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Homemade Cleaning Agents

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By

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Home furnishings and equipment are often neglected because of the expense of cleaning agents. It is possible to have a sufficient supply on hand at small expense if the homemaker is willing to spend a little time making them. They are cheaper made in larger quantities, and it is nice to know that there is a supply sufficient to use as needed.

I. Homemade Soap

Soap is considered a luxury in some countries. Soap making was an early American art. There is real satisfaction to be found in transforming waste fats of the home into pure, lovely soap for toilet and laundry use.

Ingredients

Fats: Lard, tallow and vegetable oils may be used for making soap, also grease collected from cooking. Poultry fat does not make good soap. It should be saved, however, for it is delicious used as a substitute for butter or lard to season or fry foods.

A mixture of different kinds of fats for soap making usually gives best results. Half lard or cooking grease and half tallow makes a good laundry soap. Half sweet lard or vegetable oil (castor oil, olive oil, cottonseed oil) and half tallow is best for toilet soaps.

Fat for soap making should be freed of water and impurities before storing. A piece of raw potato dropped into the hot fat before emptying it into the storage can will help to clarify it. Impurities may also be removed by straining the fat through fine muslin tied over the top of the storage can. Soap fats should be kept well covered in a cool, dry place. No water should be allowed to get into the grease as it causes it to turn rancid more quickly. Fats from cooking should not be kept too long before making into soap. With even the best of care fats will eventually become rancid.

Before making into soap, the fats should be sweetened and made free from all impurities. To sweeten rancid or sour fat, boil it in a mixture of vinegar and water (1 part vinegar to 5 parts water). Let it stand until cold. The fat collects on the top. Remove it, being careful to take up as little of the water as possible.

After the rancid fat has been sweetened, the vinegar and other impurities, such as sugar, salt and flour, must be removed. Pour over the fat an equal quantity of boiling water, stir it thoroughly and cool it. The impurities dissolve and settle to the bottom. The fat collects on top and is taken off when hardened.

If the fat is colored it may be bleached if desired. Dissolve a few crystals of potassium permanganate in a pint of rain water. Weigh and warm the fat slightly. Add the potassium permanganate solution, one pint to each pound of fat. Stir at intervals. Add more of the potassium permanganate solution if needed to obtain a good bleach. Cool and remove the bleached fat. For best success in soap making the sweetened and puri-

fied fat should be freed of water by heating. It should be watched carefully to prevent scorching.

Water: If possible, use rain water for soap making. If rain water is not available it will pay to soften some water with a small amount of lye, letting it stand three or four days before using so that all the hard particles will settle to the bottom. If a neutral soap is desired, the softened water should be tested with red litmus paper. If the paper turns blue too much lye was used, and water should be added until, when tested, the litmus paper remains red. If very hard water is used without softening, the soap may not harden well and have a tendency to be greasy. This is due to part of the lye combining with the hard elements in the water, leaving an insufficient quantity of free lye in the lye solution to combine with the fat.

Lye: Pure lye is essential for successful soap making. Obtain the highest grade lye on the market. Care should be taken in preparing the lye solution so as to avoid fumes.

Measure 2½ pints of water in the stone or enamel jar. Remove the cap from the can of lye. Hold a newspaper between you and the container; empty the contents of the can. When all the lye is out of the can, put the newspaper over the container and the cap back on the lye can. Lift the container and shake it carefully to prevent the lye forming an ice-like coat on the bottom. Cool to 70 degrees before usnig. If an enamel container is used the cooling may be hastened by setting it in water.

Utensils

1. A large wooden or enamel mixing spoon.
2. A half gallon enamel or stone jar for preparing the lye solution.
3. Enamel or granite kettle or crock for mixing the ingredients.
4. A shallow wooden box lined with cotton cloth to hold the soap while hardening. (Two plug tobacco boxes are needed to hold a whole recipe. They should be soaked until they do not leak.)
5. A heavy cardboard box large enough to hold the wooden boxes. It should be several inches higher than the wooden boxes so as to protect the blanket or rug used for covering.

