

School Nutrition

JANUARY 2013

Solutions & Strategies
for K-12 Foodservice

Getting in GEAR for a Brand New Year

EQUIPPED FOR PROGRESS • BEIN' (DARK) GREEN • THE POST-ELECTION PICTURE



HOT & COLD

BY PENNY MCLAREN

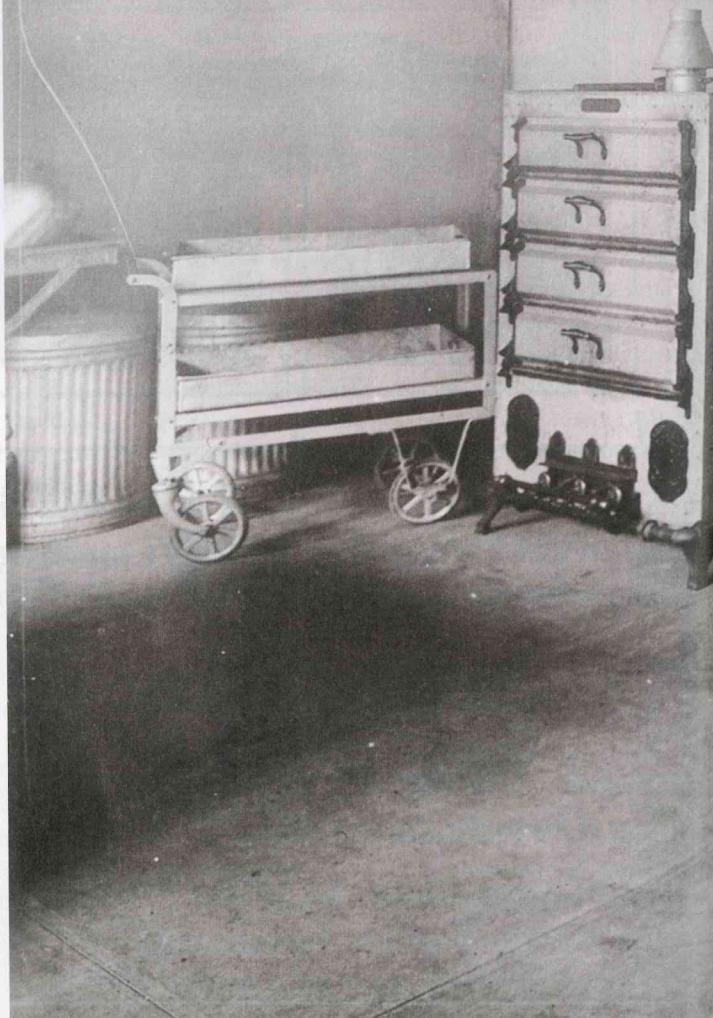
Lunch in a small, rural Wisconsin school in the early 1900s was served from a large kettle simmering on top of the stove—not a designated cook stove, mind you, but a wood stove with the primary job of providing heat to the classroom. Each day, students brought individual contributions of meat and vegetables from home to add to the kettle, and the resulting stew cooked all morning.

At roughly the same time, many urban schools in larger cities, like Cincinnati, were able to outfit their sites with some kitchen equipment, often thanks to the generosity of private donations. While these units were designed for domestic use rather than volume foodservice, it provided students with some menu variety, enjoying a hot meat sandwich with sweet potato one day or a hot wiener with rice pudding the next.

It was just the beginning of what was to become the school kitchen that you know so well today. The passage of the National School Lunch Act in 1946 led many schools to make their first professional-grade equipment purchases, using Section 5 funds allocated especially for that purpose. Still, the kitchen equipment of the mid-Forties was quite different than what is available to school nutrition operations today. Even the simple soup kettle has given way to a technologically advanced descendant.

