# Soap Making: A Quick Guide

*A summary of the most important aspects of making soap at home, from the comprehensive guide* Soap Making Made Easy: 2nd Edition *by Michelle Gaboya.*

Michelle Gaboya

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*2nd Edition*

http://soapmakingadvice.com

# Acknowledgements

Michelle Gaboya has been a soap making enthusiast for over 10 years, creating all types of elegant homemade soaps for family, friends and various occasions.

As an avid enthusiast she has accumulated a wealth of experience in the field of soap making and is a recognized personality amongst the soap makers' community. She takes great pleasure in sharing her knowledge and experience with other keen soap makers. Michelle continues to hone her craft and experiment with new designs and formulas regularly.

This book would not have been possible without the dedication of Michelle and her patience to commit all of the following from her own knowledge onto paper. You can get more information and regular articles on the Soap Making Advice blog.

Many thanks Michelle.

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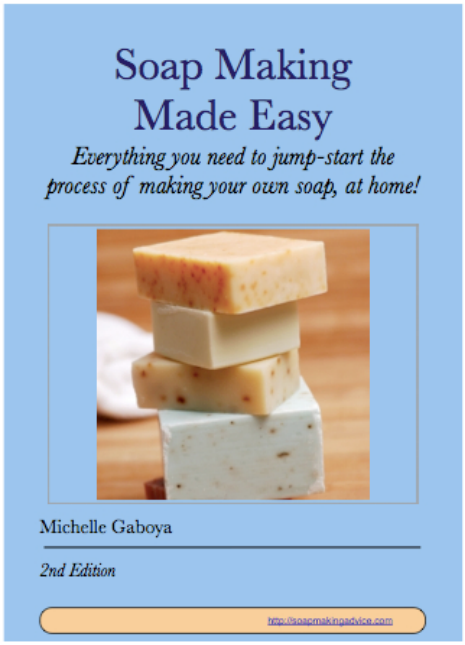


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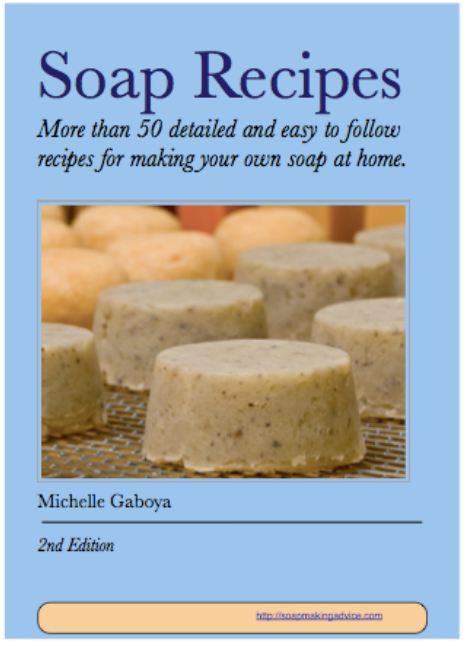


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You can get more soap making tips and information as well as regularly published articles on the Soap Making Advice blog.

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## Why Make My Own Soap?

For obvious reasons, handmade soap will result in a greater degree of customization for the soap-maker, and the consumer. Hand-made soaps are often more gentle on the skin than commercially manufactured cleansers. Making soap by hand can be an interesting and fun hobby, but it is also great for those who find that commercial soaps are too harsh, or those who want to utilize scents or ingredients that are often not found in the usual store-bought soaps.

## Tips for Beginners

Soap-making is a delicate process. The ingredients used must be of a high quality, and the manner in which they are mixed cannot be haphazard or careless. Think of it like cooking. If the ingredients you use are not of a high quality, but you follow the recipe exactly, you will have a less than ideal result. Similarly, if you have the highest quality ingredients available, but instead of following the recipe, you just throw them all together, you will probably not have the result you were hoping for – and the ingredients will be wasted.

## Basic Ingredients

### Fats and Oils

The fats and oils used in soap can be derived from either animal or vegetable fat. For example, *sodium tallowate* is a common soap-making ingredient, derived from rendered beef fat; tallow, bacon grease, lard, or any other type of animal fat can also be used. Palm, corn, canola, and olive are all common ingredients for vegetable-based soaps. Typically, soaps made from vegetable oils are softer than those made with animal fat.

### Lye

Historically, lye (also called sodium hydroxide, potash, or caustic soda) was hand-extracted from wood ashes. It is now commonly found in many hardware and grocery stores. It is the ingredient that hydrolyzes the oils or fats, and turns them into soap.

