



Bon Sel (or Good Salt) is the medicated salt that aims to eradicate the parasitic disease that swells limbs to grotesque proportions.

GOOD SALT



WITH MARKETING, R&D AND FUNDING SUPPORT FROM CARGILL, A UNIVERSITY OF NOTRE DAME PROGRAM SEEKS TO ELIMINATE A DREADED MOSQUITO-BORNE DISEASE BY 2020.

PORT-AU-PRINCE, HAITI

Jim Reimer didn't have big plans for his pending retirement from Cargill Salt. But he was feeling open to possibilities after reading "The Hole in Our Gospel," a book by Richard Stearns, president of World Vision U.S.A., that addressed the role of individuals in helping to "heal a broken world."

Suddenly, an opportunity presented itself.

Ruth Kimmelshue, then president of Cargill Salt, encouraged Reimer to become more involved with the University of Notre Dame Haiti Program, which has a mission of eliminating lymphatic filariasis (LF) in the country by 2020.

A mosquito-borne disease, LF can lead to elephantiasis, which can cause grotesque swelling of the body, typically the legs. People with the disease are often isolated in society, as if they were lepers.

The problem goes beyond Haiti. LF persists in 80 countries in South America, Africa and Asia, afflicting 120 million people. Next to mental illness, LF is a leading cause of disability in the world. The World Health Assembly—the decision-making body of the World Health Organization—has said that LF is one of five infectious diseases that can be eliminated worldwide. Potentially, steps taken in Haiti can be replicated elsewhere.

The primary weapon for eradicating LF is a pill taken once a year for a number of years. Not everyone will take the pill for a variety of reasons (see story on page 22), but everyone uses salt.



BY MARK KLEIN
PHOTOS BY PALANI MOHAN



TOP: Jim Reimer (right), a retiree from Cargill Salt, visits Haiti regularly to help with the Notre Dame program. He and Jean Marc Brissau, program director, walked through Leogane, stopping at a stand selling the typical sea salt favored by Haitians.

ABOVE: Reimer talked with Notre Dame's Father Tom Streit about the marketing support the program's branded and medicated salt will need in order to be accepted by Haiti's consumers.

In some places, the transmission rate is so high that medicated salt has become a second line of attack.

Cargill has no offices, production facilities or employees in Haiti. But Cargill is in the salt business, and in 2010 it donated salt to the Haiti program. In 2012, Cargill expanded its participation with a commitment of \$150,000 to be spread out over three years to help with the salt fortification efforts.

"We can be part of eliminating a disease in our lifetime," said Kimmelshue, who is now president of Cargill Value Added Meats-Retail. Cargill's involvement, she said, is in line with Cargill's mission of Nourishing People.

Almost more than salt and money, the program needed technical help. It had been trying to medicate salt for a number of years. It had seen some successes and had earned substantial support from the Bill & Melinda Gates Foundation, an organization Cargill has partnered with to improve the livelihoods of 200,000 cocoa farmers and 265,000 cotton farmers in Africa.

But using salt to carry medication presents challenges. For example, Haiti's locally produced salt has too many impurities, preventing the medication from sticking. Importing salt wasn't always a solution because imported salt can be too fine and too white. Haitians, who are used to a coarse salt that needs to be rinsed to remove debris, can be skeptical of the fine, white salt they call *rich man's salt*.

If medicated salt was going to make a difference in Haiti, Cargill had to contribute skills beyond salt production. The effort

would involve production planning, scheduling, logistics, warehousing, inventory management and other processes Cargill uses across many businesses.

Assembling all those pieces required someone with a special set of skills—someone like Jim Reimer.

After his retirement in April 2012, Reimer, gray at the peak but youthful in enthusiasm, began spending about one week a month in Haiti. He is part of an effort to set up a sustainable salt operation that will be used to medicate salt—not only to fight LF but also iodine deficiency disorders, another big health issue in Haiti.

“I have had the blessing of a wonderful career, gathering all kinds of information and technical expertise,” said Reimer, who started his career at the company in 1980, had postings across the world and retired as a vice president of Cargill Salt. “Now, I want to use that knowledge for the benefit of others.”

