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Dr. David G. Williams

The Best of Broth Worlds

Last month I briefly touched on a few of the uses of the amino acid glycine, showing how it could be used as a sleep aid, to accelerate wound healing, and to quickly stop “panic attacks.” Since glycine is classified as a non-essential amino acid (our body can synthesize it from other materials when necessary), very little attention has been given to its therapeutic use. This type of thinking could be a serious mistake that is contributing to many of the health problems that have become so common in the last few decades.

Most of the basic research on glycine was performed in the early 1900s, and it was then that many doctors were starting to report the wide variety of health problems that could be improved or eliminated by increasing glycine levels. Unfortunately, it was during this same period that pharmaceutical compounds became the accepted method of treating ailments and natural therapies were seen as old-fashioned and inferior.

Just because the body has the capacity to synthesize glycine doesn't necessarily mean proper tissue levels of glycine are always maintained. With the constant onslaught from various chemicals in our water, food supply, and environment, I suspect our ability to synthesize glycine in adequate amounts is insufficient. And during times of increased stress, the body may not be able to keep up with demand, particularly if it's deficient in the necessary raw materials.

The body needs a supply of high quality protein to synthesize additional glycine. Inadequate protein from the diet is common in the elderly—not only due to a poor diet, but also from a decreased ability to produce the digestive enzymes and hydrochloric acid necessary for its proper digestion.

Pregnancy can also be a factor. During pregnancy, the fetus requires as much as two to ten times the normal amount of glycine. Not only can glycine deficiencies affect the mother, they can also be a growth-limiting factor in children.

Increased amounts of glycine are also essential following injuries. During wound healing, glycine is required for the synthesis of the body's nucleotide building blocks—DNA and RNA.

Glycine also has a role in the synthesis of the detoxifying compound glutathione, so it's no surprise early doctors found that glycine-rich gelatin could support liver function and improve one's ability to deal with toxins. Glycine even addresses the detoxification of certain compounds directly, for example the benzoic acid now widely used throughout the food industry as an antimicrobial and preservative. You can find it in such common items as toothpaste, mouthwash, cosmetics, deodorants, and numerous food items.

In fact, glycine is a required component of so many functions of the body that a deficiency can result in a wide and varied range of



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You will observe with concern how long a useful truth may be known, and exist, before it is generally received and practiced on.—Benjamin Franklin

problems. In addition to its role in the synthesis of glutathione, glycine is required for the synthesis of oxygen-carrying hemoglobin, digestive bile salts, and glucose. Its importance becomes more apparent when you look at some of today's most common health problems and what doctors a hundred years ago were experiencing with their patients.

There's Always Room for Gelatin

Before the drug craze began, doctors were just beginning to research and report on the benefits of using gelatin, one of the richer natural sources of glycine. Gelatin is the protein substance made from boiling animal bones, skins, and tendons. More than a fourth (27 percent) of the gelatin consists of the amino acid glycine. [Other primary amino acids in gelatin include proline (15 percent), hydroxyproline (13 percent), lysine (4 percent), and hydroxylysine (0.8 percent).]

Over a century ago, doctors reported that one of the primary attributes of adding gelatin to the diet was an immediate improvement in digestion. Not surprisingly, it was later learned that glycine is one of the few amino acids that actually stimulates the secretion of stomach acids. (*J Clin Invest* 76;58:623-631)

Gelatin was also found to have a natural soothing and healing effect on the entire gastrointestinal tract. Dr. Pottenger, one of the more famous nutritional experts of the early 20th century, reported that adding gelatin to the meal improved the digestion of all foods. Other doctors found that food allergies, problems with mixing different types of foods, and even food reactions due to "leaky gut syndrome" could be overcome by adding gelatin to the meal. Edgar Cayce, the famed medical psychic, even recommended consuming gelatin with raw vegetables and salads to improve digestion of them. (Unfortunately, there are no vegetarian sources of gelatin. Substitutes such as agar-agar or arrowroot

provide the same gelling effect in foods, but don't have the amino acid content.)

