

Dear Consumer:

As you requested, we are sending you a copy of our letter entitled, "Better Septic Care".

We've tried to cover all of the important points as clearly as possible. You can either refer to the Table of Contents on the title page to turn to the topics of most interest, or you can start at the beginning and read it through. When you've finished reading this information, we suggest that you file it for easy reference.

Our recommendation is that - for the average sized septic tank - you pour a cup of ARM & HAMMER® Baking Soda down a toilet or drain once a week. If you do this every week, you will create a favorable pH environment for microorganism - naturally present in your septic tank - to digest sewage, so that the effluent going to the drainage field is clearer. A clearer effluent helps prevent clogging in the drain field, and backing-up in the house.

Also, at this pH level, hydrogen sulfide is fixed in solution so that it can't escape as an offensive gas. This greatly reduces the characteristic septic odor escaping from the drainage field in the lawn or from the vent in the roof.

The septic tank is part of a complex chemical, physical and biological system. For the system to work at top efficiency, all of these processes must function smoothly. Included on the last page is a list of septic do's and don't's which will help prevent major upsets to your septic system.

We believe that our advice will help you to help your septic tank work better.

Cordially,

M. Nancy Sevinsky
Manager, Consumer & Professional Relations

/mns

"BETTER SEPTIC CARE"

EVERYTHING YOU WANTED TO KNOW ABOUT
SEPTIC TANKS, BUT WERE AFRAID TO ASK

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EVERYTHING YOU WANTED TO KNOW ABOUT SEPTIC TANKS, BUT WERE AFRAID TO ASK

On-site septic systems are of vital importance to the U.S. The most recent census data indicate that one out of every four homes uses a septic tank to dispose of household wastewater and sewage. The number of homes with septic tanks will probably increase as new houses are built in areas beyond reach of municipal sewer systems, which are getting more costly to construct.

Septic tanks/systems are complicated subjects. In most areas of the U.S., permission to build a septic system, details of its construction, or changes in design must have the approval of the appropriate state or local governmental agencies since it is designed to treat sewage which is potentially harmful to human health. This information isn't intended to serve as a substitute for talking to the appropriate agencies. It's intended to serve as a guide to people who already own septic tanks and either have had problems such as bad odors, clogging, and backing up or who wish to help prevent such problems. but please remember that a septic system built in an area with unsuitable soil, or badly constructed, or being maltreated in every-day use, can have problems until the circumstances causing the problems are corrected.

WHAT IS A SEPTIC SYSTEM & HOW DOES IT WORK?

Basically, a septic system consists of two parts:

1. A septic tank in which raw sewage receives initial treatment, and
2. A drainage field where effluent discharged from the septic tank is absorbed by the soil beneath the surface of the ground and receives final treatment before becoming diluted in the groundwater.

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WHAT

DOES THE SEPTIC TANK DO?

The purpose of the septic tank is twofold:

1. To capture most of the solids and also fats/grease from household sewage inside of a water tight receptacle underground so that they can be pumped out, when they accumulate to the extent that they threaten to flow out of the tank into the drainage field where they can cause clogging.

2. To hold the liquid sewage so that there will be sufficient time for small particles of organic matter to be digested before being carried out of the tank into the drainage field where they can clog.

The Septic tank's basic objective, then, is to separate solids from liquids and hold solids so that the liquid leaving the tank will be clearer and won't clog the drainage field. The heavier material sinks to the bottom and is called sludge. The lighter material floats on the surface of the liquid and is called the scum layer. The liquid in the middle contains soluble or suspended organic matter.

WHAT IS A DRAIN FIELD?

When the partially treated liquid leaves the septic tank, it is carried by a solid pipe to a series of perforated pipes laid in trenches in the soil. The liquid seeps out of the holes in the pipes, and is absorbed by the soil. A layer of gravel surrounding the drain pipe facilitates the uniform spreading of the effluent over the entire absorption area.

THE ROLE OF MICROORGANISMS IN THE SEPTIC SYSTEM

So far, we've only discussed the mechanical aspects of a septic system. Now it's time to talk about the role of the micro-organisms, both in the tank and in the drain field, which are essential if the system is to work well - or even work at all.

BUT WERE AFRAID TO ASK

In a poorly functioning septic system, microorganisms such as bacteria (single-celled plants) and protozoa (single-celled animals) are found in all parts of the septic tank and in the soil absorption field.

