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MEADMAKING

MODERN MEADMAKING

BY BRAD SMITH

Mead, which is a fermented beverage made from honey, is arguably one of the oldest alcoholic beverages. Vessels found in China dating back to 7000 BC have organic compounds consistent with fermented honey and rice. Mead was the revered "nectar of the gods" in ancient Greece and the "drink of kings" throughout history, though it has faded to obscurity in modern times.

For homebrewers, mead is a great addition to complement your other fermented offerings. Many of your guests may have never tasted a good quality mead or melomel (fruit mead), but almost everyone enjoys this sweet beverage. Using some modern methods, mead is also relatively easy and quick to make, and you can use equipment you already have on hand for homebrewing.

Photo courtesy of National Honey Board

MODERN MEADMAKING TECHNIQUES

When I started homebrewing back in 1987, the fermentation of mead was a very slow process, taking 12 to 18 months for a mead to fully ferment and age. Honey has antibacterial properties and is poor in nutrients, particularly nitrogen, resulting in a very slow fermentation.

Over the last 10–15 years, however, meadmakers have made significant advancements in speeding the fermentation and aging process through a combination of techniques and utilizing yeast nutrients. It is now possible to complete a primary fermentation in two weeks or less, even for a high-gravity mead. Some low-gravity meads can be enjoyed in as little as a month, and even high-gravity meads can be cleared and aged within three months, though many will continue to improve with age for years to come.

CREATING A MEAD RECIPE

For the first time meadmaker, I recommend making a straight honey mead, also called a show mead, as it highlights the flavor of the honey varietal itself.

The variety of honey and strength you use will largely determine the flavor of the finished mead. Honey varieties are determined by the blossoms the bees feed and pollinate. For example, I enjoy the flavor of orange blossom honey with fruit meads. Orange blossom honey is made from bees that pollinate orange trees, and this variety also makes a nice show mead. Another honey varietal I enjoy is Tupelo, which is made by bees that pollinate white (Ogeche) Tupelo trees in the swamps of the Southeastern US for two weeks every spring. Other varieties such as clover or wildflower can have more variation in flavor depending on where specifically the honey is harvested and the mix of flowers found near the beehives. There are at least 40 widely available honey varieties, and your local area or country may have additional variants.

In the US, a lot of honey production is still done by small, independent beekeepers. The National Honey Board runs a honey locator at http://honey.com/honey-locator that can help you find local honey in your area. In addition, many commercial vendors sell honey in bulk; 60-lb. (27-kg) pails typically offer the best price and volume for a serious meadmaker.

Once you have found a source for your honey, the next decision to make is how sweet you want to make your mead. The basic guidelines for straight mead is based on the final gravity, which is mainly a function of the original gravity and the alco-

hol tolerance of the yeast used. Dry mead is generally below 1.010 finishing gravity (FG), semi-sweet runs up to about 1.020 FG, and sweet can run into the 1.030s, though very sweet "sack" meads may be as sweet as 1.040.

RESIDUAL SWEETNESS

One critical point to understand when making any mead is the fermentability of honey and the concept of residual sweetness. Honey is composed of a variety of simple and complex sugar chains and will ferment to a dry finish much like grapes ferment into dry wine. The implications of this is that, in general, yeast will continue to ferment away almost 100% of the sugars in your mead, leaving a very dry beverage with a final gravity below 1.000. The dry mead won't taste much like sweet honey, as it has almost no remaining sugars.

If you want a semi-sweet or sweet finish to your mead you need to use one of two methods. The first is simply starting with an original gravity high enough to exceed the alcohol tolerance of the yeast. In this case, the yeast will ferment until it reaches its alcohol tolerance level and then stop and leave residual sweetness because the yeast itself can't tolerate the high alcohol environment. Wine yeasts used in mead generally have a high tolerance of 15% ABV or more, so this means starting with gravity that may be 1.100–1.150 to end up with meads in the 0.996–1.040 final gravity range.

The other option you have to make a semi-sweet or sweet mead is back sweetening. This method involves adding both sulfites and sorbates to inhibit fermentation after your mead is complete and then adding additional honey or sweeteners to bring it up to your target final gravity. Many mead purists avoid this method as the fresh honey added does not have the same flavor and finish as residual fermented honey added in the primary.

For large fruit meads, I've found that fruits high in acidity and tannins such as raspberries, blackberries, tart cherries, red and black currants, and cranberries work best as they provide the acidic/tannic structure to offset residual sweetness in the honey. Variants like loganberry, elderberry, and boysenberry also work well. Unfortunately, many sweet and stone fruits like peaches, strawberries, plums, etc... tend to ferment away leaving very little fruit flavor in the finished mead.

FRUIT MEADS (MELOMELS) AND ADDING SPICES

In order of preference, I always try to work with fresh, ripe, whole fruits first as they provide the biggest, freshest flavor impact. Fruit juices, particularly pure fruit with no preservatives can also work very well. I generally stay away from purees only because they are very difficult to separate from the mead resulting in quite a bit of loss. I prefer to add all of my fruit in the primary.

As with straight honey meads, fruit meads will generally ferment very dry finishing below 1.000 specific gravity (SG) unless you make the effort to introduce residual sweetness. I personally prefer to make a high-gravity mead and ferment it to its alcohol tolerance. Keep in mind that many big "fruit bomb" meads require additional residual sweetness to offset the acidity and tannins from the fruit and may therefore need an even higher finishing gravity than sweet meads. Many of my big fruit meads finish in the 1.030s and even 1.040s if using acidic fruits.

If you are making a mead with spices, it is often best to make the mead and then create an infusion or tea from spices and add them to taste to get the best balance of flavor.

For yeast, my go-to mead strain is Lalvin 71B Narbonne dry wine yeast, which many commercial meadmakers use exclusively for all of their meads. This yeast performs particularly well in fruit meads in part because it can process some malic acids common in fruit, and also it has a predictable attenuation of just over 15% which is important for reaching a target final gravity and residual sweetness level critical for these fruit meads.

PREPARATION OF INGREDIENTS

Many older meadmaking books and articles recommend heating your honey and fruit (if making a fruit mead), or heating the must. Today, the vast majority of meadmakers mix the honey and water at room temperature before pitching yeast.

I recommend using a large plastic fermenting bucket for primary fermentation, just as you would for homebrewing. You will need to degas the mead twice a day during the early stages of fermentation, and this is much easier in a bucket than a carboy.

For melomels with fruits like blackberries, raspberries, or currants, it is often best to freeze the fruit first, which will break down the cellular walls. I typically wash, dry, and then freeze the fruit on a cookie sheet. After the fruit is frozen you can bag it to prevent freezer burn if you are not using them immediately. When you're ready to make your mead, thaw the fruit. You will have much less waste in the fermenter if you bag the fruit in a large grain bag before adding it, just as you would for dry hopping. Bagging the fruit also makes it very easy to remove after a few weeks.

When mixing the mead to create your must, the critical point is to hit your target original gravity. With software or an online mead calculator you can calculate the amount of honey and water needed. I generally add the bulk of the honey and all the water and then slowly add the remaining honey until I reach my target gravity. When working with real fruit you can crush a bit of fruit to get juice and measure the gravity of the fruit juice to get an accurate number before mixing it. Keep in mind when you mix fruit in with the mead it will often come in a bit below your predicted gravity until the fruit dissolves into the must.

When measuring high gravity meads: Always use a hydrometer instead of a refractometer to measure the gravity. Refractometer equations used to adjust for fermenting beer or wine simply do not work well and you will get an inaccurate reading. A hydrometer, as long as it has a scale high enough for your starting gravity, will work well throughout fermentation.

YEAST PREPARATION

Because most meads have a very high starting gravity, yeast preparation is very important. If you try pitching dried yeast directly into a high gravity mead you can shock the yeast due to an effect called osmotic shock. The sugar will pass directly into the cell before the yeast is in a state to regulate its cell wall resulting in a strong shock that may even kill the yeast cell. To prevent this, dried yeast should be added to warm water at about 104 °F (40 °C) with Go-Ferm yeast nutrient at the manufacturer's recommended dosing rate of 1.25 grams of Go-Ferm per gram of yeast. Next, slowly bring the temperature of the mixture down to the temperature of your mead must by adding small quantities of must, making sure you don't change the temperature of the must more than 5-10 degrees °F (5 degrees °C) at a time. This gives the yeast the nutrients and time needed to adjust to the high gravity must before pitching.

If you are using liquid yeast, osmotic shock is much less of an issue, but I do recommend using a yeast starter as high gravity musts certainly benefit from a high yeast cell count and active yeast culture.

AERATION OF THE MUST

Proper aeration of the must when pitching is probably even more critical for a mead than a typical beer. Yeast will very quickly absorb the oxygen during the early growth stage, resulting in a robust fermentation. There are two methods for aerating your wort: Vigorous stirring, and direct oxygen injection.

Vigorous stirring is usually done with a wine-whip (degasser) device or paint stirrer driven by an electric drill, which you can find at most well-stocked homebrew and home winemaking suppliers. This is the same setup you will use over the next week or so to degas the must while it is fermenting. Stir the must at high speed with the wine-whip near the surface to get as much oxygen as possible into the must, and continue for at least one or two minutes.

If you have access to pure oxygen from an oxygen tank or small welding tank (make sure it is food-grade), then direct injection is the best option. I use an aeration wand for about two minutes with pure oxygen for a typical 5-gallon (19-L) batch of mead. White Labs also recommends a second injection of oxygen at the 12-hour point for high-gravity musts (above 1.080 SG).

Photo by Aaron Lee

MONITORING THE pH DURING FERMENTATION

When you prepare the mead must, the pH should be in roughly the 3.6-4.2 range. The pH of the must will often drop once fermentation enters an active phase. If the pH drops below 3.4 it can start to affect the speed of fermentation, and if your pH falls below 3.0 it can actually inhibit fermentation and also stress your yeast. As a result, monitor the pH of the must with a pH meter once a day during early fermentation to make sure it stays above 3.4.

Monitoring pH is particularly important if you are using a large portion of acidic or tannic fruits. Fruits such as black currants and cranberries have a pH as low as 2.4 and can significantly lower the pH of the must, inhibiting fermentation. Straight honey meads are less likely to reach very low pH levels, but I still monitor them just to be sure.

If your pH drops too low, you will need an alkaline additive to raise the pH back above 3.4. My preferred additive is potassium bicarbonate, which comes in a powdered form. Since it is difficult to predict the buffering capacity of the must, the best approach is to add a little at a time. I generally mix in ½- to 1-tsp. increments (into a 5-gallon/19-L batch) and then wait an hour or two for the chemistry to settle before measuring and adding more if needed.

In the later stages of fermentation the pH will often slowly rise, and at that point you will not need any additional additives and can stop monitoring the pH daily.

DEGASSING THE MUST DURING FERMENTATION

As the mead ferments it builds up a lot of carbon dioxide. Much of the carbon dioxide will end up in solution within the must as carbonic acid, which can actually inhibit fermentation. To promote rapid fermentation, meadmakers now "degas" the must twice a day during active fermentation.

