



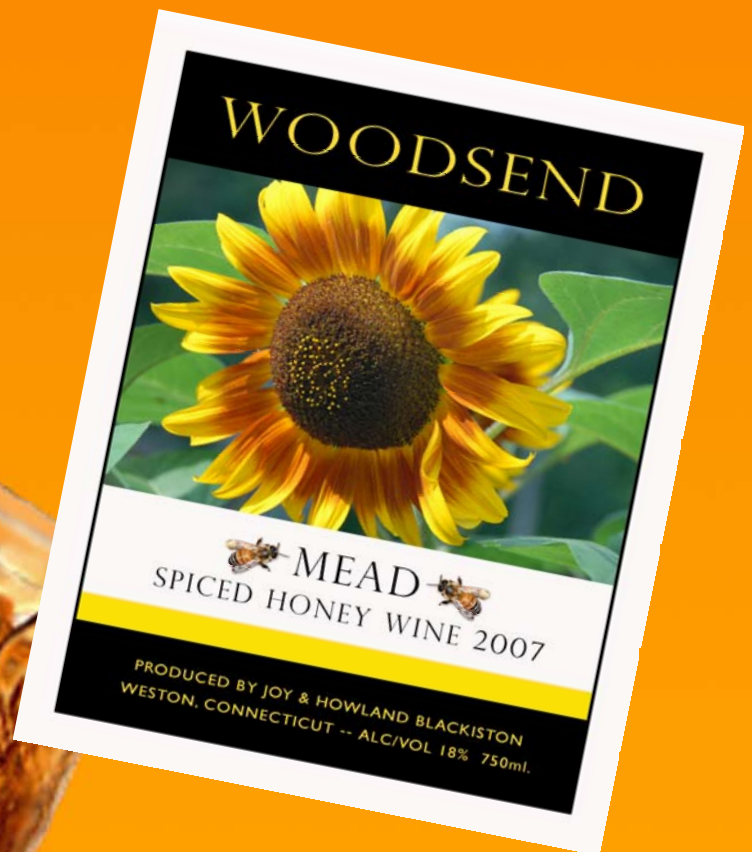
MEAD MADNESS

How to Make Honey Wine at Home

Long Island Beekeepers
Workshop and Mead Tasting Event

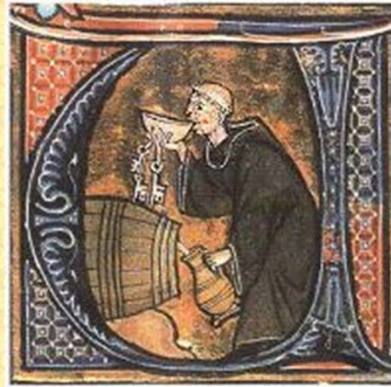
Sunday 25 November 2012

Presented by
Howland Blackiston, Author
Beekeeping for Dummies
Building Beehives for Dummies



A Little History

- History goes back many thousands of years
- Mead may be the oldest alcoholic beverage
- It was the drink of the Greek Gods, the Vikings and Robin Hood
- The drink of love

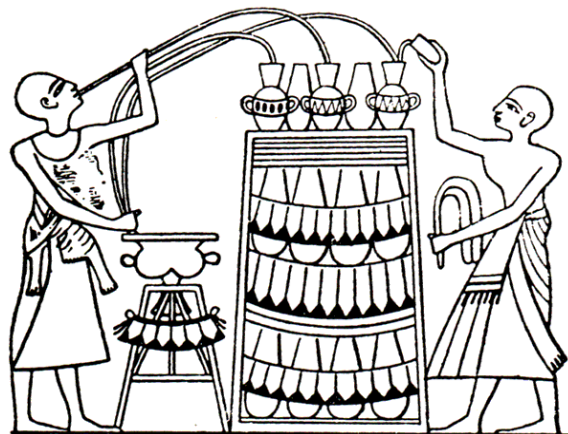


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This weekend workshop has been put together to provide some basic information that will allow you begin your wonderful adventure with the brewing of “honey wine” at home.

