

Home Laundry: Get the Results You Want

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Back during what some people refer to as the "good old days," we spent one day a week toiling over the family laundry. Everything was washed in hot water, hung on a line to dry and carefully ironed. Today our laundry practices are vastly different. Following are some of the reasons we do laundry differently.

- A decrease in household size.
- An increase in the number of women working outside the home (50 percent).
- The new "baby boom," 40 percent of married women in the labor force have children under six years of age.
- New fibers, fabrics and finishes.
- Changes in laundry equipment.
- New laundry products.
- Environmental concerns.
- An increase in energy costs.

In this guide we will examine some of these changes and find out how we can use today's technologies to get the cleanest laundry possible.

Textiles

The changes mentioned above represent giant steps in our society, but perhaps those having the most impact on our laundry practices have occurred in the textile industry. While synthetic fibers make our lives a little easier and our more colorful wardrobes make the world a little brighter, these additions also cause a few problems in the laundry room.

Pure cotton is the easiest fiber to clean, but synthetic fibers now comprise two-thirds of the family wash. Also, with fewer white items in the total wash, most people forego the practice of sorting laundry loads by color. Whites will still be "whiter," however, if we wash them separately. Synthetic fibers, particularly white nylon and white blended fabrics, tend to absorb dyes from dyed or colored fabrics. Continue to sort soiled clothing by color; it produces positive results.

New finishes, such as those used in fire retardant fabrics, may require special attention as well. Governmental regulations require fire retardant fabrics to be permanently care-labeled. When laundering, follow these care directions to maintain the properties the finish imparts to the garment.

Improve your laundry practices

In 1985, each person in the United States spent an average of \$617 on clothing. Because we want our clothing to last for several years, family laundry represents a sizable investment. To ensure that we get the most out of our clothing dollars, we need to use laundering procedures that help maintain the appearance and durability of clothing and household items.

Removing soil, be it simple dirt or a splotch of pate de foie gras on your favorite silk blouse, is the main purpose of doing laundry. So how can we be sure to have the cleanest laundry possible and increase the longevity of our clothes? Just follow the tips given below.

Don't overload your washing machine.

The most important factor related to getting clean clothes is the amount of laundry we try to do at one time. The space fabrics occupy is a more accurate indicator of correct load size than the weight of the fabrics.

A wash load should be composed of articles of varying sizes. For example, a load of two double sheets plus smaller items would be cleaned more readily than a load of four double sheets or a full load of small items. For a maximum load add loose dry clothing items to fill the washer two-thirds to three-fourths full.

Use the correct amount of detergent.

The detergent performs several functions in the laundering process; therefore, it is important to use the correct amount. These functions include:

- Helping the water to wet the fabrics and the soil quickly and thoroughly,
- Tying up water hardness to permit the detergent to do its cleaning job,
- Loosening and removing soil from fabrics, and
- Holding the removed dirt in the washing solution so it can be rinsed away from the fabrics. When too little detergent is used, one or all of these functions will suffer.

It is important to read the package directions because detergents differ in formulation and other characteristics. One very important difference is the density of the product. One powdered product may weigh 2.5 ounces (71 grams) per cup; another may weigh 5 ounces (142 grams) and yet another may weigh 8 ounces (227 grams) per cup. The heavier, denser or more concentrated the product, the smaller the volume (cup measure) of the product likely to be recommended on the package. You should read package directions to get the best results from the particular product being used.

Detergent manufacturers base package recommendations on the following wash conditions:

- A 5 pound to 7 pound (2.3 kilogram to 3.2 kilogram) load of clothes.
- Moderate soil
- Moderately hard water — 3.6 grains to 7.0 grains per gallon (61 parts per million to 120 parts per million).
- Average water volume at about 17 gallons (64 liters) of water for a top loading washer or 8 gallons (30 liters) for a front loading washer. Heavily soiled clothes, large capacity washers and hard water will require more detergent than the recommended amount. Less than the recommended amount may give satisfactory results on lightly soiled items. If the lightly soiled items are delicate (e.g. Lingerie and knits) and must be protected by reducing the water temperature and washing actions, compensate for reductions in these cleaning factors by doubling the recommended amount of detergent.

