

## Green Tea, Growing in Japan

From the convenience of PET bottle green tea to the leisurely traditional tea ceremony, and the specialist green tea shops and casual cafes in between, green tea remains ubiquitous in Japan.

Expenditure in Japan on green tea products at ¥11,625 per household in 2019 was a new high (dataset from 2003), Fig.1. This has been driven by the growing popularity of pet-bottle green tea, with sales exceeding leaf tea sales for the first time in 2007.

**Fig.1 Green Tea Expenditure per Household by Year (Yen)**

	2003	2007	2019
Leaf	6,138	5,290	3,780
Bottled	4,627	5,802	7,845
Total	10,765	11,092	11,625

Source: Ministry of Internal Affairs and Communications, Household Statistics, Conceptasia, October 2021

Green tea offers a deep sensory experience of color, flavor, and aroma, as well as delivering health benefits.

**Fig.2 Matcha in the Park, and in a Ginza backstreet**



Source: Author's photo, Conceptasia, October 2021

Fig.3 From Matcha Lattes to Matcha ice cream cones...



Fig.4 ...to Matcha Lip Balm and Matcha Soft Cookies, all at the Gion Tsujiri store



Source: Author's photo, Gion Tsujiri store, Tokyo Skytree, Conceptasia, October 2021

## Health benefits

Academic research has been ongoing since the 1980's. In summary:

Green tea is a 'non-fermented' (produced by steaming and drying the fresh leaves to inactivate the polyphenol oxidase and thus, non-oxidation occurs) tea, and contains more catechins (especially EGCG), than black tea or oolong tea. Catechins are strong antioxidants. Recent human studies suggest that **green tea may contribute to a reduction in the risk of cardiovascular disease and some forms of cancer.** <sup>(4)</sup>

Other beneficial indications include oral health, and other physiological functions such as an anti-hypertensive effect, body weight control, antibacterial, and anti-virasic activity, solar ultraviolet protection, bone mineral density increase, anti-fibrotic properties, and neuroprotective power. <sup>(4)</sup>

Studies appear to confirm that it is the catechins with high antioxidant potential that is the main contributor to these beneficial outcomes. The following is the cautious conclusion of a 2020 paper:

The Japanese powdered green tea, matcha, contains high amounts of substances with antioxidant and anti-inflammatory effects. It has promising potential health benefits, mainly through a high concentration of catechins. With regular consumption, it may support the body's efforts to maintain health and prevent disease. Research into the effects of matcha drinking and its individual components in specific disease entities is still valid and needed. The current state of knowledge only covers some of the health-promoting properties of this tea. To confirm the validity of implementing recommendations for increased consumption of tea beverages made from matcha, it will be necessary to undertake deeper and broader analyses of its effects on the human body. <sup>(5)</sup>

<b>Compound</b>	<b>Green tea (*1)</b>	<b>Black tea (*1)</b>	<b>Infusion (*2)</b>
Proteins	15	15	Trace
Amino acids	4	4	3.5
Fiber	26	26	0
Other carbohydrates	7	7	4
Lipids	7	7	Trace
Pigments	2	2	Trace
Minerals	5	5	4.5
Phenolic compounds (*3)	30	5	4.5
Oxidized phenolic compounds (*4)	0	25	4.5

Notes: (\*1) data refers to dry weight of tea leaves, (\*2) Black tea; infusion time 3 minutes, (\*3) especially flavonoids, (\*4) especially thearubigins and theaflavins. Black and green teas both contain similar amounts of flavonoids, however they differ in their chemical structure; green tea contains more catechins (simple flavonoids), while the oxidation undergone by the leaves to make black tea, converts these flavonoids into theaflavins and thearubigins.

Source: *Beneficial Effects of Green Tea: A Review*, <sup>(4)</sup> citing <sup>(6)</sup> *Conceptasia*, October 2021

Types of tea ranked by oxidation, from lowest to highest: Green tea, Yellow tea, White tea, Oolong tea, Black tea, Dark tea (Pu'er).