To degas the must, I use a simple wine whip and electric drill as discussed earlier. Vigorous degassing running a cordless drill at high speed to get all of the CO_2 out of solution can result in a huge amount of foam

on the top of bucket, which is why I recommend using an oversize 8-10 gal (30-40 L) bucket, even if you are making a 5-gallon (19-L) batch.

There is some controversy over whether it is good to add additional oxygen by splashing at this point. Some meadmakers say that the additional oxygen will be metabolized by the yeast to promote fermentation. The counterpoint is that fruits, in particular, are prone to oxidation so adding free oxygen may not be a good idea after fermentation has progressed. While I don't have the final answer, I generally avoid splashing too much when working with large quantities of fruit and focus on degassing instead.

Most sources recommend you continue degassing until about $^2/_3$ of the sugar has fermented away. This means that when you get $^2/_3$ of the way to your expected final gravity you stop degassing, though I will often degas one final time after fermentation is entirely complete because I prefer still meads (no spritz).

STAGGERED YEAST NUTRIENTS

The addition of staggered yeast nutrients — small nutrient additions added during fermentation — literally revolutionized meadmaking over the last 15 years by allowing meadmakers to make mead in months instead of years. A variety of nutrients have been used in that time, though most provide critical nitrogen needed to promote a rapid fermentation of the honey.

The current "state of the art" nutrient schedule is called TONSA-2 (Tailored Organic Staggered Nutrient Addition) and uses Fermaid O, an organic yeast nutrient, along with the Go-Ferm addition discussed earlier in the section on hydrating yeast. Go-Ferm is added when hydrating the yeast, and then Fermaid O is added in equal size increments at 24, 48, and 72 hours after pitching, and lastly at either one week or when the $^2/_3$ sugar break is complete. In my experience, this combination can result in a complete fermentation even for a high gravity mead in as little as two weeks.

I covered the Go-Ferm addition for hydrating yeast earlier, but the Fermaid O amount is governed by the nitrogen requirements of the yeast, original gravity of the must and batch size. The formula for grams of Fermaid O is:

Fermaid O = BS x YR x Brix / 5

BS = Batch size in gallons
YR = Yeast requirements. This is 0.75 for low nitrogen, 0.90 for medium, and 1.25 for high nitrogen strains.

For practical purposes Brix and Plato are the same, so for example a big 1.140 SG show mead would be 32.2 Brix/Plato. My go-to yeast, Lalvin 71B/Narbonne, is a low-nutrient strain and I generally make 5 gallons (19 L) of mead at a time. So, running the numbers I have, the equation is:

5 gal. x 0.75 x 32.2 / 5 = 24.1 grams

So my total Fermaid O requirement would be 24.1 grams, which I would then divide into four additions of 6 grams each.

For big fruit meads, only half the amount of nutrient is often needed because the fruit itself may have a substantial contribution of nutrients. For more information on this method, Google "TONSA 2 Mead" and you can find the original source article as well as online calculators to assist in determining your of nutrients addition requirements.

The other popular nutrient schedule for mead is called TiNOSA (Tailored Inorganic Staggered Nutrient Additions). It follows a similar schedule but uses Fermaid K in the place of Fermaid O, as Fermaid K is generally easier to find and less expensive than Fermaid O. Finally there are several older nutrient schedules that use either Diammonium Phosphate (DAP) or a combination of DAP and Fermaid O. These are still in wide use including by some commercial meadmakers and you can find details for either using a quick web search.

CLEARING AND FINISHING YOUR MEAD

If you've handled the yeast nutrients and degassing properly to this point, your mead should usually ferment to completion within the first two to three weeks. I've done a few very high-gravity meads that have taken a bit longer, and it is not a bad idea to let the mead sit for a month or so before adding clarifying agents and sulfites.

When working with fruit and certain yeast strains like 71B Narbonne, I generally try to separate the fruit and primary yeast from the mead as I get close to completion of primary fermentation. Depending on how much sediment accumulates, I may rack it again before attempting to clear it. While a bucket works well for active fermentation, I recommend racking to a closed glass or plastic carboy with an airlock for aging as many meads are still subject to oxidation.

The mead will not clear until fermentation is 100% complete. My personal choice for clearing a mead is Super Kleer KC Finings, which is a two-part clearing agent consisting of kieselsol and chitosan. If you have access to refrigeration, you can cold crash your mead, which will certainly clear it more quickly.

Once I'm certain my mead is 100% fermented, I also add a small quantity ($^1/_8$ to $^1/_4$ tsp.) of potassium metabisulfite (sulfite), which is a preservative. These sulfites help to stabilize the mead and also aid in preventing oxidation during aging. You can also add potassium sorbate if you plan to back sweeten your mead with additional honey or sugars.

After you've added your clarity agents and sulfites, it mainly is a waiting game while the mead ages and clears. Your mead, which may taste something like rocket fuel immediately after fermentation, will mellow significantly over time. Most meads I've made are quite drinkable within 90 days, though a few with very tannic/acidic fruits took a bit longer to age out. I generally keg my mead at low pressure without carbonation, though you can certainly bottle it, or even carbonate it if desired. BYO

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SINGLE-VARIETAL MEADMAKING

BY MICHAEL FAIRBROTHER

In its simplest form mead is a fermented beverage made from honey and water. The key to making fantastic meads is your honey, so don't think of honey as a generic ingredient — it's so much more.

Honey is a complex mixture of sugars, flavors from the pollen as well as trace enzymes, minerals, vitamins, and amino acids. The majority of the honey found in grocery stores is Wildflower honey, which is a blend of different honeys made with the goal of producing honey that is consistent in flavor and color. This type of honey is not the same as the Wildflower (or other varietal) honey you can find from a local beekeeper, which isn't likely to be a blend, and will differ based on time of year harvested, rainfall, and the types of flowers the bees visit. Store-bought honey is fantastic for making melomel (meads made with the addition of fruit); however I highly recommend using a single varietal honey, which is a type of honey derived predominantly from the nectar of one flower, for making traditional meads.

Photos by Charles A. Parker/Images Plus

VARIETAL HONEY

Bees are efficient; they fly to the closest flower sources possible looking for nectar. So when a beekeeper places a hive in a given field and harvests the honey after the bloom, the result is that flower's varietal honey. The color, flavor, and even aroma of a particular variety of honey may differ depending on the nectar source of flowers visited by the honeybees. The colors may range from nearly colorless to dark brown, the flavor may vary from delectably mild to distinctively bold, and even the aroma of the honey may be mildly reminiscent of the flower.

There are more than 300 unique types of honey available in the United States alone, each originating from a different floral source. As a general rule, the flavor of lighter colored honeys is milder, and the flavor of darker colored honeys is stronger. Varietal honeys can be compared to varietal wine in terms of annual climactic changes. The same flower blooming in the same location may produce slightly different nectar from year-to-year depending upon temperature and rainfall (bees don't go out looking for nectar when it's raining). To locate specific varietals of honey available near you, try visiting the National Honey Board's Honey Locator website, http://www.honeylocator.com

MAKING VARIETAL MEAD

Other than the honey, the other key elements to making a good single-varietal mead (or any mead for that matter) are water, nutrients, yeast, and yeast health.

Water is as critical as the honey selection, using spring water or other water that is free of chlorine and bacteria is essential. If you have very hard water consider diluting a percentage of your water with distilled or reverse osmosis (RO) water.

As with brewing, the yeast you use will make all the difference to the mead you make. I would avoid using Champagne yeast as it tends to dry out the mead too much. My go-to yeast strain for mead making is Lalvin Narbonne 71B-1122 dry yeast, which I use commercially for everything we make at Moonlight Meadery in Londonderry, New Hampshire. As a home mead maker I have also had success with Lalvin ICV D-47 dry yeast. You

also have many good choices on mead yeast from White Labs, and Wyeast, including White Labs WLP720 (Sweet Mead/Wine Yeast) and Wyeast 4184 (Sweet Mead) or 4632 (Dry Mead).

Healthy yeast and temperature control are essential for running a clean mead fermentation with less chance of off-flavors or the production of higher alcohols (fusels). Honey does not have the same amount of yeast assumable nitrogen (YAN) as you would find in malt or fruit, which is important as the yeast needs this to stay viable throughout fermentation. When making mead, it is also essential to add the yeast nutrients over the course of several days. This process can be as simple as taking the total amount of nutrients needed for the batch and dividing into four parts, adding one portion of nutrients every 24 hours until they are gone. This process is known as "staggered nutrient additions" and provides the key nutrients to the yeast cells during their growth phase. Think of it as giving the new generations of yeast what they need when they need it. I also use a slightly different method at the meadery, which is a little simpler (and good for making multiple large batches), where I add the last nutrient addition at the 72-hour mark, instead of at 30% depletion of sugar. As you become a more experienced meadmaker, you can experiment with nutrient additions to find what works best for you.

I prefer to use Fermaid K (yeast energizer) and Go-Ferm (an organic yeast nutrient) for adding the additional nutrient requirements of the yeast during mead fermentation. An alternative to Go-Ferm is diammonium phosphate (DAP). All of these nutrients should be available at your local homebrew or home winemaking supplier. The choice of what to use is up to the mead maker; as long as the yeast have nitrogen and oxygen they will continue in the growth phase. Once the yeast cells have grown, get out of the way and let them do what they do best — ferment sugar into ethanol.

Tip: When adding yeast nutrients to your must (unfermented mead) you want to start off by pulling a 1/2 cup of the must, mix the nutrient blend, then SLOWLY add it back to the fermenter. Once the nutrients are added then begin to slowly stir the must to release the main portion of the CO_2 gas. After the foaming subsides you can begin to stir more vigorously. Mix the must well enough to introduce plenty of oxygen into the fermenting must.

MEAD METHODOLOGY

Most of the traditional mead recipes that I make, especially when making a varietal mead, follow this ratio: 1 part honey, 3 parts water. Using that ratio, it's easy to scale down or up a batch as needed. This should get you in the range of a 1.120 starting gravity (SG). In a recent mead experiment I sourced 3 lbs. (1.4 kg) of 60 different types of honey, added 1.5 quarts (~1.5 L) of water, and made several different varietal meads. An experiment like this is a good way to put all those 1-gallon (3.8-L) growlers you have collected to work as mini-fermenters, as single varietal honey is expensive. It's also a great way to make sample batches of mead with different varietals of honey to find the ones you like. In my base recipe on page 22, find the honey you like best and follow the directions to make a full 5 gallons (19 L).

For a "regular" sized batch (5 gallons/19 L) of mead, you will need (at minimum): A 6-gallon (23-L) food-grade fermenter with a lid and airlock (what you use to brew beer is fine), a 5-gallon (19-L) secondary fermenter (a glass or PET carboy), 15 lbs. (6.8 kg) of a varietal honey, at I said earlier about water), yeast nutrients, your chosen yeast, a calibrated hydrometer setup, a siphon, and of course your cleaning and sanitizing agents of choice. The meadmaking process is more akin to making wine than beer — no boiling – so you can leave your brewpot to the side for this project.

