

[<- Back to Wiki Home](#)

Laundry

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Enzymes

What IS an Enzyme?

Enzymes are simply proteins that can speed up chemical reactions by breaking down complex stains into simpler substances that can be washed away by detergents. Modern laundry detergent derives most of their enzymes from two sources:

- Bacteria: *Bacillus subtilis*, *Bacillus licheniformis*, *Bacillus amyloliquefaciens*
- Fungi: *Aspergillus niger*, *Trichoderma reesei*, *Humicola insolens*

These enzymes are carefully cultivated in labs.

What Enzymes are probably in my detergent?

- [Proteases \(subtilisin, alcalase\)](#): These enzymes target protein-based stains such as blood, sweat, dairy, egg, and meat. Proteases break down protein molecules into smaller peptides and amino acids, making them easier to wash away.
- [Lipases](#): These enzymes work on fat- and oil-based stains such as grease, butter, and salad dressing. Lipases catalyze the breakdown of fats into glycerin and free fatty acids, which are easily rinsed away.
- [Amylases](#): These enzymes break down carbohydrate-based stains, such as those from pasta, potatoes, and sauces. Amylases convert starch into smaller sugar molecules that dissolve more easily in water.
- [Cellulases](#): These enzymes target microfibers in cotton fabrics, helping to remove soil and prevent fabric pilling, resulting in brighter, softer garments.
- [Mannanases](#): Effective against food stains such as ice cream, sauces and dairy products, mannanases break down polysaccharides such as guar gum, which is commonly found in processed foods.
- [Pectinases](#): These enzymes help remove fruit and jam stains by breaking down pectin, a complex carbohydrate found in plant cell walls.
- [Scientific Reports: Removal of eDNA from fabrics Dnase](#)

But how do they work?

Enzymes when put in water, will attach themselves to what they're attracted to, your stains! They will then begin to break them down into smaller water soluble pieces. The smaller pieces can then be

lifted and removed by the water, agitation, and surfactants in the laundry detergent.

Benefits of Enzymes in laundry vs just detergent

- Much better on stains
- Lower washing temps are usable, detergent alone needs hotter temps
- Gentler on fabrics
- Biodegradable: These are already enzymes that naturally occur. We're not adding any antibiotics or as many harmful chemicals to the water
- Reduce the need for more detergent

Possible issues with enzymes

- Enzymes are reactive in water meaning, liquid detergent does not have enzymes, you must use powder or an enzyme additive
- Some people have reactions to enzymes, any one with skin sensitivity should be careful by testing on one garment first.
- Storage: Enzymes are sensitive to extreme temp changes and humidity. Meaning they should be stored in a cool dark place with an air tight lid.

Enzyme Resources & Additional Info

- [Enzyme Fact Sheet](#) Link to American Cleaning Institute on Enzymes
- [Wikipedia on Enzymes in detergent](#)
- [Creative Enzymes](#)

Pretreatment

Identify the Issue

How you pretreat will depend on the issue so it makes sense we need to identify the problem. If you know exactly what caused the stain, this makes things easier. If you do not, try to investigate. Is it greasy? Is it dirt based? Could it be blood? Is it pet stains or pet/animal urine?

Urine

- Use a pet based enzyme cleaner for any type of urine (bonus this works in bathrooms too!)
- 2 brands I've used and had good success with, Natures Miracle and Eco Strong
- Follow the directions, generally these need to sit for awhile
- Rinse, repeat if necessary

Urine smell will NOT go away without an enzyme cleaner formulated for urine. The ammonia scent needs to be broken down by the enzymes and not just covered with perfume.

Resources

- [Lipase List - Pretreaters \(North America\)](#) Link goes to google drive but is made by [u/KismaiAesthetics](#) of r/Laundry on Reddit

Detergent

Liquid vs Powder

Why do so many people recommend powder over liquid? I thought we moved past that, that's what my grandma used!

You might ask. The general reason people recommend powder over liquid is, enzymes are generally liquid reactive. So liquid detergents don't usually have enzymes in it. And those that do, they are usually less effective and have more chemicals keeping the enzymes stable so they generally cost more. (see above for why enzymes)

Cool, I don't need enzymes anyway.

You might say. Well, have you ever looked at the pricing per load of powder vs liquid? Today in October of 2026, Walmart has Tide powder 50 oz good for 44 loads priced at \$11.97 and 80 fl oz of tide original good for 64 (small) loads for \$12.97. You might say, well, the liquid is cheaper! But you're realistically only going to get the same 40ish loads out of the liquid. And that liquid will not do as good of a job as the powder. In addition, despite the front of the container saying "even in cold water," it's recommended on the back to use hot water. So you're paying more for less cleaning power and you should really use hot water for every load. Are you really saving money?

Yeah but I don't care about all that!

You say again. Ok well, the liquid comes in plastic that if, it's recycled can only be recycled in specific ways. The powder comes in cardboard which is one of the easier things to recycle. Either way it's your choice, you should do what is right for you and your laundry. If you find liquid detergent easier and you're not having issues with stains and smells, keep using it!

