
FOOD PROCESSING

MARKET INSIGHT REPORT

Labor Challenges and Unplanned Downtime Dog the Food Industry

So why do 77% of plants still use preventative maintenance?



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The Food Industry Needs Uninterrupted Production

More automation, workforce issues, increasing capacity all point to the need for better monitoring of critical assets.

Food & beverage manufacturers have seen extraordinary pressures and changes as a result of the Covid pandemic, some of them temporary and some of them translating into permanent changes in the way the industry does business.

Supply chain disruptions, labor issues and unplanned downtime were the biggest challenges to operations (see Fig. 2, next page), identified by both plant floor and corporate respondents in a survey

Food Processing undertook in December 2021 and January of this year with Augury, a provider of machine health solutions. In a slightly different question, “What is your biggest risk to meeting production targets?” plant floor respondents said unexpected equipment failures were the biggest threat (Fig. 1).

Back to the question on overall challenges, the workforce skills gap actually was the second-highest

vote-getter among the plant folks, an issue that has long plagued the food industry, especially as it attempts to raise its level of automation. And in a question aimed at both sets of respondents, “How is your skilled labor affecting your ability to meet production targets?” the top answer was “Inexperienced resources take longer to troubleshoot, diagnose and repair issues, extending downtime at our site” – selected by 42% of plant operations folks and 25% of corporate respondents (see Fig. 5).

Workforce shortages and skills gaps are made all the more challenging since 77% of food & beverage plants (according to plant-level respondents) use labor-intensive preventative maintenance techniques rather than predictive maintenance. At the same time, 62% of plant level respondents have daily or weekly unplanned downtime, so they are spending time on reactive repairs. Many preventative maintenance tasks become unnecessary if plants ascend to even basic predictive maintenance; even more so if

FIGURE 1
What is your biggest risk to meeting your production targets today?
(PLANT RESPONDENTS)

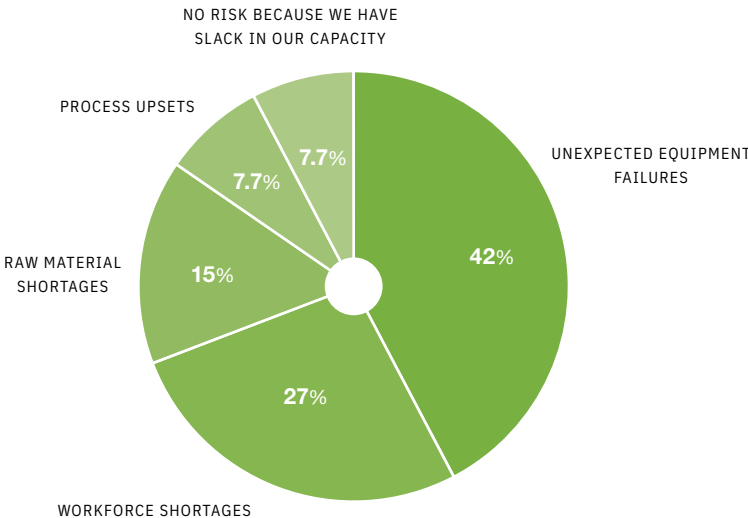


FIGURE 2

What are the biggest challenges at your site today?

SUPPLY CHAIN DISRUPTIONS



FORECASTING PRODUCTION/SCHEDULING



TIME-TO-MARKET



UNPLANNED PRODUCTION DOWNTIME



QUALITY CONTROL/WASTE



ADOPTING NEW TECHNOLOGY



CAPACITY CONSTRAINTS



GEOGRAPHICAL CONSTRAINTS (SUPPLIERS AND PATIENTS)



WORKFORCE SKILLS GAP/UPSKILLING



WORKFORCE SHORTAGES



MAINTAINING A SAFE WORK ENVIRONMENT



MEETING CORPORATE SUSTAINABILITY GOALS



REMOTE WORK ENVIRONMENTS



HIGH RAW MATERIAL COSTS



MARKET COMPETITION



□ PLANT OPERATIONS ■ CORPORATE

there's real-time monitoring of asset condition, used to detect malfunctions before they develop and to allow planned maintenance.

HOW OFTEN? HOW BAD?