### Water

The minerals and other additives in tap water make it less than ideal for soap-making. Therefore, it is best to use distilled, bottled, or spring water.

Fragrances and Other Additives

There are two types of scent oils: essential oils and fragrance oils. Fragrance oils are man-made and contain alcohol, so they are typically avoided; the alcohol and other chemicals in the oil may be drying or irritating to the skin, and cause unforeseen problems with the saponification process, or ruin the soap mixture altogether. Essential oils are more costly, and sometimes more difficult to find; however, a smaller amount is required (usually only a drop or two) and they retain their scent better because they are undiluted. Avoid potpourri, candle scent oils and other strong, commercially-made fragrances, as they often contain harsh chemicals that can be irritating to the skin as well. Whole or crushed herbs can also be used, but they will not give their full benefits in a first batch of soap; if you use herbs, the best thing to do is to rebatch the soap later, to extract the full benefit from the herbs.

Colorants

Colorants can be purchased at a soap-making supply store. There are also various other natural ingredients that you can use to color soap. Avoid using fabric dyes, hair dyes, candle colorants, or paints to color your soap; even if they are labeled as "non-toxic," they are not safe to have in contact with skin for prolonged periods, and they may dye your skin.

Preservatives

Depending on the oils used in the recipe, the resultant soap can be prone to spoilage. Various preservatives can be utilized, such as vitamins E, C, and A, which are also great for your skin. These vitamins can be found in various oils (see Table 1).

Other Additives

Sand or pumice can be added to the soap, to make it exfoliating. Also, some metals, such as titanium, silver, nickel, or aluminum can be added for antibacterial properties, and to make the soap bright white.

## Deciding on a Recipe

There are a variety of soap recipes available to choose from, and it is of course possible to create your own. The recipe you use will depend on the qualities you want your final product to possess. Whatever recipe you choose, or create, make sure that you measure the ingredients in correct proportions, and add them at the proper times. It is generally best to weigh the lye and oils using a kitchen scale, instead of measuring them with measuring spoons or cups, because different materials have different densities, and volume measurements can be inaccurate. Also, it is important to use a lye calculator to determine the amount of lye needed for your recipe.

## Equipment

Do not use any equipment made of copper, aluminum, cast iron, or zinc – the lye mixture will react with them. Use only glass, stainless steel, plastic, stoneware, or enameled cookware.

- Rubber or latex dishwashing gloves.
- Safety goggles.
- Apron.
- Long-sleeved shirt, long pants, and shoes.
- Large stainless steel mixing bowl.
- Two large plastic pitchers.
- Two sturdy plastic spoons.
- Large heat-resistant container.
- A large glass bowl or plastic pitcher.
- Measuring cups or spoons.
- Ladle.
- Miscellaneous bowls and spoons.
- Tablecloth, newspaper or trash bags.
- Stainless steel or enameled pot.
- Two glass or stainless steel thermometers.
- Vinegar.
- Soap molds.

- Pot holders/oven mitts.
- Plastic spatulas.
- Digital scale.
- Old blankets/towels.
- Wax paper, or butcher's paper.
- Stick blender.
- Paper towels or rags.

Make sure you have all of your equipment assembled, and ready to go, before beginning the soap-making process. Also, when you are finished making your soap, be sure to clean your materials and work area thoroughly. The best place to make soap is outdoors – ventilation is not a concern, and cleanup is much easier. Always, *always* keep children and pets away from your soap-making materials and equipment.

## Precautions for Working with Lye

There are some precautions that must be taken when working with lye. After opening the lye, make sure that the lid is tightly closed. Lye is also dangerous if spilled. Use protective equipment and clothing, to prevent skin burning or irritation from a lye spill. Be sure to keep the lye away from children and pets – it can be fatal if swallowed. Work in a well-ventilated area, as lye releases toxic fumes when mixed with water; mix outdoors, or wear a protective respiratory mask, if possible. Vinegar can help to neutralize the lye mixture if it spills, so keep a bottle close at hand while working with lye. Be sure to purchase lye that is labeled for soap-making. There are some materials which should *never* come into contact with lye. Do not use any container, or heating vessel, made of aluminum, brass, bronze, chromium, iron, magnesium, zinc, or anything coated with Teflon. Also, the lye should never come into contact with sugar; this mixture will produce poisonous carbon monoxide gas. Stainless steel is the best material for heating vessels, as it can withstand elevated temperatures. Plastics may soften at higher temperatures, so unless the plastic has already been tested, glass or stainless steel are the best materials for mixing containers. Because lye is a corrosive material, any amount of it that you order or purchase will most likely come with a *material safety data sheet*, or MSDS. Before handling the lye, be sure to review the MSDS, so that you know how to handle it, what precautions to take, and what to do in case of an emergency.

