

Making Weight-to-Volume Tinctures

<https://oldwaysherbal.wordpress.com/2013/12/15/making-weight-to-volume-tinctures/>

This article is part of the series “Basic Recipes for Kitchen Witches,” which is in response to students’ requests for me to post recipes online. The goal of these articles is to give you the how-to-ness, the essential mechanics of creation, as a basis for your own future creativity. You can let your little light shine all on your own from there.

First, Some Basics

Marc: solid matter in a tincture; the plants

Menstruum: liquid in a tincture; the alcohol and water (or vinegar, glycerin, honey, etc.)

Solubility: whether or not something dissolves in a particular liquid. Think of sugar in tea—soluble—versus sugar in cold water—insoluble.

Constituents: compounds that combine into a plant’s chemical makeup

Precipitate: solid or goopy stuff that settles out at the bottom of your tincture

Demulcents: herbs that moisten mucous membranes, like the lining of your mouth and throat

Mucilage: a gooey compound that acts as a demulcent

Weight-to-volume tinctures are made by carefully considering two aspects of balance: the balance between the weight of the marc and the volume of menstruum, and the balance of alcohol and water in the menstruum. We write this balance as a ratio and a percent, like 1:2 75%, which is basically a shorthand recipe letting everyone know how we made the tincture. You've probably seen something like that written on tinctures you've bought in the past.

Weight-to-volume tinctures have a couple of advantages over folkloric tinctures, including:

- You can be sure what the dosage is
- Recipes are easy to replicate, time after time; strength will still vary from year to year based on the plants themselves, but within a predictable margin
- You can use dose-dependent medicines without hurting anyone. Dose-dependent medicines make people sick in large doses, so they're not safe in folkloric preparations. Examples include poke and lobelia.

The only real disadvantages to weight-to-volume tinctures are that it takes effort to learn how to make them properly, and it helps to have a good book or website to guide you. The alternative is to make folkloric tinctures, which you don't measure (<https://oldwaysherbal.wordpress.com/2013/12/11/making-folkloric-tinctures>).

Understanding Tincture Ratios

The ratio of marc to menstruum is written as a mathematical ratio, like 1:2, 1:3, etc. That means for every 1 part of marc you use 2 parts (or 3 parts, or 4 parts) of menstruum. We measure "parts" in ounces, and here's where it can get confusing:

- Marc is measured using ounces of weight, like on a scale

- Menstruum is measured using ounces of volume, like on a measuring cup
- Liquid and solid ounces are different!

So to make a 1:2 tincture, we will use 1 ounce of marc on a scale for every 2 ounces of menstruum in a measuring cup. If you have more than 1 ounce of marc, multiply the weight of the marc by the 2nd number in the ratio. For example:

- If I have 5 ounces of an herb and I want a 1:2 tincture, I will use 10 ounces of menstruum, because $2 \times 5 = 10$.
- If I have 5 ounces of an herb and I want a 1:3 tincture, I will use 15 ounces of menstruum, because $3 \times 5 = 15$.

General Rules One of the biggest hurdles for students is learning how to choose the “right” ratio. Honestly, if you make a tincture at the less-than-ideal ratio, nothing bad is going to happen and your tincture will still be useful—it might be a little stronger or weaker than you’d hoped for, but it’s not going to explode. That said, there’s certainly a method to the madness, although the only way to really learn this stuff by heart is to experiment and practice with your own tinctures. An easy way to think about ratios is to consider your marc’s density and soak-up-ability:

- Delicate plant parts like leaves and flowers are tinctured at a close ratio like 1:2 or 1:3, because they don’t weigh much but still pack a medicinal punch. They don’t soak up all that much menstruum, so you don’t usually have to add menstruum to keep the marc submerged.
- Dense plant parts like roots and barks are tinctured at a farther ratio like 1:3 or 1:4, because they weigh more—they’ve got all that structure to carry around, all those heavy plant bones. They can soak up a lot more menstruum into that fiber, which will make your marc stick out of the top if you don’t put in enough menstruum.

The closest ratio you want to tincture at is 1:2–1:1 isn't really possible in your kitchen, although you can get that done with fancy equipment but there's no real advantage for the home medicine maker. The farthest ratio I recommend is 1:6, which is absolutely appropriate for dried barks and such like that. Past 1:7 your medicine starts to get pretty weak and the dosages get high, which are probably the #1 and #2 reasons your family doesn't want to take your medicines ("it doesn't work" and "half an ounce of grain alcohol is disgusting"). It ends up being a waste of herbs and alcohol.

