to 19th century.

Various types of tea can be made from the same tea leaves

Different kinds of tea in the world



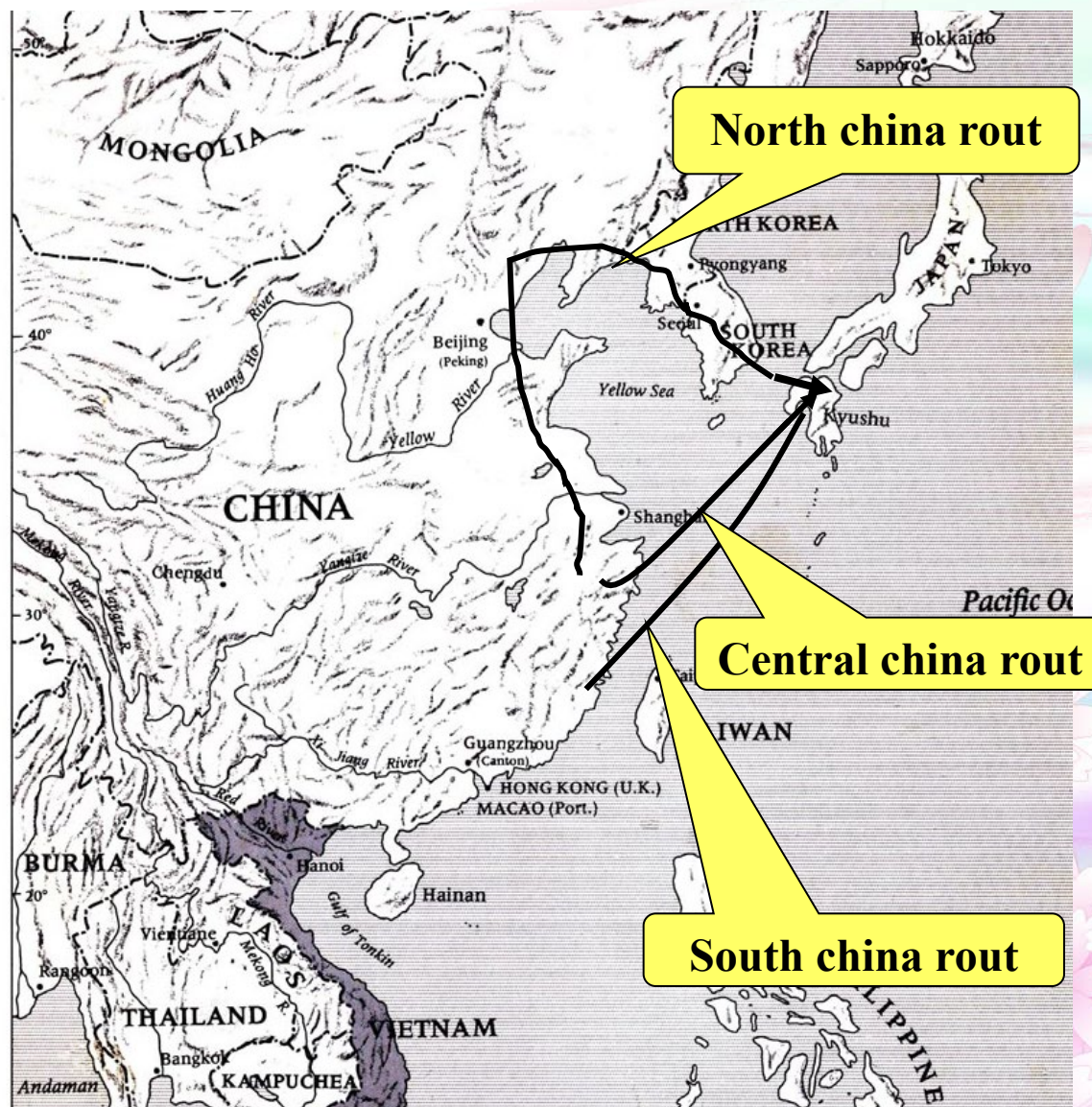
In the long history of tea production, many types of tea have been developed.

In general, tea is classified depending on the degree of fermentation (activation of oxidizing enzyme contained in the leaves).

- Green tea (non-fermented tea): After being plucked, fresh leaves of tea immediately **treated with high temperature** in order to **inactivation** of oxidizing enzyme of leaves.
- Black tea (fermented tea): The leaves are withered, rolled, and incubated for 5 to 20 hours **without applying high temperature** for fermentation.

