AUGUST 2025

INDUSTRY REPORT

Food Safety and Sanitation Trends

End User, OEM, and Supplier Perspectives

CLEANLINESS · COMPLIANCE · COLLABORATION

PMMI Business Intelligence

pmmi.org

This report adheres to the following definitions of food safety and sanitation.

Food Safety: The body of regulations, requirements, and processes end users in the food and beverage manufacturing industries follow to mitigate risks like allergen cross-contamination and foodborne illness.

Sanitation: The cleaning processes and procedures conducted by end users in the food and beverage manufacturing industries to ensure proper food safety.

The findings in the PMMI Food Safety and Sanitation Report are based on insights from 130 surveys/interviews with industry professionals.

77%

End Users (CPGs, Contract Packagers)

23%

OEMs and Suppliers

What We Do

PMMI is a global resource for the packaging and processing industry, uniting the industry across the manufacturing supply chain. Our members promote business growth in a variety of industries by developing innovative manufacturing solutions to meet evolving consumer demands, today and in the future. PMMI membership represents more than 1,000 manufacturers and suppliers of equipment, components, and materials as well as providers of related equipment and services to the packaging and processing industry.

PMMI connects consumer goods companies with our members' manufacturing solutions through the world-class PACK EXPO portfolio of trade shows, including: PACK EXPO International, PACK EXPO Las Vegas, PACK EXPO East, PACK EXPO Southeast, EXPO PACK México, and EXPO PACK Guadalajara.

About This Report

The Food Safety and Sanitation Report was researched, compiled, produced, and designed by DDR/REACH in cooperation and support of PMMI. DDR/REACH is a specialized research and business development house delivering a broad range of packaging industry reports and white papers for over a decade. We are subject matter experts across many topics in B2B manufacturing and are adept at synthesizing in-depth VOC interviews, broad-reaching survey data, and voluminous secondary research into digestible and actionable intelligence.

PMMI The Association for Packaging and Processing Technologies
12930 Worldgate Drive, Suite 200 | Herndon, VA 20170
Phone: (571) 612-3200 | **pmmi.org/research**

Publication Date: August 2025
Jorge Izquierdo, Vice President, Market Development, PMMI
Rebecca Marquez, Director, Custom Research, PMMI
Grace Lee, Manager, Market Research, PMMI

CONTENTS

FOOD SAFETY AND SANITATION ARE CRITICAL

Food safety and sanitation are bedrock principles of the food and beverage manufacturing industries, shaping everything from manufacturing processes to machine design. Adhering to food safety regulations and effectively executing sanitation strategies are not mere considerations for manufacturers of food and beverage products—they are essential mandates enforced by government regulations. These practices also serve as vital strategies for protecting customers from allergens and foodborne illnesses and guarding brands against costly and reputation-damaging recalls.

Fortunately for end users, OEMs and suppliers in the food and beverage industry are keenly aware of the food safety and sanitation challenges faced by their customers. From incorporating food safety- and sanitation-compliant design features into their machinery to offering consulting services for navigating, OEMs and suppliers play an important role in helping end users maintain safe and compliant operations.

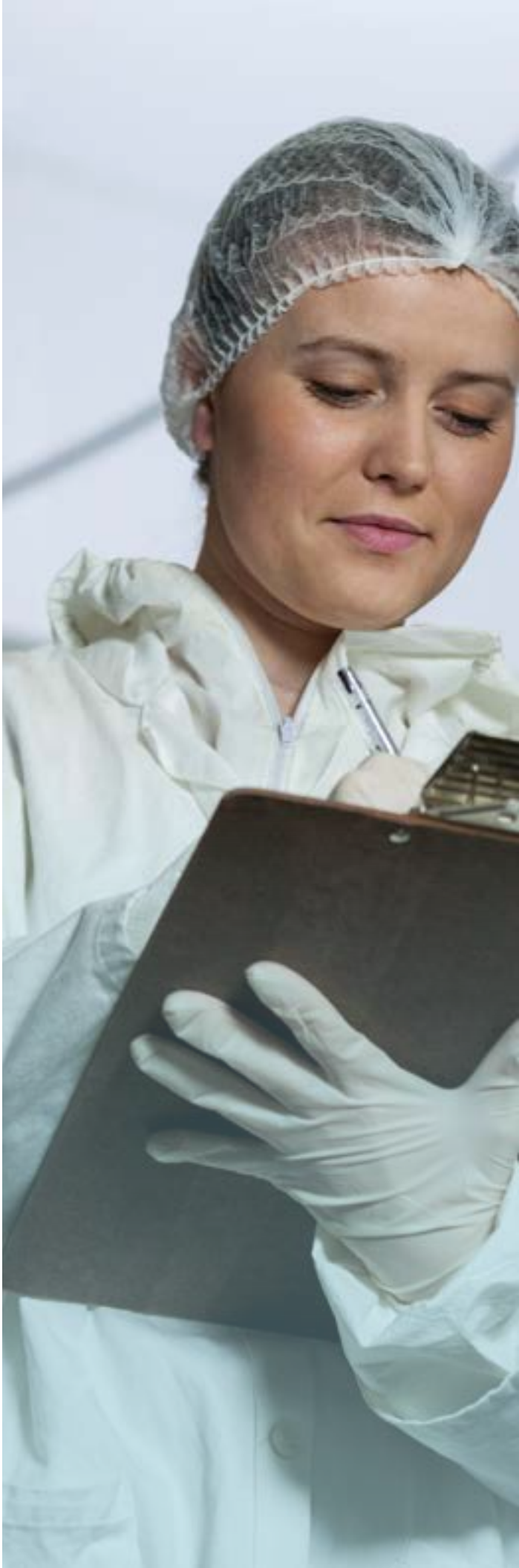
In this report, PMMI gathered insights from end users, OEMs, and equipment suppliers in the food and beverage industries to better understand the unique needs and challenges faced by these different groups.

- How are end users accomplishing their sanitation processes, and who is responsible for executing them?
- What are the biggest challenges end users face in meeting regulations and carrying out sanitation procedures?
- Which machine features and services do end users most need from OEMs and suppliers to better support their food safety and sanitation goals?
- What challenges do OEMs face in designing sanitation-focused machinery?

This report will shed some light on these questions and more to help guide OEMs and suppliers toward collaborative solutions that will enhance their machine and service offerings, while supporting their customers' food safety and sanitation objectives. Through close collaboration and candid discussions, OEMs, suppliers, and end users can arrive at mutually beneficial solutions that promote safer, more compliant manufacturing.

> "There really needs to be more communication between OEMs and end users about the actual sanitation of the equipment. OEMs can bring so much more value than just a unique piece of equipment."

General Manager, *Commercial Food Sanitation Expert*



U.S. GOVERNMENT REGULATIONS, STANDARDS, AND ENFORCEMENT BODIES

Federal Legislation

Food and beverage manufacturing is regulated by the Food Safety Modernization Act (FSMA), federal legislation passed in 2011 to oversee food and beverage safety. A stepped program, the final enforcement date is approaching in July 2028.

Agencies and Enforcement Bodies

Two agencies are primarily responsible for enforcing food and beverage regulations at the federal level in the U.S.: the United States Department of Agriculture (USDA) and Food and Drug Administration (FDA). Their primary enforcement bodies include:

- Food Safety and Inspection Service (FSIS), part of the USDA
- Center for Food Safety and Applied Nutrition (CFSAN), part of the FDA

At the state level, each state's State Food Protection Program (such as a department of agriculture or a department of public health) is responsible for ensuring adherence to federal food and beverage regulations. Exact structure and organization of these programs varies from state-to-state.

Federal Standards

Hazard Analysis Critical Control Point (HACCP): HACCP programs use a systematic approach to identify microbiological, chemical, and physical hazards in the food supply, and establish critical control points that eliminate or control such hazards. These programs include critical standards like the Pathogen Reduction Program to guard against contamination. Both the USDA and FDA issue their own HACCP standards.

Current Good Manufacturing Practices (CGMPs): a collection of regulations and standards regulating the quality and safety of food and beverage products. CGMPs are set primarily by the FDA, with input from the USDA.

FSMA: Manufactured Food Regulatory Program Standards (MFRPS), part of Integrated Food Safety System (IFSS), a program mandated by FSMA.

Collaborate with Customers

Regulations and standards for food and beverage manufacturers are elaborate, with numerous sub-organizations within the USDA and FDA responsible for direct enforcement and oversight. Depending on the facility, end users may need to follow a diverse array of regulations and standards to remain in compliance, and report to a variety of regulatory bodies. International manufacturers selling their products into the U.S. are also beholden to these requirements. It is important for OEMs and suppliers to work closely with their customers to stay informed about applicable regulations and standards and adjust machinery and services accordingly.

NON-GOVERNMENT STANDARDS AND CERTIFICATIONS

In addition to government agencies and federal standards, there are a variety of independent organizations that provide standards and certifications for the food and beverage industry. These standards are not mandated by law, but are frequently used to provide structure for adhering to government regulations. These standards can cover end users, OEMs and suppliers, or both. The following are only common examples – there are a host of other organizations, standards, and certifications that will need to be considered.

NSF International and American National Standards Institute (NSF/ANSI)

NSF and ANSI collaborate to produce joint NSF/ANSI standards for food and beverage manufacturers. The guidance covers a wide variety of food manufacturing practices and machine design considerations, with dozens of individual standards.

Safe Quality Food (SQF)

SQF is a food safety program created and managed by the SQF Institute. The standard is a globally recognized food safety and quality management system that helps businesses meet regulatory requirements at all stages of food production.

Foundation FSSC

FSSC 22000 is a third-party certification managed by Foundation FSSC and governed by an independent board of stakeholders, which consists of representatives from several sectors in the food industry. FSSC 22000 is used to control food safety risks. The system is closely related to ISO 22000 and shares the same number designation.

3-A Sanitary Standards (3-A SSI)

3-A develops standards for the food and beverage industry that cover regulatory sanitarians, equipment fabricators, and processors. 3-A SSI maintains an extensive inventory of design criteria for equipment and processing systems and oversees the 3-A Symbol Authorization program and other voluntary certificates to help affirm the integrity of hygienic processing equipment and systems.

International Organization for Standardization (ISO)

ISO 22000 is an international standard that specifies the requirements for a food safety management system (FSMS). The standard integrates the principles of the Hazard Analysis and Critical Control Point (HACCP) system. It combines generally recognized key elements to ensure food safety, including interactive communication, system management, and prerequisite programs.

RECALLS STEADY, BUT THE SOURCES SHIFT

USDA and FDA

In the U.S., food and beverage oversight is managed by the USDA and the FDA. The USDA is responsible for all meat and egg oversight (about 23% of the market), while the FDA covers the remainder of food and beverage products (about 77% of the market).

FDA Recalls Rise as USDA Recalls Fall

Overall, the number of combined USDA and FDA recalls remained relatively steady from 2023 to 2024:

Total food recalls 2023 **313**

Total food recalls 2024 **296**

The USDA reported a decline in recalls in 2024 compared to 2023, while the FDA reported an increase:

USDA

55 recalls in 2024, a 38% decline from 2023

FDA

241 recalls in 2024, an 8% increase from 2023

Historically, the number of recalls has averaged between about 300 and 400 per year since 2018.

Recall Events by the Numbers: USDA and FDA Combined

Reasons for a recall are numerous, but three categories account for nearly three-fourths of all events: undeclared allergens, listeria, and salmonella.

Undeclared allergens

101 recall events (34%) in 2024; down from 154 in 2023.

Listeria

65 recall events (22%) in 2024; up from 47 in 2023.

Salmonella

41 recall events (14%) in 2024; up from 27 in 2023.

While the number of recalls remained relatively steady in 2024, the number of illnesses reported from recall events increased from 1,118 in 2023 to 1,392 in 2024.

Sources: US Food and Drug Administration (FDA); US Department of Agriculture (USDA)

Executive Summary

SANITATION STRATEGIES

To ensure thorough cleaning, end users typically rely on a combination of different sanitation methods, performed at different times throughout the production cycle.

Top Three Cleaning Strategies at End Users

76%

Report spot cleaning during production shifts

68%

Carry out scheduled full sanitation shutdowns for cleaning

67%

Deploy rotational cleaning during line idles or changeovers

End users report an array of strategies to carry out their sanitation processes and adhere to food safety requirements. For the most part, end users prefer to use a combination of different sanitation methods, primarily executed by their own internal sanitation teams.

86% Of end users indicate they use a combination of both CIP* and COP* processes in their operations.

75% Of end users report using both wet and dry sanitation processes in their operations.

73% Of end users rely only on internal teams to execute their sanitation processes.

**Clean-in-Place (CIP), Clean-Out-of-Place (COP)*

REGULATIONS, CERTIFICATIONS, AND COMPLIANCE

Adhering to food safety and sanitation regulations is essential for food and beverage manufacturers, and machine design plays an important role in compliance. End users report a number of different ways to measure sanitation compliance. Even with the measurements listed below, end users face frequent challenges in meeting regulations and are actively adjusting their operations and processes. Some end users have adopted third-party certifications as a way to enhance their sanitation and food safety processes.

End Users Use a Variety of Measurements to Track Sanitation

66% Measure microbial counts

39% Track adenosine triphosphate (ATP) readings

32% Test for potential contaminant proteins

Some end users also follow third-party certification standards.

44% Of end users adhere to 3A standards.

32% Of end users follow NSF 14159 standards.

Top Three End User Regulatory Challenges

Top Three End User Changes to Meet Regulations

75% Updated Sanitation Standard Operating Procedures (SSOPs)

72% Enhanced employee training and education

53% Implemented predictive/ preventive cleaning schedules

MACHINE DESIGN CONSIDERATIONS

End Users

End users report considering a variety of different sanitation and food safety machine features when evaluating new equipment purchases.

