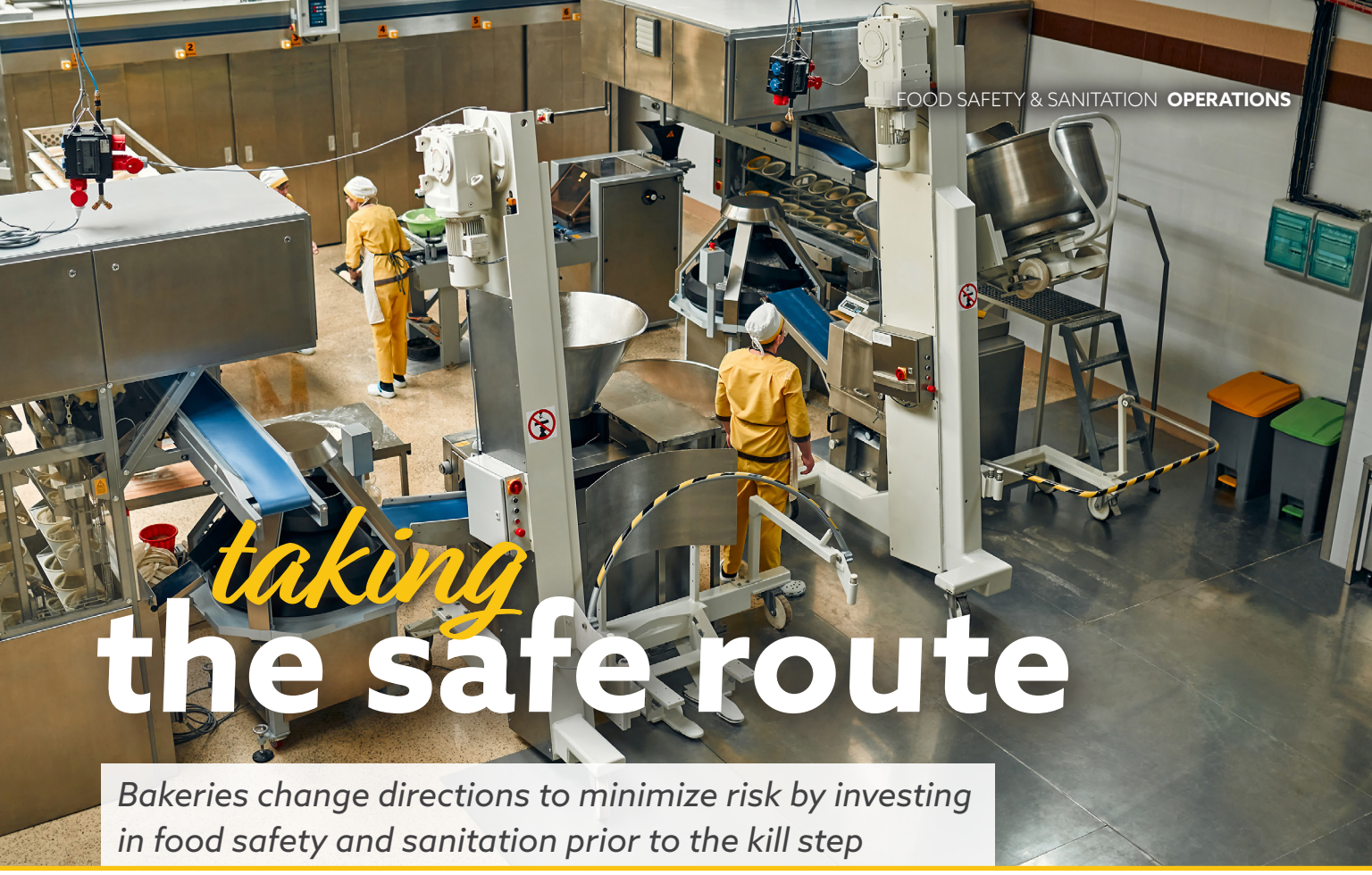


taking the safe route

Bakeries change directions to minimize risk by investing in food safety and sanitation prior to the kill step

by Dan Malovany

Pay now or pay later. That's the message that bakeries eventually learn, and sometimes the hard way, when it comes to food safety and investing in their operations.

