Fermentation vs Oxidation: Black Tea Isn't Fermented

From the teas.co.uk wiki

> **Fermentation vs oxidation, in summary:** Black tea is oxidised (enzymatic), not fermented. True fermentation is microbial and means pu-erh and dark tea. Getting the word right explains why some teas are best fresh and others reward years of storage.

This is the single most common processing error in popular tea writing. This sits in the processing cluster beside tea oxidation explained.

Last reviewed by the teas.co.uk team in April 2026.

The common error

Black tea is frequently called "fermented". That is inaccurate: it is oxidised, which is an enzymatic process, not a microbial one. Once rolling ruptures the leaf cells, the leaf's own enzymes meet oxygen and drive the browning that develops black tea's colour and flavour, chemically the same family of reaction that browns a cut apple. Stop it early with heat and you get green; let it run partway under control and you get oolong; let it run fully and you get black. No microbes are involved at any point, which is precisely why "fermented" is the wrong word for the whole green-to-black range. See black tea and the oxidation guide.

	Oxidation	Fermentation
Mechanism	Enzymatic, leaf enzymes meet oxygen	Microbial, bacteria and fungi
Everyday analogy	A cut apple browning	Bread, yoghurt, real culturing
Which teas	Green to oolong to black spectrum	Pu erh and dark (hei cha)
Ageing	Black tea does not keep improving	Pu erh really does mature for years
Correct word	"Oxidised"	"Fermented"

What fermentation actually is

True fermentation involves microbes, bacteria and fungi, which change the leaf over time. In tea that points at one family: pu-erh, especially shou, and the broader dark hei cha category. These are the teas where microbial action really does keep changing the leaf, which is why they age along a path nothing in the green-to-black range follows, the distinction the shou versus sheng guide turns on. White and yellow tea sit outside the question entirely: white is mostly careful withering and drying, lightly oxidised at most, and yellow adds

only a gentle smothering step, so neither is microbially fermented either. The clean rule is to use "oxidised" for the white, green, yellow, oolong and black range, and reserve "fermented" for pu erh and dark tea, which really do involve microbes.

Why the words got tangled

The muddle is historical rather than stupid. Early Western tea writing, and some translated terminology, used "fermentation" loosely for the browning of black tea long before the enzymatic chemistry was widely understood, and the loose usage embedded itself in books, packaging and habit. It survives today in otherwise reliable sources. That is why the useful move is to correct it kindly rather than sneer: a person calling black tea "fermented" is usually repeating a respected old error, not inventing a new one.

Why it matters: storage

Getting the word right is practical knowledge, not pedantry, because it gives you a storage rule. Oxidised teas, white, green, oolong and black, are best fresh and do not improve in the cupboard, so buy them in amounts you will drink while they are alive and keep them sealed, cool and dark. Properly fermented teas, pu erh and dark, can reward deliberate long storage under the right conditions. Mistaking one for the other is how people either hoard black tea expecting it to mature, or drink a young sheng disappointed that it has not. The single test that sorts the whole family is one question: did the character come from the leaf's own enzymes meeting air, or from microbes working on it over time? See tea storage.

Common questions

Is black tea fermented? No. It is oxidised, an enzymatic reaction. True fermentation is microbial and mainly means pu-erh and dark tea.

Why do so many sources say "fermented" then? Historical and translated terminology used the word loosely for oxidation and it stuck, even though the chemistry differs.

Is oolong fermented? No, partially oxidised. It sits between green and black on the oxidation spectrum, with no microbial step.

Which teas are actually fermented? Pu-erh (especially shou) and the dark hei cha family, where bacteria and fungi really do transform the leaf.

On the practical shopping side: English Breakfast, Earl Grey, green tea, loose leaf tea, Darjeeling, oolong, and herbal tea. Wander the tea shop for the rest, with free UK delivery once you reach £35.

FROM THE CURATOR

teas · Start cheap with each kind and stay cheap until something stops you. Most rich teas reward patience, not budget.

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