## The Cold-Process Soap-Making Method

Step 1: Don protective equipment

Step 2: Prepare molds

Determine which molds you want to use; almost anything can be utilized as a mold, and the soap you make can look as plain or as decorated as the mold you use.

Step 3: Measure your ingredients

To accurately measure the fat and lye amounts you'll need, look up the *saponification value* of the fats being used in the soap. Each fat or oil has its own unique saponification value, so always check before measuring your lye. Measure oils and water using a measuring cup, placed on the digital scale. The scale should also be used to measure the lye powder.

Step 4: Prepare the lye mixture

Dissolve the measured amount in cold (preferably refrigerated) water. Pour the lye into the water, a little bit at a time, and stirring constantly. *Always* add the lye to the water, never the other way around. Use a thermometer to monitor the temperature of the solution while mixing; it should not exceed 190°F. Continue stirring until the mixture is clear, and all of the lye has been completely dissolved. Once all of the lye has been dissolved in the water, allow the water to sit and cool until it is 100-110°F.

Step 5: Heat the fats

As the lye mixture is cooling, the fats must be heated. Be very careful while heating the oils; each oil has a *flash point* – a temperature at which it will ignite – and some are lower than others, so the oils must be heated very gently. Use a stainless-steel pot on low-heat, and stir often. If the fats used are liquid, then they must be heated to approximately 100-110°F, to match the temperature of the lye mixture. If the fats are saturated enough they will be solid at room temperature, so they will have to be melted; this will most likely mean heating the fats past 110°F, then allowing them to cool to the proper temperature.

Step 6: Mix the fat and lye

Once both the fat and lye mixtures are at 100-110°F, they can be combined. Pour the lye mixture into the fat, slowly and steadily, stirring it in small, rapid circles as you pour.

Step 7: Stir

After the ingredients are combined, they must be stirred. If stirring by hand, the mixture must be stirred for 5 minutes, and then allowed to set for 15. This pattern is repeated for up to 3 hours; the amount of stirring required will vary based upon the recipe.

Step 8: Trace stage

Take a spoonful and drizzle it across the top of the mixture; if it remains visible, or leaves a trace, for a few seconds before blending back into the mix, then the mixture has begun to trace. Most additives, such as superfatting oils, herbs or colorants, will be added at the trace stage. Measure out the essential oils, colorants, or any other additives you plan to use in a separate bowl. Mix a spoonful of the soap mixture with the additives. When it is well-blended, add it to the soap mix, stirring slowly and steadily as you pour.

Step 9: Pour into molds

At the end of the trace stage, the soap mixture is poured into the molds, and allowed to set for 18-48 hours; saponification takes place during this period of time.

Step 10: Insulate the molds, and allow to set

The molds should be wrapped in towels or blankets, to retain as much of the mixture's heat as possible.

Step 11: Remove the soap from the molds

Once the one- to two-day molding process is completed, the soap is firm enough to be removed from the mold and cut. Be sure to use gloves when you remove the soap from the mold, because the lye may still burn your skin. If you lined the mold with cellophane or wax paper, it should be fairly easy to get the soap to release; if not, try putting the mold in the freezer for a while.

Step 12: Curing the soap

After they are removed from the mold, the bars should be placed on wax paper, and left in a cool, dry place for 2 to 6 weeks, to cure and harden. The actual curing time required will depend upon the recipe.

Step 13: Test the pH of your soap

Before using your soap, test a bar for pH level, using a chemical called *phenolphthalein;* this chemical turns fuchsia, or pink, if the pH is too high.

Step 14: Storing your soap

If your soap is satisfactory, and you want to keep it, be sure to store it in a cool, dry place, out of direct sunlight. Label each bar clearly with the batch code, so that you will be able to quickly reference what is in each bar, when it was made, etc. Your memory is good now, but after a few months go by, and you have made several batches, it may become difficult to distinguish one bar from another.

## Basic Soap Recipe

(For Normal to Oily Skin)

Ingredients:

- 598g coconut oil
- 296g vegetable shortening
- 30g beeswax
- 58g avocado oil
- 150g lye (6% discount)
- 368ml distilled water

Mix the lye and water, and set aside. Heat the avocado and coconut oils, vegetable shortening, and beeswax to approximately 110°F. When both mixtures are at the proper temperature, mix them together. It should take about 15 minutes for the mixture to trace. When it does, pour it into the molds, and allow it to set for 24 hours. After removing it from the molds, allow it to cure for approximately 3 weeks before packaging/using the bars.