VIVA VARIETAL

The complexity of making single varietal mead is much like making fine wine — choose a good honey source and keep the meadmaking simple to let the honey character shine through. Source the best, most interesting honeys and with a clean fermentation, the proper nutrients, cleanliness and patience, you can make a world-class mead that will express the nuances of your honey.

VARIETAL HONEY CHOICES

Some of the honey varietals that I like to use for meadmaking include: Tupelo, Orange Blossom, Star Thistle, Cranberry, Almond, Brazilian Peppercorn, and Arizona Pecan Blossom. As with many ingredients, the more honey you buy the better the price break you can negotiate, even on a small scale. You can expect to pay more than $8 per pound for honey. I purchase the majority of the honey for Moonlight Meadery from Dutch Gold in Pennsylvania and they have been very helpful to us as we have grown.

I am not a fan of Buckwheat or Pumpkin Blossom honey, and I also can't say that I am overly thrilled with Heather Blossom honey either. These varietals of honey tend to taste extremely earthy when they are fermented. I have customers at the meadery who absolutely adore that earthiness, but for me it's a bit challenging — it's really up to you as a mead maker to decide what you like and then use it.

Here is a list of some of the most common honey varietals you may be able to buy near where you live, and my thoughts on using them for mead making:

Alfalfa: A white or extra light amber-colored honey. It has a mild flavor and aroma that is reminiscent of beeswax. It's OK for meads, but not extremely popular.

Almond: A great candidate for making into mead. It is light in aroma and its flavor has a slight nuttiness. Almond honey is one of our meadery's most requested single-varietal meads, and also my mother's personal favorite.

Arizona Wild Mountain Pecan Blossom: This is a deep, dark honey with lots of malt-like character, which may appeal to homebrewers. It ferments into a wonderfully rich mead that will have the color of a brown ale and taste distinctive and delicious.

Avocado: This honey is dark amber in color with notes of caramelized molasses. It is a robust flavored honey with a little bit of nut character.

Blackberry: A light colored honey that finishes with a nice floral note. It is excellent for making into mead and leaves a hint of the berry note.

Basswood: A very light colored honey, identified as water white. Basswood is fantastic for making meads and has an herbal note with a clean finish.

Blueberry: The aroma of Blueberry honey is reminiscent of green leaves with a light citrus note. The honey has a moderately fruity flavor that finishes with a light buttery note. It is well suited for making into mead.

Buckwheat: A very dark honey, which when raw tastes like a cross between molasses and malt. When it is fermented out in a mead . . . well that's another story; it is (how do I put this) very pungent and dominated with earthy notes. I personally find the aromas overwhelming in a mead, but some people like it.

Cranberry: The color of Cranberry honey is medium to dark amber, with a slight red tint. Berry notes are also evident. It has a deep complexity when fermented out, and the berry notes fade a bit, but it is quite delicious in a mead.

Orange Blossom: Put this varietal in your "must make mead with" list. Orange Blossom has strong citrus notes that are fantastic in mead. It is very light in color and has a citrus-like character. I prefer to make Orange Blossom honey into a semi-sweet mead.

Raspberry: Another very light honey that works great in meads. There are not as many berry notes in Raspberry as Blackberry honey, but it is light and it finishes clean with little need for acidity adjustments.

Star Thistle: Light to extra light amber in color, with the slightest greenish cast. It has some anise notes in aroma and flavor, and it makes for a wonderful mead.

Tupelo: Light amber in color, with a complex floral, herbal note. When fermented, Tupelo has a spicy finish that is very distinctive. Tupelo is extremely expensive honey that is very difficult to come by in large quantities, however. BYO

Michael Fairbrother began making mead in 1995 and opened Moonlight Meadery in Londonderry, New Hampshire in 2010. He helped develop and has taught the meadmaking course at The Honey and Pollination Center at the Robert Mondavi Institute at-UC Davis and is a past President of the American Mead Makers Association.

SESSION MEADS

BY JASON PHELPS

There is not currently a standard definition for session mead; the very use of the term itself is a matter of some dispute, depending on who you talk to. However, based on the commercial meads available in the market bearing this designation there are a couple of things one can expect from a session mead. First, session meads have an alcohol level that is typically 50% or less of their stronger siblings — generally coming in between 6–8.5% ABV, making them much lighter in body and texture than dessert-style meads.

Secondly, session meads also tend be quite a bit drier in comparison to dessert meads, and many are objectively dry, meaning they have no residual sugar. Session meads are offered in a broad range of flavors, and with each new release it seems there is no limit to the ingredients and creativity being brought to bear, however the dryness is a common thread tying them together.

The final key aspect of session meads is that they are packaged as a carbonated beverage. For me personally, the carbonation in session meads is what brings them together and makes them such an appealing beverage. The lower alcohol, drier finish, and range of flavors are wrapped up nicely with the crisp, prickly texture of CO_2 bubbles.

Another term that readers may see used to describe what I have defined as a session mead is hydromel. This term is most often used in competition settings, or by those who have mead judging experience. Specifically, hydromel is used to categorize meads that are less than 7.5% ABV from those that are stronger.

Now that we have a working definition of session mead, let's consider why we would make one. Of course we don't really need a reason to make a session mead any more than we need a reason to make mead in the first place, but there are some genuine motivations for the production of session meads that are worth discussing. Maybe most conspicuously, the lower amount of alcohol in a session mead changes how one can approach consuming it. This characteristic opens up the possibility of casual consumption by the glass and over a longer period without the downside of intoxication.

Photos by Charles A. Parker/Images Plus

The overall lighter profile, dryness, and carbonation of session meads can also make them even more food-friendly than other styles of mead, another great motivation for making your own session mead or seeking out commercial versions.

SENSORY ANALYSIS OF SESSION MEADS

The aromas of traditional (unflavored) session meads will be subtle in comparison to dessert meads, but despite that, it would not be unexpected that you might describe a session mead as floral, fruity, herbal, earthy, or in other terms similar to ones used for the base honey itself. Once you add flavors it should be assumed that the additions will be obvious and may in fact be more perceptible than the honey. While balance is the goal for well crafted beverages, it is also practical to expect that a strawberry session mead will be strawberries first in the nose with honey providing background notes.

Dry, unflavored session meads will follow the flavors of the base honey, which can span quite a range. A recent batch I made was from a base of clover and mesquite honeys, which made it grassy, minty, and slightly fruity. When it was fermented dry it was mostly grassy, almost grain-like, with hints of mint and fruit. I've also found that wildflower honeys make a great start for session meads. After fermentation, these meads typically end up with subtle notes of flowers and fruit, but can be quite bland. Additions of fruits and/or spices will then bring everything together.

Session meads are typically light in body, but unless they are very low ABV (<5%) they shouldn't taste outright watery. Until a session mead is carbonated the light body is really obvious and can underwhelm. The addition of carbonation brightens up the aromas and flavors and adds a

fanciful texture.

INGREDIENTS

Ingredient selection for session meads is not fundamentally different than that for any other mead, but the volume of honey and fruits used will be significantly less than for dessert meads, which does pose a couple potential challenges.

For session meads the starting and final gravities are much lower, which means we aren't putting a lot in the must and we will be fermenting all of the sugars that we do include out to dryness.

With this first challenge in mind there are a couple different approaches that can be taken to produce a delicious session mead. At the 2017 Mazer Cup I caught up with Joey Zumalt from Kaw Point Meadery in Kansas City and asked him what his preferred method of creating session mead bases was. He suggested using a good all-around honey, like clover, orange blossom, or wildflower, fermenting it dry and then using fruits and specialty honeys to add aromas, flavors, and textures to the stable mead. I've employed this approach several times with great success. Used this way the base honeys don't necessarily need to be unique or specifically characterful because you are going to layer additional flavors on top.

Another approach would be to select a varietal honey that is more characterful and ferment it dry with the expectation that the more unique attributes of the honey will show through in the finished product. This decision would be most applicable for session meads with no added ingredients or lightly spiced versions. For this method, honey varietals like blackberry and raspberry would provide much more resulting character in a session mead base. A honey like buckwheat would also work this way, but buckwheat honey can sometimes have an overwhelming character (barnyard & urea), which makes for a great example of understanding your ingredients before starting a new project.

A third method would be to ferment a strong mead and then dilute it to the target volume after stabilization. I have employed this process several times, but not enough to truly be able to suggest how to decide when it would be best used. I have observed that meads with primary additions like tea, hibiscus, and other spices might work better this way.

Like any other style of mead, the addition of fruits and/or spices is a choice that a meadmaker has in their toolbox. Session meads with additions of fruits and spices can be really fantastic. Just imagine an ice cold, light bodied, and carbonated mead with flavors of strawberry and lemon on a hot day. The application of fruit and/or spices in session meads is similar to that of other meads, but bear in mind that you won't need as much because the base mead is so much lighter. Almost any fruit can be used to flavor session meads, and combinations like berries and lemon, peach and ginger, or orange and vanilla can create even more interesting results.

YEAST SELECTION

Yeast selection for the fermentation of session meads is pretty straightforward. The potential alcohol of a fermented session mead is low enough for most yeasts to reliably complete the process. Without the alcohol toxicity of the yeast to consider you are left with temperature, nutritional requirements, and any special attributes a yeast might typically impart to make the decision. Mixed strain fermentations are another area that meadmakers are working in, but that is a topic for another article.

There are several yeast strains that I use to ferment mead. Let me share a bit about my "house strains," if you will.

LALVIN 71B-1122 is a great all around yeast for me. It has a lower alcohol toxicity, typically around 14.5% ABV, and ferments clean at cooler temperatures. I typically employ it at 62–64 °F (17–18 °C), and have noticed once you get down to 58–60 °F (14–16 °C) it will be very slow or may actually stall. It does have higher ability to metabolize malic acid than other wine yeasts, and it can extract more esters and phenols from meads/wine musts so it is favorably viewed as a yeast that will soften the profile, reducing the time required for aging.

SAFALE US-05 is an ale yeast, but it also works very well on mead fermentations. US-05 will ferment well, but slowly, below 60 °F (16 °C), but I've found it works best at 62–64 °F (17–18 °C) without the production of unwanted esters, phenolics, or fusel alcohols. Known for its neutral profile, US-05 won't typically impart any of its own character at cooler temperatures, allowing for the honey and other ingredients to show through. There is no reliable alcohol toxicity data for US-05, but my experience has shown that 13–14% potential alcohol would not be unexpected.

Champagne yeasts are very common recommendations for mead fermentations. I feel this is very bad advice, especially for new meadmakers. These yeasts are powerhouses with high alcohol tolerances and the propensity to create lots of fusels and higher alcohols, even at relatively cool temperatures. Unless you are truly doing a high-gravity fermentation, above 1.160 for example, and still want to retain 5% or more residual sugar, I don't recommend these yeast strains for session meads.

