

## Continuous Brewing: Tastier, Easier and Superior Kombucha



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A number of years ago, our family started experimenting with fermented drinks. We tried sun teas, fermented coconut juice, assorted kefir and ginger sodas. But kombucha captured our hearts and those of our children. At first, we used the modern, western method of straight shot brewing. Then a good friend kindly explained to us the more traditional art of continuous brewing. In a short time, we were hooked on a combination of better taste, more consistent supply and less work with our kombucha, and began refining and [teaching](#) the method to others.

### Benefits of Continuous Brewing

Continuous brewing is a traditional method of making kombucha. After I had spoken with numerous native Russians and consulted with a few different reference works, I realized that the liquid was kept in some sort of fermenting container and a portion was drawn off for drinking or other uses as needed. As liquid was drawn off, fresh replacement was added, sometimes soon after or sometimes a few days later. Thus, in traditional brewing, the culture is fermenting continuously, without interruption, at all times—a constant mixture of predominately older and some younger liquid.

The [benefits](#) of continuous brewing are both practical and nutritional. They include:

Less risk of mold and other contamination in kombucha batches, as once established, the liquid maintains a far more acidic environment, more hostile to outside invaders because of smaller amounts of free sugar and a greater population of good bacteria and yeast.

- Less overall work to produce more overall volume.
- More consistent supply of kombucha (a few bottles every day or every few days rather than having a large batch all at once).
- A broader array of bacteria and other beneficial compounds in the final product.

### CAFFEINE AND KOMBUCHA

A number of families in our group expressed concern over the amount of caffeine in kombucha, especially since very young children were drinking it daily. Kombucha is relatively low in caffeine, especially compared to mainstream beverages, although the amount of caffeine in a particular serving will depend on the types and amounts of teas used and the length and strength of the ferment.

On average, one serving of kombucha will contain approximately one-third the caffeine (or more precisely, of caffeine-like substance) than a similar tea beverage of the same size. Also, is converted into other substances during the fermenting process, but this conversion is both unpredictable and highly debated. Furthermore, the caffeine reduction appears to be largely related to “starving” the culture for many days (not adding any new sweet tea mixture to the

ferment), and thus would probably have a negligible effect on the caffeine content in a continuous brew that was drawn down more than twice per week.

Thankfully, tea leaves are easy to partially decaffeinate, since caffeine is highly water-soluble, allowing removal of between 40-70 percent of the caffeine in three minutes of steeping (see side bar page 68), while the poly-phenols and many other beneficial substances in the tea leaves remain because they are less soluble. Many [Internet sources](#) claim much higher rates of caffeine reduction via this home method (as high as 80 percent in under one minute of steeping), but this is not the true. Caffeine reduction of 70-90 percent requires a second steeping with fresh, hot water after initial the steep, lasting another three minutes, which would have an uncertain, yet surely negative impact on the beneficial compounds in the final product, not to mention the taste.

Thus, if caffeine content is a concern, lower caffeine varieties of tea can be employed or the tea leaves can be decaffeinated prior to brewing. If you need to completely avoid caffeine, then commercially decaffeinated teas are the only sure option, although these will have a negative impact on the health benefits of the finished beverage. Also, we know a few people who prefer to preserve the inherent caffeine content of kombucha, as this makes the drink a great, natural replacement for those who are required to work at night and may need a natural, low-caffeine drink to help them stay awake and work safely.

## **CONTINUOUS BREWING AND SUGAR**

The second question that often comes up with kombucha in general, and continuous brewing in particular, concerns the residual sugar content. Again, since kombucha is a living product, affected by seasons, temperature, humidity and other factors, the amount of sugar present in the final product is very hard to determine. If you have concerns about residual sugar in your brew, you can reduce it through a number of approaches:

1. Allow the mixture to ferment longer and draw it off less often or in smaller amounts (remove 10 percent rather than 15-20 percent of the volume, three times per week).
2. Allow a longer second ferment once bottled (the result will be more of a kombucha wine, vinegar or beer).
3. Choose a sweetener like white sugar, which breaks down more thoroughly and is more easily digested by the culture.
4. Choose flavorings that do not contain large amounts of additional sugar and/or allow the second ferment in the bottles extra time to break down this sugar.
5. Check for sourness; the more sour the beverage, the less residual sugar it will contain.