Drawing upon help from other Cargill people, he’s come up with a plan to take locally produced salt, clean it in a brine wash, screen it to get a size acceptable to Haitians, then package, market and distribute it. The salt will be fortified with diethylcarbamazine (DEC) for LF and potassium iodate for iodine deficiency.

The newly built processing plant for salt fortification will be located in the capital of Port-au-Prince and will be owned and operated by the Haitian branch of the Congregation of the Holy Cross, the same Catholic order that founded and directs the University of Notre Dame.

“Sometimes in life, things fall into your lap,” said Gregory Crawford, Dean of the university’s College of Science, which includes the Haiti program. “Our Notre Dame Haiti team had a vision for eradicating lymphatic filariasis. What we lacked was a business model. That’s what Jim has brought us.”

Added Jean Marc Brissau, a Haitian who is director of the program: “Each time Jim comes here, we take a step forward. It will be a big benefit to my people.”

PREVENTING THE NEXT GEORGE

His name is George. He is 29 and he lives with his mother, aunt and uncle, nieces and nephews in a small but well-kept house near the city center of Port-au-Prince. Like 95 percent of Haitians, he is black—his long-ago descendants were enslaved to work on sugar and coffee plantations. LF is another cruel legacy of the slave trade, most likely brought over from Africa.

As George leads visitors into his house, it’s obvious that the right pant leg of his already baggy jeans is extra, extra wide. He is a nice-looking gentleman of average size, except for his right leg. Seated in the courtyard of the home, out of sight of the neighbors, he rolls up the right pant leg. Starting below the knee, the leg gradually balloons. His ankle is about twice the size of the top of his thigh. To fellow Haitians, he has *Gwo Pye*—a Creole expression for Big Foot.

George has elephantiasis, a manifestation of LF.

Sitting to George’s right is Father Thomas Streit—“Father Tom,” as everyone calls him. He is the founder and chief scientific investigator of the University of Notre Dame Haiti Program. Always wearing his white clerical collar, Father Tom brings pas-



Father Tom Streit visited George, a victim of lymphatic filariasis (LF). Father Tom has been working in Haiti since 1993 and hopes to see LF eliminated by 2020.

“WE CAN BE PART OF ELIMINATING A DISEASE IN OUR LIFETIME.”

RUTH KIMMELSHUE

President of Cargill Value Added Meats-Retail and former leader of Cargill Salt

One day, this stretch of beach in Haiti could hold a modern solar salt facility—an idea that is receiving consulting services from Keith Long, a retired engineer for Cargill Salt.



sion to the program, combining his spiritual dedication with a doctorate in biology.

“I was quite worried about George the last time I saw him,” said Father Tom. “He had a very high fever and was depressed.”

To George’s left is Brissau, who translates for the soft-spoken George. “He says it was in 2008 and he was playing soccer,” said Brissau after asking George about the origin of his illness. “He hit his ankle and that was that.”

Reimer looked on, listening to the conversation. “This is why we are working on the salt project,” he said, looking at George. “It’s to prevent the next George.”

Father Tom explains that not only are George’s soccer days over, he likely will never have a day in his life when he feels comfortable. “This leg was burning up the last time we met, George,” Father Tom said, gently putting his hand on the swollen leg.

When Father Tom graduated from the University of Notre Dame in 1980, he probably couldn’t have predicted he would end up working in Haiti.

After developing an interest in tropical diseases, he went to Haiti in 1993 to research LF as the on-site representative for the Centers for Disease Control and Prevention (CDC). His base was the Hospital St. Croix in Leogane, which is 18 miles (29 kilometers) west of Port-au-Prince. Not long after, he founded the University of Notre Dame Haiti Program at a clinic within the hospital.

Twenty years after arriving in Haiti, Father Tom is in his 50s. Over those years, the program has “mapped” the extent of LF in different regions and began a major effort to distribute pills to fight it. Yet, over the years, the program endured politi-

cal unrest, hurricanes and the massive earthquake in January 2010—trials that might cause most people to give up on the beleaguered country.