Standard Soap Recipe (Makes 9 lbs.)

6 lbs. fat — 2½ pints water — 1 can high grade lye

Melt the fat in an enamel pan or crock. If several kinds are used, mix thoroughly with a wooden or enamel spoon and cool to the correct temperature, or until the spoon begins to leave a track in the mixture. At this point, add the lye mixture which has been cooled to correct temperature. Pour the lye solution slowly in a thin stream into the fat, stirring *slowly, steadily* and *in one direction.* It should be stirred until all the lye has combined with the fat and the mixture assumes a honey-like texture. At this point the mixture soon becomes as thick as cream or salad dressing and should be poured *at once.*

Pouring the Soap Into the Mold: The wooden box used for molding the soap should be previously prepared (lined with cotton cloth wrung tightly out of hot water). It is best if the wooden box is set inside the cardboard box on a solid table or other solid surface above the floor and out of drafts in the room where it is to be left.

The soap mixture should be poured gently into the wooden box. Never flop it—the jolt from the flop might cause separation. Cover and wrap the cardboard box with a blanket or rug to keep in the heat. Sometimes

the bang of a door or jar caused by walking on loose floor boards causes separation after it is poured into the box.

To Test the Soap: At the end of 24 hours cut a corner out of the soap (full depth). If there is neither grease on top nor liquid at the bottom, turn the soap out and cut it into bars with a string or fine wire (never use a knife). The sharp edges of soap may be scraped off and the cake polished by rubbing with the hand. A better polish may be obtained by moistening the hands with alcohol before rubbing the soap.

If, at the end of 24 hours there is a film of grease on top of the soap, leave it 48 hours longer or until all the grease has been acted upon by the free lye. Then cut the soap as directed. If at the end of 24 hours when the corner is cut from the soap a liquid is found in the bottom of the pan, cut the soap with a *knife* in small squares just as you would cut a cake, and let it stand until all the liquid is absorbed. The liquid may be either glycerol or lye.

To Reclaim Soap: If, after standing, the liquid is not absorbed into the soap, shave the soap into a kettle (wear rubber gloves or lift with paper). Add the liquid from the box and seven pints of water. Stir slowly and evenly. Bring slowly to the boiling point. In a few minutes the ingredients will blend together into soap. Pour it gently back into the box. The bulk will be greater than before, but the soap content will be the same.

Points to Remember for Successful Soap Making

Success in soap making depends largely on the following points:

1. Accurate measurement of all ingredients.
2. Fats free from impurities and water.
3. Fats melted and kinds carefully blended before adding lye solution.
4. Right temperature of ingredients.
5. Correct manipulation.

Temperature: Soap made at as high a temperature as the lye and fat will react together, is of more velvety texture than soap made at a low temperature. The temperature should be right, but it is better to have it too hot than too cold. If too hot the mixture will continue to be thin and to look greasy after all the lye has been added. In this case the kettle should be placed in a pan of cold water and the mixture gently stirred until it is cool enough to change into soap. (Assumes honey-like consistency). There should be no sign of grease collecting on top of the mixture before pouring into the box. If all the grease has not blended with the lye the grease will come to the top of the soap after it is poured, and it will have to set a long time before it is changed into soap.

If the ingredients are too cold, lumps will form on the spoon and in the mixture. The mixture becomes thick and the lye separates out. In this case the kettle should be placed in a pan of hot water, and the contents stirred until the lye is reincorporated again, and the mixture is the right consistency to be poured.

The temperature for the lye solution and the fat varies with the room temperature, the kind and condition of the fat. At ordinary room temperature (about 70 degrees) the temperatures should be as follows:

Lard, 100 degrees F.— lye solution, 70 degrees F.
Tallow, 130 degrees F.— lye solution, 90 degrees F.
Tallow and lard mixture, 115 degrees F.— lye solution, 80 degrees F.
Rancid fat—about 10 degrees higher than sweet fats.
Cottonseed oil, 135 degrees F.— lye solution, 80 degrees F.

