

Let's talk about mead and cider...

Balance – this is something every brewer is familiar with. Two or more aspects of the beer, in harmony. They don't have to necessarily be equal, but must complement each other – that IPA has way more hops than malt, but without ANY malt, it wouldn't be balanced. So each style and each individual creation has their own balanced points.

There's more than two aspects to balance in mead, and there isn't only one right answer. The legs of the chair you're on can be balanced at a shorter or longer length, and a slight imbalance will barely be noticeable.

Balance in mead and cider

- Sweetness – generally a function of FG, with higher FG being sweeter, however some honeys (meadowfoam/tupelo) will remain sweet at a fairly low FG. Can be from residual sugar or back-sweetening
- Acidity – low pH, sometimes tartness or sourness. Balances well with sweetness, though too much of each and you've got a Sweet-Tart – Good in candy, not a great combination in most meads. Not enough acid, and you've got a "flabby" uninteresting, structureless beverage like the blackberry mead I served last time.
- Alcohol – this tends to balance sweetness and increases bitterness. Body gets bigger with more alcohol but IMO the perceived body gets lower.
- Tannin – these can be hard (bitter) or soft (astringent) and are perhaps most easily noticed in wine or over-brewed tea. They have a drying aftertaste, and increase perception of dryness in mead/cider, and increase body. Other than grapes, some apples have a lot of tannins, but honey has little. We can add grape tannin.
- Carbonation – dissolved CO₂ lowers pH, can thin body and cut sweetness, increases bitterness.
- Honey/apple flavor – big flavors will require more of other aspects to balance, and if flavor is very light, things like alcohol can easily overwhelm them.
- Body – component of Mouthfeel. Generally sweet meads will have fuller body, but other aspects can change perception. Some honeys have less body than others. Orange blossom is thin, buckwheat is full.

Mead specifics:

Before you make any beverage, you decide what you want from it. The most obvious aspects of this is to ask how much sweetness and how much alcohol you want in it. Figure out this alcohol % in gravity points – for instance, 100 gravity points is approximately 13% ABV. Now, do you want a sweet, semi-sweet, or dry beverage? Honey is almost 100% fermentable, so the yeast will eat all the sugar you give it, until they reach their **alcohol tolerance level** or something else stops them from working (cold, pH, other stress). The alcohol tolerance level is given for every yeast that is out there. Expect your mead will be on the upper end or slightly above this level if you are taking good care of your yeast – the listed 12-14% tolerance yeast may hit 15 or 16% before stopping working.

What this also means is that up until a certain point, every beverage will be dry. OG 1.050 = dry. 1.060 = dry. 1.080 = probably dry unless you have a very low tolerance yeast.

So if you want a semi-sweet beverage and you expect your yeast to create 13% ABV, you need to give them more sugar than they can eat, OR create a dry beverage and back-sweeten. Assuming you do the former, you need more than 100 gravity points. Assume 34-35 points/gallon from each lb of honey (it will vary a bit). Assuming you use 12 lbs (1 gallon) of honey and make a 4 gallon batch, your OG will come somewhere around 1.100 - 1.105: $(35 \times 12 / 4) = 105$ gravity points. This isn't really enough residual sweetness for semi-sweet, so we either need to add more honey or make a smaller batch. Let's assume 3.5 gallon batch instead. $35 \text{ppg} \times 12 \text{ lbs} / 3.5 \text{ gallons} = 115\text{-}120$ gravity points; OG approx. 1.115 - 1.120.

If this yeast stops working at 13% I'll have a FG of approximately 1.015 to 1.020, which probably gives a high side of semi-sweet impression. I could also give the yeast 100 gravity points, let it go dry, and then back-sweeten with honey until FG is 1.015. Back-sweetening will take a little more time to smooth out and not seem "raw" and unfermented, but does work well.

So what do I do?

- 12 lbs (1 gallon) of honey – any honey will do, but for your first use wildflower, orange blossom, or tupelo.
- 2.5 gallons of water – Wichita tap water + campden tablets works fine.
- Dry white wine yeast – Lalvin D-47 for straight mead, Lalvin 71B for fruit mead. 2 packs, about \$1 each.
- Fermenters (you're going to sanitize them, right?) – I use a 6+ gallon primary and a 3 gallon secondary.