More than a third of the plant respondents said unplanned production downtime because of an issue with a critical asset occurs daily at their plants, another 27% said it happens weekly (Fig. 3). Fortunately, these disruptions are short in duration (69% said "a few hours"), especially in comparison to other industries (Fig. 4).

The most common cause of unplanned asset downtime (65%) is mechanical problems – "physical deterioration of assets due to age or usage" – far outweighing operational or design problems (Fig. 6).

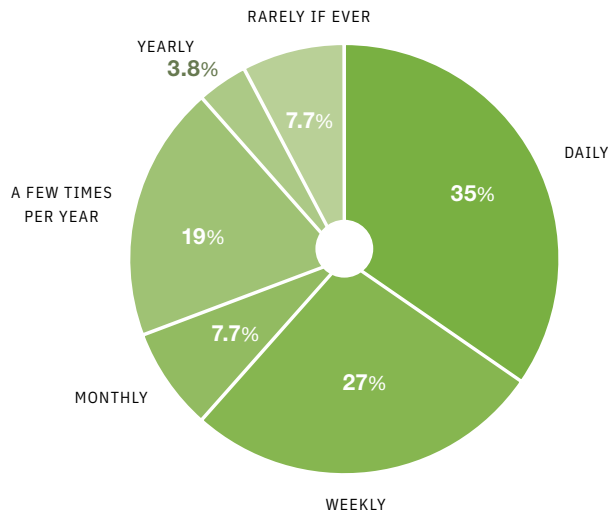
Machine problems can also compromise quality. 19% of the plant operations respondents said that's often the case, and another 62% said it happens at least sometimes. In other industries, quality issues mean scrap, rework, customer returns, covered repairs. But in the food & beverage industry, quality issues usually become food safety issues, and those can mean regulatory repercussions, recalls, people getting sick and even loss of life. And loss of the entire business.

Most of the established food & beverage industry, especially the biggest, center-of-store players, enjoyed sales growth in the

FIGURE 3

How often does your site experience UNPLANNED production downtime because of an issue with a critical asset?

(PLANT RESPONDENTS)



*A critical asset=Equipment in which loss in performance and/or low availability has a significant impact on production, could cause total or partial plant shutdown, or may present an environmental or safety hazard. Generally, these machines will also be expensive to maintain or replace.

FIGURE 4

How long do unplanned disruptions usually last?

(PLANT RESPONDENTS)

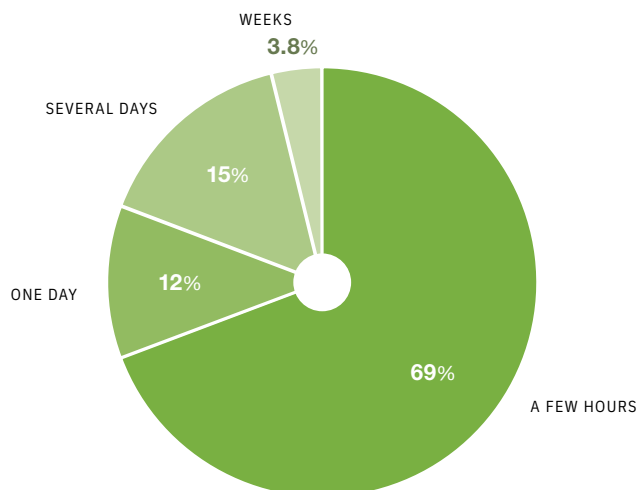


FIGURE 5

How is your skilled labor affecting your ability to meet production targets?

INEXPERIENCED RESOURCES TAKE LONGER TO TROUBLESHOOT, DIAGNOSE, AND REPAIR ISSUES, EXTENDING DOWNTIME PERIODS AT OUR SITE



INEXPERIENCED RESOURCES LACK EXPERIENTIAL KNOWLEDGE OF OUR PARTICULAR SITE, LEADING TO EITHER OVER- OR UNDER-MAINTAINING OF EQUIPMENT OR BOTH



LACK OF INSIGHT INTO REAL-TIME MACHINE PERFORMANCE LIMITS ABILITY TO PLAN AND PRIORITIZE THE MOST EFFECTIVE MAINTENANCE ACTIVITIES