When a combination of fats or oils is used the temperature should be an approximate between that required when each is used alone.

In hot weather the temperature of the fat may be about 10 degrees less, and the temperature of the lye solution from 2 degrees to 4 degrees less. A thermometer is an aid to successful soap making.

Manipulation: Slow even stirring in one direction, gentle pouring and handling are essential to success. A jerky motion in beating, a flop into the box when pouring, a jar after pouring into the box may cause separation.

Other factors: A greasy soap shows shortage of lye or insufficient length of curing. Soaps made of lard or oils require a longer time to cure Hard crumbly soap may be due to excess of lye or hard vigorous stirring. Hard brittle soap may be caused by a too low temperature while setting.

Curing of Soap: Soap should cure at least two weeks before using. This allows free lye in the cake to unite with the other ingredients and make a neutral product which will not fade colors, weaken fibers or injure the skin. Soaps made of lard or oil require longer curing than others. Toilet soaps should be allowed to cure a month or longer before using. Soaps should not be allowed to freeze while curing.

Tests for Good Soap: Soap properly made and cured should have firm even texture. It is neither too moist or too dry. It can be shaved off in a curl. It is practically tasteless. It contains no free lye (does not bite the tongue or turn red litmus paper blue).

Storage of Soap: Homemade soap is best wrapped in waxed paper and stored in a covered container in a dry place.

Colored, Perfumed and Floating Soaps

Non-poisonous and Non-fading Color for Toilet Soaps: Nice, white soap may be more lovely than colored. It is more economical. If coloring is used it should be non-poisonous and non-fading. The following coloring agents are commonly used:

Red—Rhodamine B—1 grain in 1 oz. water.
Yellow—Flouresceim—5 grains in 1 oz. water.
Green—Naphthol Green B—4 grains in 1 oz. water.

Orange rind squeezed under water— (water which is to be used for the lye solution will tint and perfume soap). Sassafras bark boiled in the water which is to be used for the lye solution will also impart color and odor to the soap.

Perfumes: Oil of citronella—use a trace (cheap and pleasant).
Oil of wintergreen.
Rosemary—use a trace.
Oil of lavendar.
Saffrol oil—or synethetic oil of sassafras (cheaper).
Rose geranium—expensive.

If color or perfume is to be added to the soap it should be added just after the lye has been taken up by the fat and the mixture has assumed the honey-like texture. If soap that will float is desired, then is the time to cut and fold it gently with the wooden spoon. Only a few minutes of cutting and folding is needed to make a soap that will float. The cutting and folding should be done very gently in one direction.

Abrasive Soap

Mechanics and farmers will appreciate a good abrasive soap.

Fat mixture—130 degrees F.	Lye solution 90 degrees F.
4½ lb. tallow.	1 can lye
1½ lb. lard.	2½ pts. water.

Two lbs. of abrasive. (Fine emery dust, pumice stone or Tripoli powder may be used.)

Make the soap according to general directions. Add the abrasive when the soap begins to thicken. Wait until the mixture has become quite thick before pouring, to prevent the abrasive from settling to the bottom. Tar soap may be made in he same manner, adding the tar slowly and gently after the soap has begun to thicken.

II. Cleaning Agents Made From Soap

Soap Jelly

Soap jelly has many uses about the home. When made of neutral soap, it may be beaten to a stiff lather and used as a shampoo for the hair, or as the base for a cornmeal rub for the face and hands. (See Extension Circular 322, "Keeping Up Personal Appearances"). It is also used as the base for pumice paste which is used both for toilet and culinary cleaning purposes. It is used as the base for a cleansing cream to clean light colored woodwork, and for polishing metals.

