

FORMULATING







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WHAT DO 'VEGAN' AND 'VEGAN SKINCARE' MEAN?

Veganism refers to someone who does not use or consume animal products. It is a plant-based lifestyle, and most adherents follow a path that is driven by consciousness around personal health and vitality for all living creatures – and ultimately, for the planet as a whole.

The vegan movement is growing on a global scale. "The plant-based foods industry has gone from being a relatively niche market to fully mainstream,"¹ says Michele Simon, executive director of the Plant Based Foods Association (PBFA). The global vegan cosmetics market size was estimated at USD 12.9 billion in 2017². There is huge growth in this sector; the sale of vegan prestige beauty products in the UK reported an increase of 38% in the 12-month period from February 2017 to end of January 2018, according to the NPD group³. Google searches for 'vegan beauty' in the UK have doubled every year since 2012 and globally, there has been a 175% increase in vegan cosmetics launches over the past five years⁴.

In terms of skincare, vegan products are products that are not tested on animals, and that don't contain any animal-derived ingredients. This means that, barring a few exceptions, vegan products are typically cruelty-free, and can be considered highly ethical.

While it's true that choosing to formulate vegan products does limit the variety of ingredients that can be used, vegan and cruelty-free options do exist. There is still a fantastic array of ingredients from which to choose, especially because natural skincare largely consists of plant-based ingredients in the first place.

With a few tweaks to your products, you can not only have something that is natural or organic, but also cruelty-free, ethical, and vegan. Vegan products are just as potent as non-vegan ones, and can provide everything needed to care for your skin. You won't be missing out on vital skincare ingredients by choosing to buy, use, or make vegan skincare products.

WHY SHOULD I CONSIDER FORMULATING VEGAN SKINCARE?

You don't have to be vegan to enjoy vegan skincare. You may want to do so for ethical reasons, or you may simply like the way a certain vegan product works for you.

Natural, vegan skincare products can offer the same benefits as other natural skincare products, and in addition are also considered more ethical. Because no animal-derived ingredients are used in formulating vegan products, and neither the products nor ingredients have been tested on animals, no harm has come to animals at any stage of the production process. This makes vegan products not just natural, but also cruelty-free.

So, even if you are not vegan, there are some serious thumbs-up when it comes to creating skincare products that conform to a highly ethical code, especially if you intend to make products to sell. Cruelty-free and vegan products can be a huge boost to business. Even for many non-vegan, eco-conscious consumers of natural beauty products, if a skincare product is available that has been made without harm to animals, that can be a huge plus. You would enter into the fast-growing segment of the natural and organic beauty market that's also in search of cruelty-free, vegan, and ethical products, while still appealing to the broader natural beauty movement. Going vegan with your skincare products helps you to hone in on a growing target market – and the market impact you could create could be even greater.

ARE VEGAN COSMETICS NATURAL?

Vegan products are not necessarily natural, just as natural products aren't necessarily vegan.

It is possible to create a vegan product – one which does not contain any animal or animal-derived ingredients, and which is not tested on animals – that still contains ingredients which are not 'natural' by some measure of 'natural' standards. Synthetic ingredients derived from petrochemicals are not permitted in natural standards but would be permitted by vegan certifications (as long as animal testing has not taken place).

It can be confusing, so we created this image to show the difference between vegan and natural and where the two can meet:



FORMULATING WITH VEGAN INGREDIENTS

While there are significant benefits to formulating with natural and organic ingredients, the greatest benefit to formulating with vegan ingredients is that you're avoiding things which might have caused animals to be harmed. For our students who are especially concerned about the ethical and environmental impact of their ingredients, this can be a huge reason to switch.

In terms of marketing, there is the audience-appeal factor to vegan products. This means that, with the right swaps, you won't have to compromise the effective and functional qualities of your products, while also broadening your potential customer base.

If you're interested in learning more about certifications available for vegan products, you can check out:

- <u>Vegan Society</u>: UK-based organization certifying vegan products.
- Vegan: US-based organization certifying vegan products.