All synthetic detergents are **biodegradable**. This means they no longer contain active foaming agents when attacked and degraded by bacteria in sewage systems.

The two most important ingredients in synthetic detergents are **surfactants** and **builders**. These ingredients vary with the brand and manufacturer. Builders help the surfactants remove the soil by tying up hard water ions that interfere with the cleaning process.

The most prevalent type of builder is the complex phosphate compound (sodium tripolyphosphate). Complex phosphates became an environmental issue in the 1970s, so the detergent industry reduced the amount of phosphates by one-half to one-third. Complex phosphates can be removed from the water by proper sewage treatment.

Sodium carbonates are alternative compounds used as builders and are the basis for many detergents. Problems have occurred with these alternative builders. Fabrics become harsh; wear life of garments is reduced; thread and elastic become brittle and break; zippers break; colored clothes fade; white fabrics yellow; flame retardant finishes are impaired and washing machine parts may be damaged.

Detergents contain many other ingredients, such as optical whiteners, soil anti-redeposition agents, suds control agents, perfumes, etc. Optical whiteners impart the appearance of whiteness to white fabrics and brightness to colored fabrics. These agents act early in the wash cycle and are inhibited by chlorine bleach. If bleach is necessary, it should be measured, diluted and added after the first five minutes of the wash cycle.

Measure the temperature of your wash water.

It is a fact of life that hot water cleans heavily soiled clothes better than warm or cold, even with all the new products that claim to work in cold water. Measure the temperature of your water to make sure it is at recommended levels (you may need to adjust the thermostat on your hot water heater):

- Hot water — 140 degrees F (60 degrees C)
- Warm water — 100 degrees F to 120 degrees F (38 degrees C to 49 degrees C)

Measure the temperature of the water in the washing machine because the temperature will drop as the water travels from the water heater to the washing machine. For each one foot of water pipe the temperature drops one degree. Detergent and appliance manufacturers agree that detergent effectiveness declines rapidly in water below 70 degrees F (21 degrees C). Cold water washes are not economically sound; no detergent is effective in water below 60 degrees F (16 degrees C).

Most fibers can be washed in hot water except woolly acetate, olefin (polypropylene) and some acrylics. Permanent press fabrics will wrinkle more when washed in hot water. However, if permanent press articles are heavily soiled you will get better results by using hot water, plenty of detergent and your iron.

While hot water is still best for cleaning clothes, studies show that most consumers use warm water washes more frequently than either hot or cold. A warm wash is a fifty/fifty mixture of hot and cold water. Keep in mind that the temperature of your cold water varies considerably depending on the season and geographic location. As long as the water temperature does not fall below 70 degrees F (21 degrees C), you will still be getting your clothes clean.

Hot or warm water is not necessary for rinsing. Cold water rinsing is just as effective and does save fuel costs.

If lower water temperatures are used in the wash cycle, consumers should presoak, pretreat heavily soiled areas, agitate longer, and use additional detergent. For cold water washes, use one and one-half the recommended amount of detergent and dissolve the detergent prior to adding it to the wash water.

Sort by color.

Dyes may transfer from dark to white items when washed in the same cycle. White nylon fabrics discolor easily because they have an affinity for color. Even when presoaking, color should be taken into consideration. Prolonged presoaking of colored items can result in dye transfer in some fabrics. Additional factors for consideration in sorting garments are:

- **Amount of soil** — Heavily soiled clothing should be washed together. Pretreatment or soaking may be required for adequate soil removal. Keep in mind that grease and oil migrate to other fabrics, particularly polyesters.
- **Tendency to lint** — Wash items that produce lint (towels, mattress pads, blankets) separately from items that easily pick up lint (corduroy, synthetic fabrics).
- **Fabric** — Sheer and delicate fabrics should be washed separately, at lower water temperatures for shorter periods of time than more durable fabrics.

Laundry products

New laundry products have been developed in recent years to meet the changing needs and preferences of consumers. These products are designed for specific purposes. The key to successful laundry results is to match the right product to the right purpose. Laundry products are chemicals; using a product at the wrong time or for an incorrect purpose will create additional problems.

