Brewing Sake

Brian Boshes – March 2015

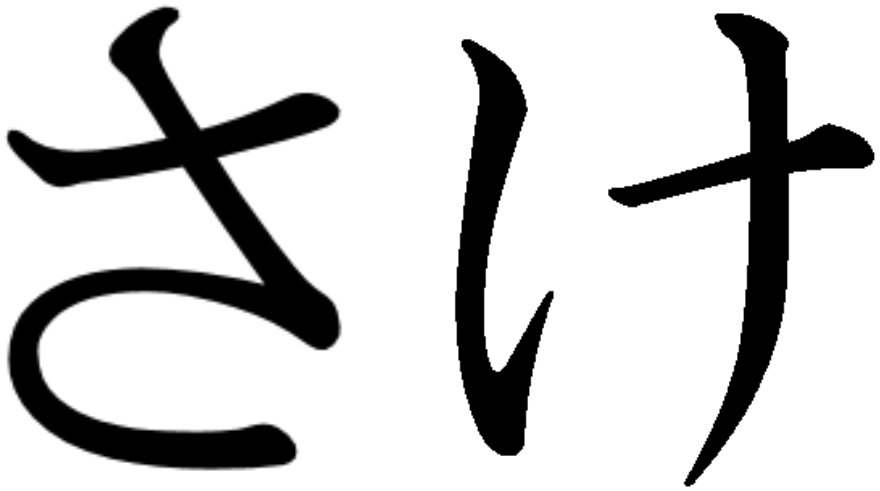
So you're looking for a challenge?

- What is Sake?
  - Japanese
  - History of Sake
  - Brewing Process
  - Drinking Sake
- Homebrewing Sake
  - Scaling it down
  - Resources

The Japanese Language

- Do I have to learn Japanese to drink or brew sake?
  - No (sort of)!
  - Not more than you have to learn German to brew beer or French to learn wine.
  - Some stock phrases that have no English equivalent
  - Internationalization!

Is it “Sa-key” or “Sah-keh”?



SA - KE

Reading Stylized Japanese

日本酒

Types of Sake

- **Futsushu**: “table sake”, >75% of sake produced
- **Junmai(shu)**: pure rice sake
- **Honjozo**: sake with added alcohol
- **Gingo(shu)**: rice milled to 60% or better
- **Diaginjo(shu)**: rice milled to 50% or better

More Terms!