"Equipment that lacks hygienic design features often suffers from mechanical failures due to chemical corrosion or moisture ingress, leading to unplanned downtime and increased maintenance costs," said Wan Mei Leong, food safety specialist, Commercial Food Safety (CFS), an Intralox company.

Over time, she added, the increased operational efficiencies and risk reductions outweigh the initial investment, making hygienic design a cost-effective and proactive approach to food safety and business performance.

"Ultimately, equipment with a lower upfront cost but poor design may prove to be the most expensive option as it carries a higher risk of food safety incidents, such as product recalls or allergen cross-contamination, which can significantly harm a bakery's brand reputation and financial performance," Leong explained.

All too often, sanitation is an afterthought or brought into latter stages of the equipment purchasing process.

"Cleanability generally isn't criterion number one. Or number two. Or three," said Richard Walsh, senior staff scientist at Ecolab. "It's easy to see how and why this happens, but completely deprioritizing it is a mistake. When expensive equipment winds up being difficult to clean thoroughly, you pay for it down the line in higher food safety risk and more labor-intensive cleaning and sanitation procedures."

Perhaps bakers should answer a few key questions before making an investment.

"How easy will it be to clean and sanitize?" Walsh asked. "Does the equipment come apart in such a way that facilitates simpler and more thorough cleaning and sanitation? Are there high-risk components that will inevitably turn into a harborage point nightmare down the line?"

It's not necessarily that a penny saved is a penny earned when purchasing a new mixer, divider or another integral piece of equipment that's designed to boost capacity and the bottom line. It's much more than that because food safety and proper sanitation come with many hidden costs.

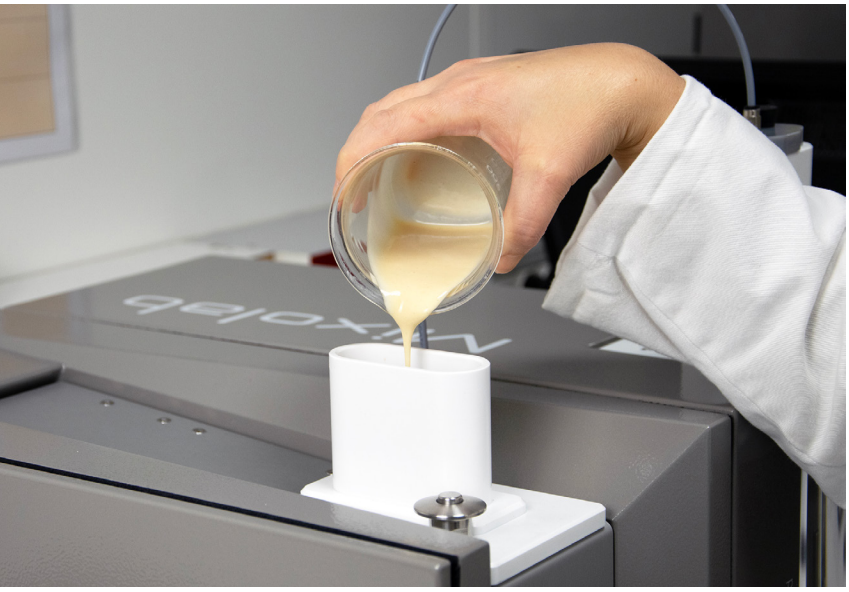
"If a bakery can save two hours a day on cleaning time, at $20 per hour for five days per week, the savings would be over $10,000 per year," said Mark Weighner, president, *vericuda.com*, a food safety compliance platform built for food manufacturers. "While this is a significant amount of cost savings, it could easily pale in comparison to costs associated

Food safety and sanitation are integral parts of the total cost of ownership when purchasing new equipment.

with customer complaints and recalls caused by unsanitary equipment. Equipment that is easy to clean appropriately inherently has lower risk of contamination, allergen cross-contact and/or recall."