## **BULK BREWING REPLACEMENT LIQUID**

Continuous brewing is a big time-saver and allows a more consistent supply of kombucha. We can bulk brew our concentrated “replacement” liquid once every two weeks, then as needed add the concentrate and additional water to our fermenting vessels.

Our basic kombucha recipe follows a ratio of 2 to 1 to 1 to 1; that is, *2 cups water* for every *1*

*cup sugar and 1 tablespoon each organic green and black tea. Three-fourths cup of this concentrated liquid plus 3 1/4 cups water can then be used to replace 32 ounces of liquid in your kombucha jar.*

We brew about two gallons replacement liquid at a time and store it in half-gallon mason jars in the refrigerator. (It could also be stored in a cold cellar, garage or other cool place—just be very careful that the place is cold enough to inhibit the growth of mold.) The replacement liquid keeps for up to two weeks, saving time and dishes. This also makes our every-other-day kombucha routine very compact—add flavoring to bottles, decant the appropriate number of bottles (10-20 percent of total volume), add concentrated replacement followed by additional water to the fermenting vessel, and enjoy!

## **THE IMPORTANCE OF A SPIGOT**

A jar with a spigot is an absolute must for efficient kombucha brewing. As any family or farmer knows, the less work and time involved in the daily chores, the more enjoyable the chores (and all of life). The task of ladling out liquid and then funneling it into bottles creates a large amount of additional work and mess that is best avoided.



Continuous kombucha three- and five-gallon brewing jars with spigots.

There are various jar options available to the home brewer, ranging from simple and plain to large and decorative. Whatever jar you choose, be certain that no metal will be in contact with your fermenting liquid or above or around it, even just a very small amount around the spigot seals or some other area of the container.

For those looking for an inexpensive fermenting vessel, Ball makes glass sun tea jars that have a plastic spigot. These cost around seven to eight dollars and in the late fall many stores sell them for as little one to two dollars each, making them perfect starter or experimental jars.

A good website for jars is [www.infused-vodka.com](http://www.infused-vodka.com), although I find that the sizes listed for the

jars are not always accurate.

## VARIATIONS

Kombucha blends extremely well with all sorts of flavorings. We recommend that you only add flavors after decanting, as once flavorings have been added to the main brewing jar, you will never again achieve a neutral base with the kombucha culture you are using.

There are three main ways to flavor your kombucha, although other methods are available albeit less widely used (hydrosols of essential oils, for instance, the leftover water from making essential oils).

1. Juice of fruits, vegetables and herbs.
2. Fresh and frozen fruits, vegetables and herbs, whole, cut up, or pureed.
3. Dried fruits, vegetables and herbs.

We use the second option most frequently, since fruit juices are often pasteurized, somewhat expensive and may have additional additives that are best avoided; while dried fruits can also be very expensive and in our experience don't seem to add as much flavor (or color) as well as their fresh or frozen counterparts. We use some fresh fruits (seasonally), and a large amount of frozen fruit, since frozen fruits are easier and less messy to cut into small pieces, especially the berries. Yet, we know many who have had great success using some or all of these approaches.

A warning: if you use dried fruits, remember that the pieces will expand in size as they absorb liquid. If the pieces you place into the bottles become too large, you may have a very difficult time getting them back out. Even fresh fruits and vegetables may expand after sitting in the bottles, so smaller pieces are better.

A tip: an excellent way to save time when flavoring kombucha is to pre-cut up a large amount of fruit and keep it frozen; or use a blender or food processor to pre-blend, slice or shred a large portion of your favorite flavoring and then refrigerate or freeze the extra.

Note that your choice of flavorings is directly affected by your choice of teas—some teas will mesh better with certain flavors than others, so experimentation and research is key, as is a good notebook to keep track of your results.

Kombucha can also be flavored with a wide array of herbs, spices and roots. It's best to experiment in single- or double-bottle quantities and, as always, to keep good notes on the results so that you don't end up with a large batch of undrinkable brew. Always keep a spare kombucha culture or make sure you have a fellow brew mate with an extra in case your experiments go awry.

## ALTERNATE TEAS AND SWEETENERS

While most people use basic green and black teas for their kombucha, many other teas are

suitable. We do recommend that you try alternate teas in small batches (such as a one-gallon jar) apart from your main jar, so as to not risk losing your primary culture.

