Formulating CP Soap Recipes

By Amanda Gail | www.lovinsoap.com

www.lovinsoap.com/hscg2017

Why learn when there are so many great recipes out there?

- **Formulating your own recipes is good for your soap business.** You don't want to use someone's recipe as the basis of your business.
- **Sometimes customers ask for custom soaps.** You'll have the knowledge to put together a recipe for baby's skin or for a dirty mechanic.
- **You'll know how to tweak a recipe or formula to make it better.** Have you ever made a soap and thought, "*Gosh, I wish I could make it just a bit more moisturizing or make the lather creamier*?" This presentation will show you how to tweak a recipe for many different outcomes.

We'll talk about...

- Fatty acid profiles of common soap making oils
- Creating single oil soaps
- Modifying a soap recipe
- Starting from scratch (starting ratios)
- Going palm-free
- Tips for formulating

Fatty Acid Profiles

- Learning the fatty acid profiles of soap making oils will help you better formulate. Let's look at some common profiles.
- http://www.lovinsoap.com/oils-chart/

Fatty Acid Profiles

Show 50 entries

Base Oil	Lauric	Myristic	Palmitic	Stearic	Ricinoleic	Oleic	Linoleic	Linolenic
Coconut Oil	49	19	9	3	0	8	2	0
Babassu Oil	50	20	11	4	0	10	0	0
Palm Kernel Oil	49	16	8	2	0	15	3	0
Palm Oil	0	1	44	5	0	39	10	0
Castor Oil	0	0	0	0	90	4	4	0
Sal Butter	0	0	6	44	0	40	2	0
Kokum Butter	0	0	4	56	0	36	1	0
Shea Butter	0	0	5	40	0	48	6	0
Cocoa Butter	0	0	28	33	0	35	3	0
Mango Butter	0	0	7	42	0	45	3	0
Tallow (Beef)	2	6	28	22	0	36	3	1

Lauric Acid

- Shelf Life: Long
- Cleansing: High
- Lather: Abundant Fleeting Lather
- Primary Oils: Coconut Oil, Palm Kernel Oil, Babassu Oil
- Secondary Oils: None

Fatty Acid Profiles

Show 50 entries

Base Oil	Lauric	Myristic	Palmitic	Stearic	Ricinoleic	Oleic	Linoleic	Linolenic
Babassu Oil	50	20	11	4	0	10	0	0
Coconut Oil	49	19	9	3	0	8	2	0
Palm Kernel Oil	49	16	8	2	0	15	3	0
Tallow (Beef)	2	6	28	22	0	36	3	1
Palm Oil	0	1	44	5	0	39	10	0
Cocoa Butter	0	0	28	33	0	35	3	0
Lard (Pig)	0	1	28	13	0	46	6	0
Emu Oil	0	0	23	9	0	47	8	0
Rice Bran Oil	0	1	22	3	0	38	34	2
Neem Oil	0	2	21	16	0	46	12	0
Avocado Oil	0	0	20	2	0	58	12	0

Myristic Acid

- Shelf Life: Long
- Cleansing: High
- Lather: Abundant Fleeting Lather
- Primary Oils: None
- Secondary Oils: Coconut Oil, Palm Kernel Oil, Babassu Oil

Fatty Acid Profiles

Show 50 entries

Base Oil	Lauric	Myristic	Palmitic	Stearic	Ricinoleic	Oleic	Linoleic	Linolenic
Babassu Oil	50	20	11	4	0	10	0	0
Coconut Oil	49	19	9	3	0	8	2	0
Palm Kernel Oil	49	16	8	2	0	15	3	0
Tallow (Beef)	2	6	28	22	0	36	3	1
Neem Oil	0	2	21	16	0	46	12	0
Palm Oil	0	1	44	5	0	39	10	0
Lard (Pig)	0	1	28	13	0	46	6	0
Rice Bran Oil	0	1	22	3	0	38	34	2
Cocoa Butter	0	0	28	33	0	35	3	0
Emu Oil	0	0	23	9	0	47	8	0
Avocado Oil	0	0	20	2	0	58	12	0