A Useful Tip If you find yourself with a tincture that keeps soaking up menstruum and you don't want to add more at the expense of your ratio—good examples include fresh hops, fresh milky oats, and many dried barks—put the whole tincture through the food processor. The marc gets nicely crushed up into the menstruum and the whole tincture lays down much more quietly in the jar.

Understanding Alcohol Concentration

The second aspect of balance you have to figure out to make a weight-to-volume tincture is the balance between alcohol and water in the menstruum. We write the alcohol content as a percentage, with the remaining percentage out of 100% as water: 40% means the menstruum is 40% alcohol, 60% water. The concentration of store-bought alcohol is easy to figure out because it is half of the proof, which is written on the label. For example, 80 proof vodka is 40% alcohol, and the remaining 60% is water. This balance between alcohol and water affects how much medicine will dissolve into your tincture, a concept known as solubility.

Solubility Something is **soluble** if it dissolves in a particular liquid. In herbal medicine, we talk about alcohol-soluble and water-soluble **constituents**, plant compounds that dissolve in either alcohol or water. It's an either-or thing: an

individual constituent can't be both alcohol-soluble and water-soluble, it's one or the other. All plants contain both alcohol-soluble and water-soluble constituents; the question is whether the *medicinal* constituents are soluble in alcohol or water.

The herbs have a preference for the ideal balance of alcohol and water to get the most well-rounded medicine, which determines the tincture ratio: make water-preferential or alcohol-preferential medicine based on what results you want. In some herbs, like echinacea, the medicine is mostly alcohol-soluble; in other herbs, like willow, the medicine is mostly water-soluble. However, in most herbs the medicine is a nice mix of both alcohol and water soluble constituents; think about all those good medicinal tea herbs that also make nice tinctures, like holy basil, nettles, and dandelion. Those herbs are in the middle of the water-alcohol solubility spectrum.

You can tell that an herb has a lot of compounds that aren't soluble in alcohol if a lot of stuff settles out at the bottom of your tincture, or **precipitates**. Think about the goop at the bottom of a burdock or elecampane tincture—that's the stuff that can't dissolve in alcohol. Actually, it's mostly fiber, which does for plants what bones and fat do for people (structure & food storage). Burdock and elecampane are both examples of herbs that tincture best at lower alcohol concentrations so their water-soluble compounds can play too.

Water-Soluble Herbs For an herb that is more water soluble, you want to use a lower alcohol concentration like 60% for a fresh tincture and 40% for a dried tincture. I really like low alcohol tinctures of most roots, like the aforementioned burdock and elecampane, as well as plants that famously love water like willow.

Alcohol-Soluble Herbs For an herb that is more alcohol soluble, you want to use a higher alcohol concentration like 80% for a fresh tincture and 60% for a dried tincture. Herbs that contain berberine or volatile oils as well as herbs that

don't have a lot of fiber in them fall into this category, along with many other constituents. Rosemary, echinacea, holy basil, lemon balm, spilanthes and motherwort are good examples here.

Alcohol Selection Grain alcohol is the highest alcohol concentration you can get at 190 proof, or 95%. If you use straight grain alcohol in a tincture, just pretend it's 100% alcohol when you're measuring it out—there's no need to torture yourself by trying to add 5% water by volume. Really, 5% of 12 oz (a common size for a tincture) is 0.6 oz, so it's pretty negligible whether it's in there or not. Straight grain alcohol (95%) is only appropriate for fresh plant tinctures, and even that is arguable. This is because dried plants have no water in them (obviously), so the water-soluble constituents in a dried herb tincture will not dissolve into a pure alcohol menstruum. In fact, water soluble constituents in a fresh herb tincture don't dissolve in a pure alcohol menstruum either—which is why I don't make tinctures at 95%, but many people do so I'm presenting the option here, as you are an intelligent human and are capable of deciding such things for yourself.

General Rules The lowest concentration you should make tinctures from is 40%, and that's only for dried herbs. Fresh herbs have a lot of water in them, which reduces the actual percentage of alcohol in your tincture and leave you open to mold and spoilage—anything below 40% is at risk of going bad on you. Vodka, gin, and most other varieties of liquor can be found at 40%, or 80 proof; just remember to make sure it's not 40 proof, which is 20% alcohol and not worth making medicine with.