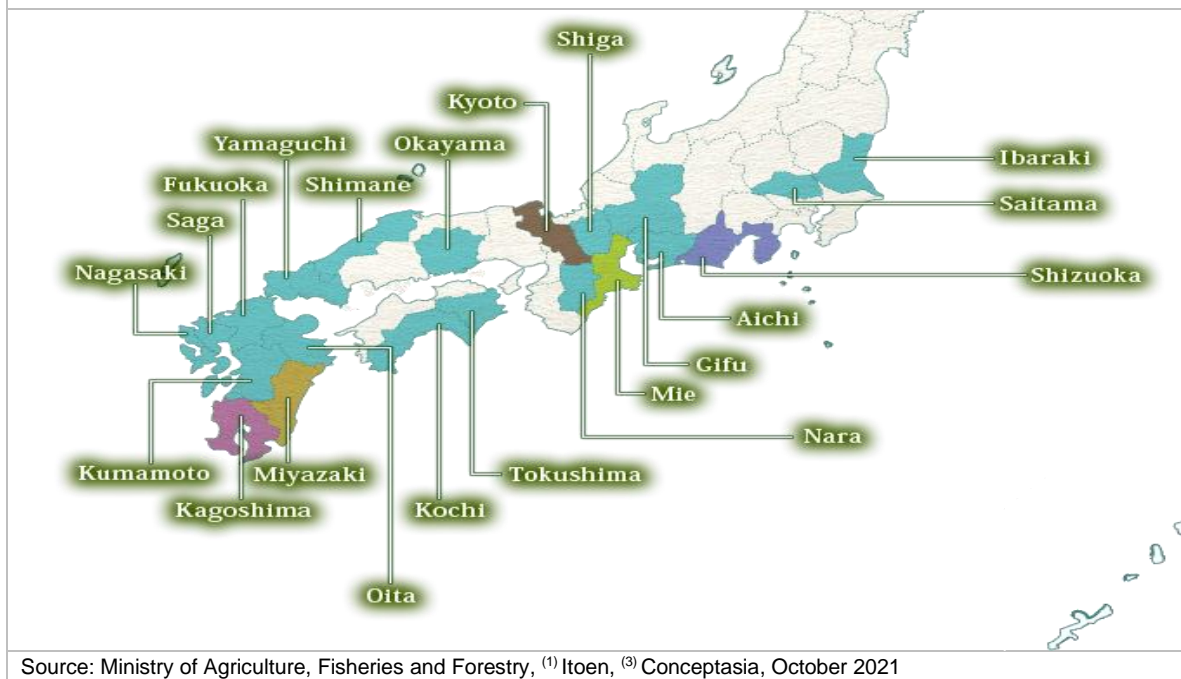
## The deep sensory experience of color, flavor, and aroma

Surprisingly, the sometimes-bewildering diversity of green tea all derives from the same tea plant. Production methods create the differences, please see Fig.8.

Fresh leaf is harvested and processed (steaming, rolling, drying) into crude tea in the growing region, Fig.6, and then blended into refined tea nearer consumers. Crude tea is a ¥100bn industry.