Palmitic Acid

- Shelf Life: Long
- Cleansing: Med
- Lather: Stabilizing, Creamy
- Primary Oils: Palm Oil
- Secondary Oils: Tallow, Lard, Avocado Oil, Emu Oil, Neem Oil, Rice Bran Oil

Fatty Acid Profiles

Show 50 entries

Base Oil	Lauric	Myristic	Palmitic	Stearic	Ricinoleic	Oleic	Linoleic	Linolenic
Palm Oil	0	1	44	5	0	39	10	0
Cocoa Butter	0	0	28	33	0	35	3	0
Tallow (Beef)	2	6	28	22	0	36	3	1
Lard (Pig)	0	1	28	13	0	46	6	0
Emu Oil	0	0	23	9	0	47	8	0
Rice Bran Oil	0	1	22	3	0	38	34	2
Neem Oil	0	2	21	16	0	46	12	0
Avocado Oil	0	0	20	2	0	58	12	0
Olive Oil	0	0	14	3	0	69	12	1
Cottonseed Oil	0	0	13	13	0	18	52	1
Babassu Oil	50	20	11	4	0	10	0	0

Stearic Acid

- Shelf Life: Long
- Cleansing: Low-Med
- Lather: Low, Creamy, Lotion-like
- Primary Oils: Sal Butter, Kokum Butter
- Secondary Oils: Shea Butter, Cocoa Butter, Mango Butter, Lard, Tallow

Fatty Acid Profiles

Show 50 entries

Base Oil	Lauric	Myristic	Palmitic	Stearic	Ricinoleic	Oleic	Linoleic	Linolenic
Kokum Butter	0	0	4	56	0	36	1	0
Sal Butter	0	0	6	44	0	40	2	0
Mango Butter	0	0	7	42	0	45	3	0
Shea Butter	0	0	5	40	0	48	6	0
Cocoa Butter	0	0	28	33	0	35	3	0
Tallow (Beef)	2	6	28	22	0	36	3	1
Neem Oil	0	2	21	16	0	46	12	0
Lard (Pig)	0	1	28	13	0	46	6	0
Cottonseed Oil	0	0	13	13	0	18	52	1
Emu Oil	0	0	23	9	0	47	8	0
Palm Oil	0	1	44	5	0	39	10	0

Ricinoleic Acid

- Shelf Life: Long
- Cleansing: Low
- Lather: Low, boost lather because of solvent properties
- Primary Oils: Castor Oil
- Secondary Oils: None

- No substitutions but you can add sugar as a lather-booster. ½-1 teaspoon per pound of oils.

Fatty Acid Profiles

Show 50 entries

Base Oil	Lauric	Myristic	Palmitic	Stearic	Ricinoleic	Oleic	Linoleic	Linolenic
Castor Oil	0	0	0	0	90	4	4	0
Kokum Butter	0	0	4	56	0	36	1	0
Sal Butter	0	0	6	44	0	40	2	0
Mango Butter	0	0	7	42	0	45	3	0
Shea Butter	0	0	5	40	0	48	6	0
Cocoa Butter	0	0	28	33	0	35	3	0
Tallow (Beef)	2	6	28	22	0	36	3	1
Neem Oil	0	2	21	16	0	46	12	0
Lard (Pig)	0	1	28	13	0	46	6	0
Cottonseed Oil	0	0	13	13	0	18	52	1
Emu Oil	0	0	23	9	0	47	8	0

Oleic Acid

- Shelf Life: Medium-Long
- Cleansing: Low-Medium
- Lather: Conditioning Lather
- Primary Oils: Shea Butter, Cocoa Butter, Mango Butter, Lard, Tallow, Avocado Oil, Emu Oil, Rice Bran Oil, Canola Oil, Sweet Almond Oil, Apricot Kernel Oil, Olive Oil, High Oleic Sunflower Oil, High Oleic Safflower Oil, Jojoba Oil, Macadamia Nut Oil
- Secondary Oils: Palm Oil, Soybean Oil, Cotton Seed Oil, Grapeseed Oil

