Food Safety and Sanitation Trends
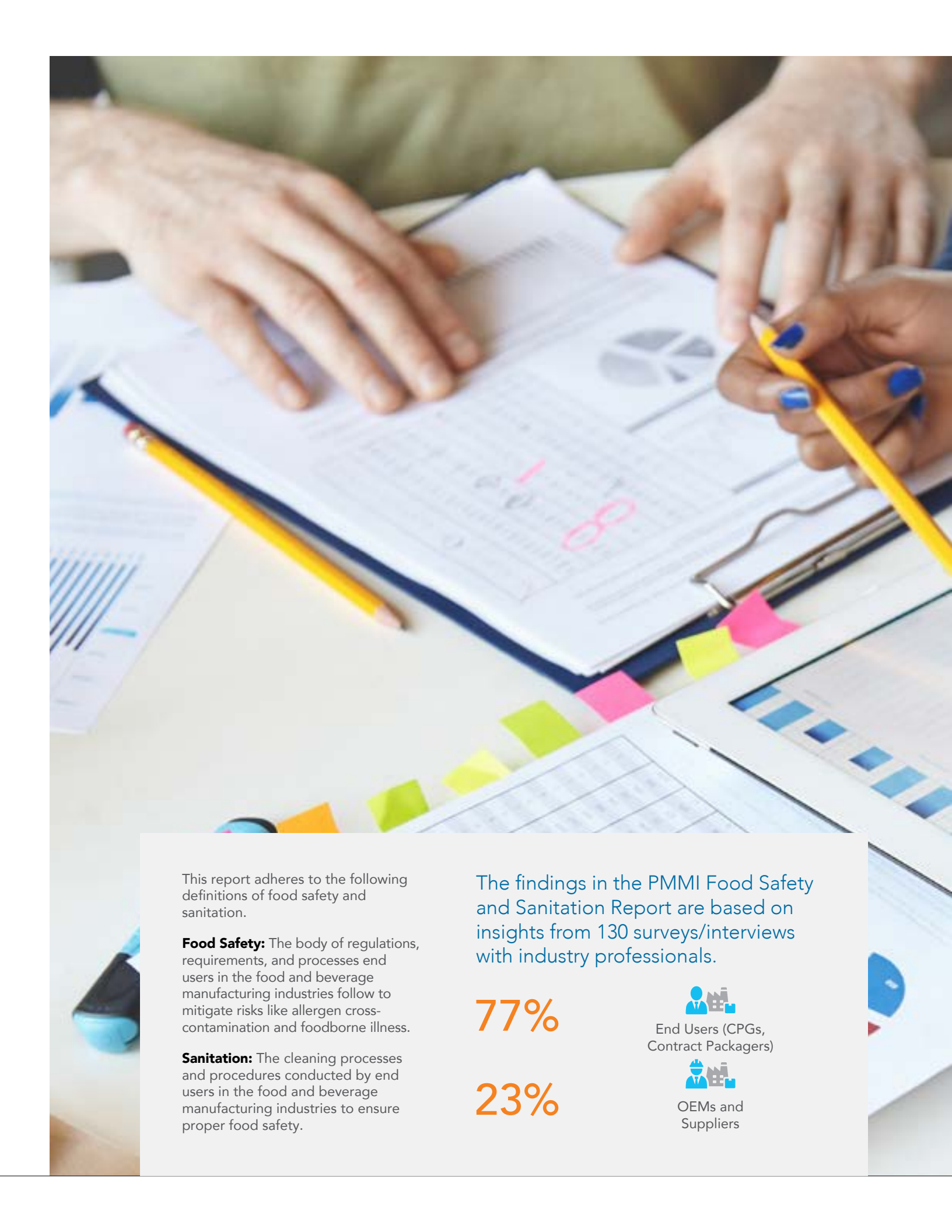
End User, OEM, and Supplier Perspectives

CLEANLINESS · COMPLIANCE · COLLABORATION

EXECUTIVE SUMMARY

PMMI Business Intelligence

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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.