While some teas are said to be an absolute no-no for kombucha brewing, such as Earl Grey tea, we have spoken with people who have successfully used this and many other brands. The various choices of tea, sweetener and flavoring allow for an almost infinite array of tastes and textures, while also unlocking the possibility for a wide array of subsidiary benefits through the medicinal actions of the components.



Bottles for kombucha: left to right, juice spritzer bottle with wire-held stopper, a GT Kombucha bottle, a glass juice bottle and a Virgil's Root Beer bottle.

Another way to alter the finished flavor and properties of kombucha is through the changing or mixing sweeteners. Many modern kombucha recipes call for white sugar, yet traditional brews would have usually been made with unrefined, local sweeteners. While the choice of white sugar is understandable since it is inexpensive, predictable and breaks down quickly in fermentation, it should not deter you from experimenting with other sweeteners, including raw honey, tree syrups and whole sugar cane. Brews that employ other sweeteners will usually not ferment as quickly as those relying primarily on white sugar, since white sugar is a very “high octane” fuel option for ferments.

## **BOTTLING AND BOTTLES**

The best bottles for kombucha are those for Grosch, Fischer or Virgil’s root beer, or any other similar reusable glass beer or root beer bottle with wire stoppers. Bottles from the store, such as GT’s, sparkling water or glass juice bottles, can also be reused, but if their lids are metal, they will begin to rust, which is a concern both from the metals in the lids and the BpA or other possible chemicals that are contained in the small white seal you see around the edge of the lid.

Bottles with tight-fitting caps have the added bonus of creating wonderfully fizzy drinks, a sure delight for those trying to wean themselves off carbonated, sugar-, chemical-, and heavy metal-

laden alternatives. After adding flavoring to each bottle and filling them with kombucha, we normally allow them to sit for three to seven days, depending on time of year and temperature, to mellow and develop carbonation.

## **COST AND TIME OF CONTINUOUS BREWING**

Soft drinks are very expensive: they cost four to eight dollars per gallon and they create medical expenses by destroying our teeth and overall health. Americans spend over sixty billion dollars a year on soft drinks, consuming over one gallon per person per week. Kombucha can be brewed and flavored with all-organic ingredients for two dollars per gallon or less, saving money and strengthening overall health. Furthermore, we are able to produce about forty 16-ounce bottles per week in about one hour of actual work. Thus, continuous kombucha is an extremely useful method for producing an affordable, health-promoting drink for a family and community to enjoy.

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### **SIDEBARS**

#### **How to Decaffeinate Tea Leaves**

We use loose leaf teas, as they are far less expensive than their packaged counterparts and can be easily strained out of the tea mixture before adding the sugar.

To decaffeinate, place *8 tablespoons each green and black tea* into a one-quart glass container or ceramic bowl. In a teapot or saucepan, bring a few cups of water to a boil. Let the water just come off the boil, then pour it over the tea leaves. Allow the tea to steep for approximately three minutes. The caffeine will quickly leach out of the leaves. Strain the tea leaves and discard the water. Now you have decaffeinated tea (anywhere from 40-70 percent less caffeine will now be present in the leaves). The process can be repeated for those wishing to bring the caffeine content down even more.

#### **Caffeine Content of Common Foods and Beverages**

##### Caffeine Content of Popular Sodas

Caffeine content per can

Diet Mountain Dew and Mountain Dew 55 mg

Diet Coke 46 mg

Diet Dr Pepper 44 mg

Dr Pepper 43 mg

Pepsi 39 mg

Diet Pepsi 37 mg

Coke 34 mg

SOURCE: Journal of Food Science, August 2007.

## Caffeine Content of Popular Coffee Brands

In milligrams per 8 ounces

Caribou Cappuccino 120-150

Decaffeinated, instant 2

Decaffeinated, brewed 2

Espresso 512

Instant 62

Plain, brewed 95

Starbucks Caffè Latte 75

Starbucks Coffee Grande 165

Sources : Caribou Coffee Co., 2007; Starbucks Corp., 2007; USDA National Nutrient Database for Standard Reference, 2007.

Estimates for the caffeine content of kombucha range from approximately 8-16 mg per 8-ounce serving and 2-8 mg for batches done with home-decaffeinated tea leaves.

## **KOMBUCHA VARIATION FAVORITES**

For one 16-ounce bottle

*Imitation Sprite : A few small chunks of lemon, optional chunks of orange and optional grated ginger.*

*Ginger Berry : 1/4 teaspoon grated ginger root and 2-3 blueberries, sliced in half, optional 1/4-1/2 strawberry.*

*Ginger Banana : 1/4 teaspoon grated ginger root and 1-2 slices of ripe banana, about 1/8 inch thick, cut in half.* In our experience, any flavoring that uses banana should not be stored more than 3-4 days.

