Mead: It's the Bee's Knees!
By Lady Kassandra de Haas

What is mead?

Essentially, mead is wine made with honey, water, and yeast. However, there are many varieties of mead depending on what ingredients you use. See page two for a chart.

Where did mead come from?

Mead has been around for thousands of years and it is unclear exactly where it originated. We may never know though it is quite possible, it was discovered by accident. What we do know is that there have been finds all over the Mediterranean, Europe, Russia, and even Africa that show how popular mead has been throughout history.

How does brewing work?

The basic chemistry behind it is actually pretty simple. Yeast is a living creature and it feeds off of sugars. Honey, on its own, is not easy for yeast to eat, but when water is added, it gives the yeast room to move and populate. Essentially, yeast processes the honey in a similar way we do. Think of it this way: yeast burps out CO_2, pees out alcohol, and the "waste" settles to the bottom. When the alcohol content is high enough, the yeast goes dormant. There are a number of ways to artificially make yeast stop, such as adding sulfites, which can be handy if you have a particularly aggressive yeast, but is not a guarantee that the yeast will stop completely.

Just like any other living creature, there is a variety of different kinds of yeasts and each taste and behave differently. Some are more aggressive than others. Typically you will want to stick to wine yeasts, rather than beer yeasts. You can use beer yeasts, like Meridian Hive does, if you want a lower alcohol content and for faster turn around, however, you may end up with a beer flavor. This class focuses on the traditional brewing method using wine yeast. Sweet mead yeast is a wine yeast so you will have a higher alcohol content than beer, but it tends to be less aggressive than a champagne yeast for example, so they tend to produce sweeter results. The more aggressive the yeast, the drier your mead will be because they will have processed more of the sugar, which can also lead to a higher alcohol content. I like the White Labs Sweet Mead Yeast WLP720 which comes in a pouch and is already in liquid form, however you are more than welcome to use a powder yeast, such as Lalvin K1-V1116 . Make sure to follow the instructions on the yeast packet to ensure a healthy batch of yeast for brewing.

How sweet is mead?

That depends on several things but mostly how much honey per gallon of water and what kind of yeast you use. Here is a chart to make it easy.