Those are what you NEED. Everything else is somewhat to completely optional. Honey/water/yeast creates a “show mead” which uses no nutrients, but that is not recommended for beginners, so I do this:

- ½ teaspoon calcium chloride – I preboil my water and dissolve this in it and let cool in the fridge
- 10 grams of Lallemend Go-Ferm. Added to sterile 110F water and the yeast is added at 105F to rehydrate
- 2 teaspoons Diammonium Phosphate, or DAP
- 1 teaspoon Fermaid-K (this and DAP are mixed together and I'll feed it to the yeast in ¼ increments.)
- Mix-stir – invaluable at mixing honey into water, aerating the must, and degassing (later)
- 2 grams of potassium carbonate – added at pitching or on the second day to feed yeast and raise pH.

I ferment at close to 60F, usually in an unheated basement room in the winter. Fermentation will go slower at this temp. You may want to initially start fermentation closer to 70F to get it going before lowering it. 71B works faster than D47 and creates some interesting esters. If you cannot keep the temp below 70F, I recommend 71B as D47 starts throwing fusels at that point.

When pitching rehydrated yeast I add ¼ of the Fermaid-K/DAP mixture and 2 grams potassium carbonate. The second day I degas the mixture using my mix-stir, and then add another ¼ of the mixture. **IMPORTANT:** be careful and start slow when you degas your mead. CO₂ is toxic to yeast but you don't want a mead volcano. Adding nutrients and then degassing is a sure way to end up with partially fermented honey all over your floor – I repeat: degas and THEN add nutrients. This is why I use such a big fermenter for a 3.5 gallon batch.

I degas the must 2-3 times per day. Do it at least once.

On the third day I degas and add another ¼ of the nutrient mixture.

I check gravity daily with my refractometer. There are programs online that will calculate FG from this.

When fermentation is 1/3 complete I add the last of the nutrient. I continue to degas through at least half of fermentation, which can take 1-2 weeks. When finished I check gravity with a hydrometer; usually my refractometer readings have gotten me within a point or two.

Once complete and after most yeast has flocc'd out, I rack into a sanitized 3g Better Bottle. Note that I've sized this batch to completely fill my secondary, as we no longer want oxygen in there! Top off with a small amount of sterile water if you have to.

Give it some time. It'll be drinkable in weeks, and will clear in months. Make a lot of mead and you won't be in a hurry to drink it. You can use various fining methods if you want to clear it faster. Fruit meads always seem to clear very fast.

After you've experimented with D47 and 71B, talk to me about other yeasts to try like Wyeast Forbidden Fruit or Sweet Mead.

What if I want to add fruit/spices?

Adding fruit to make a melomel will likely speed up your fermentation, due to the increased nutrients in the fruit. You will also get some acid and perhaps tannin from the fruit. I recommend you add most if not all the fruit during primary fermentation, and to use a bucket so you can remove the fruit after a couple weeks. Bigger and sweeter meads can handle more fruit, but be careful to not just make a fruit wine. If you are not satisfied with the fruit character you can add some to secondary. Be aware that if all the fruit is added after fermentation that the resulting melomel may have a raw fruit character that some judges don't like. Degas even more often with melomel, which is called "punching down the cap" in this case.

I don't recommend adding spices until fermentation is complete. You can always add more, but it is difficult to remove excess. Experiment with small volumes before you add something to your entire batch! Be aware that spices often add bitterness or astringency/tannin.

When creating a high alcohol mead the yeast will stop on their own. Rack a few times and you can back-sweeten with little fear of the yeast going back to work. If you ferment to dryness but below alcohol tolerance level, be aware that the yeast are just resting, and back-sweetening without stabilization will just make them go back to work!

Campden tablets (adding sulfites) and potassium sorbate together will generally stabilize your mead and keep yeast from going back to work. Follow the directions and be aware that pH of your mead will affect how much is necessary. Note they will NOT stop an active fermentation.

I created this mead, but it kinda sucks...(actually this goes for cider too)

Well, yeah, we haven't fixed it yet.

Remember that talk on balance? It would be unreasonable to expect your final product to be perfect without tweaking it. Perhaps your yeast was really happy, and kept eating until 16% ABV and FG = 1.006. This isn't very sweet, and gives an alcohol-dominant mead. (dry + high alcohol together can be kind of harsh!) So take a sample of your mead, and divide among small glasses. Slowly add some honey to each glass in increasing amounts. It is good to measure gravity of each sample so you know what you are aiming for. Taste, and taste some more, and don't make any plans to drive. Use this method to determine how much sweetness the entire batch needs and scale up from there. Cider usually needs apple juice/concentrate to sweeten, not simple sugar. Note that if your yeast is just resting that you must stabilize before back-sweetening...