The history of mead is as old as history itself. Long before the grape was used in winemaking, honey was the sole sweet for fermentation. The mention of mead evokes images of heroes and romantic tales, of castle feasts and chivalry. Legends surround it, that of golden nectar, swirling in a goblet chased with silver, with the heady, erotic aroma of honey caressing the senses. We see Vikings, downing great tankards of frothy mead after a successful raid. One can imagine a beautiful maiden, holding the stirrup cup in her lithe hand, offering it along with a shy smile to the handsome and chivalrous knight preparing to go off to battle.

Legend has it that the word *honeymoon* is derived from an ancient tradition of sending a newly married couple off to seclusion for a month with much mead, to ensure their best chance to start a family quickly. Mead has been, and still is, considered the drink of love.



Names for Honey Wine








-  **Mead:** Honey Wine (honey only, no spices)
-  **Sack mead:** Sauterne-like sweet Honey Wine (uses more honey)
-  **Metheglin:** Spiced, Herb Mead (gruit)
-  **Sack Metheglin:** Sweet Spiced Mead (uses more honey)
-  **Cyser:** A Sherry-like Mead made with apple juice/cider
-  **Melomel:** Mead made with fruit juice (not apple juice)
-  **Clarre or Pymeat:** Honey and grape juice
-  **Hyppactas:** Spiced Pymeat
-  **Braggot:** Honey and malt, sort of a mead-beer

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There are as many different kinds of mead as there are types of wine or beer. It can be sweet, dry or sparkling. Each category of mead has its own "name", depending upon the ingredients used. For example, is the mead made with just honey and water? Or were fruit juices, grape juices, apple juices or spices added? The list of names is far longer than what you see here. These are a few of the more common mead types.



Basic Equipment

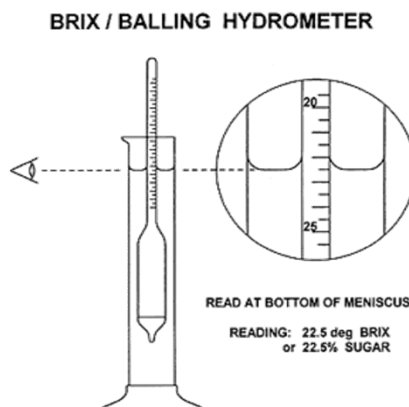
-  **1 Primary fermentation tank**
-  **2-3 five gallon glass carboys**
-  **2-3 fermentation valves**
-  **Hydrometer**
 - Determines sugar content of must
-  **Thermometer**
-  **Plastic tubing**
 - For racking & bottling
-  **Bottles and corks**




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Many wine & beer making suppliers offer wine making kits for those interested in making mead. The suppliers used for making mead are identical to the supplies used for making wine. Only the ingredients differ (honey versus grape juice). The quantity and size of the equipment you need is proportional to the amount of mead you intend to make. I suggest starting small (to gain experience) and scale up as you gain confidence and knowledge (just like beekeeping!).

A special word about the Hydrometer, as this is a very valuable tool to have when making any kind of mead or wine. Essentially this is a special glass float, weighted at the large end, that is used to measure the density of the Must and Mead to determine the alcohol content. The more sugar there is, the denser the liquid and the higher the hydrometer will float. When the sugar is converted into alcohol, the density decreases and the float drops further into the liquid. They come in small tubes to hold the mead sample, although they can be floated in the open fermenter as long as they have been properly sanitized. Make sure the one you buy is not specifically made for beer, and follow the directions provided for calibration.



Basic Ingredients

 There are just a hand-full of ingredients that are used on a regular basis when making wine:

- Acid Blend
- Yeast Nutrient
- Yeast Energizer
- Campden Tablets
- Yeast






These simple ingredients will allow you to make 95 percent of the wines you could ever imagine making.