LEAN MAINTENANCE CREW ONLY HAS ENOUGH TIME IN THE DAY TO REACT TO ISSUES, NOT TO EXECUTE PREVENTATIVE MAINTENANCE ACTIVITIES



UNTRAINED RESOURCES DO NOT HAVE THE ABILITY TO USE PREDICTIVE MAINTENANCE TECHNOLOGIES, ADDING TO OUR OPERATIONAL RISK



REPAIRS MADE BY INEXPERIENCED RESOURCES ARE NOT ALWAYS EFFECTIVE, ADDING TO OUR OPERATIONAL RISK



INABILITY TO RECRUIT/RETAIN SKILLED LABOR PUTS ADDITIONAL STRAIN ON CURRENT RESOURCES TO MAINTAIN PRODUCTION AND MAINTENANCE SCHEDULES



RESOURCE CONSTRAINTS ARE PREVENTING KNOWLEDGE TRANSFER



SKILLED LABOR SHORTAGES DO NOT AFFECT OUR ABILITY TO MEET PRODUCTION TARGETS



OTHER (PLEASE SPECIFY)



□ CORPORATE ■ PLANT OPERATIONS

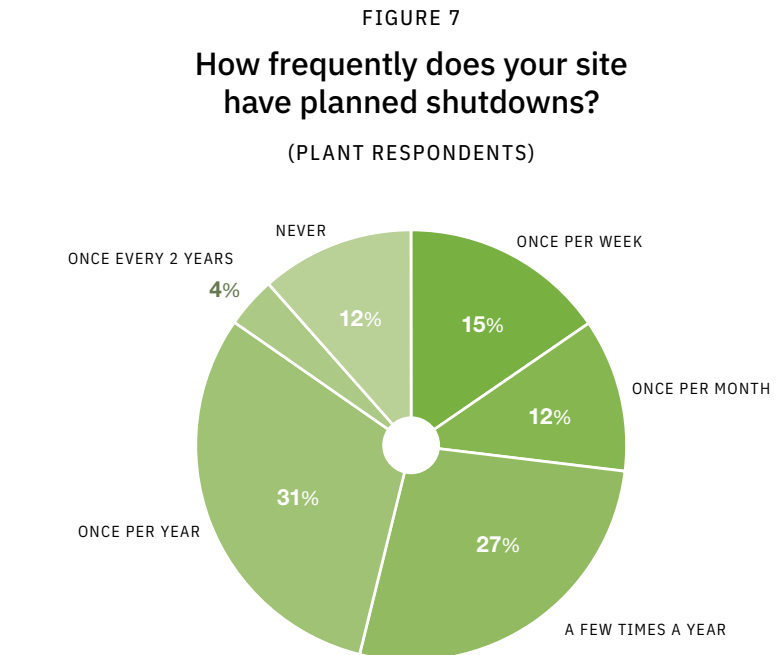
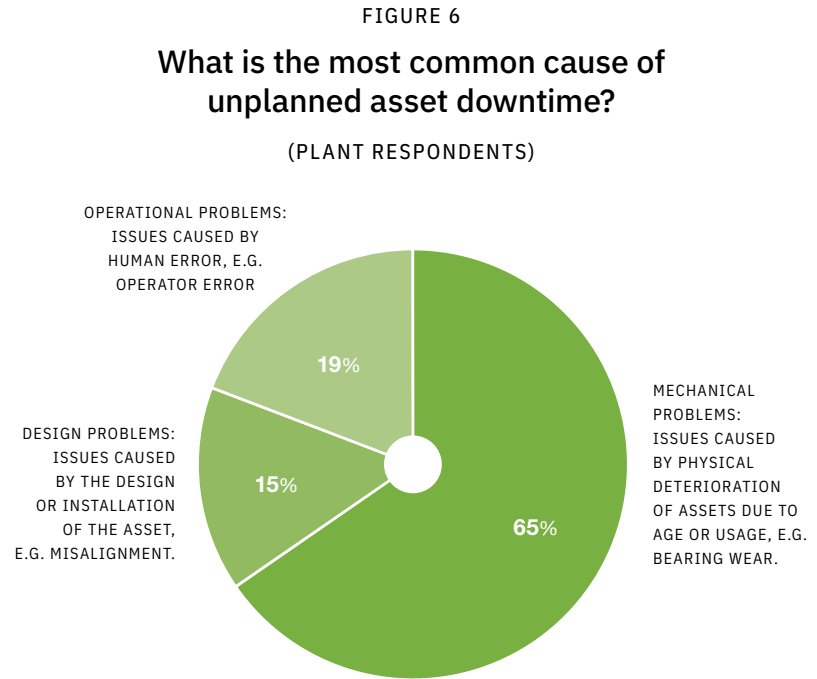
pandemic's first two years; for some, it was the first top-line improvement in years. Respondents from both Plant Ops and Corporate said they were planning on increasing demand over next 18 months (till about mid-2023) – 91% of corporate respondents said demand for their products was increasing. But how to increase capacity?