During this step (fermentation process), oxidizing enzyme are especially active and change catechin to the oxidized form.

The Introduction of Tea into Japan



North-china route

North china $\Rightarrow$ Korea $\Rightarrow$ Japan
Oldest root (about A.D.600)

Central china route

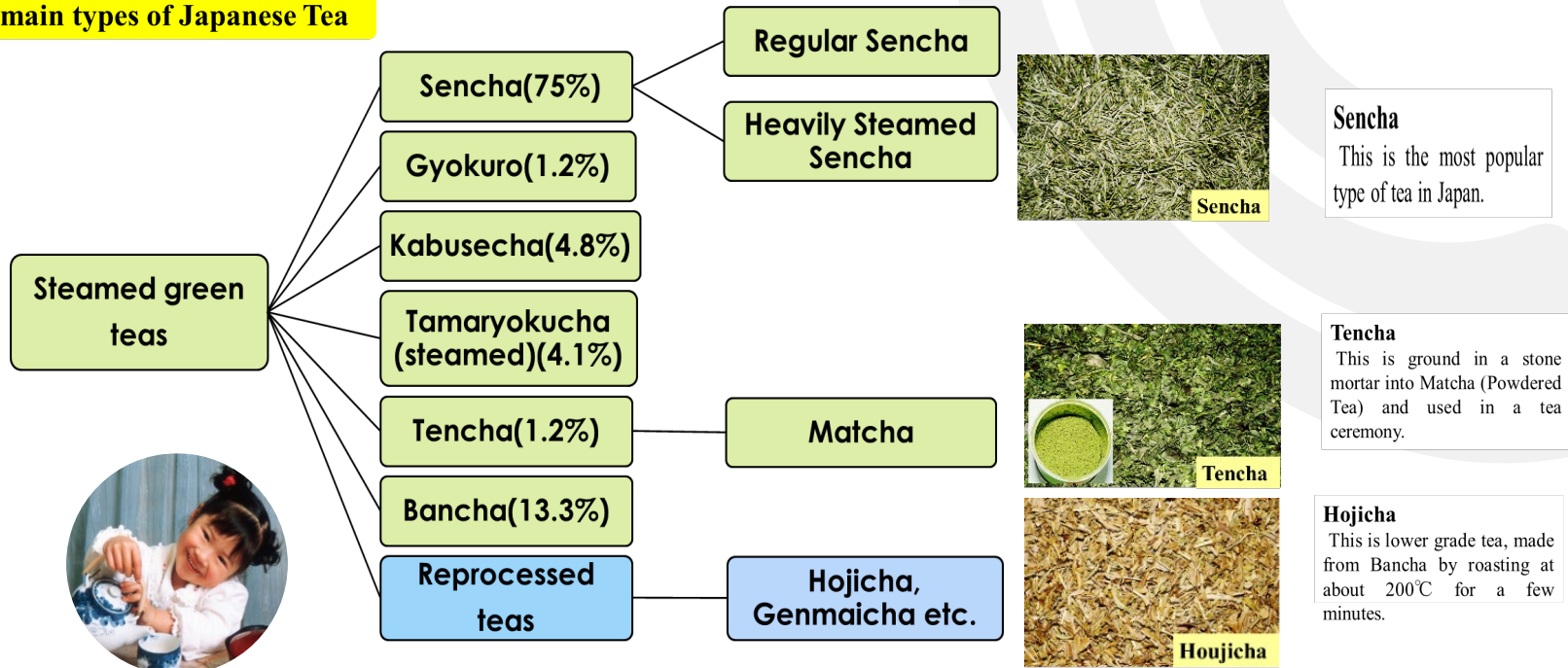
Introduction of the cake tea,
powder tea (About A.D.1100)

South china route

Introduce of pour tea (About
A.D.1600)

The main types of Japanese tea

The main types of Japanese Tea



Japanese Green Tea Production

Japanese tea is processed by **steaming** to stop oxidation, then kneading and drying. Steaming is a characteristic of Japanese green tea, and it is a method of heating tea leaves that is rare in the world.

Japanese tea can be divided into gyokuro and tencha, which are grown under cover, and sencha and bancha, which are the other types.

In addition, there is also a classification of tea that is repelled in a process such as sorting, that is, stem tea, sprout tea, powdered tea, and raw material tea for tea bags.

Sencha is an everyday tea of Japan



The soluble rate of chemical component is different on water temp.