Water softeners

Water is essentially 99 percent of the wash solution; the condition of that water is extremely important in the laundry process. The quality of water is referred to as water hardness. This is expressed in terms of equivalent parts of calcium carbonate parts per million or grains per gallon (17.1 ppm. = 1 grain). Not only are water hardness ions found in water, but also in the soil on the dirty clothing. Missouri has a wide variation in water hardness varying from soft water in the south to moderately hard water in the east and west to extremely hard water in the north.

As water hardness increases, the cleaning ability of soaps and most detergents decreases. Water hardness can be controlled by builders in built detergents.

Table 1. Water hardness scale.

Water type	Hardness scale	
	Grains per gallon	Parts per million
Soft	0 – 3.5	0 – 60
Medium	3.6 – 7	61 – 120
Hard	7.1 – 10.5	21 – 180
Very hard	10.6+	180

Phosphate builders are more effective in the wash and cause less garment damage than carbonate builders.

There are three methods of softening water beyond the use of built detergents. These are a mechanical system a non-precipitating packaged softener and a precipitating packaged softener. The mechanical system (Culligan etc.) is the most convenient and least expensive to use over the long run. Purchasing these units requires a large initial capital investment, so many consumers choose to rent.

In selecting a packaged water softener, be aware that the two types mentioned above have quite different performance levels. The non-precipitating variety (Calgon, Spring Rain) is generally the better of the two. It ties up the hard water ions and keeps them from interfering with detergent action. The precipitating softener (washing soda) may leave deposits on garments and washer parts.

Packaged softeners such as Calgon and Spring Rain are available at the grocery store. For most effective performance in the laundry process, these products should be used in **both** the wash and rinse cycles. It's important to find out how hard your water is so you will know how much packaged softener to use. Most consumers find this system inconvenient, cumbersome and expensive.

Iron

Iron in the water creates serious laundry problems. Packaged laundry aids do not provide a permanent solution, but the non-precipitating softeners will tie up soluble iron. You can buy equipment to attach to the household water system that will control the iron by precipitation and filtration. The amount and form of iron present will determine equipment needs; to find out what your needs are, contact the local water supplier or plumbing companies.

Apply a rust stain remover (Whink) if iron stains appear on washable fabrics. Read and follow package directions. (Never use rust stain remover inside a porcelain enamel washer because it is very corrosive; also, don't use Whink on white nylon.) After treating the stain, rinse the garments. Add a non-precipitating water softener to the wash water before laundering the garment; this will keep iron from depositing on the garment. Use the water softener in the rinse cycle as well.

If rust has discolored a load of white items, wash in a phosphate detergent (Tide or Cheer) with 1 cup of oxygen bleach (Snowy, Clorox 2) or enzyme presoak (Biz or Axion). If stain remains, soak clothes in a mixture of 1 ounce of oxalic acid crystals and 1 gallon of water. (Use a plastic bucket or tub.) Soak clothes for 10 to 15 minutes. Rinse and launder.

Observe safety precautions when using oxalic acid; it is a poison.

Prewash products

Pretreating stained clothing saves time and yields good results. Prewash products include two groups: enzyme products (Biz and Axion) and prewash soil and stain removers (Spray 'n Wash and Shout).

Enzyme products are effective in breaking down protein stains (milk, formula, egg, cheese sauce) but are only partially effective on other soils such as grease or beverage stains.

For best results you need the right combination of time and temperature. Warm water temperatures and prolonged soaking are criteria for satisfactory performance.

Some caution should be noted in using enzyme products.

- Because enzymes break down proteins, fabrics made of protein fibers (wool, silk, angora, etc.) should not be treated.
- Chlorine bleach and hot water inactivate enzyme products.
- If long soaking is required to remove the stain, check the color-fastness of the garment before using this treatment.

Prewash products are available in liquid form in either aerosol or pump-type plastic containers. They are designed to attack oily soil. These products contain organic solvents and surfactants. The solvents attack the oily soil and the surfactants hold the oily soil in suspension until it can be rinsed away in the wash water.

The prewash products are especially effective on heavily soiled areas, synthetics and blended fabrics. Heavy duty liquid detergents (Era or Solo) can also be used as effective pretreatments on these garments.