Both camps are frugal ... and wary of leading-edge technology. 62% of plant-floor folks and 56% of those at corporate said the answer is expanding capacity at existing sites via the addition of more equipment. For both groups, you could throw a hat around “process debottlenecking, advanced process control and decreasing the number and duration of planned outages.

Only 5.2% of the corporate execs said a new, greenfield plant was coming on line soon. Only 7.7% of plant ops and 18% of corporate said deploying advanced technology – such as artificial intelligence/machine learning – aimed at improving yields and unleashing capacity is the solution.

Yet expanding production capacity (69%) and increasing productivity and workforce efficiency (62%) were the highest priorities for corporate respondents when evaluating a new manufacturing technology or solution.

Considering those constraints – making more product in the same plant – what's the biggest threat



to meeting production targets? Unexpected equipment failures were the No. 1 answer among 42% of the plant folks. (Interestingly, corporate respondents were more worried about current raw material

shortages.) But both agree, overwhelmingly, the top operational risk that could result from an unexpected equipment failure is extended time to repair due to long lead times for spare parts (65% of

plant ops folks and 66% of corporate), although overtime costs (58%/48%) and rework (54%/31%) were not far behind (multiple answers were allowed).

Ironically, the common prescription for equipment failures and unplanned shutdowns remains the planned shutdown. 31% of plant respondents say those occur only once a year, another 27% say “a few times per year.” But it’s a weekly occurrence for 15% and at least monthly for another 12% (Fig. 7).

While “deep cleaning” is the reason for half of the planned shutdowns – and sanitation, of course, is vitally important – higher numbers go to major equipment maintenance (62%) and equipment check-ups (54%) – things that could be accomplished or improved with real-time monitoring of those assets.

BECOMING PROACTIVE

Not surprisingly, everybody thinks it’s a good idea to become more proactive, to get a better handle on the health of critical assets and to fix or maintain them before they break down. How soon before they break down is hard to figure – although it needn’t be.

Nearly half (44%) of the plant operations respondents said they’ve conducted a criticality assessment at their site(s), and another 16% plan on doing one in the next 12 months.

A whopping 93% of plant folks think it’s important to standardize

FIGURE 8

Do you have access to the following information about failures in your critical assets?

(PLANT RESPONDENTS)