Fatty Acid Profiles

Show 50 entries

Base Oil	Lauric	Myristic	Palmitic	Stearic	Ricinoleic	Oleic	Linoleic	Linolenic
High Oleic Sunflower	0	0	3	4	0	83	4	0
High Oleic Safflower Oil	0	0	5	2	0	77	15	0
Almond Oil, Sweet	0	0	7	0	0	71	18	0
Olive Oil	0	0	14	3	0	69	12	1
Apricot Kernel Oil	0	0	6	0	0	66	27	0
Canola Oil	0	0	4	2	0	61	21	9
Macadamia Nut Oil	0	0	9	5	0	59	2	0
Avocado Oil	0	0	20	2	0	58	12	0
Shea Butter	0	0	5	40	0	48	6	0
Emu Oil	0	0	23	9	0	47	8	0

						Oleic		
Neem Oil	0	2	21	16	0	46	12	0
Lard (Pig)	0	1	28	13	0	46	6	0
Mango Butter	0	0	7	42	0	45	3	0
Sal Butter	0	0	6	44	0	40	2	0
Palm Oil	0	1	44	5	0	39	10	0
Rice Bran Oil	0	1	22	3	0	38	34	2
Kokum Butter	0	0	4	56	0	36	1	0
Tallow (Beef)	2	6	28	22	0	36	3	1
Cocoa Butter	0	0	28	33	0	35	3	0
Soybean Oil	0	0	11	5	0	24	50	8
Grapeseed Oil	0	0	8	4	0	20	68	0
Cottonseed Oil	0	0	13	13	0	18	52	1
Palm Kernel Oil	49	16	8	2	0	15	3	0
Safflower Oil	0	0	7	0	0	15	75	0

Linoleic Acid

- Shelf Life: Short (Can develop DOS – Dreaded Orange Spots – Rancidity)
- Cleansing: Low-Medium
- Lather: Conditioning Lather
- Primary Oils: Soybean Oil, Cotton Seed Oil, Grapeseed Oil, Sunflower Oil, Safflower Oil, Hemp Seed Oil
- Secondary Oils: Rice Bran Oil, Canola Oil, Sweet Almond Oil, Apricot Kernel Oil

Fatty Acid Profiles

Show 50 entries

Base Oil	Lauric	Myristic	Palmitic	Stearic	Ricinoleic	Oleic	Linoleic	Linolenic
Safflower Oil	0	0	7	0	0	15	75	0
Sunflower Oil	0	0	7	4	0	14	70	1
Grapeseed Oil	0	0	8	4	0	20	68	0
Hemp Oil	0	0	6	2	0	12	57	21
Cottonseed Oil	0	0	13	13	0	18	52	1
Soybean Oil	0	0	11	5	0	24	50	8
Rice Bran Oil	0	1	22	3	0	38	34	2
Apricot Kernel Oil	0	0	6	0	0	66	27	0
Canola Oil	0	0	4	2	0	61	21	9
Almond Oil, Sweet	0	0	7	0	0	71	18	0
High Oleic	0	0	5	2	0	77	15	0

Linolenic Acid

- Shelf Life: Short (Can develop DOS – Dreaded Orange Spots – Rancidity)
- Cleansing: Low
- Lather: Conditioning Lather
- Primary Oils: None
- Secondary Oils: Hemp Seed Oil