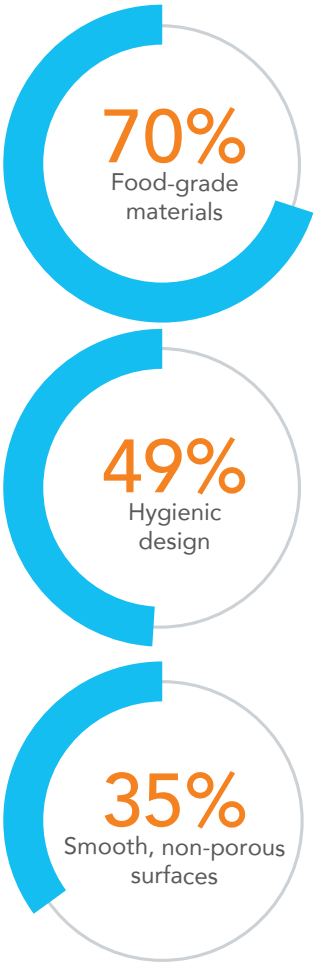
Top Three End User Considerations for Food Safety Features

73% Clear documentation and labeling

48% Automated monitoring of temperature, pressure, and flow

47% Fail-safe alarms for deviations from food-safe parameters

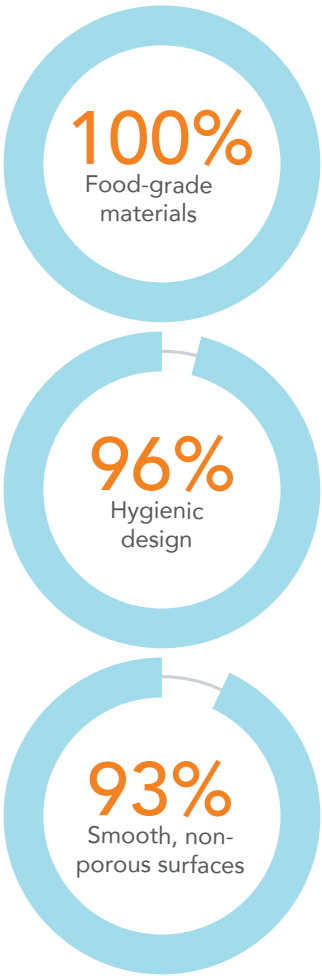
Top Three Sanitation Features End Users Consider During Selection



OEMs and Suppliers

OEMs include many standard sanitation and food safety design features on their machinery, with plans to add more automated and digitally integrated functionality in the future.

OEMs Top Three Machine Sanitation Features Offered Currently



OEMs Top Three Machine Sanitation Features To be Added in the Future

35% Automated or self-cleaning functions

35% Integrated, sanitation-safe HMI/PLC to log activity

27% Digital integration capability for sanitation processes

CHEMICALS AND DURABILITY

End users, OEMs, and suppliers agree that machine wear and corrosion are caused by harsher cleaning chemicals in sanitation processes:

63% Of end users report sanitation procedures have a moderate, high, or severe impact on the wear of their machinery.

63% Of end users indicate harsher cleaning chemicals either occasionally or frequently contribute to machine wear.

63% Of OEMs and suppliers see their customers using harsher sanitation chemicals.

56% Of OEMs and suppliers say those harsher cleaning chemicals are primarily damaging sensitive machine components like sensors and control panels.

Very few OEMs and suppliers provide any kind of chemical recommendations to their end users:

7% Of OEMs and suppliers provide chemical supplier preferred lists through direct partnerships.

11% Of OEMs and suppliers provide specific chemical supplier recommendations.

15% Of OEMs and suppliers provide lists of acceptable chemical suppliers.

End users, OEMs, and suppliers agree that the food and beverage industry could benefit from a standardized chemical resistance rating system on machinery:

82% Of OEMs and suppliers either somewhat or strongly agree there is a need for a standardized chemical resistance classification system for machinery.

66% Of end users either somewhat or strongly agree there is a need for a standardized chemical resistance classification system for machinery.

TRENDS, CHALLENGES, AND ASKS

End users in the food and beverage industries report several macro trends are having a direct impact on their operations.

Top Three Trends Affecting End Users

61% Labor shortages and employee turnover

59% New or changing regulations

52% Concerns about cross-contamination in the production space

The top trend reported by end users - labor shortages and employee turnover - is translating directly into operational challenges related to food safety and sanitation.

65% Of end users report getting employees to properly and consistently follow SSOPs is a challenge.

42% Of end users indicate training employees on new technology and equipment is a challenge.

End users of food and beverage equipment indicate they face a number of persistent headaches when it comes to sanitizing machinery.

Top Three End User Sanitation Challenges

33% Sanitizing small parts and components

28% Validating and measuring sanitation effectiveness

23% Condensation, pooling, and trapped moisture

To address these challenges, end users are asking for a number of different machine features and services from their OEMs and suppliers.

Top Three Machine Features and Services Desired by End Users

1. **40%** More all-stainless machine design
2. **36%** More CIP-capable machinery
3. **31%** More support developing SSOPs

MACHINE SPENDING

OEMs and Suppliers

OEMs and suppliers have good reason to be optimistic about the future of the sanitation-ready and food safety-compliant food and beverage equipment market. From a historic perspective, OEMs and suppliers mostly reported growth over the last three years.

52% Of OEMs and suppliers report selling more food safety-compliant machinery over the last three years.

41% Of OEMs and suppliers report selling the same amount of food safety-compliant machinery over the last three years.

End Users

End users predict healthy spending on food-safety and sanitation services and equipment in the coming year. A majority of end users indicated they intend to make a purchase of food-safety compliant and sanitation-ready equipment within the next three years.

93% Of end users predict spending the same or more on food-safety and sanitation equipment or services in **the coming year.**

68% Of end users anticipate buying food-safety compliant equipment within **the next three years.**

1

Sanitation Strategies

HIGHLIGHTS

Sanitation is an essential part of food and beverage manufacturing, protecting consumers from exposure to allergens and foodborne illness, and guarding brands against costly and reputation-damaging recalls. There are a wide variety of strategies, methods, and processes food and beverage manufacturers can pursue to craft comprehensive sanitation protocols. From our survey, the most common methods of sanitation reported include:

86%

Of end users indicate they use a combination of both CIP and COP processes in their operations.

75%

Of end users report using both wet and dry sanitation processes in their operations.

73%

Of end users rely only on internal teams to execute their sanitation processes.

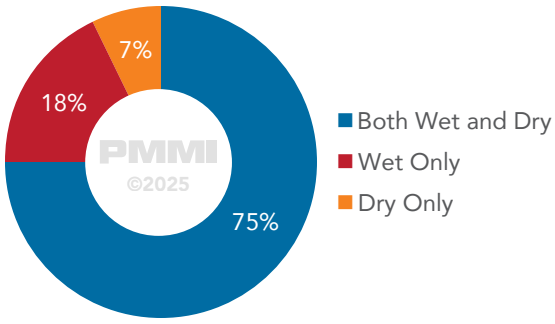
Understanding how food and beverage end users carry out sanitation is an important consideration for OEMs and suppliers. Factors such as wet vs. dry, CIP vs. COP, and internal teams vs. third-party contractors can have significant impacts on machine design and employee training. These findings provide OEMs and suppliers with valuable insights into common strategies used by food and beverage manufacturers, but it is also important to speak directly with individual customers to tailor solutions to each unique operation.

WET VS. DRY SANITATION

75%

Of end users report using both wet and dry sanitation processes in their operations.

End User Types of Sanitation Methods



There are two general, primary types of sanitation strategies:

Wet

Wet sanitation utilizes water and other liquid chemicals.

Dry

Dry sanitation involves methods such as wiping, vacuuming, scraping, and dry chemical cleaning.

"Electrical components are too often destroyed during our wet cleaning process from do-it-yourself covers. It would be more effective if the components had a custom fitted cover to better protect from moisture penetration."

Director of Quality Assurance, *Confectionery*

KEY TAKEAWAY

Both approaches have advantages and risks, and some processes are better suited to one method over the other. This is reflected in the fact that a majority of respondents report using both strategies. However, wet sanitation can pose challenges, including exposing sensitive components to moisture and accelerating machine wear. End users are encouraged to work with OEMs and suppliers to determine which sanitation methods are best suited to their specific equipment and operational needs.

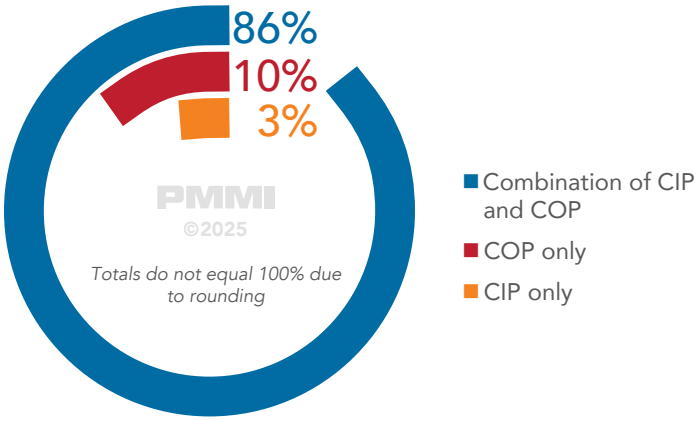
CLEAN-IN-PLACE (CIP) AND CLEAN-OUT-OF-PLACE (COP)

In addition to wet and dry sanitation methods, end users also must decide whether to utilize CIP or COP strategies. CIP allows machines to remain assembled during sanitation, while COP requires machines or parts of machines to be disassembled for cleaning.

86%

Of end users indicate they use a combination of both CIP and COP processes in their operations.

End User CIP and COP Use



COP: Two Main Approaches

End users can carry out COP sanitation either by disassembling machines and washing them on site or by removing critical components and sending them to a third-party provider for off-site cleaning and return.

> "Many machines come with CIP now which we are purchasing due to the lack of labor available. When used alongside our central cleaning systems, we achieve more thorough sanitation."
>
> **Senior Engineer,** *Fresh On-the-Go Food*

KEY TAKEAWAY

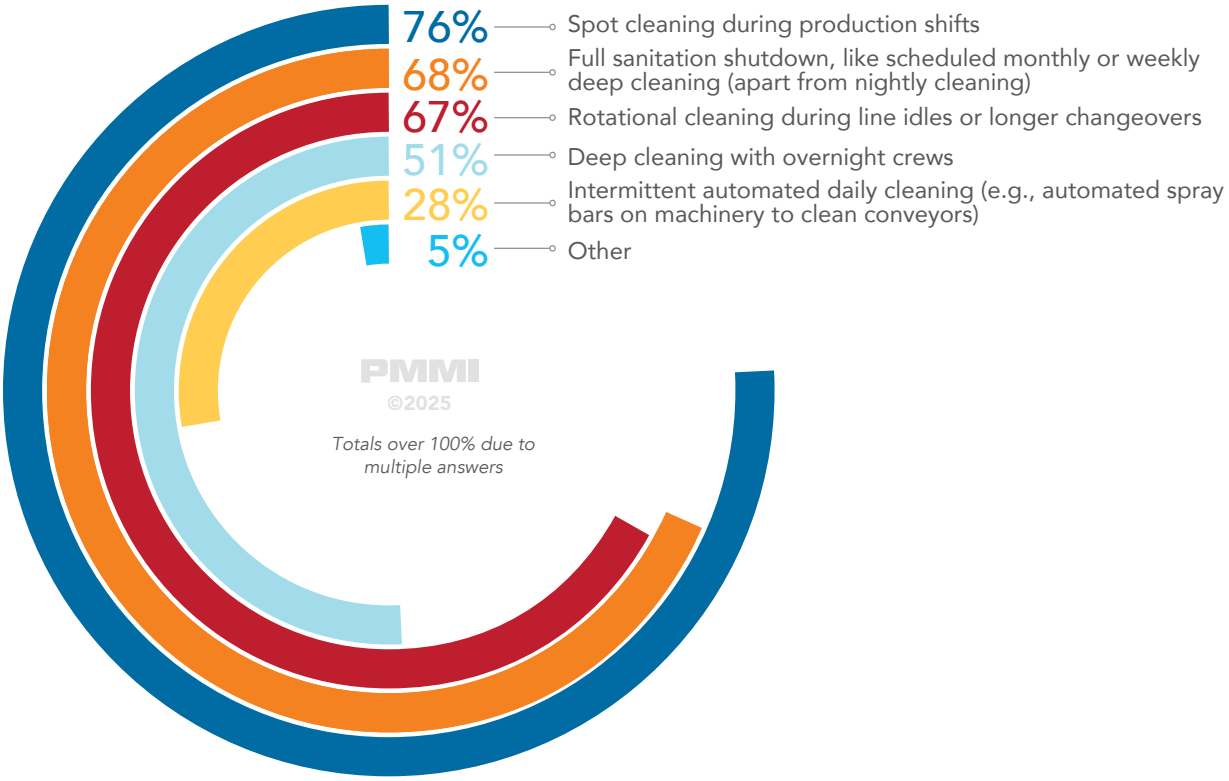
Much like the decision between wet and dry sanitation strategies, the choice between CIP and COP depends on the types of machines, and the nature of the processes, as well as the capabilities of employees.

CLEANING STRATEGIES AT END USERS

Many end users leverage a combination of cleaning strategies to achieve the level of sanitation required to meet regulatory standards. About three-quarters of respondents indicated spot cleaning during production shifts is a primary sanitation strategy.

> "We design machines to withstand heavy washdown environments, since the sanitary processes are different at each customer."
>
> Director of Engineering, *OEM*

End User Sanitation Strategies



KEY TAKEAWAY

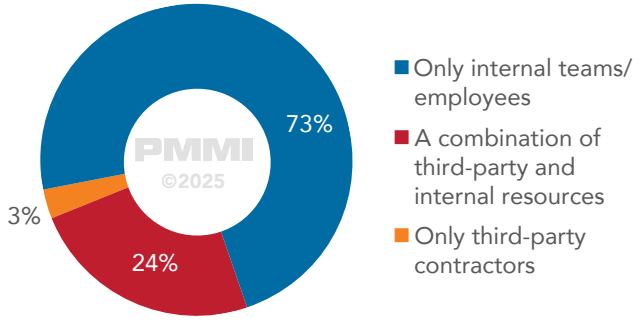
Currently, only 28% of end users report using daily automated cleaning strategies. As automated processes continue to proliferate across manufacturing, OEMs may need to consider incorporating more or updated automated cleaning technologies into the next generation of machinery.

WHO IS RESPONSIBLE FOR SANITATION?

End User Sanitation Responsibility

End users have a couple of options when it comes to who executes their sanitation processes. They may rely entirely on internal teams, hire third-party contractors, or use a combination of both.

73% Of end users rely only on internal teams to execute their sanitation processes.



KEY TAKEAWAY

Nearly all (97%) of end users are using internal teams to accomplish at least some of their sanitation processes. As labor shortages continue to challenge the manufacturing sector, OEMs and suppliers will need to evaluate whether their training and education for the cleaning of their equipment is comprehensive enough. Educational seminars, in-plant demonstrations, and detailed instructions (such as linked instructions on a scannable code on the machinery) are all valuable tools OEMs and suppliers can offer to support effective sanitation practices.

"From a macro trend, staffing continues to be a challenge to get the right people, the right skills, and then retaining them; not only in the QC department, but most departments."

Project Engineer, *Drink Mixes/Frozen Novelties*

"Even with thirty-year employees who have a high degree of familiarity, it's important to continue to train and reinforce the protocols for allergen handling to avoid cross-contamination."

Director of Operations/Sales, *CM/CP Food and Beverage*

2

Regulations, Certifications, and Compliance

HIGHLIGHTS

Food safety and sanitation processes in the food and beverage industries are governed by a number of different regulations – such as the Food Safety and Modernization Act (FSMA) in the U.S. and the Safe Food for Canadians Regulations (SFCR) in Canada – that end users must follow. Adhering to these regulations and keeping up with changes is an ongoing challenge and end users are looking to turn to OEMs and suppliers for help in navigating complex requirements.