There weren't many published reports on these findings, because the quality and availability of commercial gelatin at that time varied widely and made study results hard to duplicate. Some products reportedly were made solely from animal hides with no bones or cartilage. To make matters worse, the production and stabilization techniques weren't uniform, so it was impossible to know what quality of gelatin you might receive. In many ways, the situation hasn't changed much to this day.

If you look at the list of items found in gelatin, you'll see that it contains the same compounds that are being promoted and sold individually as food supplements to help arthritis and joint problems. In fact, many of these compounds are made by either boiling or chemically stripping animal bones, tendons, and cartilage and then isolating these various components. Doctors at the turn of the last century discovered that their patients could achieve the same basic anti-arthritis benefits of the many supplements being sold today by simply consuming high-quality bone broth.

There are dozens of cartilage-based products on the market, but I know of only one that doesn't use harsh solvents, high temperatures, or dangerous chemicals. While these techniques may make the process more efficient and cost-effective, they obviously take their toll on the quality and effectiveness of the finished product. One of the best and most economical ways to get the greatest health benefits from gelatin is to simply make your own bone broths. Don't be surprised if it turns out to be one of the best health habits ever for you and your family.



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Dr. Williams works closely with Mountain Home Nutritionals, a division of Doctors' Preferred, Inc. and subsidiary of Phillips Health, developing his unique formulations that supply many of the hard-to-find nutrients he recommends. Dr. Williams is compensated by Doctors' Preferred, Inc. on the sales of these nutritional supplements and health products, which allows him to continue devoting his life to worldwide research and the development of innovative, effective health solutions.

Homemade Health

Digestive problems such as indigestion, food allergies, acid reflux, ulcers, bloating, and burning have become common in our society. It's possible that many of these problems could stem from a glycine deficiency. In all probability, this lack of glycine could also be linked to the arthritis and joint problems that have affected recent generations.

I have no doubt that much of the arthritis problem being experienced today stems partially from an extra strain on the joints from obesity and a lack of exercise. There has also been a reduction in our overall dietary consumption of compounds such as collagen, hyaluronic acid, chondroitin sulfate, glycosaminoglycans (GAGs), glycine, proline, sulfur, and many of the other components found in the bones and cartilage of animals. This reduction is primarily due to the decreased popularity of making and consuming bone broths. Part of the problem stems from the fact that people seem to spend less and less time cooking.

Through the simple addition of bone broth, I've seen chronic joint and arthritic pain eliminated in a matter of weeks, practically all types of digestive and food allergy problems disappear for good, skin problems start to improve almost overnight, insomnia problems finally resolve, chronic muscle twitching and cramping stop permanently, and bone fragility and weakness become a thing of the past.

Bone broths are easy to make. You just need to keep a few minor points in mind.

The ingredients are few and simple. Begin with bones from fish, poultry, beef, lamb, or pork. The bones can be raw or cooked, and they can be stripped of meat or still contain meat remnants and skin. (When making meat broth, I throw everything in the pot: bones, attached meat, skin—including the parts normally not eaten, such as the rib cage and spine, chicken feet, and fish heads.)

Ideally, the animal should be raised organically, or at least naturally. On the positive side (not from the animal's perspective, I'm sure), most animals raised for consumption don't live long enough to have large amounts of toxic metals accumulate in their tissues. Obviously, however, the better their environment, the less risk of you having to deal with such problems.

Cover the bones with water in a covered pot. Add a couple of tablespoons of one of the following

per quart of water: apple cider vinegar, red or white wine vinegar, or lemon juice. Gently stir and then let it sit for about 30 minutes to let the acid go to work. (I recommend a pot made of either stainless steel or porcelain. I don't suggest aluminum because the acidic vinegar or lemon juice may cause aluminum to leach into the broth.)

