The Beekeeper's Corner

Simple Mead

Making Mead

Introduction to Mead Making

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THE Beekeeper's CORNER PODCAST

Presentation Topics

- Unlocking a Successful Process
- Some Mead Making Terminology
- Ingredients and their Role
- Nutrients – Why to use them
- Factoring in Add-Ins
- Yeast Options
- Workspace > Crafting Mead Process
- Basic Mead Recipe Explained

Learning to "MEAD"

- **There are two paths…**
  - Put honey and water in a jar, and make mead
  - Do research, labor over the process, and then make mead

Which are you?

- If you chose the latter, then this presentation is for you
- If you are the former, perhaps this presentation will at least fill you in on what you are missing

What is Mead

Mitigating the Prospects of Poor-Quality Mead

Success with Mead

❑ Luxurious Elixir or Jet Fuel

- If you have ever tasted homemade mead, it is often *JUST OK*.
  - As consumers, we are spoiled; We can have premium beverages from a liquor store, and they are consistently high quality.
- *"Just Ok", is lackluster, especially considering as beekeepers understand* ***the value of the premium ingredient*** *> HONEY*
- *Our primary objective is to have* ***a drinkable better than average mead*** *and* ***avoid Jet Fuel*** *at all costs.*

A Very Likely Path to Luxurious

- With attention to detail > ~~No Jet Fuel~~

What if we could follow a recipe, or at least a process, that will yield an above average mead, and likely give us an exemplary one > ~~No Jet Fuel~~

- *It stands to reason that to avoid Jet Fuel is to understand what leads to Jet Fuel; then explicitly follow a process that prevents that.*

Mead Fermentation Basics

- Fermented Honey Water
  - *If you mix honey and water together, you will form a simple syrup.*
  - *In time the natural yeasts present in the environment and the honey will start to ferment the sugars in the honey.*
  - *The **byproduct of yeast consumption results in flavors** and the liquid is transformed into an **alcoholic beverage**.*

Definition

Mead: an alcoholic drink of fermented honey and water.

Definition

Fermentation: a chemical reaction in which a ferment causes an organic molecule to split int o simpler substanc es, esp the anaerob ic conversion of su gar to ethyl alcohol by yeast.

No STRESS Mead

*The **byproduct of yeast consumption results in flavors** and the liquid is transformed into an **alcoholic beverage**.*

- Jet Fuel
  - *The byproduct of yeast consumption gone wrong is Jet Fuel*
- To avoid Jet Fuel….
  - ***Keep the yeast happy.***
    - If there is anything to take away about mead making, this is it.
    - Yeasts that are stressed in the fermentation process lead to off flavors

Much of this presentation will focus on how to prevent the yeasts in your mead from being stressed and creating off flavors.

Mead Terminology

Some key terminology for Mead Makers

Terminology

- **Beneficial concepts and terms**
  - *In order to produce consistently good mead, it pays to learn a few key concepts and terms for mead making.*
    - Learning these terms helps you to keep track of different aspects of the mead making process and whether they are on track

The next few slides will cover some of the more important aspects.

Begin with the end in mind

- When starting out to make a mead
  - *You will want to determine*
    - What will be the final sweetness?
    - What will be the alcohol strength?
    - What characteristics and flavors will be in the mead?
  - *You make a decision and then you choose a recipe that suits the profile of the mead you want to make*
    - Measuring the attributes along the way to get to your final product

How would you measure ‘sweetness’?

- Mead classifications…
  - *What is the standard for Mead Sweetness?*
    - Mead makers have settled on the terms
    - They have also settled on a way to measure (or at least describe) how sweet a mead is.
      - Incidentally, sweetness is mostly independent of the strength, and it is not associated with the ‘fruitiness’ of a final mead as sometimes acidity is considered.
    - At the core of measuring sweetness, is the remaining residual sugars in the final product.
      - This is measured through a process called Final Gravity

Sweetness and Alcohol Content

- Honey (and added ingredients) provide the sweetness
  - *Some of the honey is consumed by the yeast (and converted to alcohol)*
  - *Measuring the sweetness* ***at the beginning, and the end,*** *tells you two things:*
    - How much sweetness is left
    - How much alcohol was created during the yeast consumption

Term: Gravity

- **Gravity** (ratio of density against a reference)
  - *In the premise of making mead, gravity refers to the concentration of honey in the mead.*
    - REFERENCE– The gravity of water is 1.0
    - **When you add honey to water, the gravity increases**.
      - A hydrometer is used to measure the sugar concentration in liquid.
      - Since honey is denser than water, you will see a measurement greater that 1.0
    - When making mead it is customary to take a gravity reading when the mead is started, while it is fermenting, and when it is finished.

Concept

Gravity: Gravity, in the context of mead making, is a measurement of a Meads sugar/water density.

Gravity Measurements

Definition

Must: to start a mead you mix honey and water. This mixture in brewing terms is referred to as a 'must'.

Gravity Types

- *Original Gravity (**OG**)*
  - Original Gravity measurements are taken when the must (honey and water) are mixed together to start a mead.
    - Taking the measurement ensures that you have the right starting sugars for the mead
    - The Original Gravity reading is also instrumental in the eventual calculation of how much sugar has been consumed.
      - This becomes an input to determining how what the alcohol strength is.
      - There is a calculation for this discussed in subsequent slides.

Gravity Measurements

Gravity Types (continued)

- *Final Gravity (**FG**)*
  - The gravity reading taken **at the end of the fermentation** process.
    - The Final Gravity value is the primary input used to classify the sweetness of the mead.
      - It could be noted that a final gravity could be less that 1.0
        - Alcohol has gravity of less then 1 and if there is enough alcohol to offset the residual water remaining then the gravity can be lower than 1.
        - In this situation the resultant alcohol will likely be pretty potent and like *jet fuel*…
- *Specific Gravity (**SG**)*
  - A reading taken at any point along the way in the process. At a point in time…

Gravity Readings

- You use a hydrometer
  - *It has a graduated scale imprinted on the exterior*
  - *You float it in the liquid (wine, mead, etc.)*
  - *It provides you with a reading*
    - This reading you can cross reference to a gauge on how much sugars are in the liquid being measured

Final Gravity (for mead classifications)

Final Sugar Densities

- *Meads are classified how much sugar content they contain **after** fermentation*
- *4 Categories (higher numbers are sweeter)*
  - Dry: FG of 1.006
  - Semi-sweet, or medium: FG between 1.006 and 1.012
  - Sweet: FG between 1.012 and 1.020
  - Dessert: FG greater than 1.020

1.010 to 1.015 is the "*sweet spot*".

This is often just right for most.

Specific Gravity (a quick note)

❑ Specific Gravity Measurements

- *As noted a specific gravity is whatever is noted during any particular reading.*
  - Often mead makers will refer to the first measurement (aka the OG) as a specific gravity.
    - Truthfully, any time you are recording a measurement it would be considered a specific gravity (for that time).
  - SG Readings are Beneficial
    - SG readings can gauge if how much sugars is left for the yeast to consume, or to ascertain if you have achieved a specific sweetness and should halt fermentation.

Measuring alcohol strength

Definition

ABV: Alcohol by Volume (ABV): a standard measure of how much alcohol (ethanol) is contained in a given volume of an alcoholic beverage.

Alcohol Strength

- *Consumers want to know what the potency is of an alcoholic beverage*
  - The mead industry uses a standard measurement for alcohol: **Alcohol By Volume (ABV)**
  - The alcohol content in a mead is a byproduct of how much sugar has been consumed by the yeasts during fermentation.
- *ABV Measurement*
  - One can compare the difference between the original gravity and final gravity to determine how much sugar has been consumed.

The calculation for ABV is [% ABV = 131.25 * (SG – FG)]

Mead Alcohol Strength Terms

- Three terms are commonplace
  - ***Hydromel*** *(aka session)..... (ABV) level 3.5 – 7.5%*
    - Alcoholic potency is akin in strength from a light beer to a conventional beer
  - ***Standard Mead****.....(ABV) level 7.5 – 14%*
    - Alcoholic potency is akin from a conventional beer to a table wine
  - ***Sack Mead****.....(ABV) level greater than 14%*
    - Alcoholic potency from a table wine to a vodka, rum, brandy, etc.
      - It is common for these liquor examples to be around 35 to 40% ABV.

Some other Terms

Lees, Flocculation, and Autolysis

- ***Lees*** *– When the yeasts die and collect on the bottom, the dead yeast strata found on the bottom of the container is called Lees*
- ***Flocculation*** *– Process where the yeast cells clump together and fall to the bottom*
- ***Autolysis*** *- Autolysis is the process of the yeast cell breaking down after fermentation.*
  - This breaking down (decomposition) can result in off flavors.
  - Generally, you have about 3 weeks after sediment forms on the bottom of your fermenter to rack without autolysis.

