Why chai boils over, and how to stop it

From the teas.co.uk wiki

Water boils and bubbles burst. Milk does something different: as it heats, proteins and fat gather at the surface, and the steam bubbles rising through cannot escape. Instead they build a stiff foam that climbs the pan, and the foam needs room the liquid never did. That is why a pan of milky chai that looked half empty is suddenly on the hob. The Max Planck Institute for Dynamics and Self-Organization explains the mechanism in its account of boiling milk. Why milk boils over

Add tea and spices and it happens faster, because you are stirring and adding solids that give bubbles something to form on.

The five-second fix

1. **Use a pan at least twice the volume of the drink.** Two mugs of chai (about 500ml) wants a litre pan, minimum.
2. **Turn the heat down before it rises, not after.** The moment the surface starts to lift, drop the heat.
3. **Stay with it.** From "nothing happening" to "over the side" is about ten seconds.
4. **Stir.** Stirring breaks the foam and releases trapped steam.
5. **Lift the pan off the ring** if it surges. On an electric hob turning the dial down is not enough: the ring stays hot.

Build the chai so it cannot happen

The traditional order helps, because most of the cooking happens before the milk arrives:

1. Simmer the water with the whole spices for 5 minutes.
2. Add the tea and brew for 2 minutes.
3. **Now** add the milk, and bring it just back to a simmer without letting it boil hard.
4. Strain into mugs.

You get more spice flavour and far less drama. See how to make masala chai and how to make chai at home.

A ready blend such as Tea India Ginger Chai removes a step while you get the heat right.

The wooden spoon trick, and other myths

A wooden spoon laid across the pan is often claimed to stop boil-overs. It can pop a few bubbles, and it does nothing about the heat under the pan. Treat it as a party trick, not a method.

Blowing on it works briefly, for the same reason. Turning the heat down works permanently.

If it does boil over

- Turn the heat off first, then move the pan if the handle is safe to grip.
- Let the spill cool before cleaning it; burnt milk lifts more easily after soaking in warm soapy water.
- Wipe the hob before the next use: dried milk scorches and smokes.

Common questions

Why does milk boil over when water does not?
Water bubbles burst at the surface. Milk forms a skin and a foam that traps the steam and lifts.

Does plant milk boil over too?
Yes. Oat and soya both foam, and barista versions foam more, not less.

Does a bigger pan really matter?
More than anything else. Foam needs headroom; a wide, tall pan gives it somewhere to go.

Can I make chai in the microwave?
You can heat the milk, but it is easy to overshoot and it will erupt. A pan you are watching is safer.

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