Then bring the water to a boil and immediately cut back to a slow, steady simmer. Cover and continue to simmer for 4 to 6 hours for fish, 6 to 8 hours for poultry, and 12 to 18 hours for the other types of bones. Keep a lid on the pot to avoid having to add water (but add water if and when necessary). A slow cooker works well since the temperature is generally low enough that the lid will keep in the steam and it won't require much attention. However, I've found that slow cookers generally take about 1/3 longer than when I cook on the stove, so that's something you'll have to decide for yourself.

If you want just the broth, strain the liquid through a colander and consume it immediately either by sipping as a tea or soup, or making it into a gravy. Although I have never used it for such, it can also be used as the liquid to cook rice, beans, or grains. If you want to add vegetables, strain the liquid first and then add the vegetables for about the last 30 minutes. Feel free to add other items—such as salt, pepper, butter, or olive oil—to enhance the flavor. The broth can be stored in the refrigerator for about five days, or stored frozen for several months. (I generally pour the cooled liquid into quart freezer bags and freeze those. When I want some broth, I simply rip open the bag and reheat the broth in a pot. *Never cook or reheat the broth (or gelatin) in the microwave. There is some question as to the safety of doing so. Certain amino acids may convert into forms that can be toxic to the body when microwaved.*) (*Lancet* 89;2(8676):1392–1393)

Also keep in mind that bone broth is not nutritionally complete. You couldn't live on the broth alone. It contains only a few proteins and should be added to a more complete diet rather than used as a stand-alone. Research has shown that it improves the ability to digest just about anything that you eat it with. Cancer patients fare better when it is added to their regular diet, and the broth has a calming, nourishing effect on anyone who's sick.

In earlier days, our diets routinely contained bone broths. I don't think I had a Thanksgiving as

a child where Mom didn't boil the left-over carcass of the turkey to make soup. Chickens were also made into soups, as were left-over beef bones. And this practice of making bone broth, gravy, and soup was even more prevalent in generations before mine. When food supplies weren't as abundant and refrigeration wasn't as commonplace, every part of a butchered animal was utilized.

I've traveled to dozens of third-world countries and have discovered that the most abundant and tasty dishes are often the bone broths that have been slowly cooked for hours and then lightly seasoned with a sprinkle of chopped vegetables, chilies, fresh spices, or whatever happens to be available. I think the best broth I've ever tasted was a couple of years ago in a very small local "restaurant" in a Vietnam alleyway. They had two giant kettles simmering and a huge bowl of broth with rice noodles, chilies, and onions sprinkled on top. The same time-consuming process used on the back streets of Hanoi forms the basis of many of the stocks, soups, and gravies of the top chefs in the world. While it seems both ends of the social spectrum still capitalize on the benefits of bone broth, the middle portion of society seems to have forgotten this powerful cooking technique for restoring and maintaining health.

If you suffer from digestive complaints, gastrointestinal disease, food allergies, slow healing, liver problems, skin abnormalities, muscle pain/cramping/soreness, arthritis, or other joint pain/inflammation, then do yourself a favor and start including a bone broth in your diet each day. I think you'll be pleasantly surprised at the changes you'll see in just a few short weeks.

Appetite Saboteur

The sweetener fructose keeps popping up in the news—especially with the newfound awareness and concern over the ever-growing problem of childhood obesity. While the manufacturers of high fructose corn syrup (HFCS) and groups like the Corn Refiners Association continue to place the full load of blame on increased calorie consumption and an overall lack of exercise, the latest research indicates HFCS is undoubtedly a major contributing factor.

I've been warning about the dangers of HFCS for years, and one of the latest studies from the University of Pennsylvania supports the idea that HFCS impairs your body's ability to recognize

when it is full. These new findings take this idea beyond just a theory and unveil the exact mechanism of how this process takes place.