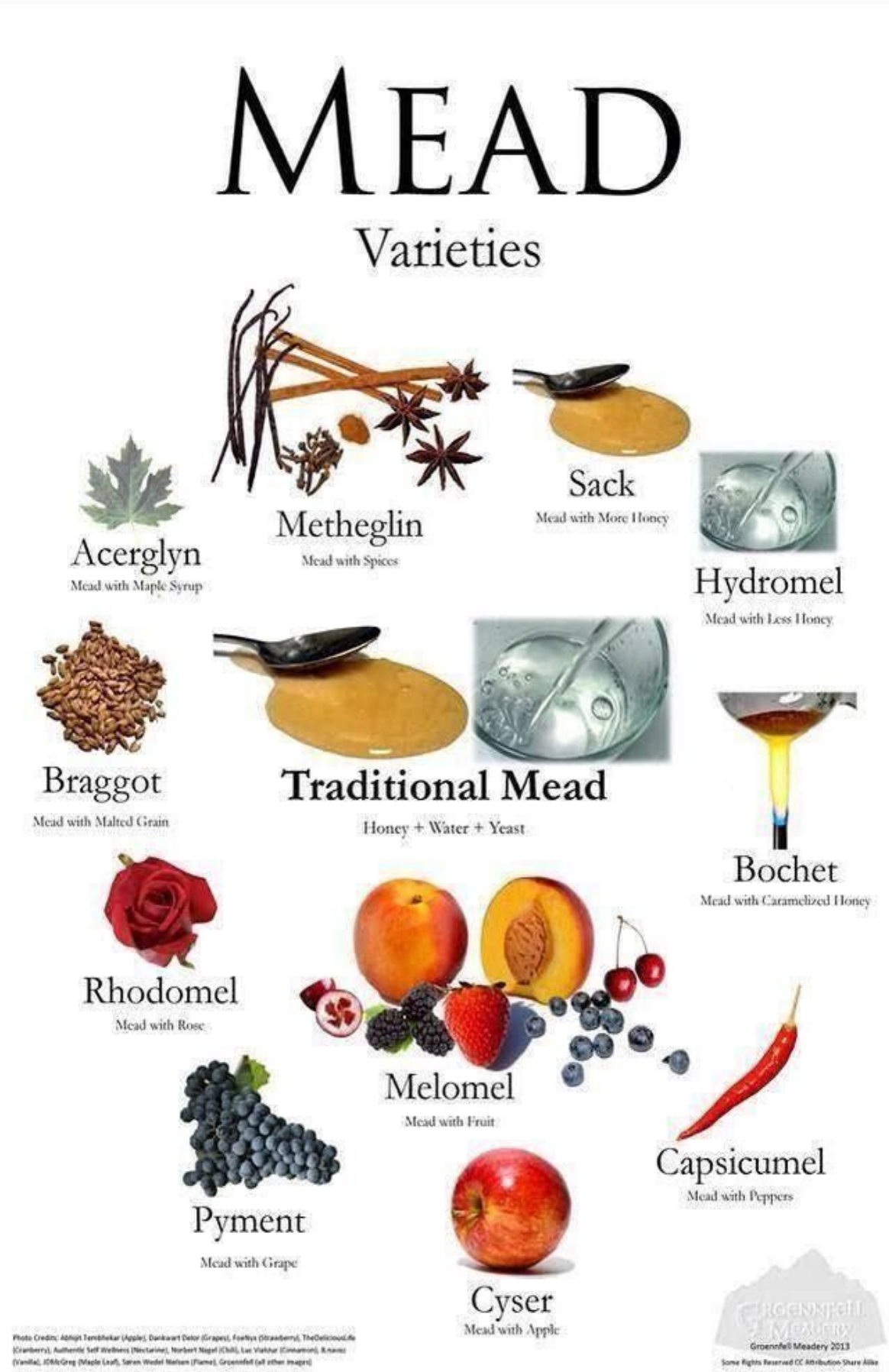
Amount of Honey in lbs./gallon of water

	1-2 lbs.	3-4 lbs.	5-6 lbs.	7+ lbs.
Sweet Mead Yeast	Dry Mead	Med. Sweet Mead	Very Sweet Mead	Syrup
Dry Mead Yeast	VeryDry Mead (paint thinner)	Dry Mead	Med. Sweet Mead	Sweet-Very Sweet Mead

What affects flavor?

Besides what kind of flavoring you choose, such as spices, fruits, juice, etc, nearly everything from what is in your water, to what kind of yeast and honey you use, can affect your flavor. Clover honey, the kind that is most easily accessible in bulk in stores, sometimes has a metallic flavor to it. Wildflower honey is what I suggest, however, you can use any honey you prefer. Check out your local apiaries and ask about their bulk pricing! Just like cooking, your mead will only be as good as the ingredients you use. My favorite is Goodflow Honey (512-472-6714) and they are located at 6001 Techni Center Dr, Austin, TX 78721. Make sure to call ahead if you need to buy in bulk.

For flavors, you can use spices, fruit, fruit juice, maple syrup, peppers, flowers, grains, etc. If you plan to use the whole fruit, I suggest cutting and freezing it first, removing as much pith and/or seeds as possible. Anything solid like fruit or spices, I suggest using a mesh or muslin brewing bag to make clean up easier.



Equipment:

Phase 1:

- Stockpot (20 quart or larger preferably Steel)
- 2 total: 6 gallon Food grade bucket (with a lid and a bunghole) and/or carboy
- Long Handled Stirring Spoon (plastic or steel)
- Airlock and bung
- Sanitizer (I use the 1 step no rinse powder)
- Thermometer (Brewing, Candy, or Laser)
- A dark, easy to clean place, preferably somewhere in the 68-80 degree range to store your brew while it ferments
- Notebook & pen
- Plastic bucket opener (if using brewing buckets or buying bulk honey in buckets)
- Large Funnel (if using carboys)

Phase 2 & 3:

- Dark colored bottles** or kegs
- Racking Set (cane, tube, and at least 4ft of tubing)
- Bottling wand or bucket

What is nice to have but not required:

Phase 1:

- Hydrometer & Cylinder (used to calculate alcohol content)
- Sweet Traditional Mead Pack or Yeast Nutrient
- Wort Chiller
- Aerator
- Mesh Brewing bag
- Thief (glass or plastic tube used to steal some mead from the batch)

Check Craig's List, Facebook, Offer up, garage sales, and thrift stores for

cheap brewing equipment. Clean well before use.