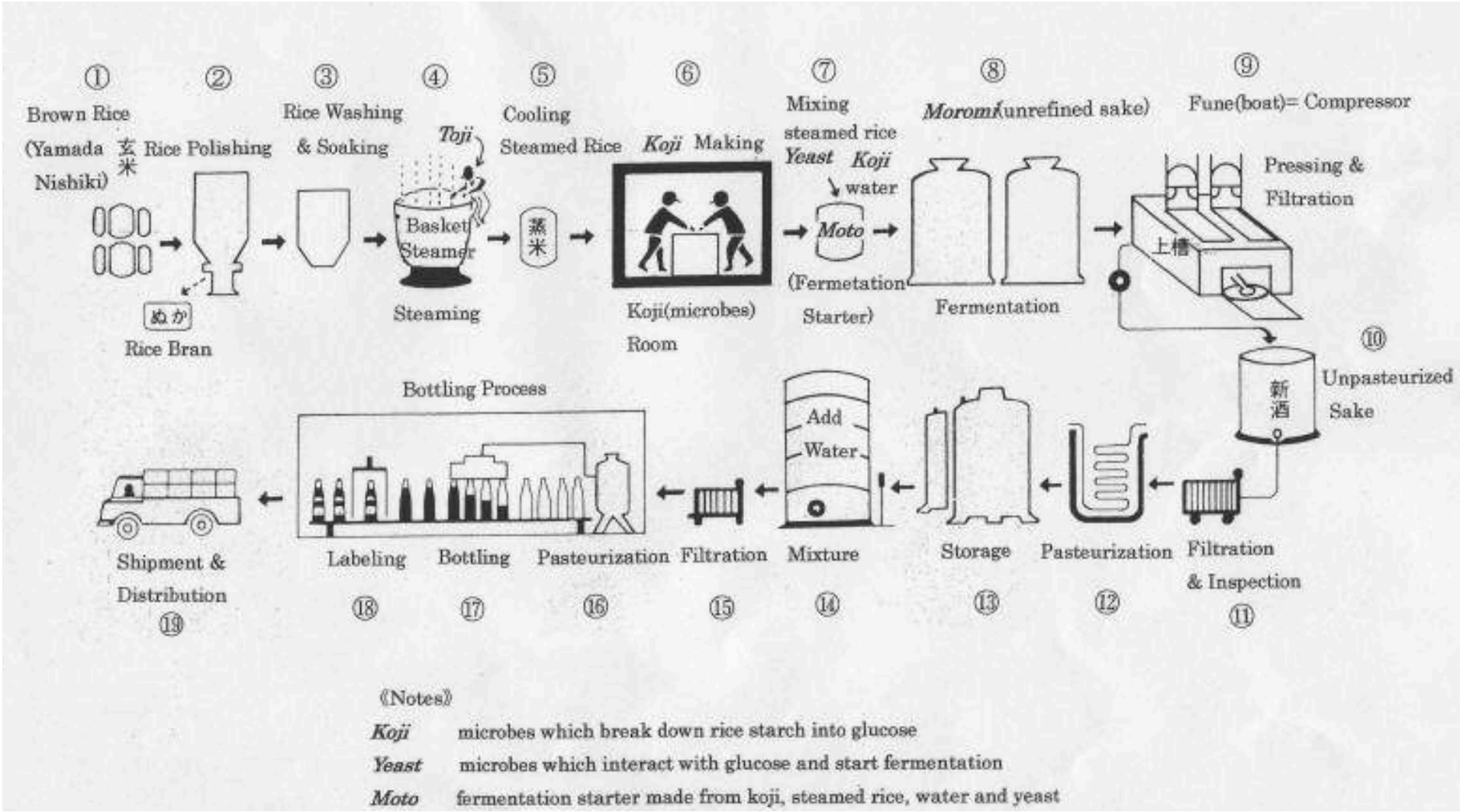
- **Tokubetsu**: “special”
- **Namazake**: unpasturized sake
- **Taruzake**: aged in cedar casks
- **Nigori**: course filtered sake
- **Genshu**: full strength sake
- **Yamahai/Kimoto:** sake made using older starter methods
- *More terms about levels of filter, aged, etc.*

History

Compressed History

- Around 1,500 years old
- Originally came from China
- 12th Century – start of lactic acid fermentations and starter mashes
- 17th Century – Edo citizens drinking 54 liters per-capita annually
- Miyamizu found in 1850
- 1909 – Yamahai moto replaces kimoto moto
- WWII supports and popularizes honjozo style
  - >75% of today's sake has alcohol added