Fructose doesn't stimulate an increase in insulin the way most sugars do, nor does it cause an increase in the compound leptin—both of which signal the body's central nervous system to stop eating. Fructose also increases the level of another compound, ghrelin, that enhances the desire to eat more. In simple terms, fructose completely disrupts your body's natural ability to tell when you're satisfied and should stop eating—which ultimately leads to weight gain and obesity. (*J Clin Endocrinol Metab* 04;89(6):2963–2972) (*Am J Clin Nutr* 02;76(5):911–922)

No Magic Bullets

As you know, there's really only one way to lose weight: you must burn more calories than you consume each day. To keep it off you need to change your eating habits so they become a permanent part of a healthy lifestyle. The pharmaceutical industry knows that a safe, effective pill that will curb the appetite would be a gold mine for them. And, I have no doubt, the general public would accept such a pill with open arms. What surprises me, however, is that *HFCS has been scientifically shown to do just the opposite of a diet pill.*

HFCS adversely manipulates levels of the exact same hormones and compounds that the pharmaceutical companies are trying to influence. But, instead of causing a loss of appetite and weight loss, it effectively increases appetite and weight gain. I'm astounded that there hasn't been an outcry from the public to have it removed from our food supply.

The general public has been led to believe HFCS is a safe and desirable sweetener, but that's not the case. It is the sweetest of all natural sugars, and it has been touted as being safe for diabetics since it doesn't raise insulin levels. It is also one of the least expensive sweeteners to produce (even cheaper than cane sugar). Manufacturers love the stuff, so don't expect them to voluntarily pull it from the market when it's sweeter than sugar, mixes better, and is less expensive to produce.

Check the labels of the foods and drinks you consume. If they contain HFCS, you're in effect routinely taking a compound that is fooling your body into eating more and helping you gain weight. Is that what you want?

Spreading the Seed

One of my old nutritional standbys has always been flaxseed. More and more research continues to support the enormous benefits you can receive through its daily use.

The oils from flaxseed provide an excellent source of raw material from which your body is able to produce hormones and help balance their levels. Many times I've seen fresh ground flaxseed correct even the most horrific hormone fluctuations and hot flashes in women. Additionally, flaxseed quickly improves bowel function, eliminates dry skin conditions, helps normalize blood sugar, and provides a full, satisfied, energetic feeling that can eliminate hunger and help you reach your ideal weight.

The regular consumption of flaxseed has long been associated with a reduced risk of developing numerous types of cancer. The latest research indicates that it can be instrumental in reversing precancer of the prostate gland. In a study at Duke University Medical Center, researchers placed 15 men with suspected early-stage prostate cancer on a low-fat diet that included 30 grams of flaxseed a day. All of the men were scheduled to undergo repeat prostate biopsy within six months.

At the six-month point, PSA levels completely normalized in two of the men, and no biopsy was deemed necessary. The other 13 men also saw significant decreases in their PSA levels—and only one was suspected of having cancer following his biopsy. The researchers are convinced this regimen of a low-fat diet and flaxseed supplementation is a safe and effective method of controlling abnormal growth of the prostate. (*Urology* 04;63(5):900–904)

Unfortunately, few men with suspected prostate cancer are told just how beneficial it can be to quickly switch to a low-fat diet (20 percent or less of total calories) and begin supplementation with flaxseed (30 grams a day). This simple, inexpensive program can often reduce the growth rate and aggressiveness of the tumor in a relatively short time. Even patients awaiting prostatectomy have seen positive results. In just over 30 days, men who make these simple changes have experienced significant drops in cholesterol, testosterone, and PSA levels. (*Urology* 01;58(1):47–52)

Ideally, you'll begin adding the flaxseed to your morning routine before you experience a prostate problem in the first place, but keep in mind that it's never too late to start.

Water, Water, Everywhere

During disaster situations, one of the primary concerns among survivors is the ability to obtain clean drinking water. It often becomes a matter of life and death. The same concern is paramount during war and military conflicts, like those in Iraq and Afghanistan. The news footage of last December's tsunami disaster included images of pallet after pallet of bottled water being unloaded from huge transport planes.

Restoring a supply of clean water is one of the rescuers' first priorities. Bottled water is usually sent in first, followed by water filtration units (after a means to power them has been established), and, eventually, a rebuilding of the on-site wells and water systems. Thankfully, a small, innovative company in Albany, Oregon has recently developed a unique water purification device that is dramatically changing the way pure drinking water can be restored to disaster areas. It's technology that you, too, might one day find useful, or even life-saving.

