

GENES MAY HELP TOMATOES CATCH UP TO HEIRLOOM TASTE

WASHINGTON: Bite into a supermarket tomato and you'll probably notice something missing: taste. Scientists think they can put the yum back into the grocery tomato by tinkering with its genetic recipe. Researchers are reinstalling five long-lost genetic traits that add much of the sweet-yet-acidic taste that had been bred out of mass-produced tomatoes for the past 50 years. They're using mostly natural breeding methods, not genetic modification technology.

"We know what's wrong with modern tomatoes and we have a pretty good idea how to fix it," said University of Florida horticultural scientist Harry Klee, co-author of a study in Thursday's journal *Science*. Yield of tomatoes has tripled since 1960, but there's been a slow decline in taste quality as tomatoes have been bred for size and sturdiness at the expense of flavor. Klee said a tastier supermarket tomato could be ready within three years.

"Nobody deliberately set out to make tomatoes that don't have flavor," Klee said. "Basically it was a process of neglect." One key issue is size. Growers keep increasing

individual tomato size and grow more per plant. The trouble is that there is a limit to how much sugar each tomato plant can produce. Bigger tomatoes and more of them means less sugar per tomato and less taste, Klee said.

'Like eating candy'

So Klee and colleagues looked at the genomes of the mass-produced tomato varieties and heirloom tomatoes to try to help the grocery tomatoes catch up to their backyard garden taste. Good tiny heirloom tomatoes "are like eating candy," said New York University nutrition professor Marion Nestle, who wasn't part of the study. "For people who care about how food tastes, it's a very big deal."

Klee isolated some sugar genes and ones that were more geared to pure taste, but figured those won't work as well because they clash against growers' shipping and size needs. So he found areas that affect the aroma of tomatoes but not size or heartiness. Reintroducing those into mass-produced tomatoes should work

because smell is a big factor in taste, he said. Altering genes in a lab would make the process faster, but because of consumer distrust and regulations, Klee is opting for natural breeding methods - with help from an electric toothbrush to spread pollen. He's not quite there yet, but is close.

Jose Ordovas, a nutrition professor at Tufts University, applauds the work, but cautions: "It is possible that some traits are not compatible and you cannot make the plant to behave exactly the way that you want." Reggie Brown of growers' Florida Tomato Committee praised the study, saying it could help make supermarket tomatoes taste better.

No matter how much tinkering scientists do to mass-produced tomatoes, picking them too early and refrigerating them can make them bland. And consumers do have to be willing to pay more to have fresher, unrefrigerated tomatoes, said Klee, who generally doesn't do the taste testing in his lab. "I don't like raw tomatoes very much at all. You know, I'm kind of tired of them," he said. — AP



DES MONIES: In this March 23, 2011 file photo, a woman shops for tomatoes at a grocery store. — AP



BEIJING: In this Jan 9, 2017, Zou Yi rolls up posters showing years long record of the snaps he takes from his apartment to record the air quality at his apartment. — AP photos

SMOG PUSHES BEIJING CITIZENS TO INNOVATE FOR THE WORLD

MANY RESIDENTS DEVELOPING THEIR OWN PARTIAL SOLUTIONS

BEIJING: Beijing residents concerned about breathing the capital's thick gray air are adapting, inventing and even creating businesses to protect the health of their families and others. Some of their efforts could help people around the world. Already this year, the smog-shrouded capital has suffered particularly hazardous bouts of pollution caused mainly by coal burning and vehicle emissions. Like other Chinese cities, Beijing is trying to tackle the problem: City authorities say they will spend \$2.7 billion this year to help replace coal with natural gas, close heavily polluting factories and take older vehicles off the road. Official figures show improvement since 2013, but Beijing has a long way to go. With no quick fix available, many residents developing their own partial solutions. Here are some of their ideas:

Shooting the sky

For the last four years, Zou Yi has diligently captured the sky's change in colors from the window of his central Beijing apartment, where he can - usually - see the landmark Beijing Television tower. The background in his photos runs from dirty brown to deep gray, interspersed with one or more days of cobalt blue. On the worst days, nearby buildings can't be seen. A 10-day period of particularly heavy pollution inspired his project. The government had just started publishing data on levels of PM2.5 - tiny particulate matter that can clog lungs - and a taboo on state media's discussion of the sensitive topic had just been lifted. "I couldn't go out, I couldn't open windows, I couldn't see the building next to me because the smog was so bad," he said.