Basic Sweet Mead Recipe (5-6 gallons)

Ingredients:

- 18-20 lbs of honey (approx 1.5 -1.75 gallons liquid or crystallized) (feel free to add or subtract honey based on your preferences)
- 4 gallons of water (I use bottled distilled or spring water, but use what you have)
- 10 lbs of ice (if you do not have a wort chiller)
- Sweet Mead Yeast*
- Optional: Flavorant (spices, fruit, juice, etc)

*Note: If you plan to use a liquid yeast, pull out of the refrigerator at least 4 hours ahead of time to allow it to come to room temperature. If you are using a powder yeast, you will want to get it started 24 hours ahead of time. This is called making a slurry and instructions are usually on the back of the yeast packet.

Directions: Phase 1 - Starting Your Mead

1. Gather all your equipment and ingredients into a clean work space.
2. Make your sanitizing solution following the directions on the container in a clean sink or brewing bucket. I use the No Rinse Powder Sanitizer because it does not require rinsing and does not contain bleach. This has to be in contact with everything for at least 30 seconds. Usually I will use an extra bucket to make my sanitizing solution and keep all my tools in the bucket until I need them, replacing them in the bucket of sanitizing solution when I am done. However, you can use your sink in the same way previously mentioned or sanitize your bucket lid and lay it upside down on a clean and sanitized counter and lay everything else on top of it.
3. Sanitize your clean stockpot and bring 1-2 gallons of water to 185º. Make sure to leave enough space in the pot so that you can add at least another gallon and a half of honey and have some space to stir.
4. While you are waiting for your water to heat, you should sanitize the rest of your phase 1 equipment (see page 2), if you have not already. You can also use a spray mister to spray sanitize your equipment, Tandy makes a great one for leather dye that you can fill with sanitizer.
5. In your notebook, write down every detail of what you are using, such as what kind of yeast, honey, flavors, brand names, amount, etc. You can't duplicate a recipe if you don't know what you did! It is also good to notate how much you paid for your honey and other ingredients so you can track expenses over time, if that matters to you.
6. Check your water with a thermometer periodically or if you don't have a thermometer, wait until the water has formed bubbles and is visibly hot, but not boiling.
7. Once your water reaches 185º turn off the heat and carefully add your preferred honey.
8. Turn your heat back on and bring your temperature back to 185º, stirring frequently. This phase melts all your honey into the water, and is especially important if your honey has crystallized.
    a. If you are using raw honey, there may be some scum (made up of wax, bee parts, etc) that forms on the top, just skim it off with a spoon and discard.
9. This step is optional but recommended: Lower your heat and keep it at 185º for 20 minutes. This is the pasteurizing phase to kill off any bacteria, such as botulism. Honey is a natural antibacterial, but that is why honey bought in stores often come with a warning not to feed to children under 2 years old.
10. Once the honey has dissolved, turn off the heat. At this point we are ready to start cooling.
    a. If you have the Sweat Mead Nutrient pack, add it now and stir well. This contains all the yeast nutrients, acids, and tannins your mead will need to increase the chances it will kick off immediately and reduce the need to add more yeast. Again, this step is optional. Some people believe nutrient packs are necessary but I have had great success without them.
11. Cool your honey water mix, called must, to 70-80º. You can do this several different ways.
    a. For the purposes of this class, and for ease, I suggest pouring the must into a sanitized bucket and adding 8-10 lbs of ice, as well as enough juice (if using) and water to make it a full 5-6 gallons. 8 lbs of ice equals a gallon of water, so a 10 lb bag of ice is approximately 1.25 gallons. DO NOT USE ICE WITH A

GLASS CARBOY!

b. You could use a wort (beer term, for mead it is called a must) chiller which is pricier but works really well. Basically it is a coil of copper tubing used to run cold water through as much of the must as possible and works quickly. If you choose to use this method, you will place your very clean and sanitized wort chiller into the bucket or pot of hot must and run cold water through the lines. Make sure the wort chiller's hoses are well connected so no leaking occurs.

c. You can place the whole stockpot into a cold bath of ice water and wait for it to cool.

d. You can pour your must into your bucket or carboy, seal it, and wait 24 hours for it to reach room temperature.

e. TIP: If you are adding juice during this phase, partially or completely freeze it to help you with cooling down.

f. Keep in mind, you will need to adjust your juice/water ratio in the recipe to make sure you have enough total must if you choose not to use the ice method. Your total yield should be about 5-6 gallons, give or take a bit. The more water you have the less sweet your mead will be unless you added extra honey. See guide on page 1 for water to honey ratios.