Demystifying Ingredients

Honey + Water + Yeast + Nutrients + Flavorings + Add-Ins

Drinking Mead

- A reminder that experiences vary
  - *Meh, Ok, Awful – These are not what we are looking for*
    - If you have sampled meads over time, then it is likely that you have had good, bad, and excellent meads.
    - When you want to make mead; it stands to reason that **you want to make excellent mead**.
      - This is **especially true when considering the cost and effort** to produce the pounds of honey typically employed
  - *Excellent Mead*
    - To make excellent mead, especially batch after batch, it requires know how

Old School or New School

Modern: *This process will explore the 'modern' way of doing things. For a new mead maker, it is likely to be a more successful, or at least more predictable, path to follow*

Two Paths

- *Traditional*
  - Traditional mead is mead made the old way. With know how, patience, expertise and experience many can make an amazing mead the tried-and-true way.
    - If you know a mead maker that does this appreciate them, they are truly a craftsman
- *The Modern way*
  - Modern mead makers control the process, technique, and applied chemistry to control fermentation (speed, intensity, and phenol/ester profiles), clarification, and stabilization, shortening time to maturity to produce a product of an equal quality.

Some pundits, books, internet sites, blogs, podcasts, simply say all you need to use to make mead is **honey and water.** It has been done this way for centuries so keep it simple.

On the opposite end of the spectrum are mead makers talking about mystery ingredients, like Go-Ferm, Fermid-O, Fermaid-K, DAP and more. How these are required for mead?

Confusion Abounds

Ingredients

❑ Honey + Water

- *Mead has been made with honey and water for centuries.*
  - Natural yeasts in the environment, and in the honey contributed to the fermentation process naturally.
  - Often times a mix of simple honey and water would yield an alcoholic beverage that was pleasant to taste. **Sometimes it works and other times it doesn't**.
  - The Vikings did not have the science we have so they simply have to live with the serendipitous outcome.
- *Still > **Honey + Water** sometimes yielded poor outcomes: **Jet Fuel***

Ingredients (flavoring and add-ins)

Definition

Must: to start a mead you mix honey and water. This mixture in brewing terms is referred to as a 'must'.

- **Honey + Water + Flavoring & Add-Ins**
  - *Likely began with wine making and other pursuits.*
    - Mead makers found ways to fix problems or enhance flavors through add-ins
    - Of course, through the knowledge of wine making; grapes, other fruits, and other flavorings were added to meads as a natural progression of things.
      - It is not uncommon for mead makers to add **raisins** to the **Must**
  - *Still > even with flavorings and add-ins: Jet Fuel*

Raisins: *We will find out shortly how serendipitous this was* – they didn't know the science, but it turns out it was very beneficial, and they reaped the benefits of a more viable outcome.

Ingredients (Yeast)

- Honey + Water + **Yeast**
  - *Control the yeast, **steer the outcome**.*
    - In time, likely with science and with knowledge of making wine and/or bread, mead makers came to know **if they inoculated their mead with specific yeasts**, they could get better control of the outcome.
    - Specific strains of yeast behave differently, and it turns out that with testing, trial and error, and the right conditions, you could use this technique to yield more consistent and successful product.
      - If you got this right, you could forgo flavorings and add-ins….. *Less $$$ and complexity*
  - *Honey + Water + Yeast > **sometimes**, but not as often : **Jet Fuel***
    - Still, something was missing

Ingredients (Nutrients)

- Honey + Water + Yeast + **Nutrients**
  - *There is a relatively 'new' way of thinking*
    - Modern mead makers not only choose the yeasts to use, but they also feed the yeast with supplemental **Nutrients**.
      - Honey is a great food for yeasts, but it is lacking: Namely **Nitrogen** and minerals
      - **When the yeast does not get what it needs, the byproduct is undesirable compounds.**
      - Sometimes these off-putting compounds would appear in young mead but dissipate after time.

Honey is a great food for yeasts, but it is lacking: Namely Nitrogen and Minerals

Ingredients (Nutrients)

- Honey + Water + Yeast + **Nutrients**
  - *There is a relatively 'new' way of thinking*
  - Unlike grapes (wine) or barley (beer), honey is a nutrient-poor substance.
    - It lacks some of the necessary compounds and elements that yeast needs.
      - Ideally a level of **150-200ppm** of **nitrogen** should be present.
      - **Honey** falls short with short with an average of around only **30ppm**

Term

PPM: Parts per Million (PPM): a commonly used unit to represent concentrations for small amounts.

Ingredients (Nutrients)

Assimilable is a fancy industry term for 'taking something in'

- Honey + Water + Yeast + **Nutrients**
  - *Nitrogen Need - Yeast Assimilable Nitrogen (YAN)*
    - The higher the initial concentration in the must, the more YAN required.
      - The Low levels of YAN in a must can put undue stress on yeast cells and significantly hinder their performance.
      - In some cases, yeast may create unpleasant flavors and/or aromas or even stop fermenting.

mgN/L:

This table infers the maximum concentration of nitrogen that can be consumed from the dose

Nutrient	Dose 3.125g	Dose 6.25g	Dose 7.5g	YAN Source
Dap	25 mgN/L	50 mgN/L	63 mgN/L	Inorganic Nitrogen
Fermaid-O	12.5 mgN/L	25 mgN/L	30 mgN/L	Inorganic nitrogen (from DAP) and organic nitrogen from autolyzed yeast
Fermaid-K	6.5 mgN/L	13 mgN/L	16 mgN/L	Organic nitrogen from autolyzed yeast
Go-Ferm	3.75 mgN/L	17.5 mgN/L	10 mgN/L	Organic nitrogen from autolyzed yeast

Ingredients (Nutrients)

- Honey + Water + Yeast + **Nutrients**
  - *How adding Nutrients benefits the mead making process*
    - As we are learning, when you ferment honey and water alone, **the yeast will often become stressed**, stops fermenting too soon, and start producing undesirable off-flavors (Jet Fuel)
      - This commonly appears as burnt rubber or rubbing alcohol flavors in the young mead.
    - These can be avoided altogether by **treating your yeast well** and keeping them healthy at the beginning, *and throughout*, the fermentation process.
      - As an added benefit, supplying yeast with proper nutrition for a healthy fermentation results in a **cleaner tasting mead**, and one that is **ready to consume in a shorter amount of time**.

Ingredients (Nutrients)

❑ What Nutrients?

- *Earlier slides presented some of the more commonplace nutrients being used: Go-Ferm, Fermaid O, Fermaid K, DAP, etc.*
  - These nutrients are present to bolster nutrition and energy needs of the yeast.

What follows is a quick primer on these nutrition supplements

Ingredients (Nutrients)

❑ Go-Ferm, DAP

- *Common Yeast Nutrients and Yeast Energizers*
  - **Go-Ferm** - Go-Ferm Protect is a natural yeast nutrient that is added to the yeast hydration water before adding your selected yeast strain.
    - Go-Ferm provides your yeast with the proper sterols, unsaturated fatty acids and micronutrients needed to begin fermentation in optimal shape.
    - Go-Ferm contains a balance of micronutrients developed to enhance fermentation kinetics and to help avoid fermentation problems like hydrogen sulfide.
  - **DAP** - DAP (Diammonium Phosphate) is used as a fertilizer. DAP is also used as a yeast nutrient in winemaking and brewing mead

Ingredients (Nutrients)

In the same way that farmers sometimes use fertilizers to bolster soil for feeding plants, mead makers have employed supplements to feed yeasts

❑ Fermaid K, Fermaid O

- *Common Yeast Nutrients and Yeast Energizers*
  - **Fermaid K** - Fermaid K is a blended yeast nutrient that supplies ammonia salts (DAP), free amino acids (organic nitrogen from deactivated yeast), sterols, unsaturated fatty acids, key nutrients (magnesium sulfate, thiamin, folic acid, niacin, biotin, calcium pantothenate) and inactive yeast.
  - **Fermaid O** - Fermaid O is a newer formulation of the same Fermaid K that winemakers everywhere have learned to trust their ferments to. The main difference in composition between the two, is that the Fermaid O has replaced the inorganic DAP with an **organic** source.

Ingredients (Nutrients)

❑ A quick aside about DAP

- DAP formulations from manufactures include the phosphate and other added ingredients. A more common added ingredient is *UREA*.
  - Products are labeled as "DAP" but **some in the marketplace are UREA HEAVY**.
  - Unmetabolized UREA after fermentation **creates carcinogens** and is **banned** in US commercial winemaking but not homebrew.
  - Visually the extent of UREA in a product is noticeable by what it looks like the in granules
    - Urea crystals are ball-shaped and opaque white. It is therefore easy to tell what concentration your mixture has in it.