Zou shared the photos on the Twitter-like

Sina Weibo and the smartphone messaging app WeChat. He found his friends had similar feelings of frustration and recruited his building manager to take the pictures when he was out of town. "They wanted me to share a photo with them every day, so I did it every day, every month," said Zou, 50. Hundreds of thousands of people have seen his photos on social media.

What started as a way to complain has morphed into his full-time passion. This month, Zou set up the non-governmental organization BeijingAirNow to work with scientists on technology to read pollution levels from around the world by analyzing the tint in the images rather than using expensive monitoring equipment to collect air particles. He says he is handing over more than 300,000 photos for computer analysis.

A purified home

Wang Jiang, 42, and her family had eight air purifiers at home, yet found that the indoor air quality was still not good enough on heavy pollution days. Then they decided to take their efforts up a notch. But sealing windows and doors and turning on the purifiers caused carbon dioxide levels to spike, leaving Wang to wake up last year with headaches while pregnant with her second daughter.

So now they have installed a \$5,000 industrial-grade filtration system that sucks in outdoor air, cleans it via three filters and distributes it around the house through newly fitted pipes. They filled in vents from their building's central heating system and installed their own. While some might find that extreme, it's an increasingly popular solution. Filter manufacturer Yuanda

says their customers range from the ruling Communist Party's Central Committee to homes and about 1,000 kindergartens and schools.

A marketing representative, who only gave his surname, Hu, said their purifying systems often go out of stock. "If you order one today, it won't get installed until March," Hu said. Now Wang, a coffee importer, can exercise on a living room treadmill when pollution is bad without worrying about her health. Her husband, Frenchman Ludovic Bodin, 38, said he thinks every house should have an air filtering and ventilation system pre-installed. "At least if you cannot secure outdoors because it takes time ... at least try to secure the house inside," he said.

Crowdsourcing data

Frenchman and long-term Beijing resident Yann Boquillod wanted to know what kind of air his five children were breathing at home, so he developed a portable air quality monitor. It also tells users when carbon dioxide levels are high from sealing rooms too tightly, and advises that they should open windows for 10 minutes even if there is pollution outside. Boquillod's start-up, AirVisual, also provides air pollution readings around the world using data from more than 10,000 monitoring sources, both public and private. The company shares a 3-D real-time global map of air pollution and weather patterns on its website.

On the website Wednesday, easily the largest mass of unhealthy levels of PM2.5 pollution was a swath that covered much of eastern China, from Beijing in the north to Kunming in the south. Boquillod, 39, sees this as an educational tool and means of self-protection. He consults with schools, hospitals and offices to test air quality and find gaps in door and window frames that could allow pollution in. "The most important thing is to first start by monitoring the air quality and from that we can take the right decisions on what kind of air purifiers to install (and) know about the leakage inside the building," he said.

Masked students

Children as young as 3 at Ivy Bilingual School know they need to wear face masks when the smog is bad. The school also invites mask makers to come in and cut open masks to demonstrate which ones have extra layers and are better for their health. The children can even educate their parents on the masks and how to fit them, said campus director Victoria Li.

The school monitors pollutant levels and instructs teachers to make sure windows are closed 15 minutes before school starts to give the air purifiers time to work. It also puts up green or red signs indicating whether children can go out and play. Some international schools in Beijing have installed air-inflated sports domes for athletics, complete with air filters and rotating doors to help keep them sealed. — AP



BEIJING: Yann Boquillod, founder of start-up AirVisual, uses a device to test the air coming through a gap in the door at the Ivy Bilingual School.

MONGOLIANS STAND IN PROTEST OF POLLUTION

ULAANBAATAR: Thousands of Mongolians stood in frigid weather yesterday for the second time this winter to protest the government response to smog that routinely blankets their capital. An estimated 7,000 people, many of them wearing air masks and gas masks underneath thick winter hats, braved temperatures that fell below minus 20 degrees Celsius (minus 4 Fahrenheit). Standing in the city's central Sukhbaatar Square, they held black balloons and protest signs. One banner read: "Wake up and smell the smog."