In the septic tank, their primary role is digestion of organic matter suspended or dissolved in the liquid so that the clearest possible effluent can be discharged into the soil disposal field to minimize solid clogging and back-up. Their secondary role is to digest some of the heavy solids (sludge) and some of the light solids (scum). Without the work of these microbes, the storage capacity of septic tanks would soon be exhausted.

In the soil, bacteria and other microbes complete the digestion of organic matter. Various physical, chemical and biological processes in the soil also renovate effluents.

WHAT ENCOURAGES INCREASE IN THE NUMBER OF MICROORGANISMS AND IN THEIR ACTIVITY?

Since they are alive, microorganisms need such things as food and water in order to reproduce themselves, and multiply. Abundant food and water is provided in the septic tank with the incoming sewage. However, in order to make proper use of this food and water, it is essential that a favorable pH exists in the septic tank. pH is a measurement of the quantity of acidic elements vs. basic elements in solution. A pH of 0 indicates that a solution is as acid as it can get, a pH of 14 indicates that a solution is as basic as it can get, and a pH of 7 indicates neutrality.

It isn't surprising that a neutral pH is more favorable for microorganisms to thrive and function well in a septic system. All living organisms from a single-celled bacterium up to a human being require a similar pH range for bio-chemical processes to operate well. Judging from our own scientific research and the work of other scientists, the microorganisms in a septic tank die, or are rendered dormant, when the pH drops to about 4.5 (acidic) or when it rises to above 9.0 (basic). The most favorable pH range for microorganisms in the septic tank is between 6.8 to 7.6.

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The basic problem in a septic tank is that the microorganisms - in digesting organic matter - produce large quantities of carbon dioxide, methane gas, hydrogen sulfide and organic acids. If allowed to build up without being neutralized, these acids will lower the pH to levels unfavorable to the microorganisms. In other words, if left to their own devices, microorganisms may limit their digesting organic matter.

THE MAIN BENEFIT OF ADDING BAKING SODA TO A SEPTIC TANK

Baking Soda (also called sodium bicarbonate) is a unique product. It's safe, U.S.P. (United States Pharmacopoeia) and Food Grade chemical. It has the property of serving as a buffering agent and as a source for reserve alkalinity without increasing pH. When sufficient baking soda is added to drinking water, the pH levels off to about 8.2. As acids or bases are added, the buffering capacity of baking soda tends to prevent the pH from increasing or decreasing.

Regular addition of baking soda to the septic tank brings the pH up to a range between 6.8 to 7.6. The pH normally doesn't go as high as 8.2 because some of the baking soda is used to neutralize the acids produced by the microorganisms busily digesting the sewage and also some baking soda is flushed out of the septic tank every time water/sewage enters the tank.

As indicated above, a pH range between 6.8 to 7.6 is highly favorable to microorganisms found in septic tanks. Although some microorganisms tend to lower the pH in a septic tank by producing acids and CO₂ in the digesting sewage, baking soda raises the pH to a favorable level and tends to keep it there. There is no danger that adding too much baking soda will raise the pH to a level harmful to microorganisms. The extra baking soda stays in solution and is called buffering capacity or reserve alkalinity. This means that the baking soda is held in reserve so that it can swing into action when needed to neutralize acids continually being produced by microorganisms.

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OTHER IMPORTANT BENEFITS OF ADDING BAKING SODA

As well as restoring and maintaining a favorable pH for the growth of microorganisms, the addition of baking soda helps prevent septic odors from escaping from the tank into the drain field or out of the house vent in the roof by keeping the liquid from becoming acidic. When microorganisms digest organic matter, hydrogen sulfide usually is produced. As an acid pH, hydrogen sulfide escapes from water as a gas which has the odor of rotten eggs. On the other hand, in a more neutral pH range between 6.8 to 7.6, hydrogen sulfide will be in solution for the most part so that there is very little odor. There is a very noticeable decrease in odor with an increase of only one pH unit, such as from 5.0 to 6.0.

WILL PRODUCTS OTHER THAN BAKING SODA HELP?

Chemicals sold to consumers for use in septic tanks fall into one of four categories:

1. Products consisting of living microorganisms, e.g. yeast.
2. Products which provide food for bacteria and other microorganisms.
3. Products which are designed to dissolve solids in the tank but which raise the pH to levels where the microorganisms can be deactivated or killed.
4. Products which are designed to remove soap from septic tank walls. Freeing fats and grease, however, adds those substances to the drain field where they can cause clogging.

