

# Excellent Character of Japanese Green Tea and Advanced Production Technology in Japan



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## Characteristics of Tea



Tea have different chemical components from other plants

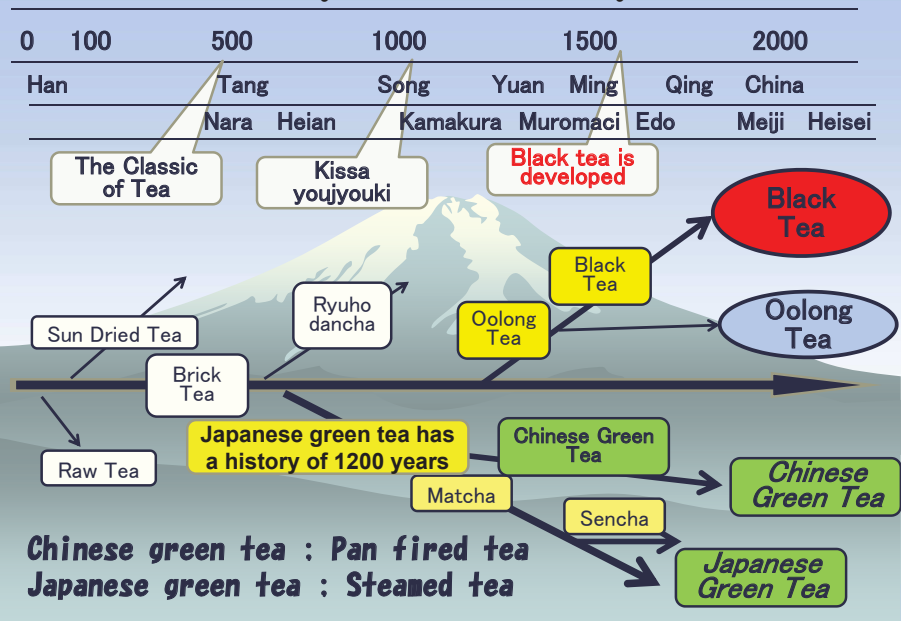
- ☆ **Caffeine**
- ☆ **Catechins of Gallate type**
- ☆ **Theanine (Free Amino Acid)**
- ☆ **Others(Fluorine, Aluminum etc.)**



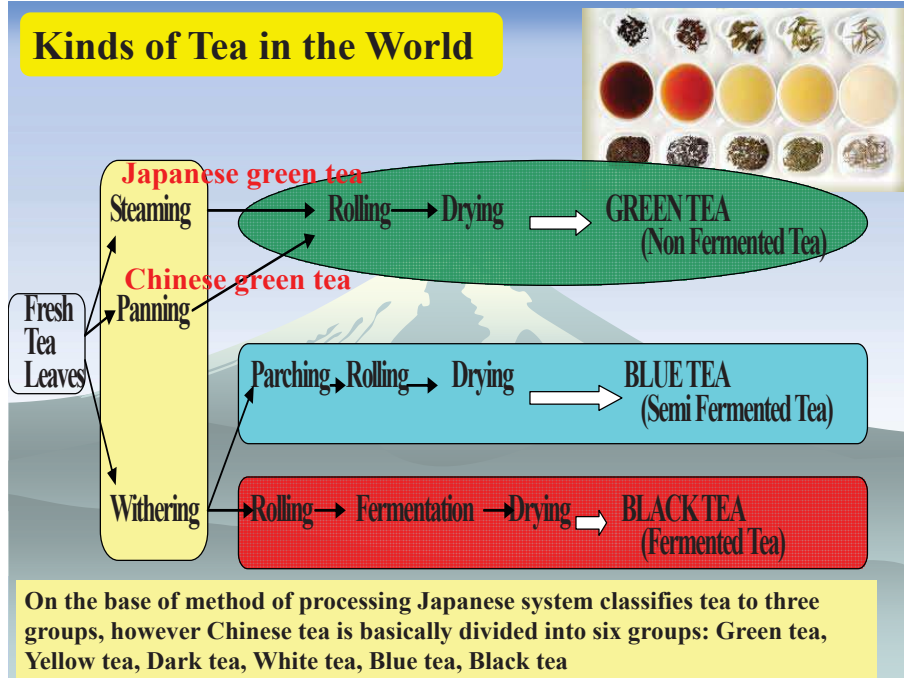
# 1. Excellent Character of Japanese Green Tea