“Some have quit, but this disease affects the poorest of the poor,” he said, noting that Haiti is often called the poorest country in the Western Hemisphere. Many victims can barely afford food—let alone window screens, netting over beds or mosquito repellent. Because LF is generally not fatal, it gets less attention than killers like AIDS, tuberculosis and malaria. “It’s in the poorest neighborhoods among people who have no voice, and that’s why we don’t hear about it.”

PRODUCING SALT IN HAITI

George’s problem didn’t start with bumping his right ankle playing soccer. It happened many years before when he was a child and was bitten by the mosquito *Culex quinquefasciatus*. LF is spread from person to person by mosquitoes. Following the bite from an infected mosquito, parasite larvae make their way to the human’s lymphatic system, which maintains the body’s fluid balance and fights infection.

Years after that mosquito bite, when someone like George bumps an ankle or gets an infection, the body’s immune system goes into overdrive. But with the lymph system compromised, the body responds with swelling, most often in the leg as with George. Once the swelling in the legs has developed, it cannot be reversed, but proper hygiene is important to prevent further infections.

DEC pills and DEC-medicated salt can break the cycle of transmission of the disease. Fortifying salt has been used for decades to prevent iodine deficiency disorders, which can



With help from Cargill R&D in Minneapolis, the salt lab at Notre Dame's Haiti Program has found ways to medicate the salt without changing its color. A key to marketing the salt is to keep it as close to the locally produced salt that consumers prefer.

cause loss in IQ and developmental disability in children and, in adults, goiters (thyroid gland enlargement) or stillbirths. Few Haitian households have access to adequately iodized salt, and iodine deficiency disorders is estimated to affect more than half the Haitian population.

Most salt in Haiti is produced along the northwest coast using rudimentary methods to evaporate seawater. Individual producers obtain about two salt harvests a year from their small basins, but along with sodium chloride, the salt contains mineral impurities and dirt. The impurities make medicating the salt ineffective. And because of the dirt, Haitians are used to washing the salt, which would rinse away any medication.

As a near-term measure, salt for the Haiti program comes from Cargill's modern solar sea salt program in Bonaire, in the Lesser Antilles, just north of the coast of Venezuela. In 2010, Cargill Salt agreed to provide 100 tons of pure salt from Bonaire. The salt was delivered to Haiti by Cargill's long-time customer Bromo Industrial of the Dominican Republic.

While the Bonaire salt is being used near-term, no one— not Cargill, the University of Notre Dame or the Haitian government— wants to put the hundreds of small Haitian salt producers out of business.

Several non-governmental organizations— focused on fortifying salt to fight iodine deficiency— had been trying in recent years to convince the Haitian producers to form cooperatives and adopt the “modern” salt production methods. Under this approach, 20 or so producers would contribute their individual ponds to create a series of interconnected shallow basins. These systems allow the sea water to gradually circulate sea water, pond after pond, over a period of years, to crystallize the salt and eliminate impurities.



Cargill's Jim Reimer came up with a screen that helps eliminate the finest crystals. Haiti's consumers like their salt to have large crystals. While Notre Dame can sell medicated salt, the medication will have no effect unless the product is widely accepted by consumers.

Efforts to get Haitian producers to adopt a modern system have gone slowly—partly because of the cost of equipment like pumps, and partly because of tradition. “My theory,” Reimer said, “is that the producers think ‘I’m just going to do what I’ve always been doing.’”

REIMER’S PLAN

Until he received treatment, George had never heard of LF. He said when he first became ill, he believed it was a voodoo curse. Most Haitians are Catholic, but many also practice voodoo, a blend of African spirit religion and Catholicism. George wasn’t sure what he’d done—upset someone playing soccer, cut off a driver in traffic—but he soon learned he received the infection from a mosquito as a child.

George is able to work as a welder at a shop around the corner from his house. His eyes light up when he talks about welding, but he otherwise looks forlorn. His life is what it is, and he probably won’t marry or have a family of his own. Efforts to medicate salt aren’t of much interest to George—not that he doesn’t want others to be helped. But he knows he’s beyond help.

While standard thinking for medicating salt involves construction of modern salt ponds, Reimer has a different idea.

