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Just Add Water

Hydroponic gardens in school cafeterias feed salad bars and fertile minds alike.

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Maggie Mae Kennedy, SNS, is a self-professed killer—of plants. "I usually kill everything," she says, explaining her surprise at the easy success she's enjoyed growing leafy greens, herbs, tomatillos, peppers, cucumbers, tomatoes and more over the last year. The breakthrough was using a hydroponic gardening approach.

Kennedy wasn't alone in enjoying this agricultural achievement. She shared it with colleagues and students at Spring Branch Independent School District (ISD) in Texas, where she serves as assistant director of student nutrition services and where she launched a hydroponics-based, hands-on, agriculture and nutrition education program for the youngsters in her district. Students grow selected crops using an indoor hydroponic farm system and then enjoy the fruit (er…vegetables) of their labors as part of their school meals.

Hydroponic school gardens are not new to school cafeterias. *School Nutrition* wrote about one such classroom-cafeteria project in Massachusetts back in September 2016. But they do seem to be gaining traction in recent years, as school nutrition operations continue to rely less on processed foods

At Spring Branch ISD, in Texas, the Frostwood Elementary School PTA sponsors a hydroponic garden to support a cafeteria salad bar. Harvests in 2025 included lettuce greens, cherry tomatoes, cucumbers and peppers.

and incorporate more fresh ingredients into meals and as they bounce back from COVID-related disruptions. Details of cafeteria-based hydroponic garden projects are showing up in both conventional media, as well as the social media pages of school meal programs from coast to coast, plus Alaska and Hawaii.

At SNA's upcoming Annual National Conference (ANC) this summer, Kennedy will be joined by Sue Malesa, from vendor partner Fork Farms, to share their respective experiences and insights in "Fresh Food, Fresh Ideas: Indoor Hydroponics," a Learning Burst education session. Kennedy and Malesa graciously agreed to expand on their presentation to help inspire *SN Plus* readers.

Hydroponics 101

Hydroponics is a Scrabble-worthy word to describe a soil-less, water-based approach to plant growth. Plants need water, nutrients and light to grow. In traditional gardens, soil provides the medium for roots to absorb water and nutrients. But the hydroponics process bypasses soil, delivering nutrients directly to a plant's roots through a water-based solution.

There are several different types of hydroponic systems. In one, a wick draws the nutrient solution from a reservoir to the roots. In another, called the Nutrient Film Technique (NFT), a shallow stream of nutrient solution continuously flows over the plant's roots. Or a nutrient solution might be dripped directly into the root zone. In an aeroponics set-up, plant roots are suspended in air and periodically sprayed with a nutrient solution. Different lighting systems may be employed. Most hydroponic systems are set up indoors or in a greenhouse environment.

There are many benefits to hydroponic farming:

- Plants can **grow more quickly** due to direct access to nutrients and optimal growing conditions (no droughts or floods to worry about).
- Farms can produce **higher yields** for the same reasons.
- Some hydroponic systems are designed to recirculate water, **conserving total water usage.**
- Hydroponic systems can be built "up," using a **smaller footprint** than traditional gardens, which must be built "out."

Second-graders at Housman, Elementary Spring Branch ISD, Texas, marvel at the 28-day transformation of their seedlings.

The Flex Farm structure from Fork Farms can be disassembled to allow young students to more easily harvest their classroom's crop.

- By eliminating soil, there is greatly **reduced risk for pest and diseases.** And there are no weeds!
- Hydroponic systems are not season-dependent; when set up indoors, they offer **year-round harvests** in all parts of the country.

Many of these benefits make hydroponic farms perfect for school settings, whether in a traditional classroom or in the cafeteria as classroom. It's easy to involve students in the farming process, providing valuable hands-on engagement for learning about science, agriculture and nutrition. And harvests can be incorporated into school salad bars and other menu items.

Sowing the Seeds

Which benefits inspired Kennedy to get permission from her boss to purchase equipment and launch a school-cafeteria-based hydroponics program? All of the advantages were a good incentive on top of her ongoing desire to innovate. "I'd be so bored at work if all I did was write bids and prepare for administrative reviews," she says. "I'm always looking for the next exciting thing."

While Kennedy rarely opens unsolicited vendor emails, she was intrigued by one sent by Fork Farms, a Wisconsin-based vendor that offers efficient, scalable hydroponics technology through easy-to-manage modular systems. It also offers a free education curriculum with lesson plans and short, skill-building activities that can be conducted in any setting.

"I was so intimidated by the process," Kennedy says, reiterating her classic "black thumb" experiences. "But their Flex Farm program made me comfortable. It was very easy, and the fact that the education curriculum was built in was a big advantage over other vendors with similar systems." The two-pronged approach of using the hydroponic farm to produce ingredients for school meals and provide a teaching component was always a priority for Kennedy.

Hydroponic farming with the second grade classes at Housman Elementary, Spring Branch ISD, Texas, fostered a greater sense of community between the onsite school nutrition services manager, the cafeteria team and the students.

