



Making Mead

(honey wine)

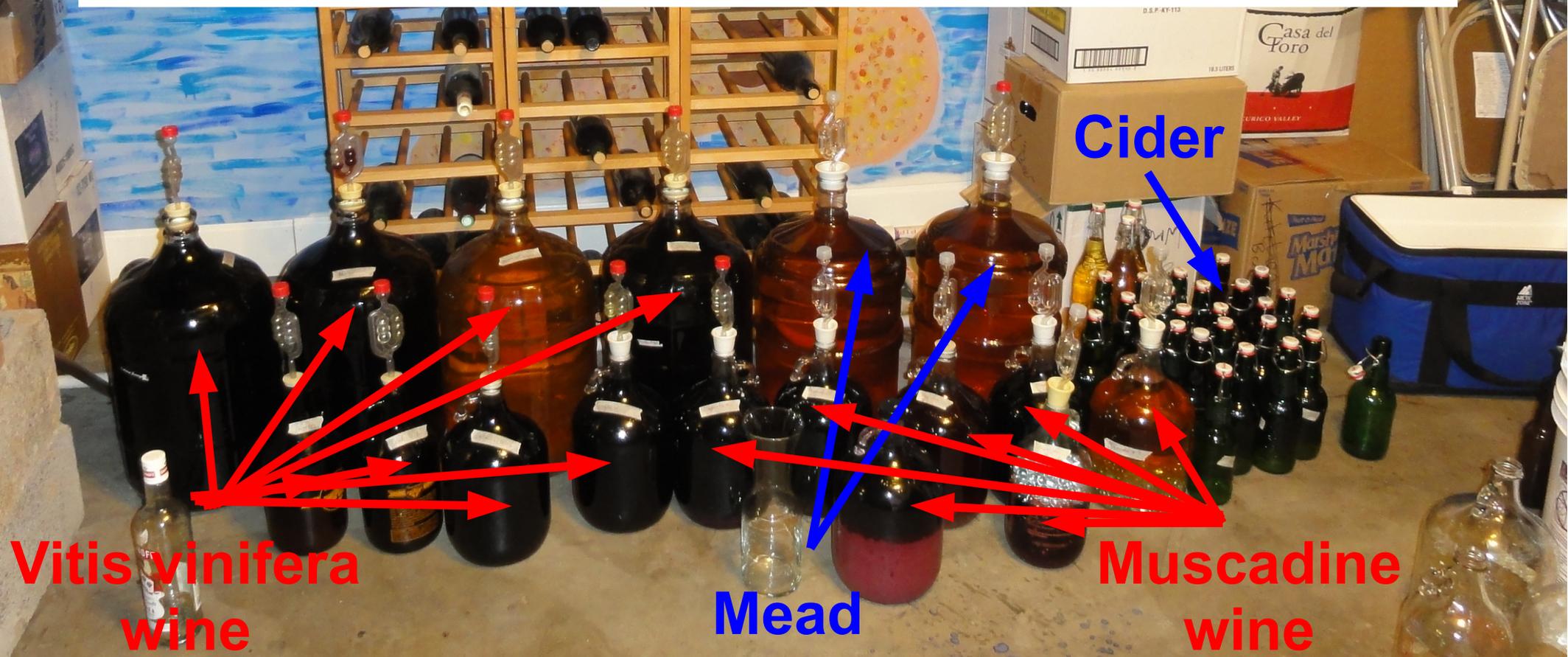
Christine Natrass



This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. To view a copy of this license, visit http://creativecommons.org/licenses/by-nc-sa/3.0/deed_en_US.

Who am I?

- Professional physicist, but... bachelors degree in biochemistry.
- Have brewed: beer, wine (starting from grapes!), mead, fruit wine, and cider
- Am currently brewing: mead, cabernet sauvignon, petite sirah, merlot, sauvignon blanc, 4 different muscadine wines



The process

- Dissolve honey in water
 - Sterilize
 - Add nutrients
 - Let cool/rest
- Add yeast
- Primary fermentation
- Secondary fermentation
- Bottling



Supply stores

- Fermentation Station
<http://www.fermentstation.com/>
8817 Kingston Pike
(865) 694-7993
- Allen Biermakens
4111 Martin Mill Pike
(865) 577-2430
- www.maltose.com

The recipe

My recipe

- 4 pounds of honey/gallon
- 2 boxes Sun Maid white raisins/5 gallons
- Heat to ~160°F for 45 minutes.
- Let cool.
- Inoculate with Lalvin EC-1118 yeast and use carboy for primary fermentation
- Rack in ~1 month and 2-3 times over the next year
- Bottle ~1 year after starting

How much honey?

- 4 lbs/gallon is a lot. This makes a very strong mead. Initially the honey won't even all dissolve in the water. There will be some residual sugar.
- 2 lbs/gallon is weak enough that the alcohol content might not get high enough for it to store well. A wine needs to get to ~12.5% to keep contaminants from growing well and this is a little too low for many honeys.
 - Should work better for making vinegar – it will ferment faster. BUT keep your vinegar far away from your wine making supplies.
- 3 lbs/gallon should be sufficient.
- **Exact flavor and final alcohol content depends on the honey and the yeast!**
- You can try to adjust the specific gravity to what it should be according to wine books/ the web but **beware** – honey is not pure sugar and the calculations can be off.