## Tea has a history of at least 2000 years



## Kinds of Tea in the World



## Comparison of chemical contents of green tea and black tea infusion

The chemical contents of green tea and black tea infusion (Dry weight %)

	Green tea	Black tea
<b>Total Catechin</b>	30-42	3-10
<b>Theaflavin</b>	0	2- 6
Polyphenol	2	3
<b>Flavonol</b>	8	24
Theanine	3	3
Organic Acids	2	2
Caffeine	3-6	3-6
<b>Vitamine C</b>	4	0



## Can make the various types of tea from the same leaves



Tea leaves

Green tea

Black tea

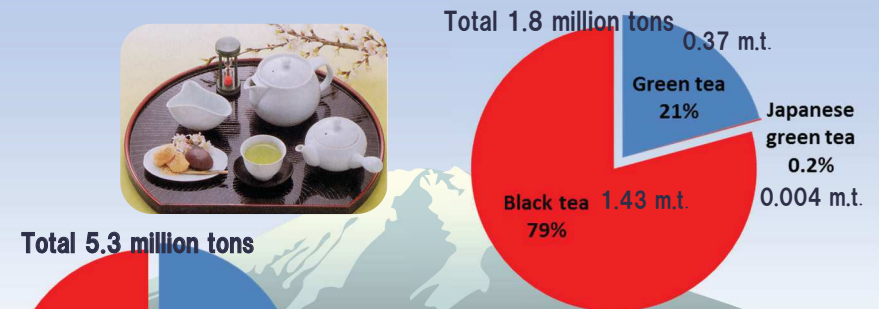
Catechines  
Chlorophyll  
Vitamine C

Catechines ⇒ Theaflavins, Thearubigins  
Chlorophyll ⇒ Pheophytin  
Vitamine C ⇒ Nothing(Oxide, Hydrolyzate)

Aroma

Fresh, Grassy ⇒ like frowerly or fruity

## Japanese green tea is a precious tea in abroad



Production volume of world tea

## Different Kinds of Japanese Green Tea



Sencha



Gyokuro



Tencha

### Sencha

This is the most popular type of tea in Japan.

### Gyokuro

This is the finest tea in Japan, and its taste is a tender sweet astringency and special flavor.

### Tencha

This is ground in a stone mortar into Matcha (Powdered Tea) and used in a tea ceremony.

## Excellent character of Japanese green tea

1. Have a long history
2. Culturally rich
3. Superior cultivar
4. Beautiful tea field
5. High technology
6. Steaming method
7. Tea look a needle
8. Color is green
9. Umami is strong
10. Greenish aroma
11. Vitamin C content is high etc.

The taste differs depending on how it is made

## Different Kinds of Japanese Green Tea



Bancha



Hojicha



Genmaicha

### Bancha

This is lower grade of tea, made from mature leaves and stalks.

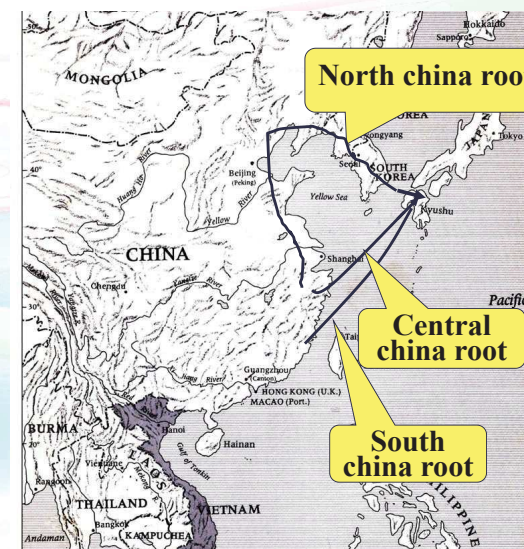
### Hojicha

This is lower grade tea, made from Bancha by roasting at about 200°C for a few minutes.

### Genmaicha

This is Bancha, in which poprice and Genmai are added, having good flavor.