Due to the significant overlap between vegan and cruelty-free, it's also worth considering those organizations:

- Leaping Bunny.
- <u>Choose Cruelty-Free</u>.

NON-VEGAN INGREDIENTS AND VEGAN ALTERNATIVES

Whether you are formulating products yourself or checking the ingredients of products you buy, here are some things to look out for. Some of the ingredients below can be obtained from both animal and vegetable sources, some are synthetic, and you will need to check with the supplier of the ingredient or product to find out which one they are using.

Formulating vegan products can be as simple as choosing carefully the source of an ingredient (for example choosing vegetable glycerin over other versions).

It may mean substituting one ingredient for another. For example using an alternative emollient to lanolin. Or using carnauba wax instead of beeswax. If changing an existing non-vegan formula to a vegan one you may need to alter the percentage that you use the substitute ingredients to achieve a similar end result.

It may mean simply not using certain ingredients such as keratin.

1. BEESWAX (INCI: CERA ALBA)

Beeswax, be it natural yellow or purified white, is a staple in many cosmetic products, especially in balms and salves. It acts as a lipid thickener – thickening oils into solid oily balms. It also functions as an occlusive, forming a protective layer on the skin to prevent moisture loss. It comes in the form of pellets that melt at approximately 63°C (145°F).

Alternatives for beeswax are plant-derived waxes; there are many to choose from. Here are some options:

CANDELILLA WAX (INCI: EUPHORBIA CERIFERA WAX)

Candelilla wax is obtained from the coating of the wax slipper plant found mainly in Mexico. The wax is extracted by boiling the plant (to separate the wax and the plant material). The wax floats to the top of the water and is skimmed off and processed.

Melting temperature: 70°C (158°F).

CARNAUBA WAX (INCI: COPERNICIA PRUNIFERA WAX)

Carnauba wax is produced by the leaves of a Brazilian palm tree. It is the hardest of the vegetable waxes, and comes in the form of yellowish-brown hard and brittle flakes.

Melting temperature: 84°C (183°F).

BERRY WAX (INCI: RHUS VERNICIFLUA PEEL CERA)

Berry wax is produced from the fruit peel of berries that grow on rhus plants, native to China. Berry wax is very useful for hardening balms, but also makes a lovely addition to creams, because of its ability to impart a soft and silky feel.

Melting temperature: 50°C (122°F).

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2. LANOLIN (INCI: LANOLIN)

Lanolin and its derivatives (lanolin alcohol, hydrogenated lanolin, laneth-, acetylated lanolin) are commonly used in cosmetics for their nourishing and emulsifying properties. Lanolin is a lipid substance secreted by the sebaceous glands of sheep. Lanolin is sometimes mistakenly called wool fat, but it's not really fat, since it's not made of triglycerides. Lanolin is actually a waxy ester made of long-chain fatty alcohols. Lanolin plays an important role in skincare products due to its high sterol content – because of this it helps to keep our lipid barrier strong, and it acts as an emollient and occlusive. Lanolin and its derivative also make good emulsifiers, especially suitable for protective cosmetic products.

Lanolin has a unique composition and it doesn't have a direct vegan substitute, but some commercial products come quite close to it, for example:

SOFTISAN® 649/LIPONATE® BDP (INCI: BIS-DIGLYCERYL POLYACYLADIPATE-2)

Softisan is a very good lanolin substitute derived entirely from vegetable sources. It has similar occlusive properties and very good water binding capacity. It functions as a nourishing, emollient and occlusive ingredient, as well as an emulsion-stabilizing ingredient. It's suitable for use in balms, ointments, creams and lotions, lip care products, and color cosmetics.

Suppliers: Alexmo Cosmetics (DE), New Directions (AU), Naturally thinking (UK).