Adding nutrients

- Grapes and apples are the only fruits with all of the essential nutrients to grow yeast. To make mead, you need to add something that will give the yeast nutrients or else your mead will ferment v e r y s l o w l y.
- Two choices:
 - Grapes/raisins
 - Any type of grape will do, but this will affect the color and flavor of the mead.
 - If you use fresh/frozen grapes with seeds, you need to limit the contact with the must to no more than 2 weeks.
 - Beware any product which may have been (chemically) pasturized! It will prevent your must from fermenting!
 - Yeast nutrient
 - Available at a brewing supply store

Sterilizing the must

- When you start with any natural product, there is a chance it contains yeast or bacteria which could contaminate the must.
- For that reason when you start any fermentation you sterilize the must.
- Three main methods:
 - Boil/heat – some people think this destroys at least some of the flavors in the honey.
 - Sulfites – sold as Campden tablets, typically 1/gallon but read the package! Sulfite concentration will decrease with time.
 - Sorbate – if you do this you have to shake your must vigorously for 15 minutes before introducing yeast.

Melomels

- Honey + fruit wine
- If you do this, consider adding pectic enzyme. Must must be cool. This will break down the cell walls of the fruit and allow more juice out. This is most important with berries.
- You can sterilize fruit by just pouring boiling water over it. This could be your hot honey/water solution.
- You still need yeast nutrients.
- If you sterilize your must with sulfites, wait 12 hours before adding pectic enzyme.
- Wait 12 hours after adding pectic enzyme before adding yeast.

Which yeast?

- After trying a few different yeasts, my favorite is Lalvin EC-1118.
 - Champagne yeast with alcohol tolerance of ~18%
 - Will dry out the must
 - This means no popped corks!
 - Ferments well in just about anything, including the difficult environment of mead.
- Any wine yeast should work
- Dry vs liquid
 - I've tried both. The strain is what matters. Dry is cheaper, easier to store and less likely to fail so I've mostly moved over to dry.



How to stop the fermentation

- Wait until the yeast runs out of sugar
 - Beware of yeasts other than Lalvin EC-1118, especially with high honey concentrations. They could just ferment very slowly and then later you have popped corks.
- Add alcohol
 - Fortified wines like brandy
- Add pressure
 - Champagne
 - Not really practical for home brewers
- Add chemicals
 - Sorbate – prevents yeast's ability to reproduce. Add after fermentation finished and wine racked and before bottling.
 - Usually added with sulfates to keep bacteria from growing too.
 - I never do this but just let the fermentation stop naturally and bottle it like that.

How long should it take?

- 4 lbs/gallon of honey takes about 1 year to ferment with Lalvin EC-1118
- Less honey → faster fermentation
- Ways to tell it's done:
 - Specific gravity stops changing
 - No more bubbles coming out of fermentation lock
 - Fermentation lock not pressurized
- Err on waiting longer since it will not hurt and you will have fewer popped caps.

Bottling

- To add or not to add sorbate and/or sulfites?
That is the question.
 - I never have added them at bottling. I have never had a problem.
- Use clean bottles. Sterilize them the way you would sterilize your other equipment. You can buy them or collect them. If you collect them, rinse them out immediately after use.

Your recipe

- 2-4 pounds of honey/gallon
- Grapes or raisins or yeast nutrient
- Fruit if desired
- Heat/boil or add sulfites and/or sorbate.
- Wait until cool (heating) or 12 hours (sulfites)
- Inoculate with yeast
- Rack in ~1-4 weeks month and 2-3 times before bottling
- Bottle no sooner than 6 months after starting
- Wait at least 1 year to drink

Sterile technique

Sterile technique

- Treat everything as if it is contaminated – any surface not explicitly sterilized (including hands) and the air.
- Contact with air can lead to contaminants.
 - This is how your mead can accidentally turn to vinegar. If you want to do this on purpose I recommend using a starter culture (mother of vinegar).
 - Minimize your equipment and your wine's contact with air.

Methods for sterilizing

- Heat – boiling or autoclaving
 - Not practical for most equipment for home brewers
- Iodine
 - For kegs – chlorine-based cleaners can pit the metal
- Sulfites
 - Only kill bacteria
- B-Brite
- Bleach
 - Add ~1 tsp/gallon, preferably with hot water. ***Let sit 20 minutes in bleach solution. Let dry for 20 minutes before using.***
 - CDC method for restaurants. One method we used around the lab for cleaning the counters.
 - Scares people at hobby stores. Claims that it can lead to off tastes.
 - I've done this all the time and have no problems, BUT have always timed the 20 minute intervals.

BUT...

- Fear of contamination keeps a lot of people from brewing.
- People have been making beer & wine since before the Germ Theory.
- My guideline: If it smells funny, looks funny, or tastes funny, don't drink it. No matter how much it cost to make it.
- This guideline has worked well for me so far.