## Other Soap-Making Methods

The basic process for making bars of solid soap is similar for each technique, but there are variations depending on the method used by the soap-maker.

Melt-and-Pour Method

This method involves taking pure glycerin (animal or vegetable derived), which is always in liquid form, and solidifying it by adding other chemicals. The lather is created by adding pure detergents. "Melt-and-pour" can also refer to a different process – melting commercial or pre-made bars of soap, adding your own fragrance and other additives, and creating new bars from the mixture.

Rebatching

Rebatching refers to the process of melting soap scraps, or chunks of soap base, and remolding them. Rebatching is useful if you have soaps that are warped, or otherwise aesthetically flawed, but still usable; it also helps to extract the full medicinal or beautifying benefits from any herbs you have added to soap.

Semi-Boiled, or Hot-Process, Method

The hot-process method differs from cold-process in that external heat is applied after the fats and oils are mixed together. Instead of allowing saponification to take place during the molding stage – which takes a long time – saponification takes place before the soap is molded. The hot-process method was commonly used when the purity of the lye soap-makers were able to obtain was in question. Also, if you want to use a natural lye solution, such as potash, instead of 100% lye, hot-process is the best method to employ.

Warm-Process (or Oven Hot-Process) Method

The warm-process method is, as you may guess, somewhere between the cold-process and hot-process methods. Instead of insulating the soap with blankets while it is in the molding stage, or boiling it to achieve faster saponification, the filled soap molds are heated in an oven.

Full-Boiled Method

This method is typically favored by commercial soap-makers. All ingredients are added at once, in a large container, and heated to cause saponification. Glycerin is a by-product created via this method. The glycerin is typically removed by commercial soap-makers, and sold; however, your soap, with the glycerin still in it, will be naturally more moisturizing and skin-conditioning than commercial bars.

Transparent Method

Alcohol is added to the other ingredients to prevent crystallization while it cools and solidifies. This produces a clear soap, and lots of creative projects can be made with this variety of soap. It's great for innovative and adorable gifts. Transparent soap is sometimes called glycerin soap, but this is a misnomer, since glycerin isn't utilized at all during this process. One downside to transparent soap is that, because of the alcohol added to the mixture, it can be somewhat drying for some skin types.

## Making Liquid Soap

There are two processes for making good liquid soap. One process is quite similar to the cold-process method for making solid bars; however, instead of curing your soap after removing it from the molds, it should be cut up into small pieces, or grated. Making liquid soap is easier if the solid bars are made from an oil that results in a softer soap, such as canola oil. Also, try using potassium hydroxide lye for liquid soap, instead of sodium hydroxide; it makes softer bars, so the process of making liquid soap from the bars is easier. The other way to make liquid soap is to make it via the hot-process method. Liquid soap can be prone to spoilage, so glycerin or another oil containing vitamin A, C or E should be added to help preserve it. Store your liquid soap in a pump, or flip-top bottle, to further guard against spoilage. Use the soap within 6 to 8 months, and dispose of it if it becomes cloudy, or smells rancid.

## Stick Blenders vs. Hand Stirring

Stick blenders can speed up the mixing process significantly. Soap that is mixed with a stick blender is likely to reach trace much more quickly, is less prone to separation, and can usually be cut and shaped without breaking or crumbling, once it has been removed from the mold. If you are just starting out in the hobby of soap-making, you may want to use a spoon or hand-mixer to blend the batter, until you are able to tell the difference between the various stages of trace.

## Superfatting

For those with sensitive or dry skin, a process known as *superfatting* can result in an even more luxurious and moisturizing soap. Superfatted soap contains, as it sounds, more fat than other soaps, which makes it less harsh on skin; however, if too much fat is used, it can leave users with a greasy feel to their skin after it is rinsed away. Superfatting can be accomplished by, obviously, adding extra fat to the soap; this would take place during the trace stage, after saponification, so that the superfatting oils do not interact with the lye. Another superfatting process, known as *superfat discounting*, or *lye discounting*, accomplishes the same ratio of fats to lye, by adding the same amount of fat, but less lye.Superfatting by adding extra oil after saponification allows the soap-maker to have greater control over the amount of oils left in the soap. Adding the oil at the trace stage also keeps the oil in its natural state, unaffected by the lye and providing instant nourishment to the skin when used.

## Batch Codes

After you complete a batch of soap, it is a good idea to include a *batch code* with the soap's packaging. The batch code is a numeric (or alphanumeric) code that enables the soap-maker to identify which batch of soap each bar originated from. This is important because if you find a bar that is flawed, or if you receive a complaint about your soap, you will be able to quickly identify all of the bars in that batch, so that you can dispose of all of them.