Top Three End User Regulatory Challenges

54%
Training employees on regulatory requirements

36%
Getting all stakeholders on the same page

34%
Keeping track of regulations

In addition to government-mandated regulations, several third-party organizations offer industry- and product-specific certifications for machinery. End users report valuing different certifications depending on the industry, with the key takeaway being that these certifications play a role in end user decision making, meaning OEMs will need to be aware of design requirements for certifications their customers value. Equipment certifications from these organizations could be a differentiator during machine evaluations.

End Users Report Using Certified Machinery

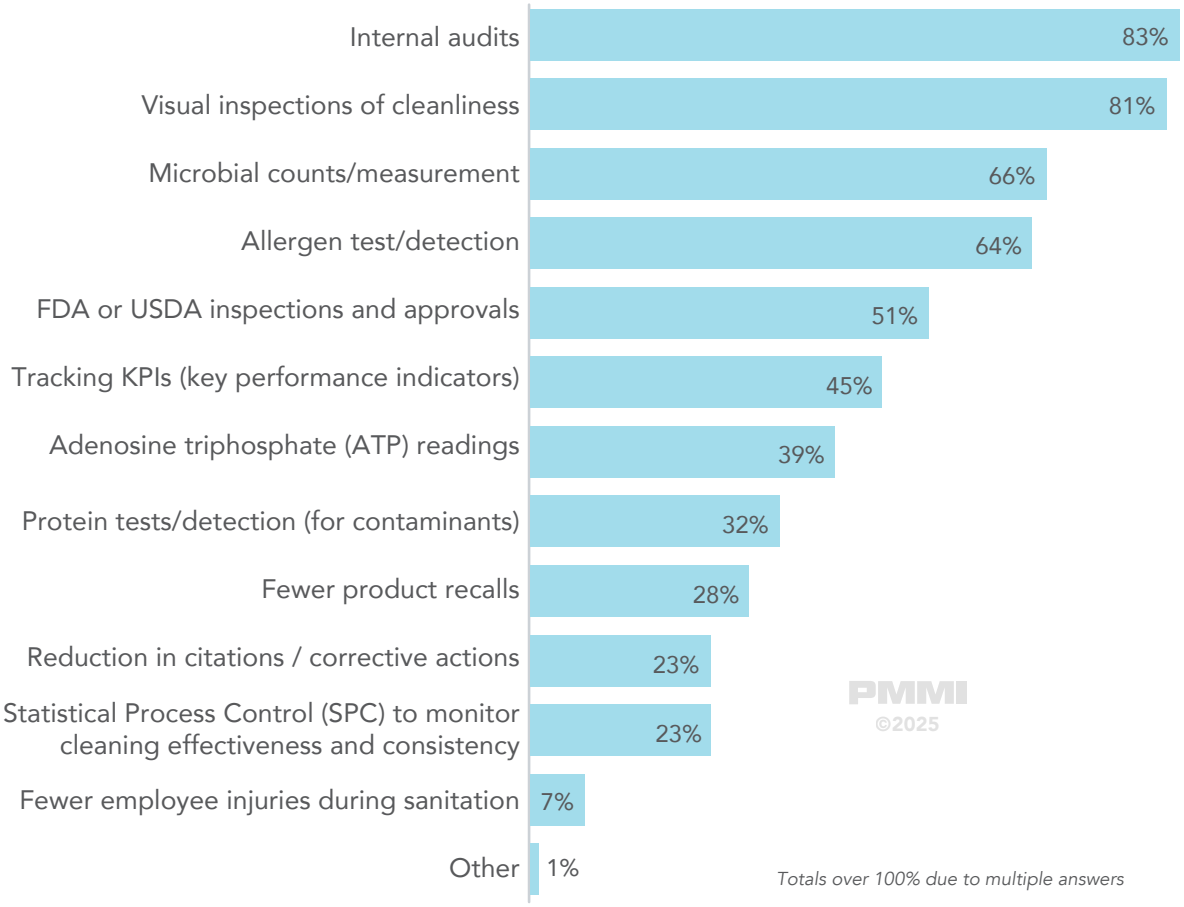
44% Of end users have machinery that adheres to 3A standards.

32% Of end users have machinery that adheres to NSF 14159 standards.

MEASURING SANITATION EFFECTIVENESS

End users deploy a diverse set of measurements, tests, and benchmarks to gauge the effectiveness of their sanitation processes. With internal audits being the most commonly used strategy (83%), OEMs and suppliers can work with end users to better understand how sanitation is measured and how machine designs can best support those efforts. This is particularly relevant for specific tests reported by end users.

How End Users Evaluate Sanitation Effectiveness

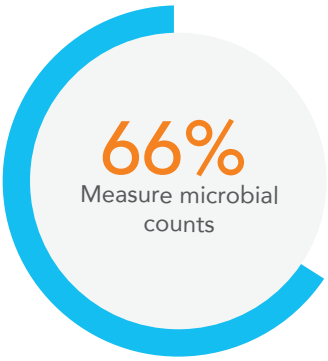


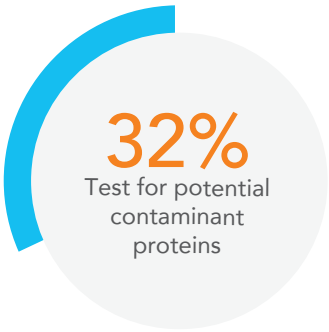
Totals over 100% due to multiple answers

> An absolute driver of asset investments is if our ATP swab program that measures cleaning effectiveness continuously fails. It then becomes a necessity to get the right tools or new equipment."

VP of Innovation/FSQA, *CM/CP Frozen Seafood and Produce*

End Users Measure a Variety of Specific Tests to Track Sanitation





KEY TAKEAWAY

One of the least-used measurement tools was Statistical Process Control (SPC), reported by only 23% of end users. SPC relies on a high level of operational data for effective analysis. OEMs and suppliers may need to consider both helping end users increase the volume of sanitation data collected and supporting efforts to analyze the data for potential improvements to cleaning procedures.

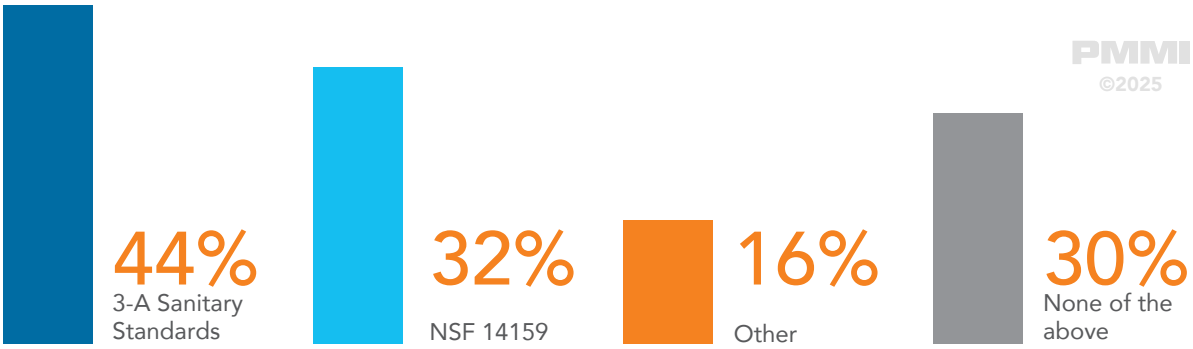
INDUSTRY-SPECIFIC CERTIFICATIONS

There are a variety of industry-specific standards that end users report following, particularly 3-A and NSF 14159:

3-A Sanitation is an equipment standard designed to ensure machinery used in the food and beverage industry can be effectively and efficiently cleaned. These certifications are maintained by 3-A Sanitary Standards, Inc. (3-A SSI) and include dozens of specific design requirements OEMs must follow to achieve compliance.

NSF 14159 is a machine design standard for meat and poultry equipment, created to ensure equipment can be effectively cleaned. Regulated by NSF International, the standard aims to prevent contamination and foodborne illness in meat and poultry products.

Standards End Users Follow



Totals over 100% due to multiple answers

KEY TAKEAWAY

While not all end users report using machinery that adheres to industry-specific standards, a majority do. OEMs that achieve these certifications have an opportunity to stand out to end users, and should promote the relevance of these certifications to their customer base – particularly certifications like NSF 14159, which may be especially important for OEMs serving a number of meat and poultry customers.

"We build to comply with 3-A standards and USDA regulations, but we'll meet any customer regulatory compliance that's in their specifications."

Director of Engineering, *OEM*

"Over the last two to three years, we've seen a mild uptick in food producers asking for products that comply with 3-A standards, as well as other European enforced regulations. We believe it's driven by contaminants getting into the food supply."

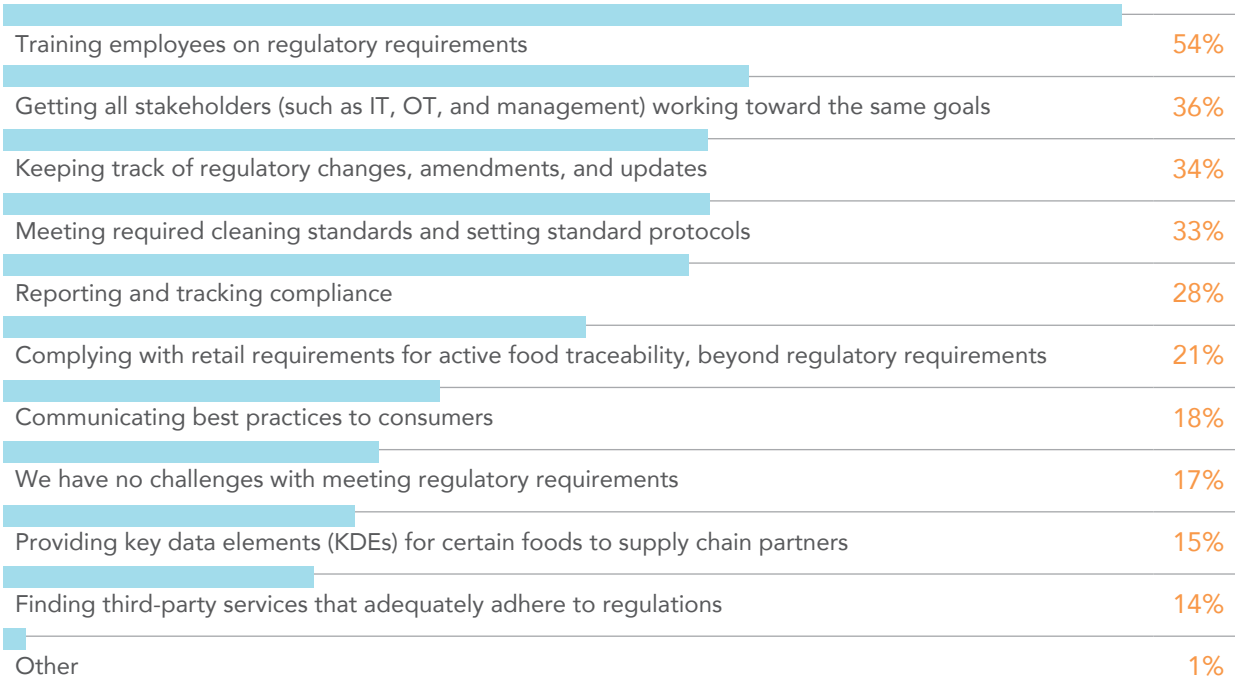
GM and Head of Operations, *Component Supplier*

END USER REGULATORY CHALLENGES

When end users were asked about what challenges, if any, they have in meeting regulatory requirements, more than half indicated training employees as a top challenge. They also noted hurdles in getting all organizational stakeholders on the same page, as well as keeping track of new or changing regulations.

> "Cost is still the number one driver of equipment purchases, but regulatory requirements are a close second."
>
> **Regional QA Manager,** *Snack and Frozen Foods*

End User Challenges With Meeting Regulations



Totals over 100% due to multiple answers

KEY TAKEAWAY

The top three challenges reported by end users all revolve around aligning internal teams and understanding or adhering to regulatory requirements. OEMs may want to consider strategies to support end users facing these regulatory challenges, such as:

> Additional employee training, from onboarding new hires to upskilling experienced operators.

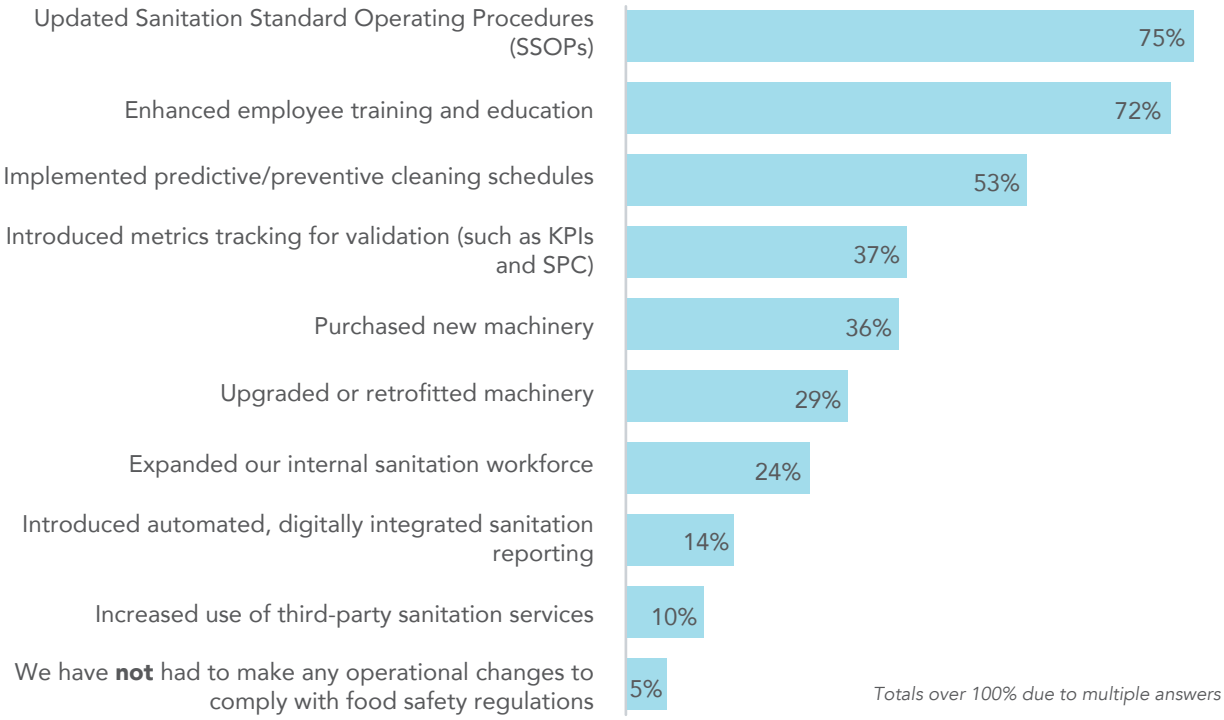
> Expanding education beyond operators to include other stakeholders, with the goal of building operation-wide cooperation and buy-in.