Ulaanbaatar is one of the world's coldest capitals, and more than half of the city's 1.3 million residents rely on burning raw coal, plastic, rubber tires and other materials to stay warm and cook meals in their homes. In impoverished neighborhoods that ring the city, known as ger districts, many herders and others live in traditional round tents without heating, leaving them to burn polluting fuels.

UNICEF, the United Nations' children's agency, said last year that Ulaanbaatar was one of the 10 most polluted cities in the world. It found that the lungs of children living in the districts with the highest pollution did not function as well as those of children living in rural areas, putting them at risk of chronic respiratory diseases as they grow older.

Pollution readings in one ger district Friday were at times nearly 30 times above

the levels considered safe by the World Health Organization. Icy winds that whipped through the square during yesterday's protest cleared some of the previous day's pollution. Sanchir Jargalsaikhan, a political scientist in Ulaanbaatar, said climate change has intensified summer droughts and winter colds, making it harder to maintain livestock and forcing more herders into overcrowded ger districts.

"The policies our government is pursuing are pretty piecemeal, I would say," Jargalsaikhan said. "They're not part of a development project or a comprehensive program." Mongolia's environment and tourism minister, Oyunkhorol Dulamsuren, said in December that the government spent more than \$37 million and international donors \$47 million between 2011 and 2015 on measures to cut down air pollution.

But many protesters Saturday said that they didn't have the means to do more on their own. Dorjin Dolgor, a retiree, said she lives on an annual pension of 275,000 MNT (\$112). She burns coal in the stove of her house to stay warm. She called herself a "smogmaker" by necessity.

"To get heaters for my three-room house would cost me one year of my pension, and maybe not even be enough," she said. "That is the real price. And on top of that, we don't know how my electrical bill would be afterward." — AP



ULAANBATAAR: Protesters hold up banners on Sukhbaatar Square. — AP

STUDY: SUPERBUG INFECTIONS FOUND IN CHINESE HOSPITALS

LONDON: New research suggests a worrying number of people in China may be infected with bacteria resistant to an antibiotic used as a last resort. Researchers examined more than 17,000 samples from patients with infections of common bacteria found in the gut, in two hospitals in China's Zhejiang and Guangdong provinces, over eight years. About 1 percent of those samples were resistant to colistin, often considered the last option in antibiotics.

The study, published Friday in the *Lancet* journal, is one of the first to document the extent of drug-resistant infections in more than one Chinese province. For decades, China has used colistin in its agriculture industry to speed animals' growth, but the drug was not used in people. Scientists say the latest work is further evidence that overuse in animals can spread to people.

Chinese officials earlier this year approved colistin for use in hospitals, raising fears that it could worsen the resistance problem. "It will be very important to ration its use so that it's only used when absolutely nothing else will work," said Mark Enright, a professor of medical microbiology at Manchester Metropolitan University, who was not part of the research.

Health officials have long worried that colistin-resistant bacteria might spread more widely, setting the stage for superbug infections that would theoretically be impervious to medications. Only a small number of such cases worldwide have been detected, including in the US.

Rising concerns

Rising concerns over drug-resistant germs have prompted the United Nations to encourage countries to cut back on antibiotic use and develop new medicines. People infected with these resistant strains can usually be treated with current antibiotics, but doctors warn that as these bacteria - which are already untreatable with last-resort drugs - acquire resistance to current drugs, the infections may become impossible to treat.

Experts also noted a surprise: the apparent ease with which the resistant gene spread between bacteria, including different species of bugs. "It now looks like there's potential for the resistance gene to move around and spread between different species of bacteria," said Nigel Brown, a spokesman for Britain's Microbiology Society, adding that it could lead to a jump in infections. In a separate study also published in the *Lancet*, another group of Chinese researchers analyzed samples from patients with blood infections at 28 hospitals. About 1 percent had the colistin-resistant gene - a much higher figure than would be expected in developed countries. Colistin's use in hospitals should be restricted to avoid problems, said Yunsong Yu, one of the study's authors.

"This is a warning shot about the possible scenario where we don't have very much left in the armory to treat (bacterial) infections," said Brown. "I don't think we are very close to that happening, but it is a remote possibility if we aren't careful about how we use our antibiotics." — AP