Ingredients (Nutrients)

❑ Choosing Nutrients

- *What nutrients you choose, if any, are personal preference.*
  - Some will opt for a more natural path (Example: organic combination of Fermaid O and Go-Ferm) while others will use what serves them best.
  - Given this is likely to be a more mainstream preference for this application we will go this way too.

❑ Nutrients over time:

- *There is one more dynamic to cover – timing of nutrient additions*

Ingredients (Nutrients + Time + SNA)

Concept

SNA: Staggered Nutrient Additions.

- **Honey + Water + Yeast + Nutrients *over {Time}***
  - *Add Yeast Nutrients & Energizers* > *Solve the Problem* (kind of)
    - Mead makers found the gap and filled it through adding Nutrients.
      - Happy yeast made happy mead- *kind of.*
      - Mead makers were still experiencing some off batches.
    - Stressed Yeasts
      - Yeasts are live entities and as such they have different characteristics
        - Some pig out all at once, while some are grazers – *and need to be fed throughout the fermentation*
      - Miss the mark on providing nutrients > **Jet Fuel**

Ingredients (Nutrients + Time + SNA)

Definition

Pitch: the point at which the yeast is added to the must.

- **Honey + Water + Yeast + Nutrients *over {Time}***
  - *Staggered Nutrient Additions (SNA)*
    - Spreading out the nutrient additions over time is what they landed on.
    - Feed all at once – or feed over time > it all depends on the yeast being used
  - *Nutrition Addition Schedule*
    - The addition schedule is somewhat standardized
      - Mead makers often talk about the following intervals > 24, 48, 72 hours (after **pitch**)
      - A fourth nutrient addition is made at the 1/3rd sugar break or on Day 7, whichever comes first. [More on this in a bit]

https://gotmead.com/blog/the-mead-calculator/

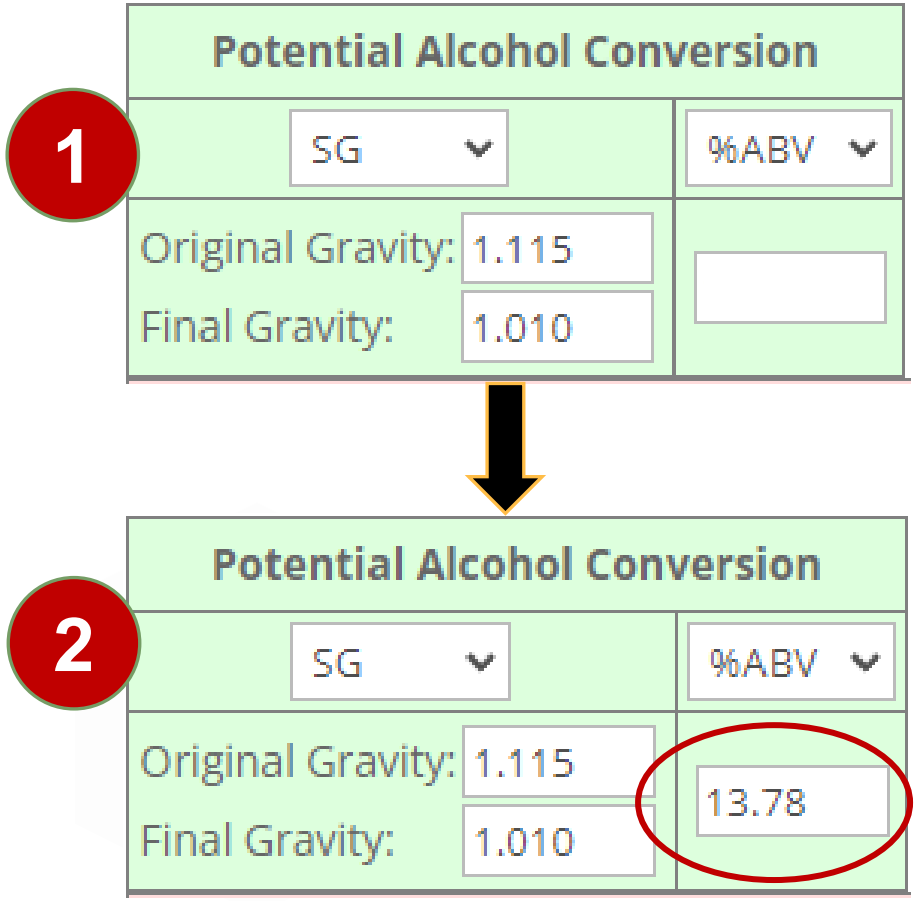
The MEAD BATCH Calculator

- Two Steps:
  - *1. Calculate the Gravities (OG/FG) Based on ABV*
    - Reminder Formula: 131.25 X (OG-FG) = ABV
    - Example: If you want an Alcohol By Volume of 14%.
      - Use the calculator, enter the Finish Gravity, and the target ABV (14%) and the Got Mead calculator will tell you the starting GRAVITY
        - This will also let you know how much sugar is needed which works for the next step
  - *2. Determine how much Honey*
    - Using the GotMead calculator, enter the ABV and batch size. Click Calculate and it tells you how much honey to use.

Example (GotMead Website)

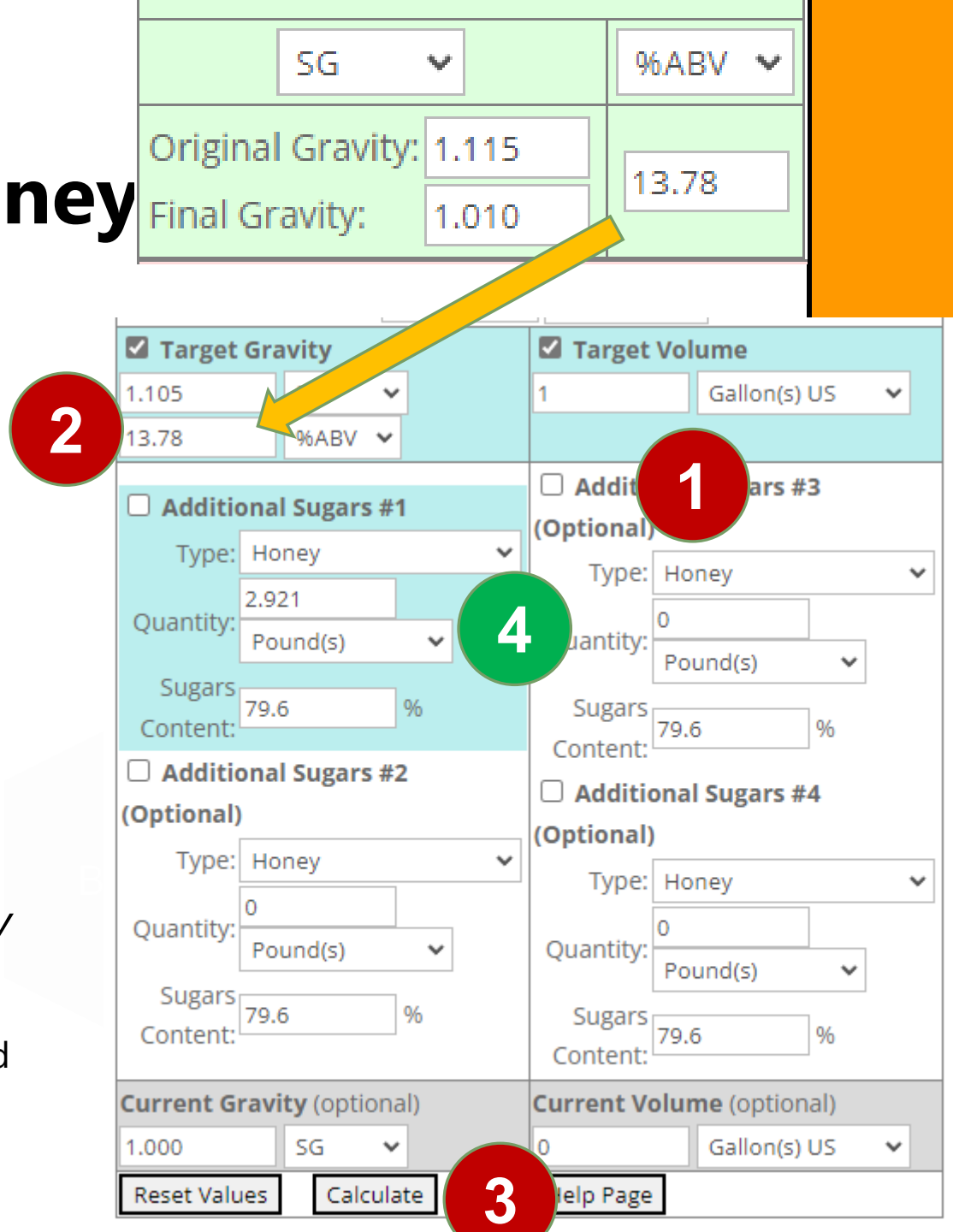
❑ Using a Web Calculator

- *1. Using this tool; Enter the Original and Final Gravities, and click somewhere on the page.*
- *2. The form calculates the values and provides you with the projected ABV*
  - Takeaway, in this case, if yeast consumes .105 Gravity (115-105), then you get 13.78% ABV



