Nature's Garden
Wholesale Candle & Soap Supplies

Soaping Oil/Butter Properties

Typical Bar Soap Recipe Values:	
Hardness	29 to 54
Cleansing	12 to 22
Conditioning	44 to 69
Bubbly lather	14 to 46
Creamy lather	16 to 48

Soap is made by the chemical reaction that occurs when mixing fatty acids, lye (NaOH for bar soap, KOH for liquid soap), and water. Lye acts as the chemical emulsifier that bonds fatty acids with water molecules by generating heat. This process is called **saponification**. **Soap cannot be made without lye.**

Each soaping oil/butter has its own fatty acid composition, and these fatty acids provide finished soap with important characteristics. The following are the most common fatty acids found in soaping oils/butters along with the qualities they provide in a finished bar of soap.

Lauric Acid: Provides hardness, cleansing, and bubbly lather.
Linoleic Acid: Provides conditioning
Myristic Acid: Provides hardness, cleansing, and bubbly lather.
Oleic Acid: Provides conditioning.
Palmitic Acid: Provides hardness and a creamy lather.
Ricinoleic Acid: Provides conditioning, bubbly lather, and a creamy lather.
Stearic Acid: Provides hardness and a creamy lather.

Each soaping oil/butter has a unique **saponification value** (the number of milligrams of lye required to saponify 1 gram of the specified oil/butter).

In order to create a quality bar of soap, it is necessary to find a balance between hardness, cleansing, conditioning, bubbly lather, and creamy lather. This usually involves using a combination of oils/butters in your soap recipe. A typical bar soap recipe calls for 38% water content, and a 5% superfat (the percentage of oils that do not saponifiy).

Soaping Oil/Butter	Hardness (1-100)	Cleansing (1-100)	Conditioning (1-100)	Bubbly Lather (1-100)	Creamy Lather (1-100)	Sap Value NaOH/KOH	Misc. Information
Almond Oil, Sweet	7	0	89	0	7	0.139/0.195	Composed of the following fatty acids: Palmitic-7% Oleic- 71% Linoleic-18% A light, liquid oil at room temp. Recommended usage of this oil in soap recipes is 5-10% primarily for conditioning purposes. Almond oil easily absorbs into the skin to provide nourishment.
Apricot Kernel Oil	6	0	93	0	6	0.139/0.195	Composed of the following fatty acids: Palmitic- 6% Oleic- 66% Linoleic- 27% A light, liquid oil at room temp. Recommended usage of this oil in soap recipes is 5-10% primarily for conditioning purposes. Apricot kernel oil easily absorbs into the skin to provide nourishment.
Argan Oil	15	1	81	1	14	0.136/0.191	Composed of the following fatty acids: Myristic- 1% Palmitic- 14% Oleic- 46% Linoleic- 34% Linolenic- 1% Referred to as "liquid gold" in Europe, Argan oil is used in soap to provide antioxidants, nutrients and

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							conditioning to the skin. Provides a stable, rich lather. Usage rate 5-10%.
Avocado Oil	22	0	70	0	22	0.133/0.186	Composed of the following fatty acids: Palmitic- 20% Stearic- 2% Oleic- 58% Linoleic- 12% A nutrient-filled soaping oil that provides creamy lather and conditioning to the skin. Due to its high levels of unsaponifiables, many soapers use this oil to increase the moisturizing qualities of their soap. Avocado oil is great in soap for people with sensitive skin. Usage rate can be 5-30% in a soap recipe.
Babassu Oil	85	70	10	70	15	0.175/0.245	Composed of the following fatty acids: Lauric- 50% Myristic- 20% Palmitic- 11% Stearic- 4% Oleic- 10% Babassu oil closely resembles the qualities of coconut and palm kernel oil when used in soap. It provides bubbly lather. May speed trace. Great for itchy skin.
Beeswax	0	0	0	0	0	0.067/0.094	Composed of the following fatty acids: Contains none