Soap jelly is made by dissolving soap in rain water or softened water. The amount of water needed will depend on the quality of the soap. Enough water should be used so that the soap will remain in jelly form after standing.

Pumice Paste

Pumice paste is made by beating soap jelly to a stiff lather, then adding sifted pumice stone slowly, beating while adding. The amount of pumice stone required will vary with the consistency of the soap jelly and quality of the pumice. Enough should be added to make a soft paste. Should you prefer a scouring brick, add enough pumice to make a very stiff dough which can be molded into cake form. (See circular 319, "Keeping up Household Appearances," concerning the use of pumice).

Silver Polish

Silver polish is made as described above except that sifted whiting is used instead of pumice. The addition of glycerin helps to keep the paste soft and increases its cleaning quality. Two tablespoons of glycerin may be added to each pint of paste.

III. Other Homemade Cleaning Agents

Household Spot Remover

A solution is used to remove spots from rugs, upholstery, drapes and other household fabrics.

2 oz. borax	6 oz. household ammonia
2 oz. chipped neutral soap	4 oz. denatured alcohol
2 oz. sulfurous ether	1 oz. salt peter

Dissolve the borax, salt peter and chipped soap in the boiling water. Cool solution; then add the ether, ammonia and alcohol. Bottle tightly to prevent evaporation of ether. Before using test the color fastness of the fabric to be cleaned by applying the solution to an inconspicuous piece.

Rug Cleaner

1 lb. neutral soap flakes
¼ lb. borax
1 qt. boiling water
¼ pt. ammonia
1 T. glycerin

Dissolve the soap flakes and borax in the boiling water. Add the glycerin. Cool and add the other ingredients. When some of it is to be used, beat a portion to a stiff lather. A small amount of warm water may need to be added. Keep lather as dry as possible. Apply to a small area, brushing with nap of rug. To remove cleaning solution rinse with rag or sponge wrung out of clean, warm water. Be careful not to get the rug water-soaked. Wipe with a dry cloth.

Painted Wall Cleaner

Dissolve one cake of pure neutral soap (shaved) and two ounces of glue each in one quart of boiling water. Mix the two solutions. Let stand until it becomes jelly-like in consistency. To a pail of luke warm water, add a sufficient amount of the cleanser to form a good suds. Apply to walls with a sponge.

Wall Paper Cleaner

1 c. flour
1 T. salt
1 t. kerosene
2 t. ammonia
2 t. vinegar
½ c. warm water

Mix dry and liquid ingredients separately. Combine them and cook well, stirring constantly. As soon as cool, take up and knead with hands. Use the same as commercial cleaner, rubbing the dough over the soiled surface. When soiled, cut off outer soiled portion. If the mixture tends to stick to the hands, dip them in flour and work a sufficient amount of the flour into the mass to keep it from sticking. If the mixture is too soft it will streak the paper.

Laundry Bleach and Disinfectant

An economical laundry bleach is made by mixing together in the following order ¾ pound of washing soda, 1 quart of boiling water, 1 pound of fresh chloride of lime and two quarts of cold water. Stir the mixture well. Let it settle and clear. Pour the clear liquid into bottles and store. The sediment is an excellent disinfectant for toilets and drain pipes. The clear liquid also has antiseptic qualities and may be used as a disinfectant to wash unfinished shelves in cupboards or for basement cleaning. When used as a laundry bleach for white clothes, use ½ to 1 cup to a gallon of water, depending upon the delicacy of the fabric.

Household Ammonia

Mix six ounces of 28 per cent concentrated ammonium hydroxide with one gallon of boiled rain water. Store the solution in glass jars or bottles with tightly fitting glass covers or rubber stoppers.