No more black thumbs for Maggie Mae Kennedy, assistant director of school nutrition services, Spring Branch ISD, Texas. The first year of the department's foray into hydroponic farming was a bountiful success.

The curriculum is a five-week program built around a 28-day production cycle, from seed to harvest. Spring Branch's Student Nutrition Services department offers it twice a semester, changing school locations each time. In its debut last spring, the second-grade classes at two sites participated, growing several types of lettuces to give each class its own variety, while engaging between 80 and 100 students. Crops included romaine, butterhead lettuce, green star lettuce and kale. "They planted the seeds in a separate medium, transplanted the seedlings to the Flex Farm, tested PH levels, learned about composting and then harvested their crops during the fifth week. The modular Flex Farm has panels that can be removed to make it easier for the children to harvest the lettuce and see the root structure.

Currently, there are three hydroponic farms in Spring Branch ISD. One is the Flex Farm purchased by Student Nutrition Services. Another was purchased by a very active elementary school PTA that sponsors a twice-monthly salad bar through the cafeteria, providing a broad selection of toppings. Now, the group is growing their own lettuce. A third hydroponics system was purchased by a school principal using grant money, but it hasn't been touched, as no one at the site took ownership. (Student Nutrition Services doesn't currently have the operational bandwidth to manage another farm.)

Blooming When Planted

Sue Malesa is associate vice president of culinary and foodservice at Fork Farms, but this role came along after 25 years as a school foodservice director in different Wisconsin school districts. She was introduced to hydroponics after being prompted by one previous boss to "get

Students at Housman Elementary in Spring Branch ISD, Texas, each got a tiny, sprouted seedling to plant in the hydroponic farm.

better greens on the plate" during the state's long winters. "Initially, I was resistant to the core," Malesa admits. But as the system proved itself right out of the gate, "We all got on board very quickly. It made a believer out of me, and it changed the trajectory of my career."

Unlike Spring Branch's Kennedy, Malesa had no intention to incorporate an education element to her hydroponic farm, at least not at first. The entire purpose was to produce ingredients to use in school meals, and she and her team set up farms in areas without access to students, including an abandoned

Wildly successful farms led to some plants being transferred to a container garden set up outside the administrative offices of the school nutrition department.

The hydroponics farm run by the School Nutrition Services team at Spring Branch ISD, Texas, travels to different schools throughout the year, bringing hands-on agriculture and nutrition education to youngsters through a 28-day learning cycle.

biology lab and an old boiler-turned-storage room. "We used a master key and went through buildings, hunting for space," she recalls.

Malesa could give willing staff more hours to tend to the individual farms at different sites. A driver would visit all the locations, pick up the harvests and return them to a prep kitchen. And per the mandate, the greens certainly were "better." In fact, she reports, "Our lettuce consumption went up 30%!"

Eventually Malesa developed agreements with her education colleagues. The foodservice department would purchase a system that teachers or principals could use for education purposes, but she retained the rights to the harvest. "That expanded my growing platform even more," she recounts. Plus, she fully embraced the idea that the hydroponic farm could engage children in learning.

Today, while she marvels at how districts continue to repurpose under-utilized spaces to place hydroponic farms, Malesa is excited to learn of districts that actually plan for these as they develop blueprints for new construction and renovations. "That's really cool to see."

Green But Growing

How can you get started in hydroponics? Begin by asking, "What do you want to do with your hydroponic garden?" According to Malesa and Kennedy, popular answers include: "Get more fresh ingredients on cafeteria trays," "Use the farm as an engagement tool to bring kids closer to food sources," "Collaborate with other departments and build relationships" and

EXPERT TIPS FOR GETTING STARTED IN HYDROPONICS:

1. Get more fresh ingredients on cafeteria trays.
2. Use the farm as an engagement tool to bring kids closer to food sources.
3. Collaborate with other departments and build relationships.
4. Create a better perception of the cafeteria by students and their parents.

How does your garden grow? With hydroponics, there are no weeds or bugs!

"Create a better perception of the cafeteria by students and their parents."

Your answer will allow hydroponics vendors to make appropriate recommendations for the type and configuration that will best meet those goals. According to Kennedy's assessment of social media, if the primary goal is to produce harvests for school meals, it often tends to be located at the secondary school level, while elementary schools often prioritize the education component.

At Spring Branch ISD, the Student Nutrition Services team bought the Flex Farm from Fork Farms. Mobility and flexibility were two top selling points. The unit can be wheeled from one site to another within a building or it can be easily broken down and transported in pieces to another site. It doesn't require any plumbing and can be powered from a single outlet.

What Will Your Garden Grow?

Leafy greens seem to be the top crop for most school cafeteria hydroponic farms. The education curriculum offered by Fork Farms is based on the 28-day growing cycle of most leafy greens. But other popular crops for hydroponics include green beans, peppers, tomatoes and cucumbers. "We advise against plants where the vegetable grows below ground, but I know of one school that grew 288 carrots!" recounts Malesa, also citing corn and radishes as other surprising crops.