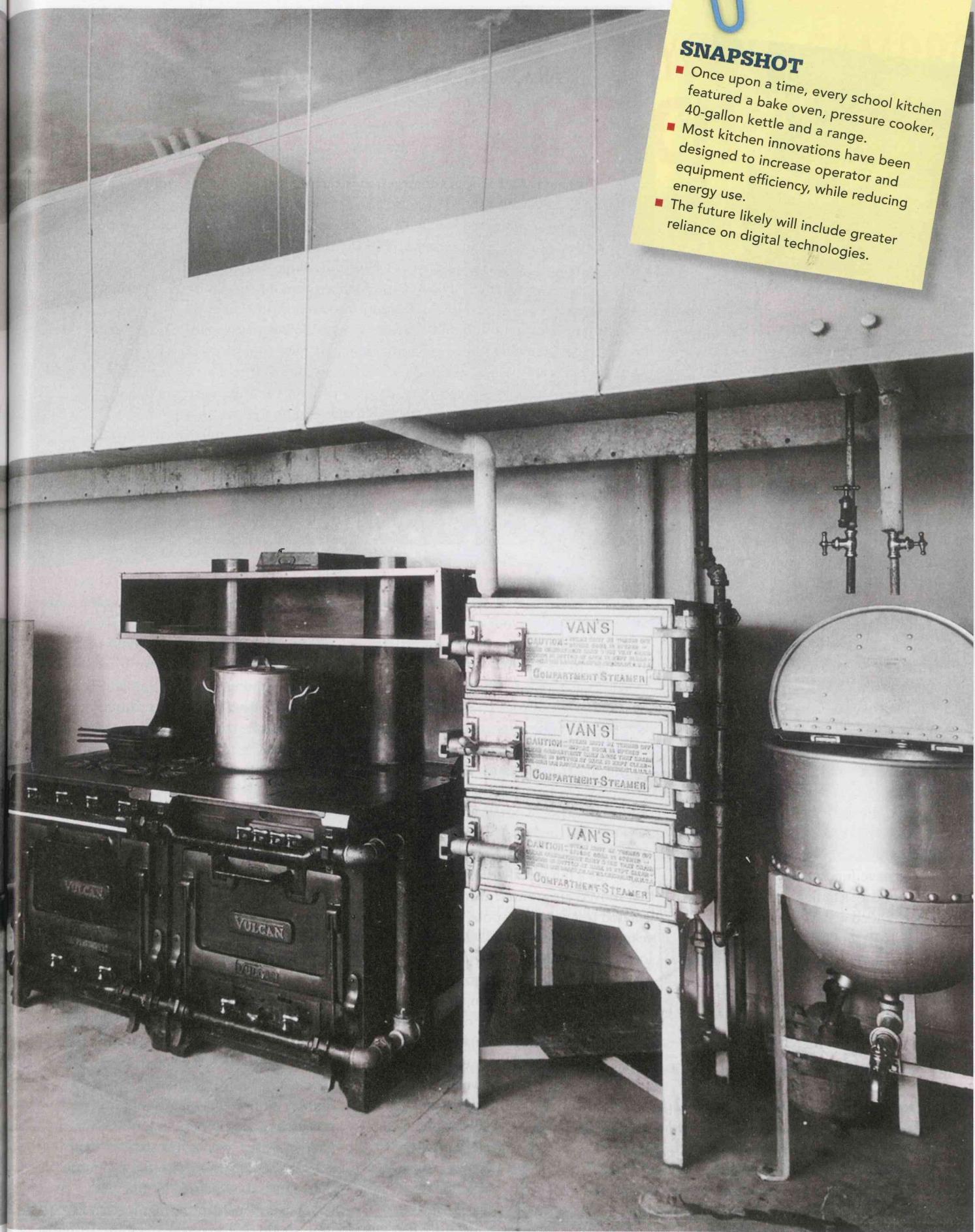
Newly constructed school kitchens are being outfitted with equipment that makes it possible to serve fresh-prepared meals to hundreds or thousands of students quickly, safely and with less labor than ever. To fully appreciate the ease, efficiency and reliability we enjoy today, we need to look back at how equipment has evolved, citing just a few examples of systems currently available to schools. What's changed in getting hot foods hot, keeping cold foods cold—and cleaning up, afterward?

While school kitchens today look nothing like those predicted in Sixties-era science fiction (such as the animated “*Jetsons*” sitcom), basic kitchen equipment technology has evolved over the years.



SNAPSHOT

- Once upon a time, every school kitchen featured a bake oven, pressure cooker, 40-gallon kettle and a range.
- Most kitchen innovations have been designed to increase operator and equipment efficiency, while reducing energy use.
- The future likely will include greater reliance on digital technologies.





GETTING HOT FOODS HOT

Mike Burke, CFSP, SNS, has more than 30 years of foodservice equipment experience, 21 of them with ITW/FEG. As product manager of Steam Cooking for the FEG Cooking division, he considers himself lucky to have been trained by a mentor and predecessor, who, having started in the business in 1948, had firsthand experience with the history of both foodservice equipment *and* the federal school lunch program—and passed this along to his apprentice.