Bleach for Spots on Wood Surfaces

Dissolve four teaspoons of oxalic acid crystals in 2 C. lukewarm water. Store in a pint fruit jar with tight fitting glass cover. (This solution is *poisonous*). It should be stored out of reach of children and handled with care. The solution is most effective when applied hot. It should be applied carefully to the spot only, and allowed to remain until the spot is bleached. Sometimes a second application is necessary. As soon as the spot is bleached the wood should be washed free of the bleaching agent.

IV. Softening of Hard Water

Many dollars are wasted every year by depending on soap and high priced softening agents to produce suds in hard water. The chemistry department of State College tells us that lye—a high grade pure lye—is not only the cheapest but the most effective softener for South Dakota hard water.

A can of high grade lye costing about fifteen cents, will soften a very large quantity of water. It is impossible to make a general estimate of the amount of lye needed to soften a gallon of water; the degree of hardness varies so widely throughout the state. By experimenting one can best determine for herself the amount of lye needed to soften the water she uses. The process is very simple, but it requires patience and accuracy. Accurately softened water may be used for bathing babies or for laundering the most delicate fabrics.

Prepare a softening solution by dissolving one can of high grade lye in two pints of water. Use a tall enamel or stone container. One with a small mouth is preferable. The container should be large enough to prevent the solution from "boiling over" while the lye is dissolving. To avoid fumes, empty the entire contents of the lye can into the water, holding the can upright. Hold a folded newspaper between you and the container while emptying the can. Place it over the top of the container as soon as the lye has been added. Put the cover back on the lye can. As soon as the solution has stopped fuming, stir it with a stick, wooden or enamel spoon, to prevent the lye from settling and forming an icy coat on the bottom of the container.

Put a gallon of hard water in a stone or enamel container. Add one tablespoon of the lye-softening solution. Let stand three days. The lye from the softening solution will unite with the "hard" elements in the water, forming a precipitate which will settle to the bottom of the container. The water is completely softened when all the hard elements have precipitated. If too much lye is added (more than will unite with the hard elements) it will remain *free* in the water and will irritate skin and weaken cloth fibers.

After three days, test the water with red litmus paper. (It can be obtained at most drug stores; 100 small strips cost about fifteen cents). When the red litmus paper turns blue it indicates the presence of free lye. In this case, add hard water, a half cup or less at a time. Stir thoroughly and let stand. Test again with red litmus paper. If it turns blue, continue adding water (keeping accurate count of the amount added) until the water, when tested, no longer turns the red litmus paper blue. When the paper remains red it may mean that you have just happened to get the correct balance between lye and the hard elements in the water. At least there is no free lye present. It may, however, indicate an insufficient quantity of lye. In this case, all of the hard elements in the water will not be separated out and the water will not be truly soft. In this case more lye solution should be added, a very small amount at a time, possibly a few drops or spoonfuls until when tested the red litmus paper begins to turn bluish showing the presence of free lye. Then very small quantities of hard water should be added until the litmus paper again remains red.

If you find it difficult to work with so small a quantity of water, repeat the experiment using a two, three or five gallon unit of water. Keep accurate account of the total quantity of lye solution and water added.

Regular Softening of Hard Water: After having determined the amount of lye needed to accurately soften a gallon of water, it is a simple matter to keep a constant supply on hand. Two water-tight kegs or barrels, each large enough to hold a three-day supply of softened water, will be required.

To begin, the known quantity of water in both containers is softened by adding the correct amount of lye solution for each gallon. Let the water stand three days before using. As soon as the softened water in keg No. 1 has been used the sediment at the bottom should be removed, the keg washed, refilled and the correct amount of lye-softening solution added. By the time keg No. 2 is emptied the water in keg No. 1 will be softened ready for use.

The water has to be removed from the top of the kegs because of the sediment forming at the bottom. If a siphon is to be used the kegs must be set high enough so that the entire content of the kegs may be drained. The top of the kegs should be securely covered.

Since the water in the same well varies in degree of hardness from time to time, an occasional test of the softened water should be made to check on the quantity of lye solution used.

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