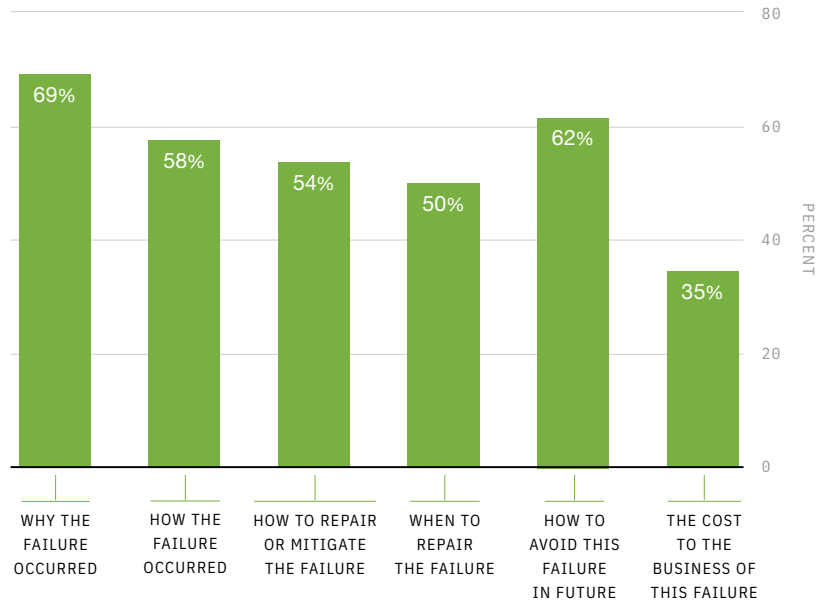
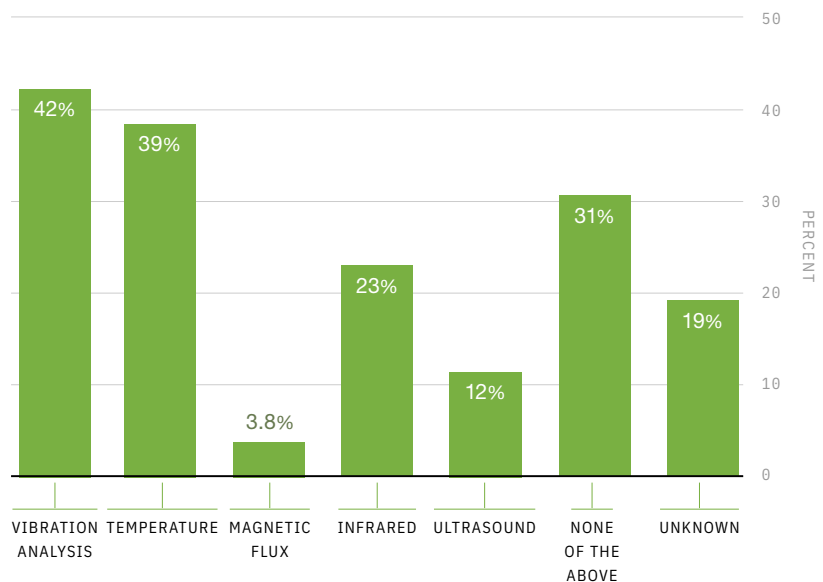


FIGURE 9

What type of analysis is being done on your critical assets today?

(PLANT RESPONDENTS)



a global maintenance and reliability program across all the company's manufacturing sites – 62% called it very important and 19% identified it as critical.

The food & beverage industry is a little behind other industries in real-time data collection. Only 41% of corporate respondents say they have the ability to visualize the real-time condition of critical assets across all sites. However, there is access to data after a failure occurs (Fig. 8). The plant ops people said they can tell why the failure occurred (69%), how it occurred (58%), how to repair or mitigate the failure (54%) and when to repair it (50%) (undoubtedly NOW!). And maybe most importantly, how to avoid this failure in the future (62%).

The biggest challenges faced by plant people when collecting data about assets are the time it takes to collect the data (54%) and the accuracy of the data (53%), with frequency of the measurements a distant third at 30%.

In summary – and none of these is a radical conclusion – both corporate and plant-level people in the food & beverage industry see the need to increase capacity with current assets; to avoid unplanned machine failures and shutdowns; and to maintain assets when they need maintenance, not when they don't. Unfortunately, current labor scarcity and the legacy issues of employee turnover and under-skilled people prevent machine operators from knowing when there's something wrong with their machine.

Few food & beverage processors are ready for full-blown Industry 4.0 and artificial intelligence, where plant managers run their plants remotely, consumer buying habits effect immediate production changes and maintenance workers wear Google Glasses to troubleshoot machines. But a little help from cloud-based experts with the empirical experience of many plants would be a good first step.

Real-time condition-based monitoring of machines and a touch of artificial intelligence to interpret what the machines are “saying” would appear to be the solution to many of the food & beverage industry's current and future problems. ■

Who answered the survey?

This report is based on 134 responses to a joint Augury-Food Processing survey taken in December 2021 and January 2022. The survey split respondents into two large groups – corporate vs. plant-floor professionals – although they further self-identified according to the pie chart. Some of their responses are reported separately, some are combined. Combining the two groups, 33% made finished foods, 24% made consumer packaged goods, 13% beverages and 12% raw foods. 66% represented five or fewer plants, 7% spoke for 6-10 plants, 5% for 11-20 and 22% for 21 or more plants.