Yeast selection does have an impact on the final product, and some yeasts and yeast management techniques can also help with the perception of body. Some yeast strains and fermentation conditions can produce more glycerol, an odorless sugar alcohol that tastes sweet and is perceived to be smoother and fuller than ethanol. Lalvin 71B-1122 is on the high end of the glycerol production scale, one reason it is a popular choice for winemakers.

RESIDUAL SUGARS

Because we aren't using a lot of fermentables and aren't leaving much, if any, residual sugars as an immediate result of fermentation, session meads are typically much lighter in body than stronger, sweeter beverages. Practically, this should be the obvious and expected outcome, but I've heard meadmakers lament the lack of body in lighter meads more than I expect-

After adding a re-hydration agent to water at 110 °F (43 °C), add dried yeast to the mixture when the temperature drops to 104 °F (40 °C) or below to allow it to re-hydrate and start to bloom. Then add a little honey or must 10 minutes later.

ed. Adding sugars to dramatically increase the body of a finished session mead won't create a balanced, enjoyable mead. Session meads shouldn't be watery and thin, but they could easily seem that way when compared to another style. So what do we do to retain body in our session meads?

Lighter, carbonated meads really only taste balanced with residual sugar up to around 5%. After that the carbonation struggles to balance the density of the sugar and keep the mead bright. Ideally, I find that 2–3% residual sugar is a nice sweet spot (pun intended) where balance is easy to achieve, especially in fruited meads where the tartness and acidity of the fruit needs a bit of buffering, but the sugar helps express the flavors of the fruit. When I back-sweeten a mead after fermentation I will typically use honey, fruit juices/purees or other sugars like agave nectar.

ENZYMES

There are also winemaking enzymes that are worth considering for the production of mead. I've experimented with both of the winemaking enzymes Opti-White and Opti-Red from Scott Labs and found that they can improve the overall profile of a mead similarly as they are used for the production of wine. Both of these additives most noticeably create smoother outcomes, but will also enhance the body, and when it comes to session meads and a pursuit of more body or the perception of it, a little more smoothness can go a long way. I would recommend the application of these two products in different musts based on their contents, where Opti-Red will be best suited for red/dark fruit meads and Opti-White more suited for pale fruited or traditional session meads.

Now that we've reviewed potential ingredients and how they might influence the outcome of a session mead, let's dig into how to use these ingredients to make them.

MAKING SESSION MEADS

Making a session mead is not much different than any other kind of mead, but with a lower starting gravity the fermentation of session meads will typically be much shorter (a week to ten days) than a stronger beverage. Session meads should be made using techniques typical to other mead styles, including yeast re-hydration, aeration, degassing, staggered nutrition, and stabilization (learn more about these techniques at: https://winemakermag.com/story1624). Because the typical session mead fermentation will be shorter it is extremely important to be prepared to manage these processes in a compressed timeframe.

Building up your mead must is a pretty straightforward activity. Using a large-mouth carboy or plastic bucket, measure out the honey and any fruit juices you wish to use. In order to achieve approximately 6.5% ABV from a dry ferment I have been using 1.4 pounds of honey to each gallon (~170 g of honey per L) of initial volume. Add some hot tap water (just enough to get the honey liquefied after mixing) and mix up the ingredients. Once mixed, top off to your target volume with cool tap water.

Leave space if you are adding whole fruit in primary, and also consider that for every ten pounds (4.5 kg) of whole fruit you are adding about 1 gallon (4 L) of water, which should be factored into your starting volume. For most of my session mead recipes I prefer to use my fruit in secondary. I do this because I want to retain all

the aromas, flavors, sugars, and acids of fresh fruit or juice in the finished product. There is no right or wrong answer, and experimenting with different techniques is the best way to find a process that works best for you.

At this point you have a must ready to ferment. Preparation of the yeast is up next, and after pitching the yeast you will want to get your fermentation vessel closed up and sealed with an airlock.

Yeast preparation for any type of fermentation is one of the key steps that should be taken to guarantee a successful outcome. There are many techniques documented in books and on the Internet, but after nearly 15 years of fermentation experience I have standardized around the use of a yeast re-hydration agent and a short re-hydration process prior to pitching. When using a yeast re-hydration agent it is recommended practice to follow the usage guidelines for optimal results. The simple process, also covered in step-by-step detail at the earlier link, is to warm water to 110 °F (43 °C) and add your re-hydration agent and stir. Once the temperature comes down to 104 °F (40 °C) or below, the yeast is added and allowed to hydrate and start to bloom. After 10 minutes I typically also stir a small amount of honey or my prepared must into this solution to give the yeast something to eat. You should see obvious activity in about 20 minutes after adding the yeast.

Yeast amounts vary from one meadmaker to the next, but in the last couple years I have arrived at a typical regimen based on the gravity and volume of the mead working under the "yeast is cheap" mantra. For session meads I will use 2–3 grams of yeast per gallon (4 L). I acknowledge that these amounts may exceed the 5- to 11.5-gram sachet sizes commonly sold at homebrew shops and recommended for 5–6 gallon (19–23 L) batches. Think of it this way, the yeast you add are the workers who will get the job done. Making sure you have enough workers and that they are well fed will definitely have a positive impact on the outcome.

Now that you've prepared and pitched your yeast, you should expect to see an active fermentation in anywhere from a couple of hours up to a day. I typically see the onset of fermentation in 4-6 hours. Once fermentation begins, it's time to focus on degassing and nutrition. There are a number of common protocols for mead fermentation nutrition, and for the most part you will find success with any of them that employ a staggered nutrient addition method. The calculation of the amounts of nutrient and timing of additions will be based on gravity, volume, and the pace of fermentation.

During the fall and winter months in my home state of New Hampshire is when I tend to do the majority of my fermentation. This is both because the ambient temperature in my house is in the low 60s °F (~17 °C), which is great for fermenting in containers without any other temperature control, but also because our three season porch, which hovers in the low 30s °F (~0 °C), makes for a great place to cold crash finished meads. I use cold crashing to speed the flocculation of yeast and precipitation of sediment prior to stabilizing the mead. In the warmer months I use a temperature controlled refrigerator to ferment and cold crash, but that doesn't provide nearly enough space to have many projects going on concurrently as I am known to do.

Once a cold crashed mead looks to have cleared, I will rack off the clearing liquid and leave the entire cake of sediment behind. To this newly racked mead I add potassium meta-bisulfite and potassium sorbate to prevent continued fermentation. In standard winemaking practice completely dry wines/meads that are being stabilized and will *not* be back-sweetened do not need potassium sorbate as part of the stabilization addition. I typically add both when I am making session meads because it is rare that I do not add something that has a small amount of fermentable sugar. After a couple days, during which I will check to see if there is airlock activity, I will then proceed to add any secondary additions.

With a fermented and stable session mead base there are many options of what to do next. If the goal was a dry traditional mead, then go straight to clarification, or even packaging if the mead is clear enough for your tastes. If fruit, spices, and/or some sweetness are desired this is where you can finish the mead with these additions. Fruit juices and purees work really well at this stage, but whole fruit is also a possibility. There is really only one key aspect to keep in mind, you really don't want to add too much of anything and risk losing the subtle honey character. As mentioned previously, you also want to keep an eye on the amount of sugar added because above 4–5% residual sugar makes finding balance in the finished, carbonated product more challenging.

Once clear, I like to keg and force carbonate my session meads. There are other options like bottle conditioning, but that will only apply to dry sparkling meads. Anything with residual sugar will need to be kegged in order to be carbonated. Once kegged, any method of carbonating the keg will suffice. If I leave a keg on with my typical service pressure it will take about 1 week to fully carbonate.

FINAL THOUGHTS

Session meads are quickly moving from a relatively obscure style to a very mainstream mead offering. Making them is not that much different than other meads, but where the outcome is lighter and more austere it makes sense to understand what to expect for both the process and the finished product. Session meads still provide a great blank canvas for creativity and experimentation, and the addition of carbonation can add dimension that really makes them shine! BYO

Jason Phelps is a longtime homebrewer and meadmaker. In 2017 he and his wife opened Ancient Fire Mead & Cider, a producer of meads, ciders, and wines in Manchester, New Hampshire.

FRUIT MEADS (MELOMELS)

BY BRAD SMITH

I enjoy a good mead as much as anyone and there are some great lower-alcohol meads being made commercially. For my money, though, you can't beat a high-gravity mead made with a ton of fresh fruit or berries like those produced by Schramm's Meadery. It is my favorite mead style, bar none.

This article will focus on a single style of mead — the high-gravity fruit mead, which meadmakers call a melomel. This style is made from just fruit and honey, combined with a high alcohol level of 14% or greater. The purest examples are made from whole fruit, honey, and water, but are carefully fermented to achieve the proper balance of residual sweetness, fruit flavor, and alcohol.

In some ways, melomels present the ultimate fermentation challenge. Not only are you working with challenging ingredients like whole fruit and honey, but you may be starting fermentations at gravities of 1.160 (35.7 Plato) or higher, which places unusual stresses on the yeast during an extended fermentation. Yeast health, proper yeast nutrition, and the application of modern meadmaking techniques are critical to creating a great melomel.

BIG MEADMAKING PRINCIPLES

Some guiding principles drive the formulation of a big fruit mead. Without the right fruits providing the balance between the fruit, sweet honey, and high alcohol levels you will just end up with bad mead.

BALANCING TANNINS, ACIDITY, SWEETNESS, & ALCOHOL

The first principle of big meadmaking is to balance the tannins and acidity from the fruit against residual sweetness from the honey and alcohol from the fermentation. If any of these three are out of balance you will get a mead that is too sweet, too tannic, or too boozy.

Achieving this balance starts with choosing the right fruits. For a high-alcohol melomel, I prefer to work with fruits that are high in tannins or acidity such as tart cherries. Much like tannic grapes are critical to making a robust red wine, these tannic fruits provide the structure and fruit flavor for the melomel. Softer, subtle, less tannic fruits may work fine in lower-gravity meads but will fade badly in this style.

Meadmakers use residual sweetness from the honey to balance the tannic fruit flavors. Fruit sugars are all simple sugars that will ferment rapidly away. Honey also will ferment completely if left on its own, though it does so more slowly. To achieve residual sweetness in a finished mead, therefore, we use a lot of honey so we drive the alcohol level beyond the tolerance level for our yeast strain. We literally feed the yeast cells until

they die from too much alcohol. The sweetness left after this alcohol tolerance level gives us residual sweetness. Alcohol also plays a role in the perception of sweetness, and a great mead balances alcohol, sweetness and tannins/acidity.

All of this is to say, you must pick a particular yeast strain, fruit type, and honey amount needed to achieve the perfect balance.

TARGETING A FINAL GRAVITY

The residual sweetness in a finished mead depends on your final gravity. To get this balance, meadmakers talk about targeting a specific final gravity as well as original gravity. For big fruit mead at 15% alcohol, the starting gravity will be 110 points (0.110 SG) or more higher than the finishing gravity. So if we are targeting a 1.042 final gravity, the mead and fruit must start at 1.152 or higher.

The meadmaker's challenge, then, is the fermentation equivalent of leaping off a tall diving board and landing in a small bucket of water. You manage your recipe and fermentation to hit your target gravity.