> Tracking and regularly updating clients on new or changing regulations.

END USER CHANGES MADE TO MEET REGULATIONS

There are a number of operational and process changes that end users have pursued to meet regulations. The most common change - updating SSOPs - was chosen by three-fourths of respondents, followed closely by enhanced employee training (72%) and implementing predictive/preventive cleaning schedules (53%).

Changes End Users Have Made to Meet Regulations



Totals over 100% due to multiple answers

KEY TAKEAWAY

End users are altering their processes – including SSOPs, training, and schedules – to meet regulatory demands. OEMs and suppliers can consider providing consulting support to end users revamping internal processes.

End users also report actively investing capital into new or upgraded machinery, specifically to meet regulatory requirements. OEMs and suppliers may want to place extra emphasis on ensuring their newest equipment designs address regulatory challenges like data tracking and reporting.

3

Machine Design Considerations

HIGHLIGHTS

Since food and beverage manufacturers must adhere to several food safety and sanitation regulations, they often have specific machine design needs that OEMs and suppliers need to be aware of. End users identified key machine features they look for when evaluating new machinery.

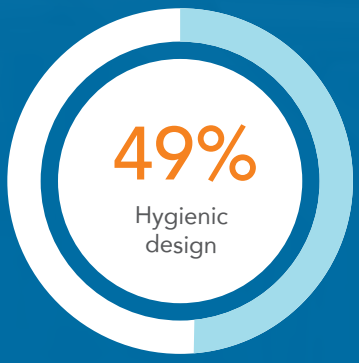
Top Three End User Food Safety Features

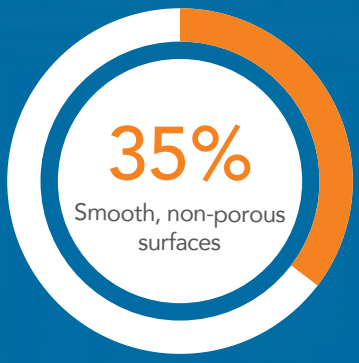
73%
Clear documentation and labeling

48%
Automated monitoring of temperature, pressure, and flow

47%
Fail-safe alarms for deviations from food-safe parameters

Top Three Sanitation Machine Features





It is vital that OEMs and suppliers be responsive to the food safety and sanitation needs of end users. Fortunately, OEMs overwhelmingly indicate they are already using food grade materials (100%), hygienic designs (96%), and strive for smooth, non-porous surfaces (93%), some of the top features end users look for when purchasing new machinery.

OEMs also indicate they are looking toward the future needs of their food and beverage customers by designing machinery with more technology-oriented features. These features will play a vital role in supporting the expansion of automated processes and digital integration in food and beverage sanitation in the future.

Top Three Machine Features OEMs Plan to Add in the Future

35%
Automated or self-cleaning functions

35%
Integrated, sanitation-safe HMI/ PLC to log activity

27%
Digital integration capability for sanitation processes

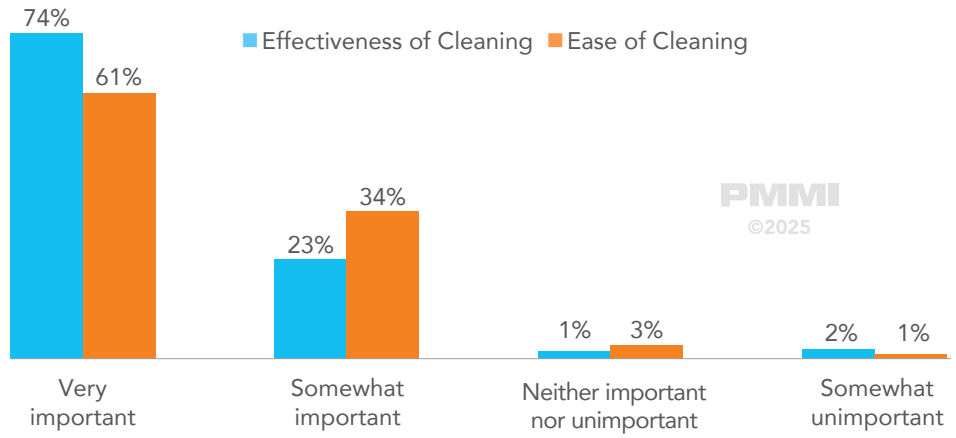
END USERS FIND OVERWHELMING VALUE IN SANITARY DESIGN OF NEW EQUIPMENT

End users almost universally report valuing sanitation-oriented machine design on their equipment.

97% Of end users report effectiveness of cleaning machinery is somewhat or very important.

95% Of end users indicate ease of cleaning machinery is somewhat or very important.

End User Perspectives on the Importance of Effectiveness and Ease of Cleaning



KEY TAKEAWAY

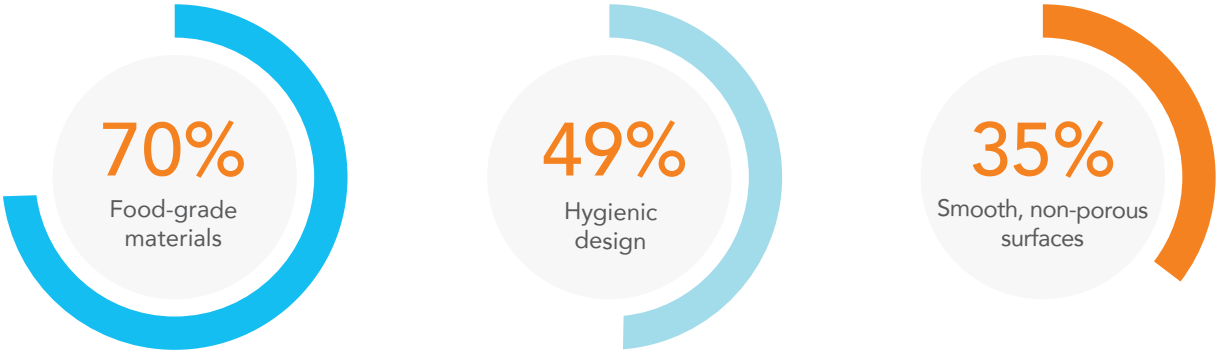
Nearly all end users look for new machinery that is easy to clean and can be cleaned effectively. OEMs and suppliers will need to continue factoring in ease and effectiveness of cleaning when looking to design new machinery or update existing machine designs, especially for equipment that requires break down for COP.

"Customers are talking about their sanitation processes now more than ever before, bringing their sanitation group into the machine evaluation process. Sanitation is no longer an afterthought but a requirement for machine designs that are easier to clean and maintain."

Director - Sales & Engineering, *OEM*

END USERS: IMPORTANT SANITATION DESIGN FEATURES

The top sanitary design features prioritized by end users when evaluating new machinery are:



Beyond these high priority features, there are other features/capabilities that end users consider:

31%
Corrosion and chemical resistance

25%
Sealed motors and electrical components

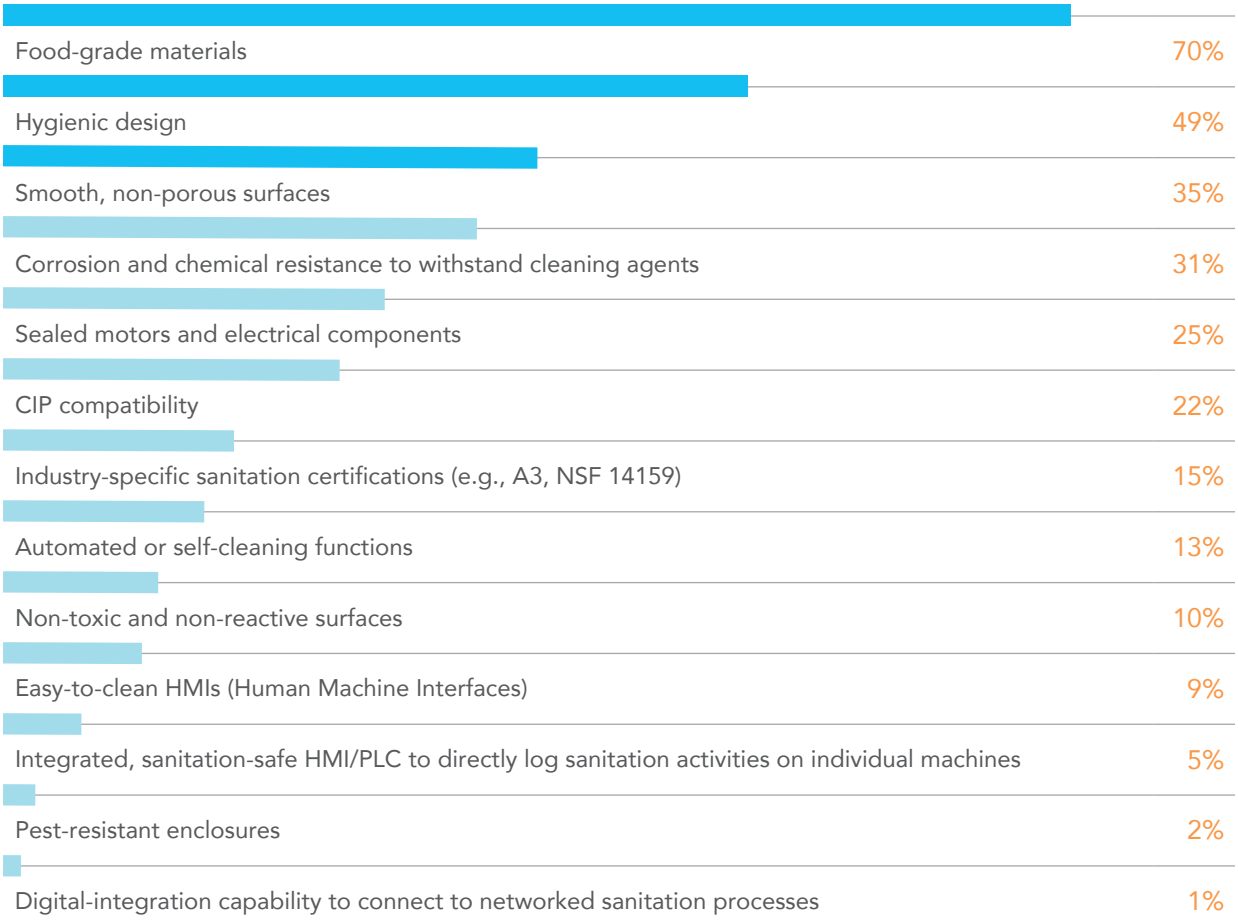
22%
CIP compatibility

15%
Industry-specific sanitation certifications

"We've moved to more electric equipment from a food safety standpoint, and when we look for new equipment, we look to automate to improve ergonomics and to reduce manual, repetitive tasks."

Engineer, *Pork Products*

Top Three Sanitation Features End Users Look For on Machinery



Totals over 100% due to multiple answers

KEY TAKEAWAY

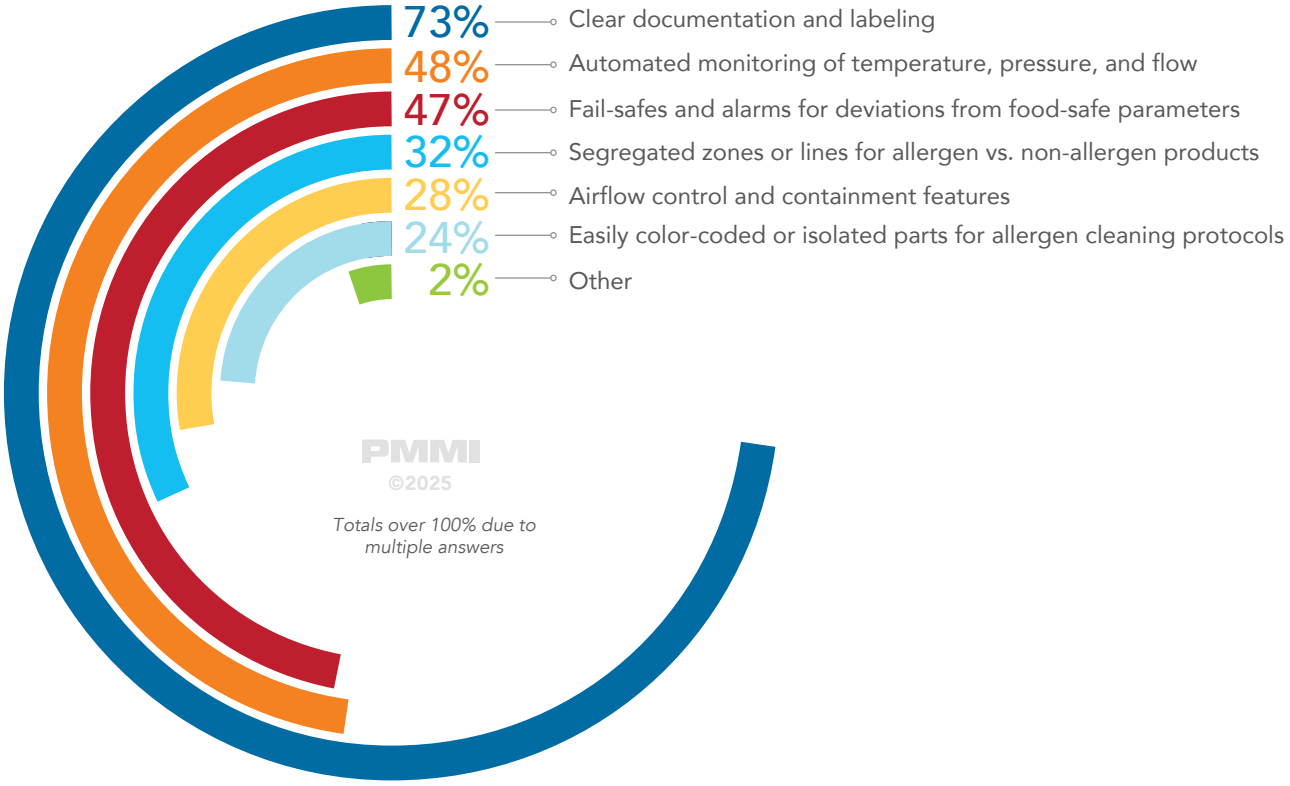
End users currently prioritize core sanitation fundamentals—materials, design, and non-porous surfaces—over advanced technologies. Additional considerations, such as corrosion resistance and sealed components, reflect expectations around equipment durability and cleaning efficiency. While technology-centric features like automated cleaning and digital integration are currently lower priorities, they may serve as future differentiators rather than immediate decision drivers. OEMs that align with top-to-mid priorities today—while innovating for tomorrow—will be best positioned to meet shifting food safety and sanitation needs.

END USERS: IMPORTANT FOOD SAFETY DESIGN FEATURES

End users place a heavy emphasis on food safety monitoring and reporting when evaluating machinery. When end users were asked what food safety features they look for on new machinery, a strong majority (73%) indicated clear documentation and labeling. Just under half also noted automated monitoring and fail-safe alarms as important machine features.

