

# Introduction to Mead Making

## Brief History

While no one knows for certain, historians have picked 8000 BC as the likely period when mead was first made. Mead is mentioned in writings as early as 3000 BC, but the earliest actual mead recipe I have seen is from AD 77 in Pliny the Elder's "Historia Naturalis." There is no doubt that mead was a popular beverage throughout the period we study, but towards the end it was on the decline. The rising cost of honey caused mead to lose out in competition with improving quality in beers and increased access to wines.

## Ingredients

Mead needs only four ingredients: honey, water, yeast and patience. The quality of the first three ingredients will have the biggest impact on your final product, and the fourth will help you get to that final product.

**Honey** is where the main flavor for your mead will come from - it is also the source of the sugars that will be converted to alcohol during fermentation. You can easily use honey from the grocery store, or you can seek out different varieties of honey. Most commercial honey will be heavily processed and pasteurized, resulting in a less delicate flavor and fewer natural nutrients. A better choice is locally packaged honey, but the best choice is honey directly from a local bee keeper. The variety of honey you choose will depend on the type of mead you would like to make. In general, the darker the color of the honey the stronger flavor the resulting mead will have. Lighter honeys, like clover, make lighter flavored meads.

How much honey you use will determine the amount of *potential* alcohol in your mead. While different types of honey will have different amounts of sugar, on average you need one pound of honey for each percent of alcohol in a five gallon batch. The potential alcohol is the maximum amount of alcohol that you will get. How close your mead gets to the maximum will depend on the yeast used and how complete the fermentation is.

**Water** is used to dilute the honey to the point where fermentation can take place and will make up the volume of your mead. The honey/water solution along with any other ingredients is called *must*. Like the honey, the quality of your water will affect the quality of your mead. The key here is to start with good tasting water. Some minerals are ok, but chemicals are right out. Distilled water is bad because it is missing all trace minerals.

The **yeast** will actually do the work of converting the sugar to alcohol and carbon dioxide through the process of fermentation. Any yeast will do the job, but different strains of yeast have different strengths and weaknesses, e.g. how much nutrients they need, what temperatures they work best at, what their alcohol tolerance is and what flavors they enhance or impart in the final product. Beer and ale yeasts are good for low alcohol (small) meads, and wine yeast is ideal for all other meads. For my first meads, I used Lalvin 71B-1122, and I was quite happy with the results. As you learn more and experiment more you may want to try different yeasts, but 71B is a good place to start. 71B has an alcohol tolerance of about 14% and a temperature range of 60 - 85° F. If the alcohol in your mead goes above the tolerance level, the yeast will start to die off. The yeast will be most effective when the mead is kept within the temperature range. Too hot can kill off the yeast, and too cold will cause them to go dormant.

Most modern recipes will have additional ingredients to help aid fermentation (yeast nutrients) or to make the mead match modern tastes (acids and tannins). What you choose to use will depend on your goals. You can buy yeast nutrients, acid blends and tannin from your homebrew store or you can use more natural sources, such as raisins, lemon juice and black tea. For your first mead, I recommend adding

some sources of nutrients - modern yeasts may not get enough nutrients from just honey and water. Later you can experiment with recipes that do not use them or that use other sources.

### **Other Ingredients**

While they are beyond the scope of this class, you can also add a variety of fruits, spices, herbs, flowers, or nuts to your mead to produce different styles and flavors. These can serve as sources of nutrients for the yeast as well as flavors for the mead.