Hydration Technologies, Inc. (HTI) has developed the first commercially viable forward osmosis membrane that can purify the filthiest, most contaminated water without iodine tablets, chlorine, pressure filters, or electricity. You can literally put the special filtration bag in water from a roadside ditch, toilet, or septic tank and have pure, clean, uncontaminated water in a couple hours.

Tiny Gaps, Big Results

The filtration process works through osmotic pressure. Small amounts of sugars and/or salts are placed inside a plastic bag made from a semi-permeable membrane constructed of thin sheets of cellulose-based plastic with gaps just 5 angstroms across. To put this in perspective, bacteria range from 2,000 to over 500,000 angstroms, and the smallest viruses are 50 to 1,000 angstroms. (Five angstroms is 0.0005 microns, and most conventional hand pumps only filter down to the 0.1 micron level.).

Osmotic pressure pulls the contaminated water through the membrane to the side with the sugar

or salt. The gap in the membrane is so small that only water is allowed through while the contaminants remain behind. Tests performed with the U.S. Department of Defense show the filter is effective at removing all bacteria and viruses, and most other contaminants. (It was even shown to remove all biological pathogens, including 100 percent of all anthrax particles.) It removed 100 percent of undissolved radioactive particles, 85 percent of radioactive ions, 95 percent of chemical warfare agents, 95 percent of herbicides and pesticides, and 85–90 percent of heavy metals. An updated version incorporating a carbon cloth is expected to reduce these levels even more. The current model isn't effective at filtering salt or brackish water, but they have a new product called the Sea Pack with this ability that will soon be released. Although their unit is not specifically designed to filter urine, it has been used to do so on numerous cases during emergencies and under combat situations in Iraq, and it has been credited with saving the lives of those involved.

Portable Peace of Mind

HTI has several models available. The least expensive and easiest to use is called the HydroPack. It provides ten 2-liter uses, and it retails for \$20 plus shipping. It is designed to be carried backpacking, in the car, et cetera. To activate it, you simply charge the bag with a sugar solution (they provide two charges, but honey works just as well) then toss the bag into a water source. It will self-fill with two liters of clean water in about two hours, leaving the parasites, bacteria, viruses, and other contaminants behind. It's a foolproof survival tool. Like all of HTI's products, when stored under proper conditions the HydroPack has a shelf life of around three years.

HTI also offers a higher-grade model called the X Pack. [It can be used three times daily (4 liters per day) for ten consecutive days.] This is the model currently being issued to the U.S. Marine Corps, Air Force, Army, and Special Operations forces. It sells for \$60, and resupply kits are \$20.

If you have an interest or need, I suggest you check out their Web site for more information (www.HydrationTech.com) or contact them at Hydration Technologies, Inc., P.O. Box 1027, Albany, Oregon 97321, or 541-917-3335. Mention the HTI Health offer when you order and they will give you a ten percent discount on the HydroPack.

Pomegranate Evening

One of my favorite fruits has recently made research news, and I suspect it will be getting a lot more publicity in the future.

I've always loved pomegranates. Their only downside has been the short period of time they are available each year—only two or three months in the winter. This latest research will undoubtedly generate year-round demand for pomegranate juice.

Researchers at the Rambam Medical Center in Haifa, Israel treated patients with carotid artery stenosis using pomegranate juice for three years, and the results were nothing short of remarkable.

Carotid Care

The carotid arteries are the two large vessels that run along either side of your neck and supply the brain with blood. Stenosis of these arteries is simply a narrowing, or blockage, of the blood flow due to atherosclerosis (a buildup of deposits along the arterial wall).

Carotid artery stenosis often goes unnoticed for years. Individuals with the problem may not experience any symptoms, though some start to complain that they hear a “swishing” noise with each heartbeat—which is due to blood swirling past the blockage. A more common complaint is probably “mini strokes,” which I've discussed in the past.