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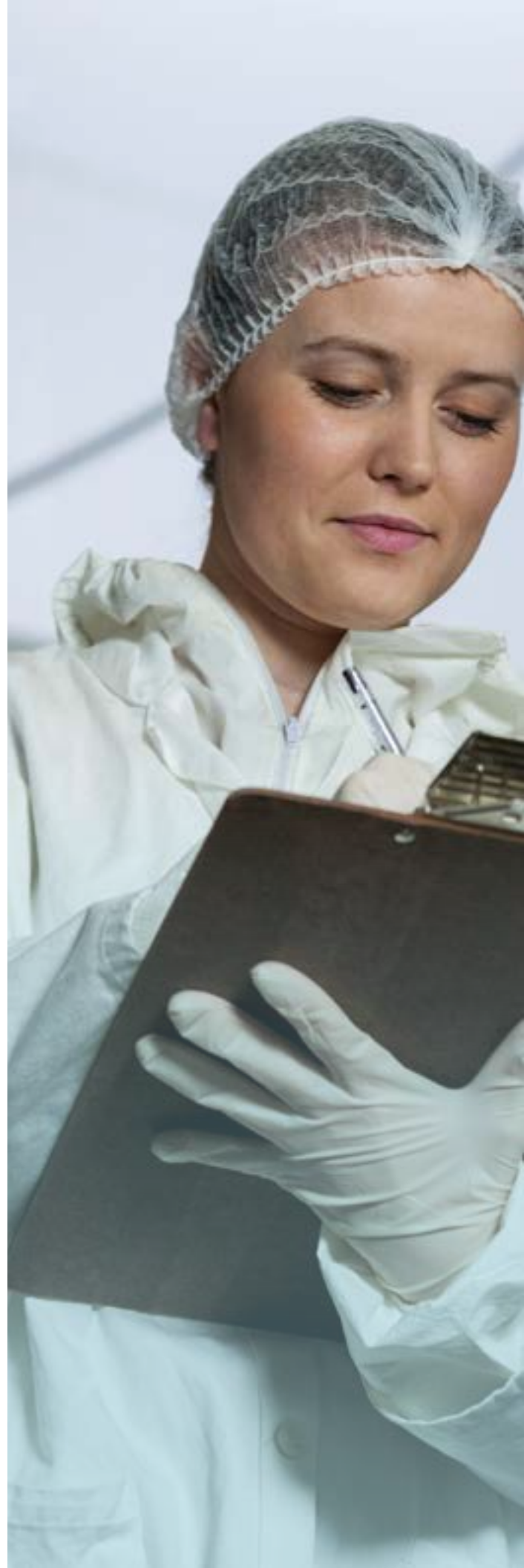
U.S. GOVERNMENT REGULATIONS, STANDARDS, AND ENFORCEMENT BODIES

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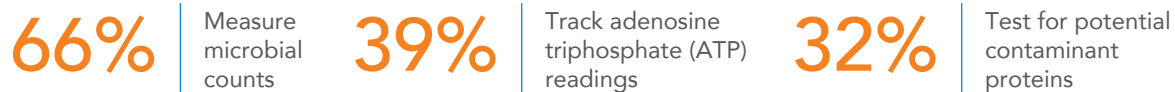
73% | Of end users rely only on internal teams to execute their sanitation processes.

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

54% Training employees on regulatory requirements

36% Getting all stakeholders on the same page

34% Keeping track of regulations

Top Three End User Changes to Meet Regulations

75% Updated Sanitation Standard Operating Procedures (SSOPs)