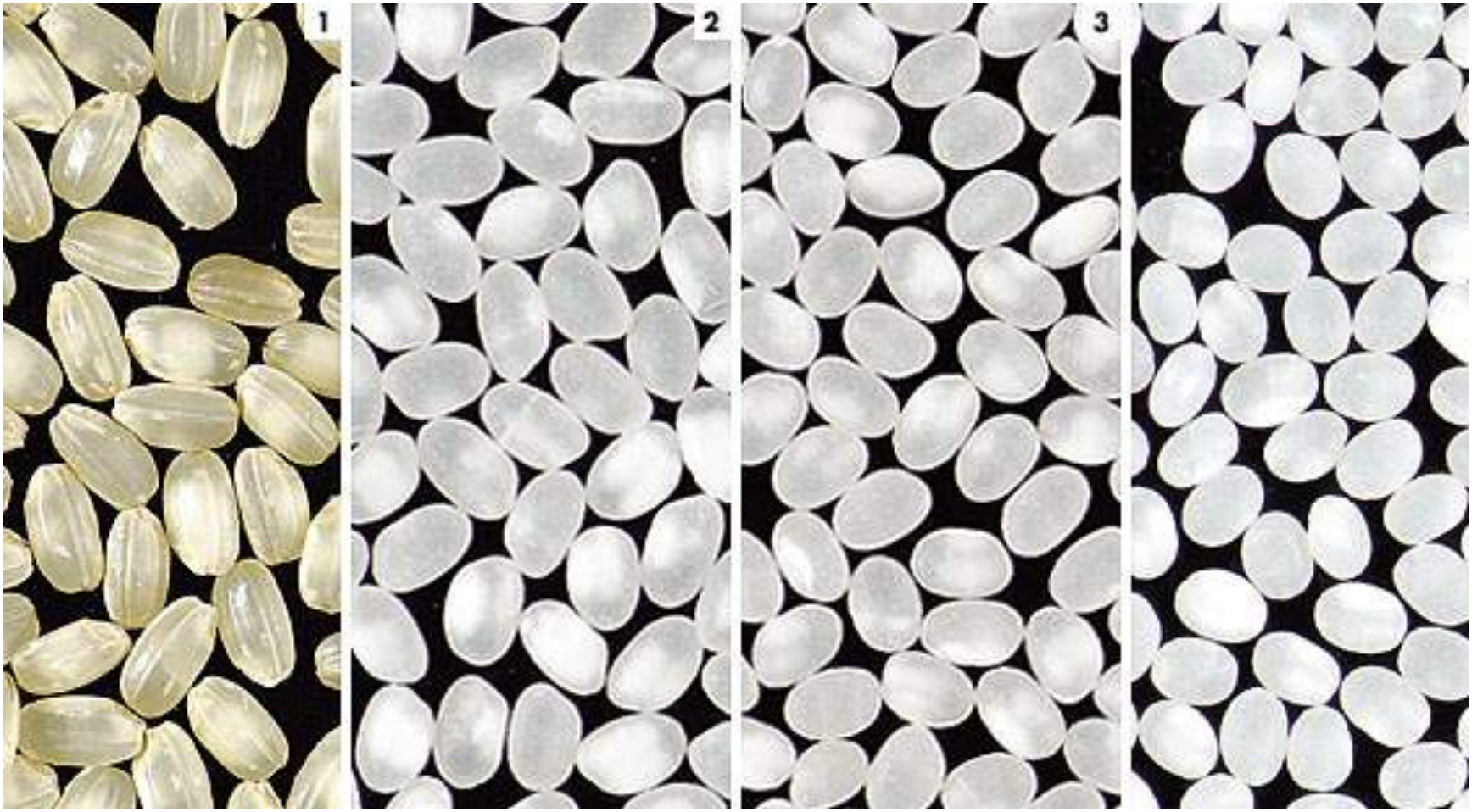
Brewing Process



《Notes》

Koji	microbes which break down rice starch into glucose
Yeast	microbes which interact with glucose and start fermentation
Moto	fermentation starter made from koji, steamed rice, water and yeast