Fatty Acid Profiles

Show 50 entries

Base Oil	Lauric	Myristic	Palmitic	Stearic	Ricinoleic	Oleic	Linoleic	Linolenic
Hemp Oil	0	0	6	2	0	12	57	21
Canola Oil	0	0	4	2	0	61	21	9
Soybean Oil	0	0	11	5	0	24	50	8
Rice Bran Oil	0	1	22	3	0	38	34	2
Sunflower Oil	0	0	7	4	0	14	70	1
Cottonseed Oil	0	0	13	13	0	18	52	1
Olive Oil	0	0	14	3	0	69	12	1
Tallow (Beef)	2	6	28	22	0	36	3	1
Safflower Oil	0	0	7	0	0	15	75	0
Grapeseed Oil	0	0	8	4	0	20	68	0
Apricot Kernel Oil	0	0	6	0	0	66	27	0

For reference

Fatty Acid Properties in Soap

Show 20 entries

Search:

Fatty Acid	Shelf Life	Cleansing	Lather	Primary Oils	Secondary Oil
Lauric Acid	Long	High	Abundant fleeting lather	Coconut Oil, Palm Kernel Oil, Babassu Oil	None
Myristic Acid	Long	High	Abundant fleeting lather	None	Coconut Oil, Palm Oil, Babassu Oil
Palmitic Acid	Long	Medium	Stabilizing, creamy	Palm Oil	Tallow, Lard, Avocado Oil, Emu Oil, Neem Oil, Rice Bran Oil
Stearic Acid	Long	Low	Low, creamy	Sal Butter, Kokum Butter	Shea Butter, Cocoa Butter, Mango Butter
Ricinoleic Acid	Long	Low	Low, creamy, boost lather because of solvent properties	Castor Oil	None
Oleic Acid	Medium	Low-Medium	Conditioning lather	Shea Butter, Cocoa Butter, Mango Butter, Lard, Tallow, Avocado Oil, Emu Oil, Rice Bran Oil, Canola Oil, Sweet Almond Oil, Apricot Kernel Oil, Olive Oil, High	Palm Oil, Soybean Oil, Cotton Seed Oil,

Single Oil Soaps

- http://www.lovinsoap.com/single-oil-soaps/


Regular Olive Oil
Coconut Oil
Unrefined
Shea Butter
Corn Oil
Extra Virgin Olive Oil
Avocado Oil
Unrefined
Cocoa Butter
Lard
Pomace Olive Oil
Rice Bran Oil
Sunflower Oil

Interesting results

- Pomace olive traces and sets up faster than regular and extra virgin
- Color difference between olive oils
- White soaps – lard, coconut, regular olive oil, refined avocado
- Sunflower took 4 days to unmold/cut – super sticky
- Unrefined shea/cocoa butters are really dark
- Hemp, sunflower (non-high-oleic), soybean – DOS/rancid quickly
- Shea/cocoa butters were brittle to cut

Lather Tests

Regular Olive Oil

Refined Avocado Oil

Hempseed Oil

Coconut oil

Babassu Oil

Castor Oil

Rice Bran Oil

Single Oil Soaps - Tips

- 500 gram batches
- 5% superfat
- Liquid oils – 1.5 times lye for water (ex. 60 grams lye | 90 grams water)
- Solid oils/butters – 2 times lye for water (ex. 60 grams lye | 120 grams water)
- Record
  - Time to trace (slow, medium, fast)
  - Time to harden in mold (#hours)
  - Time to unmold (#hours)
  - Time to cut (#hours/days)
  - Time to cure (weigh bars until they stop losing weight)
  - Lather tests (upon cutting & after cure)
  - Other observations such as stickiness, DOS/rancidity...etc.

Modifying a Soap Recipe

- When you know the properties of fatty acids once saponified, you can use this knowledge to easily modify a soap recipe.

Your soap is too soft or dissolves too quickly in the shower. How can you formulate a harder bar of soap?

- Raise the percentage of oils high in lauric acid, myristic acid, palmitic acid and stearic acid.
- Please note that if you bump up oils high in lauric acid and myristic acid (coconut, palm kernel, babassu), you will also be increasing the cleansing, which can make a dryer bar of soap.
- Bump up the oils high in palmitic acid and stearic acid (palm oil, butters, lard, tallow).