> "In the last few years, we've automated temperature tracking to comply with regulations on record retention and documentation."
>
> **Engineer,** *Pork Products*

Top Three Food Safety Features End Users Look For on Machinery



Totals over 100% due to multiple answers

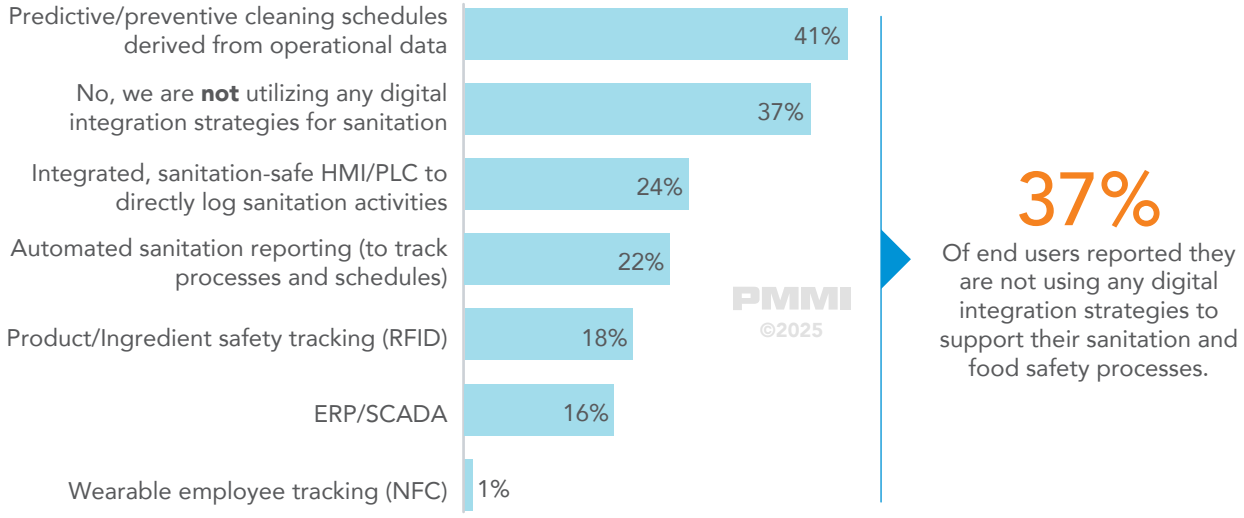
KEY TAKEAWAY

Food safety precautions are preventative measures that require regular reporting, and end users must react quickly to any breaches in protocols to prevent the risk of contamination and damaging recalls. To support end users in both monitoring and reporting, OEMs and suppliers will need to evaluate expanding digital integration and data-gathering strategies—both within their own equipment and across end user facilities.

DIGITAL INTEGRATION AND TECHNOLOGY-FOCUSED FEATURES SUPPORT FOOD SAFETY AND SANITATION

The most common technology and integration feature end users report using to support sanitation and food safety is predictive/preventive cleaning schedules compiled through operational data, at 41%. However, almost the same amount of end users indicated they are not using any digital integration strategies at all.

Digital and Technology Strategies in Use at End Users



37%

Of end users reported they are not using any digital integration strategies to support their sanitation and food safety processes.

Totals over 100% due to multiple answers

> Traceability is a big deal now and we've adopted more digitalization of our quality checks and in-house lab testing."

Regional QA Manager, *Snack and Frozen Foods*

> We still require paperwork, but I'd like the PLC to track and log the cleaning process – like how many gallons used and measurements like that – with a lockout/tag out system built into the equipment."

VP of Innovation/FSQA, *CM/CP Frozen Seafood and Produce*

KEY TAKEAWAY

Digital integration is becoming an essential tool in the food and beverage industry, but not all operations have achieved levels needed to leverage the full benefits of a highly networked facility, especially for food safety and sanitation procedures. Only a handful of end users (16%) are using an enterprise resources planning (ERP) system in their sanitation processes. OEMs and suppliers may need to help end users achieve greater levels of digital integration – like connecting sanitation processes to operation-wide software management systems – to unlock the additional benefits of connected operations.

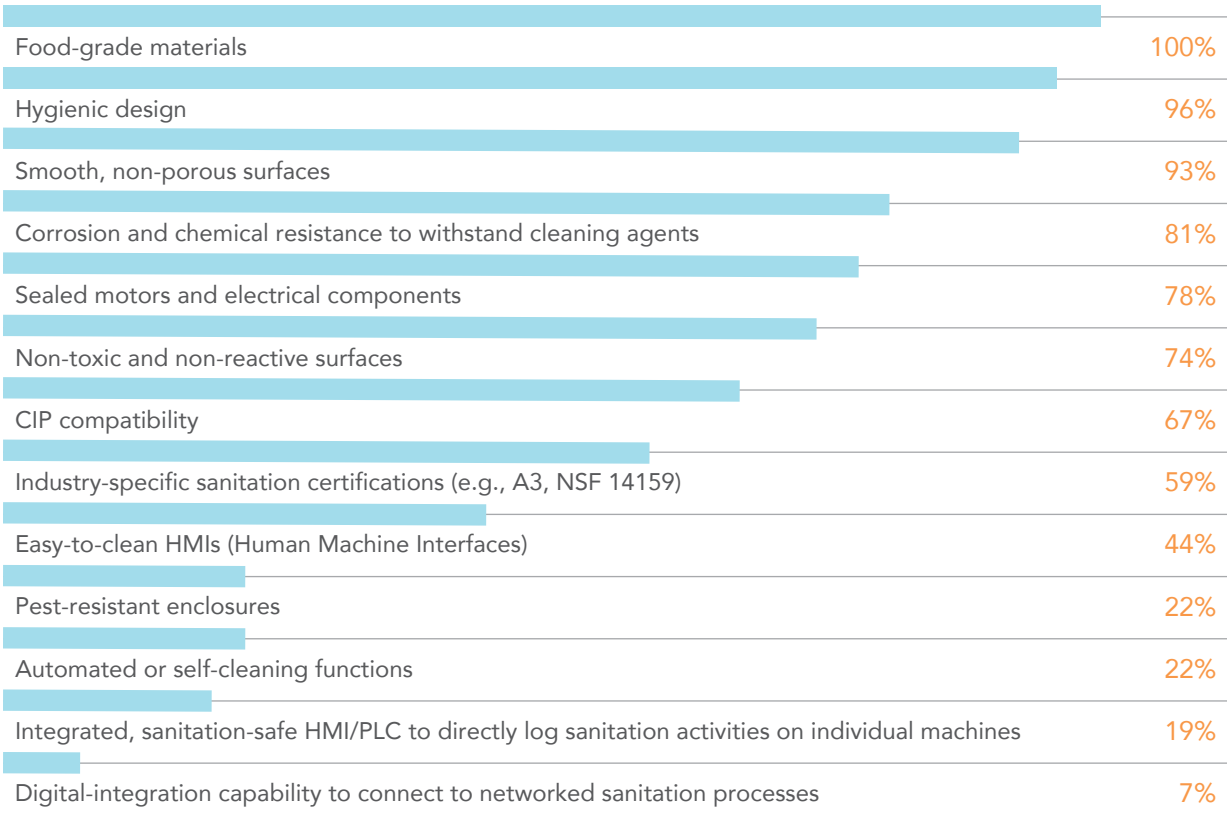
OEMs: CURRENT FOOD SAFETY AND SANITATION FEATURES

Most OEM respondents have already incorporated machine features to improve sanitation and food safety processes, including: food grade materials (100%), hygienic design (96%), and smooth, non-porous surfaces (93%).

At the other end of the spectrum, the least commonly reported feature—digital integration capabilities for networked sanitation processes—represents an opportunity for future innovation. As digitalization continues to expand, OEMs will need to explore how to integrate more connected features into the next generation of sanitation-ready equipment.

7% Of OEMs and suppliers report they incorporate digital integration capabilities for sanitation into their equipment.

Current OEM Machine/Component Design Features in Use to Support Food Safety and Sanitation



Totals over 100% due to multiple answers

KEY TAKEAWAY

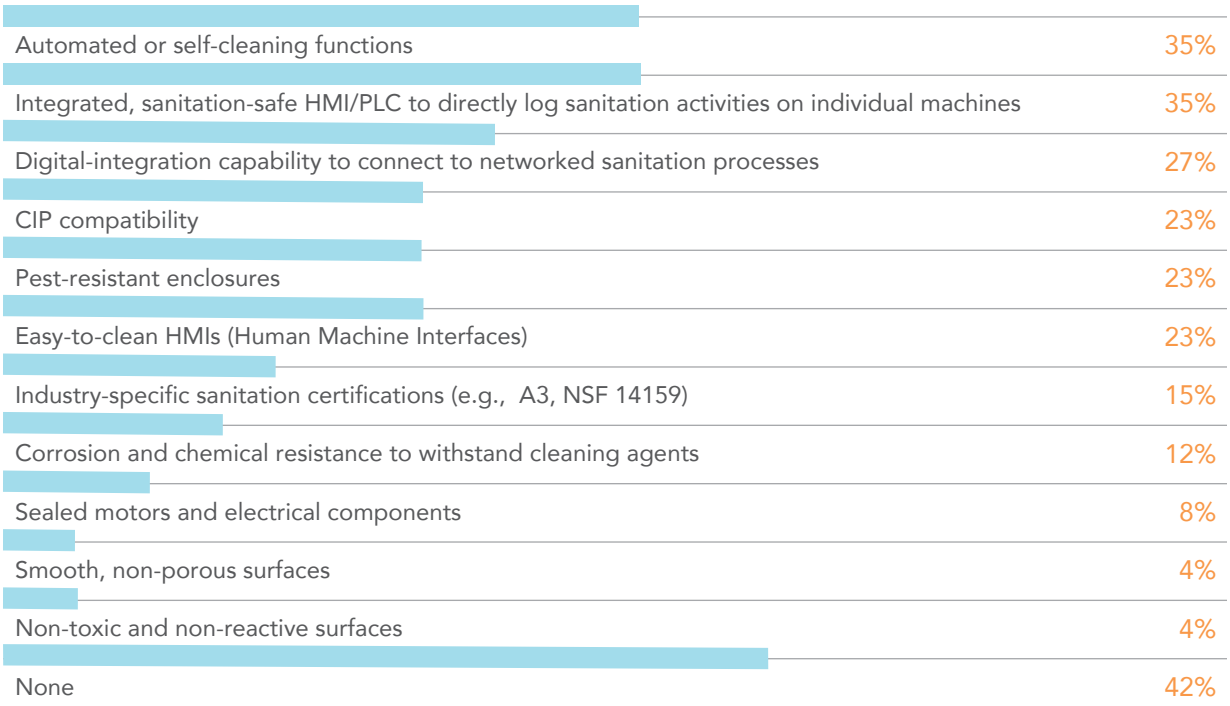
Digital integration in sanitation processes is crucial to unlocking powerful tools like predictive and preventive cleaning routines, a strategy already being used by 41% of end users.

OEMs: FUTURE FOOD SAFETY AND SANITATION FEATURES

When looking forward, the top sanitation features OEMs plan to incorporate in the next three years all revolve around digital connectivity and automation. Just over one-third of OEMs plan to incorporate automated self-cleaning functions and integrated, sanitation safe HMI/PLCs, while about one-fourth will add digital integration capabilities.

> "We are making equipment easier to run with fully automated processes – and including more ancillary automation features like alarms – to address the reality of less experienced operators."
>
> VP, *Operations/Sales/Marketing, OEM*

Future OEM Machine/Component Design Features to be Added in the Next Three Years to Support Food Safety and Sanitation



Totals over 100% due to multiple answers

KEY TAKEAWAY

Most OEMs have already incorporated the top sanitation priorities valued by end users. Looking ahead, some OEMs are planning to add more technology-centric features. However, with 42% reporting no planned additions, and tech-driven features currently ranking low in current end-user evaluations, OEMs should continue balancing core sanitation performance with selective innovation to meet both immediate needs and future opportunities.

INDUSTRY-SPECIFIC CERTIFICATIONS

OEMs shared several challenges when designing equipment to meet food safety and sanitation needs, from managing costs (59%) to accounting for harsh chemical exposure (52%). The most common challenge, educating end users, presents a valuable opportunity for OEMs and suppliers to build deeper partnerships.

63%

Of OEMs struggle with educating end users about sanitary design options.

OEM Design Challenges for Food Safety- and Sanitation-Compliant Equipment

Totals over 100% due to multiple answers

KEY TAKEAWAY

End user education remains an ongoing challenge, but it also presents an excellent opportunity for OEMs and suppliers to strengthen relationships by discussing what strategies would best fit into customers' operations. OEMs and suppliers can explore a variety of ways to improve end user knowledge, such as regular email updates, in-person educational seminars, and on-site visits to build trust and cement their reputation as trusted experts.

OEMs AND SUPPLIERS: SANITARY DESIGN IS ESSENTIAL

OEMs and suppliers report sanitary design is of the utmost importance for end users in the food and beverage industry.

96% Of OEMs and suppliers indicate sanitary machine and component design is somewhat or very important to their food and beverage customers.

KEY TAKEAWAY

Sanitary design is critical for food and beverage brand owners. Most OEMs are aware of the need for standard sanitary considerations like hygienic materials and non-porous surfaces. Next-generation sanitation-ready equipment will also need to incorporate features like automation and digital integration capabilities to meet evolving customer expectations and regulatory demands.

"A customer was concerned about a harbor zone; we retrofitted a new assembly that eliminated the harborage points. At many customers, a robust-but-easy-to-clean design is compensating for the lack of a cleaning workforce."

Director of Engineering, *OEM*

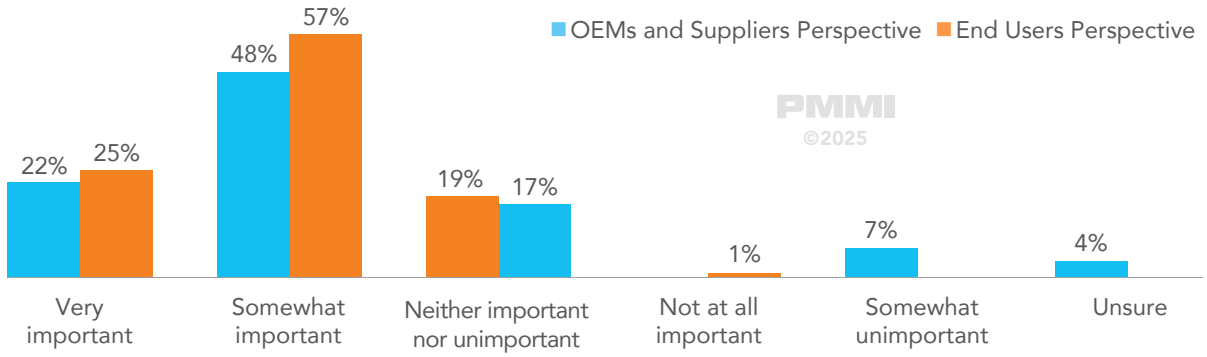
"We have challenges primarily in older equipment that is not designed for newer cleaning chemicals. The options are to buy new equipment, or work with the OEM to make modifications."