Rice Milling



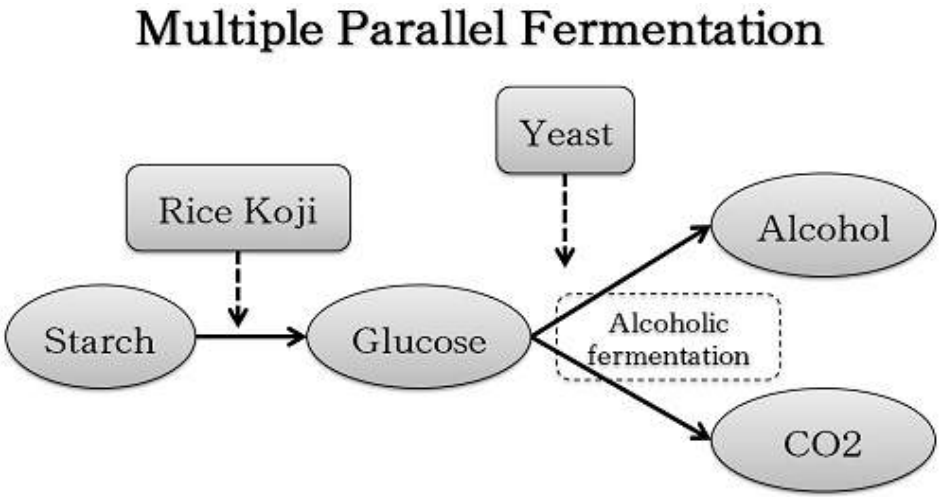
Rice Washing & Soaking

Rice Steaming

Making Koji

Wait!?! What is Koji?

- Koji (Aspergillus oryzae) is a type of mold that converts the starch in rice to glucose
  - a-amylase and glucoamylase
- Used to ferment soybeans (soy sauce, miso) as well as other foods



Koji-kin

Moto (starter)

Moromi (main mash)

- 15% Koji, 50% Water, 35% Steamed Rice
- Divided into “additions” over 12 days
  - 1st - Hatsuzoe
  - 2nd - Nakazoe
  - 3rd – Tomezoe
- Ferments for around a month
  - Foam names: Muscle, Water, Rock, High, Falling, Ball, Land or Ground