With steadily rising costs this year, bakeries are exploring additional alternatives to drive efficiency and lower overhead. Here, hygienically designed equipment can become a part of that equation because it impacts so many parts of the operation, noted Sarah Day, director of education and standards, American Society of Baking, and secretary to the society's Z50 Safety and Sanitation Committee.

"Obviously, it affects labor in terms of your downtime, your changeovers, your cleaning, your maintenance team and even inspections and product loss," she stated.



With many master bakers retiring from the industry, bakeries are exploring at-line testing of doughs to provide quality assurance.

Leong mentioned that the return on investment (ROI) for hygienically designed equipment can be quantified by evaluating the reduction of risk and the total cost of ownership (TCO) over time, rather than just the initial purchase price. In many cases, the initial cost of a piece of equipment typically represents only about 10% to 15% of its total life-cycle cost, while the remaining 85% to 90% is driven by ongoing operation, maintenance and sanitation.

"By engineering equipment for faster, more effective cleaning, a facility can convert non-productive sanitation hours back into profitable production time, creating a measurable financial return that far outweighs the upfront premium," she observed. "Additional financial benefits come from extended equipment life, fewer maintenance issues and improved compliance with regulatory and audit standards, which can

ASB, BEAG seek to heighten food safety and sanitation standards

Thoughtfully designed equipment that enables proper cleaning should not be optional. Rather, it should be a minimum requirement that enables the baking industry to continue to deliver safe, high-quality food, noted Jeff Shura, senior vice president of engineering and technology at Flowers Foods, Thomasville, Ga., and chairman of the Bakery Equipment Assessment Group (BEAG).

That group's mission is to advance standards and best practices for bakeries through ANSI/ASB Z-50 aligned equipment.

Shura said the ANSI Z-50 standards were developed by a group of bakers, equipment manufacturers, industry experts, sanitation and food safety professionals, consultants and academics to establish the design elements necessary to ensure people and food safety.

"Following the ANSI Z-50.2 sanitary design standards will ensure equipment and building finishes in higher-risk areas — and where water may be used during cleaning — are designed to facilitate inspection and allow for the proper cleaning of any surface, niche or component that may be a harborage for microbiological and chemical risks," he explained.

The updated ANSI Z-50.1 standard was released earlier this year, and the process to update the ANSI Z-50.2 standard recently kicked off. The American Society of Baking (ASB) is seeking nominations for subject matter experts to participate in the revision of the ANSI/ASB Z-50.2 Standard for Bakery Equipment – Sanitation Requirements.

An ASB sub-committee will play a critical role in shaping the next version of this industry standard. Shura recommended that bakeries and equipment companies contact ASB to nominate a potential sub-committee member.

In addition, ASB is offering the BEAG Internal Equipment Evaluator certification course, designed to help baking industry professionals apply hygienic design principles in a practical, standards-based way. The course covers food safety laws, good manufacturing practice expectations and the ANSI/ASB Z-50.2 sanitary design criteria for bakery equipment, with a focus on cleanability, access, contamination prevention and proper equipment evaluation. Visit *beagroup.org* for more information.

KPM Analytics

protect brand reputation and prevent costly disruptions."

That risk of recalls is often overlooked in any calculation.

"If you have an unfortunate incident with a cross-contamination or with a pathogen, your ROI is in the toilet, right? We're talking about potentially millions of dollars with a recall," Day said.