### **My First Mead**

(Or what might be my first mead if I was starting over)

#### *For a 1 gallon batch:*

2.5-3.5 lbs Honey (dry - sweet)  
Yeast nutrient (per package instructions)  
1 packet Lalvin 71B-1122 yeast  
Water to make 1 gallon

#### *For a 5 gallon batch:*

14-17 lbs Honey (dry - sweet)  
Yeast nutrient (per package instructions)  
1 packet Lalvin 71B-1122 yeast  
Water to make 5 gallons

#### *Optional:*

2 tsp Lemon juice  
1/4 cup Black tea (brewed, not leaves)

#### *Optional:*

3 Tbl Lemon juice  
1 cup Black tea (brewed, not leaves)

### **Required Equipment**

- Primary fermentation container - I recommend a food grade plastic pail (with lid). You can also use a glass carboy, but you'll need to be careful about the initial foam from fermentation overflowing or getting into your air lock. If using a carboy, you will also need a funnel to get everything into the carboy.
- Secondary fermentation container - A glass jug or carboy. You will probably want at least two of them, so you can move your mead from one to the other when it's time to **rack** (siphon the mead off of sediment in one carboy and into a clean carboy).
- Rubber stopper and airlock - The airlock will allow CO2 out of your carboy and prevent oxygen and contaminants from getting in.
- Plastic tubing - For siphoning your mead when you rack it.
- Sanitizer - Either something from a homebrew store or bleach. If using bleach, be sure to rinse your equipment very well.
- Bottles and corks or caps - Something to hold your final product.
- Notebook - Use a dedicated notebook to keep track of your recipes, measurements and any tasting you do. This will help you recreate good batches and avoid repeating mistakes.

### **The Process**

#### **1. Sanitizing**

The first and maybe most important step is to make sure all of the equipment you will be using is clean and sanitized. If you are using a sanitizer from a homebrew shop follow the instructions that come with it. I use "One Step No Rinse Cleaner" which is basically a food safe Oxyclean. If you are using bleach, make sure it is unscented. Soak the equipment in a solution of 2 ounces bleach per gallon of water for at least 10 minutes and then rinse it well.

#### **2. Preparing the Must**

There are several schools of thought as to the best way to combine your honey and water.

- Many early recipes call for boiling the water and adding the honey to it. As the mixture boils you skim off any scum or foam that rises to the top. This may have made good sense when the quality of the water was in question and when they were using raw honey with lots of wax

and other debris, but these days many people feel that boiling the honey destroys some of its more delicate properties.

- A second school of thought says to pasteurize the honey by dissolving it in 150° F water and keeping it at that temperature for five minutes. This will not only get the honey into solution, but it will kill off any wild yeast that may be present.
- A final option is to not use any heat at all. Add the water and honey to your primary fermentation container then stir or shake to dissolve.

Add any additional ingredients (tea, juice, nutrients) to the must. Add the must to your fermentation vessel and allow it to cool (if necessary).

### **3. Starting the Yeast**

Follow the instruction on the yeast to prepare it. You will usually need to wait at least 15 minutes from when you start the yeast to when you can add it to your must (called *pitching the yeast*). If you heated your must, do not add the yeast until the must has cooled to at least lukewarm temperature or you risk killing the yeast with the heat.

### **4. Primary Fermentation**

When both are ready, add the yeast to the must. Shake or stir it vigorously to get some oxygen into the mixture. The yeast will need this oxygen to reproduce during the primary fermentation, but after this step you will want to avoid exposing your mead to oxygen (otherwise you may get off tastes as it oxidizes). Seal your fermentation vessel with an airlock. Store it some place safe with a constant temperature and away from direct light (wrap it in a towel if needed). Within a day or two your must should be bubbling away. Write down the recipe and date in your notebook.

### **5. Secondary Fermentation**

After the primary fermentation has slowed down (within 2-4 weeks) it is time to rack the mead into a new clean (and sanitized!) carboy. This will get it off of the dead yeast that has started to collect at the bottom of the primary fermentation vessel. The mead will continue to ferment at a slower rate for a while. It will also start to clarify as more and more particulate matter settles out. Whenever you see an inch or so of gunk at the bottom, you should consider racking into a clean carboy again. Steal a taste of the mead when you rack it, but don't be too concerned by what it tastes like - young meads can be very harsh tasting. Write down the dates you rack as well as any thoughts about the taste in your notebook.