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							Beeswax can be used in soap at 1-3% to help produce a harder bar of soap, and will reduce the amount of "ash" that is produced as your soap cures. Using too much beeswax will inhibit lather.
Canola Oil, High Oleic	6	0	90	0	6	0.133/0.186	Composed of the following fatty acids: Palmitic- 4% Stearic- 2% Oleic- 74% Linoleic- 12% Linolenic- 4% Many soapers use canola oil as a partial replacement for more expensive olive oil in their soaps (using 10-15% in recipes). Canola oil produces stable lather and conditioning. Canola tends to slow down trace, therefore making it an ideal oil to use in soap recipes that will involve swirled soap. Canola oil will reduce the hardness of soap.
Canola Oil, rapeseed	6	0	91	0	6	0.133/0.186	Composed of the following fatty acids: Palmitic- 4% Stearic- 2% Oleic- 61% Linoleic- 21% Linolenic- 9% Many soapers use canola oil as a partial replacement for more expensive olive oil in their soaps

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							(using 10-15% in recipes). Canola oil produces stable lather and conditioning. Canola tends to slow down trace, therefore making it an ideal oil to use in soap recipes that will involve swirled soap. Canola oil will reduce the hardness of soap.
Castor Oil	0	0	98	90	90	0.128/0.18	Composed of the following fatty acids: Ricinoleic- 90% Oleic- 4% Linoleic- 4% Castor oil provides a rich, creamy lather in soap when used at 5-7%. Using more than 10% castor oil in soap can produce a sticky soap.
Cocoa Butter	61	0	38	0	61	0.138/0.194	Composed of the following fatty acids: Palmitic- 28% Stearic- 33% Oleic- 35% Linoleic- 3% Cocoa butter helps to produce a harder bar of soap that has rich, creamy lather. Can speed trace. Cocoa butter is typically used to superfat soap. It is high in antioxidants and is not prone to rancidity. Provides moisture to the skin.
Coconut Oil 76	79	67	10	67	12	0.183/0.257	Composed of the following fatty acids: Lauric- 48%

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							Myristic- 19% Palmitic-9% Stearic- 3% Oleic- 8% Linoleic- 2% Coconut oil provides cleansing ability to a bar of soap, but using more than 30-35% of coconut oil in soap can strip the skin of its natural oils, leaving the skin dry and irritated. In order to counter this problem, many soapers superfat their soap recipe with soaping oils which are highly conditioning to the skin. The 76 next to coconut refers to the Fahrenheit temperature at which this oil melts.
Coconut Oil 92	79	67	10	67	12	0.183/0.257	Composed of the following fatty acids: Lauric- 48% Myristic- 19% Palmitic-9% Stearic- 3% Oleic- 8% Linoleic- 2% Coconut 92 and coconut 76 contain the same levels of essential fatty acids, however some soapers prefer using the coconut 92 because it is easier to scoop than the coconut 76. The 92 next to coconut refers to the Fahrenheit temperature at which this oil melts.
Coconut Oil, fractionated	93	93	0	93	0	0.232/0.325	Composed of the following fatty

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							acids: Lauric- 2% Myristic- 1% Produces a harder bar of soap that cleanses and bubbles. Absorbs easily into the skin without leaving a greasy feel. Not prone to rancidity; almost unlimited shelf life. Liquid at room temp.
Corn Oil	14	0	84	0	14	0.137/0.192	Composed of the following fatty acids: Palmitic- 12% Stearic- 2% Oleic- 32% Linoleic- 51% Linolenic- 1% It acts like most of the other vegetable liquid oils like soybean or canola. It can be used as part of your recipe (10-15%) and will help give a moisturizing, stable lather. Can soften your soap.
Cottonseed Oil	26	0	71	0	26	0.138/0.194	Composed of the following fatty acids: Palmitic- 13% Stearic- 13% Oleic- 18% Linoleic- 52% Linolenic- 1% It can be used as part of your recipe (10-15%) and will help give a moisturizing, stable, and silky lather. May be prone to rancidity, so proper storage is a must.