According to Burke, to prep the classic Type A lunch served in the late Forties and Fifties (and even into the Sixties), a school kitchen needed:

- a bake oven
- steam cooker or pressure cooker
- a 40-gallon kettle and
- a range

How many of you have such a collection at the site where *you* prep meals for students? While we know that many communities today still have schools built back then, only a small percentage of these continue to have *functional* equipment from this era. Let's look back and forward at what's changed across the years.

DID You KNOW?

When you shop for an oven, the specifications will reference BTUs. A BTU is how heat value in stoves, furnaces, grills and air conditioners is measured. It is short for British Thermal Unit. One BTU is the amount of energy needed to heat one pound of water one degree Fahrenheit.

STRANGE-BUT-TRUE EQUIPMENT TALES

Veteran school nutrition professionals have seen it all!

It seems that school construction is rarely finished on time, right? That's okay—when kids need to be fed, operators just turn to Plan B. "Does anyone ever have a Plan B? Really?" asks Jane Johnson, school nutrition director, Crane Elementary School District, Yuma, Ariz.

When the school kitchen at a new junior high school was delayed, elementary staff at one site had to make room for the junior high kitchen team to squeeze in and cook alongside them. Add to that the headache that the operation didn't have any kind of delivery system or personnel in place. Step One: Borrow a truck with a lift-gate from the warehouse department. Step Two: Recruit a cafeteria manager to be a driver. Step Three: Master the frustrating lift-gate without the transporter falling off. Repeat daily. And repeat again and again for about one month. Staff was greatly relieved when their kitchen was finally open for business! "After that episode, the manager got her commercial driving license and is a cross-country truck driver today!" says Johnson, adding, "Okay, that part isn't true—but it could be!"

Replacing the Bake Oven

Early bake ovens called for close monitoring by kitchen staff, because they didn't heat evenly, featuring hot and cold spots. "You had to watch food carefully, and move things around," Burke says. Even the popular pizza deck oven with a 12-in. door (which came into use in the 1950s) was plagued by hot and cold spots.

To solve this problem, manufacturers developed the professional-grade convection oven, making its debut in Europe before appearing in U.S. schools in the 1960s. The key to the technical advancement was a fan installed inside the cavity that moved air around, eliminating isolated temperature spots. Over the years, fan technology has improved to lower energy costs.

Changes in oven size helped to maximize kitchen space. The standard bake oven was 60 inches wide, making the 40-in. convection oven an attractive alternative. Indeed, despite its smaller width, it offered greater capacity, because with hot air circulating constantly through

the cavity, pans could be placed closer to the top of the oven and closer to each other without compromising the quality of the recipe, ultimately allowing cooks to fit more pans inside at one time. The convection oven soon became a mainstay of school kitchens—and, according to Burke, they continue to be the oven of choice for most school nutrition operations furnishing new kitchens or replacing failing equipment.

Replacing the Pressure Cooker

Pressure cookers had been a means to employ steam cooking since the early 1900s. But only since World War II did pressure cookers gain popularity among home cooks, becoming an in-demand appliance in support of home victory gardens. Poor construction quality soon caused problems, and the equipment fell out of favor.

Still, the concept and benefits of steam cooking persisted. Burke references an article in a 1975 *School Food Service Journal* by J. Harrison Holman, a vice president at equipment manufacturer Market Forge, who advocated for steam cooking as a solution that allowed more nutrients to be retained by the food, ultimately benefiting students. In addition, steam delivers heat at a high degree of

STRANGE-BUT-TRUE EQUIPMENT TALES

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Do construction projects ever go on schedule? In Delaware, Seaford School District Supervisor of Nutrition Services Patricia Cunningham was looking forward to the renovation of an elementary school's walk-in cooler, freezer and storage area—that is, until the demolition stage was delayed until two weeks before the start of school! A neighboring high school was charged with prepping food, and the custodial staff was asked to help transport it. Right. "Need I say anything else?" asks Cunningham.

