

GROWING THEIR OWN

Grow

Webster schools work to cut costs, reduce waste and improve food services with aquaponic greenhouse

Lauren Peace Rochester Democrat and Chronicle | USA TODAY NETWORK

A U.S. Centers for Disease Control and Prevention warning issued late last week recommended customers throw out any store-bought romaine lettuce following an E. coli outbreak that left several people across the country sick, but cafeterias in Webster Central School District were spared from tossing their leafy greens. ■ In January 2018, the district began growing its own. ■ “We’ve probably already harvested around 10,000 heads of lettuce,” said Mark Balfour, the district’s director of food services.

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Misha Broikou and Ayden Ashe move sprouts from a hydroponics tray. MAX SCHULTE/@MAXROCPHOTO/STAFF PHOTOGRAPHER



Michael Rissone and Ashleigh Johnson process lettuce for delivery to lunchrooms in the Webster school district. MAX SCHULTE/ @MAXROCPHOTO/ STAFF PHOTOGRAPHER “People are a little disconnected from their food. I wanted students to see how it all works.”

Mark Balfour

Webster schools director of food services

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Thanks to an alternative method of agriculture fully adopted by the district earlier this year, Balfour is no longer left to place hefty produce orders to West Coast farms to supply school cafeterias with one of the most popular sellers: the grab-and-go salad. Instead of relying on California produce as he did in the past, Balfour now turns to a unique greenhouse on the back side of Webster Schroeder High School, where he works with students and staff to grow enough peppers, tomatoes, cucumbers and lettuce to deliver fresh salads to schools across the district — cutting the distance between seed and table by approximately 3,000 miles and the delivery time by nearly two

weeks. The sustainable approach he's taking to local farming, called aquaponics, is changing the way the district provides food to its students while simultaneously presenting hands-on educational opportunities for Webster science classes and reducing both waste and long-term cost.

The method is being adopted by schools around the country.

"It's nice to know exactly where your food is coming from," said Paige Hoyt, a 16-year-old student at Webster Thomas High School who makes the trip to Schroeder with her chemistry class once per week to work in the greenhouse.

So what's the deal with aquaponics?

Balfour has always had an appreciation for local food sourcing. In 2015, he turned that appreciation into action and approached Brian Freeman, an assistant superintendent, to suggest an initiative to begin growing food for the district, in the district.

"I approached Brian because I've worked all over the country, and it just seemed to me that people are a little disconnected from their food," said Balfour, while standing in the 3,400-square-foot greenhouse on Monday. "I wanted students to see how it all works and appreciate that." It was around the time of his initial inquiry that Freeman, who oversees the district's business and finances, coincidentally found himself watching a PBS documentary on aquaponic greenhouses. Aquaponics, a combination of aquaculture and hydroponics, is a unique form of agriculture in which fish are raised in tanks that are connected to plant beds through simple irrigation systems. The plants are then grown in the water from the tanks, drawing the nutrients they need to flourish from fish waste, which is high in nitrogen.

In simpler, but perhaps less appetizing, terms: The plants thrive in water with a high concentration of fish poop.

"I hardly ever watch TV, but I just so happened to be watching this documentary that said a not-for-profit organization in California was working with educational facilities to create these aquaponics greenhouses," said Freeman. "So we started doing our research."

After six months of back-and-forth conversation with the organization, it became apparent to Freeman and Balfour that if they wanted to move forward with their vision, they were going to have to seek a different source of direction. The two continued their pursuit, and by April 2016 they had gained the school board's support in funding the construction and maintenance of an aquaponics greenhouse. In October 2016, they began assembling the \$150,000 project. It was completed in February of the following year. "The driving factor for

this project was food service. Half of the time, we'd order lettuce from California, and by the time it arrived it was garbage. Generally, we'd spend \$50,000 a year on lettuce and end up throwing away so much food," said Freeman, who noted that the system will pay for itself in three to four years. "We undertook this as a business decision, but it's also feeding the education process."

Hands-on greenhouse learning

Approximately 5,000 gallons of water circulate in the greenhouse, which is populated by about 300 fish, currently tilapia. New fish are brought in about every six months, and the mature specimens are harvested and sold to staff for consumption. Nothing goes to waste. "We can raise roughly 20,000 heads of lettuce," said Balfour, who noted that the produce is grown without the use of chemicals.

Doing so is made easier with student help.

While the greenhouse provides food to the district, it also serves as a hub for hands-on lessons in chemistry, biology and sustainability for Webster students across multiple schools and grade levels. Leslie Barnes, a science teacher at Webster Thomas High School, brings her general chemistry class to the greenhouse once a week to test the water levels, weigh the fish and see the practical application of their coursework. "How can I relate this to chemistry? Well, how could I not? My students are here testing the water quality, testing the pH, testing the nitrates and nitrites," said Barnes. "My students are able to come here and contribute and they're seeing science in action. It's totally engaging."

When Barnes began student teaching in 1991, the school that she was at offered a course called greenhouse science. She said that when she first visited the greenhouse in November 2017, after plants had first begun to grow, she recognized the opportunity for her class.

"What a valuable teaching experience this is for students," she said.

Paige Hoyt, who is a member of Barnes' class, agreed.

"We get to interact with the fish. We get to feed them and take care of the plants. It's nice to learn about all of the work that goes in and to see the process," Hoyt said. "I know a lot of people, especially me, are hands-on learners. I actually understand better while we're out here doing this. You learn a lot more dealing with it instead of just looking at the information on a board."

And the facility has attracted more students than just those who visit for class.

Savannah Wright, a senior at Webster Schroeder High School, volunteers at the greenhouse once a week during her study hall.

"I'm going into architecture and sustainability design," said Wright, who plans to attend Ryerson University in Canada in the fall. "I've always been really interested in self-sustainability and how hydroponics and aquaponics work. Not many people get to experience this."

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Bella Valdivia returns fish back to the tank after they were weighed. MAX SCHULTE/@MAXROCPHOTO/STAFF PHOTOGRAPHER

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The roots of fresh lettuce are cut and composted for reuse in the greenhouse. MAX SCHULTE/@MAXROCPHOTO/ STAFF PHOTOGRAPHER



Shen Stamski looks for an open spot for lettuce sprouts in the aquaponics/hydroponics greenhouse.

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