## 1. The introduction of Tea into Japan



North china root

Central china root

South china root



### North-china root

North china ⇒ Korea ⇒ Japan  
Oldest root (about A.D.600)

### Central china root

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

### South china root

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

## 2. Establishment of tea ceremony “Chanoyu / Sado”

Peace of the world  
from one bowl

The  
Book of Tea

Kakuzo  
Okakura

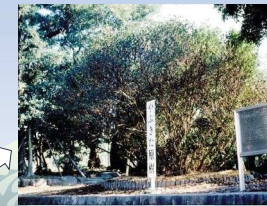
Chanoyu is often called a multiple art. Exquisite traditional arts and craft such as tea bowls, hanging scrolls, flowers, tea room and garden are all essential parts of the ceremony



## 3. Breeding and spreading cultivar suitable for Japanese green tea



Seedling tea field



Superior cultivar



Cutting propagation and clonal tea field



## Sprits 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



## 4. Beautiful tea fields blended into life



## Scene of tea fields in Japan



Conventional Field



Field in Snow



Severe Shading Field

Field for Riding-type Machine



Ligth Shading Field

## Rail-tracking and riding-type plucking machine



Rale-tracking plucking machine



Harvest bag Type



Harvest small bag Type



Riding Container Type

## 5. High-yield and quality tea field by high technology

- 1) Thickness of the branch of leaf layer is made uniform.
- 2) The size of a leaf is made uniform.
- 3) The aging of stem (branch) is made uniform.

The control by trimming and pruning



## 6. The only steaming process in the world

The oxidizing enzymes contained in the fresh leaves are stopped by the steam-heat. By steaming the leaves it becomes the aroma and taste exceptional to Japanese tea.

Steaming is an important process in making of Japanese green tea



Steaming machine



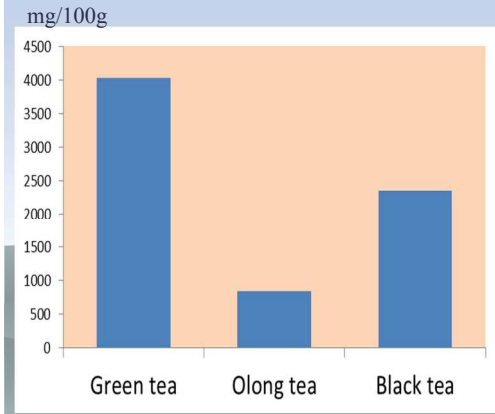
Steaming by hand

## 7. Japanese green tea is a sharp tea like a needle

Needle type tea can only be done by steaming



## 9. Japanese green tea has a high amino acid and a low catechin content



**Catechins contents of various kinds of tea**

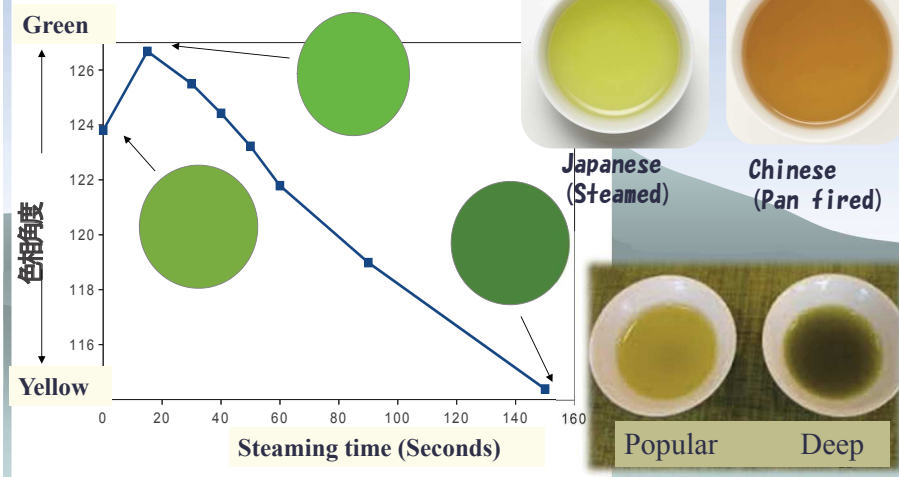
Chinese type	13~17%
Hybrid	16~23%
Assam type	25~30%

