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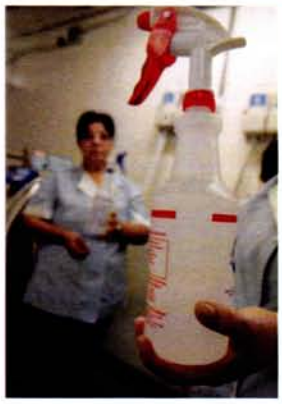

A grime-fighter, but wait! There's more!

Electrolyzed water cleans, degreases – and treats athlete's foot. The solution is replacing toxic chemicals.

By Marla Dickerson

It's a kitchen degreaser. It's a window cleaner. It kills athlete's foot. Oh, and you can drink it. Sounds like the old "Saturday Night Live" gag for Shimmer, the faux floor polish plugged by Gilda Radner. But the elixir is real. It has been approved by U.S regulators. And it's starting to replace the toxic chemicals Americans use at home and on the job.

The stuff is a simple mixture of table salt and tap water whose ions have been scrambled with an electric current. Researchers have dubbed it electrolyzed water – hardly as catchy as Mr. Clean. But at the Sheraton Delfina in Santa Monica, some hotel workers are calling it *el liquido milagroso* – the miracle liquid.

That's as good a name as any for a substance that scientists say is powerful enough to kill anthrax spores without harming people or the environment. Used as a sanitizer for decades in Russia and Japan, it's slowly winning acceptance in the United States. A New York poultry processor uses it to kill salmonella on chicken carcasses. Minnesota grocery clerks spray sticky conveyors in the checkout lanes. Michigan jailers mop with electrolyzed water to keep potentially lethal cleaners out of the hands of inmates.

In Santa Monica, the once-skeptical Sheraton housekeeping staff has ditched skin-chapping bleach and pungent ammonia for spray bottles filled with electrolyzed water to clean toilets and sinks. "I didn't believe in it at first because it didn't have foam or any scent," said housekeeper Flor Corona. "But I can tell you it works. My rooms are clean."

Management likes it too. The mixture costs less than a penny a gallon. It cuts down on employee injuries from chemicals. It reduces shipping costs and waste because hotel staffers prepare the elixir on site. And it's helping the Sheraton Delfina tout its environmental credentials to guests. The hotel's kitchen staff recently began disinfecting produce with electrolyzed water. They say the lettuce lasts longer. They're hoping to replace detergent in the dishwasher. Management figures the payback time for the $10,000 electrolysis machine will be less than a year.

"It's green. It saves money. And it's the right thing to do," said Glenn Epstein, executive assistant at the Sheraton Delfina. "It's almost like fantasy."

Actually, it's chemistry. For more than two centuries, scientists have tinkered with electrolysis, the use of an electric current to bring about a chemical reaction (not the hair-removal technique of the same name that's popular in Beverly Hills). That's how we got metal electroplating and large-scale production of chlorine, used to bleach and sanitize.

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It turns out that zapping salt water with low-voltage electricity creates a couple of powerful yet nontoxic cleaning agents. Sodium ions are converted into sodium hydroxide, an alkaline liquid that cleans and degreases like detergent, but without the scrubbing bubbles. Chloride ions become hypochlorous acid, a potent disinfectant known as acid water.

"It's 10 times more effective than bleach in killing bacteria," said Yen-Con Hung, a professor of food science at the University of Georgia-Griffin, who has been researching electrolyzed water for more than a decade. "And it's safe."

There are drawbacks. Electrolyzed water loses its potency fairly quickly, so it can't be stored long. Machines are pricey and geared mainly for industrial use. The process also needs to be monitored frequently for the right strength.

Then there's the "magic water" hype that has accompanied electrolyzed drinking water. A number of companies sell so-called ionizers for home use that can range from about $600 to more than $3,000. The alkaline water, proponents say, provides health benefits.

But Richard Wullaert, a Santa Barbara consultant, said consumers should be careful. "Some of these people are making claims that will get everybody in trouble," said Wullaert, whose nonprofit Functional Water Society is spreading the word about electrolyzed water. "It's time for some serious conferences with serious scientists to give this credibility."