Laundry bleach

We continue to use bleach in the laundry process because of its quick, visual results and low cost. The problems associated with bleach are generally the result of improper use. Follow these guidelines in using bleach:

- Read the permanent care label on the textile item.
- If the care label says "Do not bleach," do not use ANY bleach.
- If the care label does not say anything about bleaching, you can assume it can be bleached.
- Check the fiber content of the item: chlorine bleach should not be used on wool, silk, spandex, fire retardant and resin finishes.
- Measure bleach as recommended on the bleach label.
- Dilute the bleach before adding it to the wash.
- Delay adding bleach to the wash for 5 minutes, so the detergent components can work effectively.
- If bleach is used as a presoak, do not soak longer than 15 minutes or the fabric will be weakened.

There are two major types of bleach, **chlorine** and **oxygen**. Chlorine bleaches are usually liquid; two nationally distributed brands are Clorox and Purex. Oxygen bleaches are generally in a dry form except for sodium peroxide; other oxygen bleaches are Snowy and Clorox 2.

Bleach acts on stains by converting them into soluble chemical matter that is released from the fabric and is washed away. Chlorine bleach whitens fabrics whereas oxygen bleach contains whitening agents that brighten whites and colors. The effectiveness of oxygen bleach comes from repeated use.

The temperature of the water affects bleach activity. In general, the greater the water temperature the more rapid the bleach action and the greater the fiber damage particularly to cellulosic fabrics such as cotton. Follow the recommended care label for water temperature to be used on specific garments.

Liquid chlorine bleach is one of the most effective and inexpensive laundry disinfectants. Follow directions on the label for sanitizing; bleaches are effective in hot, warm or cold water. Disinfecting can be carried out in the wash cycle.

Fabric softeners

The popularity of these products stems from improved garment performance and appearance as well as reducing the need for ironing. Fabrics feel softer because of the lubricating action of the product, they have fewer wrinkles, look better, require less ironing and have less static cling.

Fabric softeners are available in liquid and dryer forms. The liquid softeners are generally designed to be used in the rinse water, as the compound interferes with detergents, bleaches and water softeners. Liquid softeners are available in two forms: concentrated (blue) and diluted (pink). Both types of liquid softeners should be diluted before coming in contact with the garments in the wash, because the dye in the fabric softeners could discolor the clothes as well as create an oily stain. If liquid fabric softener is used correctly, it should provide greater softening potential than the dryer variety.

The inconvenience of returning to the washer to add fabric softeners has led to fabric softener dispensers in washing machines, the addition of fabric softeners to some detergents and the dryer variety of softeners. The dryer types of fabric softener are effective in controlling static electricity but provide only one-fifth as much softening as the rinse cycle products. The effectiveness of the dryer type depends upon surface contact between the tumbling items to be dried and the sheet containing the softener.

The sheet variety of fabric softeners can create greasy stains on polyester fabrics (particularly solid colors) when started in a warm dryer or when a hot setting is used. This stain can be removed by wetting the fabric, rubbing the spot with a bar soap (make sure it is a true soap like Ivory; most bar "soaps" are actually synthetic detergents), and rewashing the garment in detergent and warm water. For more difficult spot removal, use a hydrocarbon or dry cleaning solvent (Energiene) to remove the oily residue.

Laundry products will continue to change to reflect changing lifestyle, laundry equipment and social concerns. Effective laundry results can be obtained by two simple procedures: reading the directions on the products and measuring the recommended amounts to be used.

Energy savers in the laundry

An authority on detergency commented that the real savings of energy is "doing it right the first time." Below are several more energy savers.

- Adjust the water level to the load size.
- Wash full loads rather than several partial loads, if possible.
- Do not overload the washer.
- Pretreat or soak heavily soiled items.
- Wash white items in hot water.
- Adjust cold and warm water temperatures with the season of the year.
- Use cold rather than warm water rinses.
- Measure and use the recommended amount of detergent.
- Remove clothes from the dryer promptly. Overdrying wastes energy twice when garments must be ironed to remove wrinkles.
- Clean the lint trap of the automatic dryer after every load.
- Use fabric softeners to reduce wrinkling.
- Hang clothes on a clothesline if available.

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Disclaimer — The use of names of commercial laundry products was for clarification and identification and was not intended to be an endorsement.

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