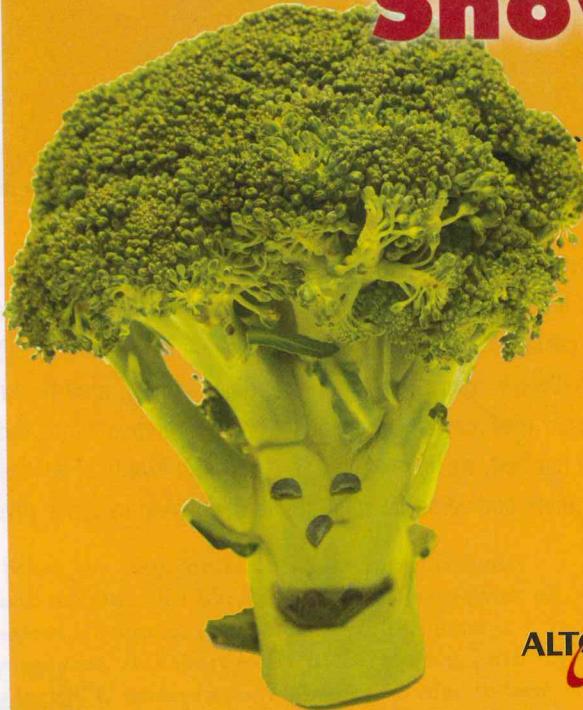
Next, they arranged for a small refrigerated unit to be placed outside the kitchen in the adjacent parking lot. Following concerns that vandals would shut off the temperature switch, the unit was secured within a nearby chain link fence. That didn't help when the unit itself failed on its own, causing the loss of all product. Then it was determined to be inadequate storage, so Cunningham turned to a dual freezer/refrigerated tractor trailer. Finally, adequate, working storage—but "now my staff had to become gymnasts, as they tried to scale the steep steps to the trailer doors," recounts Cunningham. "It was an accident waiting to happen." That necessitated a ramp, which, while imperfect, worked well enough, while the construction dragged on for almost two months into the school year. "Nothing goes without a challenge in our wonderful world of school nutrition—but we are resilient and love our jobs!" exclaims Cunningham.

energy, allowing speedy heat transfer to food, with a consequential savings in energy use and costs. A compartment steam cooker is like a pressure cooker; it will cook items like rice in the same pan used for service. The only thing steam cooking could not do was bake cakes and pastries.

So, how do you improve on the basics of steam cooking? Let us count a few ways. In 2008, Vulcan introduced the PowerSteam Series Steamer, which uses superheated steam to give faster cook times. And back in 1976, Rational introduced the combi steamer, combining a convection oven and a steamer, creating a unit that could cook with dry heat, steam heat or a combination of the two.

Another manufacturer, Winston Industries, initially broke into the school segment with its holding cabinets. That led to its development, some 20 years ago, of a cook-and-hold technology for combi ovens that uses water vapor instead of steam. According to Barry Yates, Winston's director of innovation, this system, CVap (Controlled Vapor Technol-

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ogy), requires less staff monitoring for high-quality results. "Traditional cooking depends on a skill set," he explains. "For example, you can bake pizza at 400 degrees for 15 minutes, and it is just fine. But at 16 minutes, it is overcooked." CVap, he asserts, "understands water in food. The oven allows it to cook to the right point and no farther." A culinary team has developed eight preset cook cycles of time and temperature that can accommodate virtually any food product or recipe, asserts the company, promoting the technology as a labor-cost saver.

Winston markets its technology to operators aware of the realities associated with the need to prep high volumes that must be served in a short time period. To this end, most operations rely on holding cabinets. According to Greg Siegelman, Winston's vice president of marketing, the CVap system allows food to be held for three or four hours "and you would swear you just made it." As an alternative, staff can prepare a large batch of a particular menu item, hold it until just prior to serving and quickly finish it off with a final cook step. "It might enable schools to try serving foods they couldn't do before, like asparagus," asserts Siegelman.

Replacing the Range

Simmering, boiling and cooking on the range may be tasks you perform regularly in your home kitchen, but the use of individual pots, pans and kettles on a range is a rarity in school nutrition operations, except, perhaps, those with a very low volume of student customers. Burke concedes that some districts specify a two-burner range in new kitchens, but on his own visits to K-12 sites, he finds that often these aren't even plugged in.



Instead, the return to fresh-prepared recipes and menus in many districts may have given rise to something better suited to the volume demands of this segment: dedicated equipment like the braising pan.

The braising pan has the stovetop versatility of a single piece of equipment. For example, the Vulcan V Series braising pan can be used for grilling, braising, pan frying or steaming. It saves storage space in kitchens, and it cooks volumes of food quickly and easily. Of course, the braising pan has been a foodservice tool since the mid-Sixties. But with the addition of some mechanical features (such as a drop-down pan support and embossed gallon markings for quantity measurement), it has become even easier for school kitchen staff. The braising pan is, says Burke, "the Jack of all trades, the master of all processes." With it, school chefs can cook chili or stew, grill cheese sandwiches, pan-fry chicken or steam vegetables—without limits.