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Crisco, new with palm	25	0	74	0	25	0.138/0.193	Composed of the following fatty acids: Palmitic- 20% Stearic- 5% Oleic- 28% Linoleic- 40% Linolenic- 6%
Crisco, old	26	0	70	0	26	0.137/0.192	Composed of the following fatty acids: Palmitic- 13% Stearic- 13% Oleic- 18% Linoleic- 52%
Flax Oil, linseed	9	0	90	0	9	0.135/0.19	Composed of the following fatty acids: Palmitic- 6% Stearic- 3% Oleic- 27% Linoleic- 13% Linolenic- 50% Flax seed oil is said to help heal skin damage, rashes, swelling, redness, and scars. Provides excellent conditioning to the skin. Use at 5-10% in soap recipes. Typically used to superfat soap. Will reduce the hardness of soap.
Grapeseed Oil	12	0	88	0	12	0.129/0.181	Composed of the following fatty acids: Palmitic- 8% Stearic- 4% Oleic- 20% Linoleic- 68% A light weight oil typically used to

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							superfat soap. Grapeseed oil easily absorbs into the skin without leaving a heavy greasy feel. Typically used in anti-acne soap recipes. Usage rate of 5% in recipes. Can be prone to rancidity after 6 months. Proper storage is a must.
Hemp Oil	8	0	90	0	8	0.138/0.193	Composed of the following fatty acids: Palmitic- 6% Stearic- 2% Oleic- 12% Linoleic- 57% Linolenic-21% Hemp seed oil is a deep, green color with a light, nutty smell. It gives a light, creamy/silky lather. Because of its fatty acid makeup, it has a very short shelf life; less than six months. It should be refrigerated or even kept in the freezer. It can be used as a luxury healing/moisturizing oil in soap up to 10%-15%.
Jojoba Oil (a liquid wax)	0	0	12	0	0	0.066/0.092	Composed of the following fatty acids: Oleic- 12% Jojoba is actually a liquid wax. It contributes a nice stable lather, has remarkable absorption and moisturizing qualities and unlike some of the other luxury moisturizing oils, has a very long

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							shelf life; 1-2 years. Use it at 5-10% maximum. Can speed trace.
Lanolin Liquid Wax	0	0	0	0	0	0.076/0.106	Composed of the following fatty acids: Contains none. Lanolin contains almost no saponifiables, and therefore maintains its conditioning characteristics during the entire saponification process. Provides a silky feel to soap. Use at 1-5% in soap recipes, and keep temperature of lanolin around 110F when adding to your soap recipe.
Lard, Pig Tallow	42	1	52	1	41	0.141/0.198	Composed of the following fatty acids: Myristic-1% Palmitic- 28% Stearic- 13% Oleic- 46% Linoleic- 6% Lard makes a super-hard, very white bar of soap with a low, creamy, stable lather that is moisturizing. Before vegetable oils were commonly available, it was one of the main fats (along with beef tallow) that folks used to make soap. If you use animal oils in your soap, then combining lard with some of the other liquid oils like coconut and olive makes a wonderful, well balanced bar of

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							soap - and is really economical. Make sure your lard is fresh and of high quality. Use it at any percentage in your recipe, but I recommend not much more than 30-40% or so. Cold process laundry soap can be made with 100% lard with a 0% superfat percentage.
Macadamia Nut Oil	14	0	61	0	14	0.139/0.195	Composed of the following fatty acids: Palmitic- 9% Stearic- 5% Oleic- 59% Linoleic- 2% Macadamia nut oil is a light oil with a mild nutty odor. It is unique in its fatty acid makeup in that it contains palmitoleic acid - which makes it really easily absorbed into the skin - and is reported to be really great for older skin.
Mango Butter	49	0	48	0	49	0.136/0.191	Composed of the following fatty acids: Palmitic- 7% Stearic- 42% Oleic- 45% Linoleic- 3% Mango butter helps produce soap that is conditioning, with a rich, creamy lather. Mango butter is typically used at around 5% to superfat soap.
Meadowfoam Oil	0	16	84	0	0	0.12/0.169	Composed of the following fatty acids:

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							Contains none. Meadowfoam oil is typically used to superfat soap due to its conditioning qualities. Has excellent resistance to oxidation, and is not prone to rancidity. It is used as a binder that may help to increase the life of fragrance oil in soap and bath products. Usage rate 5-10% .
Neem Oil	33	0	63	0	33	0.139/0.195	Composed of the following fatty acids: Palmitic- 18% Stearic- 15% Oleic- 50% Linoleic- 13% Neem oil has a distinct odor, and should be used at small amounts in soap recipes. Contributes to a stable, creamy lather in soap, conditioning, and is said to treat skin conditions such as dandruff. Usage rate 1-5%.
Olive Oil	17	0	82	0	17	0.135/0.19	Composed of the following fatty acids: Palmitic- 14% Stearic- 3% Oleic- 69% Linoleic- 12% Linolenic- 1% Castille Soap, also called baby soap, is soap made by using 100% olive oil (no other soaping oils used). Marseille soap is referred to soap

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							made by using no less than 72% olive oil in the recipe. Most soapers use additional soaping oils in their recipes to achieve better lather; as high olive oil soap can be a bit "slimy" with limited bubbles.
Olive Oil, Pomace	17	0	83	0	17	0.134/0.188	Composed of the following fatty acids: Palmitic- 14% Stearic- 3% Oleic- 69% Linoleic- 12% Linolenic- 2% Castille Soap, also called baby soap, is soap made by using 100% olive oil (no other soaping oils used). Marseille soap is referred to soap made by using no less than 72% olive oil in the recipe. Olive oil pomace contains unsaponifiable components that provide luxurious soap, but may contribute to the acceleration of trace. Most soapers use additional soaping oils in their recipes to achieve better lather; as high olive oil soap can be a bit "slimy" with limited bubbles.
Palm Kernel Oil	75	65	18	65	10	0.176/0.247	Composed of the following fatty acids: Lauric- 49% Myristic- 16% Palmitic- 8% Stearic- 2% Oleic- 15%

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							Linoleic- 3% Palm kernel oil provides cleansing ability to a bar of soap, but using more than 30-35% of palm kernel oil in soap can strip the skin of its natural oils, leaving the skin dry and irritated. In order to counter this problem, many soapers superfat their soap recipe with soaping oils which are highly conditioning to the skin.
Palm Kernel Oil, Flakes	90	66	4	66	24	0.176/0.247	Composed of the following fatty acids: Lauric- 49% Myristic- 17% Palmitic- 8% Stearic- 16% Oleic- 4% Palm kernel oil provides cleansing ability to a bar of soap, but using more than 30-35% of palm kernel oil in soap can strip the skin of its natural oils, leaving the skin dry and irritated. In order to counter this problem, many soapers superfat their soap recipe with soaping oils which are highly conditioning to the skin.
Palm Oil	50	1	49	1	49	0.142/0.199	Composed of the following fatty acids: Myristic- 1% Palmitic- 44% Stearic- 5% Oleic- 39%

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							Linoleic- 10% Palm oil, along with olive and coconut, is one of the top oils used by soap makers today. Because of the qualities it gives soap - a hard bar with a rich creamy lather. Palm oil can speed trace. It is a solid at room temp.
Palm Stearin	67	2	33	2	65	0.142/0.199	Composed of the following fatty acids: Myristic- 2% Palmitic- 60% Stearic- 5% Oleic- 26% Linoleic- 7%
Peanut Oil	11	0	82	0	11	0.137/0.192	Composed of the following fatty acids: Palmitic- 8% Stearic- 3% Oleic- 56% Linoleic- 26% Peanut oil provides a stable, creamy lather, and conditioning to soap. However, it can be prone to rancidity, and must be stored properly. Peanut oil is high in vitamin E, and will make a softer bar of soap. Usage rate 1-5%.
Pine tar	0	0	0	0	0	0.043/0.06	Composed of the following fatty acids: Contains none. Contains a small amount of saponifiables, and has been used for centuries to treat dandruff,