Got Mead (How Much Honey

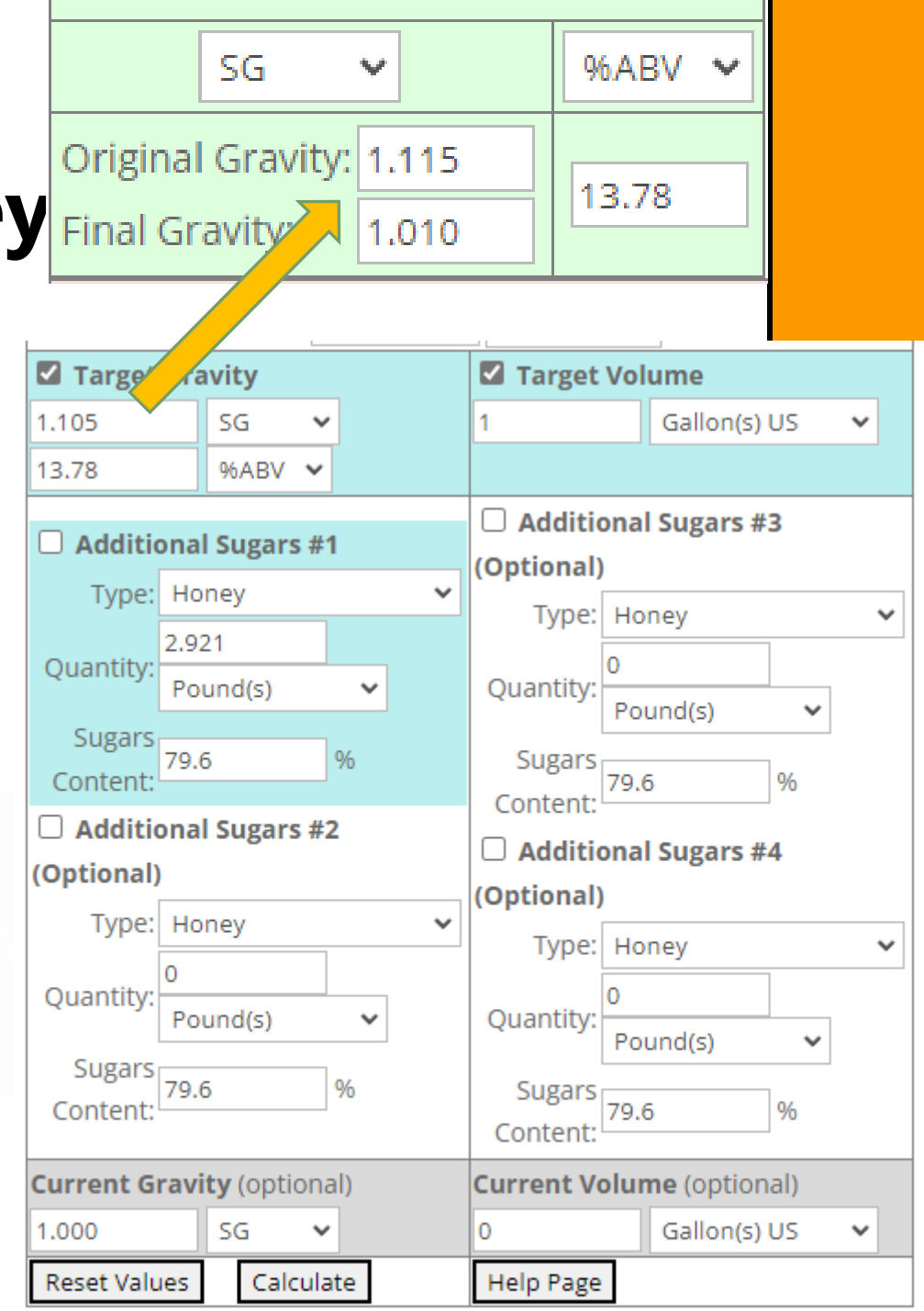
- Determine the Honey for the recipe
  - *1. Specify the Target Volume (1 Gallon)*
  - *2. Enter the ABV (13.78)*
    - Calculated from previous step
  - *3. Click the Calculate Button*
  - *4. The Calculator updates the amount of honey required*
    - Note: This can be changed to ounces, pounds, fluid ounces, etc.



Got Mead (How Much Honey

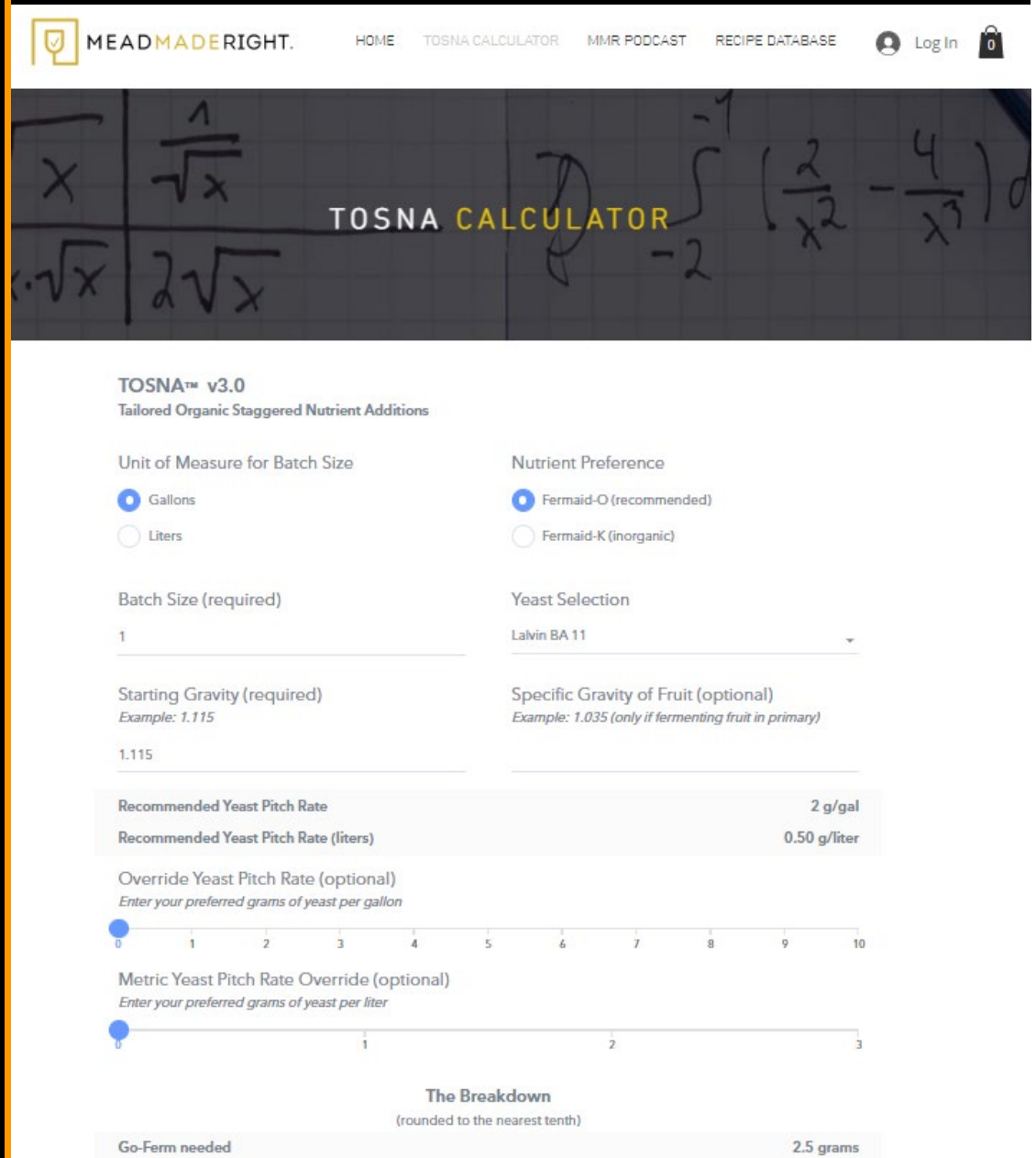
❑ Quick Note

- *If you subtract the Final Gravity from the Original Gravity you get .105.*
- *When you hit calculate, the SG lists in the Target Gravity box and note that it is 1.105*
  - 1 is for the water
  - .105 affirms that the gravity needed for density matches



Tailored Organic Staggered Nutrient Addition (TOSNA)

https://www.meadmaderight.com/tosna-calculator



TOSNA Calculator

❑ How it works

- *You enter key information into the calculator, and it provides the details of the nutrient add-ons and in what amounts as well as when to add it.*
  - It has the flexibility to account for more advanced calculations based upon additional information that may apply

Example: TOSNA Calculator

❑ Determine Additions

- *1. Chose the Unit and Value*
  - (1 Gallon)
- *2. Choose the Nutrient*
  - Fermaid-O
- *3. Enter the Starting Gravity*
  - 1.115
- *4. Choose the Yeast*
  - Lalvin BA 11

TOSNA Calculator (cont.)