**Amino acid contents of various kinds of tea**

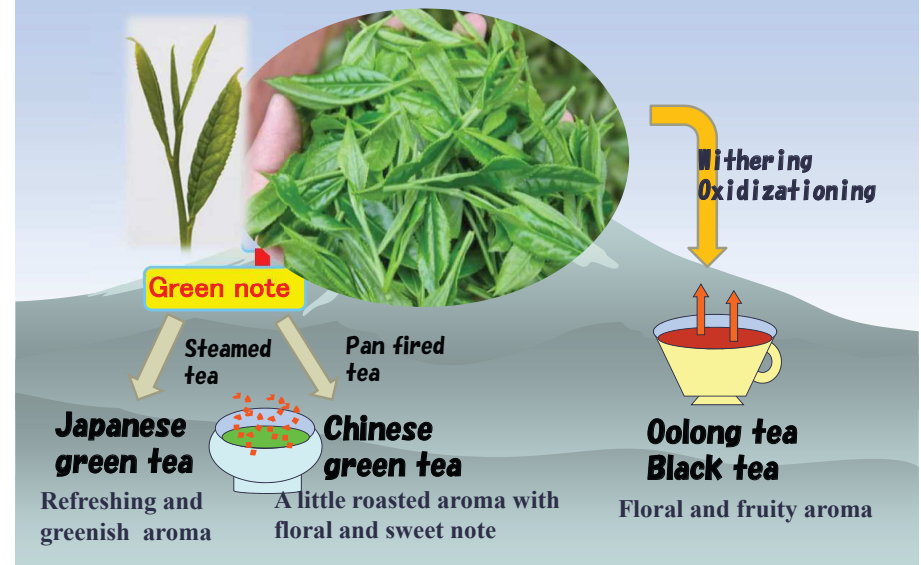
## 8. Japanese green tea infusion is green color

Color changes depending on steaming time

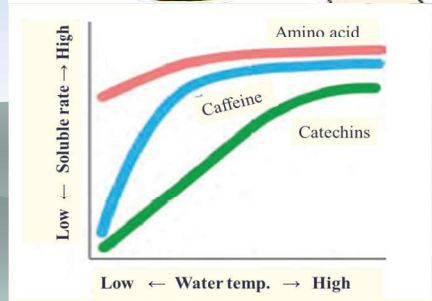
Difference in color between Japanese and Chinese green tea



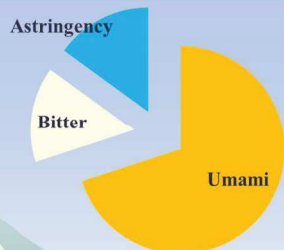
## 10. Japanese green tea has a green note



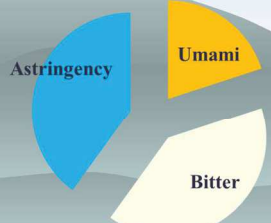
## Chemical composition of various pour tea



The soluble rate of chemical component on different water temp.