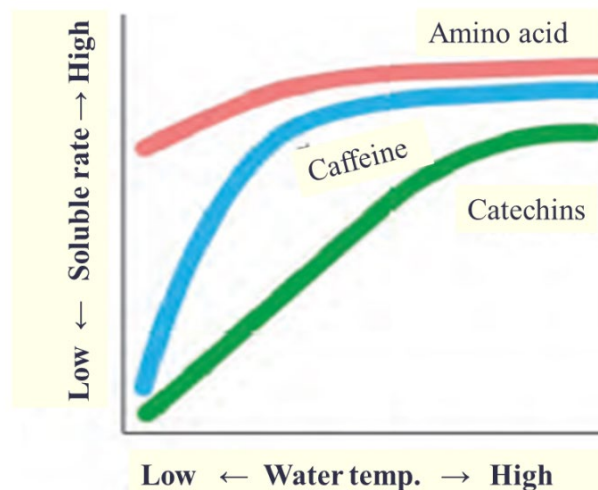
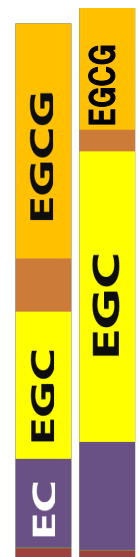


Image of the soluble rate of chemical component on different water temp.



The major component and the taste of tea

Amino Acids	Theanine	Sweet, Umami
	Gultamic acid	Umami, acidity
Chtechnins	Epicatechin	Bitter
	Epigallocatechin	Bitter
	Epicatechin gallate	Astringent, Bitter
	Epigallo catechin gallate	Astringent, Bitter
Caffeine		Bitter

The soluble rate of Catechins

H; High water temp.
L; Low water temp.

Matcha is one of the representative teas



Tencha, which are known as the finest tea in Japan, is made from the leaves grown under the ceiling-shelf covering.

Tencha, the raw material for matcha, is grown under cover. Cultivation under cover reduces the catechin content and increases the amino acid content. The tea leaves are steamed typically within 2-3 hours after plucking to inactivate the enzymes activities in the leaves and then dried without rolling. Tencha-ro consist of a furnace and an exhaust gas duct, and several steps perforated belt conveyers (3-5 steps) with brick walls. And, Tencha is grinded by the stone and becomes Matcha. Matcha for ceremony grade is ground by the special stone mill, designed for grinding tencha, rotated by a specially developed electric motor. The median particle diameter of matcha powder is less than 20 μm .

Production Process of Matcha

Processing stages

Tea leaf cooling spreader



Tencha dryer ('Tencha-ro')

Grinding stages



Tea grinder (special stone mill designed for matcha grinding)



Matcha.

It is possible to consume vitamin A (beta carotene), vitamin E (tocopherol), dietary fiber etc which can not be ingested with tea brewed in teapot.

Spirits of “Chanoyu / Sado”

In chanoyu, through exchanges of hospitality and appreciation, the host and guests can share a quite, heartwarming, peaceful time and reach a state of spiritual enlightenment so called Wa-Kei-Sei-Jyaku.



Wa-Kei-Sei-Jyaku (和敬清寂)

“Wa” : open each other’s heart.

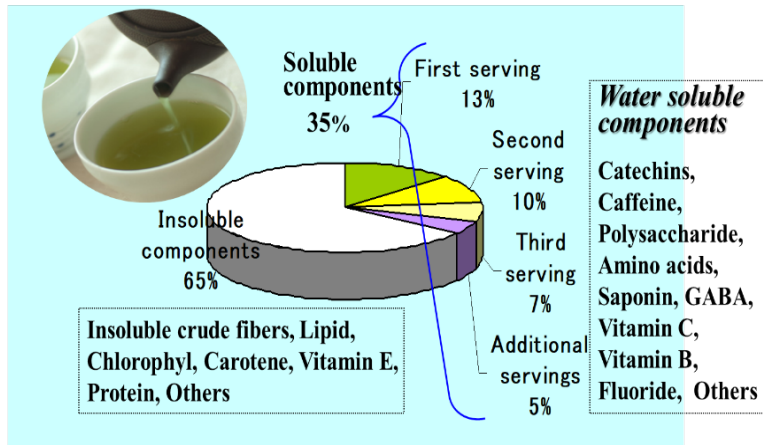
“Kei” : respect each other.

“Sei” : purify your surrounding and your spirit.

“Jyaku”: maintain a spirit of quietness



Physiological functions of Japanese green tea



Green tea contains about 35% water soluble compounds, including catechins, caffeine and amino acids et al.