“It will take a long time to get modern salt production done,” he said. “That would be a whole new generation of kids who get lymphatic filariasis. People like George.”

Near-term, the Haiti program will make use of a building in Port-au-Prince as a salt packing plant. A 15-year-old piece of equipment mixes the DEC and potassium iodate with Bonaire salt. The salt is then hand-packed into consumer-size bags with the Bon Sel Dayiti™ brand.

Under Reimer’s plan, a salt processing facility is being built on the site of a former sugar refinery. It is close to the capital city’s port, where locally produced salt from the north could come in by boat. Instead of working with modern salt, the plant would clean, screen and package the local salt.

Because the salt is locally produced, it supports Haitian families. Because it looks more like the salt Haitians normally use, it might gain more acceptance than “rich man’s salt.”

Once the processing plant is in operation, Bonaire salt wouldn’t be totally cut off. About every third year, Haiti is hit by a major storm, such as a hurricane, which wipes out local production until the ponds can be rebuilt.

“We will basically have a belt and suspender approach,” Reimer said. “We’ll be able to use imported salt in years when local salt production is wiped out.”

Reimer brought screening equipment from the United States to show the packaging plant staff how they could separate the coarser crystals Haitians prefer. “If I was a Haitian consumer, I would buy this and I wouldn’t feel I had to wash it,” he said.

The fine salt that would otherwise be a by-product of the screening could be diverted to other users, such as makers of bread, cheese and butter. Now, Reimer is trying to identify potential customers for the salt and the best ways to market

it. The plan is multiple products, including coarse salt in small bags for retail sales, fine-grain salt in large bags for foodservice customers and even coarse-grain salt for industrial users like ice makers and hide tanners.

The packaging plant hasn’t been without problems. When the salt was getting mixed with the two medications, it was turning yellow. Haitians simply weren’t going to accept yellow salt. “That was a nightmare,” Father Tom said.

The problem was turned over to Scott Koefod, a senior research scientist in Minneapolis. He observed that the DEC medication is acidic, which caused a chemical reaction that turned the salt yellow. Koefod’s solution was to raise the pH (reduce the acidity) by adding a base, like sodium hydroxide.

“It’s about as routine as chemistry can get,” he said modestly in his way of making the complex sound simple.

The new salt production plant could be in operation by 2014. Reimer also is looking long-term at the possibility of building a modern salt production system in the north, which could serve as a model for traditional farmers to consider.

To help with that long-term project, Jim brought in Keith Long, who retired several years ago from Cargill Salt. “Keith is one of the foremost people in the world who know solar salt production,” Reimer said. “There are no Keith Longs in Haiti.”

Now a consultant to Cargill, assisting with solar salt operations, Long had worked with Reimer on a number of Cargill Salt projects around the world. “Here’s an opportunity to impact hundreds of thousands if not millions of people,” Long said of the Haiti program. “Who wouldn’t jump at that?”

AU REVOIR, GEORGE

George walked his visitors back to their van, which was parked by the metal shop where he works. He hadn’t wanted to talk in front of the shop when they first arrived. “The neighbors will talk,” he said. “You know how it is.”

Hands are shaken and the visitors board the van with a better idea about why the effort is worthwhile. Although the yellow salt problem has been solved, there probably will be other challenges ahead.

But Reimer doesn’t look at the project like a ledger book of credits and debits—a pure business analysis like he did in his Cargill days. “Our mission isn’t to build a salt industry,” he said as the van begins to move. “It’s to eliminate disease as fast as we can.”

It’s a mission he hadn’t foreseen when he was thinking about retirement. But he cites a Bible verse from Ephesians 2:10, which says God goes ahead of us and establishes in advance a path of good work for us to do and then we walk in that path.

“This feels like my path,” he said. “Doors started opening and things happened that would otherwise be unexplainable.”

To be sure, Reimer and the Notre Dame team may not be building a commercial salt industry in Haiti, but that hasn’t kept him from coming up with a slogan for the Bon Sel™ brand: “Pure salt that brings healing,” he said with a smile. “That’s my credo.” 