VEGALAN/VAL/PLANTASENS VL/PLANTSOFT L (INCI: BUTYROSPERMUM PARKII (SHEA) BUTTER (AND) GLYCERYL ROSINATE (AND) OLEA EUROPAEA (OLIVE) OIL UNSAPONIFIABLES)

Vegalan is a lipid mixture made of shea butter (giving it emollient and occlusive properties), glyceryl rosinate (offering skin conditioning and emulsifying properties) and olive oil unsaponifiables (providing skin conditioning and barrier support). It has a similar jelly-like slightly sticky structure and it can be added to many skincare formulas, eg lip care, salves and ointments, creams and lotions.

Suppliers: Garden State Naturals (USA), Flowertales (ITA), Factory Organica (SI), Trulix (AU), Pure Nature (NZ), Go Native (NZ).

3. HONEY (INCI: HONEY)

Honey is produced by honeybees and it consists mainly of sugars and a small amount of water. In cosmetic products it functions as a humectant. Raw honey can also have some antimicrobial properties, so it can be used to speed up wound healing or to prevent acne.

Vegan honey alternatives can be various food-grade syrups, such as maple syrup, yacon root syrup or coconut nectar syrup. When substituting powdered honey in cosmetic formulations (eg in dry powdered masks) you can try using different fruit powders, eg banana powder (INCI: Musa Sapientum (and) Maltodextrin) – it will provide sugars for humectant properties as well as various vitamins and micronutrients.

4. MILK/YOGHURT (INCI: LAC/LAC POWDER/CAPRE LAC/GOAT MILK/MILK/YOGURT)

Milk and dairy products (yogurt, buttermilk) are included in cosmetic products as humectants, emollients and gentle exfoliants (due to the lactic acid content).

The emollient function of animal milk can be achieved by using coconut milk, either liquid or powder (INCI: Cocos Nucifera Fruit Juice/Cocos Nucifera Fruit Powder). For exfoliating properties, you can look for fruit-derived alpha hydroxy acids (AHAs).

5. CARMINE (INCI: CARMINE, OR CI 75470)

Carmine is a bright red oil soluble pigment that is made from the shells of cochineal bugs. It is used as a food coloring but it's most known as being a staple ingredient in red lipsticks.

A vegan (and natural) alternative to carmine is red iron oxide – it has a more earthy-dark hue, but it can be adjusted with other mineral pigments like white titanium dioxide for lighter, pink tones. Plant-based pigments, such as beetroot powder, can also be used to add color to cosmetic products.

6. ANIMAL-DERIVED GLYCERIN (INCI: GLYCERIN)

Glycerin is made as a byproduct of saponification of oils – either vegetable oils or animal fats. In cosmetics it functions as an inexpensive humectant and also a solvent for botanical extracts (glycerites). Nowadays, the vast majority of glycerin is vegetable derived, but it's still a good idea to ask your supplier from which source their glycerin is derived.

7. HYALURONIC ACID (INCI: HYALURONIC ACID/SODIUM HYALURONATE)

Hyaluronic acid is one of the strongest humectants used in cosmetic products. It can be produced from rooster coombs, but most of it is produced through microbial fermentation and is thus vegan. Check with your supplier how their hyaluronic acid is sourced.

8. SQUALANE (INCI: SQUALANE)

Squalane is a lipid ingredient used as a luxury emollient and a light occlusive. It used to be extracted from shark livers, but today, most of it comes from plant sources (olive oil and sugar cane). Check with your supplier about squalane sourcing.

9. CAPRIC/CAPRYLIC TRIGLYCERIDE (INCI: CAPRIC/CAPRYLIC TRIGLYCERIDE)

This light carrier oil, also called a medium chain triglyceride, can be produced from goat milk fat. More commonly, it is coconut-derived (and also referred to as fractionated coconut oil).

10. KERATIN (INCI: KERATIN)

Keratin is a key structural protein which forms hair and nails. It functions as a humectant, conditioning ingredients and film-former. It is derived from ground hooves, horns, feathers and quills, and the hair of various animals.