Regional QA Manager, *Snack and Frozen Foods*

INDUSTRY-SPECIFIC CERTIFICATIONS PLAY A ROLE IN MACHINE SELECTION

OEMs, suppliers, and end users agree that industry-specific certifications - such as 3-A and NSF 14159 - play a role in end user machine evaluations. 82% of end users and 70% of OEMs and suppliers indicated certifications are somewhat or very important.

Perspectives on the Importance of Machine Sanitation Certifications



KEY TAKEAWAY

Sanitation certifications remain an important factor for end users when evaluating new machinery. However, there is a slight disconnect between end user importance (82%) and OEM perceptions (70%). OEMs may want to engage more directly with their customers to better understand which certifications matter most—and consider expanding certification coverage to better align with end user needs.

"There are core industry certifications and standards – like NSF – that guide a facility to be a more sanitary facility."

Director of Operations/Sales, *CM/CP Food and Beverage*

"Sanitation of equipment downstream from food processing seems important to a growing number of end users. We're trying to determine if our entire machine needs to be 3A certified, or if it's only needed at the food contact point where contamination could occur."

Regional QA Manager, *Snack and Frozen Foods*

4

Chemicals and Durability

HIGHLIGHTS

Sanitation processes often involve the use of strong cleaning chemicals to ensure all contamination is eliminated from machine surfaces, especially those that come into direct contact with ingredients and finished products. While important to the sanitation process, harsh cleaning chemicals can accelerate equipment wear.

63% Of end users report sanitation procedures have a moderate, high, or severe impact on machinery wear.

OEMs and suppliers also observe use of harsher cleaning chemicals among end users (63%), often resulting in damage to sensitive machine components. This is a crucial consideration for OEMs as they continue to refine their machine designs to accommodate sanitation procedures.

56% Of OEMs and suppliers say sensitive machine components like sensors and control panels are most affected by harsh cleaning chemicals.

With an upward trend of most OEMs and suppliers observing their customers using harsher cleaning chemicals (63%), and end users reporting harsher chemicals are causing accelerated wear on their machinery (63%), the food and beverage industry faces a challenge with prolonging component and equipment life. One potential solution is to develop a standardized chemical resistance classification system to help end users evaluate equipment durability more accurately—and to guide OEMs and suppliers in making informed design and recommendation decisions.

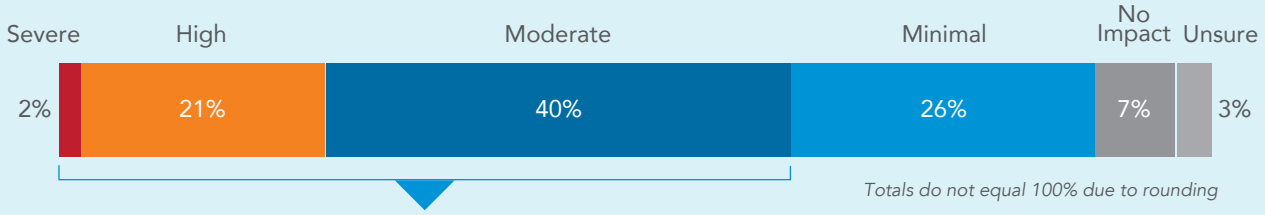
82% Of OEMs and suppliers either somewhat or strongly agree there is a need for a standardized chemical resistance classification system for machinery.

66% Of end users either somewhat or strongly agree there is a need for a standardized chemical resistance classification system for machinery.

END USER PERSPECTIVE:
SANITATION CHEMICALS AND MACHINE WEAR

Nearly all end users (89%) report sanitation procedures contribute—at least to some extent—to equipment wear, though the severity varies.

To What Extent Have Sanitation Procedures Caused Machine Wear Or Damage?

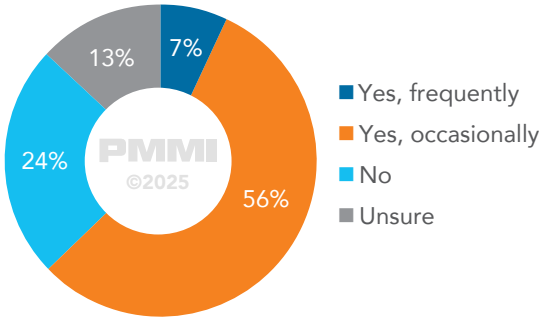


Totals do not equal 100% due to rounding

63% Of end users report sanitation procedures have a moderate, high, or severe impact on the wear of their machinery.

Similarly, a majority (63%) of end users say stronger sanitation chemicals contribute to equipment wear - 7% say it happens frequently, and 56% say it occurs occasionally.

Have Stronger Cleaning Agents Caused Machine Wear or Reduced Lifespans?



KEY TAKEAWAY

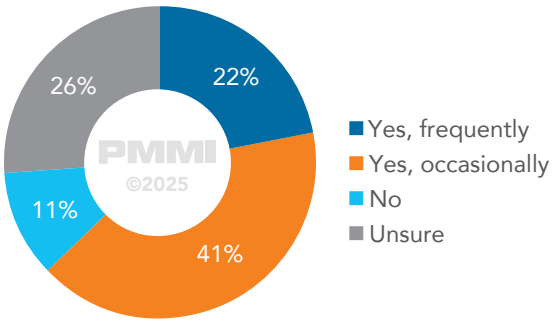
With a majority of end users linking both sanitation processes and chemical use to machine wear, OEMs and suppliers may need to explore new strategies to increase the durability of their machines. Notably, while 81% of OEMs report incorporating corrosion-resistance properties on their equipment, end users continue to experience wear—suggesting that current measures may not fully address the realities of increasingly aggressive sanitation protocols.

OEM AND SUPPLIER PERSPECTIVE:
SANITATION CHEMICALS AND MACHINE WEAR

The majority of OEMs and suppliers (63%) report observing a trend of customers using harsher cleaning chemicals during sanitation—and say this is contributing to equipment damage, especially when it comes to sensitive machine components.

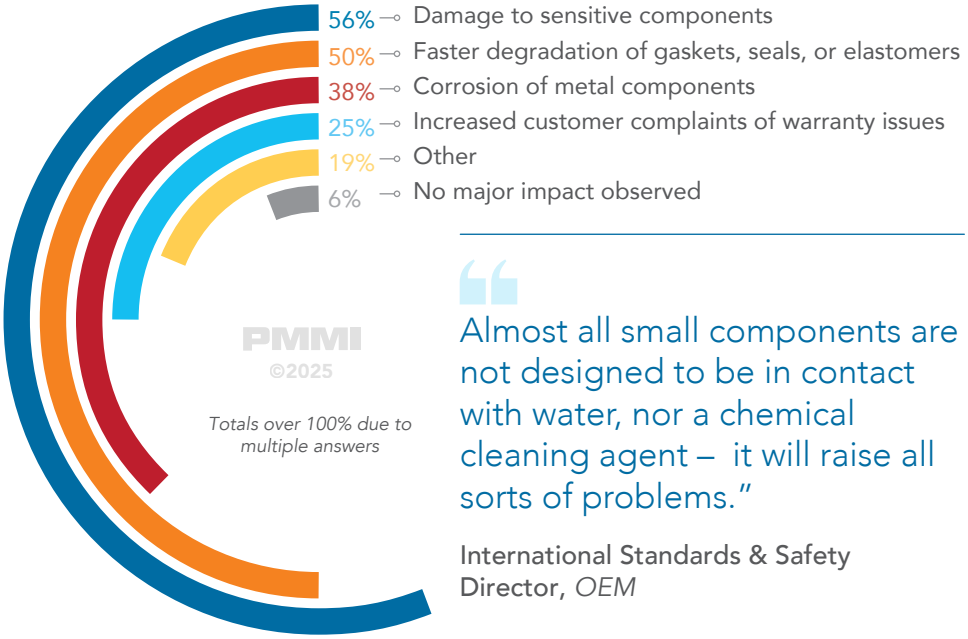
63% Of OEMs and suppliers report their customers using harsher sanitation chemicals.

Are Your Customers Using Harsher Sanitation Chemicals?



To What Extent Have Sanitation Procedures Caused Machine Wear or Damage?

56% Of OEMs and suppliers say those chemicals are primarily damaging sensitive machine components like sensors and control panels.



Totals over 100% due to multiple answers

> "Almost all small components are not designed to be in contact with water, nor a chemical cleaning agent – it will raise all sorts of problems."
>
> International Standards & Safety Director, *OEM*

KEY TAKEAWAY

OEMs, suppliers, and end users agree: harsher sanitation chemicals are contributing to machine wear. While our research reveals many OEMs and suppliers already offer corrosion-resistant materials (81%), the next step is to strengthen sensitive components—such as sensors and control panels—by enhancing their water and chemical resistance.

MOST OEMS AND SUPPLIERS DO NOT MAKE CHEMICAL SUPPLIER RECOMMENDATIONS

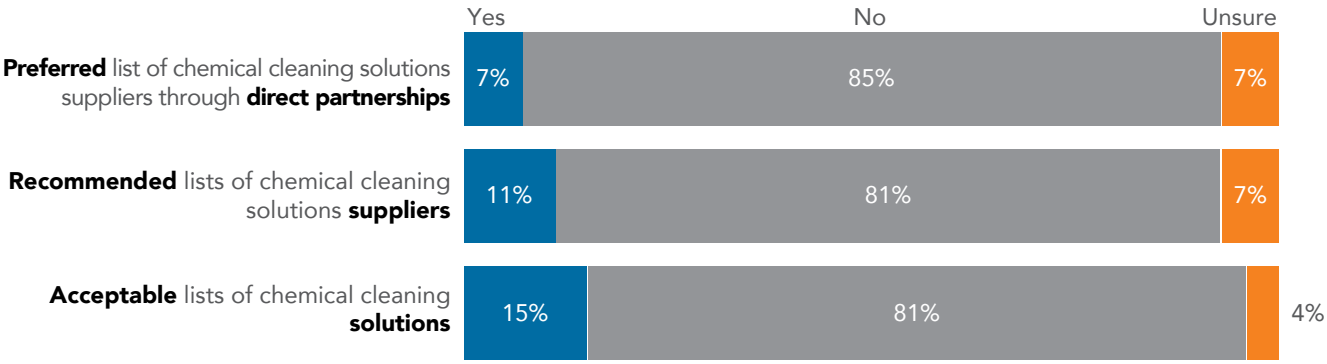
Few OEMs and suppliers provide recommendations for chemical suppliers – whether through direct partnerships, recommended vendors, or even a list of acceptable vendors.

7%
Of OEMs and suppliers offer preferred supplier lists through formal partnerships.

11%
Of OEMs and suppliers offer specific chemical supplier recommendations.

15%
Of OEMs and suppliers offer lists of acceptable cleaning solutions suppliers.

OEMs and Suppliers Provide Lists of Chemical Partners



KEY TAKEAWAY

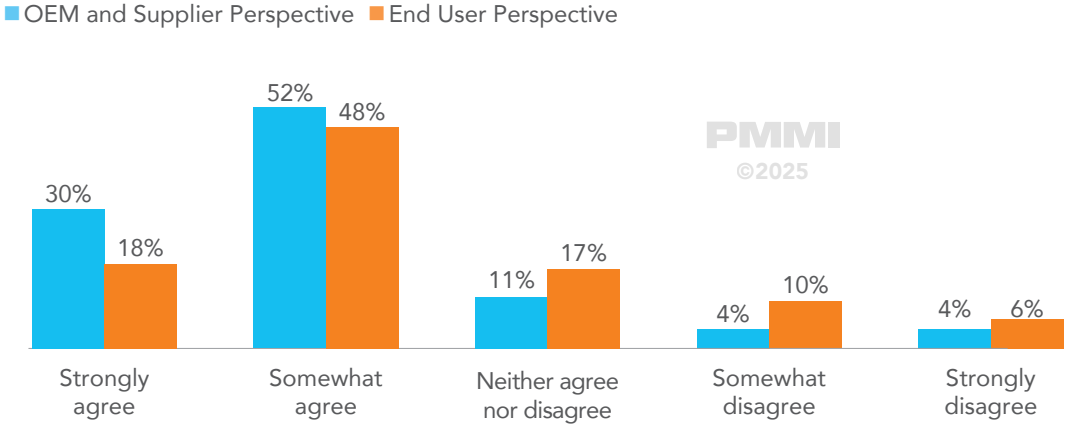
OEMs and suppliers may want to consider compiling lists of acceptable chemical vendors or finding chemical suppliers to partner with directly to help end users minimize machine damage. Offering these services could present a differentiation opportunity—allowing OEMs and suppliers to deepen customer relationships.

> "We'd like guidance on which wet or dry cleaning chemicals to use."
>
> Regional QA Manager, *Snack and Frozen Foods*

A STANDARD RATING SYSTEM FOR CLEANING CHEMICALS COULD BE USEFUL

A majority of end users, OEMs, and suppliers agree that the food and beverage industry would benefit from a standardized rating system to clarify machinery's resistance to aggressive cleaning agents. 82% of OEMs and suppliers and 66% of end users somewhat or strongly agree there is a need for such a system

Perspectives on the Need for Machine Chemical Standards or Ratings



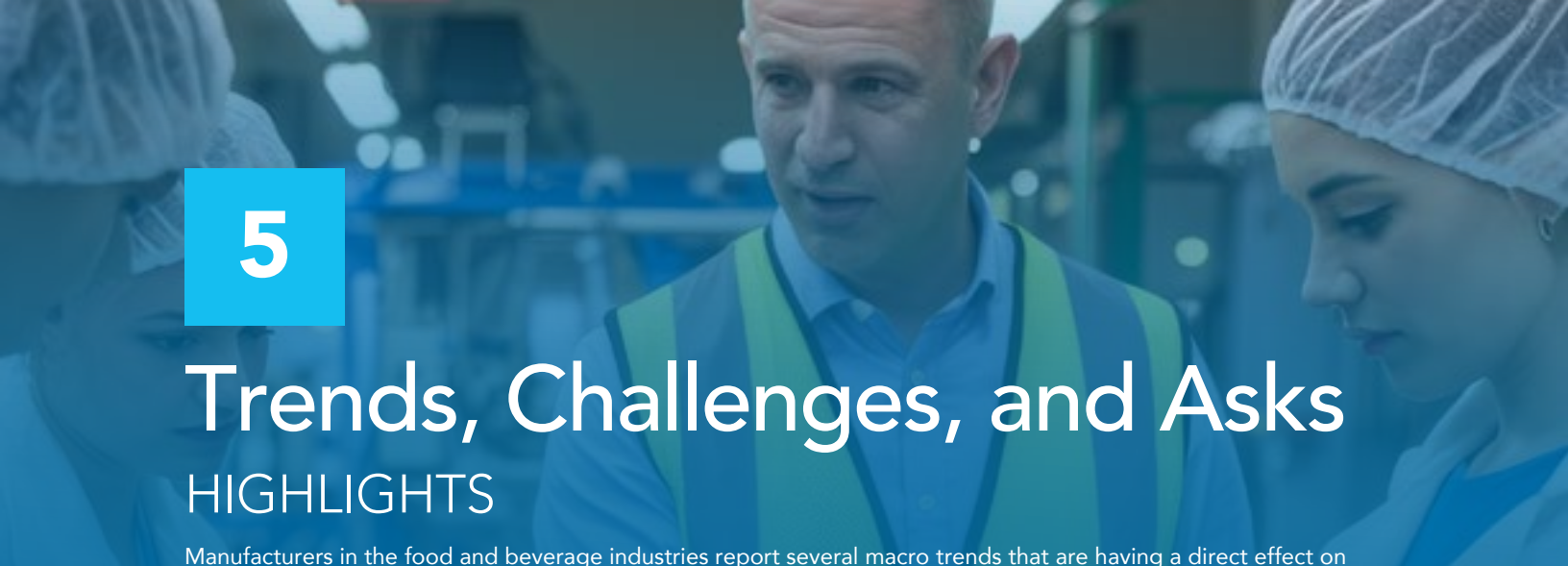
Totals do not equal 100% due to rounding

KEY TAKEAWAY

With end users, OEMs, and suppliers all reporting harsh cleaning chemicals are contributing to equipment wear—and OEMs and suppliers observing a trend toward using even harsher sanitation chemicals—the industry is in need of a standardized classification system. Such a system could help end users more effectively evaluate which chemicals are best suited for their sanitation processes and help OEMs and suppliers determine which chemicals their machines need to withstand to improve durability.