But what about pods? Pods are great for accessibility. If you struggle with lifting or mobility or, any type of problem that keeps you from being able to effectively do laundry, absolutely use pods. The reason they are recommended less is price, and they need to be used with hot water. Not using in hot water can cause the wax on the outside to not break down and the detergent and additives to not make it into your laundry. There's also issues with washers where you place the pod in the drum, the clothes on top, and the water starts on it's own where the pods don't break open. This can be remedied by putting the pod on the top so it will be touched by the water, but that can be too extreme for some fabrics.

All in, laundry detergent and the way you do your laundry is a personal experience. You should do what works for you and what is accessible for you. If that's powder, liquid or pods, it's up to you. Just stay away from laundry sheets. They've been proven over and over again to do nothing.

How do I choose a good Detergent?

Good surfactants!

[Per Wikipedia](#): A surfactant is a chemical compound that decreases the surface tension or interfacial tension between two liquids, a liquid and a gas, or a liquid and a solid. The word surfactant is a blend of “surface-active agent”, [1] coined in 1950. [2] As they consist of a water-repellent and a water-attracting part, they are emulsifiers, enabling water and oil to mix. They can also form foam, and facilitate the detachment of dirt.

Surfactants are what we commonly refer to when we're talking about detergent. They are what actually lifts and pulls soils and stains from the clothing. When I look for detergent I'm looking for, good surfactants, something that's been tested over and over again. This is one of the things some of the bigger companies can do so well since they have the teams and resources to do the research needed. Companies like Tide and Persil post their studies and have been in the game for many years.

Enzymes

In addition to surfactants, you want a detergent that has some enzymes. Below in the resources is the Lipase List, every detergent on there will have AT MINIMUM lipase in the ingredients list. If you read the above section on enzymes, you'll know they do the heavy lifting on stains and break down stains into smaller bits so the surfactants can wash them away.

Things to also consider:

- Do you have skin sensitivities? That may make you want to look for a “free and gentle” or a perfume and dye free type of detergent.
- Do you have sensitivities or allergies to optical brighteners? You may need to look for detergents that do not contain those
- Clothing type, Certain fabric types like wool, will require specific detergent and laundering instructions (dry clean items should not go in the wash at home!)
- Extra dirty, if you work in the automotive field or somewhere with an extra amount of grease, you'll want something that breaks down grease more thoroughly
- Kids, kids can come with a whole wide array of messes, you probably want to consider something that's been well tested, works on just about anything, and isn't damaging to clothes. Recommendations on this can include kirkland, Tide, Aerial, Persil powder in a free and clear format
- Accessibility. As mentioned above in the liquid vs powder debate, use what you'll actually be able to use. If you physically or mentally have a disability, issue or literally anything holding you back, USE WHAT IS EASIEST TO USE. Again, please just stay away from laundry sheets, they don't do anything.

Resources

- [Lipase List - Detergents \(North America\)](#) Link goes to google drive but is made by [u/KismaiAesthetics](#) of r/Laundry on Reddit
- [Wikipedia:Surfactants](#)
- [What are Surfactants and how do They Work?](#)

Boosters

Citric Acid

How to use

- 1.5 - 2 measuring teaspoons dissolved in water is all you need and can be placed in the laundry softener compartment or something similar to a Downy Ball if you don't have one.
- Used to correct overdosed detergent, won't effect correct or underdosed detergent
- Used in the final rinse cycle or, fabric softener tray

Pros

- Citric Acid is great at preventing and mitigating odor rebloom (where something smells bad a day or two after wash)
- Citric Acid will replace your fabric softener. Unlike softener it will not leave a waxy build up on your clothes but it will leave clothes feeling softer and nicer on the skin.
- Desolves calcium (yes, it'll be great in your bathroom too)

Cons

- It's acidic, don't leave it laying out on metal, stone, etc.
- Getting it in your eyes is very much going to suck and could potentially be dangerous, be careful
- Powder needs to be mixed with water before putting it in but, liquid does exist.

Resources

- [Lipase List - Boosters \(North America\)](#) Link goes to google drive but is made by [u/KismaiAesthetics](#) of r/Laundry on Reddit
 - [Reddit post about why citric acid](#) by [u/KismaiAesthetics](#)
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Reddit Sources:

- [Lipase List](#) Link goes to google drive but is made by [u/KismaiAesthetics](#) of r/Laundry on Reddit
- [Laundry 101 with u/KismaiAesthetics](#) — [non-Reddit Link](#)
- [Sunscreen stains- what cause them, how to prevent & remove them](#) by [u/Fair-Shift-1962](#) — [Non-Reddit Link](#) (images are missing)
- [Laundry Spa Day by u/KismaiAesthetics](#) — Author has specifically requested no reposting of this post so there is no non-reddit link.
- [When The Rinse Washes You Clean, You'll Know --- Citric Acid Rinses by u/KismaiAesthetics](#) — [Non-Reddit Link](#)
- [Polyquat Spots by u/KismaiAesthetics](#) — [Non-Reddit Link](#)
- [Scrud - The Dirtiest Word in Laundry](#) by [u/KismaiAesthetics](#) — [Non-Reddit Link](#)

Last updated 8th of Oct 2026 by greatwhitebuffalo41 - Page Creation, Added Reddit sources and non-reddit links

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Last update: **2026/10/08 18:00**