## Natural Colorants

If you don't want to use synthetic colorants to color your soap, there are a wide variety of natural colorants that you can use. Natural colorants are sometimes safer, but the reality is that most colorants are processed at some point; if you want to be sure that the colorants you are using are *truly* natural, do some research into the methods with which they were harvested and processed. Before you use any colorant in your soap, it is always a good idea to test it first. Testing the colorant will allow you to decide how much to use to achieve the right hue, and will prevent a batch of soap getting ruined by using the wrong amount, or an herb to which you have a skin sensitivity. Also, different colorants should be added at different stages of the soap-making process, so these important tests can give you an idea of when to add the colorant to your soap mixture.

## Other Soap-Coloring Options

If the natural colorants don't work for you, or are too expensive or unpredictable, there are a variety of synthetic colorants that can be used. Pigments, micas, and FD&C colorants are some of these.

*Pigments* are colorants that were originally mined, but now, due to FDA regulations, are manufactured in laboratories. Pigments tend to be pretty stable, and the color that they will impart to your soap is predictable. The liquids are extremely easy to use, but the powders must be mixed with liquid before they are added to the soap batter, and they may clump.

FD&C colorants are also manufactured in a laboratory. By way of comparison, they are easier to use than many pigments, and provide a much wider range of colors. FD&C colorants are inexpensive, and very easy to use; they are great for use in melt-and-pour soap, but they don't usually remain stable in cold-process soap, due to its high alkalinity.

Micas are a combination of natural and synthetic materials. The micas themselves are natural material; after they are mined, they are then coated with FD&C colorants, or pigments, to provide them with color. Because of their metallic sheen, micas can only display their color by reflecting light; therefore, they work best in translucent soaps. They blend very smoothly, but a larger amount is required than if you were coloring the soap with other colorants. Micas also look nice in cold-process soap, but because some of them are coated with FD&C colorants, they should be tested before use.

## Scenting Your Soap

As stated earlier, the best substances for adding scent to your homemade soap are essential oils. There are three categories of essential oils; top, middle, and base. The top note is immediately perceived, and usually the first to disperse; the middle note provides most of the scent's character; the base note is the last to be noticed, but usually the strongest, and tends to remain after the other scents have faded. A general guideline is to use 3 parts top note, 2 parts middle note, and 1 part base note. The amount of oil you will use will vary based on the size of your batch, and individual preferences; however, a good guideline to follow is 15-20 ml of the top note oil, 5-10 ml of the middle note, and 2.5-5 ml of the base note, per 700 ml batch of soap.

## Selling Your Product

Many amateur soap-makers begin making soap simply because it is a fun and rewarding hobby. Others, however, hope to turn their hobby into a source of income. For stay-at-home moms, those who are unemployed or cannot work, or even for those who want a part-time income, soap-making can be a great idea. With a few hours' work, you can turn a minimal investment in equipment and ingredients into a product that is potentially worth a great deal of money. It is possible to turn a profit selling soap, but it is not as simple as making the soap and exchanging it for money. There are lots of factors to take into account, if you want your soap to stand out against the competition, and actually turn a profit.

## Packaging and Presentation

Once your soap is completed, you'll want to package it to reflect the care, effort and pride that you put into your product. Hand-made soap is more expensive than mass-produced brands, and with good reason; the ingredients are of a higher quality, the results are superior, and it takes longer to make. However, to compete with the mass-produced soaps, your packaging needs to reflect all of the reasons that spending the extra money on your soap is worthwhile to the buyer.

## Where to Sell Your Soap

One of the easiest and most cost-effective ways to sell your soap is at craft fairs, flea markets, farmers' markets, or other festivals. Tables at these types of events are generally fairly cheap, and people go there expecting to spend money. Therefore, if your soap isn't ludicrously over-priced, odds are pretty good that someone will consider it a low-cost luxury; people like things that are hand-made, it is a nice alternative to mass-produced soaps, and they make very nice, but cost-effective, gifts.

## FDA Regulation of Soap

In the United States, the Food and Drug Administration (FDA) does not regulate soap. However, their definition of "soap" is very narrow. In order for your soap to be considered as such by the FDA, it must consist of alkali, fatty acids, and water, and very little else. Also, the only claim that you can make, regarding your soap, is that it cleanses the body.

## Liability

Many entrepreneurs research the creation and marketing of their product, but some forget one important detail: liability. In today's litigious society, there is no way to safeguard yourself against being sued. However, there are ways that you can protect your personal assets, in case of a lawsuit.