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Of course in addition to these ingredients and supplies, you will need honey. The type of honey (dark or light) does not matter. Each honey will impart a unique flavor to your mead, just as different grapes impact the flavor and characteristics of wine. Each variety of honey will contribute its own aroma, complexity, and body to the Mead. But rest assured that no mead you ever drink will taste as good as the mead made with your own honey!

There is no set rule for what you can and cannot put into Mead to add flavor. If you like the taste of a particular fruit, vegetable, or spice, then give it a try and see what happens. My most recent batch of mead was made by adding grape juice to the mix (putting it in the category of a clarre or pymeat).

Where to Ferment?





-  **Separate room**
 - Can get messy and smelly
 - The basement or cellar works well
-  **Temperature control**
 - 72-78 F. is ideal for fermentation
-  **Avoid sunlight**
 - The sun can cause temperature fluctuation
-  **Sanitation is crucial**
 - Be sure to minimize dust
-  **Washable bench**
 - Stone, porcelain, stainless steel, laminate

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I have made use of my basement for making mead. That was a decree made clear to me by my good wife when she banished me from the kitchen after a rather spectacular mishap. The disadvantage to the basement has been that I have no running water in my basement. So there have been many trips up and down to the kitchen. But this sub-terrain venue has resulted in domestic tranquility and a modicum of "stair master" exercise for this mead maker.

My basement, like many, tends to be cooler than the living quarters above. For storing bottled wine this is very desirable. But the cool temperatures can impede proper fermentation. A space heater placed near your fermentation tanks is the solution. Use one with a thermostat, and you can keep the mead brewing environment at the desired 70-78 degrees.

Keeping Everything Clean

-  **Sanitation is a critical precaution**
 - Maintain sterile “laboratory” conditions
-  **Sodium metabisulphite**
 - Yeast can still grow, but not other undesirables
 - Rinse thoroughly
-  **Clorox**
 - Highly toxic to yeast
 - Must flush thoroughly with non chlorinated water
-  **Never use soap**

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Probably the most important aspect of home brewing is sterilization and sanitation. This concept of cleanliness can not be over emphasized. Many failed attempts in making mead are the result of contamination of the product. All equipment must be sterilized before use. Keeping everything clean is not a huge chore, but it is a discipline that should be followed religiously.

If you are not starting with a clean environment, you may find yourself brewing some fairly nasty concoctions. One of the worst things a home brewer has to face is the prospect of pouring gallons of undrinkable liquid down the drain. So, as you prepare to mix your first batch, repeat these words over and over before ever even touching your ingredients: *Sanitize Everything!*

100% sterilization is not possible in the kind of environment most of us make our Mead in. This is because there are always bacteria, spores, and wild yeasts floating around us, sitting on us, and doing their best to get in where they are not wanted. We must therefore do our best to get rid of the great majority so as to give our brewing yeast a head start in the Must. There are two ways of doing this; by using heat or chemicals.

First, heat. This can be accomplished by either placing the equipment in boiling water for at least 1 minute, or by heating the water to pasteurizing temperatures and keeping it there for enough time to kill anything still lurking.

Second, chemicals. There are a whole slew of chemicals out there that can be used to sanitize and sterilize, from regular household bleach to specialty brewery sanitizers. Each one has its unique methods of use, such as needing to be rinsed after immersion, so it is important to read the instructions.

Barrels & Carboys



Wooden barrel

- Oak or redwood; cleaning is difficult; must be stored full; new barrels impart too much flavor; 25 gallon size is appropriate



Plastic should be avoided

- Some plastics produce off-flavors



Glass carboy is good

- Able to watch progress; easy to clean; easy to store; 5 gallon size is practical



You need a container (5 gallons or more) in which to ferment your mead. In truth, you will need several of these, as mead is routinely siphoned off from one container to the next (a process called "racking"). More on this later.

