GUEST COMMENTARY

A Call for Action to Increase the Scrutiny of Surface Cleaning and Cleaning Agents in Retail Food Establishments

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According to the most recent Food and Drug Administration (FDA, 2022) Retail Food Risk Factor Study, proper cleaning and sanitization of food contact surfaces in retail establishments remain an unmet need, with up to 60% of delis, fast food, and full-service restaurants failing to comply with the cleaning objectives for food contact surfaces set forth by the FDA model *Food Code*. While these results could reflect shortcomings with proper chemical sanitizer use, its critical preceding cleaning step (i.e., the effective removal of soils and particles that allow for viruses and bacteria such as norovirus or *Salmonella* to survive and infect individuals) is likely a significant performance culprit (Todd et al., 2007). Indeed, if tools were available to accurately evaluate proper cleaning of encrusted grease and food soils beyond a qualitative "clean to sight and touch" guideline, the actual incidence of environmental sanitation violations would most certainly increase (Kim et al., 2021).

This practice gap is critical, for without a proper cleaning step, visible and invisible food soils that linger on glasses, utensils, dishes, and general food contact surfaces can inhibit or quench quaternary, chlorine, iodine, or lactic acid sanitizing chemistries, thus rendering food contact sanitizers ineffective (Araújo et al., 2013; Lambert & Johnston, 2001). Further, because foodstuff is much less heat conductive than glass, ceramic, or metal surfaces, food soils on contaminated surfaces can also insulate these surfaces from achieving the proper temperature thresholds required to inactivate bacteria and viruses in applications that leverage hot sanitization strategies. Accordingly, overlooking the cleaning step can result in a false reassurance of sanitation and heightened risk for foodborne infection transmission.

Unfortunately, the regulatory framework described in Chapter 4 of the *Food Code* appears to lack enough granularity to help end users and health inspectors evaluate the cleaning process outcomes. "Clean to sight and touch" might meet the need from an intent perspective, but its real-life execution is much more complicated. Invisible soils such as starches and specific proteins can easily be missed on dirty surfaces. Indeed, many soiled surfaces appear to be clean, which has been widely documented in the healthcare industry as a major risk factor for infection control professionals in the struggle to mitigate transmission of infectious pathogens (Sherlock et al., 2009). Further, touching a surface can reintroduce contaminants onto areas that had previously been cleaned. More importantly, this cleaning success criteria relies on the sensorial perception from food establishment employees and health inspectors on if surfaces meet the criteria.

Unlike registered sanitizers and disinfectants whose public health claims have been judiciously scrutinized by the U.S. Environmental Protection Agency (U.S. EPA) to ensure they perform as advertised, cleaning agents and products typically used in retail food establishments (i.e., products that are not registered by U.S. EPA or lack public health claims) are not required to undergo performance validation by regulatory agencies. This lack of cleaning performance oversight by reguatory entities affects the vast majority, if not all, of the cleaning agents and products used in the first compartment of commercial kitchen sinks or in mechanical warewashing machines, among others. As a result, the performance of cleaning and detergent products against food soils is not assessed by independent entities.

So, what options are we left with? Instruments that can measure cleanliness on a surface do exist, but they are costly; complex to use, calibrate, and maintain; and are primarily left for applications in healthcare or food manufacturing. Their main practical focus has in many cases been reduced to training cleaning staff rather than quantifying soils (i.e., was a target surface left untouched by the cleaning staff?). Further, their relevance and accuracy have sometimes been the subject of scrutiny among the scientific community (Omidbakhsh et al., 2014).

What is more beneficial in this cleaning and detergent product performance vacuum is a combination of the following framework we call the four Ps: product, procedure, place, and practice.

Product

Not everything that foams is a cleaning agent, and not every cleaning agent is good at cleaning. Commodity cleaning agents and products are formulated with limited amounts and types of ingredients that fail to tackle the incredibly large number of soils encountered in a retail food establishment. These commodity products do not always keep up-to-date with changes in food marketplaces or regulatory trends. For example, moving from animal-based fats and oils to plant-based ones (e.g., canola, soy, corn, coconut, sunflower) to combat the adverse health effects of the former created an unintended cleaning issue.

Plant-based oils interact with oxygen and moisture in the air and the heat of the cooking process functions to "cure" these oils, hardening them onto the ware surfaces. These hardened oils might not be removed easily with commodity cleaning agents and products and could create the need for additional labor or rewash to improve results. Whenever possible, using cleaning agents and products with a demonstrated strong history of superior cleaning performance and innovation is best. Otherwise, user directions for many food contact sanitizers—such as "preclean visible soils"—places the burden on the end user to guess when soils have been visibly cleaned.

An important case is the use of single-detergent sanitizer or cleaner sanitizer products

for soil cleaning. The type and concentration of ingredients used in their formulation is restricted by the norms set forth in CFR 40 §180.940. These special products are formulated to be safe enough to be left on food contact surfaces without the need for a potable water rinse. The performance trade-off, though, is their cleaning power against hardened food soils might be limited, because very powerful cleaning agents are excluded from CFR 40 §180.940. As such, using a proper, alternative cleaning and detergent product followed by rinsing with potable water could provide a better cleaning outcome.

Procedure

Cleaning agents and products will not do the job if they are not used according to label instructions and the processes they were designed for. Reading labels, though, can be a burden for employees in a retail food establishment. Instead, clear, succinct, and primarily visual instructions and procedures for how to use a cleaning agent or product are crucial to achieve the cleaning goals of the *Food Code*. Items that need to be covered in the instructions and procedures include how much cleaning agent to dilute or apply directly on a surface, soaking time if recommended, water temperature requirements, and cleaning tools; these steps are the most common, necessary ones for manual cleaning of food contact surfaces. Meticulously following all steps in a procedure while using inferior commodity cleaning agents and products might not achieve the proper food soil removal.

Place

According to the Conference for Food Protection (2016), "cleaners should be used according to a Sanitation Standard Operating Procedure (SSOP) specific to a location or piece of equipment being cleaned." Cleaning a deep fryer requires a different performance strength from the detergent of choice compared to products intended for a salad bar. Likewise, cleaning agents and products that meet the cleaning needs in a steakhouse or sit-down restaurant will differ from cleaning agents and products that can do the job in a limited-capacity coffee shop.

Practice

Personal hygiene shortcomings (e.g., lack of handwashing etiquette, touching foods with contaminated hands, working while ill or failure to report an illness, among others) is a major driver of food-related outbreaks. Personal hygiene is correlated with knowledge, attitudes, and behaviors of food service managers and employees alike (Pragle et al., 2007), and those same factors affect the perception by food service managers and employees of the cleanliness of surfaces in the retail establishment. The person in charge and—equally importantly—the health inspector must educate food service workers (and validate the learnings acquired) about the importance of effective surface cleaning through proper training and continuous monitoring and improvement.

Conclusion

Cleaning should not be regarded as a chore. Proper cleaning of surfaces in food service establishments remains an opportunity—and with it, an improvement—in mitigating a major risk factor for transmission of foodborne pathogens. Implementing the appropriate cleaning tools, superior cleaning agents and products, easy-to-execute procedures, and the right mindset will help achieve these goals.

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