Playing it safe

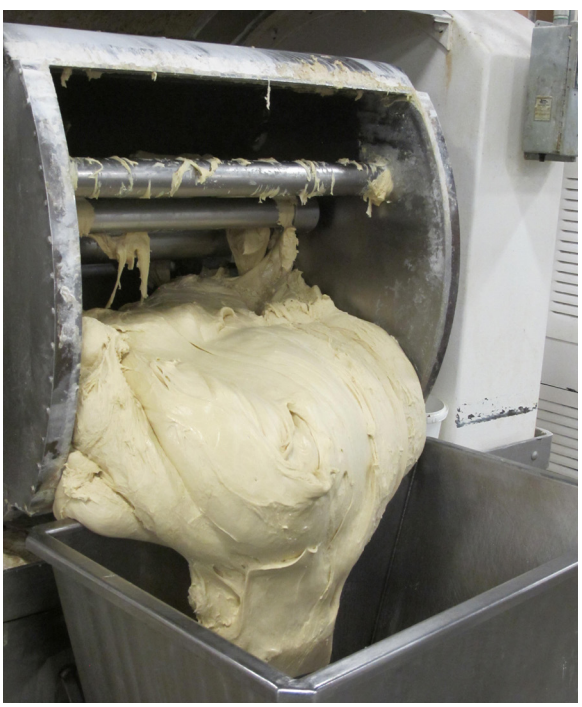
Sanitation procedures differ significantly before and after the oven or "kill step" where heat from the baking process effectively eliminates harmful microorganisms in food.

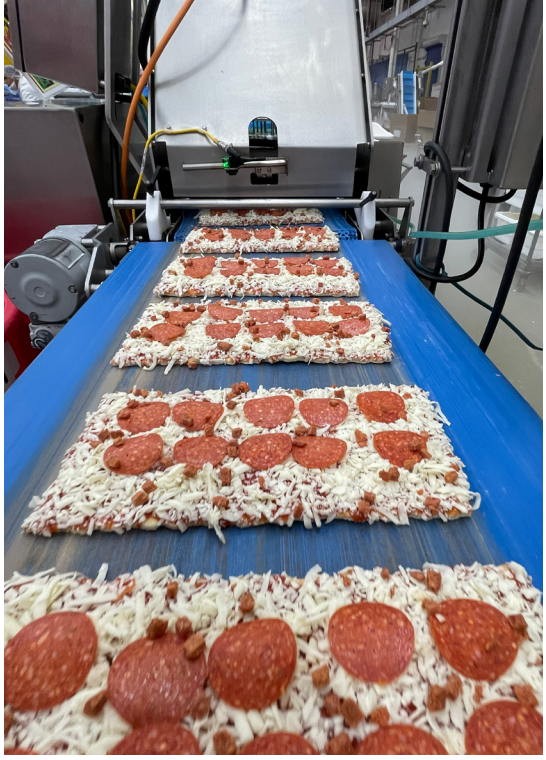
"Before the oven, wet cleaning is typically used because the product is still raw and heavier soils such as proteins and fats accumulate on equipment and require water, detergents, scrubbing and rinsing for effective removal," advised Stacey Prager, food safety manager, bakery and snack, for CFS. "The focus in this area is on reducing microbial loads and preventing buildup, recognizing that the subsequent heat step will eliminate most pathogens."

Pablo Coronel, senior fellow, food process and safety, CRB, emphasized thorough cleaning and sanitizing to prevent the growth of bacteria and molds that can generate toxins, such as salmonella or listeria, earlier in the baking process.

"At this stage, dough or batter have a high water activity, and most microorganisms will be able to grow because of this," he said.

Older mixers contain nooks and crannies that may harbor dough and other materials, thus requiring longer cleaning during changeovers.





Top: Pizza facilities require an extensive washdown to thoroughly clean belts, conveyors and makeup equipment. Bottom: Producing sweet goods may create challenging conditions for maintaining high levels of quality assurance.

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After the oven, Prager pointed out that dry cleaning methods are preferred to limit moisture, which can promote the growth of environmental pathogens and mold spoilage organisms in ready-to-eat (RTE) food areas.