KEEPING COLD FOODS COLD

Replacing the Refrigerant

Refrigeration systems were developed for commercial kitchens around the same time as commercial stoves, so refrigerators, in some form, were probably introduced in schools at about the same time. Chance Hunt, product line director for Avtec and Randell, divisions of Unified Brands, has 20 years of experience in refrigeration, from building units on the factory floor to designing to his present role in product management. "In general, refrigeration has not changed at all," says Hunt. What has changed over the years are the refrigerants themselves.

DID You KNOW?

Steam produces six times more heat than boiling water. In fact, it is said the means of heat transfer through steam is faster than that of the hydrogen bomb.

DID You KNOW?

In the early days, refrigerants were somewhat volatile compounds, like ammonia, methyl ether and sulfur dioxide. Some of these proved corrosive and leaked dangerously, so over the years, manufacturers worked to find safer alternatives. One refrigerant category called Freons (chlorofluorocarbons) was the preferred type for many years, because of its stability. But scientists discovered that the most popular varieties of this type were dangerous to the atmosphere and ozone layer; they have been mostly discontinued in the United States (although are still in production in other parts of the world).

Manufacturers continue to seek a refrigerant option that has low volatility, but is effective in cooling systems. In the meantime, most manufacturers continue to use two varieties of freons. "They are the answer in refrigerants until they find out that they aren't," Hunt notes.

Powering Down

Manufacturers of compressors and components also are working to reduce power usage, reports Hunt. For example, they have improved a refrigerator's performance throughout an on/off cycle. A compressor might have kicked on when it sensed an internal temperature of 42 degrees, and then off when the temperature got back down to 35 degrees. With today's microprocessors, refrigeration units can maintain a precise temperature, without variation. For example, according to Hunt, the Randell FX system can hold any temperature selected by the user; of course, this extends the shelf life of food, maintains quality and ensures food safety.

One of the biggest and most recent changes for all food and foodservice segments, including school nutrition operations, was a change in NSF-7 guidelines for refrigeration. The guidance dropped the accepted holding refrigerated temperature from 45 degrees to 41 degrees. "It might not seem like four degrees is much," says Hunt, "but for manufacturers, it was a big step." Being able to deliver that holding temperature became the new standard.

Meeting ENERGY STAR™ guidelines

When natural ice was popular as a means of refrigeration, it is said that 1,000 tons of ice—per day—were removed from Walden Pond to be shipped elsewhere for refrigeration use. The ice shipping industry died off when the contamination of water sources became an issue for breweries and other commercial manufacturers that used ice.

is another challenge for refrigeration manufacturers. In order to reduce energy use, some manufacturers are reducing the compressor size. But there's a risk of losing cooling capacity as a result.

It's difficult to foresee more energy savings that manufacturers can build in to refrigeration equipment, warns Hunt. When comparing energy savings, a better steamer might save thousands of dollars, he notes, while the most energy efficient refrigerator might only save only hundreds. "It is not that big a difference."

Beginning a Blast

The introduction of blast chillers has revolutionized the ability for foodservice operations to improve food safety. First introduced in Europe, blast chillers broke into the U.S. market in the last 15 years. "A blast chiller is the only way to take heat out of a product," explains Hunt. "Refrigeration is just for keeping cold food cold and that's if the food is already cold. [The unit] is not designed to remove heat, only to maintain the cold." But what if you could take the heat out of food before storing it safely? Enter the blast chiller.

According to research cited by Hunt, if a food product is put in the refrigerator, it might take up to 22 or more hours to get down to 39 degrees, depending on the size and depth of the pan, as well as the density of the product. But "The blast chiller will take the pan down to temperature within 90 minutes," he asserts. One newly popular use in schools is blast freezing





fresh produce from local farm-to-school programs.



KEEPING IT CLEAN & SAFE

Replacing the Sink

Automated dishwashers started appearing in the 1920s in restaurants, hotels, the homes of the wealthy—and, likely, schools. But they weren't common in home use before 1937, upon the production of smaller motors that made such

home-scale appliances possible. Much like refrigeration, the basic dishwasher design—a tub with water and soap delivery—has not changed significantly, even given higher-yield applications, tools and volume. So, where do things

stand today with the "classic" school warewasher? Let's look at the product line of just one manufacturer as an example.

According to Jim Klimt, vice president of sales for Duke Manufacturing,

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DID You KNOW?