The most common and least costly fermentation device is a glass carboy. For me, the disadvantage is that they can get slippery when wet, and of course being glass, they are fragile. Do you recall my earlier mention of a kitchen mishap? I gather that some suppliers now offer a plastic version of the carboy.

The oak barrel approach has great romance to it, and it can impart a delightful mellowness to the mead. But these containers are very difficult to keep clean and sanitary; they are very heavy; and they are very expensive.



Specialized Fermentation Tanks



Stainless Steel

- Expensive but practical
- Look for ones with a variable top
- Have built-in valves



Polymer

- Practical and less expensive than stainless
- Easy to clean
- Have built-in valves



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I have given up my glass carboys in favor of fermentation tanks made just for this purpose. The food-grade plastic ones are not very expensive, and they are easy to keep clean (that wide opening makes washing out a breeze). They also have a spigot that makes the potentially messy process of siphoning a thing of the past. I love these tanks. They come in 9, 14 and 22 gallon sizes.

The stainless steel tanks are also easy to clean, and some (like the one shown in the picture) have variable tops, meaning you can adjust the position of the top as the mead level drops from one raking to the next. This is important, as you never want too much air space above the mead (too air space can lead to off-flavors). But be aware that these premium quality tanks come at a considerable cost. Depending upon the size you get, they can run from \$450 and up.



Fermentation Valves

- Fill to mark with sterilized water or glycerin
- Keeps bacteria out
- Designed to protect wine
- Sterilized cotton also works
- Allows you to watch progress
- Clean & dry carboy's neck



Remember what I said about keeping everything sanitary? That also means not allowing any air to get into the tanks following the initial fermentation stage (you actually want air and O₂ during the first or initial fermentation). But after that, the mead must not be exposed for any length of time to airborne contaminants (wild yeasts, bacteria, dust, pollen, etc.).

There are a variety of "fermentation locks" available that allow for fermentation gasses to escape, while preventing air from getting in. These locks are typically filled with sterilized water, which serves as the barrier (gasses can bubble out, but air can not get into the tank). These bubbles, by the way, are a great visual aid in determining how your fermentation is progressing.

Hint: Use food grade glycerin in the locks in place of water – glycerin does not evaporate like water. It's available from wine making suppliers.



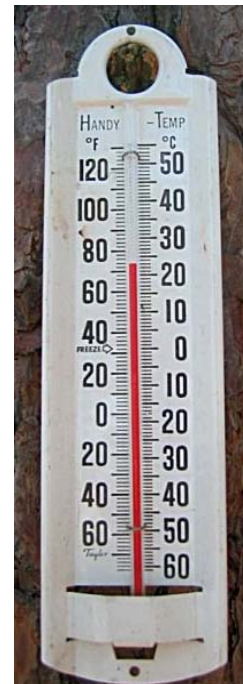
Temperature Control

- 🐜 **Dark room/uniform temperatures**
- 🐜 **Basement is ideal**
- 🐜 **72-78 F. is ideal range**
- 🐜 **Bad if less than 65 F.**
 - Ceases or slows fermentation; slows aging process
 - Note that a space heater can help maintain proper temperature
- 🐜 **Bad if more than 80 F.**
- 🐜 **Fermentation is exothermic**
 - Yeast generates heat
 - Can be a problem if the tank is more than 50 gallons




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The second most common reason for failure (poor sanitation being the first) is poor temperature control. A successful fermentation requires a fairly narrow temperature tolerance. When you get outside of this range, yeast cells can become inactive or even die. Temperatures that are too hot can also result in off-tasting meads.

I use a thermostatically controlled space heater in my basement to keep temperatures within ideal ranges. And I monitor temperatures using an inexpensive "outdoor" thermometer purchased at the hardware store.



The Best Yeast for Mead

-  **Champagne-type wine yeast**
 - May be best for clearing wine
-  **Special mead yeast**
 - Nothing very special about it
-  **Liquid versus Dry**
 - Liquid yeasts can be more “active”

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First and foremost, bread yeasts do not work well in mead or wine making. Don't use them. They are not “designed” for this kind of fermentation.