"It would be helpful if OEMs rated their equipment on the resistance level to different cleaning agents."

Project Engineer, *Drink Mixes/Frozen Novelties*



5

Trends, Challenges, and Asks

HIGHLIGHTS

Manufacturers in the food and beverage industries report several macro trends that are having a direct effect on their operations.

Top Three Trends Affecting End Users

61%
Labor shortages and employee turnover

59%
New or changing regulations

52%
Concerns about cross-contamination in the production space

The top trend reported by end users – labor shortages / employee turnover – is also translating directly into operational challenges related to food safety and sanitation:

65% Of end users report getting employees to properly and consistently follow SSOPs is a challenge.

42% Of end users indicate training employees on new technology and equipment is a challenge.

Top Three Sanitation Machine Features

End users of food and beverage equipment also indicate several persistent headaches when it comes to sanitizing machinery.

33%
Sanitizing small parts and components

28%
Validating and measuring sanitation effectiveness

23%
Condensation, pooling, and trapped moisture

To address these challenges, end users are asking for several machine features and services from their OEMs and suppliers. These are important considerations for OEMs to keep in mind when designing new equipment and establishing long-term relationships.

Top Three End User Asks

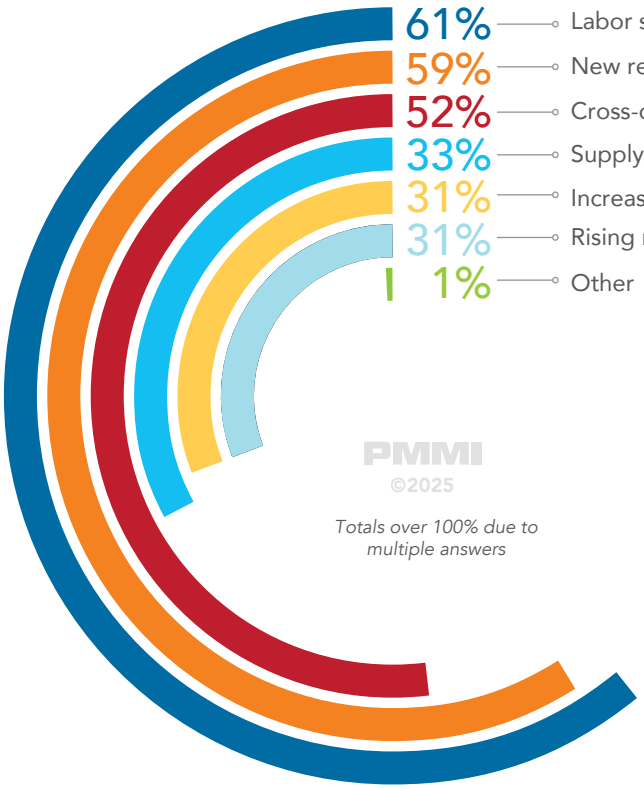
40%
More all-stainless machine design

36%
More CIP-capable machinery

31%
More support developing SSOPs

END USERS REPORT BEING AFFECTED BY LABOR, REGULATION, AND CONTAMINATION TRENDS

Top Three Food Industry Trends Influencing End User Food Safety and Sanitation



- 61% Labor shortages / turnover
- 59% New regulations or changes to existing regulations
- 52% Cross-contamination concerns in the production space like allergens
- 33% Supply chain variability
- 31% Increased inspections
- 31% Rising number of product recalls / preventing recalls
- 1% Other

> The beer industry is in turbulent times now with unending turnover creating a real struggle to constantly train new people, especially when they have no prior experience in cleaning and sanitizing equipment."

Operations and Quality Manager, *Brewery*

KEY TAKEAWAY

There are a couple ways OEMs and suppliers can consider supporting end users as they respond to key industry challenges:

> Introduce more automation to help offset labor shortages.

> Expand educational outreach to keep end users informed about evolving regulations.

> Collaborate more on process planning and offer technology-driven solutions—such as tracking and automated inspections—to address cross-contamination risks.

MANAGING AND TRAINING EMPLOYEES ARE TOP FOOD SAFETY CHALLENGES FOR END USERS

The top two challenges faced by end users involve managing and training employees on how to correctly carry out standard sanitation operating procedures (SSOPs), especially when it comes to new equipment and new technology:

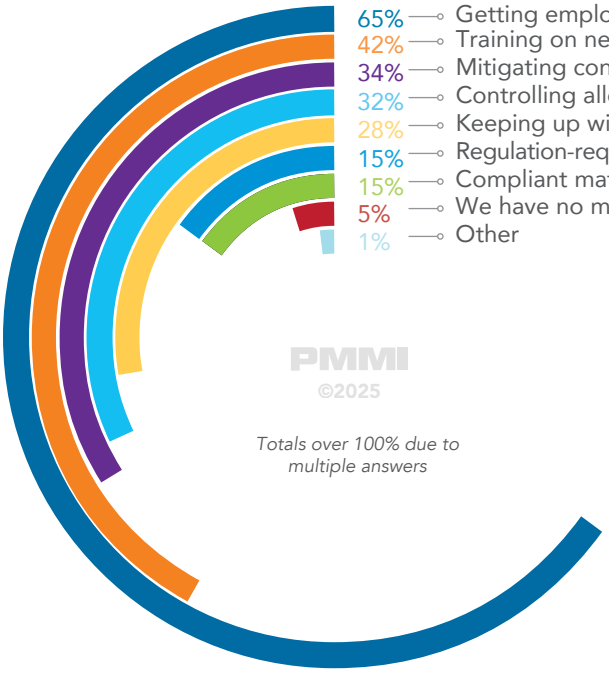
65% Of end users report getting employees to properly and consistently follow SSOPs is a challenge.

42% Of end users indicate training employees on new technology and equipment is a challenge.

Another frequently cited challenge is external:

34% Of end users struggle to mitigate contamination from incoming materials.

Top Three End User Food Safety Challenges



> We want equipment that offers CIP, no harbor points, easy access to small components, and offers a parts guide for reassembly. It's all about efficiency and getting the equipment back up and running."
>
> VP of Innovation/FSQA, *CM/CP Frozen Seafood and Produce*

KEY TAKEAWAY

To help end users overcome workforce-related challenges, OEMs and suppliers should consider increasing the scope and breadth of their training programs, as well as their education outreach on regulations.

To address concerns around contaminated incoming materials, OEMs and suppliers could also explore digital tracking tools—such as NFC/RFID—to help end users better monitor incoming materials and ingredients. This is particularly important given that only 18% of end users currently track materials with digital tools.

THE TOP SANITATION CHALLENGES FOR END USERS INCLUDE SMALL PARTS, VALIDATION AND MEASUREMENT, AND CATCH POINTS

End users are faced with a variety of diverse sanitation challenges, ranging from cleaning difficult parts, to evaluating cleaning effectiveness and managing residual moisture. With end users reporting an array of different challenges, OEMs and suppliers will need to evaluate individual customer needs.

Top Three End User Sanitation Challenges

Totals over 100% due to multiple answers

KEY TAKEAWAY

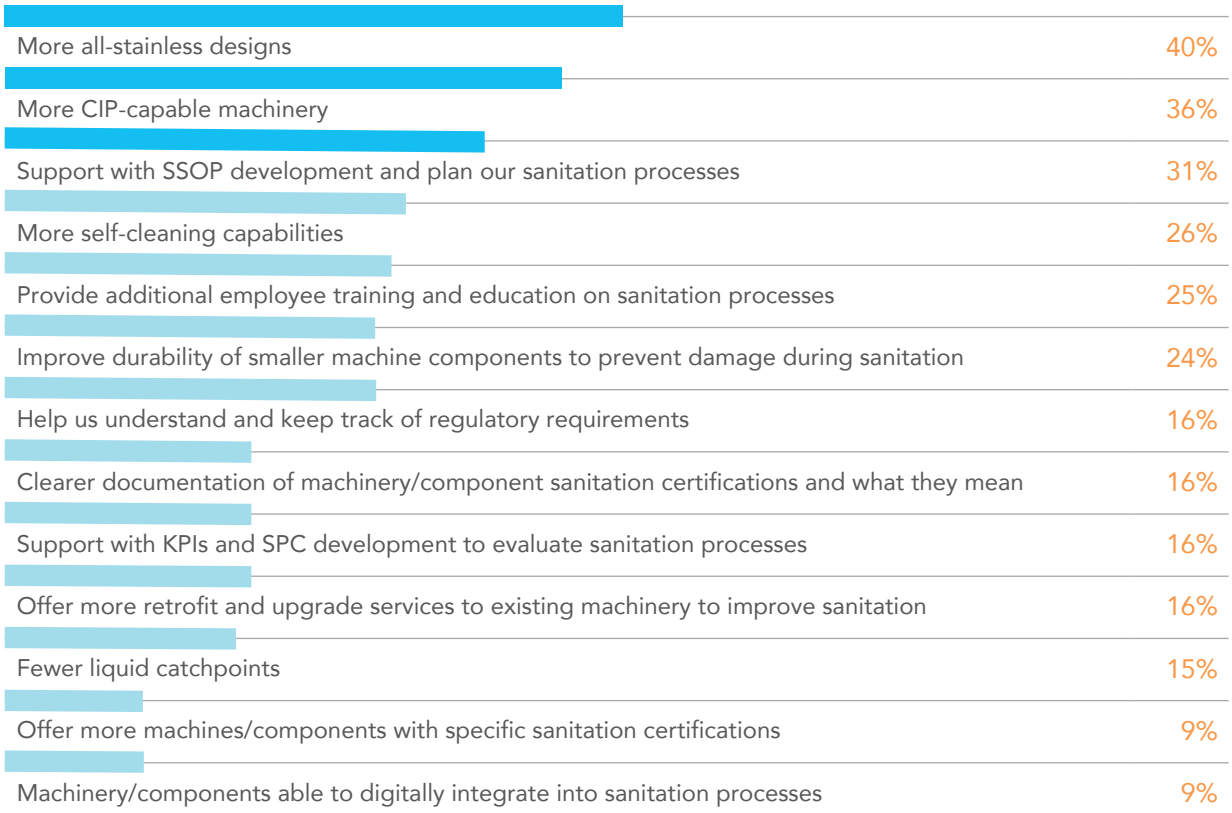
OEMs and suppliers can support end users by striving to further reduce liquid catchpoints, making equipment easier to break down, increasing accessibility to all areas of the machine for cleaning, and improving the chemical resistance of components.

Since end users are also reporting challenges around measuring and validating sanitation outcomes, OEMs and suppliers may want to offer their expertise to collaboratively craft metrics and measurements for cleaning to help quantify cleaning effectiveness.

END USERS WANT MORE STAINLESS, MORE CIP, AND HELP WITH SSOPS

End users have some specific asks for OEMs and suppliers when it comes to food safety and sanitation, from machine design considerations to additional supportive services. End users are asking for more all-stainless machine design (40%), more CIP-capable machinery (36%), and more support developing SSOPs (31%).

Top Three Features and Services End Users Want to Improve Food Safety and Sanitation



Totals over 100% due to multiple answers

KEY TAKEAWAY

OEMs and suppliers universally reported using food grade materials (100%) and hygienic design features (96%). With end users specifically asking for more stainless steel (40%), OEMs and suppliers will need to consider either increasing their use of stainless steel, or more prominently promoting their existing stainless designs.

CIP capability is currently offered by 66% of OEMs, a feature asked for by over one third of end users. CIP will remain an important design feature for end users in the future.

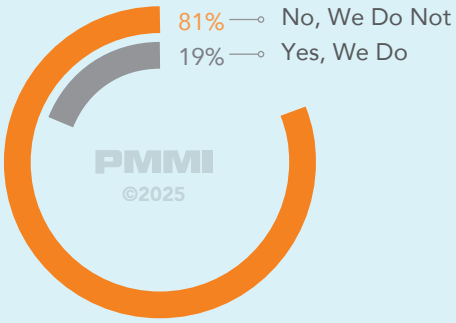
With nearly one-third of end users requesting help with SSOP development, OEMs should consider whether offering consulting services or template guidance could differentiate their support offerings and enhance customer satisfaction.

MOST OEMS AND SUPPLIERS DO NOT OFFER CONSULTING SERVICES; SOME END USERS WOULD LIKE THEM TO

OEM and Supplier Perspective: Do You Offer Food Safety and Sanitation Consulting Services?

A strong majority of OEMs and suppliers report not offering any consulting services when it comes to crafting planning, and evaluating food safety and sanitation processes.

81% Of OEMs and suppliers **do not** offer any consulting services for food safety and sanitation process.



KEY TAKEAWAY

Very few OEMs and suppliers offer food safety and sanitation consulting services, but 31% of end users are specifically requesting more assistance from OEMs and suppliers in crafting and evaluating SSOPs. In addition, 28% of end users report validating and measuring their sanitation practices as a top concern, the second most important need. By offering more consulting services that focus on codifying and measuring sanitation processes, OEMs and suppliers could help alleviate persistent end user challenges, while simultaneously deepening trust and relationships with their customers.

> "We don't get overly involved in SSOPs."

Operations/Sales/Marketing, *OEM*

> "The problem isn't the cleaning agent itself, but an internal process of making sure titration is done properly. It all ultimately goes back to training and adherence to SSOPs to eliminate the mindset that more chemicals is better."