Personally, I use grain alcohol to make almost all of my tinctures, adding water to get a lower concentration of alcohol based on what herb I'm tincturing—instructions on how to do this are in the recipe at the bottom of the article. I like the control of being able to choose exactly what my concentration is. You can

always decrease the alcohol concentration by adding water, but you can't increase alcohol concentration, so I start high and decrease as needed. I like the flexibility of being able to make high alcohol tinctures when I need to, which you can't do with the lower proof alcohols. Also, I make a point of choosing alcohol concentrations I can figure out in my head, like 60% and 75%—no need to make myself crazy trying to make a tincture that's 71.25% alcohol when the plant matter itself is going to put an indeterminate amount of water right back into the tincture and mess up my careful exactness.

A fun experiment for nerdy kitchen witches You can magnify the energetics of the medicine you make by using different kinds of alcohol. For very warming tinctures made from dried herbs I recommend brandy or scotch, because the liquors themselves definitely add heat—go ahead and make a prickly ash brandy tincture, then tell me you disagree. Likewise, cooling tinctures of dried herbs go nicely in gin (which is also a tincture, incidentally). I strongly recommend getting creative with this, it's very satisfying to magnify the effect of your medicine simply by your choice of menstruum! Those of you who have made cough medicines with honey and mineral tonics with vinegar, you know what I'm talking about. You feel like the queen of kitchen witchdom and you tell other people about it and they look at you like you're green and melting, but that's okay, because you can make medicines that work, and that's one of those things you carry around with you.

Putting it Together

Fresh Herbs Fresh plant matter is tinctured at a higher alcohol concentration and a closer ratio, because it already contains water. A good general rule of thumb is 1:2 to 1:4, based on how dense the plant parts are, and 60% to 80%, based on whether the medicine you're trying to make is more alcohol soluble or more water soluble. It's totally appropriate to make a fresh tincture of the above ground parts

of an alcohol-loving plant like echinacea at 1:2 80%, and the menstruum would then be 20% water. It's also totally appropriate to make a fresh tincture of the bark of a water-loving tree like willow at 1:4 60%, and the menstruum would then be 40% water.

Dried Herbs Dried plant matter is tinctured at a lower alcohol concentration and a farther ratio because it doesn't have any water and needs some in there to extract any water-soluble compounds. The range I use with dried herbs is generally 1:4 to 1:6 and 40% to 60%. Again, the high end of the spectrum is for delicate parts of alcohol-loving plants, so a dried echinacea tincture would be 1:4 60% (with 40% water). The low end of the spectrum is for dense parts of water-loving plants, so a dried willow bark tincture would be 1:6 40% (with 60% water).

Guessing at Solubility Intuition, observation, and experience are the most important tools you have to decide if a new herb is more alcohol-soluble, water-soluble, or in the middle somewhere. Where does the herb grow—on a dusty, windswept hillside, or on a shady riverbank? If it's growing in a wet place, like willow does, it's sending a pretty clear message about its preferences. Echinacea is native to dry prairies and flourishes where folks still burn their prairie, which is a great example of a dry-loving plant that tinctures at high alcohol concentrations. Another clue is what's it growing near? St Johns wort and bee balm both grow alongside echinacea. Taste and smell are important indicators of solubility, too. If it's slimy when you taste it, like marshmallow or violet, you're tasting that demulcent medicine, that water-loving aspect of the plant. If it makes your mouth go numb and tingly like spilanthes, or smells really fragrant when you crush it like anything in the mint family, most likely that plant will do well in a high alcohol tincture. Of course there are plenty of exceptions to all of this and every medicine maker has their own personal preference—this is where experience comes into

play: observe your herbs, intuit what you think they'll like, and then give it a whirl and see what happens.

Just Try It The best way to learn is to experiment—tinctures are loose, estimate and adjust as necessary. In the beginning, make several batches at the same time to gain experience of the different character of the medicine: I often will make 3 or 4 little tinctures of a new plant at different ratios and concentrations to get a sense of what I like the best. When it comes down to it, there's no right or wrong here so figure out what you and your family think works the best—just be sure to write it down! If you're in doubt, you're working with a new plant, or you want more plant-specific guidance on solubility, check out Michael Moore's tincture ratios at <http://www.swsbm.com> or Lisa Ganora's work on phytochemistry *Herbal Constituents* (I love this resource but it's a difficult read, even for the science-minded).