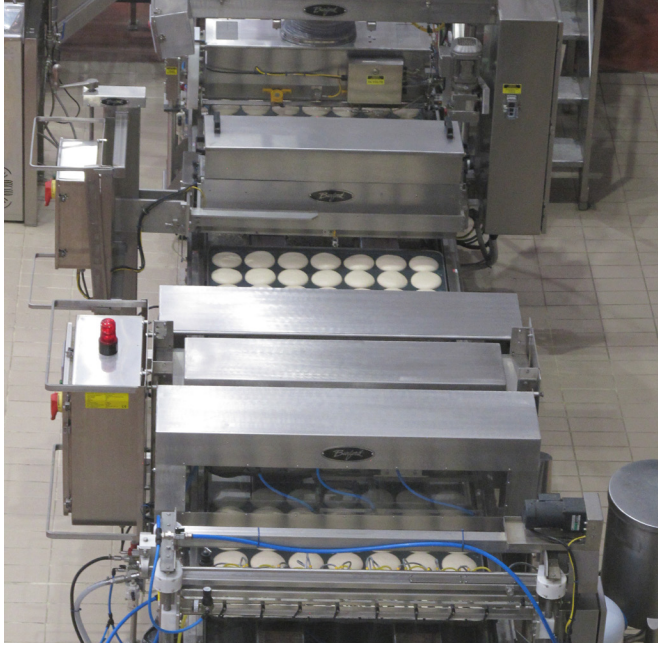
"Since no further kill step is applied, post-oven sanitation must be more stringent, incorporating thorough cleaning methods such as HEPA (high-efficiency particulate air) vacuuming, the use of approved sanitizers and dry steam cleaning," she said. "The use of compressed air should be minimized, as it can potentially spread allergens and airborne bacteria, increasing the risk of cross-contamination."

Weighner stated that "sanitation of post-bake equipment is more important than pre-bake." He recommended using alcohol and other non-water-based sanitizers to keep surfaces safe.

Additionally, good manufacturing practices should include dust control, handwashing and using uniforms and personal protective equipment (PPE) to preserve the integrity of finished products.

"An indicator of unsatisfactory environmental conditions is typically reflected by shorter than expected shelf life, especially with mold," he said. "While mold is not considered pathogenic, the higher the level of mold spores in the air is definitely reflected in shorter shelf life and would assume a higher risk of environmental contamination that could lead to illness."

With master bakers retiring or pursuing new lines of work, bakeries no longer can rely on them to manually inspect the texture and consistency of dough samples from the line, recalled Yuegang Zhao, chief commercial officer, KPM Analytics. That's why many



Hygienically designed makeup equipment should include easy-to-remove components to expedite sanitation.

operations are looking to standardize at-line dough testing to ensure product quality at the front of the process.

"At-line rheological testing of doughs and batters has become a quick and effective way to validate incoming flour quality and dough development," Zhao said.

"A benchtop-sized instrument like the Mixolab 300, which includes analytical software for testing doughs of all kinds, provides an objective reading of the sample for quality and consistency in as little as two minutes of testing time," he added. "This effort removes much of the guesswork and training time required to educate inexperienced operators on this important step in the baking process."

Up to today's standards

Day suggested that bakers purchase their equipment not just on production criteria.

"The question should not just be whether the mixer, conveyor or makeup system can run the line and how much output it has at the end of the day, but can it be easily accessed, inspected, cleaned and maintained in a sanitary condition over time?" she asked. "Are your surfaces smooth, cleanable and corrosion-resistant? Are there recessed fasteners or places that product could accumulate? Those are where you're going to have either contamination or cross-contamination issues."

Bakeries should calculate the amount of chemicals and water it takes to properly clean old vs. new mixers and makeup equipment, said Larry Van Nort, general manager, Americas, AIB International.

"Those are measurable ways to say, 'This will save us X amount per month or per year,' " he said. "With that older mixer, maybe you are getting really bad dough build up in it and have to shut down for 30 minutes every shift or every day. That's a lot of lost time that you need to clean it. Maybe it has grease buildup or glycol coming out of the mixing bowl jacket, so now you have product loss. With new sanitary-designed equipment, you're going to get a higher yield when you have a shorter changeover for cleaning and by eliminating any foreign-matter issues."

To slash sanitation time and water consumption, Van Nort also advocated dry cleaning as much as possible to remove old dough and soil material prior to wet cleaning of equipment at the front end of the process.

When it comes to food safety, bakeries are killing it in a good way by initially targeting those high-risk areas at the beginning of the production line as part of their overall enhanced cleaning and sanitation procedures. ●