Additions and Schedule

- *It lays out the initial Nutrient add-in (Go-Ferm) and how to dilute it* *(in this case with 50ml water)*
- *It spells out the yeast volume by weight*
- *It spells out the total Nutrients* *(in this case we were using Fermaid-O in our example)*
- *And it tells you that in the four additions, what the grams should be for each addition* *(1.7grams)*
- *It also tells you how to measure the last sugar concentration (1.075) for the final addition*

The Breakdown

(rounded to the nearest tenth)

Go-Ferm needed	2.5 grams
Water to dilute Go-Ferm	50 ml
Yeast needed	2 grams
TOTAL NUTRIENT NEEDED	6.8 grams
Each nutrient addition (4 total)	1.7 grams

SUPPLEMENTAL DATA

1/3 Sugar Break	1.075
Starting Gravity Converted to Brix	27.01
Fruit Sugar Percentage	0

Ingredients (Add-Ins)

- Honey + Water + Yeast + Nutrients + **Add Ins**
  - *A few quick thoughts about Add-Ins*
    - Once mead makers make traditional mead (Simple Honey + Water + Yeast), they soon will venture into other mead types. That often means **Add-Ins**.
      - Before elaborating on choices and impacts - A quick aside about RAISINS:
        - If you caught it before we said that it was serendipitous that mead makers learned to add raisins to the must. It turns out that raisins supplemented the yeasts by providing **nutrients**.
      - Incidentally, many modern mead recipes will tell you to use raisins in the beginning and you do not need to any nutrient add ins. This is somewhat a viable way to go as the raisins act as a stand in. **Turns out however they are not very rich in nutrients.**
        - *Sometimes it does not*. As we have learned, certain yeasts may need nutrients that the raisins are lacking, or the raisins do not feed them long enough.

Raisins: *coming back to the point about raisins called out earlier*

Ingredients (Add-Ins)

- Honey + Water + Yeast + Nutrients + **Add Ins**
  - *Add-Ins*
    - Whatever **Add-Ins** you choose supplement the recipe can **impact the nutrient load** required to feed the yeast. As such whatever you add should be factored into the formula.
  - *Calculators*
    - Mead Makers have figured out how to calculate recipes that address the amount of nutrients to add for a given batch size.
    - More advanced mead making calculators can ***also* factor in** what ***add-ins*** you are using and make adjustments to accommodate how much nutrients they contribute to the formula. This results in lower "nutrient" additions.

Ingredients (Yeast)

- Honey + Water + **Yeast**
  - ***Coming back to yeasts****, there is a bit to expand upon.*
    - The selection of yeast has a profound impact on the outcome.
    - Yeasts, being living organisms, vary widely in characteristics and behaviors.
  - *Characteristics and behaviors expanded*
    - From the type of yeast (dry vs. wet) employed, nitrogen demand, temperatures that they optimally work with, clarity of the product on finish, there are several factors to consider.
    - The good news is that there is a lot of information available on yeasts and their characteristics – as well as solid recommendations

Ingredients (Yeast)

- Honey + Water + **Wine Yeast**
  - *Yeast Strains chosen for wine are superior for making mead*
    - Bread yeasts are not in tune with the job at hand – one of the bigger problems being they do not ferment the volume of sugars well or completely.
      - The result of yeasts consuming sugars > they create alcohol, CO2, enzymes, oils, acids, etc.
      - These are the things that impart mouthfeel, taste, and acidity, and other characteristics in your mead.
      - In trying to complete the job bread yeasts become stressed and produce off-flavored enzymes and fatty acids.

Ingredients (Yeast)

- Honey + Water + **Yeast (Wine)**
  - *Yeast Strains chosen for wine are superior for making mead*
    - Bread yeasts are not in tune with the job at hand – one of the bigger problems being they do not ferment the volume of sugars well or completely.
      - Bread Yeasts lack the ability to fully process the sugars and often stop early. In contrasts wine yeasts are tailored to do the job and have the full ability to process the sugars into alcohol (referred to as an alcohol tolerance level).
    - Cloudy Meads
      - Bread yeasts do not settle well and that results in a cloudy mead.
    - Wine yeasts are lock step with making mead and bread yeasts should be avoided.

Ingredients (Yeast)

- Honey + Water + **Yeast**
  - *Yeast Properties and performance*
    - Resources are available that tell you about critical factors of yeast performance and after review a selection can be made for one that is suitable for the mead being produced.
  - *Selection Criteria*
    - Temperature limits (high and low), Nitrogen needs, Sensory Contributions, packaging (dry, liquid), Alcohol Tolerance, Flocculation, and more
    - In the next few slides, we will expand on some of these.

Yeast Performance (Flocculation)

Definition

Flocculation: form or cause to form clumps or masses

❑ Product Clarity

- *Yeasts will settle when they are finished fermentation*
  - As a yeast comes to end of life, one of its exhibited characteristics is whether or not it will dissipate and sink to the bottom of a mead formulation (to be strained off later)
- *Tendency to Flocculate*
  - Yeasts are rated for their behaviors to flocculate. (Typical: Low, Medium, High)
  - Ideally spent yeasts will fall to the bottom and leave a clear liquid to pull of and bottle.

Yeast Performance (Lees)

Definition

Lees: Lees are leftover particles from **autolysis**, which is the self-destruction of yeast cells by enzymes created from fermentation.

- **Residual mass at the bottom a ferment**
  - *The residual settled material is referred to as Lees*
    - When the yeast has consumed all of the sugar in the Mead, it drops to the bottom of the fermentation vessel.
      - In wine making anything that settles (bits of grapes, stems, and so on) is called the gross lees. This would apply if you are adding additional ingredients in your mead.
      - In Wine and Mead making the collection of fine particulate matter has a silkier consistency and is referred to as the 'fine lees'.
      - **If mead is allowed to age on the lees, it does impart flavor in the form of a nutty, yeasty flavor profile.**
    - Yeasts sometimes indicate their lees properties.

Yeast Performance (Alcohol Tolerance)

❑ Yeast Percent ABV Tolerance

- *Yeasts are assessed for the amount of sugars they can consume*
  - Yeast providers will provide a guide for the stamina of the yeasts and their ability to convert sugar to alcohol (the brewing term for this conversion is attenuation)
  - The alcohol tolerance measure will dictate the sweet/dry characteristics of the mead.
  - As part of choosing your yeast, you will want to confirm this number and ensure it has the ability to process all of the sugars you need to get your final result.
    - Ranges for yeasts can be as low as 10% and as high as 20%. It seems typical for them to be between 14 and 18%.

Yeast Performance (Other Items)

❑ Yeast Temp Range & Storage

- *Many are familiar through bread yeasts, that yeasts have a zone which they perform best.*
  - Each yeast will be marked for the Temperature in which they can operate. Most operate in a range of 60° to 90°F but work best in cooler temps right above 60.

❑ Yeast Dry/Liquid

- *Yeasts are sold in two primary forms, dry in packets, and in a liquid suspension. Most for mead applications will be the dry form.*

Yeast Performance (Temperature)

❑ Yeast Temp Range & Storage

- *Many are familiar through bread yeasts, that yeasts have a zone which they perform best.*
  - Each yeast will be marked for the Temperature in which they can operate. Most operate in a range of 60° to 90°F but work best in cooler temps right above 60.
  - Mead is usually best made in winter, as it seem easier to find a cool dark place to allow the mead to ferment.
  - Ideally temps should be close to 60°F and one should avoid temperature swings, especially fast temperature changes.