Adding to the challenge is the fact that the amount of residual sweetness needed will vary depending on the choice of fruit, the fruit's acidity/tannin levels, and how much fruit is used. Something like a big tart cherry mead might only need to finish around 1.034 while a mead made with a lot of black currants might need a final gravity in excess of 1.048. So a big tannic fruit mead might have a finishing gravity higher than the starting gravity for many beers.

ADDING FRUIT IN PRIMARY VS. SECONDARY

While there is a great debate among beer brewers about when to add fruit, for these high-gravity meads I recommend adding all of the fruit and juice up front in the primary. There is a simple reason for this: Fruits have a much lower gravity than honey and are more fermentable, therefore they dilute the must. So if we add the fruit up front we are actually lowering the starting gravity required for the mead and we can account for this from the beginning.

If we consider the alternative of adding the fruit in the secondary, we can see that it works against us in a high-gravity mead. Adding fruit after fermentation means we need to aim for a higher starting gravity prior to fermentation. Given that the yeast is already stressed at 1.140–1.160+ starting gravities, raising it further is not a great idea.

WORKING WITH FRUIT

As I mentioned in the previous section on principles for a high-gravity mead, the first challenge is picking the right fruit or fruit combination. I recommend choosing tannic or acidic fruits for this particular style. I've had the best luck with fruits like black or red currants, raspberries, blackberries, tart cherries, loganberries, elderberries, and other dark tannic fruits. Blueberries and tannic grape varieties are also good if you can work with whole fruit as most of the tannins come from the skins of the berries.

I don't recommend using soft fruits like peaches, pears, plums, etc. as these simply don't have the tannins or acidity to provide the structure needed for a big melomel. While an experienced meadmaker can bring these flavors out, they are much harder to balance in a high-gravity mead. They work better in lower-gravity meads.

You can get fruit in several forms including juice, fruit concentrates, fruit puree, canned fruit, and fresh whole fruit. In every case, fresh whole fruit will give you the best boost of flavor, but not all of us have access to the large quantities — often 18 lbs. (8.2 kg) or more — of whole fruit needed to make a 5-gallon (1-L) batch of mead.

FRUIT JUICE AND JUICE CONCENTRATES

These are by far the easiest to obtain and use. You simply add fruit juice to your must up front and let it ferment out. Choose only top shelf pasteurized fruit juices with no preservatives as the preservatives can kill your yeast. I've had good success with Knudsen brand juices, which are available in 1-quart (1-L) jars from many grocery stores and online suppliers.

FRUIT PUREE

I don't recommend most fruit purees. While fruit puree works well for adding an accent flavor to a beer, they are very difficult to separate from a mead. The problem is that you need a lot of fruit to make this style of mead, and using that much puree makes it hard to separate the puree sediment from mead, resulting in high losses. That said, if supplementing puree in the case when you don't have quite enough fruit, this problem is minimized. If using puree, the key is racking many times.

CANNED FRUIT AND FRUIT WINE BASE

These are mostly whole fruit pieces and juice that are canned. I did make a lovely loganberry mead from canned wine base by bagging the fruit in a grain bag and simply lifting it out after a little over a week in the fermenter. It isn't quite the same flavor as fresh fruit, but it works. Bag your fruit in a mesh bag for easy separation.

WHOLE FRUIT

Fresh, whole fruit provides the best flavor and quality, though it does require some preparation. I prefer to clean, dry, and freeze my fruit before use as it breaks down the cell walls and makes the fruit easier to ferment. I typically clean it with tap water, then dry it on cookie sheet trays before freezing and bagging it. When I make the mead I will thaw the fruit out by immersing the bags in warm water first, then I will put all of the fruit in a grain bag before adding it to the must. The grain bag lets me remove the fruit when needed — typically 1 to 2 weeks after fermentation starts — and also lets me lift the bag when I need to degas the must during fermentation.

When using any kind of fruit, I recommend using pectic enzyme. Pectic enzyme helps break down the pectin and complex sugars in fruit that can lead to an overly thick mead. Use $^1/_{10}$ tsp. per pound (0.45 kg) of fruit or $^1/_2$ tsp. per gallon (4 L) of juice.

DETERMINING FRUIT BRIX VALUES

One significant challenge when working with fruit is determining the sugar content, which is traditionally mea-

Target Final Gravities of Melomels From Brad Smith

Fruit Used	Final Gravity (Actual)	Notes
Raspberry	1.036	Fairly tart, could use a bit more sweetness
Blackberry	1.043	Slightly sweet, but delicious
Black Currant	1.047	Slightly tart, wine-like. Great!
Loganberry	1.040	Fantastic, well-balanced
Tart Cherry	1.036	Well-balanced
Currant, Cherry, Raspberry	1.042	Well-balanced

sured in degrees Brix. For juices and many extracts this is pretty simple to do as you can just use a hydrometer or refractometer. This number becomes important when finalizing your original gravity.

For whole fruit, what I do is extract some of the juice from the fruit, usually just taking some of the juice that pools in the bottom of the bucket I use to prepare and bag my fruit. After knowing the Brix, you can then use that number to make final adjustments to the recipe to hit your original gravity target.

HOW MUCH FRUIT TO USE

It takes a lot of fruit and honey to make a mead in this style. My general rule of thumb is approximately 1.15 parts honey to 1 part fruit by weight. Honey obviously has a much higher starting gravity so in terms of overall sugar content, the honey provides approximately 80–90% of the fermentables. So I might use something like 17 lbs. (7.7 kg) of blackberries in a 5-gallon (19-L) blackberry mead along with nearly 20 lbs. (9.1 kg) of honey.

For fruit juice, you can actually do the same calculation by volume. I use roughly equal volumes of fruit juice and honey, so if I was adding 1.5-gallons of honey, I might include 1.5 gallons of fruit juice (or 1 liter to 1 liter). One gallon (4 L) of juice is approximately equal to 8 lbs. (3.6 kg) of fruit when both are at 12 °Brix.

Both of these vary somewhat. If I'm using a stone fruit like tart cherries, I would use more fruit or juice than with something as highly tannic/acidic as black currants. Similarly a low-Brix fruit juice or wine base would require a larger fruit addition — so I might push it up to 2 gallons (8 L) of fruit with only 1.5 gallons (6 L) of honey.

HONEY CONSIDERATIONS

Honey selection and determining the right amount of honey for a given fruit is the next consideration when developing a melomel recipe.

SELECTING A HONEY VARIETY

There are well over 60 honey varieties readily available in the US and probably hundreds worldwide. The variety is determined by the blossoms the bees feed from. I can't cover them all, but my rule of thumb is for a fruit mead it's best to choose something sweet and relatively clean rather than a strongly flavored variety that may detract from the fruit flavor such as mesquite honey.

My personal go-to variety is orange blossom as it is pleasant, floral, and goes well with almost any fruit. I generally stay away from wildflower and clover honey as these can vary in flavor quite a bit. The honey itself is usually not the focus of this mead style so you want something clean and neutral.

HOW MUCH HONEY TO USE

I'll say it again, the key to making a large fruit mead is the right balance between alcohol, tannins/acidity, and residual sweetness. This balance is driven primarily by the final gravity as it determines the residual sweetness and residual sweetness counteracts tannins/acidity.

In the next section I'll cover yeast, but to target a given final gravity you need to know the alcohol tolerance of your yeast. For a variety of reasons, I use Lallemand 71B Narbonne, which has an alcohol tolerance of about 15.1%. This corresponds to a drop in specific gravity of 0.110 to 0.112 if I properly manage my fermentation. So I will start my fermentation 110 to 112 gravity points above my target final gravity.

The final gravity (FG) depends on the fruit's acidity/tannin level. The chart at the top of this page includes some of the meads I've made and their target final gravities. Many of these were determined after extensive research and experimentation.

Keep in mind when looking at the chart that if I gave you a 1.042 FG sweet mead made just from honey it would be much too sweet and cloying for most people's taste. It's the fruit tannins and acidity that provide balance, and more tannic fruits like black

currant require a lot more sweetness to offset them.

To get the original gravity (OG) of any of the meads in the chart we add the number of gravity points corresponding to the alcohol tolerance of the yeast used. So for the 71B Narbonne strain, we add 0.111 to these numbers to get the original gravity. So for tart cherry this works out to 1.036 + 0.111 = 1.147 as the original gravity. For black currant we get a very high 1.047+0.111=1.158 OG.

Once you have the target OG and FG you can use software to estimate the amount of fruit/honey needed based on their respective sugar content. Alternately, you can also add the fruit and some water first and then slowly raise the OG using honey (18 lbs. of honey is roughly 1 gallon, or 2 kg is roughly 1 liter if you find it easier to measure by volume).

TIME TO FERMENT

Because we are working at very high starting gravities, yeast selection, nutrition, and yeast management are all important for creating these meads. If you don't pay close attention to all you will end up with a stuck or very slow fermentation.

YEAST SELECTION

Since both honey and fruit will ferment dry if left to their own devices, the alcohol tolerance of the yeast is what gives us residual sweetness. Alcohol itself also plays a role in the finished balance. If you choose a yeast strain with too high or low of an alcohol tolerance it won't be balanced. For me the ideal level seems to be around 14–15% ABV.

My go-to yeast strain for this style is Lallemand 71B, a dry yeast isolated and selected by the INRA (National Agricultural Research Institute) in Narbonne, France. This strain is also known for fermenting fruity rosé wines and semi-sweet whites because it produces long-lived aromas that result from the synthesis of relatively stable esters and higher alcohols. It not only has the roughly 15% alcohol tolerance level we are looking for, but it also has low nutrient requirements and an ability to metabolize some of the harsh malic acid found in many fruits into lactic acids. I've also found it to be remarkably consistent in fermenting high-gravity meads.

Photo by Jason Phelps

Degas twice a day during fermentation until your fermentation is two-thirds complete.

PROPER YEAST HYDRATION AND AERATION

Due to the insanely high starting gravities of this style, you can't just sprinkle the yeast on top and ferment it out. Dry yeast cells will suffer from osmotic shock from the high sugar content as they are unable to regulate the cell wall properly before they are hydrated.

The manufacturer recommends hydrating your yeast in lukewarm (104 °F/40 °C) water mixed with Go-Ferm yeast nutrient. Mix the Go-Ferm and water first, then mix in the yeast and slowly add small amounts of must to the mixture until you are within 10 degrees °F (5 °C) of your must temperature.

You also want to aerate the must, ideally with pure oxygen, before pitching. I use a slightly longer aeration period as oxygen will not be as soluble in the high-gravity must as with lower-gravity beverages. I will often aerate again at 12 hours, as the growth phase is usually much longer due to the high gravity.