On the other hand, the remaining 65 % of the components of tea are water insoluble compounds, including fiber, vitamin E, carotene, protein and chlorophyll et al.

In the case of serving green tea, the 13% of soluble component in the green tea dissolves in hot water with first serving. And second serving is 10%, and third serving is 7%.

Crystals of tea catechins



EC



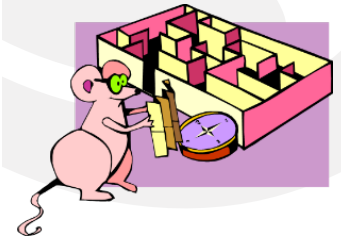
EGC



ECg



EGCg



Physiological functions of green tea components

Green Tea Components	Contents	Functions
Catechins	10~18%	Anti-oxidative, radioprotective, Anti-mutagenic, Anti-tumor, Enzyme inhibitory, Anti-hypercholesterolemic, Anti-hyperglycemic, Fat reducing, Anti-hypertensive, Anti-ulcer, Anti-bacterial etc.
Caffeine	3~4%	Removal of fatigue, Sleepy feeling, Diuretic etc.
Vitamin C	150~250mg%	Removal of stress, Cold prevention
Vitamin B	1.4mg%	Excitometabolic action of carbohydrates and amino acids
Vitamin E	25~70mg%	Anti oxidative, Aging prevention
γ amino butyric acid	0.1~0.2%	Anti hypertensive
Flavonoids	0.6~0.7%	Halitosis prevention
Theanine	0.6~2%	Anti hypertensive

Catechins, caffeine and theanine are the most important chemicals and catechins shows various physiological functions, such as anti-oxidative, Anti-cancer, fat reduce et al. Caffeine show removal of fatigue, sleepy feeling. Theanine show anti-hypertensive effects. The benefits of tea drinking in both aspects of mental and physical health have been discussed for thousand years in China and many other countries where the tea is consumed. Recently, with the advance of modern chemistry, components of tea have been analyzed and health benefits argued in the past been attributed to the tea element. In particular, as for catechins in green tea a great many effects have been studied and a number of functionalities have been proved.

Matcha is a highly functional superfood



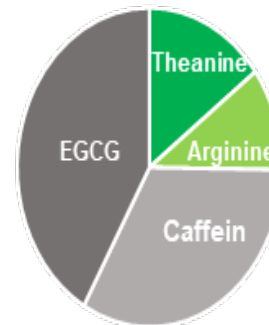
Modern life can cause stress in people, and the accumulation of stress is strongly linked to various diseases. Intervention of stress-induced alterations with dietary supplements is a potential therapeutic strategy for a healthy life. Reducing stress with matcha may become a new health-giving strategy for achieving good daily life.



The power of theanine in matcha

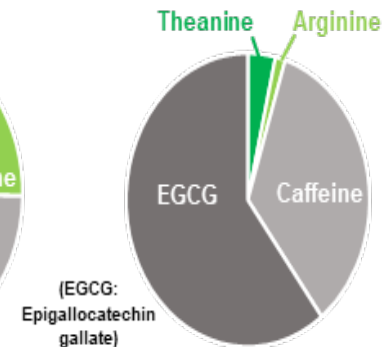
Theanine exhibits an excellent stress-reducing effect on mice and humans. However, the effect of theanine is antagonized by caffeine and epigallocatechin gallate (EGCG), which are two major components of green tea. In contrast, the stress-reducing effect of theanine is enhanced by arginine, which is the second most abundant amino acid in Japanese matcha. An effective stress-reducing outcome is only possible when the molar ratio of (caffeine (C) + EGCG (E)) / (theanine (T) + arginine (A)) is 2 or less. Matcha with a CE/TA ratio of 2 or less is high-grade matcha, and if the ratio is greater than 2, it is a low-grade matcha in terms of reducing stress.