There are many different kinds of “wine” yeasts. Each strain of yeast has its own unique tolerances to certain conditions. These include alcohol level, pH level, sugar level, etc. Of most concern to a brewer is the alcohol tolerance, since it is this value that will dictate the sweet/dry characteristic of the Mead. It is therefore important for the brewer to decide early on what level of sweetness is desired and to select the yeast based on its capacity to convert sugar to alcohol (known as Attenuation).

For my mead making, I have had good success with Champagne yeasts. I like to pre-activate the yeast before adding to the “must” by introducing it to a small quantity of warm (not hot) water. About 100 degrees is ideal; and no more than 15 minutes in the water before adding to the must. This gets the yeast going, so it has a bit of a head start when it is introduced to the initial fermentation.

Note that for mead making, it's important to add some yeast nutrients to the must. As with any living organism, yeast have to be fed to survive. Unfortunately, honey does not have much in the way of nutrients, particularly if it has been boiled. It is therefore up to the brewer to ensure the right combination of nutrients is added to the Must to ensure a healthy fermentation. If this is not done, then the Mead could experience a number of negative results, such as Stuck Fermentation and Hydrogen Sulfide Contamination (Rotten Egg Smell). Fortunately, it is fairly easy to meet the nutritional needs of the yeast. Use between 0.5 – 1 tsp. of Nutrient per gallon of Must. They can be added during the boil, or directly to the fermenter if the no-boil method is used.

Sulfiting Meads

Sodium metabisulphate tablets (Campden Tablets)

- These tablets release sulfur dioxide when dissolved in a liquid. Added in small doses directly to fresh juices 24 hour before adding yeast. This is done to kill wild molds and bacteria that naturally come with these fruits which can cause off-flavors in the finished wine. Also, used in stronger doses with water as an equipment sanitizer.
- One tablet per gallon = 50-75 p.p.m. of sulfur dioxide



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These tablets are very handy, as they take the guesswork out of measuring out doses to maintain the correct parts per million of sulfur dioxide. Just add one tablet per gallon at each racking and prior to bottling. Crush tablets and pre-dissolve in a small amount of your mead before adding to the fermentation tank.

Larger doses of Camden tablets in water can be used to sanitize equipment.

When to Sulfite Mead?



Sulfite mead 2 or 3 times






- Add to freshly diluted honey
- Wait 24 hours before adding the yeast to the must
- Sulfite again at each racking
- Sulfite one last time prior to bottling



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I sulfite the must 24 hours prior to the primary fermentation. And then I usually add one tablet per gallon at every racking and at bottling time.

Primary Fermentation

-  **Use large pail to mix “must”**
(mixture of honey and water)
-  **Add a few drops of anti-foam agent** (optional)
-  **Takes 14-28 days for the primary fermentation**
-  **It's all over when the bubbles stop**
-  **Dead yeast cells will fall to bottom**



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Yeast is a peculiar organism in that it does not necessarily need straight oxygen to survive. Instead, it can obtain the O₂ required to reproduce by fermenting any available sugars. But, since O₂ is used to build up strong cell walls, the yeast is able to reproduce far quicker, and with fewer unwanted byproducts, if it can get the O₂ without having to break it off from the sugar molecules. It is therefore important to introduce O₂ into the Must before the yeast is pitched, and for the first 2 to 3 days until the yeast population has grown sufficiently.

In the case of this initial fermentation, I like to vigorously stir and splash the must to introduce lots of bubbles prior to this primary fermentation. Commercial mead makers sometimes actually add oxygen at this stage, as this helps with a fast and effective fermentation. The container must not be sealed up at this stage. I simply lay a clean towel over the top (to keep dirt out, while allowing the must to “breathe”). Make certain to leave lots of head space, as the bubbling and foaming can quickly overflow a container that is filled too full!

