

Is it the beginning of the end for household chemicals?

A Canadian invention uses ozone-treated water to kill bacteria and sanitize fruits and vegetables, **MICHAEL RYVAL** reports

When Steve Hengesperger first got involved in developing a water-treatment system five years ago, he noticed something striking in his employees' attitudes toward chemicals. They were stringent about the slightest whiff of chemicals at work — but had no qualms about using strong detergents at home.

Mr. Hengesperger realized these attitudes were quite common. But it inspired him to find a way to reduce chemicals and dangerous bacteria in the home.

"I was learning about ozone and water," recalled Mr. Hengesperger, a 39-year-old mechanical engineer who at the time was looking at buying the assets of a bankrupt company based in Welland, Ont., that had launched an ozone-based water treatment system for consumers.

Instead, he opted to start from scratch and set up Tersano Inc., in nearby St. Catharines, to develop his own ozone-based water treatment system for residential use.

"I thought, 'I have a better application for this whole system than water purification. We can make this system that uses just straight water and eliminate chemicals from the home.'"

Mr. Hengesperger's "better application" has evolved into the patented Lotus Sanitizing System for use in household cleaning chores as

well as cleansing fruits and vegetables.

The product got a major boost this month when Time magazine ranked it as one of the best inventions in 2006. The endorsement was timely, coming on the heels of the tainted spinach scare that swept the continent.

The Lotus system — which consists of a base, a multi-purpose plastic bowl and a spray bottle — uses an electrical charge to infuse ordinary tap water with superoxygen, otherwise known as O₃ or ozone. The resulting oxidizing effect kills bacteria, mould and mildew.

The system can be used to sanitize fruits and vegetables in the bowl, eliminating bacteria and pesticides in just a few minutes. With the spray bottle, you can clean kitchen counters and remove food-based stains in fabrics and materials.

The ozone-treated water is a more powerful and safer disinfectant than bleach or hydrogen peroxide, Mr. Hengesperger said. "We know that [with the system] you do not need a chemical cleaner in your home."

And it's safe because the superoxygenated effect wears off in about 15 minutes and the water reverts to normal form. In contrast, chlorine-based detergents have to be wiped off surfaces.

Last spring, Tersano began shipping the Lotus to Sharper Image stores in the United States and Canadian Tire in Canada. It retails for \$199 in both countries and, so far, about 20,000 units have been sold across North America.

Mr. Hengesperger acknowledged it could be a while before Tersano's \$5-million investment pays off, but added: "I'm in this for the long run."

He said the key to marketing a new invention is patience. "It took so long to develop because it is a new product category."

(Mr. Hengesperger is as busy as he is patient: he is also president of Advantage Engineering Inc., a Windsor-based company with 150 employees that designs plastic prototypes for the automotive industry.)

The Lotus system was largely the result of a team effort at Tersano, which has 13 employees. The company hired Hamilton-based OHM Industrial Design Ltd. to design the actual product.

Mr. Hengesperger marketed the product himself. He attended the International Housewares Show in Chicago, where he met buyers from major retailers.

He has also been lucky as both Canadian Tire and The Sharper Image have created marketing programs to build consumer awareness of the Lotus. Now that those programs are finished, he will pick up the advertising this fall with print and radio ads.

Before the Lotus could go to market, Tersano had to win approvals from the U.S. Environmental Protection Agency, Underwriters Laboratories and the Canadian Standards Association. All told, the



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company spent 4½ years dealing with regulatory bodies. "We also had to explain to people how the product works, and [how] what they're doing now may not be the best way," Mr. Hengesperger said.

The system's technology is modelled on large-scale commercial applications. For example, hospitals use very large machines, based on the same principles, to sterilize equipment.

Mr. Hengesperger noted that the U.S. Food and Drug Administration first approved the ozone-treated water process to preserve fruits and vegetables in 1987.

The Lotus has built-in sensors

that create the appropriate amount of ozone in the water; the amount of ozone is measured and shown in a liquid crystal display within a few minutes. "You can always feel comfortable that the unit is working properly and creating a sanitizing agent for you," he said.

While he acknowledged that Canada's food supply is generally safe and rarely contaminated, Mr. Hengesperger said the Lotus offers other side benefits. "We're not trying to scare people into using our product. That incident about E. coli on spinach was a rare one. But there is a payback on our machine — it makes your fruit and vegetables

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taste better and last longer."

He said the science behind the Lotus system was tested by Dr. Gary Roderick, a microbiologist in the food science department at the University of Florida.

In this country, it got an endorsement from Dr. George Szatmari, a microbiologist at the University of Montreal, who was retained by Canadian Tire to test the system.

"It will very nicely sanitize and get rid of any bacterial growth or micro-organisms in fruits and vegetables," Dr. Szatmari said in an interview. "Ozone is a very powerful oxidizing agent and can also significantly reduce pesticide residues," he said.

As well, Dr. Szatmari noted the Lotus system will keep food fresher. "By treating them with this type of unit, it can certainly increase their shelf life."

Not surprisingly, Mr. Hengesperger would like to see the Lotus in as many homes as possible.

"Our goal is to get to 500,000 units a year — which we can reach in a couple of years as long as we keep our marketing in the right direction."

Special to The Globe and Mail