

Koji Making for Sake (homebrew)

お酒の麴を作り

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BrewSake.org

Notes:

Commercial koji making is very similar to this except some of the temperatures and other details change because of environmental or timing considerations. What you are learning here is based on my experience both as a home brewer and a commercial sake brewer in the US and in Japan.

This is intended to be a quick checklist and not a deep dive on koji theory. Please see brewsake.org/koji for more.

- Timing, Temps, and Humidity can all change based on koji-kin, rice type, and incubator.
- If you need an incubator for homebrewing: [Build One with lots of insulation](#)
- If you want rice to steam better, use [Dummy Mai](#) (amazon links)
- If you need any other equipment: BrewSake.org/equipment
- Join the [Sake Discord](#) and [Koji Discord](#) if you want more help or to contribute

Instructions:

- **PREP**
 - **weigh dry rice**
 - I usually separate out 100g of rice into a separate cup that I can constantly drain and weigh so I can track the water absorption, but this can also just be done in advance of the full rice quantity.
 - weigh wet rice to determine time to 30-32% absorption
 - soak the rice quickly and then drain the water off. This weight is the reference point when you check the values
 - This doesn't include post steam absorption, which would be closer to 40-42%. While the rice cools, it will return to about 30-32% from evaporation.
 - 洗米 (Senmai) - washed rice (try to keep to < 5 min)
 - if the rice is milled more than 90% seimaibuai, track this time exactly
 - be gentle when washing (avoid scraping the side of your container or mesh) to prevent breaking your rice
 - if you can look through several inches of water and clearly make out the grains, it's probably OK
 - 浸漬 (Shinseki) - steep in cold water
 - strain and weigh the rice again to see how much has already been absorbed (repeat until the ideal number is reached)

- make sure you match the temperature of the rice to avoid cracking
 - note the temperature of water you tested the absorption rate with so that it is as accurate as possible.
 - かし Kashi - (check ability to crush into a powder)
- ザル上げ (zaruage) - drain the water
 - tip strainer at 45 degrees to avoid water collecting/pooling around the base
- からしい (resting) - allow the rice to sit after draining so that the surface water will drain and evaporate off, giving the grain a dryer surface and evening out the moisture content within the grains. The rest period can be from 45 minutes to 10 hours if rested overnight, with 3 hours being a reasonable starting point to try.
 - The key point here is to remove as much surface water as possible so the rice doesn't become mushy or sticky during steaming. Excess water will also be absorbed into the rice if it is not yet saturated.
- 蒸す (musu) - steam the rice,
 - If over 2 KG, you can use 揚げがけ (nukegake), but it is not necessary. This is a traditional style of ensuring the rice steams evenly.
 - Leave the rice uncovered and wait until the steam is coming through the top before starting your timer.
 - Turn your heat down to 6.5 (or equivalent) to keep a low boil
 - Use false rice at the bottom to prevent water from accumulating on the bottom
- 蒸しあがり (mushiaragi) - check the texture of the rice, using ひねりもち
 - mash a few grains into a ball or quarter-sized disc and check for a spongy or stretchy consistency (think silicone)
- 蒸し取り (mushitori) - Rice From Steamer (+60-80C)
- Cool to less than 45C
 - 35-40C is a safer range. 35C was recommended by Koichi Higuchi. Also you may add an optional rest stage here in order to dry the surface of the rice before inoculating.
 - methods for cooling
 - use a fan to cool the rice
 - put it in a pan, mix it and then return
 - put it in the koji container to prime the humidity levels (slower)
- 種切り (tanekiri) - Begin inoculating at 40C as it cools
- 包み込み (tsutsumikomi) - Finish inoculating before it hits 30C and wrap in blanket.
- **Relative Humidity to 80-90%**
- **Keep incubator at 29-32C for 12-18 hours later** (koji temp will rise to 34-38C)
 - If humidity loss is a problem on day one, consider wrapping the koji in a plastic tarp or bag to contain the moisture.
 - Don't aim for quick growth, if the temp is rising toward 38-40C too quickly, then turn down the incubator to slow the growth. Aim for a gradual temp increase.

- **12-18 hours**
 - 切り返し (kirikaeshi) - mix the rice to ensure even germination
 - **the rice temperature begins slowly raising to 32C after mixing**
 - **IF the rice temp is higher than this there is either too much moisture, too much heat, or too much koji-kin was used.**
- **24 hours**
 - **reduce Relative Humidity to 50-70%**
 - ****No hard and fast numbers here since humidity depends on many factors. Dry environments might require elevated humidity to compensate.**
 - 盛り (mori "heap"-shigoto) -, when the koji temp has risen to **36C**, transfer the rice into a tray in a big **heap** and mix it, ideally 10-20% of the rice has mycelia growth visible.
 - This will drop the temp during the mixing to **30-34C** and it will need time to rise back to 36C.
- **28-30 hours**
 - 仲仕事 (naka-shigoto) middle job, after the temperature returns to **38.5C**, mix the rice again.
 - 30-50% of the rice should show visible mycelia growth
 - Again this will drop the temperature to **32-36C**
- **32-34 hours**
 - 仕舞仕事 (s himai-shigoto) end/final job, after the temp returns to 40C, mix it one last time.
 - 60-80% of the rice should show visible mycelia growth
 - Temp will drop again post-mixing to **36-39C**
 - Make the 花道 (hana-michi) "flower road" to help disperse heat and oxygen
 - 最高気温をチェック (saikou-kion) - checking maximum temperature
 - **maintain 40-43C for the next 12 hours**
- **48-60 hours (Dekoji)**
 - remove koji when fuzzy mycelia growth is covering 100% but BEFORE spores form.
- **Cool the koji**
 - put it in the fridge to prevent the koji from continuing to grow

Sections to add: Different growing conditions and timing between Tsuki-haze / So-haze; for futsushu, junmai, ginjo, daiginjo; differences for hatsu-zoe, naka-zoe, tome-zoe.