Alternatives to animal keratin are hydrolyzed vegetable proteins, eg hydrolyzed corn protein and hydrolyzed wheat protein (although they don't provide exactly the same effect). Some suppliers sell Phytokeratin (INCI: Hydrolyzed Corn Protein (and) Hydrolyzed Wheat Protein (and) Hydrolyzed Soy Protein), which is a blend of hydrolyzed proteins.

11. ALLANTOIN (INCI: ALLANTOIN)

Allantoin is a wonderful skin-conditioning ingredient that softens and regenerates the skin. It is found in animal urine and in some plant species (such as comfrey). Cosmetic grade allantoin is mostly made synthetically nowadays. Still, check with your supplier if their allantoin is vegan.

12. RETINOIDS (INCI: RETINOL/RETINYL PALMITATE/RETINAL)

Retinoids or Vitamin A derivatives, are potent anti-aging skincare ingredients. Retinol is mainly found in animal sources (eg fish, eggs, milk, cheese).

Most of the retinoids used in cosmetics are made synthetically. If you wish to use natural alternatives, you can use carotenoids. Carotenoids, like retinoids, are also derivatives of Vitamin A but the difference is they are found in plants – and hence are vegan. A well-known example of a carotenoid is beta-carotene, which can be found in macerated carrot oil and sea buckthorn oil, so these are possible vegan alternatives.

13. SHELLAC (INCI: SHELLAC)

Shellac is a resin secreted by the lac bug. In food it is used as a glazing agent, while in cosmetics it can be found in natural hair styling sprays. It doesn't have a direct substitute, but plant waxes and zein (corn protein) can be used in a similar way.

14. XANTHAN GUM (INCI: XANTHAN GUM)

A popular thickener and stabilizer, xanthan gum is made by fermentation from plant sources, but in some cases it can be processed with animal-derived ingredients, such as egg whites. It's best to check with the supplier whether or not the xanthan gum they sell is vegan.

SPOTLIGHT: VEGAN ALTERNATIVES TO BEESWAX

Our students often ask about vegan alternatives to beeswax. Luckily, there are plenty to choose from! But you do need to be aware that different waxes may need to be used at different amounts to achieve the same hardness in a product.

We carried out an experiment with vegan waxes (carnauba wax, candelilla wax, jojoba wax and rose wax) and how they compare to beeswax. Our Diploma in Natural Skincare Formulation includes the full experiment and report so you can easily see how much of a vegan wax you would need to use in order to replace beeswax. We also compared other characteristics such as how the waxes felt on the skin, and how easily they were absorbed. Here is a summary of our findings:



Here we share a simple but luxurious formula for Cocoa Butter Lip Balm. It is very easy to change this into a vegan product by switching the beeswax for a vegan wax. In the case of this formula, we use beeswax at 16%. As you can see from the chart above, at percentages between 15-20% beeswax, candelilla wax and carnauba wax create a similar level of firmness, so you can keep the percentage the same. Outside of this percentage range you might also need to change the percentage used.

ORIGINAL COCOA BUTTER LIP BALM FORMULA:

73.5g sunflower or sweet almond oil

16g beeswax

10g cocoa butter

0.5g essential oil of your choice (eg orange, peppermint or geranium)

VEGAN COCOA BUTTER LIP BALM FORMULA:

73.5g sunflower or sweet almond oil

16g candelilla wax or carnauba wax

10g cocoa butter

0.5g essential oil of your choice (eg orange, peppermint or geranium)

EXAMPLE FORMULAS



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VEGAN LIPSTICK

This lipstick contains no beeswax as a thickener or carmine as the pigment. It can be made with lipstick molds, but it can also be poured into a lip balm tube.