Racking the Wine

- ✂ **Separate wine from lees** (settlings of dead yeast)
- ✂ **Transfer to 3-5 gallon carboys**
- ✂ **Maintain 1" headspace under valve** (add some water to top-off if absolutely necessary)
- ✂ **Rack 3-4 times at 1 month intervals**
- ✂ **Maintain ~50-75 p.p.m.** (1 Campden Tablet per gallon)
- ✂ **Don't splash** (adds too much oxygen)

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This process of "racking" is done several times during the process of brewing mead. Mead seems to need more racking than when making grape wine. With each racking the mead becomes more and more clear. Patience makes perfect..





The purpose of racking is fourfold:

1. To stop fermentation by removing the Mead from the yeast and adding Sulfites and Sorbates.
2. To remove the Mead from the Lees (layer of yeast on the bottom of the fermenter) so as to avoid a yeasty flavor imparted by the breakdown of yeast cells before bulk aging.
3. To add additional ingredients for flavor during secondary fermentation.
4. To help clarification by removing the Mead from the Lees before bottling.

It is absolutely vital that the Mead not be mixed with too much air during racking as this will introduce oxygen that will affect the flavor. Also, as always, make sure all of the equipment that will be coming into contact with the Mead is thoroughly sanitized.



Bottling Your Mead

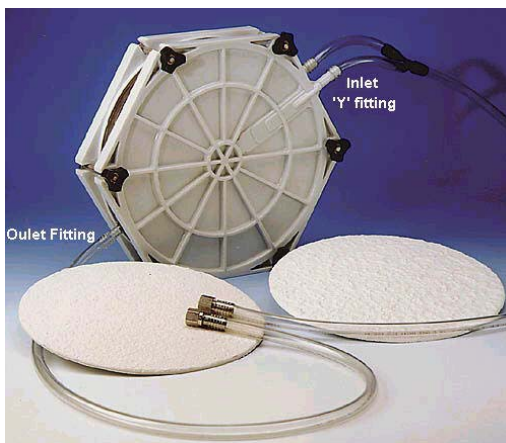
-  **My favorite: clear glass sauterne**
-  **Sterilize in dishwasher**
-  **Real corks & shrink-wrap foils**
 - No crown caps or screw caps
-  **Leave the newly corked bottles upright for 2 days**
 - Allows compressed air to leak out
 - Avoids seeping wine and a bacteria path



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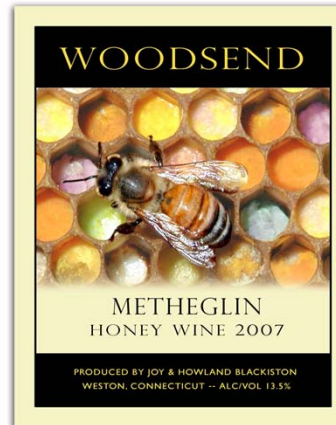
Don't forget to sterilize your corks before you insert them in the bottles. Soak in a non-chlorinated disinfecting solution for a few hours before bottling, and then dry them off with a clean towel.

It is also advisable to filter your mead (through a wine filter) at bottling time. This results in a sparkling clear wine, free from haze and sediments. Such filters are available at wine making supply houses. The "manual pump" variety are not expensive. The "electric pump" variety can cost hundreds of dollars.



Create a Unique Label

- ✈ Create your own brand name
- ✈ Include the name of the producer (that's you!)
- ✈ Indicate "type" and date
- ✈ Create an attractive design using your computer
- ✈ Blank computer labels for wine are available from www.onlinelabels.com






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If you don't want to design your own label, some of the wine making supply houses sell pre-made generic labels that are quite nice looking (see below).