Or perhaps your beverage is flabby, with no acid? You can add acid blend or other acid sources to give some "zing" and balance that sweetness and provide some structure. Tannins from grape skins can be added too. As with honey, it is good to test on a small amount first! That apple mead (cyser) is a bit one-sided and tart? – a touch of honey and some cinnamon oil may help balance it, and perhaps a touch of vanilla to soften/round out that sweetness?

Occasionally I'm unhappy with the excessive alcohol content of my finished sweet mead. You can always water it down! For this you are much better off using de-oxygenated (boiled and cooled) water, but if you're planning to drink it right away, there should be little negative oxidation with using bottled distilled or spring water. I don't ever use plain tap water for this.

Once you've created a lot of mead you can employ my favorite tweak, which is BLENDING. Too sweet? – blend in some dry mead! Too much cinnamon? – blend in an un-spiced batch. Don't be afraid to throw away seriously bad batches, but if it is just a component of balance that is off we can very likely save it.

A few words on cider...

We don't live in an area with an abundance of good apples, at least not for cider. The ones you see in the store are largely "dessert apples" and not great cider-makers. These apples have low acid and very low tannin, and create boring beverages with little character. (there are exceptions; Honeycrisp apples make great cider)

So, if you do not have interesting apples, I recommend you do interesting things with your apples.

White wine yeasts used for mead are commonly used to create cider, but all will ferment apple juice to complete dryness, with little character left. Let's go simpler than that. Let's also set some limits to start – cloudy cider drinks just fine, for instance!

Here's a simple beginner recipe:

- 2 gallons store-bought apple juice. Use only 100% juice, with Vitamin C the only acceptable additive.
- 2 gallons pasteurized apple cider (NO SORBATE!)
- 1 package Wyeast 3711 French Saison - if fresh you can pitch it directly; if you need to make a starter I get half my gravity from apple juice and the other half from DME. The tart nature of this yeast works really well with apples. FG will end up somewhere around 1.005; dry but with some sweetness.
- If you want to raise the gravity a bit, add one can of frozen apple juice concentrate.
- Ferment at low room temp, upper 60's to lower 70's. Bottle condition after a few weeks, 2-2.5V.

Those of you that keg are in luck. You can safely add sugar to your keg and create a sweet cider. Creating sweet bottle-conditioned cider (or mead for that matter) is a tough/dangerous proposition. If the above cider is too dry for you, you can add some unfermentable sugars like lactose or an artificial sweetener like Splenda (a little goes a long way, I'd use maybe 0.25oz with my priming sugar on this recipe).

Other beer yeasts to try:

- Wyeast 1968/White Labs 002 – the Fullers strain makes a great cider
- Wyeast 3726 Farmhouse – my favorite, but a seasonal at best offering
- Wheat beer yeasts – Wyeast 3068, 3333, 3056.
- Wyeast 1728 Scottish – I haven't tried this one but supposedly good

The Belgian/farmhouse yeasts can go a bit warmer. Scottish/English/wheat yeasts are best generally fermented in the low 60's range. Beware of oxygen; the next natural step in cider is apple cider vinegar...

Search natural food stores for "fancy" apple juice of varieties that make good cider – Honeycrisp, Gravenstein, Newtown Pippin, etc. You may also experiment with adding ½ lb of turbinado sugar to your recipes.

If clarity is important to you, let the juice sit for several hours with an addition of pectic enzyme before pitching yeast. Note that pasteurization will set some pectins and thus that may not all clear. Time will clear most ciders.

It is up to you whether you add any yeast nutrients. Belgian yeasts tend to rip through apple juice with little help. Some others may not create a clean cider without help, and will produce quite a bit of sulfur. Be patient, and create a lot of small batches to see what you like.

As you get better at this you can experiment a bit. Nutrients help yeast but also mean your finished product will be more dry. Withholding nutrients (mostly nitrogen) is one way to create a sweeter cider. This is easiest with organic apples where no nitrogen fertilizers were used. By crash cooling cider you may also be able to stop fermentation with some residual sweetness remaining; this is much easier with highly flocculent yeasts.

If you have access to unpasteurized fresh-pressed apple juice and want to create a spontaneously fermented beverage talk to me!