Ingredients (Yeast)

- Honey + Water + **Yeast:** ***some recommendations***
  - *D47, 71B – Sweet/Semi-Sweet Traditional and Show Meads*
  - *K1-V1116, RC212 – Dry Traditional Meads*
  - *71B – berry melomels*
  - *K1-V1116 – Cysers (although EC-1118 and D47 well too)*
  - *RC-212 – dark grape pyments*
  - *DV10, EC1118 – sparkling mead base*
  - *K1-V1116, D47 – Metheglins*

Ingredients (Yeast)

- **A quick note about – *which* – yeast to use**
  - *A study onto itself*
    - You can pick a yeast, by looking at its attributes, and do quite well.
    - You can also analyze several yeast strains for how they will perform and pick one that is optimal for what you are doing- and in time, if you do enough of this, you may learn by feel.
    - What yeast to pick, optimally, and why is a whole study onto itself.
    - For the purpose of this discussion, we are going to select a good candidate that will work. Is it the optimal, penultimate one, maybe it is maybe it is not, but it will produce a good mead.

Building your first Mead

Prepping the Workspace and Making the Mead

Mustering to Mead

- **Pick a place**, pick a process
  - *Kitchens – most of us will work in a kitchen*
    - It has ready access to sink, and its surfaces are helpful to work on.
    - It may or may not be clean enough, and that is not meant to be a slight.
      - To be clean enough it must be scrupulously clean of microorganisms
      - For that mater so must you and the environment. You should shower, be well groomed and ensure there are no windows blowing in micro-organisms on the wind – no pets present and so on.
    - There is a detailed, well written primer on sanitation on the Got Mead Blog and it is a prerequisite to explain what is required (it has a lot of good tips)

Mustering to Mead

- Pick a place, **pick a process**
  - *Mise en Place*
    - The process of making mead is two things.
      - It is a several step process, And it is a several stop process done in phases
    - Initial, Ongoing, Final Processing
      - To make mead you will first assemble the ingredients, sanitize, make a must, and finish of that stage.
      - Periodically you will do maintenance through the course of mead development
      - And in the end, you will finish the batch, bottle the mead, and clean up / reset.
    - Practice **Mise en place** each time. Work it through and be prepared

Definition

Mise en place: there is a concept in cooking, developed by the French, to set everything in its proper place before cooking

Cleaning Steps

Cleaning Basics

- *Why Clean*
  - Cleaning rids foreign contaminants that could cause off flavors or food contamination
  - It also reduces the impacts of any wild yeasts and/or bacteria present
- *Three step process*
  - Clean – remove any contaminants
    - Clean dirt, debris, oils, old food or ingredient particles, hair, and any other foreign matter
  - Rinse
  - Sanitize

Cleaning Steps

The Three Bucket Process

- *Bucket 1 = Clean*
  - 5-Gallon bucket with hot water (100 to 160°F) and 1-ounce PBW
    - PBW (powdered brewery wash) used for cleaning equipment and is especially helpful in brewing operations for cleaning off residual sediment and other contaminants
    - It is not FDA safe so you should be sure to rinse it off after use.
    - It is considered a CIP (Clean in Place) solution.
      - Clean in place solutions are used where you do not have to dismantle equipment. This particular product rose to prominence while in use by COORS brewing.
    - Clean dirt, debris, oils, old food or ingredient particles, hair, and any other foreign matter off your equipment before use.

Cleaning Steps

❑ The Three Bucket Process

- *Bucket 2 = Rinse*
  - Rinsing
    - ☐ Fill a bucket with fresh clean water.
    - ☐ Rinse all of the equipment that was cleaned in PWB
    - ☐ Can also rinse in the sink with top water (in a clean sink!).
    - ☐ Refresh the water as needed

Cleaning Steps

The Three Bucket Process

- *Bucket 3 = Sanitize*
  - Sanitizing (StarSan): 1 ounce to 5-Gallons Water
    - > 5-minute contact time.
    - The product is a bactericide and Fungicide. It is designed to foam which aids in the product getting into the nooks and crannies.
    - Residual product is food safe and there is no need to rinse it off.
  - Bleach
    - Bleach can be used. It must of course be thoroughly rinsed so it does not impart any flavors.

Collecting Equipment and Ingredients

Setting Up

- *In preparation for brewing, planning is required*
  - Equipment
    - Equipment is necessary for crafting the mead, maintaining the mead, and finishing / bottling. Details shortly.
  - Ingredients
    - A list of ingredients, nutrients, and other items will have to be ordered or collected
      - Ingredients can all be added all at once in the beginning or in stages along the way
  - Other Items
    - Cleaners, sanitizers, fining agents, and other adjuncts may be considered

Prep Your Homebrew Toolkit

❑ Equipment

- *Brewing mead requires the following equipment considerations:*
  - You will need to mix, weigh, measure, stir, clean, and perform other activities.
    - Carboys, Buckets, Hydrometers, Refractometers, Glassware, Airlocks, Stoppers, Racking Cane, Wine thiefs, tubing, and so on to consider.
    - They can be supplemented with spatulas, pitchers, washcloths, chopsticks, trays, dish soap, measuring spoons/cups, pitchers, corks, caps, bottle brushes, thermometers and more.
  - What you source and use is part of the adventure… kind of like building a kit.
    - Basic equipment will be disclosed during the mead process coming up.

Assemble Your Ingredients

❑ Ingredients and Nutrients

- *In preparation for brewing, you will need to plan*
  - Depending up on what you are making, even for a basic mead, you will need at minimum:
    - □ Yeast: More on this when we get to the recipe we are going to cover
    - □ Nutrients: Go-Ferm and Fermaid O / Fermaid K/ Dap, and other options
    - □ Added Ingredients: *Not going to use any for our basic mead*
    - □ Clarifying agents, etc.

Walking the Overview of the Process

- Think of the mead making routine as a process
- Considered what is needed for each step
  - *Clean, Rinse, and Sanitize anything that will come into contact with product*
  - *Yeast Rehydration step*
  - *Preparation of the Must and Pitching the Yeast*
  - *Maintaining the Mead During Fermentation – Adding Nutrients*
  - *Transferring the mead / Clarification if required / Bottling*

Homebrew Ingredients

Quality Ingredients and Mix-Ins

- *Honey, Water, and other odds and ends to flavor, clarify, feed….*
  - **Water**: A key consideration.
    - Use bottled water or good quality water. **Forgo the tap if you are in a managed municipal system that has treated water.** Good mead requires excellent water.
  - **Honey**: Your mead will only be as good as the honey you are adding.
    - **Use a natural honey, never store bought**.
    - Use one that tastes good off of a spoon. No exotic tastes initially, just a simple basic good tasting honey.

Basics of Crafting Mead

Equipment and Ingredients

Batch Size

- **Start with the end in mind**
  - *It doesn't have to be 5 gallons*
    - 5-Gallons is a lot of mead, expensive, and a risk if you get it wrong.
    - 1-gallon batches are a good way to experiment without spending large sums of money.
      - They also occupy less space while fermentation persists.
    - Adjusting a recipe up from a 1-Gallon batch to a 5-Gallon batch is as simple as multiplying the ingredients by 5.
      - This means if you get it right you can easily scale it up.

Building a Recipe

Start with the end in mind

- *Desired Sweetness & ABV*
  - When you want to make a mead, flavor aside, consider the final sweetness and the alcohol potency.
    - Translating this into formulating a recipe the two corresponding measures are **Final Gravity (sweetness)** & **ABV (Alcohol Punch)**.
    - Consider that we might want at semi-sweet mead and an alcohol potency of wine
    - Semi Sweet Mead: **Defined as final gravity of 1.010,**
    - TOSNA Calculators (MMR) are set to **consume about .100 to .105 gravity**.
      - If we add this to our final gravity target, we can get a number for our starting gravity.
    - Potency of Wine: **ABV about 14%**

sum 1.010 [FG] **+ 0.105** [Consumable] **= 1.115 [SG]**

Honey Recipe – 1 Gallon Batch

1-Gallon Batch – Wildflower Mead

- *Let's assume for our first go we will do a 1-gallon mead*
  - Gravity OG 1.115 / FG 1.010 / 13.78 ABV
  - You will need
    - Honey [3 1/6th pounds] (32 1/2 Fluid Ounces, 1376 grams)
    - Water [3 Quarts] +/- to bring the starting gravity to 1.115
    - Yeast [2g] Lalvin CY3079 (2g)
    - Nutrient: [2.5g] + [5ml] Go-Ferm + Water
    - Nutrient: [6.5g] Fermaid O in 1.7g installments

Honey – Weight/Volume

Measuring/Weighing Honey

- *The industry bottles and sells honey by the pound.*
  - When you prep your honey you likely will grab pound bottles and got to town.
  - However, when it tells you to use ounces or fractions, sometimes the translation is a little difficult to come by.
  - Honey as a product varies but there is a general guide as to weight to volume conversions. This can be used as a standard measure.
    - Note that you can scale this up and it will hold true.