Aging Your Mead

-  **Many desirable changes take place**
 - Clarity, color, and odor improves
 - Becomes smooth & mellow
 - 3-6 years is ideal for mead
-  **Maintain constant temperature**
 - 60 F. dark room is ideal
-  **Keep bottles on their sides**
 - Keeps the corks from drying



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This is the hardest part of mead making: the waiting time. Be patient, as the results are far more rewarding when you give the mead time to mature.

This is not to say that no Meads can be enjoyed within a few weeks of fermentation, but most Meads will improve if given a little time to mature. Aging allows the desired flavors to blend and come to the front, as well as having the advantage of allowing certain unwanted "off" flavors to dissipate. The following guidelines will help you age your Mead properly:

- Try to keep your Mead as close to 60°F as possible (avoid high temperatures). Slight changes in temperature around the 60°F will not have a negative effect as long as they are gradual.
- Store the bottles on their side to keep the cork moist and prevent shrinking. This is not a concern if you are using artificial corks.
- Keep the Mead away from the light as this causes oxidation and "off" flavors.
- Avoid vibrations and shaking.
- If possible, bulk-age your Mead rather than bottling and letting it age individually.

The amount of time needed for the Mead to mature is subjective. Some people enjoy drinking it young, while others prefer to let it sit for many years. A rule of thumb seems to be that at least 1 to 2 years is fine. Sample the Mead every few months or so until you feel that it is at it's best, then bottle and drink away.

My Favorite Recipe (to make 5 gallons)

-  1 tsp grated cinnamon
-  1 tsp sliced ginger
-  13 pounds of wildflower honey
-  5 gallons of water (non-chlorinated)
-  Yeast nutrient
-  Acid Blend
-  1 Packet of Champagne Yeast
-  Campden Tablets


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Note that this mead recipe calls for the addition of spices. That makes it “metheglin”. I love the subtle blend of honey, cinnamon and ginger. Yummy! Today you’ll have a chance to taste this very recipe.

My Favorite Recipe


1. Add honey to 2 gallons of water and boil for 30 minutes skimming off scum


2. Allow the mixture to cool and add:

 4 tsp of acid blend (available at wine-making supply stores)

 5 tsp of yeast nutrient (available at wine-making supply stores)

3. Pour the mixture into a large (8-10 gallon) initial fermentation tank.

 Top off with water so that the tank contains a total of 5 gallons of "must"*

 Stir vigorously to blend and add oxygen

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Note that I recently learned from a master mead maker that he no longer boils the honey and water mixture prior to fermentation. This step has been a tradition for years (is supposed to help with the clarity of the end-product). He finds that there are no significant advantages, and that not boiling seems to impart a superior "honey" flavor to the finished product. Boiling also reduces the amount of O₂ in the must. So the revelation of "not boiling" came as good news, as this step is quite a chore. For my most recent batch of mead, there was no boiling involved. Time will tell.

Pros of Not Boiling:

Not boiling the honey greatly minimizes the loss of any volatile components in the honey, resulting in a Mead that retains much of the true floral flavor and bouquet of the honey being used.

No boiling, no heating, no fuss. Easy and quick.

You can pitch the yeast immediately since the Must is already at the correct temperature.

Cons of Not Boiling :


Slight potential for contamination, mostly from the water supply rather than the honey.

Harder to dissolve the honey. Most new Mead makers completely underestimate the stirring involved for complete dissolution of the honey into the water and as a result leave some unblended honey at the bottom of the vessel. Stratification of the must can slow, stress or stall your fermentation and result in off flavors. Get ready for a good deal of shaking and stirring.

The chlorine must be removed from chlorinated water prior to pitching of the yeast, or you can use distilled water.

My Favorite Recipe

4. Add the following ingredients to the tank of must:

 5 Campden tablets (available at wine-making supply stores) to hinder the growth of undesirable bacteria

5. Wait 24 hours, and then add the following to the must in the fermentation tank:

 2-1/2 packets of champagne yeast (stir to blend)

6. Cover loosely and let the “must” ferment for a few weeks before performing the first “racking”*




**Racking is the process of siphoning off the liquid and leaving the dead yeast behind*

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The actual time for this initial fermentation will depend on your batch, conditions, etc. You can observe fermentation activity by peeking under the hood. When the vigorous initial fermentation has settled down to nary a bubble, it's time to conduct the first racking. For my most recent batch, that took three weeks.