Mini strokes, or transient ischemic attacks, occur when small pieces of the fatty deposits lining the arteries break loose and block small blood vessels further up in the brain. The result can be memory loss, temporary blindness, numbness, tingling, and muscle weakness. Fortunately, the effects are generally temporary, but these events are often just a prelude to a bigger, full-blown stroke.

Conventional treatment for carotid artery stenosis falls into basically two categories. If the blockage is less than 70 percent, the goal is to keep the blood thin and flowing with aspirin, anticoagulants, and other drugs—and hope nothing “breaks loose.” If the blockage is over 70 percent, surgery to clear out the blockage is often the course of action (in addition to the drugs). The procedure has been nicknamed the “roto-rooter” procedure. (The technical name is carotid endarterectomy.) In either case, there are two factors to consider.

First, if there's atherosclerosis in the carotid arteries, you can be certain it's elsewhere in the body, too. It's a systemic problem, so there is likely some degree of blockage in the arteries of the heart and elsewhere. Secondly, removing the blockages in the carotid arteries is only treating the symptom and not the underlying cause. If the atherosclerosis isn't addressed through diet and nutrition, the problem will recur, or you will suffer from some other cardiovascular event in the future—such as a heart attack or stroke. It's at this point where pomegranate juice has been shown to be a tremendous help.

Red Juice to the Rescue

Dr. Michael Aviram, with the Lipid Research Laboratory at Rambam, thinks it's possible that many high-risk cardiovascular patients can be spared both bypass and carotid surgery by simply drinking pomegranate juice.

Dr. Aviram's recent study involved 19 patients (5 women and 14 men, 65–75 years old) with severe carotid artery stenosis. Ten were selected to receive 250 mL (8.3 ounces) of 100 percent pomegranate juice daily, and the other 9 were given a placebo.

Several tests were performed on the different groups. The primary one utilized ultrasound to measure any changes in the thickness of the walls of the carotid arteries.

After one year, those not consuming the pomegranate juice had a 9 percent increase in thickness of their carotid arteries, meaning their arteries were becoming even less resilient. Those consuming the juice showed a decrease in thickness of 35 percent. These changes began to show up rather quickly. There was a 13 percent reduction in just the first three months of drinking the juice. And there were other benefits, as well.

While the blood pressures of those on the placebo didn't change, the systolic pressure (top number) of those on pomegranate juice went from an average of 174 to 162 mm Hg in just a month. And it reduced even further, to an average of 152 mm Hg at twelve months.

Other tests indicated that the juice drinkers had lower blood levels of oxidized cholesterol and more antioxidants. (*Clin Nutr* 04;23(3):423–433)

Even though this study was relatively small, the results are quite remarkable and confirm the simi-

lar findings of previous studies. In one earlier study, atherosclerotic lesions in mice were reduced in size by 44 percent by supplementing the diet with pomegranate juice. (*Am J Clin Nutr* 00;71(5):1062–1076) (*Drugs Exp Clin Res* 02;28(2-3):49–62) (*Atherosclerosis* 01;158(1):195–198)

The Promise of Pomegranate

Pomegranate juice may also prove to be promising in the treatment/prevention of breast and prostate cancer as well as in the treatment of diabetes. (*Breast Cancer Res Treat* 02;71(3):203–217) (*Angiogenesis* 03;6(2):121–128) (*Invest New Drugs* 05;23(1):11–20) (*J Med Food* 04;7(3):274–283) (*J Med Food* 04;7(3):305–308)

Additionally, one of the more unusual uses of pomegranate juice has to do with preventing the spread of AIDS.

Since the AIDS pandemic continues to spread (and it doesn't appear there will be any vaccine or other effective way to prevent the disease in the near future), researchers have started to look at topical microbicides in the form of creams or suppositories to block the entry of HIV into cells.