1 Pound of Honey = 10.75 Fluid Ounces = 317 Milliliters = 454 grams = 1 1/3 cup

Step 1: Equipment Prep

❑ Prep Steps

- *Gather Equipment / Equipment Suggestions*
  - Brewing Vessels: Bucket, Carboy, whatever you are using
  - Large Pot & Sous Vide (if you have one; otherwise, a thermometer for a pot)
  - Utensils
- *Gather Cleaner / Sanitizers*

Step 2: Gather Ingredients

❑ Prep Steps

- *Gather Ingredients*
  - Honey [3 1/6th pounds] (32 1/2 Fluid Ounces, 1376 grams)
  - Water [3 Quarts] +/- to bring the starting gravity to 1.115
  - Yeast [2g] Lalvin CY3079 (2g)
  - Nutrient: [2.5g] + [5ml] Go-Ferm + Water
  - Nutrient: [6.5g] Fermaid O in 1.7g installments

Step 3: Cleaning

- ❑ **Clean and layout the workspace**
  - *Clean the surfaces where the assembly is to take place.*
    - Clean the surfaces and sink with detergent-based cleaners and clean cloths.
    - Prep places to lay cleaned, prepped equipment to avoid contamination
- ❑ **Clean and prep the equipment**
  - *Sterilize the utensils and vessels*

Proposed Process

Sous-Vide

- *One thing about making mead is temperature control*
  - When prepping the Go-Ferm, when prepping the must, when pitching the yeast, **each of these elements has to be done with temperature control** so that the yeast will not be damaged.
  - As such, one way to approach this is to leverage a **Sous-Vide** and employ an approach where the water and honey are brought to temperature
  - This allows you to mix things in a contiguous process.
    - It can be done in a step-by-step process, heating water, warming honey, waiting for things to cool and such – but **with the sous-vide the assembly is more precise and fluid**.

Step 4: Clean the Sous-Vide Pot

❑ Restaurant Pot

- *Clean the sous-vide and a vessel that is at least 2-Gallon in capacity.*
  - In our case we have a large restaurant pot.
  - Clean the vessel with hot water and dish detergent.
  - Rinse **thoroughly** to ensure there are no lingering detergent vestiges that could taint the mead.

Step 5: Clean the Honey Vessel(s)

❑ Honey Jar Prep

- *Clean the honey jar exteriors*
  - For the one-gallon batch you need around 3 pounds of honey
    - You can do this with several small jars or source one 5 pound jar and use that – either way works.
  - Take the lid off of the jar(s) being used and clean them in the sink.
    - Wash the interior and exterior and rinse them thoroughly.
  - Wash the jar lip and rinse. Reinstall the lid, and wash the **exterior** of the jar **scrupulously**.
    - **The jar is going to go into the water that will make the mead, so it has to be clean.**

Step 6: Setup the Sous-Vide

❑ Water Preparation

- *Place a canning screen in the bottom of the pot*
- *Add the sterilized honey and fill the water until it comes to the top of the jar*
- *Setup the sous-vide to 104°F.*
- *Allow the water and honey to come to temperature*

Step 7: Pre-fermentation

❑ Go-FERM + Water + Yeast

- *Prepare the pre-fermentation liquid*
  - Using a clean utensil, add some 104° water to the vessel being used for pre-fermentation to bring it to temperature. Allow the vessel to come to temp.
  - Pour that water out and pour in the measured amount of 104°F required for the Go-Ferm Addition. Place this in the microwave and warm it to 110°F.
  - Once the water is at 110°, add the Go-Ferm and stir it in until combined.
  - Allow the Go-Ferm and water combination to come to 104°F.
  - Once at 104°F gently stir in the yeast. Close the container and move it into the water bath.

Step 8: Must and Pitch

❑ Water + Honey & Yeast

- *Prepare the must*
  - Pour the honey and water into the carboy. Measure the gravity and add water as needed to set it to the specified gravity.
- *Pitch the yeast*
  - Aerate the honey mixture and pitch in the rehydrated wine yeast.
  - Open the container and add it into the carboy.

Step 9: Nutrient Feed

Feeding Intervals

- *Addition of Fermaid O*
  - First Installment - 24 hours after yeast pitch
  - Second Installment – 48 hours after yeast pitch
  - Third Installment – 72 hours after yeast pitch
  - Fourth installment – 7 days (or at the 1/3rd sugar break)
    - 1/3rd sugar break is defined as when 1/3rd of the starting gravity sugars are consumed

Fermentation and Racking

Definition

Racking: racking means to siphon the mead from a primary container into a secondary fermenter so that the batch of beer is not sitting on the yeast leeds.

Watching Fermentation

- *While the mead is fermenting, you will leave it in a cool dark place and check on it periodically*

Racking

- *When it ceases with fermentation, Rack it off of the Lees*
  - Often brewers will rack the product when a majority of the yeasts are dead and present on the bottom.
  - The mead will continue to ferment for a period of additional time. After it slows to a stop, it is racked once more.
  - Again, it is monitored; then when it is final, it can be bottled.

Questions

- Note: **This presentation is available for download**

  https://www.bkcorner.org

  - *Search for presentations, it will appear in the search results*
  - *It will also be on the EAS website*

- **Kevin Inglin**

  - *kevin@bkcorner.org*

Resources

- **Melovino TOSNA Calculator**
  - https://www.meadmaderight.com/tosna-calculator
- **Mead Research**
  - *Yeast Handling:* https://www.meadmaderight.com/yeast-handling
- **Yeast Reference Chart** (one of many on the web)
  - Quick-Yeast-References-Chart_2018_LR.pdf (lallemandwine.com)

Alcohol Content

Alcohol Content Varies

- *Like many styles of alcohol, mead can be produced to with a moderate alcohol strength or with a significant punch.*
- *Much of the alcohol potency is at the discretion of the formulation and ingredients chosen by the mead maker.*
  - Like most alcoholic beverages, mead is judged by its Alcohol by Volume (ABV) readings.
  - In correspondence to the ABV, Terms have been established to give indication as to the potency of mead types

Mead Strength

- Alcohol Strength – 3 common terms
  - ***Hydromel*** *(aka session)*
    - Alcoholic potency is akin to a range like a light beer to a conventional beer (hydro=water, Mel=honey)
  - ***Standard Mead***
    - Alcoholic potency is akin to a range like a table wine
  - ***Sack Mead***
    - The punch of a distilled alcohol

Taste Characteristics

Mead Sweetness

- *Given recipes and tastes vary, final sweetness varies in meads.*
  - Similar to how ABV can be varied, the mead maker can choose a number of options when formulating a recipe to determine sweetness
    - They can start with more honey, they can use a different strain of yeast, they can add honey to the final production in the end…
- *Sweetness and Characteristics classifications*
  - As one might assume, the mead industry has settled on some terms that classify and describe how sweet a mead is and other attributes.

Taste & Style Characteristics

❑ Mead Descriptors

- *As one might assume, the mead industry, like the wine industry, has settled on some terms that classify and describe mead*
- *Sweetness classifications*
  - **Dry**
  - **Semi-Sweet**
  - **Sweet**
  - **Dessert**

Sweetness classification are judged by the amount of residual sugar in the mead.

- *Mead Attributes*
  - Sweetness
  - Carbonation
  - Strength
  - Color
  - Aroma
  - Flavor
  - Mouthfeel
  - Honey Variety
  - Appearance (clear, cloudy, etc.)

Dry Mead

Impressions

- *Flavor…….Subtle, crisp, honey flavor with a dry finish.*
  - May have little to no honey flavor and residual sweetness levels are low to non existent.
- *Aroma…….. Light subtle aroma with notes of honey if a specific type*
- *Mouthfeel…Light to medium, but not watery*
- *Visual…….Typically brilliant, light, clear, and high clarity*

Semi-Sweet Mead

Impressions

- *Flavor…….Subtle to moderate honey flavor*
  - May feature varietal honey notes with subtle to moderate sweetness
- *Aroma…….. Notable honey aroma with varietal differences possible*
- *Mouthfeel…Medium-light to Medium, with no lingering sweetness*
- *Visual…….Can be clear to showing signs of body*
  - Color can be clear or range in various golds, ambers, and venture all the way to to dark brown. Conventionally most would be in the straw to gold range.

Semi-Sweet to Sweet Meads

❑ Impressions

- *Flavor.....Moderate to significant honey flavor*
  - Typically, sweet and full, but not with a syrupy or cloyingly sweet finish.
- *Aroma..... Dominant honey overtones and flower nectar scents*
- *Mouthfeel...Medium full to full bodied; akin to a dessert wine.*
- *Visual.....Range from clear with body to viscous*
  - Typically richer in the depth of color and can border on almost syrupy in appearance.