A woman created one of the first successful models of a dishwashing machine shown at the World's Fair in 1893. Josephine Cochran, granddaughter of John Fitch, the inventor of the steamboat, was wealthy and enjoyed entertaining. Her servants washed dishes, but she sought a machine that could do the task faster and without breaking expensive plates. Her machine design proved popular with hotels and restaurants decades before the machines were adopted for homes, and her company eventually became the KitchenAid corporation.



the two- or three-compartment sink for pans, pots and other kitchen ware has long reigned as the standard in schools. Manufacturers continue to use that basic format, adding power and efficiency within the structure. For example, systems like Duke's SteelKor XStream are designed to improve the way 18x26 food pans—and many similar foodservice items—get clean through the use of 21 jets in each bay of its "motion sink." Users can

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When it comes to serving school meals in Alaska, the processes of transport-delivery and the installation of new equipment can bring great stress and challenge. In Kenai Peninsula Borough School District, Director of Student Nutrition Services Dean Hamburg, SNS, recalls Summer 2011, when he needed a two-door reach-in refrigerator for the K-12 school (total enrollment: 90) in Nanwalek, located at the extreme southwest point of the Kenai Peninsula.

Nanwalek School is not connected to the already-limited road system in Alaska. The village is served mostly by small aircraft and the occasional landing craft on the English Bay beach just below the school. But, explains Hamburg, a two-door reach-in refrigerator does not fit in the small Cessna 206 planes that fly to the village. Option #2: Charter a small landing craft.

The refrigerator was loaded in Homer (at the end of the road system for all of North America), and good weather allowed the landing craft to make the crossing, timing delivery with high tide to get a maximum reach up the beach. So far, so good. School staff met the landing craft with a pickup truck. Watching wave action and guarding against the truck tires sinking into the beachside mud, the equipment was rocked and flopped into position on the truck for the short drive—up a hill. After "much grinding and jerking momentum," the truck arrived, and the refrigerator was scooted on its side into a space near the kitchen.

Fast forward to late August and preparations for the start of a new school year. Uh-oh—the kitchen team discovers that the compressor has been damaged. When and how don't really matter; the challenge is to get it to work! A supporting repair vendor is contacted, who agrees to fly out to the school and fix the unit. The total transport and repair cost was roughly equal to the purchase price of the equipment. "Budgeting for the anticipated and significant transport needs for school meal equipment is a very real part of school meal operations in rural America," notes Hamburg.

simply drop dirty items in the sink and let the system do the hard work instead of scouring by hand. "It's the pinnacle of warewashing," insists Klimt. A companion system, the SteelKor XClean, uses the same technology to clean and sanitize cookware and dishware.

Newer to the K-12 school market is the automated vegetable wash sink. With the rise in popularity of the farm-to-school movement, many school nutrition operations are receiving produce—from their own gardens or local farmers—that has not been cleaned or processed, thus requiring more labor time and effort. In response, Duke has introduced its XGreen produce wash system. Produce is loaded into a wash tub and agitated with a produce wash (Fit by Proctor and Gamble) to

remove 99.9% of the contaminants on the food. The system also provides documentation of the date, time and method of cleaning for food safety records.

WHAT'S NEXT?

Foodservice equipment fits the schools of today, the foods of today and the students of today. In many ways, it's a far cry from the "old" days. Mike Burke remembers Mrs. Bruns making delicious yeast rolls by hand in the school kitchen every day. That just-out-of-the-oven odor and flavor is something he's never forgotten, and he laments the decline of full-fledged scratch baking in schools. Still, dynamic, multi-functional equipment, combined with cost-effective ingredients and a speed-scratch mentality, means that many of



today's students are being treated to a similar experience that they will remember when they have school-age children of their own.

What will be the *next* innovation in cooking, cooling or cleaning technology? Manufacturers are understandably reluctant to divulge or preview the advances they hope will give them the competitive edge. In general, there has been a greater shift to incorporating digital technology into equipment. Sure, digital readouts replace dials, and internal sensors hope to make hand-held probes obsolete, but manufacturers are pushing farther with more customizable programming, monitors, documentation and alerts. Beyond that, will there be a genuine evolution in the kitchens of tomorrow? Time will tell. But there's one likelihood to count on: Foodservice equipment will continue to play a significant role in the challenge of getting children to eat nutritious meals at schools. **SN**

Penny McLaren is a freelance writer in Vancouver, Wash., and a former editor of this publication. Photos courtesy of **ITW Food Equipment Group** and the **National Food Service Management Institute** (*collections of the Secretary of Agriculture and Earnestine Camp*).

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