YEAST NUTRIENTS

I recommend using the TOSNA-2 (Tailored Organic Staggered Nutrient Addition) mead nutrient schedule. TOSNA-2 uses four additions of Fermaid O yeast nutrient at 24, 48, and 72 hours, and 7 days (or $^1/_3$ remaining sugar break). A typical 5-gallon (19-L) batch would use four additions of about 5 to 8 grams of Fermaid O for each addition. A mead with a high percentage of fruit would use only slightly less based on fruit content. I covered this in greater detail in the story "Modern Meadmaking" in the October 2017 issue of *BYO* and you can find more information on TOSNA-2 at MeadMadeRight.com.

DEGASSING YOUR MUST AND REMOVING FRUIT

During active fermentation you need to degas your must to get rid of excess CO_2, which can build up as carbonic acid and inhibit fermentation. I prefer doing the primary fermentation in a bucket for this reason as it gives me easy access and space to degas.

A wine whip or wine degasser attached to a power drill works well for this process. If applicable, I lift the

bag of fruit from the must when doing this. Stir gently at first as it is easy to release so much gas that the foam spills over the top of your bucket. Continue degassing twice a day down to the 1/3 sugar break, which is the point at which 1/3 of your 110 expected gravity points remain.

You also want to push the fruit down twice a day (called punching down the fruit cap) as you don't want the floating fruit to dry out or spoil. Remove the fruit bag after about 7–14 days, or rack the mead away from the fruit to a second fermenter. Leaving the fruit in too long can result in flavor and haze issues.

MEASURING GRAVITY AND MANAGING pH DURING FERMENTATION

At the high gravities we are working at, refractometers simply don't work well. Use an old-fashioned glass hydrometer instead, which you can sanitize and leave in the bucket during fermentation if you like.

Managing pH levels is also a problem with many fruits, particularly those high in acidity. When you start fermenting, the pH will drop rapidly and if you have a lot of acidic fruit it can drop well below 3.0, which can inhibit or even stop fermentation.

To counter this, use a pH meter, particularly during early fermentation, to measure the pH. If the pH drops below about 3.4, add potassium bicarbonate to raise the pH back to an acceptable level. For a 5-gallon (19-L) batch, add about 1 tsp. at a time and wait a few hours to take another measurement as it can take some time for the pH to stabilize after the addition. Using the TOSNA-2 nutrient schedule, pH management, and degassing, it is possible to complete the bulk of fermentation in as little as two weeks. Some high gravity or highly acidic fruits can take a week or two longer. The mead at this point will have a distinctive "rocket fuel" flavor to it but this will fade during aging.

Transfer the mead after it gets within 5 gravity points of its final gravity to separate the mead from the fruit and yeast sediment. Once you get down to your final gravity you can consider adding finings such as Super-Kleer to aid in clearing.

Rack the mead once or twice more during aging until it is completely clear. I use glass carboys for aging to reduce the chance of oxygen spoiling the mead. I also add a small bit of CO_2 gas to the top of the fermenter to provide a blanket preventing oxidation.

Add potassium sulfite, which acts as an antioxidant and preservative, once the mead has reached its final gravity and has been transferred. A good starting point is 1/4 tsp. in a 5-gallon (19-L) batch, though you may need one more small addition before bottling.

BACKSWEETENING AND ADJUSTING GRAVITY

I don't backsweeten or cut my meads unless I've made a mistake. I'm not a fan of the flavor that unfermented honey adds. However, if you do come in low on your final gravity or the mead is too tart, you can backsweeten with fresh honey or a sweeter mead, using the Pearson's square to calculate the amount needed. Before you do that you need to add sulfites and sorbates to inhibit further fermentation. Add the potassium sulfites first, and then some potassium sorbate at the rate recommended by the manufacturer on the package.

Give it another day or so before adding fresh honey to backsweeten the mead. You can either calculate the amount of honey needed to raise the final gravity a few points or perform bench trials by pulling a measured sample of your mead and add measured amounts until you determine the right proportions.

If your mead is too sweet and cloying you can try to thin it using clear, flavorless liquor such as vodka. Vodka has a lower gravity than water and thinning it with liquor won't risk restarting fermentation. Obviously you can only lower it a few points before you run the risk of upsetting the alcohol balance, but this can help if your mead is too sweet.

AGING

These big fruit meads get better with age in most cases, and can be enjoyed for years if properly stored. I prefer to keg my meads initially and then bottle some as gifts or to pack away for long-term storage.

The 350 mL "dessert wine" bottles are the perfect size for these big fruit meads as you rarely need a full wine bottle in one sitting. They make unique gifts as well, since few people have experienced this style themselves and it has enough complexity and sweetness to appeal to many. BYO

Brad Smith is the author of BeerSmith homebrewing software and host of the BeerSmith podcast on iTunes. He has nearly three decades of experience brewing beer and mead at home.

HOLIDAY MEADS

BY JASON PHELPS

Seasonal drinking traditions are a really interesting subject to delve into, as holiday parties and family gatherings often open people up to new beverages that aren't available or of interest during other parts of the year. There's also the added excitement around family traditions, which may seem unique to your family, but they often have common traits shared much more broadly. No matter who you are, where you are from or what you celebrate, there are common themes with the liberal usages of herbs, spices, and fruits, as well as unique, scarce, or prized ingredients in the holiday beverages from wherever you hail. Now that is something we can all celebrate!!

Photos by Charles A. Parker/Images Plus

MAKING YOUR BEST HOLIDAY MEADS

Because of the extra attention paid to the details of our holiday gatherings and celebrations we should expect holiday meads to be their best selves as well. Well appointed, while an interior decorating term, came to mind as I was trying to explain the additional allure and hopes for a truly great holiday mead. Great holiday meads will have structure, body, rich flavors, and a balance between the ingredients and attributes that conceptually make sense, but they should also be accessible. We plan to use fruits and spices liberally, and the best holiday meads should be expressive with characteristics that are distinguishable to make that moment of tasting memorable.

The path to a great holiday-inspired mead is one of trial and error. Working with ingredients that may be particularly expressive like peppercorns, anise, or clove, even with short contact times, requires some finesse. Time is the hard detail that can be monitored, but taste is king because the variance of many ingredients, even in the same quantities, means it has to taste right before it can just be made on a schedule. Understanding this means recipes can be great guides, but focusing in on that "perfect" outcome requires your skills in the process. Loving the mead is part of the desired outcome.

To that tune, I'm going to share with you four of my favorite meads that I consider perfect for the holidays. Note that all of these recipes have flexibility to adjust the amounts of spices, fruits, and other ingredients, as well as the techniques used when making them. I will outline my basic procedure, but feel free to follow your own traditional process and adapt the recipe as you feel comfortable.

Spices are the most immediate example of a theme for holiday meads. I love apple pie. I mean, who doesn't? How about a mead that tastes like liquid apple pie?

I'LL HAVE THE PIE

(5 gallons/19 L)
OG = 1.138 FG = 1.025
ABV = 14.5%, est

INGREDIENTS

16 lbs. (2.3 kg) honey
3–4 gallons (11.5–15 L) fresh-pressed cider
25 g 71B-1122 wine yeast
Yeast rehydration agent
Yeast nutrients
Stabilization additives
Peels of two large oranges
5 cinnamon sticks
10 dried berries of allspice (roughly crushed)
3 whole cloves
3 vanilla beans (split and scraped)

I like wildflower honey for apple meads, but keep in mind that all honeys will impart their unique character to mead, so you can search for different honeys that really sing with apples and spices! Mesquite and buckwheat honeys are interesting alternatives, the character of each being fully expressed in the final product. You can also put a caramel apple twist on a mead like this just by caramelizing some of the honey prior to the ferment. This can be done by heating a small amount of honey in a large saucepan (leave space for expansion as the honey rolls, creating foam) over medium-high heat until it begins to brown and takes on a candy-like flavor. A long-handled spoon and gloves are advised when stirring your caramelized honey this way as hot honey splatter can be very painful.

In this recipe, the honey and cider are mixed together from the onset and fermented.

My typical meadmaking process would be to use the yeast rehydration agent to prep the yeast before pitching, and then a staggered nutrient addition regimen (with degassing) to feed the ferment for the first few days. Depending on the time of year and temperature in my house, I may or may not choose to place the fermenter in a 64 °F (18 °C) temperature-controlled space. Once the fermentation is complete I always use both potassium sulfite and potassium sorbate as stabilization additives, whether I filter the mead or not. All of these additions are based on volume and there are a number of choices for the types and sources of nutrients that can be used.

The fermentation should arrest near the target final gravity (FG), after which the spices and orange peels can be added. The spices and peels should be removed once the flavor is as desired. I will often check in 24-hour increments. To my taste, I often find the flavors I am seeking just after three days. For stronger meads, additional contact time with spices allows for the development of robust flavors to balance with the alcoholic strength and potential sweetness of the mead. Use your own taste to decide if more contact time is needed, or even if you want to add more of any of the spices used. If adding more, I most often remove the existing spices and add a fresh dose of anything I want more of. I also typically use a nylon straining bag to contain citrus peels, whole spices, hops, and other small items to make their removal easier.

Mead has a treasure trove of contextually specific words that typically describe a specific style of mead. In this case, I'll Have The Pie is a melomel, which means a fruit mead, but it is also technically a cyser, a fruit mead made from apple and honey, as well as a metheglin, a spiced/herbed mead, because of the addition of spices. This makes this particular mead a hybrid of both fruited and spiced meads, a very common intersection in mead!

I love the season in which the holidays of Thanksgiving, Christmas, and New Years are celebrated. The added focus on spending time socially means groups of people are looking for experiences to try new and interesting twists on flavors inspired by the season wherever they are. We think of foods with different "classic" flavors right away, but don't forget the drinks!

PEAR & GRAPE COCKTAIL MEAD

(6 gallons/23 L)
OG = 1.067 FG = 0.997
ABV = 7%, est (final, 9% after ferment)

INGREDIENTS

6.4 lbs. (2.9 kg) honey
Water to 4.5 gallons (17 L)
12 g QA23 wine yeast
Yeast rehydration agent
Yeast nutrients
Stabilization additives
12 lbs. (5.4 kg) pears (cored and chopped)
0.3 oz. (8 g) dried elderflower
18 fluid oz. (30 mL) Chardonnay juice (25 °Brix)
1.5 lbs. (0.68 kg) honey
Water to 6 gallons (23 L)

The honey and first fraction of water are combined and fermented. The initial volume will be 4.5 gallons (17 L). Once the fermentation stops

the mead will be dry and should be racked off the lees to a clean container and stabilized. The pears and dried elderflower can then be added. Remove these when the flavor is at the level desired, which could be as short as 3–5 days for the elderflower. To finish this mead, mix the remaining honey with water and add that and the Chardonnay juice to a final volume of 6 gallons (23 L).

This pear and white grape mead was inspired by a cocktail that contains pear vodka, white wine, and St. Germain liqueur. The aromas of the drink alone can elevate your mood. I've always associated pears with Christmas gatherings in my family, so I think this mead is a great fit for holiday entertaining.

With this recipe we've got another hybrid melomel/metheglin, using both the fruit and spice to blend into the final result.

Mid-winter celebrations come in many forms, and I've seen quite a few mead recipes designed for Yule festivities. While not true for all of these recipes, quite a few contain a lengthy list of components, almost like a tincture for cocktails. Here's my take on a herbed/spiced mead made to usher in the new winter season.

