

# MISO fermentation class!!!!

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## What is Miso? - fermented soybean paste

- Miso is a savory, high protein seasoning made from grain, bean, salt, water and Koji (*Aspergillus oryzae* culture).
- It is a concentrated source of protein, vitamin B12, & other essential nutrients.
- It is a live food and has digestion aiding enzymes.
- It requires a 2 part fermentation process.

Its NOT just a soup! Miso can be used on veggie, meat and egg dishes, as spreads and dressings, to ferment veg. pickles, and can even be an ingredient in many desserts!

## What is Koji?

- Grain (typically rice) inoculated with *Aspergillus oryzae* bacteria.
- The bacteria transforms simple sugars of the grain into organic acids which create the flavor and help prevent spoilage.
- Can also make Sake (rice wine), Amazake (sweet rice pudding), & Tamari
- Japanese translation- “tradition”, “origin”, “orphan.”

## Types of miso

**Aged miso**- less koji/more bean, more salt, longer fermentation time, darker color, richer/saltier flavor

**Barley miso/Mugi**-usually red miso. Dark, salty, earthy.

**White/Sweet miso/Shiro**- sweet/mellow flavor. Short fermentation time (~1 month).

Good for making spreads, dressings, and desserts. Ranges in color from off white to beige. More koji/less bean, less salt, shorter fermentation time, lighter color

**Yellow miso/Shinshu**- Semi sweet and slightly earthy. Medium fermentation time (~6 months). Ranges in color from beige to yellow/orange.

**Red miso/Aka**- Often made from barley. Long ferment (~1-2 years). Ranges in color from red to dark brown.

**Black miso/Hatcho**- not very common. Dark color. Made with all bean. Longest ferment (multiple years). Strongest flavor. Flavor very pungent- similar to Marmite.

**Alternative Grains**- corn, millet, wheat, buckwheat, rye, sweet potato, chestnut ...

**Alternative Protein**- peanuts, garbanzo, azuki, pinto, navy, kidney, green peas, lentils ...

## Things to think about when making miso at home-

- Fermentation vessel (Crock)- ceramic or glass. NOT metal or plastic.
- Incubator- oven pilot light or plastic cooler.
- Labeling- make sure to label all ferments! In 6 months you might not remember what in your crock or when you are supposed to check it!
- Where to store it- dark dry place out of the way.
- Transfer- into clean jars but leave 1+ inch at top of jars

## Resources-

*The Book of Miso* by William Shurtleff and Akiko Aoyagi- "the miso bible"

*Wild Fermentation & The Art of Fermentation* by Sandor Katz

Gemcultures.com to order spore (& many other starters)

## Making Koji- (the way Liat does it...)

Recipe for one batch-

- 6c. rice (washed/polished)
- 1/4c sterile flour (rice flour recommended)
- 2tsp koji starter

Things needed- stove/fire, large pot, steamer, food thermometer, muslin or cheese cloth, large spoon, towels/blankets, box/cooler, jars, clock

- Massage and rinse rice several times (till water appears clear)
- Soak rice in 12 cups of water for 6-10 hours and then drain well
- Bundle rice in cheese cloth or muslin and steam for 50 min (almost always you will have to add water mid steaming). Ideally, the rice will be rubbery when its done, but if its not, its probably OK.
- While rice is cooking, sterilize the flour by heating it (but not burning it) in a skillet. When the flour has cooled, add in the koji starter. Also sterilize the other equipment.
- Open the rice on clean towels and spread it out to cool. Bring the temp down to 113\*
- Sprinkle 1/2 of the starter/flour mixture onto the rice & stir. Then add the rest and mix till rice seems evenly coated.
- Bundle the rice back up (I keep it in the muslin and add a towel around it)
- Place the bundle in an incubator. I use a cooler or box and lots of towels or blankets. Typically I fill 2 jars with hot water and put them in the bottom. Place 1 towel on top of the hot jars, then put in the rice/koji bundle. And then fill the incubator to the top with more cloth.
- Check every 2-4 hours. You want the temp to stay between 81\*-85\* F.(you dont have to check it while you are sleeping)
- After 24 hours the rice should have formed a whitish mold throughout and smell/taste sweet. If it doesn't, give it more time.
- Transfer the koji onto baking trays. Spread it out about 2/3in thick and run furrows through it in order to maximize surface area. Cover with lids (other trays) and towels to keep moist and warm. You don't want the temp of the koji to drop below 77\* or go above 104\*.
- Check it every 4 hours, stir, and replace covering. At this point the koji is creating its own heat. If you dont check on it, it has the ability to become too hot and kill itself.
- After 24hours on the trays, you are ready to make miso, tamari, sake, amazake, or add it to breads, desserts, and so on!

\*miso companies pearl the grain to get rid of the bran. Bran inhibits penetration and growth of mycelium. Bran has much of the grains nutrients.

\*NEVER BOIL rice for Koji

\*if you let the koji sit to long, it will begin to turn yellowish and then olive green. This means it has sporified. Dont use it for koji, but do **harvest it for spore**.

## **SWEET MISO: 3-4 week ferment (yields 3-4 cups miso)**

- 1c. dry beans (soy, garbanzo, or white )
- 3 ½ koji rice
- 2 ½ tbsp salt
- 1c bean cooking liquid
- 1 tbsp finished miso (as a seed start - optional)

\*Soak beans 8-12 hours. Then cook till soft (keep the cooking liquid!)

\*Drain beans and mash. Add 1c. cooking liquid and salt.

\* When thoroughly mashed add koji & seed miso.

\* Pack in a crock/jar. Expel air bubbles.

\* Lightly sprinkle top with extra salt. Cover with layer of plastic and weight.

\* **LABLE!!!** With what it is, when it was made, and when you estimate it will be done.

Also- if you keep a calendar mark it in your calendar.

\*Keep in a cool/dry/dark place.

\*let it sit for 3 weeks and check it. If mold has grown on the top its OK, just skim it off.

If the miso is to your liking, its ready to eat. Put it in the fridge to slow down fermentation. You may want to give it 1 more week or so. Make sure you leave air space in the top of your container or have a way for the air and gasses to escape the container.

**For sweet miso, the ratio is apox double koji rice to bean  
For Longer miso the bean and koji are generally about equal.  
Salt is ~double from that of sweet.**

## **Long Miso- 6-12 months**

- 2c dry bean
- 2 1/2c fresh koji
- 1/2c salt
- 1c bean cooking liquid
- 1tbsp seed miso (optional)

same process as above for short miso



\*when you check on your miso, the top will very likely have lots of mold on it; this is absolutely normal. Take a large spoon and scrape off as much of the mold as possible before puling up the plate. Assuming there is still liquid ontop, the mold will not have gotten into your miso. If you pack the crock to age it longer make sure to add 1/2inch of water with a sprinkle of salt to keep mold out.