If the hydroponics system is not purchased by the school nutrition department for school meals, the list of possibilities rivals that of traditional gardens. "I've seen classrooms grow plants for fundraisers, like poinsettias for the holidays, apple tree saplings, landscape plants, even ornamental plants for the pots at school entrances," says Malesa.

When Kennedy conducted "R&D" with the Flex Farm in her department's administrative offices, she and her colleagues experimented with a number of different crops. In addition to popular salad bar ingredients, they grew herbs

GOOD GROWTH

Ready to launch a hydroponics program in your district? Consider the following advice and suggestions:

- Do your research. The more you explore your options, the better you will feel about your choices.
- Allow yourself to be creative in your approach to implementation. "Being a trailblazer can be a bit scary, but it is extremely rewarding," says Malesa.
- Take time at the start to understand how the system you've purchased works so that you can properly train and support others. But remember, no one is an expert on day one!
- Don't get caught in a trap of thinking you need to do everything—and do it from the get-go. "That's the beauty of indoor agriculture," says Malesa. "You are totally in control of the when and what. Do it at your pace."
- Reach out to other hydroponic farmers to share best practices and troubleshoot issues. Kennedy has fielded a lot of interest through her posts on LinkedIn. Forked Farms offers Farmative, an online community of its farm partners.
- While it's important to place your hydroponic garden where others can see it and be inspired for future collaborations, it's equally valuable to learn to navigate their curiosity with care. "People can be drawn to it like a moth to a light," says Kennedy. You may need to place it somewhere with limited touch access, security cameras and appropriate signage.
- Have a plan for longer holiday and summer breaks. It's great for a summer school class, but it also can be loaned to a community organization like a firehouse, police station or public library. "They'll have time for a complete growth cycle," notes Malesa. She also suggests donating a harvest or two to a local non-profit or social services agency.
- If you are not incorporating an education curriculum but growing specifically for school meals, survey students what they would like to see grow and then eat! Fruiting plants like tomatoes, peppers and cucumbers are so much fun to watch grow—especially during colder months, advises Malesa.

like rosemary, thyme and oregano; many of these were shared with staff for use in Thanksgiving meals. "We also wanted to see if we could grow all the ingredients for a salsa, such as tomatillos, jalapeños and tomatoes," she recounts, admitting to one lesson learned here: "I didn't get the seeds to use for a hydroponic farm. I used regular seeds, so these crops grew like crazy! We had to transfer them to a raised garden that we created in the parking lot outside the entrance to our office."

A Bountiful Harvest

Kennedy is very pleased with everything that was harvested in her initial foray into cafeteria-based hydroponic farming. "It's been a rewarding experience teaching young minds about where their food comes from and how we can grow it sustainably, even in urban environments," she says. The program also led to powerful conversations about food equality, sustainability and access.

Arguably the most delicious result was how the program fostered community between the Student Nutrition Services team, students and families. The kids got to know the manager as more than a smiling face at a cashier station. "Students are excited to participate in meal times, not just for the food, but for the connection they've formed with adults who support their growth." Some parents now reach out to Kennedy directly to learn more about menu choices, Smart Snacks and other aspects of the school nutrition program.

As the program moves into SY2025-26, Kennedy details a few lessons learned. Between the first site and second site, she and her team reduced the education program from six weeks to five weeks. They also had to address an issue involving a school employee who was harvesting greens after hours for personal use. In the fall, they may expand to other more "exotic" greens like Bok choy and tatsoi. Kennedy will also spend more time onboarding site managers to be sure they fully understand the care and attention the farm needs to thrive.

Bet the Farm

"This is so doable. It doesn't take as much time as some would think," says Kennedy, noting that her boss has shed his former skepticism. "You can make it as large or small as you want. It can be just for the menu or just for the education—you don't have to do both, although it's very easy to combine. And it's a great way to get out of the office and away from the mundane."

Both agree that the impact on students and families can't be overstated. "There is nothing like getting a call from a grateful parent who tells you their child has guided them to the produce section of the market and pointed out the kind of lettuce they want to eat at home," concludes Malesa.

Patricia Fitzgerald is a freelance writer based in Washington, D.C., and a former editor of School Nutrition magazine.
Photos courtesy of Spring Branch Independent School District, Texas.

VENDORS & RESOURCES

Some of the vendors that have hydroponic farming equipment or programs for education settings include:

- **Babylon Micro-Farms**
- **Fork Farms**
- **Freight Farms**
- **Harvest Today**
- **Lettuce Grow**
- **Zip Grow**

Massachusetts Farm to School has several resources about hydroponics farming, including podcasts and webinar presentations that are free to watch and/or download the slides. **Topics include Hydroponics for the Cafeteria**, **Indoor Growing: Hydroponics in the School Cafeteria and Cleaning** and **Caring for Your Hydroponic Systems**.

Need help funding a cafeteria hydroponics farm? Check out the following organizations and web portals to discover targeted grants and other awards:

- **Green Our Planet/ HydroConnect Program**
- **How to Find Grants for Hydroponic Farming**
- **USDA Urban Agriculture and Innovative Production Grants**

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