My Favorite Recipe

7. After one month, rack liquid into glass carboys. You'll need two or three carboys for this recipe.


-  Fill right up to the neck of the carboy (you want to minimize air space/head space).
-  Add your spices (optional)
-  Place a fermentation valve on each carboy. The valve keeps air and bacteria from entering the carboy. If needed, add Campden tablets to maintain 50-75 parts per million (p.p.m.). One tablet per gallon.

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This is where a variable-top fermentation tank comes in handy. After each racking there is less and less liquid, and thus the head space becomes greater and greater as the level of liquid drops. Since your objective is to minimize head space, you only have two options with a fixed-top fermentation tank: you can add water to "top it off" (not good if you need to add more than a few pints); you can add mead from a previous batch; or you can add sterilized glass marbles to the tank to raise the level of the liquid.

My Favorite Recipe

8. Rack a total of 2-3 more times at 1-2 month intervals.

 Each racking further clears the mead. After the final racking, transfer the mead to sterilized wine bottles and cork tightly. Wait a day (to let gas escape), and then store bottles on their side. Remember, the longer the mead is aged, the better the wine.

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Waiting to drink the product is the hardest part of this adventure. One solution is to always start a new batch right after bottling a previous batch. In time, you will always have drinkable mead on hand while you wait for new batches to mature.

Wine Hobby Suppliers



Local Resource:

- Maltose Express, 887 Main Street, Monroe, CT
- Telephone: 203 452 7332



Search the web for “Wine Making Supplies”



I have used EC Kraus (www.eckraus.com)



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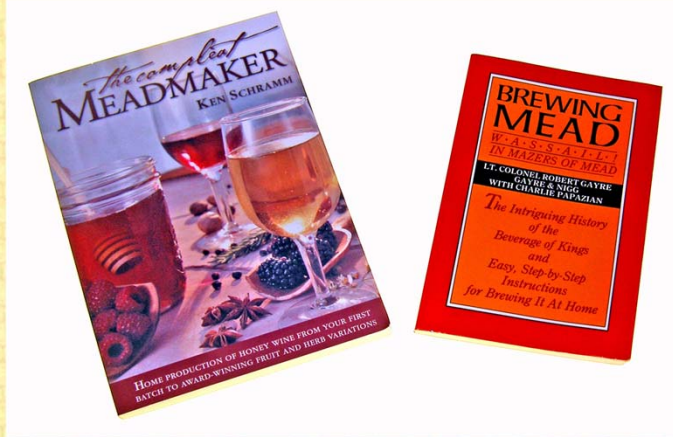
The prices and variety of products at Maltose Express in Monroe is respectable. On Saturdays the shop can get very busy, so this is not an ideal time to “pick the brain” of the shop keepers.

The online option (E.C. Kraus) has a much larger selection of supplies, but their prices are higher than the shop in Monroe. In their favor, Kraus does not charge for shipping (on larger orders), their service is excellent, and they are more than willing to answer questions on the phone or via email.

Good Reading



Both available at www.amazon.com



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There are a number of titles out there on Mead making. These are a couple of my favorites. The one on the left (*The Complete Meadmaker*) has the most detailed explanation of mead making and contains many recipes. The book on the right (*Brewing Mead*) is 80% about the history of mead, and 20% about how to make the product.

Another great information resource is on the web: www.gotmead.com. There is much free info and recipes, and even more if you sign up as a "member". Be sure to visit this site.

If you have questions following this workshop, or if you run into a problem during your mead making adventures, please feel free to call or email me. I'm no "master mead maker", but I have been playing around with this for 20 years and I am happy to share my ignorance.

Happy mead making!

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