VP of Innovation/FSQA, *CM/CP Frozen Seafood and Produce*

6 Spending

HIGHLIGHTS

OEMs and Suppliers

OEMs and suppliers should be optimistic about the future of the sanitation-ready and food safety-compliant food and beverage equipment market. From a historic perspective, OEMs and suppliers mostly reported growth over the last three years.

52%

Of OEMs and suppliers report selling more food safety-compliant machinery over the last three years.

41%

Of OEMs and suppliers report selling the same amount of food safety-compliant machinery over the last three years.

End Users

End users predict healthy spending on food-safety and sanitation services and equipment in the coming year. A majority of end users also indicated they intend to make a purchase of food safety-compliant and sanitation-ready equipment within the next three years.

93%

Of end users predict spending the same or more on food safety and sanitation equipment or services in the coming year.

68%

Of end users anticipate buying food safety-compliant equipment within the next three years.

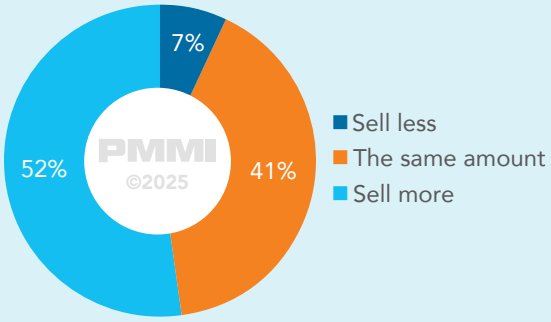
OEMS AND SUPPLIERS REPORT SELLING MORE OR THE SAME VOLUME OF FOOD SAFETY-COMPLIANT MACHINERY

OEM and Supplier Perspective: Food Safety-Compliant Machine Sales Over the Last Three Years

The vast majority (93%) of OEMs and suppliers report selling either more or the same amount of food safety-compliant equipment over the last three years.

52% Of OEMs and suppliers report selling more food safety-compliant machinery over the last three years.

41% Of OEMs and suppliers report selling the same amount of food safety-compliant machinery over the last three years.



KEY TAKEAWAY

OEMs and suppliers have reported either no change or an increase in the volume of their food safety-compliant equipment sales over the past three years, with a slight majority indicating growth. Notably, only a small minority (7%) reported a decline. This overall market stability and positive sales trajectory sets the stage for continued innovation in machine design and increased integration of advanced technologies. As OEMs and suppliers respond to the evolving demands of modern, highly integrated food and beverage manufacturing environments, these trends point to sustained momentum in the development of solutions that prioritize food safety and sanitation.

> "Legacy equipment gets replaced, but often new equipment is needed to increase production or to improve food safety."
>
> International Standards & Safety Director, *OEM*

> "There are several drivers of equipment purchases – increasing capacity, adding a new product, or achieving greater efficiency when older equipment just won't do it – and with that comes learning how to clean it."
>
> General Manager, *Commercial Food Sanitation Expert*

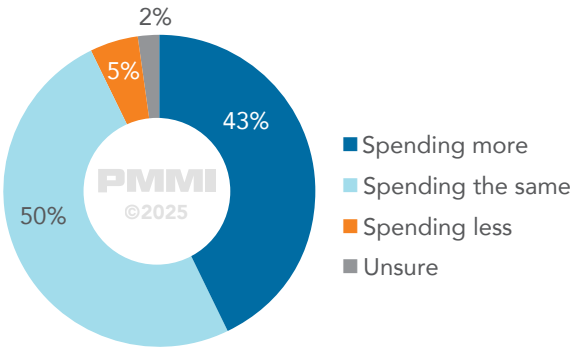
END USERS PREDICT SOLID BUDGETS AND FUTURE MACHINE PURCHASES

End users mostly predict either increasing (43%) or maintaining (50%) budgets for food safety-compliant equipment in 2025. In addition, 68% of end users anticipate making a purchase of food safety-compliant equipment or components in the next three years.

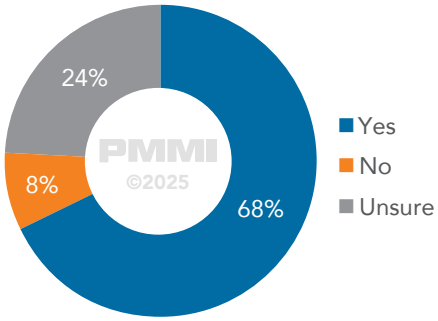
93% Of end users predict spending the same or more on food safety-compliant equipment in the coming year.

68% Of end users anticipate buying food-safety compliant equipment within the next three years.

End User Perspective: Spending in 2025 Compared to 2024



End User Perspective: Will You be Buying Food Safety-Compliant Machinery in the Next Three Years?



KEY TAKEAWAY

This is excellent news for OEMs and suppliers as the majority of end users plan to maintain or grow their investment in food safety-compliant equipment. On top of this, over two-thirds express intentions to purchase more food safety-compliant equipment in the next three years.

The challenge for OEMs and suppliers will be standing out in a competitive landscape. To differentiate themselves, OEMs and suppliers will need to consider enhanced sanitary design features, greater integration of technologies, and expanded consulting or support services.

"For big purchases, equipment longevity is most attractive, so we make sure the ROI is worth the investment. And of course, an improved design is something we consider as well."

Operations and Quality Manager, *Brewery*

7

Actionable Recommendations

When analyzing both quantitative and qualitative data captured from PMMI's database of end users, several critical themes consistently emerge. By systematically evaluating their needs, challenges, and priorities, OEMs and suppliers can derive actionable insights that inform both future equipment design and the development of targeted support services aimed at enhancing food safety and sanitation outcomes.

To facilitate strategic planning, recommendations for OEMs and suppliers can be categorized into four core focus areas. By assessing each category in detail—and engaging in direct dialogue with end users to contextualize specific operational requirements—OEMs and suppliers can identify opportunities for innovation, refinement, and improved alignment with sanitation and food safety expectations in the field.

1 Address labor challenges through increased training and an expansion of operational consulting services.

- ✓ Training new employees.
- ✓ Training existing employees on new technology.
- ✓ Offering regular refresher courses.
- ✓ Establishing advanced courses for experienced operators.

2 Assist end users in meeting and understanding new and changing regulations through outreach and education. This includes third-party certifications.

- ✓ Regular updates and educational material regarding industry regulations through a preferred communication channel.
- ✓ In-person seminars and educational workshops.
- ✓ Regular on-site visits for assessment and on-the-spot education.
- ✓ Leveraging interactive features like scannable codes on machinery and augmented reality/virtual reality tutorials for point-of-use direction.
- ✓ Expand knowledge and outreach on third-party certifications—valued by most end users—to enhance machine design and differentiate offerings beyond standard regulatory compliance.

3 Work with end users to increase digital integration, opening the door to more automated and connected operations.

- ✓ Designing more digital integration-ready machinery for sanitation. Only 7% of OEMs and suppliers report currently offering digital integration features for sanitation processes on their machines.
- ✓ Helping customers audit their data gathering and digital connectivity features in their sanitation processes, adding features, components, and equipment where necessary.
- ✓ Educating customers on the next-generation capabilities that can be unlocked through greater levels of digital integration in sanitation processes.

4 Explore industry-wide collaboration to codify a standardized rating system for machine chemical resistance.

- ✓ Encourage cross-industry collaboration—among end users, OEMs and suppliers, third-party certifiers, and associations—to develop clearer systems that help end users understand chemical resistance in machinery, while simultaneously strengthening industry partnerships.
- ✓ Explore opportunities to guide customers on chemical usage by forming partnerships, making product recommendations, or offering approved vendor lists—areas where current OEM and supplier engagement remains limited.

8

Appendix A

Profile of Participants

Broad Perspective

The findings in the PMMI Food Safety and Sanitation Report are based on the insights gathered from 130 surveys/interviews with industry professionals.

End Users by Revenue Breakdown (n=88)

$0-9M	18%
$10-499M	47%
Over $500M	35%

OEMs/Suppliers by Revenue Breakdown (n=27)

$0-$20M	52%
$20-$50M	22%
$50M+	26%

Participating end users serve the following food and beverage industries:

Bakery and Grains
Beverage
Confectionery
Dairy and Alternatives
Ingredients/Flavorings
Fresh Foods
Frozen Foods
Nutraceuticals
Pet Food
Proteins/Meats
Shelf-Stable Foods
Snacks

Participating OEMs provide the following equipment:

Bag/Pouch/Filling
Blister/Clamshells/Skin
Cartoning
Case/Tray Forming & Packing
Coding/Marking
Conveying/Accumulation
Feeding/Inserting/Unscrambling
Filling/Capping
Flow Wrapping
Form/Fill/Seal
Inspection/Vision/Testing/Checkweighing
Labeling
Material Handling
Robotics
Palletizing/Depalletizing
Thermoforming

Participating suppliers provide the following components/materials:

Additives, Coatings, and Inks
Controls and Machine Components
Flow, Level, Pressure, and Temperature Measurement Equipment
Material Handling Robotics
Motors/Drives/Gearboxes
Pre-Made Bags/Pouches
Pumps/Valves/Fittings

Areas of Responsibility (End Users, OEMs, and Suppliers)

Sr. Management/Operations

C-Suites (CEO, CFO, COO, CTO)
Chief Sustainability Officer
General Manager
President
Vice President
VP, Innovation
VP, Operations
VP, Quality
Director of International Standards & Safety
Manufacturing
Packaging Engineering
Operations
Quality Assurance/Food Safety
Sales & Engineering

Engineering/Managers

Applications Engineer
Controls Engineer
Continuous Improvement Manager
Food Technician Manager
Maintenance Manager
Mechanical Engineering Manager
Plant Manager
Plant Compliance/Sustainability Manager
Process Engineer
Production Manager
Project Manager
QA/QC Manager
Sr. Food Technologist
Sr. Principal Engineer
Sr. Product Manager
Testing Conformance Manager

References

"Current Good Manufacturing Practices (CGMPs) for Food and Dietary Supplements." Fda.gov. US Food and Drug Administration, 24 Apr 2024. <https://www.fda.gov/>

"United States Food Law and Regulations: Laws." MSU.edu. Michigan State University, 2025. <https://libguides.lib.msu.edu/>

"Food Safety Stats." FSIS.USDA.gov. Food Safety Inspection Service, US Department of Agriculture, 2025. <https://www.fsis.usda.gov/>

"Food Processing Plant Sanitation Challenges." DIversifiedserve.com. Diversified Building Services, 1 Feb 2020. <https://www.diversifiedserve.com/>

"4 Modern Food Sanitation Challenges—One Solution." Aramark.com. Aramark, 2024. <https://www.aramark.com/>

"Common Food Safety Problems." Vectorsolutions.com. Vector Solutions, 22 Nov 2024. <https://www.vectorsolutions.com/>

Hamilton, Jori. "Sanitation Challenges Modern Manufacturers Face (and How to Fix Them)." Manufacturingtomorrow.com. Manufacturingtomorrow, 17 Jun 2022. <https://www.manufacturingtomorrow.com/>

Vernon, Stacy. "How to Overcome Food Sanitation Challenges." Ciftinnovation.com. CIFT, 2024. <https://ciftinnovation.org/>

"Manufacturers' Most Common Challenges to Food Safety Culture, and How to Solve Them." Aibinternational.com. AIB International, 7 Sep 2023. <https://blog.aibinternational.com/>

"6 Steps For Effective Beverage Plant Sanitation." Foodsafedrains.com. Foodsafe Drains, 2024. <https://blog.foodsafedrains.com/>

Haley. "The Role of Professional Sanitation in the Food and Beverage Industry." A1qls.com. A1QLS, 31 Oct 2024. <https://www.a1qls.com/>

Mitchell, Josh. "Improving Sanitation in Food and Beverage Manufacturing Environments." Rs-online.com. RS Americas, 20 Apr 2023. <https://mx.rs-online.com/>

Hanacek, Andy. "Solving the People Problem in Sanitation." Foodprocessing.com. Endeavor Business Media, 14 Dec 2023. <https://www.foodprocessing.com/>

Karolenko, Caitlin. "Dry Sanitation in Food Processing: Enhancing Safety for Low-Moisture Foods." Food-safety.com. BNP Media, 2025. <https://www.food-safety.com/>

Warren, Hilarie; et al. "Into the Wee Hours, Sanitation and Safety Keep Working Side by Side." Food-safety.com. BNP Media, 2025. <https://www.food-safety.com/>

Pritchard, Andy. "Overview of Food Production Sanitation Regulations."Weeverapp.com. Weever, 19 Jan 2023. <https://weeverapps.com/>

"ISO 22000 Food safety management." Iso.org. ISO, 2025. <https://www.iso.org/>

Liivat, Katrin. "Food Safety Facts and Statistics You Need to Know." Fooddocs.com. FoodDocs, 1 Jan 2025. <https://www.fooddocs.com/>

"Food safety." Who.int. World Health Organization, 4 Oct 2024. <https://www.who.int/>

Hoffmann, Sandra. "Cost Estimates of Foodborne Illnesses." Ers.usda.gov. Economic Research Service, US Department of Agriculture, 1 May 2025. <https://www.ers.usda.gov/>

"Facts About Food Safety: What You Need to Know." Shapiroe.com. Skip Shapiro Enterprises, 19 Nov 2024. <https://shapiroe.com/>

"Analysis Shows U.S. Food Recalls Increased by 20 Percent Between 2020 and 2023." Food-safety.com. BNP Media, 2024. <https://www.food-safety.com/>

"Summary of Recall and PHA Cases in Calendar Year 2023." FSIS.USDA.gov. Food Safety Inspection Service, US Department of Agriculture, 2024. <https://www.fsis.usda.gov/>

"FDA Dashboard: Recalls." Datadashboard.fda.gov. US Food and Drug Administration, 2025. <https://datadashboard.fda.gov/>

"ISO 22000:2018 Food safety management systems — Requirements for any organization in the food chain." Iso.org. ISO, 2023. < https://www.iso.org/>

"Food for Thought 2025." Pirg.org. PIRG Education Fund, 13 Feb 2025. < https://pirg.org/>

PMMI Business Intelligence

PMMI HEADQUARTERS
12930 Worldgate Dr., Suite 200
Herndon, Virginia 20170
T: (571) 612-3200
F: (703) 243-8556
E: pmmi@pmmi.org
www.pmmi.org

PMMI LATIN AMERICA
Homero 418 Piso 7
Col. Miguel Chapultepec
Miguel Hidalgo, D.F. 11570 Mexico
T: + (52 55) 5545 4254
F: + (52 55) 5545 4302
E: latina@pmmi.org
www.pmmi.org.mx/es

Visit **PMMI's Business Intelligence Library** for More!

Visit **pmmi.org** or contact **Rebecca Marquez,** Director, Custom Research, at **571-612-3205** or **rmarquez@pmmi.org**

PMMI's most recent reports include:

2025-2027 Economic Outlook

2025 Aftermarket Parts & Service

2025 Performance Optimization: Insights for Packaging Line Readiness