Pressing

Pressing

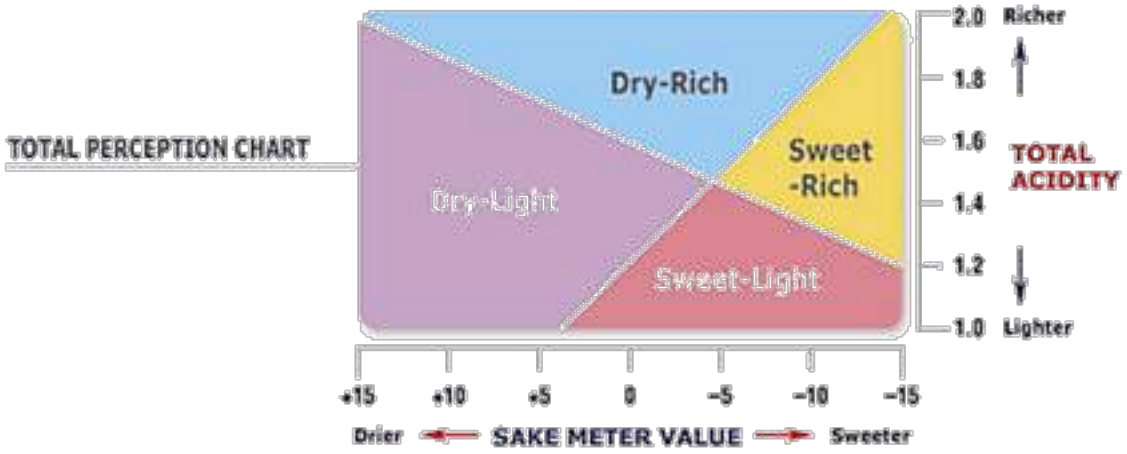
Aged, Filtered, Pasteurized

Drinking Sake

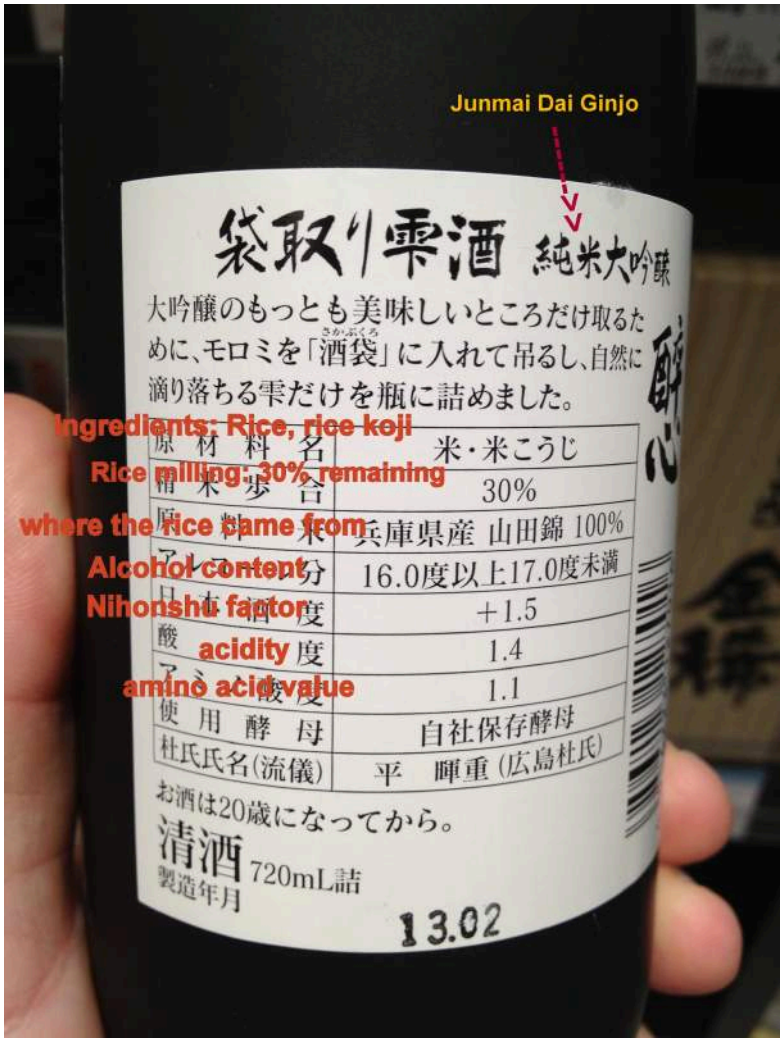
- Temperature
  - Warm
  - Room temp
  - Cold
  - *NEVER SERVE PIPING HOT OR CHILLED!!!*
- Seimaibuai – amount rice is milled
- Acidity
- Amino Acids – affects mouthfeel
- Sake Meter Value…

Nihonshu-do / Sake Meter Value

- Kind of like OG/IBUs rating for sake
- Ranges between -3 to +12
- Low number = dry / High number = sweet
- Middle of the road = +3



Reading a Label or Menu



Arajin 300ml (SMV) +3

Elegant aroma unfolds w/ layer of fresh apple & melon.

Kurobin Yaegaki 300ml (SMV) +2

Impact & aroma refined taste.

Hatsumago 300ml (SMV) +1

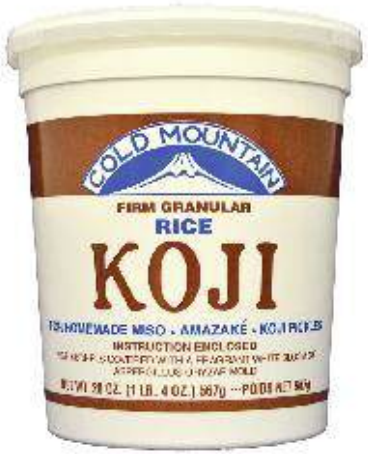
Smooth & complex taste w/ crisp refreshing end.

Homebrewing

- Aquire Koji
- Make a starter
- Do your additions
- Wait a while
- Press/Filter
- Wait some more
- Bottle
- Wait some more
- Enjoy

Koji: Build or Buy?

- Koji Mold
  - http://www.gemcultures.com/
- Cold Mountain Koji
  - Asian Grocery
- Homebrew shops



Making your own Koji

- Things you'll need:
  - Incubation chamber
  - Temp controller
  - Heating pad
  - Cup of steaming water

Making your own Koji

- Takes ~48 hours
- Use it fresh or freeze

Make a Starter (Moto)

- Water
- Koji
- Rice
- Yeast Nutrients
- 50-70 deg F
- Takes ~ week

Do your additions (Miromi)