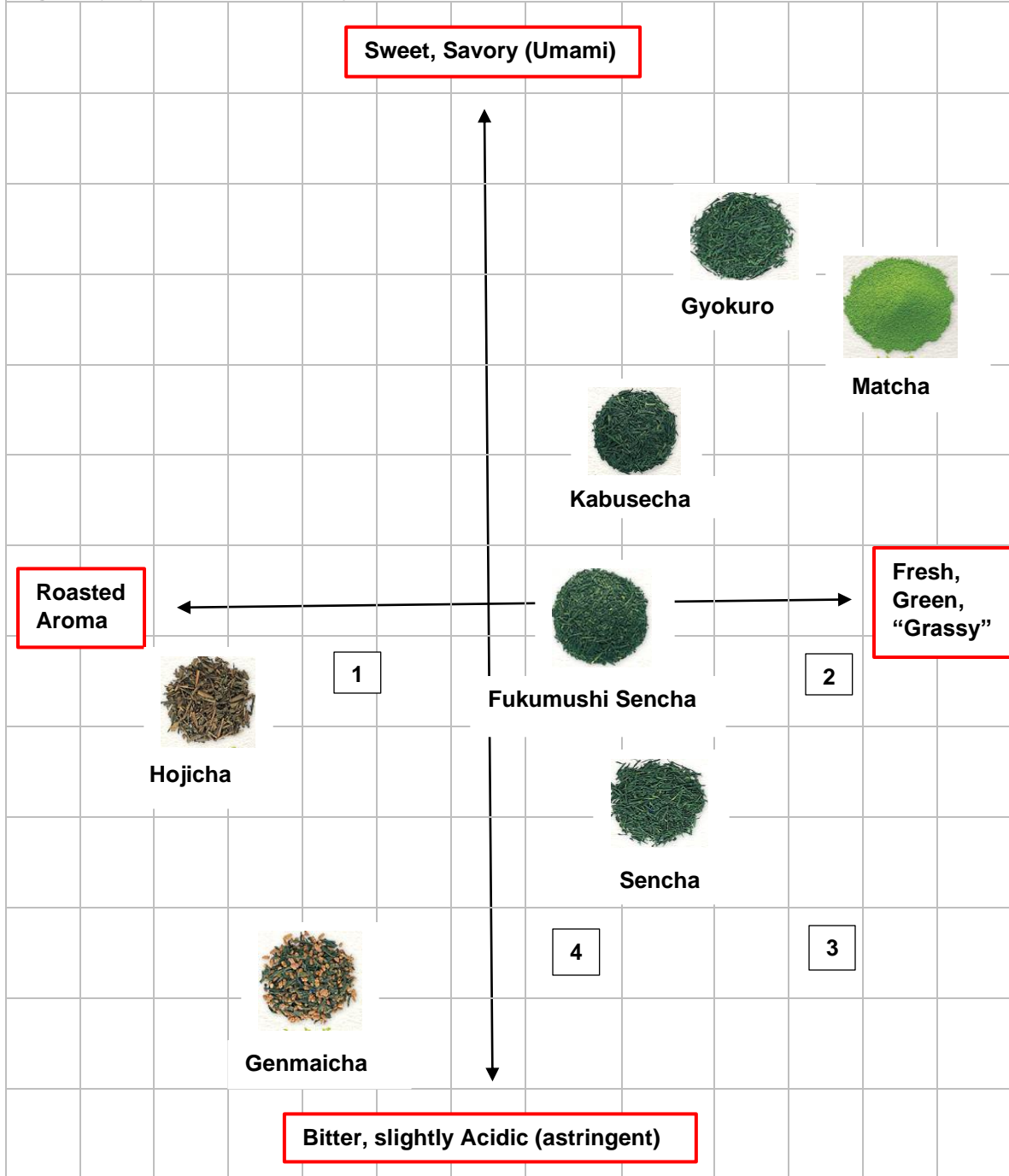
**Fig.6 Main Tea-Producing Prefectures**

Rank	Prefecture	Growing acreage (hectares)	Production volume (tons)	Specialties
1	Shizuoka	15,900	29,500	Sencha and Fukumushi Sencha
2	Kagoshima	8,400	28,000	Sencha
3	Mie	2,780	5,910	Kabusecha
4	Kyoto (includes Uji)	1,560	2,900	Gyokuro and Matcha
5	Fukuoka	1,540	1,780	Kabusecha
6	Miyazaki	1,380	3,510	Sencha
7	Kumamoto	1,220	1,270	Tama-ryokucha
8	Saitama	843	881	Sencha
9	Saga	749	1,240	Tama-ryokucha
10	Nagasaki	737	693	Tama-ryokucha
11	Aichi	517	832	Matcha
	Total	40,600	81,700	