When Not To Tincture

The main situation where you really shouldn't bother making a tincture is if you want an herb for its demulcent or mucilaginous properties. **Demulcents** are herbs that moisten mucous membranes like the lining of your mouth and throat; **mucilaginous** herbs contain mucilage, a gooey compound that acts as a demulcent. In these herbs, the medicine is in the goo, and goo doesn't dissolve in alcohol so tincturing them at any concentration wastes both the herb and the booze. Some of these herbs can be tinctured for uses not related to their prowess as demulcents—burdock tea is a great gooey tonic for the gut, but tincturing it does very nice things for its property as a liver tonic. So if you're planning to take burdock to make your skin glow, by all means, tincture away (1:3 65% fresh).

However, if you want mullein or violet to moisten a dry cough, try drying them for tea or cooking them up in honey because they won't give you that nice cooling

gooyness in a tincture form.

There are a couple of herbs that are so extremely water soluble that there's no point in making a tincture from them at all, like slippery elm (which is at-risk anyway, so please stop using it) and marshmallow. In these cases, if you make a tincture you'll realize pretty quickly that something's wrong because they form a disgusting little ghost baby of gooey fiber in the jar, instead of dissolving nicely. If you're not sure if your herb has water soluble properties but still makes a good tincture like burdock, or if your herb only has water soluble properties like slippery elm, look it up in Michael Moore's list (link above), your favorite book, or any of the many fabulous free online resources that exist in the future we inhabit.

Weight-to-Volume Tincture Recipe

Throughout this recipe, we're going to use a running example to illustrate how to put the numbers together. The example could be the fresh above ground parts of any alcohol-loving plant, so pick one to picture as we go through this. I'm picturing bee balm. If you've got imagination block at the moment, try picturing St Johns wort or goldenrod, either of those will do.

You will need: Fresh or dried medicinal herb of your choice, clean and ready to use; grain alcohol; kitchen scale; measuring cup; knife and cutting board; clean canning jars; waxed paper or clean muslin; labels or scrap paper; packing tape; depending on your herb, you also might want a mortar & pestle or food processor.

1. Decide what ratio you want to use, between 1:2 and 1:6

Example: I'm choosing 1:3

2. Decide what concentration of menstruum you want to use, between 40% and

95%

Ex: 75% (now we have 1:3 75%)

3. Finely chop or crush herbs and weigh them on your kitchen scale **using the ounce marks**. This number is the 1st number in the ratio (the 1)

Ex: My bee balm weighs 4 oz on the scale

4. Multiply the weight of your herb by the second number. This number is the volume of menstruum you need.

Ex: 1:3 is the ratio, I have 4 oz of bee balm. $4 \times 3 = 12$ oz menstruum

5. Multiply the total volume of menstruum by the concentration of alcohol you want. This number is the volume of alcohol (if the alcohol is grain alcohol). If the alcohol is not grain alcohol, you are probably using it at its bottled strength so you don't need to add water.

Ex: 12 oz menstruum \times 75% = 9 oz alcohol

6. Subtract the volume of alcohol from the total volume of menstruum. This is how much water you need.

Ex: 12 oz menstruum $-$ 9 oz alcohol = 3 oz water

7. Put it all together!

Ex: 4 oz by weight of herbs, combined with 9 oz grain alcohol and 3 oz water

8. Measure the alcohol and water in a measuring cup, **using the ounce marks**

9. Put the herbs in the glass jar and pour the water and alcohol over them. Don't

forget that herbs take up space when you choose the jar!

10. If the menstruum doesn't cover the herbs, mash them down. If they still don't submerge, add 1 more "dose" of menstruum

Ex: our tincture is 1:3, so we can make it 1:4 by adding another 4 oz menstruum (3 oz alcohol and 1 oz water) for a total of 16 oz menstruum at 75% alcohol

11. If the herbs still don't fit, or if you don't want to lower your ratio (say, because you're doing a root tincture and you're already at 1:6), put the whole works in the food processor

12. Line the lid of the jar with a square of waxed paper or muslin so the alcohol doesn't eat away at the lining of the lid and put metal and BPA's in your tincture. Clearly label with plant, date, moon phase, harvest location, etc. Cover label with packing tape so it doesn't disappear.

13. Let sit for 6 weeks or more in a cool, dark place, shaking regularly

14. Strain the marc out of the tincture using a mesh tea strainer. Then squeeze the strained marc in a potato ricer to extract the last, strongest part of the tincture. If you don't have a potato ricer you can squeeze the marc between 2 plates but the potato ricer works way better. Feed the marc to your chickens or the compost.

15. Store in a clearly labeled glass jar or bottle in a cool, dark place. Tinctures last for years.

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