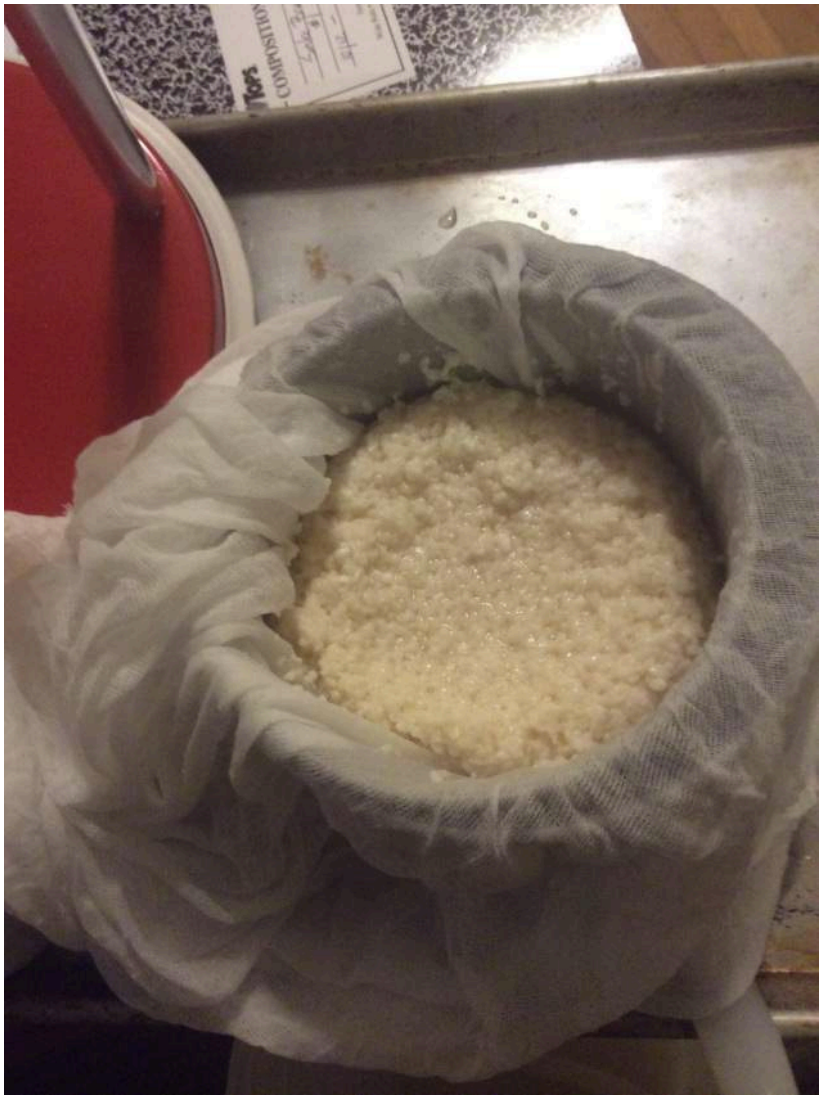
- Takes ~ 2 weeks
- Each addition is ~2x the last addition
- Pick appropriate sized vessel
- 5 gallon bucket = 3 gallon batch
- Can scale recipes up & down
  - I personally do 1.5 gal batches

Wait a while

- Another ~2 weeks
- Hold temperature
  - 40 – 60 deg

Pressing

- Need: cheesecloth or other tight weave fabric
- Draining and pressing by hand produced fine results
- Tried fruit press…



Wait a while

- Settling out
  - Can at fining agent, such as Bentonite
- Temp: low
- Wait ~month
- Rack
- 1st Pasteurization

Finishing

- Add sugar to affect SMV
- Add water to lower ABV
- Bottle
- 2nd pasteurization
- Wait some more…
- Drink!