SPICED ORANGE MEAD

(3 gallons/11.5 L)
OG = 1.127 FG = 1.020
ABV = 14%, est

INGREDIENTS

10.5 lbs. (4.8 kg) mix of clover and basswood honeys
12 g Côte des Blancs wine yeast
3 orange peels
1 fresh sprig of thyme
3 tsp. peppercorns (roughly cracked)
6 bay leaves
3 lbs. (1.4 kg) golden raisins
Yeast rehydration agent
Yeast nutrients
Stabilization additives

For this mead everything goes in up front — more on this topic shortly — and a straining bag to hold the herbs/spices is again recommended to make removal easy. Mix the honey and water together, add the spice bag, and get the fermentation going. Check the flavors after a week or so and remove the spices when you have the desired flavors. Once the ferment is complete the mead can be stabilized and ideally given a short time to age in bulk.

This mead is definitely a bit more savory than the other recipes so far. The thyme and bay leaves do impart an herbal character, but the orange and raisins balance that with some fruitiness, and the black pepper provides a streak of earthy spiciness to make the outcome that much more interesting. I'd call it a metheglin, even with the orange peel and raisins. Their attributes are used much more as a spice in this mead than you might see elsewhere.

WHEN TO ADD THE FRUITS/SPICES

We've exercised several different techniques with the fruits and spices in the recipes up to this point. In I'll Have The Pie the fruit (cider) was fermented and the spices were added in secondary. In the Pear & Grape Cocktail Mead all the fruit and spices were reserved for secondary, and finally for the Spiced Orange Mead we added everything right up front. How do you decide when to use the ingredients?

Ultimately this may come down to preference, but when you are first starting out it makes sense to try the different techniques so you can understand how they might be different. Keep in mind that you can, and should, still consider contact time no matter when you use most ingredients. This means that the impact will still be "x" days of time regardless of whether it is during or after fermentation. It is also worth remembering that any sugar added during primary will likely be fermented.

Over the nearly 15 years I had been homebrewing I ended up developing a couple basic concepts for how I made different types of meads. For most of the draft-style meads (carbonated, lower-alcohol) I tend to flavor them in the secondary. Meads containing either apple and grape juices were often co-fermented with the honey, but most others tended to have the best presentation when raw fruit was steeped with or without spices in secondary. The bold flavors and freshness is what makes this technique stand out for me.

For more traditional meads (higher in alcohol, non-carbonated) I found I would vary the technique depending on the type of ingredient, and most often how likely the delicate aromas might get blown off during a vigorous fermentation. Dried elderflower is pretty delicate and I won't risk losing the aromas from it during a ferment. Cacao nibs, on the other hand, are much more "durable" and might be something I would use in both primary and secondary. Here's an interesting tip: The necessary contact time for cacao nibs in particular is long enough that putting them in from day one starts the clock for them earlier in the process.

Can spices interact with the fermentation? While there is a possibility of some ingredients experiencing unusual bio-transformation when applied to an active fermentation, I've never seen any warnings about this that gives me reason to be concerned about doing it. Definitely watch out for anything with preservatives in it, and some dried fruits are heavily sulfited, which will impact the yeast if there is enough sulfite on them.

Spices can be also added in doses, another aspect of control, with the goal of working towards an end result with a much reduced risk of overshooting it. With this you can manage the contact time and the amount used, as well as wield multiple doses of fresh spices, something that longer contact times with the same initial spices can't always produce. There is a lot of opportunity to experiment here.

A LITTLE GOES A LONG WAY

The next recipe is a good example of a little bit of something going a long way. The first time I made candy cane vodka for use as a tincture I broke up two boxes of candy canes into a 1-quart (1-L) mason jar and covered them with vodka. By the time the candy canes finally broke down the vodka was pink and had a very strong candy cane flavor. It didn't take more than a small splash to flavor a cup of hot chocolate or a cocktail with the peppermint blast from candy canes!

This candy cane vodka-infused chocolate mead was made as a small countertop batch as a homebrewer some years ago. We made it a few months before Christmas and we poured it right from the 1-gallon (4-L) carboy we had aged it in during our family Christmas gathering!

CANDY CANE & CHOCOLATE MEAD

(3 gallons/11.5 L)
OG = 1.134 FG = 1.027
ABV = 14%, est

INGREDIENTS

11 lbs. (5 kg) wildflower honey
Water to 3 gallons (11.5 kg)
15 g Côte des Blancs wine yeast
Yeast rehydration agent
Yeast nutrients
Stabilization additives
3 oz. (85 g) cacao nibs (lightly toasted right before use)
Peppermint vodka

The honey and water can be mixed and fermented. Once the fermentation is completed the mead can be racked and stabilized. Slightly toasting the cacao nibs before using them helps to activate the chocolate and get it ready to impart its flavor to the mead. These are added after stabilization in this recipe, and allowed to steep in the mead for several weeks, but the ultimate goal is for the mead to taste nicely of chocolate, so the timing and even the choice to use more nibs is open for personal interpretation. Once the chocolate flavor has been achieved the mead can be racked off the nibs and then flavored with the candy cane vodka. Less is more here, but use as much as you need to put it right where you like. I couldn't find a documented amount from this project (this is a good time to remind everybody that good note taking is important when you are playing with new recipes!), but I vaguely recall I started with ½-oz. (15-mL) increments in a 1-gallon (4-L) batch, mixing it well in between to make sure I didn't overshoot my goal with the peppermint.

While this example might be at an extreme end of the spectrum of intense flavors, it is also a good example of something to keep in mind when using spices; a little bit often goes a long way. Furthermore, once you get the flavors from the spices in, you can't remove them. You can blend an overly spiced mead down to mellow the spice component, but with that comes other changes depending on the composition (alcohol, sweetness, flavors) of the meads used to blend.

ENTERTAINING WITH YOUR HOLIDAY MEADS

Of course we can always pour ourselves a glass of a delicious holiday spiced mead, but since the season calls for family gatherings and house parties why not use your holiday meads to take your drinks game to the next level?

Mulling or serving mead warm with spices is not as popular as it may have once been, but is an interesting option to serve mead for the holidays. The outcome can often be positive — maybe try a warm version of the apple pie mead recipe shared in this article to make it taste like a fresh apple pie right out of the oven, or even a mulled cider. The simple starter is to slowly warm a sweet, strong mead up in a saucepan with a couple cinnamon sticks. Serve the mead in a ceramic mug with a cinnamon stick for a warm, fragrant drink to push the cold winter weather back for a time. This is an ideal drink when gathering around the fire pit on a cool night!

During the holiday season people are looking for new and interesting twists on adult beverages. Cocktails are very popular and there are two obvious reasons. Firstly, cocktails are a more potent potable, which can definitely elevate an occasion, and secondly, the breadth of distinctive flavors available in spirits, mixers, and bitters can create some incredibly complex drinks. But, have you ever considered using meads in cocktails?

There are all kinds of "rules" out there for making cocktails, and they all make sense. I'd like to hone in on just a couple that can help support some mead cocktail experimentation at home:

1. Cocktails should be balanced, so the strong (spirits), weak (juice, mixers), sour, and sweet components should work together in harmony.

2. Only stir cocktails that contain just spirits (mead included), but you can shake cocktails when fruit juice or other non-carbonated mixers are involved. This is really to promote the clean, clear visuals of this type of drink, but shaking does introduce oxygen, which can dull delicate aromatics rather quickly.

3. Ice used in cocktails should be clean and fresh. As the ice melts the water becomes part of the drink. It needs to taste good.

4. Meads we might use in cocktails have alcohol in them so I recommend backing off a half shot of alcohol when initially making any cocktails with mead. You can always add it back if you feel like it needs the additional alcohol for balance.

Since I've hopefully gotten your mind turning with how meads can be used as cocktails, I guess I'd better share a recipe. Here is one I've come to know well.

At Ancient Fire Mead & Cider in Manchester, New Hampshire we make a 7% ABV, draft-style mead flavored with both apple and ginger that is named With Malus. When we make this we use 30 lbs. (13.6 kg) of fresh ginger in each batch. The result is a ginger-beer level ginger profile, so it makes for a great swap in a Moscow Mule (which is traditionally made with ginger beer). Our partners at The Flight Center Beer Cafe

in Nashua, New Hampshire actually make the Ancient Flight Mule cocktail, their riff on a Moscow Mule using our mead — they even use a copper mug to serve it! You can make your own version of this cocktail with this recipe:

MOSCOW MULE MEAD COCKTAIL

INGREDIENTS

2 shots vodka (I like Tito's because it is a bit sweet)
½ shot lime juice
6 fluid oz. (175 mL) semi-sweet ginger mead
Ice

Pour the liquids over ice in a rocks glass or a copper mug if you want to be completely traditional. Stir to mix. Garnish with a lime wedge and even a sprig of mint.

THINKING ABOUT YOUR NEXT HOLIDAY MEADS

At this point you've probably got all kinds of ideas swirling around in your head for holiday-themed meads. While they also drink well out of season, something about timing them when the flavors are at the front of people's minds really makes them sing!

With the stronger mead recipes shared here, some time in the bottle can absolutely help them further develop drinkability so why not plan ahead and start making meads for next year's holiday gatherings? As you sit around the table with your family and friends this holiday season let the flavor combinations inspire you to make something that celebrates your holiday traditions! BYO

Jason Phelps is a longtime homebrewer and meadmaker. In 2017 he and his wife opened Ancient Fire Mead & Cider, a producer of meads, ciders, and wines in Manchester, New Hampshire.

MEAD RECIPES

FAST MEAD

(5 gallons/19 L)
OG = 1.126 FG = 1.035
ABV = 13.9%

This is a simple and straightforward mead recipe that should have your fermentation finished within a few weeks.

By Brad Smith

INGREDIENTS

18 lbs. (8.2 kg) Orange blossom honey
2 packages Lalvin 71B-1122 Narbonne yeast
12.5 g Go-Ferm (when hydrating)
6.2 g Fermaid-K (at 24 hours)
6.2 g Fermaid-K (at 48 hours)
6.2 g Fermaid-K (at 72 hours)
6.2 g Fermaid-K (at 7 days or the ⅓ left sugar break)
1 package Super Kleer KC Finings
0.3 tsp. potassium metabisulfite

STEP BY STEP

Add honey to 3 gallons (11 L) of room temperature water in a large (8- to 10-gallon/30- to 37-L) fermenter. Stir the honey and water mixture well and top up with enough water to make 4.7 gallons (18 L), saving a liter of space for your yeast.

Prepare the yeast by adding it to a liter (0.2 gal.) of warm water at about 104 °F (40 °C). Add 1.25 grams of Go-Ferm per gram of yeast. Slowly bring the temperature of the mixture down to the temperature of your mead must by adding small quantities of must. When the temperature is acclimated, add the yeast slurry to the fermenter and stir vigorously.