### **6. Conditioning**

Once the mead has finished fermenting, you will want to leave it to age in a carboy for as long as you can stand to. Feel free to taste it from time to time, but be careful about getting contaminants in it or exposing it too much oxygen.

### **7. Bottling**

When you can not wait any longer, it is time to bottle your mead. Beware - bottling before the mead is done fermenting can cause pressure to build up. These "bottle bombs" can pop corks or even explode. Make sure your bottles and bottling equipment are clean and sanitized. Rack the mead one last time to avoid bottling any sediment. Take a last hydrometer reading as well. Do not overfill the bottles or you will not be able to cork them properly.

### **8. Share and Enjoy!**

You finished your first batch of mead! Time to enjoy the fruits of your labor.

## Optional Equipment

- Auto-siphon or racking cane - Makes the job of racking much easier and can help reduce the amount of air that your mead gets exposed to.
- Hydrometer - Used to measure the amount of sugar in your must or your mead. See the next section for more information.
- Wine thief - Used to extract a sample of mead from your carboy. Handy when taking a hydrometer measurement or just tasting.
- Long Handled Spoon - Good for stirring your must.
- Stainless Steel Stockpot - If you are heating your honey, you'll need this.
- Wine thermometer - Also handy if you are heating your honey to pasteurize it.
- Bottle brushes - Great for cleaning your carboys and wine bottles.
- Bottle washer - And I do not mean your spouse... These are gizmos which fit onto your faucet to make washing bottles easier.
- Bottling bucket - A food grade plastic bucket with a spigot at the bottom - makes bottling easier.
- Bottling wand - A ridged plastic tube with a spring valve at one end. Used to help fill bottles.

## Using a Hydrometer

A hydrometer is a device for measuring the density of a liquid. The ratio of that density to the density of plain water is called specific gravity (SG). The specific gravity of water is 1.000; liquids that are denser than water (such as the must for mead) will have a higher specific gravity. Liquids that have a lower density (like alcohol) will have a lower specific gravity.

A hydrometer is usually a thin glass tube with a weighted bulb at one end. This allows it to float upright when placed within the liquid being tested. Hydrometers can have several different scales; some of these include percent sugar (Brix/Balling/Plato), potential alcohol and specific gravity. We are going to assume you are working with one that has specific gravity.

Once the hydrometer is floating in the liquid, give it a slight spin to knock off any bubbles. The lowest point where the surface of the liquid sits on the hydrometer is where you take your measurement.

Hydrometers are calibrated to a specific temperature (usually 20°C or 60°F). If what you are measuring is not at that temperature, then the measurement will be slightly off. If you want to correct the measurement, take the temperature of the liquid being tested and adjust the SG by the amount on the table below. The variation from temperature is pretty small, so it may not be worth it to worry about.

Temperature corrections for a hydrometer calibrated at 20°C / 68°F	Temperature corrections for a hydrometer calibrated at 16°C / 60°F
10°C (50°F) -0.002	10°C (50°F) -0.0005
15°C (59°F) -0.001	16°C (60°F) None
20°C (68°F) None	21°C (70°F) +0.001
24°C (75°F) +0.001	25°C (77°F) +0.002
28°C (82°F) +0.002	29°C (84°F) +0.003
32°C (90°F) +0.003	32°C (90°F) +0.004

The practical uses for this in mead making are:

- To determine roughly how much alcohol has been produced by fermentation. Before adding the yeast to your must, but after the must has cooled sufficiently, take a reading (either as specific gravity or potential alcohol) and write it down in your notebook. This is considered your starting gravity or original gravity (OG). After your mead has finished

fermenting, take another reading. This is your final gravity (FG). The difference between the two readings is roughly how much alcohol was produced by the fermentation.