Experimentation

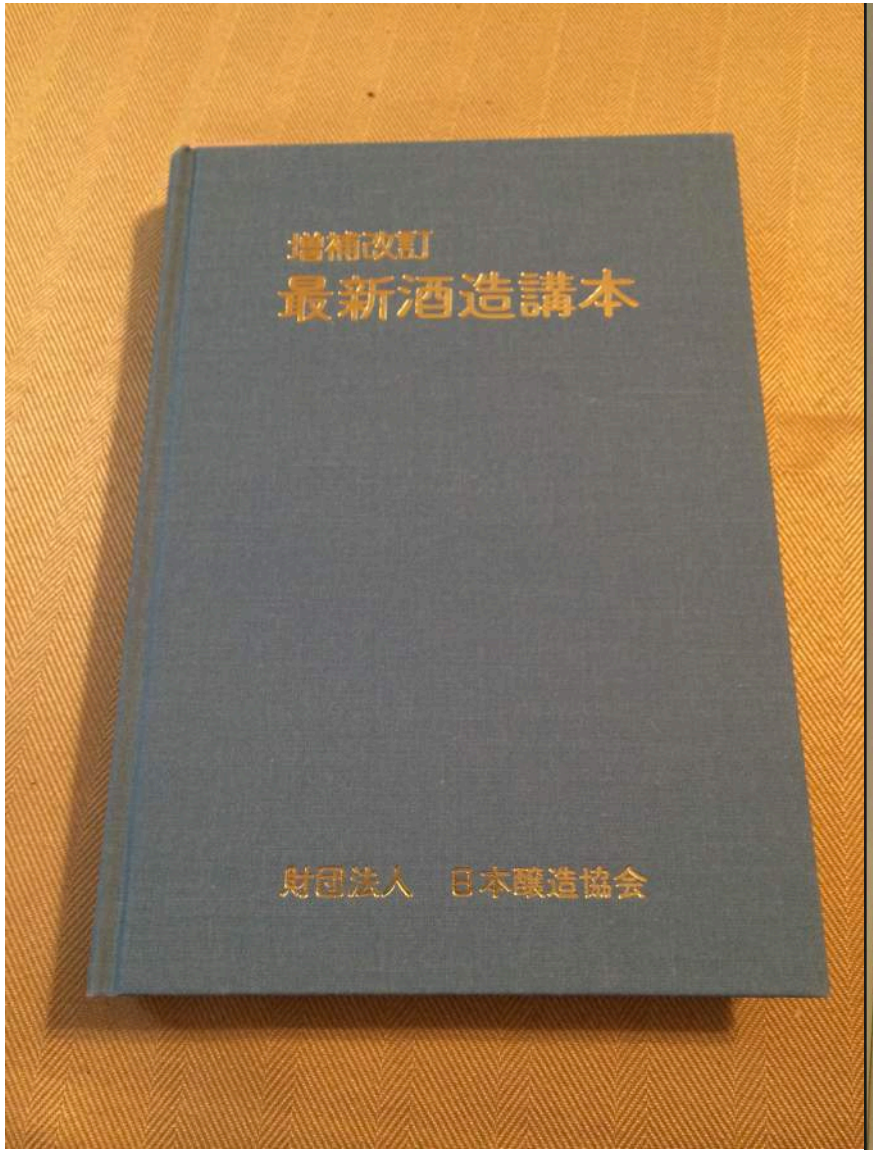
- Yeast Experiment
  - Sake #9
  - K1-V1116
  - EC-1118

More Experimentation

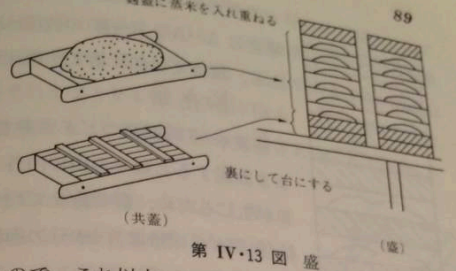
- Milling rates
- Soaking times
- Steaming times
- Rice additions
- Temperature
- Koji types
- Koji prep

Resources

- Online resources…
  - Lot's of stuff on "rice wine"
  - YouTube videos
  - My site: https://brewingthedream.wordpress.com/
  - http://homebrewsake.com/home/
- Books
  - *Sake (USA)* – Fred Eckhardt
  - *Brewing Sake, Release the Toji Within* – William G. Auld
  - *The Sake Handbook* – John Gauntner
  - Brewing Textbook (?) – Japanese Brewing Association