12. Pour your must into your bucket/carboy and add your juice (if using), if you have not already. If you are using a carboy, use a large funnel to minimize messes. Make sure to leave some space in the bucket/carboy for bubbling. If you do not leave enough space, it could overflow and make a mess. If you leave too much space, your brew could oxidize and have an off flavor. Go for at least 75% full, at the minimum.
13. If your must is already between 70-80º, move on to the next step as you do not need to add extra air, the pouring process should aerate it enough. If not, wait and let it cool, then, using your spoon, or aerator, stir hard, for 3-5 minutes. This is your aeration process, which will help with fermentation. Note: Too much air in the carboy as a whole is a problem, but having air mixed into the must is a best practice.
14. If you are going to measure the alcohol content of your mead, you will need your hydrometer and its accompanying cylinder, which are usually sold together. Use your thief (tube used much like a straw to pick up a small amount of your must) if you have one (or use a sanitized cup), to fill the cylinder about ¾ full. Carefully drop the hydrometer into the cylinder and record the specific gravity (this should be at least 1.100) in your notebook or write it on the bucket/carboy itself.
15. Once your must is between 70-80º, pitch your yeast into the bucket/carboy. It should be about the same temperature as your must. If not, it can send the yeast into shock and it will not ferment correctly. All you have to do is add more yeast as the shocked yeast will just sink to the bottom. Do not add your yeast if the temperature of the must is any more than 85º or you will kill it.
16. Fit your empty airlock into the bung and squeeze it into place in the bunghole on your carboy, or if you are using a bucket, snap the bucket lid into place, then squeeze the empty airlock and bung into the bunghole.
17. Carry to your bucket/carboy to your prepared dark storage area. Your brew will be heavy, especially if you are using a glass carboy. Get help if you need it. Make sure your hands and the carboy/bucket are dry before moving it, to minimize slips. Make sure your fermentation area is easy to clean, just in case something goes awry. Plastic drop cloths stapled or taped to the wall can really help.
18. Fill your airlock to the marked line with either water or vodka.
    a. If you use vodka, be careful not to get any into your mead. It won't hurt it if a little gets in there, but a lot will freak the yeast out. I prefer vodka for a couple of reasons. First vodka kills pretty much everything so you know you won't end up with a weird bacteria getting into your mead from the airlock. Secondly, fruit flies. If you see fruit flies or other small sugar hungry bugs in your airlock, carefully remove it, dump it out, clean it and replace with more vodka. The can ruin your mead if they get to it.
19. Clean up your work space and wash all equipment for the next time. It is best not to leave your brew equipment sticky as it can attract pests.
20. Check on your mead after 24 hours. You should see your airlock bubbling as the CO_2 we previously mentioned escapes. This is why you do not want to seal it completely, as the CO_2 build up can cause a great big mess when

it pops.

   a. If you do NOT see any bubbling or popping, open the lid off your bucket or remove the airlock from your carboy, and aerate again! Check on it again in another 24 hours. If still nothing, go ahead and pitch another batch of yeast. It will not hurt your mead, you will just have more sediment on the bottom.

21. Leave your mead to ferment for at least 30-45 days. This process is called primary fermentation and this is when it will be its bubbliest. Check on it every 3-4 days to make sure your airlock still has water/vodka in it. Set calendar appointments if you have to. Dry airlocks can mean a ruined batch. Eventually, the bubbling will slow down and all of the excess waste will settle to the bottom of the bucket/carboy.

Phase 2: Day 30 - 45 - Secondary Fermentation

1. After 30-45 days, check on your mead. If it is still bubbling, give it more time and come back to it. If it is not bubbling, carry your bucket/carboy into your clean work space.
2. Sanitize your phase 2 equipment (see page 2) and your hydrometer and cylinder, and funnel if you are using a carboy.
3. Remove your bucket lid or the airlock and bung from your carboy, and, using your thief (or a sanitized cup), take another reading with your cylinder and hydrometer. Record this number along with your original gravity reading in your notebook. This is to check your alcohol by volume during the brewing process. See Phase 3 Step 9 for the formula to figure out where you currently stand.
4. Using your racking cane and hose, syphon the mead from the bucket/carboy into a second bucket/carboy. Be careful not to catch too much of the sediment off of the bottom. Typically I suggest using a clamp to hold the racking cane in place but you can hold it as well. Either way, hold it so that the bottom of the tube is about an inch above the sediment if you can see it, or about 2 inches from the bottom. Gauge as necessary once you get near the bottom, including tipping the bucket/carboy if needed to get as much of the clean mead out as you can. If the mead going through the racking cane is cloudy at all, you are too far into the sediment, back it up more until it runs clear.
5. Once you have drained the primary bucket/carboy, set it aside for cleaning. You can clean the yeast for reuse, or just rinse the bucket/carboy out completely. Yeast can make good plant food, so feel free to compost it.
6. This is the time to check the flavor and sweetness of the mead to see if you need to make any changes. Use your thief, or sanitized cup to steal some of the mead and taste it. There will still be a yeasty flavor to it, that's normal.
   a. Is it too dry? You can backsweeten with more honey or a juice concentrate which may kick up the yeast again. If you want to add sweetness but do not want to kick up the yeast as much, you can use non-fermentable sweeteners like Xylitol, Erythritol, Stevia, Splenda, Lactose, and Maltodextrin, however, keep in mind, especially if you intend to share or enter competitions, many of these give people migraines or headaches. Keep in mind that if you intend to add any fruit or juices to flavor, they will affect the sweetness, so you may want to hold off on back sweetening until after you've added your flavors.
   b. Is it too sweet? Add more water small amounts at a time until you are satisfied with the sweetness.
   c. Make sure to document any changes you make at this stage in your notebook.