Chemicals in the first two categories don't do any harm but aren't necessary, since millions of microorganisms and the necessary food for them constantly are being added via in-coming sewage.

Chemicals in the last two categories may dissolve solids, etc. but also can kill the microorganisms which are essential for the proper functioning of a septic tank. They may produce an effluent which can cause premature failure of the soil absorption system.

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Baking Soda, on the other hand, doesn't add microorganisms or provide nutrients. It adjusts the pH level where the micro-organisms can utilize the nutrients provided by the sewage. After all, the purpose of a septic system is to get microorganisms to digest the sewage.

RECOMMENDED DOSAGE OF BAKING SODA

For the average septic tank (300-750 gallons), we recommend that 1 cup (8 oz.) of ARM & HAMMER® Baking Soda be poured down any toilet or drain once a week. Our research shows that 1 cup every week helps restore and maintain a favorable pH environment for microorganisms to digest sewage, so that the effluent going to the drainage field is clearer. A clearer effluent helps prevent clogging of the drain field and, consequently, backing-up in the house. At the proper pH, hydrogen sulfide is held in solution so that it can't escape as a gas which has a bad odor and also can cause corrosion in the top of the septic tank.

If you have a larger septic tank, increase the quantity of baking soda proportionately.

WHY IT'S IMPORTANT TO ADD BAKING SODA EVERY WEEK

It's important to add baking soda once every week because of the flow characteristics of the septic tank. Every time water/sewage is added to the tank, an equivalent amount of liquid is forced out of the tank to the drainage field. Since the average home uses a lot of water every day in bathing, laundry, flushing the toilet, cooking, washing dishes, etc. there is a lot of water being discharged into the tank and being forced out of it every day. This means that baking soda constantly is being flushed out of the septic tank. At the end of the week, there isn't enough baking soda left in the tank to help maintain the proper pH, and more must be added.

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OTHER THINGS TO DO TO HELP YOUR SEPTIC SYSTEM WORK BETTER

ARM & HAMMER© Baking Soda goes a Long way in helping your septic tank work better. But there is much more to taking care of septic tanks than only adding baking soda.

Don't flush down the toilet which microorganisms find difficult or impossible to digest: disposable diapers, facial tissues, cigarette butts, coffee grinds, cat litter or plastic items. it's best to throw such things into the garbage.

Cooking fats or grease should be collected, and put in the garbage since they are difficult for microorganisms to digest.

Don't pour antiseptic agents such as lye or other harsh chemicals down drains or toilets. They can kill or deactivate the valuable microorganisms at work in the septic tank and in the drain field. Until harsh chemicals are neutralized or flushed away, they will continue to kill microorganisms and may do extensive damage to the soil in the drainage field.

Don't over-work your septic system by using too much water. Besides flushing baking soda out of the tank, too much water pushes sewage out of the tank before it has sufficient time to be partially digested by the microorganisms busy working in the tank.

Be especially stingy with water at times of the year when heavy rains or melting snows saturate the ground, reducing its ability to absorb water.

Don't allow the brine used to regenerate water softeners to go into the septic tank. This salt solution should be piped to a special steppeage pit.

Finally, many authorities recommend that accumulated waste materials in the tank (the layer of sludge at the bottom and the layer of scum at the top) be pumped out by a professional septic tank cleaner every 3 to 5 years. Be sure that the professional service who cleans your tank mixes the liquid, sludge, and scum before pumping. All the material should be removed, and not just the liquid. In order not to kill the valuable microorganisms left in the empty tank, don't pour in disinfectant or run fresh water into the tank to wash it out. The tank doesn't need to be flushed or hosed down. It only has to be emptied.

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An on-site septic system is a natural and ecologically sound way of disposing of potentially harmful sewage. If the septic system is properly designed, constructed, and maintained, millions of microorganisms will digest the sewage and return its chemical components to the earth to be used over and over again. We believe that regular addition of ARM & HAMMER® Baking soda will help provide the optimum environment for these microorganisms to do their job and - in so doing - help keep your septic tank working better.

**RECOMMENDED DOSAGE: ONCE A WEEK, POUR ONE CUP OF
ARM & HAMMER® BAKING SODA
DOWN ANY TOILET OR DRAIN.**