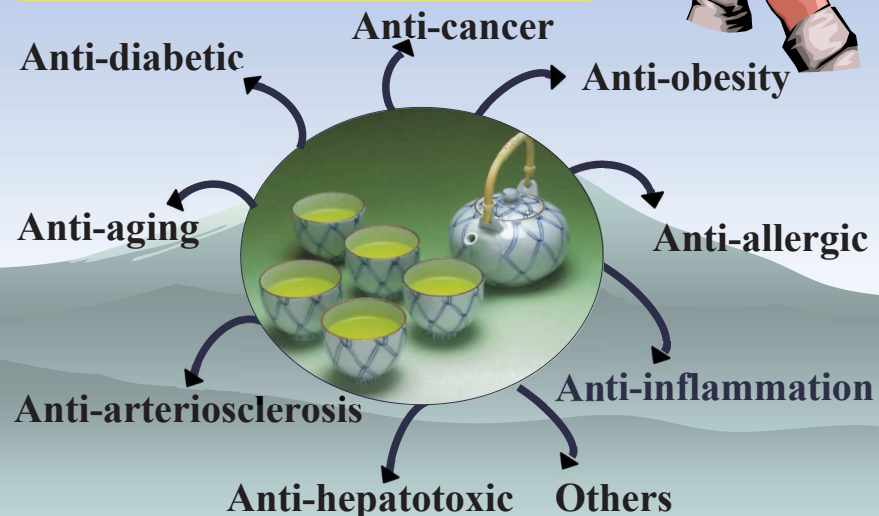


When the temperature of hot water is brewed at low temperature



When the temperature of hot water is brewed at high temperature

## A research on the functionality of green tea is initiated from Japan

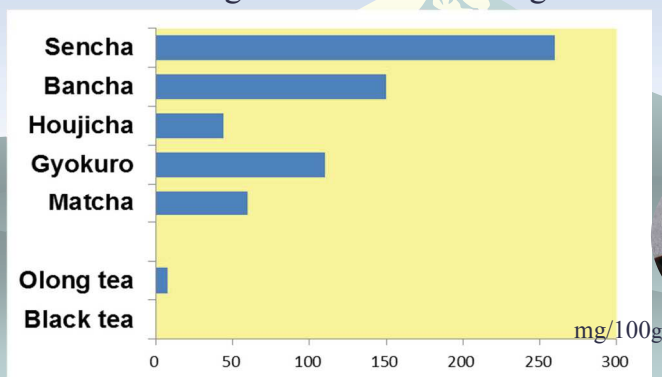


## 11. Japanese green tea contains a high amount of vitamin C

The level of vitamin C which has been shown to prevent scurvy and the common cold, is decreased during the fermentation stage.



50mg/100g



Vitamin C content of various tea



6mg/cup

## The Japanese system of Food for Specified Health Uses and Foods with Function Claims



### Foods in General

Any food labeled as a nutritional supplement, a health support, or a nutrient controlling food falls under the category

### Foods with Health Claims

<b>Foods for Specified Health Uses</b>	(individual approval system)	Nutrient contents labelling, Health claims labelling,
<b>Food with Nutrient Function Claims</b>	(standard regulation system)	Nutrient contents labelling, Nutrient claims labelling
<b>Foods with Function Claims</b>	(individual approval system)	Function claims labelling

### Drug

(including quasi-drugs)



## Foods for specified health uses



## 2. Mechanized cultivation and manufacturing in Japan

## Foods with function claims



## Changes in plucking methods



Plucking changed from hand plucking to transportable plucking machines and then to riding-type plucking machines, and plucking efficiency improved remarkably.



## Plucking Methods of New Shoots



Hand plucking

### Plucking efficiency

Methods	The amount of new shoots per day per person	
Hand plucking	10	~ 15 kg
Hand-shear plucking	100	~ 200
Mechanical plucking		
Portable machine for two persons	700	~ 1,000
Riding machine	4,000	~ 5,000
Self-rail-tracking machine	2,000	~ 3,000



Hand-shear plucking



Portable machine for two persons



Riding-type plucking machine

## The pruning and trimming are important for mechanization

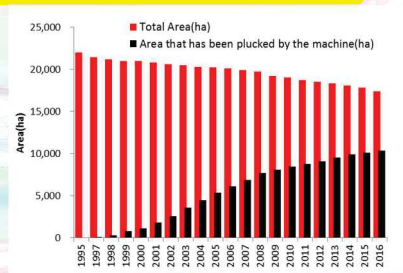
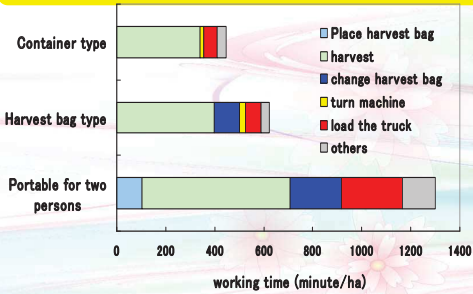


Portable pruning machine



Riding pruning machine

## Operating Efficiency of Riding-type Machine



Operating Efficiency of Riding-type Machine

Changes in the introduction area of Machine



Container type



Harvest bag Type



## Automatically controlled tea factory

**Controller panel**

**Tea flow controller panel**

生産	検査1	検査2	検査3	検査4	検査5
20	20	30	30	30	30
11	10	9	28	28	0
検査2	検査3	検査4	検査5	検査6	検査7
30	30	20	40	40	40
残り時間	2	0	0	39	39

Display the state of tea on the screen and intensively manage

## Making Process of Japanese Green Tea

**Cooperative tea factory**

**Primary drying tea roller**

**Secondary drying tea roller**

**Tea steaming machine**

**Tea roller**

**Finally drying tea roller**

## Changes in Japanese tea processing

**Early machine tea factory**

**Hand making**

**Modern tea factory by computer control**

Manufacturing has been mechanized from hand making, and recently by technologically innovating to automation with sensor and computer control, we have established Japan's unique production processing