7. If you want to make a plain mead, skip to step 7. If you choose to add flavoring such as fruit or spices, this is the time to add them. Juices can be added in primary fermentation (phase 1) but solids should wait until secondary fermentation to give it the most time for the flavors to meld. Best practices:
   a. Extremely strong flavors like cinnamon and clove, do not need to sit in the mead for long periods of time. Less is more, you can always add more later if it is not strong enough. You only need 1 or two cinnamon sticks and or 2-4 cloves for a 5-6 gallon batch.
   b. Be sure to remove any of the pith (bitter white part) of any citrus fruits or pomegranate. In all honesty, it is so much easier to use juice. You can use zest to add additional flavor, just make sure to wash the fruit thoroughly before adding.
   c. If you do use juice, make sure it is 100% juice. Concentrate is great too!
   d. Solid fruits should be washed thoroughly and frozen first to give you maximum flavor.
   e. It is easier to clean and will result in less sediment and cloudiness if you put all solids in a sanitized mesh bag, but is not required.
   f. Make sure to document any changes you make at this stage in your notebook.

8. Move your carboy/bucket back to your storage place and replace the airlock with vodka/water and bung. This is

called secondary fermentation and will stay here for the next 3-12 months, although it is drinkable after about 6 months, though the longer you wait to drink, the better it will taste.

a. Wait several days after adding your flavor, especially strong flavors, and using your sanitized thief (or sanitized cup) to try a taste of the mead. If it needs more flavor, leave it for a week or two and come back. If after several weeks, it still doesn't have enough flavor, consider adding more fruit, juice, or spice. You can keep adding flavor throughout the process until it gets to be where you want, but if you add too much, then you will have to dilute it with another batch of mead which will delay when you can drink your brew.
b. If you choose to, you can do a tertiary (third) fermentation for another 30-60 days if the flavors are not strong enough or if you need to remove more sediment.
    i. Keep tasting and altering, making notes of your changes, until you get your desired results.

9. Clean up your work space and wash all equipment for the next time. It is best not to leave your brew equipment sticky as it can attract pests.

Phase 3: 6 months - 1 year later - Storing!