Most of the growth has come outside the United States. Russians are putting electrolyzed water down oil wells to kill pesky microbes. Europeans use it to treat burn victims. Electrolyzing equipment is helping to sanitize drinking water in parts of Latin American and Africa.

It's big in Japan. People there spray it on sushi to kill bacteria and fill their swimming pools with it, eliminating the need for harsh chlorine. Doctors use it to sterilize equipment and treat foot fungus and bedsores. It's the secret weapon in Sanyo Electric Corp.'s "soap-less" washing machine. Now Sanyo is bent on cleaning up Japan's taxis with a tiny air purifier that fits into a car's cup holder. The device uses electrolyzed water to shield passengers from an unwelcome byproduct of Japan's binge-drinking business culture: vomit.

"There was some concern about the spreading of viruses and bacteria via the taxi, not to mention the ... stinky smells," Sanyo spokesman Aaron Fowles said. Sanyo's taxi air washer isn't yet available in the U.S.; commuters will have to hold their noses for now. But the U.S. Department of Agriculture, the Food and Drug Administration and the Environmental Protection Agency have approved electrolyzed water for a variety of uses.

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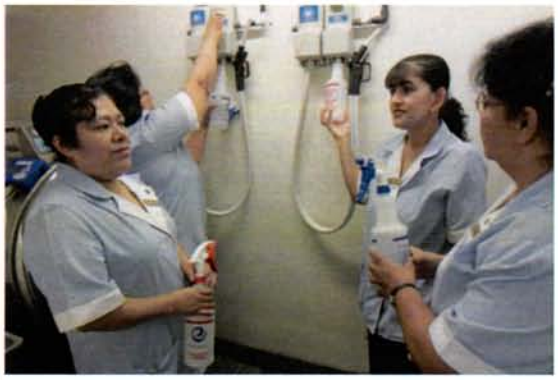
PuriCore of Malvern, Pa., and Oculus Innovative Sciences of Petaluma, Calif., have developed treatments for chronic wounds. Albuquerque, N.M. based MIOX Corp. sells municipal water-purifying systems. EAU Technologies Inc. of Kennesaw, Ga., caters to both ends of a dairy cow, with alkaline water to aid the animal's digestion and acid water to clean up its manure.

Integrated Environmental Technologies Inc. of Little River, S.C., is working with oil companies to keep wells free of bacteria and with high schools to sanitize sweaty wrestling mats and grungy football equipment that spread skin infections.

Electrolyzer Corp. of Woburn, Mass., is going after the hospitality market. The Sheraton Delfina purchased one of its machines. So has the Hyatt Regency Chicago and the Trump International Beach Resort near Miami.



Patrick Lucci, Electrolyzer's vice president of marketing, likes to bombard prospects with scientific studies then give 'em the old razzle-dazzle. He'll swig the processed salt water before he mops the floor with it. "Try that with bleach," he said.

The unit in Santa Monica looks a little like an oversized water heater, with two tanks side by side – one for making the hypochlorous acid sanitizer, the other for the sodium hydroxide cleanser. Rebecca Jimenez, director of housekeeping, heard grumbling from the cleaning staff when the hotel brought the machine in last fall. Housekeepers doubted that the flat, virtually odorless liquids were really doing the job. Some poured the guest shampoos into their bottles to work up a lather.
"If it doesn't suds up, it doesn't work," Jimenez said. "That's the mentality."

Still, she said most have come around and are enjoying working without fumes and peeling skin. Minnesota food scientist Joellen Feirtag said she was similarly skeptical. So she installed an electrolysis unit in her laboratory and began researching the technology. She found that the acid water killed *E. coli*, salmonella, listeria and other nasty pathogens. Yet it was gentle enough to soothe her children's sunburns and acne.

She's now encouraging food processors to take a look at electrolyzed water to help combat the disease outbreaks that have roiled the industry. Most are dubious.

"This sounds too good to be true, which is really the biggest problem," said Feirtag, an associate professor at the University of Minnesota.

"But it's only a matter of time before this becomes mainstream."