Efforts are underway to discover a microbicide that would be acceptable, accessible, affordable, and able to be moved quickly from the development stage to the market. When a group of researchers evaluated numerous juices and their ability to block HIV infections, pomegranate juice showed remarkable potential. In the preliminary work, it was not only safe, stable, and economical, it was also more effective than any other juice tested. I will keep you updated as I learn more in this area. (*BMC Infect Dis* 04;4(1):41)

An analysis of the pomegranate shows dozens of compounds that could contribute to its healing powers. It is rich in tannins, phenolic acids, polyphenols, and flavonoids. It is also known to contain a rare fatty acid, puniceic acid, that is structurally related to conjugated linolenic acid—a compound I've recommended many times in the past. Overall, pomegranate juice has exhibited some of the strongest antioxidant activity of any food.

For thousands of years, pomegranates have been used medicinally—particularly in the Middle East. In fact, the healing powers of pomegranates have been mentioned in the *Bible*, Greek mythology, and ancient Chinese literature. Some scholars

believe that the fruit referenced in the Garden of Eden story was actually a pomegranate. It may be new to our society, but we're just rediscovering one of the ancient health secrets known to our ancestors thousands of years ago.

You can find pomegranate juice at grocery and health food stores, and even some larger retailers (such as Costco). I'm still searching for the one I like best. Whichever one you choose, make sure it's just juice or a concentrate, with no added sugars. I'll keep you up to date on the results of my search.

I suspect that there will soon be a flood of pomegranate powder capsules on the market, but I believe that the complexity of the pomegranate will make it difficult to achieve the same effects using just a few of its components separately. So far, most of the studies I reviewed had the participants drink 250 mL a day of the 100 percent juice. Until we know more about exactly what compounds in pomegranates are producing the benefits and whether they can be isolated and standardized, it is probably wiser to stick with the juice.

With the juices I've tested so far, a daily dose would be somewhere in the neighborhood of \$1.50 a day, an amount many people are willing to spend on a cup of coffee or soft drink—and neither of those can reduce arterial plaque and prevent stroke, heart attack or even surgery. Given the bigger picture, maybe \$1.50 a day isn't such a bad deal.

Real Milk for Real People

If you've been with me for a while, then you know I think regular milk from the grocery is far from the ideal food.

Conventionally raised cows have likely been fed grain-, corn-, and soy-based feeds rather than grass, so the milk will contain practically none of the conjugated linoleic acid that provides so many benefits. They may have also been fed growth hor-

mones to increase their milk production. And they have almost certainly been fed antibiotics, which will pass into the milk.

Store-bought milk has been pasteurized, a process that involves heating it to at least 145 degrees Fahrenheit. The process is designed to kill off any stray disease-causing bacteria. Unfortunately, the good, lactic acid-producing bacteria die as well.

Pasteurization also denatures many of the proteins in milk, including the enzymes lipase and lactase needed to properly digest milk.

Finally, except for skim, all milk is homogenized so the butterfat will stay suspended rather than float to the top. These altered fat molecules cause a host of problems, including atherosclerosis.

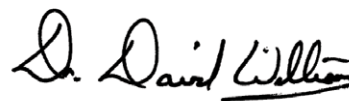
All of these problems can be avoided by consuming milk straight from the cow. In its raw state, milk has been demonized as a source of disease, including tuberculosis and anthrax. The truth is far from that.

Raw milk still contains all the proteins that nature intended, and if it is handled properly the risk of bacterial contamination is practically zero.

Some farmers have begun programs where you buy a share in a dairy cow. A portion of the milk she gives then becomes yours, and there's no government restriction on what you can do with your own milk. You can find regional sources for raw milk through the Web, at www.RealMilk.com.

If you are not near a cowshare program farmer, or if you prefer the convenience of delivery, you can contact Organic Pastures Dairy at 877-729-6455 or www.OrganicPastures.com. They can ship their raw milk products everywhere in the US.

Take care,



If you have questions or comments for Dr. Williams, please send them to the mail or e-mail addresses listed to the right. Of course, practical and ethical constraints prevent him from answering personal medical questions by mail or e-mail, but he'll answer as many as he can in the Mailbox section of *Alternatives*. For our part, we'll do our best to direct you to his issues, reports, and products related to the subject of your interest.

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