Your soap is too drying. How can you formulate a more conditioning bar of soap?

- Raise the percentage of oils high in oleic acid, linoleic acid or linolenic acid.
- Please note that when you raise the percentage of conditioning oils, you are taking away from hardness and lather.
- You can also use a higher superfat, leaving more oils unsaponified in your soap. If you are at 5% superfat, try going up to 8%. The more oils left unsaponified in your soap, the milder (less-stripping) your soap will be.

Your soap doesn't have much lather. How can you formulate a more bubbly bar of soap?

- Raise the percentage of oils high in lauric acid (coconut, palm kernel, babassu).
- If you reduce oils high in oleic acid, you will reduce the moisturizing properties of your soap.
- If you reduce oils high in palmitic acid and stearic acid, you will reduce the hardness of your soap.
- Try adding castor oil. Castor creates a more soluble soap that is easier to lather.

Starting Ratios

- When formulating a bar of soap you want a balance of hardness, cleansing and conditioning.
- What balance do you want? Who knows! Everyone is different.

Sally likes a bar of soap that has equal hardness, cleansing and conditioning.

- 33% Hardness, 33% Cleansing, 34% Conditioning
- 33% Lard/Tallow/Palm | 33% Coconut Oil | 34% Olive Oil

Betty likes a bar of soap that is hard, creamy and stable in the shower.

- 50% Hardness, 25% Cleansing, 25% Conditioning
- 50% Lard/Tallow/Palm | 25% Coconut Oil | 25% Olive Oil

Jake is a mechanic, and prefers a high-cleansing soap to wash away the oil and grime on his hands.

- 20% Hardness, 40% Cleansing, 40% Conditioning
- 20% Lard/Tallow/Palm | 40% Coconut Oil | 40% Olive Oil

Susie is 92 years old and has skin as thin as paper. She needs a super-mild soap.

- 20% Hardness, 10% Lather, 70% Conditioning
- 20% Lard/Tallow/Palm | 10% Coconut Oil | 70% Olive Oil

Going palm free

- What does palm oil contribute to a soap?
- Hardness, Body, Stable Lather
- Palm oil is high in palmitic and oleic acids.
- If we go check out the fatty acid profile chart and sort it by palmitic acid, here is what we come up with.

Base Oil	Lauric	Myristic	Palmitic	Stearic	Ricinoleic	Oleic	Linoleic	Linolenic
Palm Oil	0	1	44	5	0	39	10	0
Cocoa Butter	0	0	28	33	0	35	3	0
Tallow (Beef)	2	6	28	22	0	36	3	1
Lard (Pig)	0	1	28	13	0	46	6	0
Emu Oil	0	0	23	9	0	47	8	0
Rice Bran Oil	0	1	22	3	0	38	34	2
Neem Oil	0	2	21	16	0	46	12	0
Avocado Oil	0	0	20	2	0	58	12	0
Olive Oil	0	0	14	3	0	69	12	1

My palm free formula

- 33% Hardness, 33% Cleansing, 34% Conditioning
- 33% ~~Lard/Tallow/Palm~~ | 33% Coconut Oil | 34% Olive Oil
- 15% Butter | 18% High Palmitic Oils| 33% Coconut Oil | 34% Olive Oil
- 15% Cocoa Butter/Shea Butter | 9% Rice Bran Oil | 9% Avocado Oil | 33% Coconut Oil | 34% Olive Oil

- 33% Coconut Oil…too drying?
- Nope. My palm-free recipes are high in oleic acid, which is mild and conditioning.

Tips for Formulating Soap Recipes

Start by modifying recipes. Find a recipe, make it and then modify it.

Create single oil soaps!

Keep your batches small. (500 grams oils in Bramble Berry test silicone loaf)

Keep detailed notes.

Label everything with batch sheets/cards.

Break rules! (100% olive oil, 100% coconut oil with 20% superfat)

Just do it! Get off of the lye calcs and simply start!

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