*Berry Blend : 2-3 blueberries, sliced in half, and 1 strawberry, quartered.*

## **Kombucha Continuous Brewing : Basic Recipe for Approximately Three Gallons**

What you will need : One *kombucha culture* (called a SCOBY) and 16-32 ounces *kombucha* from a friend or from the store (if you purchase kombucha at the store, get unpasteurized, unflavored kombucha for your starter liquid), and a brewing container that is around three gallons in total volume. This will also work for 3 one-gallon brewing containers, in which case you will need 3 kombucha cultures.

**Step One :** In a large stainless steel or enamel pot, bring 2 gallons *filtered water* and 8 *tablespoons each green and black tea* (16 tablespoons total) to a boil. Slowly add 16 cups sugar to the water, stirring vigorously to dissolve. Allow mixture to steep for 10-20 minutes or longer, then strain out the tea leaves. This is your concentrated replacement liquid. You will need some

for the next step; the rest should be stored in the refrigerator.

Step Two : Place the kombucha culture and the starter liquid into your three-gallon fermenting jar; or place the three cultures in three one-gallon jars and divide the starter liquid between the jars. Add (or divide between the jars) *1 1/2 cups replacement liquid* followed by *6 1/2 cups water*. Cover the top of the jar with a breathable cloth or towel and make the covering secure with a rubber band.

Step Three : Allow the mixture to ferment for 2-6 days. Taste daily and once the mixture reaches a strong enough acidity for your liking, add another *1 1/2 cups replacement liquid* and *6 1/2 cups water*.

Step Four : Repeat step three until the jar is about 90-95 percent full. Now you are ready for continuously available kombucha!

### **Schedule for every day**

Step One : Draw off two 16-ounce or three 12-ounce bottles of kombucha from the jar and flavor to your liking. Cover tightly and allow the bottles to age for 2-5 days to develop fizz and flavor, and to mellow.

Step Two : Add *3/4 cups replacement liquid* and approximately *3 1/4 cups water*, recover your jar and allow to ferment 24-36 hours. If you notice that the mixture is starting to become less acidic over time, skip a day or two once per week.

### **Schedule for three times per week**

Step One : Draw off four 16-ounce bottles of kombucha from the jar and flavor to your liking. Allow the bottles to age for 2-5 days to develop fizz, flavor, and to mellow.

Step Two : Add *1 1/2 cups replacement liquid* and *6 1/2 cups water* and recover your jar.

### **FINDING BOTTLES**

Because kombucha produces carbonation, it has the potential to explode bottles. Personally, we have forgotten about jars of kombucha for up to six weeks (one fell under our bedroom dresser and was not found until we moved!) and never had an explosion, but others report potentially dangerous explosions, especially if the bottles are of low quality or cracked glass, or they are kept in a very warm or hot place.

The best types of bottles for kombucha are thick-walled, glass bottles that come with wire-held stoppers, glass bottles for beer, or root beer, or high-end glass water bottles (such as Pelligrino or Perrier bottles) that can be recapped easily. In order to get these you need to. . .

1. Become friends with people who drink these beverages
2. Become friends with a bar or restaurant that serves these beverages and ask them to save the



bottles for you. You should supply a bin or crate for them to use and be sure to collect the bottles regularly so as to not in any way be a nuisance in exchange for their kindness.

3. Scavenge them from recycle bins and dumpsters, especially those of stores like Whole Foods.
4. Find them on or request them from places like Craigslist or Freecycle.
5. Drink these beverages yourself.

You can also purchase these bottles from beer- and wine-making supply stores in most cities, but in our experience many of these bottles appear to be of a much lower quality than those an actual drink comes in. Another good bottling option is the organic lemonade and fruit drink bottles sold at most health food and regular grocery stores, in the pint and quart sizes. Their lids are metal and thus will need to be checked and replaced more often, but the glass is very durable and previous contents of the bottles are known and innocuous. If you do purchase bottles two good sources are [www.mainbrew.com/pages/bottles.html](http://www.mainbrew.com/pages/bottles.html) and [www.mountainhomebrew.com](http://www.mountainhomebrew.com).