- To estimate how sweet or dry a final product should be before fermentation starts.  
Take the potential alcohol value from your OG reading and subtract from it the alcohol tolerance of your yeast. Any remaining potential will remain as sugar - the more that is left the sweeter the mead will be.
- To tell how sweet or dry a final product is after fermentation.  
Look up your FG measurement on this list:  
 Dry meads: 0.990 – 1.006  
 Medium meads: 1.006 – 1.015  
 Sweet meads: 1.012 – 1.020  
 Dessert meads: 1.020 +
- To help tell if fermentation has finished.  
Test your mead from time to time by taking a specific gravity measurement (I do this every time I rack). If the measurement stops changing over time, then fermentation has finished. Note: It is possible for problems to cause fermentation to stop early. This is where knowing what sort of final gravity you are expecting can help determine if the mead has fermented to completion or if there is a problem.

Note: If not all of your honey is dissolved, you will not be able to get an accurate hydrometer reading - but it will not affect your mead.

### Possibly Useful Information

In a 5 gallon batch:

1 lb. of honey = about +0.008 specific gravity

1 lb. of honey = about 1% potential alcohol

In a 1 gallon batch:

1 lb. of honey = about +0.040 specific gravity

1 lb. of honey = about 5% potential alcohol

Potential Alcohol % by Volume

Rough guide is: Potential Alcohol = (SG – 1.0) x 132

### Yeast Chart

Yeast	Temp. Range	Alcohol Tolerance
Lalvin 71B-1122	60-85° F	14%
Lalvin RC212	68-86° F	14-16%
Lalvin ICV-D47	50-86° F	12-14%
Lalvin EC-1118	50-95° F	18%
Lalvin K1-V1116	50-95° F	16-18%
White Labs WLP720 Sweet Mead	70-75° F	15%
Wyeast 3/4632 Dry Mead	55-75° F	18%
Wyeast 3/4184 Sweet Mead	65-75° F	11%
Wyeast 3/4267 Bordeaux	64-86° F	12-15%
Wyeast 3/4021 Pasteur Champagne	55-75° F	16-17%
Red Star Premier Cuvée	45-95° F	18%
Red Star Pasteur Red	64-86° F	16%
Fleischmann's Bread Yeast		12%

## **Mead Recipe of Pliny the Elder, *Historia Naturalis***

(Translation from “The Compleat Anachronist #120”)

Hydromel [plain mead]

A wine is also made of only water and honey. For this it is recommended that rain-water should be stored for five years. Some who are more expert use rain-water as soon as it has fallen, boiling it down to a third of the quantity and adding one part of old honey to three parts of water, and then keeping the mixture in the sun for 40 days after the rising of the Dog-star. Others pour it off after nine days and then cork it up. This beverage is called in Greek “water-honey” [“hydromeli”]; with age it attains the flavor of wine. It is nowhere more highly prized than in Phrygia.

## **Links**

### Honey

Dutch Gold Honey - <http://www.dutchgoldhoney.com/>

Swarmbustin' Honey - <http://www.swarmbustinhoney.com/>

Fruitwood Orchards - <http://www.fruitwoodorchardshoney.com/>

### Yeast

Red Star - <http://www.lesaffreyeastcorp.com/wineyeast/products.html>

Lallemand/Lalvin - [http://www.lallemandwine.us/products/yeast\\_chart.php](http://www.lallemandwine.us/products/yeast_chart.php)

White Labs - [http://www.whitelabs.com/wine/wine\\_descriptions\\_amateurs.html](http://www.whitelabs.com/wine/wine_descriptions_amateurs.html)

Wyeast - <http://www.wyeastlab.com/hvino/homewpelist.htm>

### Equipment

Keystone Homebrew Supply (PA) - <http://www.keystonehomebrew.com/>

Home Sweet Homebrew (PA) - <http://www.homesweethomebrew.com/>

How Do you Brew? (DE) - <http://www.howdoyoubrew.com/>

### Groups

East Kingdom Brewers Guild - <http://www.panix.com/~ekbrew/>

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