Equipment

Equipment

Mandatory

- Food grade fermenting containers with holes for fermentation lock – at least two with at least one with little head space (\$25-35)
- Fermentation lock (~\$1.50), bung (~\$2-3)
- Siphon (for ≥ 5 gallon batches) (\$5)
- Corker or bottle capper (\$20) + corks/caps
- Bottle brush (\$5-8)

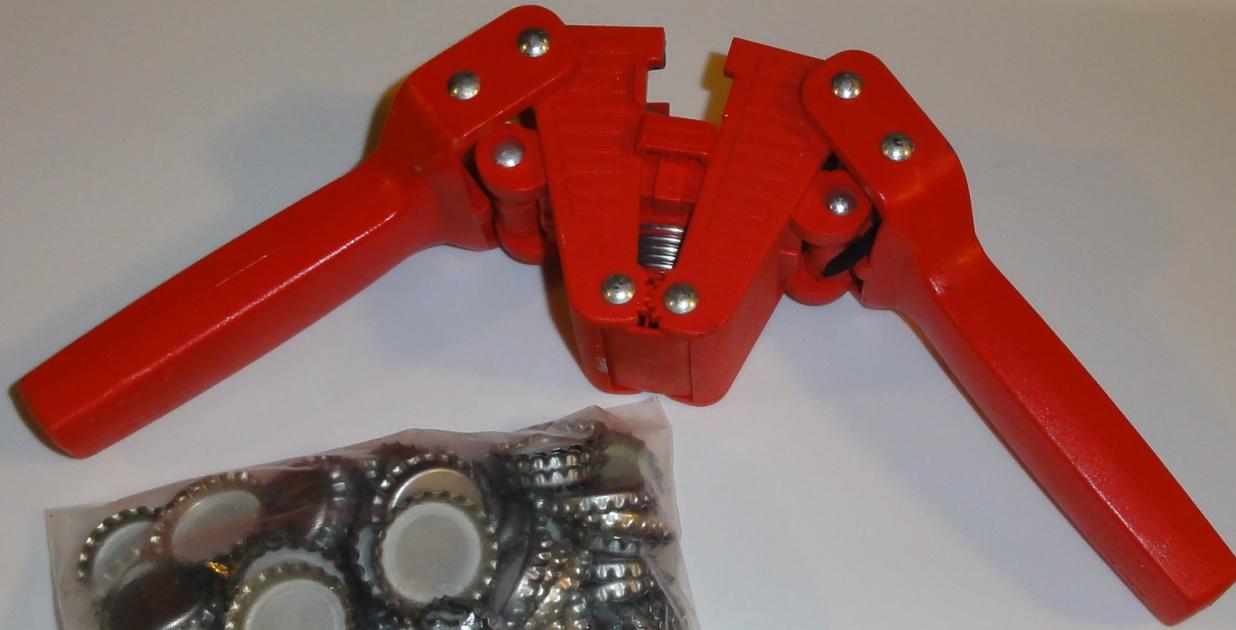
Optional

- hydrometer – for measuring alcohol content (\$8-18)
- Auto-start siphon (\$13-18)
- Bottling tip for siphon (\$5)

Hydrometer



Bottle capper



Wine corker



Bottles



Bottle brush



Yeast nutrient, yeast, oak



Self-starting siphon



Cleaning equipment



Fermenting buckets
Glass carboys



Fermentation lock



Country of Origin of Juice: USA
Packaged in California

QUANTITY ORIGIN: 5 grams 7 ml 10 grams 15 grams 30 grams 45 grams 60 grams 90 grams 120 grams 150 grams 180 grams 227 grams 454 grams

Retains: 30 grams 120 grams 227 grams 454 grams

Tip: 30 grams 120 grams 227 grams 454 grams

At the above mentioned products are packaged separately with life of all parts.



Preparing the must



Preparing the must







Liquid yeast - before



WYEAST™

Direct Pitch ACTIVATOR™ for Brewing

1007 GERMAN ALE
1305003

MFG. 11/2004



100

The Direct Pitch packet. This Wyeast packet contains 100% Pure Liquid Yeast plus an internal nutrient system allows yeast metabolism to begin prior to inoculation as well as providing proof of yeast health. Our ACTIVATOR™ is designed to inoculate 5 gallons of wort with the same pitch rate recommended by professional brewers.

100 Billion Yeast Cells

Contains: 125 ml (4.25 Fl. Oz. or 128 grams) yeast and nutrients

WYEAST™

Direct Pitch ACTIVATOR™ for Brewing

1762 BELG ABBEY II
1305003



100 Billion Yeast Cells

The Direct Pitch packet. This Wyeast packet contains 100% Pure Liquid Yeast plus an internal nutrient system allows yeast metabolism to begin prior to inoculation as well as providing proof of yeast health. Our ACTIVATOR™ is designed to inoculate 5 gallons of wort with the same pitch rate recommended by professional brewers.

Contains: 125 ml (4.25 Fl. Oz. or 128 grams) yeast and nutrients

Liquid yeast - after





Pitching the yeast



Racking



Primary fermentation



**End of primary
fermentation**

Secondary fermentation