Phase	Ingredient	INCI	Function	w/w%
A	Castor oil	Ricinus Communis Oil	Solvent, emollient	33.6
A	Jojoba oil	Simmondsia Chinensis Seed Oil	Solvent, emollient	20.0
А	Coco caprylate	Coco Caprylate	Solvent, emollient	15.0
А	Pigment mixture*	Dependent on ingredient chosen	Colorant	15.0
В	Candelilla wax	Euphorbia Cerifera Wax	Lipid thickener	8.0
В	Carnauba wax	Copernicia Cerifera wax	Lipid thickener	3.0
С	Shea butter	Butyrospermum Parkii Butter	Emollient	5.0
С	Essential oil of choice	Dependent on oil chosen	Fragrance	0.3
С	Vitamin E (95% mixed tocopherols)	Tocopherol	Antioxidant	0.1

* to add color to the lipstick, use a mixture of mineral pigments (iron oxides, titanium dioxide, manganese violet) and/or colored micas. If using micas, make sure they are lip-safe, natural and contain no carmine.

- 1. Combine phase A ingredients in a beaker and stir to disperse the pigments.
- 2. Add phase B to phase A, heat in a water bath to 85°C (185°F) until melted.
- 3. Remove from heat, cool to 60°C (122°F), add phase C ingredients and stir.
- 4. Pour into a lipstick mold or a lip balm tube and allow to set.



VEGAN VANILLA LIP BALM

This lip balm uses stearic acid and candelilla wax instead of beeswax to harden it. It also contains nourishing cocoa butter and coconut oil, as well as vanilla macerated oil for a sweet fragrance.

Phase	Ingredient	INCI	Function	w/w%
А	Vanilla macerated in sunflower oil	Helianthus Annuus Seed Oil (and) Vanilla Planifolia Extract	Emollient	30.6
А	Coconut oil	Cocos Nucifera Nut Oil	Emollient	25.0
А	Stearic acid	Stearic Acid	Lipid thickener	17.0
А	Cocoa butter	Theobroma Cacao Seed Oil	Emollient, thickener	15.0
А	Candelilla wax	Euphorbia Cerifera Wax	Lipid thickener	12.0
В	Vitamin E (95% mixed tocopherols)	Tocopherol	Antioxidant	0.1
В	Benzoin extract	Styrax Benzoin Extract	Fragrance	0.3

- 1. Add phase A ingredients to a beaker and heat them in a bain marie/water bath to 75°C (167°F) until solid ingredients are melted.
- 2. Remove from heat, cool to approximately 55°C (131°F), add phase B ingredients and stir.
- 3. Pour into lip balm tubes and allow to set.



COCONUT AND BANANA FACE MASK

This face mask comes in the form of dry powder – it is mixed with water to form a paste just prior to use. It uses banana powder as a substitute for honey powder to provide moisturizing and nourishing properties for the skin, and coconut oil for additional skin conditioning and moisturizing.

Phase	Ingredient	INCI	Function	w/w%
A	Coconut milk powder	Cocos Nucifera (Coconut) Milk Powder	Skin conditioning	50
A	Cornstarch	Zea Mays (Corn) Starch	Absorbent, thickener	20
A	Kaolin clay	Kaolin	Absorbent, exfoliant	15
A	Banana powder	Musa Sapientum (and) Maltodextrin	Nourishing, moisturizing	15

- 1. Mix all of the ingredients together in a beaker, still until homogenous.
- 2. Transfer to a jar, cover tightly and store in a dry place.





PINK LATTE BATH SOAK

This bath soak uses dried raspberry powder for its lovely scent and nourishing properties along with coconut milk powder for its hydrating and emollient properties. Pink himalayan salt also creates an interesting appearance. This bath soak can be scented with natural raspberry fragrance for a stronger scent – add it at 1-2% of the formulation.

Phase	Ingredient	INCI	Function	w/w%
А	Sea salt	Sodium Chloride	Cleansing	60
А	Himalayan pink salt	Sodium Chloride	Cleansing	20
А	Coconut milk powder	Cocos Nucifera (Coconut) Milk Powder	Skin conditioning, emollient	15
A	Raspberry powder	Rubus Idaeus (and) Maltodextrin	Color, fragrance, nourishing	5

- 1. Mix all of the ingredients together in a beaker, still until homogenous.
- 2. Transfer to a jar, cover tightly and store in a dry place.



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