Mead – The beverage

❑ Mead Beverages

- *Meads expand far beyond the category of a Simple Mead*
  - Other forms of meads in the marketplace abound.
  - Variations of mead are produced by altering the honey, through the addition of flavorings and/or the inclusion of additional ingredients
    - An example of altering the honey is a Bochet. Prior to fermentation a Bochet Mead calls for the honey to be caramelized.
    - Flavorings vary widely – extracts, teas, flowers, herbs, spices, wood pieces (like Oak barrel), hops, and more.
    - Additional ingredients – choices are far and wide: fruit juices, brewed coffee, whole or pureed fruits, malt, barley, vinegars, and again, even more.

Mead Makers have given name to the variations of mead to indicate what they contain

Meads Types: Fruit / Vegetable

- Mead with Added Fruits or Vegetables
  - ***Melomel***.....*Honey + Water + Various Fruits (1 or more)*
  - ***Pyment***.....*Honey + Water + Grape Juice.*
  - ***Cyser***.....*Honey + Water + Apple Juice.*
  - ***Morat***.....*Honey + Water + Mulberries.*
  - ***Capsicumel***.....*Honey + Water + Chili Peppers*
  - ***Braggot/Bracket***...*Honey + Water + Hops (and/or) Malt*

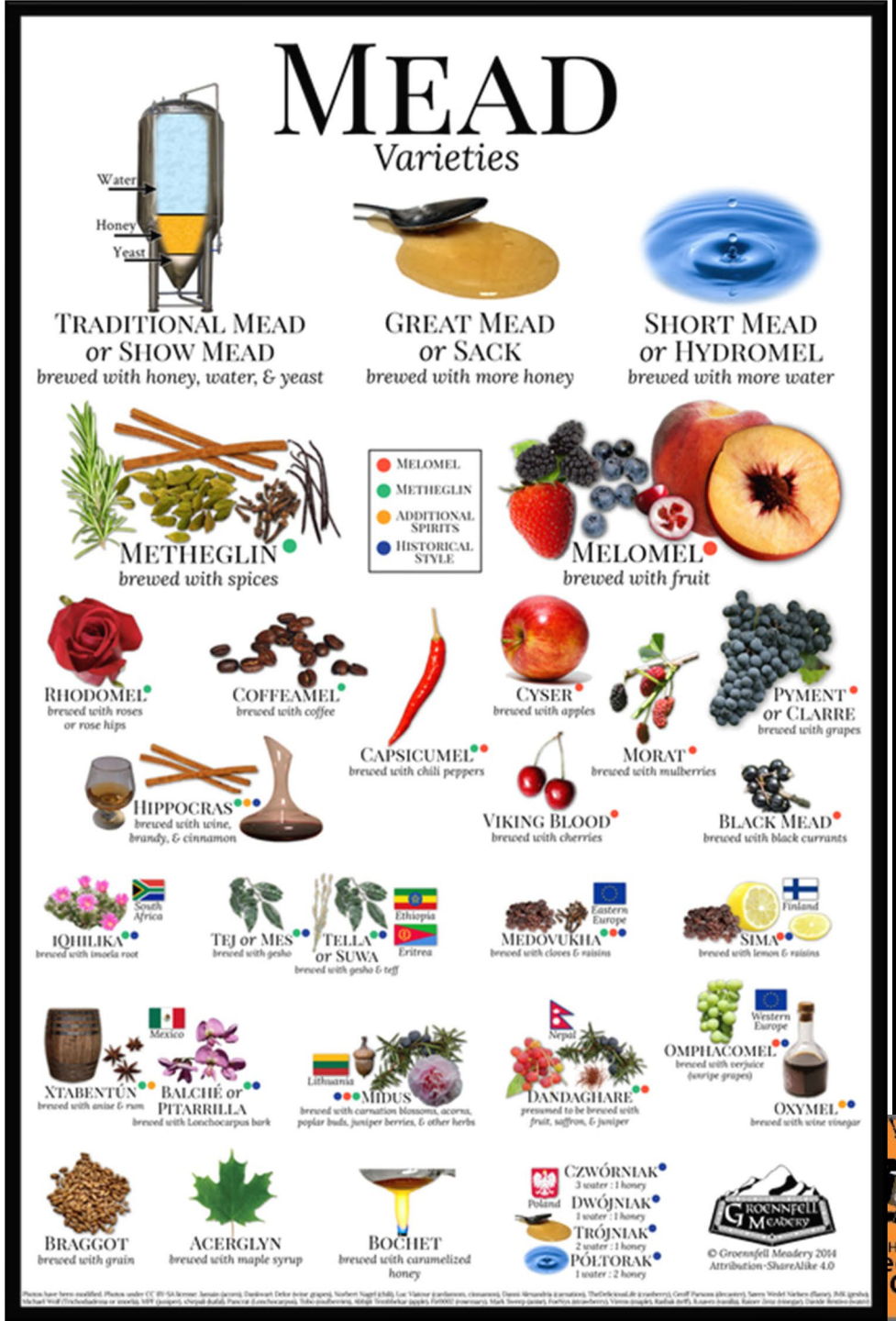
Pronounced "Size-er"

Additional Meads Types

- **Metheglins**
  - *A mead with added botanicals or spices.*
    - Examples: Cinnamon, clove, nutmeg, rosemary, spruce, and more.
- **Mead Types and Styles are diverse**
  - *Mead Types and Regional Styles*
    - Acan, Acerglyn, Black Mead, Bibemel, Bochet, Bochetomel, Chouchenn, Coffee Mead, Dandaghare, Dwojniak, Gverc, Hippocras, Medica, Medovina, Midus, **Myod** (Aged mead, Drinking mead, Boiled mead), Oxymel, Omphacomel, Pitarilla, Poltorak, Rhodomel, Sima, T'ej, Trojniak and Weirdomels

Regional style…
In some place they make it a certain way and they call it by a specific name

Myod for example is a style of mead from Russia.



Tips

- *Another little tip- I use a dry airlock for the first 7 days or so. The active fermentation is producing lots of CO2 anyway. After that I add sanitizer to my airlock.*
- *De-gas fermenter/carboy twice daily for first week to remove CO2 (swirl, stir)*
- *Fermaid O should be mixed with room temperature water before adding to an active fermentation to avoid CO2 release and overflowing of tanks or barrels.*

Mead Making Terminology

- Alcohol by volume (ABV): The percent of alcohol by volume (as opposed to weight) in the liquid being measured. Measured by changes in gravity. ABV can be figured by the following equation: OG-FG/.75 = ABV%
- Autolysis: The breakdown of dead yeast cells (lees).
- Campden Tablets: A compressed, tablet form of potassium metabisulfite (see Potassium metabisulfite).
- Carboy: A large glass or plastic jug used in fermentation, usually between 1/2 gallon and 15 gallons.
- Fermentation: Conversion of sugar to alcohol and carbon dioxide by yeast.
- Fermentation Lock: (aka Air Lock): A device that lets carbon dioxide gas escape a bottle without allowing air into it.
- Final Gravity (FG): The gravity of the must once it is done fermenting measured by use of a hydrometer.
- Fining: Clearing mead through the addition of various protein or mineral agents.
- Gravity: A ratio of the density of mead to the density of distilled water at 680 F. Specific Gravity (S.G.): Measurement of the density of juice or mead in relation to water.

Mead Making Terminology

- Hydrometer: An instrument for measuring the density of liquids (such as gravity).
- Lees: Sediment of dead and dormant yeast on the bottom of a fermenting vessel.
- Must: The unfermented or fermenting blend of honey, water, and other ingredients.
- Original Gravity (OG): The gravity of the must before it ferments. Also called the starting gravity.
- Oxidation: Degradation of mead through exposure to oxygen.
- Pitching: Adding yeast to a must to begin fermentation.
- Potassium Metabisulfite: A chemical that inhibits the formation of molds and bacteria. Used as an antioxidant for mead, and as a sanitization/general cleaning agent.
- Racking: Transferring mead from one container to another, leaving the sediment behind.
- Sanitizing: The process of reducing the number of microbial contaminants and spoilage organisms on a surface or piece of equipment to a safe level.
- Specific Gravity (S.G.): Measurement of the density of mead in relation to water at any given time, typically during the process of fermentation.
- Starter: A vigorous yeast culture prepared in advance to ensure a strong initial ferment.
- Yeast Nutrient: A blend of ingredients that provide nitrogen, vitamins, and minerals required by the yeast during fermentation.
- Topping off (a.k.a. Topping up): After racking, adding something to the fermentation vessel to take up head space (the space between the top of the liquid and the top of the carboy) to prevent oxidation.