72% Enhanced employee training and education

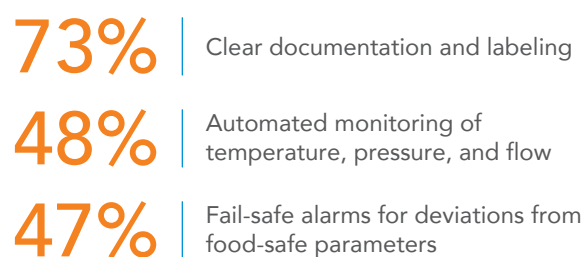**53%** Implemented predictive/preventive cleaning schedules
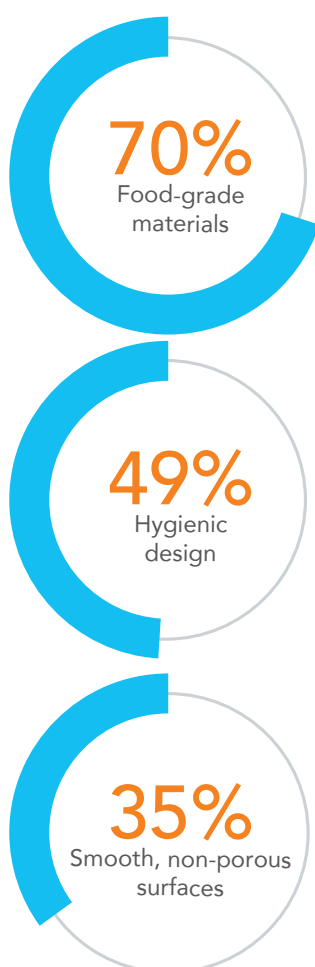
MACHINE DESIGN CONSIDERATIONS

End Users

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

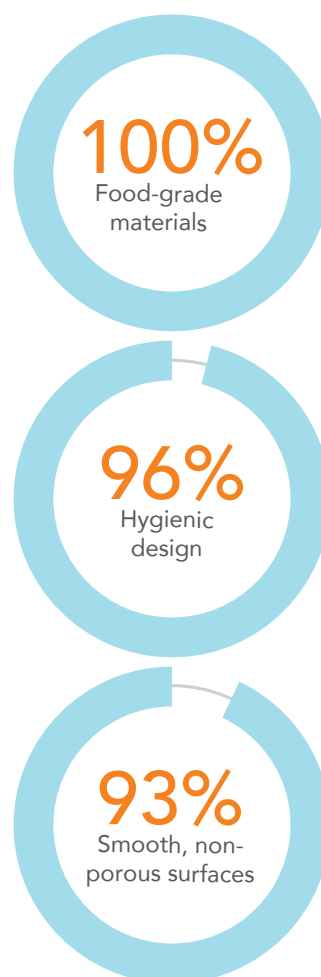### Top Three End User Considerations for Food Safety Features

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

70%
Food-grade materials

49%
Hygienic design

35%
Smooth, non-porous surfaces

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

100%
Food-grade materials

96%
Hygienic design

93%
Smooth, non-porous surfaces

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
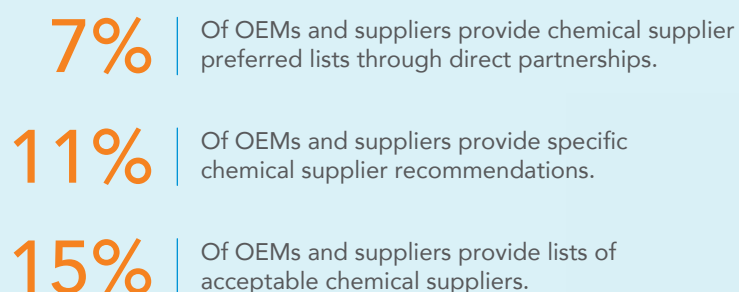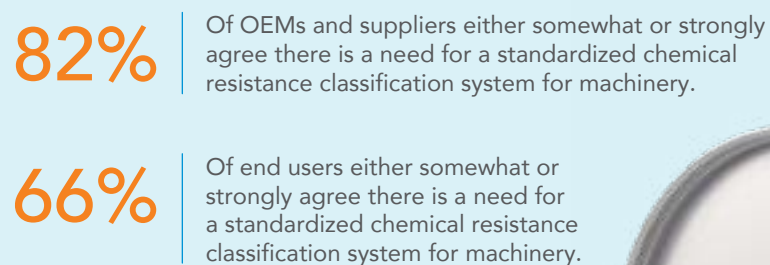
CHEMICALS AND DURABILITY

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.**

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