Monitor your pH throughout fermentation. If the pH drops below 3.4 add an alkaline additive, such as potassium bicarbonate, to raise the pH back above 3.4. Degas the must during fermentation using a wine whip regularly until about ⅔ of the sugar has fermented away. Add your fermentation nutrients at the intervals indicated in the ingredients list. Following primary fermentation, add potassium metabisulfite, and fine your mead with Super Kleer. When your mead is fined to your satisfaction, you can bottle or keg, carbonating if you choose.

KEY LIME SESSION MEAD

(5 gallon/19 L batch)
OG = 1.054 FG = 0.997 (prior to back sweetening)
ABV: ~7.6%

By Jason Phelps

INGREDIENTS

7.1 lbs. (3.2 kg) mesquite honey
1.75 lbs. (0.8 kg) mesquite honey (for backsweetening)
15 g Lalvin 71B-1122 yeast
18 g BSG Startup™ (yeast re-hydration)
7.5 g BSG Superfood®
2.5 g diammonium phosphate (DAP)
24 fl. oz. (0.7 L) key lime juice
1.6 g potassium metabisulfite
3 g potassium sorbate
1 Tbsp. Sparkalloid
¾ cup corn sugar (if priming)

STEP BY STEP

Place honey in a large fermenting bucket. Add 1.5 gallons (5.7 L) of hot water. Mix until the honey is well diluted. Top off to just shy of 5 gallons (19 L) with cold water and mix well. Mixing is the simplest form of aeration, but if you have a setup to aerate with forced oxygen this can also be used.

Prepare your Startup™ or other yeast re-hydration agent in 12 oz. (340 g) of 110 °F (43 °C) water. Add the yeast when the temperature drops below 104 °F (40 °C). Let it sit for 10 minutes. Add 1 Tbsp. of the prepared must and stir in the yeast. Allow this to sit for another 10 minutes. Activity should be obvious a few minutes after mixing the last time.

Once the temperature of the must and the rehydrating yeast are within 18 °F (10 °C) of each other the yeast can be pitched into the must and the bucket can be sealed with an airlock.

One third of the BSG Superfood® and DAP should be added at 24, 48 and 72 hours after yeast was pitched. A vigorous degassing with a spoon/paddle should be performed before each nutrient addition.

When the mead reaches terminal gravity, rack into a carboy and add the potassium metabisulfite and potassium sorbate. Allow this to sit for 1–2 days to ensure any active fermentation completes. Prepare Sparkalloid in 8 oz. (227 g) of boiled water for clarification purposes. Add the remaining honey (mix with a little hot water to liquefy), key lime juice, and Sparkalloid. Mix well. The gravity at this point should rise to about 1.010.

Once the mead is clear, or as clear as desired, it can be kegged or bottled. Mead can be left still or carbonated to 2–3 volumes of CO_2.

BLACKBERRY MEAD

(5 gallons/19 L)
OG = 1.154 FG = 1.045
ABV = 15.1%

By Brad Smith

INGREDIENTS

16.7 lbs. (7.6 kg) blackberries
20 lbs. (9.1 kg) orange blossom honey
0.5 oz. (14 g) GoFerm
1.25 tsp. pectic enzyme
1 tsp. potassium bicarbonate
3 packages Lalvin 71B-1122 yeast
16 g Fermaid O
65 mL Super Kleer KC finings
0.28 tsp. potassium metabisulfite

STEP BY STEP

Slowly stir honey with 2 gallons (8 L) of warm water, making sure it all dissolves to create the must. Put fruit in a grain bag and mash it slightly, collecting juice as well. Add the whole fruit grain bag and residual juice to the must.

Prepare 150 mL of warm water with GoFerm addition in it and then slowly mix in yeast. Slowly add must to the yeast-GoFerm mixture until you get its temperature within 10 °F (5 °C) of the must. Aerate the must with oxygen and an aeration stone or wand if available. Pitch the yeast-GoFerm mixture into your must and add the pectic enzyme.

When working with whole fruit it

can take several hours to get an accurate gravity reading, so after some time has passed, check the gravity. If needed, add a bit more water or honey to get to your target starting gravity and volume. You can optionally aerate a second time at 12 hours using oxygen.

During active fermentation you need to degas the must twice a day using a wine whip or similar device. At each of these occurrences, make sure to also punch the cap down by immersing/rotating the fruit bag so the top of it does not dry out. Add 4 grams of Fermaid O nutrient at 24 hours, 48 hours, 72 hours, and the 7-day point. If you have a pH meter, monitor the pH daily and add a tsp. of potassium bicarbonate (more if needed) if the pH drops below 3.5.

Remove the fruit bag between 7–14 days or when you notice that it is beginning to blanch (turn white). After 2–3 weeks most of the fermentation will be over. At this point, transfer to a secondary to separate the mead from the sediment. Check the gravity with a hydrometer periodically. Which final gravity has been reached, transfer the mead again, and add the Super-Kleer. With fermentation complete, add 0.25–0.5 tsp. of potassium metabisulfite as an antioxidant.

Age for two months. Transfer the mead one final time once it is completely clear. At the 3-month point, the mead is usually quite pleasant to taste, and you can consider bottling or kegging.

TART CHERRY MEAD

(5 gallons/19 L)
OG = 1.146 FG = 1.034
ABV = 15.5%

By Brad Smith

INGREDIENTS

2 gallons (8 L) tart cherry juice
18.1 lbs. (8.2 kg) orange blossom honey
4 g GoFerm
2 tsp. pectic enzyme
3 packages Lalvin 71B-1122 yeast
16 g Fermaid O
1.1 tsp. potassium bicarbonate
68.3 mL Super Kleer KC finings
0.28 tsp. potassium metabisulfite

STEP BY STEP

Slowly stir honey with 2 gallons (8 L) of warm water, making sure it all dissolves to create the must. Stir in fruit juice. Prepare 150 mL of warm water with GoFerm addition in it and then slowly mix in yeast. Slowly add must to the yeast-GoFerm mixture until you get its temperature within 10 °F (5 °C) of the must. Aerate the must with oxygen and an aeration stone or wand if available. Pitch the yeast-GoFerm mixture into your must and add the pectic enzyme. When working with whole fruit it can take several hours to get an accurate gravity reading, so after some time has passed, check the gravity. If needed, add a bit more water or honey to get to your target starting gravity and volume. You can optionally aerate a second time at 12 hours using oxygen.

During active fermentation you need to degas the must twice a day using a wine whip or similar device. Add 4 grams of Fermaid O nutrient at 24 hours, 48 hours, 72 hours, and the 7-day point. If you have a pH meter, monitor the pH daily and add a tsp. of potassium bicarbonate (more if needed) if the pH drops below 3.5.

After 2–3 weeks most of the fermentation will be over. At this point, transfer to a secondary to separate the mead from the sediment. Check the gravity with a hydrometer periodically. Which final gravity has been reached, transfer the mead again, and add the Super-Kleer. With fermentation complete, add 0.25–0.5 tsp. of potassium metabisulfite as an antioxidant.

Age for two months. Transfer the mead one final time once it is completely clear. At the 3-month point, the mead is usually quite pleasant to taste, and you can consider bottling or kegging.

SINGLE VARIETAL MEAD

(5 gallons, 19 L)
OG = 1.108 FG = 0.998 ABV = 15.7%

This is a traditional mead recipe that is perfect for showcasing a single varietal honey. Experiment with small (1 gallon/3.8-L) batches before you scale up to a 5-gallon (19-L) batch to find and invest in the varietal honey you like the best.

By Michael Fairbrother

INGREDIENTS

15 lbs. (6.8 kg) varietal honey
~3.75 gallons (14 L) water
4.5 tsp. Go-Ferm
2.5 tsp. Fermaid K yeast energizer
Fining agent (optional)
Potassium sorbate (optional)
2 packets (10 g) Lalvin Narbonne 71B-Lalvin 71B-1122 yeast

STEP BY STEP

Brew Day:
Clean and sanitize all of your fermenting equipment.

Fill a sink or cooler with hot tap water and soak the honey container(s) to make the honey easier to pour. I don't recommend using boiling water, just be patient. If your honey is crystallized, don't worry — all raw and natural honey crystallizes over time, with the exception of Tupelo blossom honey, especially in colder temperatures. Soaking the honey container in hot water will turn it back into liquid form. Fill the fermenter with 3 gallons (11 L) of room temperature water.

Pour honey into the fermenter along with the room temperature water. Take half a gallon (~2 L) of warm water (110 °F/43 °C) and carefully pour a small amount into each empty honey container. Replace container covers and shake to dissolve remaining honey, save every drop of that honey — it takes a bee its entire life to make ½ of a teaspoon. Place a ½ cup (118 mL) of the warm water/honey mix in a measuring cup (to be used for preparing the yeast) and pour the remaining dissolved honey into the fermenter. Top up with additional water as needed to achieve a volume of 5 gallons (19 L), saving space for the yeast of course. The mixture is now called the must. Stir the must until all honey is dissolved and well mixed.

This may take 5 to 15 minutes, possibly longer.

Prepare the Yeast:
Add 4.5 tsp. of Go-Ferm to the ½ cup (118 mL) of warm water/honey mix. Let the mixture cool to 104 °F (40 °C) then add the active dried yeast. Let stand for 20 minutes. Slowly (over 5 minutes) add equal amounts of must (honey/water) to be fermented to the yeast

slurry. Watch the temperature difference. Do not allow more than 18 °F (10 °C) difference between the must and the yeast slurry. Atemperate as necessary. After 15 minutes (yeast should begin to foam), stir well to mix the yeast into a slurry. Pour the yeast slurry into the fermenter. Seal the fermenter with a sanitized airlock and locate the fermenter in an area that is 65 °F (18 °C). Fermentation should start within 24 hours.

First One to Two Weeks:
Sanitize all equipment used to stir the must for each nutrient addition. Please note that adding nutrient and stirring may cause the mead to foam over, extreme care must be taken to do this slowly, a slow stir before adding the nutrient will allow the release of residual CO_2. Add ¾ teaspoon yeast energizer/nutrient mix 24 hours after fermentation begins. Add ¾ teaspoon yeast energizer/nutrient mix 48 hours after fermentation begins. Add ¾ teaspoon yeast energizer/nutrient mix 72 hours after fermentation begins.

Secondary Fermentation:
When fermentation stops and the specific gravity as measured by a hydrometer is stable (has not changed over the course of several days), it is ready to transfer into a secondary fermenter. Sanitize your fermenter and siphoning equipment. Carefully siphon the mead into the fermenter. Leave as much sediment as possible in the primary fermenter. Let the mead clarify in the secondary fermenter for three months. You may wish to add a fining agent such as isinglass to facilitate clearing, and/or potassium sorbate to prevent further fermentation.

Bottling Day:
Sanitize all of your siphoning and bottling equipment and bottles. Carefully siphon the mead to a bottling bucket. I recommend this mead be made still, but if you wish to carbonate it you would add priming sugar at this point. Fill and cap bottles like you would any beer you were making. Bottles may be consumed two weeks after bottling or kept and aged for six months or more to achieve superior flavor. BYO