Source: Ministry of Agriculture, Fisheries and Forestry, <sup>(1)</sup> Itoen, <sup>(3)</sup> Conceptasia, October 2021

Fig.7 Major types of Green Tea: by Taste (vertical axis) and Aroma (horizontal axis)



Note: 1) Kamairicha, 2) Kukicha, 3) Konacha – “the sushi restaurant green tea”, 4) Banacha

Source: Sazen, <sup>(2)</sup> Itoen, <sup>(3)</sup> Conceptasia, October 2021:

To bring out the best taste and aroma, the boiled water should be cooled to 60-85 degrees centigrade (140-185 degrees Fahrenheit). For black tea, for comparison, 82-93 degrees centigrade (180-200 degrees Fahrenheit) is recommended.

<b>Fig.8 Additional Comments on the Major Types of Green Tea</b>			
	<b>Type</b>	<b>Comments</b>	<b>% of crude tea/Crude tea price per Kg (2019)</b>
1	Sencha	Processed by steaming, rolling, and drying new shoots	53.6%/ ¥1,178
2	Kabusecha	Cultivated under a sun-shielding covering made of straw and cheesecloth for about 7 days before harvesting. Processed like Sencha.	4.2%/¥1,462
3	Gyokuro	Sun-shielding covering for about 20 days. Processed like Sencha.	0.3%/¥4,928
4	Matcha (Tencha)	Sun-shielding covering for 21-30 days. Processed by drying the tea leaf without rolling. Matcha is a powdered tea by grinding Tencha with a stone mill	4.4%/¥2,498
5	Tama-ryokucha	No trimming process	2.5%/¥1,686
	<b>Notes</b>		
A	Fukamushi Sencha is strained about twice as long as Sencha, resulting in a stronger taste and darker green color		
B	Sun-shielding (covered culture) limits light, suppresses catechins from amino acids (theanine) resulting in lower astringency and a rich flavor.		
C	Dark Matcha (Koicha) used in the tea ceremony have traditionally used tea bushes over 100 years old		
D	Shincha is the “new tea” or first picking (ichibancha) of the season. It is nutrient rich and is synonymous with Sencha leaf tea. Bancha is synonymous with second through fourth pickings (nibancha, sanbancha, yonbancha).		
E	Genmaicha is Sencha or Bancha mixed with soaked, steamed, roasted, popped, brown rice		
F	Hojicha is typically roasted Sencha or Bancha		
G	Konacha (“tea powder”) is the sushi restaurant tea and consists of the rejected buds and tea “dust” left-over from processing Sencha and Gyokuro.		
Source: Ministry of Agriculture, Fisheries and Forestry, <sup>(1)</sup> Itoen, <sup>(3)</sup> Conceptasia, October 2021			

<b>Fig.9 Some Leading Japanese Green Tea Brands</b>			
	<b>Company</b>	<b>Founded:</b>	<b>Website</b>
1	Ippodo Tea	In Kyoto, since 1717	Global.ippodo-tea.co.jp
2	Fukujuen	In Kyoto, 1790	Fukujuen.com
3	Itohkyuemon	In Uji-Tawara, Kyoto Prefecture, 1832	Itohkyuemon.co.jp
4	Gion Tsujiri	In Kyoto, 1860	Gionsujiri.co.jp
5	Aikoku Seicha	In Tokyo, 1933	Aikoku-seicha.co.jp
6	Itoen	In 1966, HQ Tokyo, Packaging innovator	Itoen.jp/itoen-global.com
Source: Company websites, Conceptasia, October 2021			

## References

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- 4) *Beneficial Effects of Green Tea: A Review*, by Carmen Cabrera, Reyes Artacho, and Rafael Giménez, 2006
- 5) *Health Benefits and Chemical Composition of Matcha Green Tea: A Review*, by Joanna Kochman, Karolina Jakubczyk, Justyna Antoniewicz, Honorata Mruk, and Katarzyna Janda, December 2020
- 6) “*Química de los Alimentos*” by Belitz DH, Grosch W, 1997