1. Once you are done tweaking your mead, decide how you want to store it.
    a. Bottles offer smaller batch transport but can be harder to store for travel and have a higher cost in the long run. Great for around the house storage and gifting, and are easy to buy from brew stores.
        i. Beer Bottles must have flip top bale closures (like Grolsch bottles) or a lip on them (no screw caps. If you decide to use lipped beer bottles, you will need a capper and caps. If using the flip tops, I suggest buying new gaskets, even if the old ones look OK.
        ii. Wine bottles will require a corker and corks appropriate to the size of the bottle you are using. Synthetic corks are fine. Refer to Austin Home Brew or any other reputable site or store for help with sizing corks.
        iii. You can use recycled beer and wine bottles, however, you need to clean and sanitize these bottles thoroughly. Removing labels can be time consuming and difficult, but if you are willing to put in the time and effort, you can save quite a bit of money. You may need to invest in a bottle brush to ensure they are clean.
    b. Kegs are more expensive initially but are more compact and great for sharing at large gatherings or keeping around the house. Kegs are cheaper in the long run over multiple batches and are safer to transport.
2. For the purpose of this class, we are going to bottle. Sanitize your hydrometer and cylinder, bottling wand and/or bottling bucket, bottles, thief or cup, and whatever closure you are using (corks, caps, flip tops and gaskets). Some people suggest just running them through the dishwasher…this really isn't enough to sanitize properly and the last thing you want is a good bottle of mead to go bad because of sanitation issues. You are welcome to do so, especially if you are recycling bottles, however I still strongly suggest sanitizing them with solution as well. You could take the time and effort to thoroughly clean your dishwasher and if you know how much water your dishwasher uses, you could use a sanitizing solution in place of your detergent. While this is an option, it is still best to sanitize each bottle in a solution so you know for a fact that they are bacteria free.
    a. If you are not going to use a bottling wand, I suggest investing in a bottling bucket. It is the same kind of bucket as your primary fermenting bucket, with one exception. It has a spigot attached which is used to make bottling easier, however the bottling wand is much easier to control and makes less of a mess. You can also use a bottling wand and bottling bucket together to make the process even easier. Just connect the hose on the back of the bottling wand to the spigot on the bucket.
    b. When sanitizing your bottling bucket, make sure to open the spigot for at least 30 seconds and allow the solution to flow through to ensure a thorough sanitization. You can sanitize your bottling wand, hose, and bottling bucket at the same time this way.
3. Using your thief (or cup) withdraw enough mead to fill the cylinder ¾ full and carefully drop in your hydrometer. Take your last specific gravity reading which should be around 1.010 if you used a wine yeast but could be more or less.
4. If you are using a bottling bucket, syphon your mead into the bucket using your racking cane and hose. If you are

not using a bottling bucket, or if you used a bottling bucket for secondary or tertiary fermentation, skip this step.

5. You need to leave about 2 finger widths distance between the bottom of the cork or cap to the top of your mead, so that it gets some air, but not enough oxidize. If corking, hold your cork up to the bottle neck to see how deep it goes by aligning the top of the cork with the top of the bottle. Place two fingers below the bottom of the cork and take note of where on the bottle that distance from the top of the cork & bottle to the bottom edge of your second finger lies. If capping, measure two finger widths from the top of the bottle and take note.
6. Either by holding the empty, sanitized bottle up to the spigot on the bucket, or by connecting your bottling wand to the bottling bucket or racking cane, fill each bottle with mead up to the line you found in the previous step, stopping at two finger widths from the bottom of where the cork or cap will be.
    a. If you are using Grolsch or similar flip top bottles, the same two finger rule applies, however, once you are done filling, you can close the bottle immediately and are done when you run out of mead or don't have enough mead to fill a whole bottle. Skip to Step 8.
    b. If you are corking or bottling, set each bottle aside until all the mead is in bottles and move to the next step.
7. Once you have bottled your mead, you will need to seal the bottles.
    a. If you are corking, follow the instructions on your corker to close each bottle. There are several models and each are a bit different, but they all basically have you load the spring with a cork, settle it over the mouth of the bottle and press. This is easier if the cork is slightly wet, so I leave my corks in the sanitizing solution until I am ready to use them.
    b. If you are capping, follow the instructions on your capper to close each bottle. There are several models and each are a bit different, but they all basically have a magnet you attach the cap to, settle it over the mouth of the bottle and press.
8. Clean each bottle by wiping with a clean cloth or rinsing in a lukewarm or cold bath, and store in an easy to clean place for a month. It is possible, especially with back sweetening and fruit meads that the sugar content can kick start fermentation again and blow corks or break bottles. This can be prevented by:
    a. allowing plenty of time to finish the fermenting process (which is why I suggest a long secondary fermentation process)
    b. with a number of additives such as sulfites which available at home brew stores (not guaranteed and can cause headaches to some with sensitivities)
    c. by shocking the mead by storing it in the refrigerator for a day or so. Just don't shock it more than three times as it can affect flavors. Also, no guarantee it will kill the yeast.
    d. storing in a wine refrigerator constantly.
9. Calculate your alcohol by volume using this formula. $ABV = (\text{Starting SG} - \text{Final SG})/7.36$
10. Clean up your work space and wash all equipment for the next time. It is best not to leave your brew equipment sticky as it can attract pests.
11. Remember to label your bottles with your name, the name of your brew, all ingredients (especially if you added any artificial sweeteners, or sulfites), ABV, and the dates brewed and bottled, particularly if you are going to be entering them into competitions or sharing. This is good practice if you plan to share with a variety of people, some of whom may have allergies..

You are done! It's a lot of work but can be so worth it in the end. Great job!

Make sure to keep several bottles for a few years to see how much better they get with time. Like any good wine, mead is better with time.