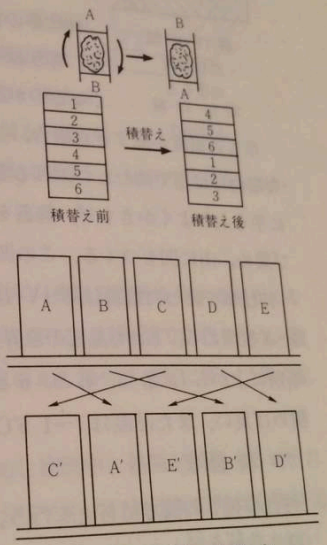
切返し後 12 時間(もみ上げ後 22 時間)が経過すると蒸米はウルミを生じ，表面に白い斑点がところどころにみられるようになり，品温はもみ上げ時より 1~2°C高くなる．麹菌の増殖が加速的に旺盛になり始める時期に当たるので，これ以上そのまま放置すると，発熱が激しくかつ水分の逸散が悪い．そこで麹蓋に移し，旺盛な増殖を促進させるとともに破精具合や温度の上り方等を調節できるようにする．これが盛である．1 枚の麹蓋に盛る量は 1.5~2.5 kg であり，麹蓋は図のように棚の上へ通常 6~8 段に重ねる．盛後の品温は 1°C程度下がり，大むねもみ上げ時の温度と同じになるのが普通である．



第 IV・13 図　盛

第 IV・13 図のように積み終ったら，全体に白ネル等の掛布をかけて保温とともに極端な乾燥を防ぐ．

5) 積替え



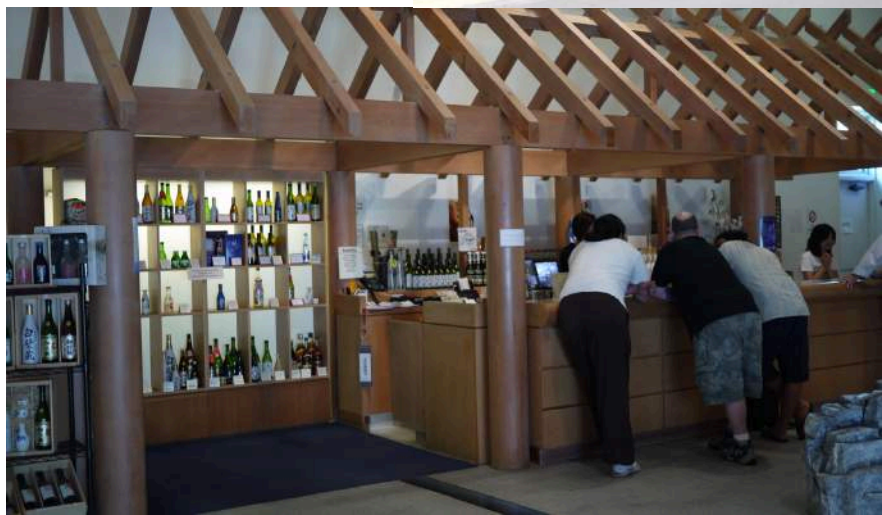
第 IV・14 図　積替え

盛後 3~4 時間すると菌糸の発育も進み品温が 1~2°C上り，上段と下段の麹蓋では温度が異なってくる．そこで 6 枚積みでは上下 3 枚ずつ入れ替えをして温度の上がり方の平均化を図る（入れ替えの際は麹蓋を 180 度回転して前後を逆にする）．これが積替えである．

なお，このとき品温の上昇が鈍く上段も下段も温度に差がない場合は，積替

Visit a Brewery!

- Takara (Berkeley, CA)
- Genkikan (Folsom Lake, CA)
- SakeOne (Forest Grove, OR)
- ~~Ozeki (Hollister, CA)~~



Sake Day

- September
- Japanese Cultural Center – SF Japantown

Kanpai