High-grade matcha



CE/TA = 1.79

Low-grade matcha



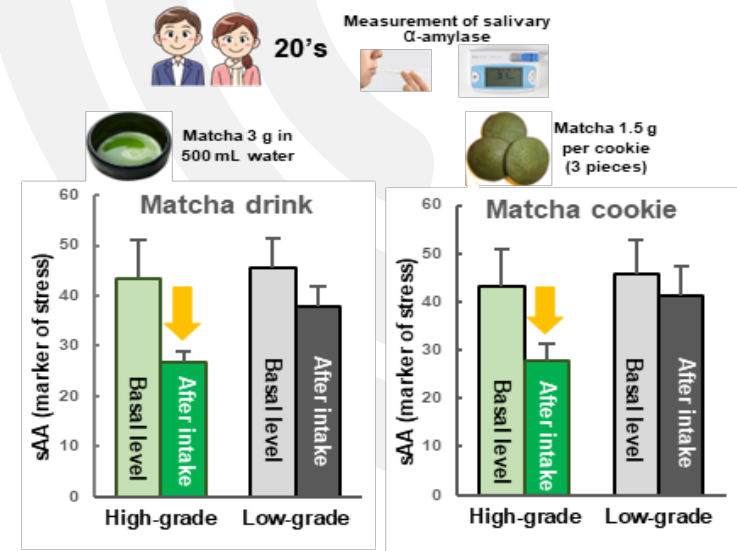
CE/TA = 10.64

Molar ratio of CE/TA =

$$\left[\frac{\text{Caffeine (C)} + \text{EGCG (E)}}{\text{Theanine (T)} + \text{Arginine (A)}} \right]$$

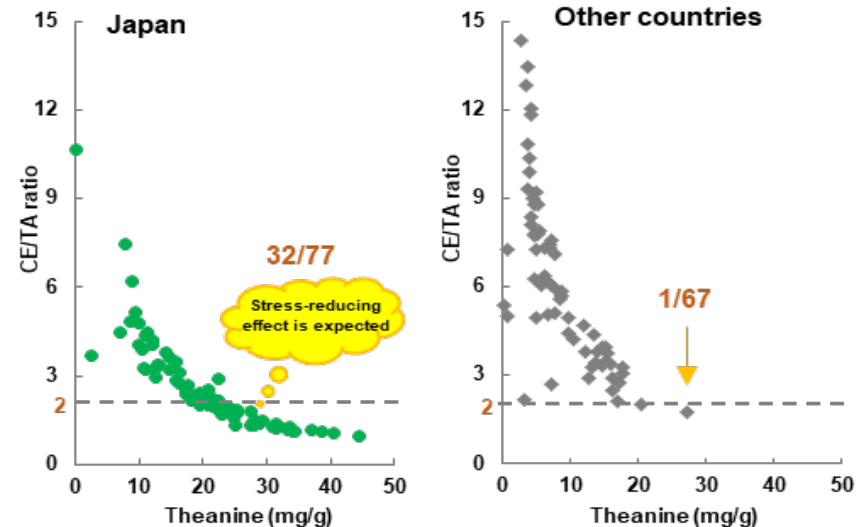
Stress reduction by high-grade matcha

As a marker of stress, salivary α -amylase activity (sAA) was measured. The basal level of sAA before matcha intake was not different between the participants of high-grade and low-grade matcha groups. The participants drank matcha (3 g/500 mL water) for a week. The level of sAA after matcha intake was significantly lowered in the high-grade matcha group. Similarly, when eating cookies containing matcha (4.5 g/3 pieces), sAA was significantly reduced in the high-grade matcha group. Both drinking high-grade matcha or eating cookies with it reduced stress. On the other hand, there was no change in stress in the low-grade matcha group.



High-grade matcha marketed in Japan and other countries

The stress-reducing effect of matcha marketed in Japan and other countries was assessed. When people ingested 3 g of these matcha per day, a stress-reducing effect was expected. About half of matcha sold in Japan is expected to reduce stress versus only one brand of matcha marketed in other countries. Almost all matcha brands in other countries had low amounts of theanine and arginine and high amounts of caffeine and EGCG. Matcha is essentially rich in theanine and poor in catechin, but not all marketed matcha satisfies these two conditions.



If you want to relieve stress with matcha, a high-grade matcha should be selected ($CE/TA \leq 2.0$).

Try Sencha and Matcha

How to make Japanese tea

Sencha (Gyokuro)

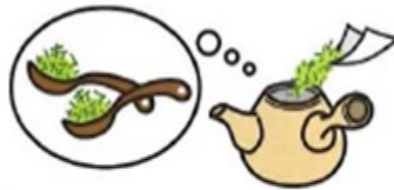
1

Cool down by pouring the boiled water into tea cups. (About 5 °C is cooled by this method)



2

Place the tea leaves into the tea pot.
6-10 g for 3-5 people



3

Pour the cooled down water into the tea pot
Water temp. 70-90 °C
Steeping time
60-120 sec.



4

Serve equally into each tea cup until the final drop is poured.
Serving temp.
50-65 °C



Matcha



The point is to brew tea at a low temperature to enjoy the umami, and at a high temperature to enjoy the aroma.