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							eczema, psoriasis, and other skin irritations. Pine tar has a distinct aroma. Typically used to superfat soap; 5%.
Pumpkin Seed Oil, Virgin	19	0	83	0	19	0.139/0.195	Composed of the following fatty acids: Palmitic- 11% Stearic- 8% Oleic- 33% Linoleic- 50% A dark colored oil with a natural nutty aroma that provides many nutrients to the skin such as vitamins A, C, E, K, and zinc. Pumpkin seed oil provides a stable, creamy lather and conditioning to soap recipes.
Rice Bran Oil	26	1	69	1	25	0.128/0.179	Composed of the following fatty acids: Myristic- 1% Palmitic- 22% Stearic- 3% Oleic- 43% Linoleic- 26% Rice bran oil provides conditioning, rich, creamy lather to soap. It is a great oil to use in recipes for mature, sensitive skin types.
Safflower Oil, high oleic	7	0	92	0	7	0.135/0.19	Composed of the following fatty acids: Palmitic- 5% Stearic- 2% Oleic- 77% Linoleic- 15%

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							Use it in your recipes like you would soybean, canola or sunflower - 5-15% . In soap, it is mild and moisturizing. Can be prone to rancidity; proper storage is a must.
Sal Butter	50	0	42	0	50	0.132/0.185	Composed of the following fatty acids: Palmitic- 6% Stearic- 44% Oleic- 40% Linoleic- 2% Sal butter provides soap with conditioning, hardness, and a creamy lather.
Sesame Seed Oil	15	0	83	0	15	0.134/0.188	Composed of the following fatty acids: Palmitic- 10% Stearic- 5% Oleic- 40% Linoleic- 43% Sesame seed oil provides conditioning, stable later, and silky feel to soap. It has a natural, nutty aroma. Long shelf life, it is not prone to rancidity. It is said that sesame seed oil can be used to treat eczema, and psoriasis. May slow down trace. Usage 5-10% typically as a superfatting oil.
Shea Butter	45	0	54	0	45	0.128/0.179	Composed of the following fatty acids: Palmitic- 5% Stearic- 40%

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							Oleic- 48% Linoleic- 6% Shea butter contains some unsaponifiables that do not react with lye; thus remain in your soap to nourish the skin. Shea provides soap with hardness, conditioning, stable lather, and a silky feel. Shea butter when used in high percentages can speed trace. It has been said that shea butter can help with skin blemishes, dry skin, and wrinkles.
Soybean Oil	16	0	82	0	16	0.136/0.191	Composed of the following fatty acids: Palmitic- 11% Stearic- 5% Oleic- 24% Linoleic- 50% Linolenic-8% Provides conditioning, stable lather in soap. Will slow trace.
Stearic Acid	99	0	0	0	99	0.141/0.198	Composed of the following fatty acids: Stearic- 99% Used in soap making to create harder, creamier lather soap.
Sunflower Oil, high oleic	7	0	88	0	7	0.135/0.189	Composed of the following fatty acids: Palmitic- 3% Stearic- 4% Oleic- 83% Linoleic- 4% Linolenic-1%

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							Sunflower oil is used in soap recipes where swirled soap is desired due to its ability to slow down trace. It provides stable lather, conditioning, and a silky feel to soap. Sunflower oil naturally resists rancidity due to its high vitamin E content. Usage up to 25% in recipes, but using high percentages will create a very soft soap.
Tallow, Beef	58	8	40	8	50	0.143/0.2	Composed of the following fatty acids: Lauric- 2% Myristic- 6% Palmitic- 28% Stearic- 22% Oleic- 36% Linoleic- 3% Linolenic-1% Like lard, beef tallow gives you a super-hard, white bar of soap with low, creamy, stable lather that is very moisturizing. Before vegetable oils were commonly available, it was one of the main fats that folks used to make soap - and remains one of the most common oils in soap. (Check your label for sodium tallowate. That's beef tallow.) If you are o.k. using animal oils in your soap, then combining beef tallow with some of the other liquid oils like coconut & olive

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							makes a wonderful, well balanced bar of soap. While you can use it at any percentage in your recipe, I wouldn't recommend much more than 40% before it starts creating a brittle bar of soap.

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*To create your own soap recipes, we suggest visiting www.soapcalc.net. This website contains a free soap lye calculator. *