

2026

Foreign Material Contamination in Food

BENCHMARK REPORT





Introduction & Methodology

Foreign material contamination is one of the most common problems food safety teams manage, and one of the hardest to fully prevent. A production line can run for years without incident, then a new supplier, a new piece of equipment, or a new process exposes a point of failure — packaging fragments, equipment parts, or material introduced somewhere upstream in the supply chain end up in finished product.

This is FlexXray's third annual benchmark report on foreign material contamination. It's organized around the three facets of a foreign material event:

1. **FREQUENCY:** how often it happens and where it originates
2. **DETECTION:** how well-equipped the industry is to find it
3. **MITIGATION:** how producers respond and move forward once it's found

The findings throughout are meant to be used to see where your own equipment, investment plans, or response to a hold stand relative to the rest of the industry. Because this is the third year of the report, the data can be weighed against historical trends for an even broader picture.

Want to compare the results to our 2025 Benchmark Report? [Read it here.](#)

Summary of Key Findings

FINDING #1

Foreign material incident rates are flat, despite more detection capabilities at plants.

Incident rates held essentially flat against last year, even as many producers continue to put automated detection methods such as X-ray in place. But those methods can't catch everything — including our new most commonly reported foreign material, plastic — and suppliers remain the top reported source of reported foreign material contamination.

The takeaway for food safety teams: consider incorporating more advanced supplier validation and monitoring in your overall program to address the problem upstream, before it reaches the plant floor.

FINDING #2

Confidence has not caught up to investment when it comes to automated detection equipment.

Planned investment in automated detection equipment is cooling rather than accelerating, with the majority of respondents describing their future additions as modest rather than large. Despite this, confidence in automated detection accuracy has not yet peaked — only a relatively small group of producers rate themselves “highly confident” that their equipment catches all foreign material in product. Of the five prevention tactics producers rated for maturity, automated detection ranks lowest relative to manual processes.

FINDING #3

Internal re-inspection remains the most common response to foreign material contamination events — even with known gaps.

Internal remediation is the most common response to a foreign material hold, with most producers handling it in-house by re-inspecting using their own in-line equipment. 18% of producers cite existing internal equipment capability as their reason for reworking product in-house. While cost pressures and recent investments in equipment may help account for this, producers should be wary of the potential gaps in this approach: in-line equipment run at production speeds is generally not designed for in-depth investigation of a potential foreign material event.

Frequency

Metal has frequently been the material most reported as a top concern in this survey — likely for two reasons:

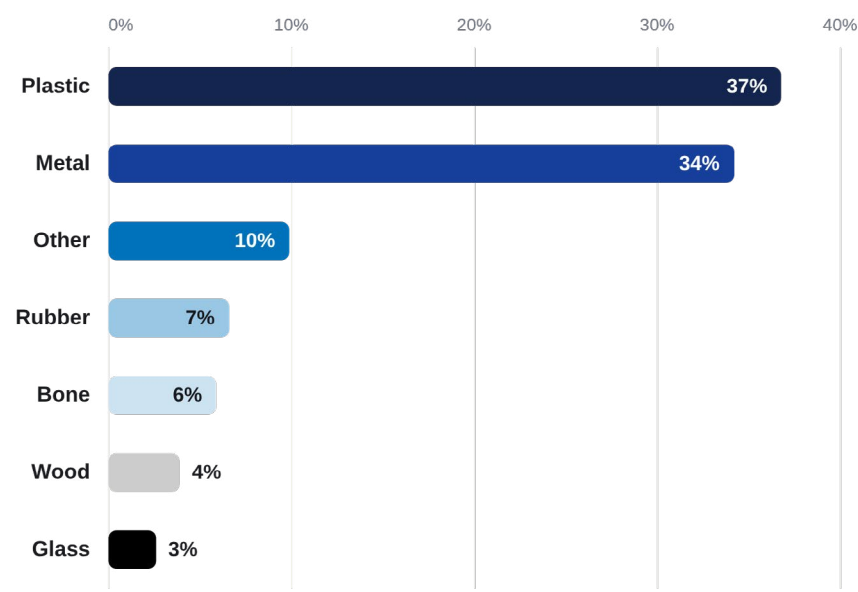
- 1. It poses a severe hazard if it reaches a consumer, and,
- 2. Compared to other foreign material types, it's relatively straightforward to detect

Metal detectors are a mature, well-understood technology that's been commercially available and refined for decades. Most food safety programs layer multiple methods to catch metal, providing several independent chances to be caught before it reaches a customer.

This year, 37% of respondents named plastic as the material they have the most frequent foreign material challenges with — narrowly ahead of metal at 34%.

Most-frequent contaminant type

Share of respondents, 2026 FM Benchmark (n = 152)



Note: This question asked producers to select their top 3 most frequent contaminant types. This data reflects each individual response for a total count.

The margin is close, and metal remains a significant concern on its own. But the two materials aren't the same kind of problem. Metal detectors work because they sense a physical property (electrical conductivity) that plastic simply doesn't have, and no equipment in wide use today closes that gap the way multiple methods do for metal. Where metal has several redundant ways of being caught, plastic currently has none that are proven at scale.

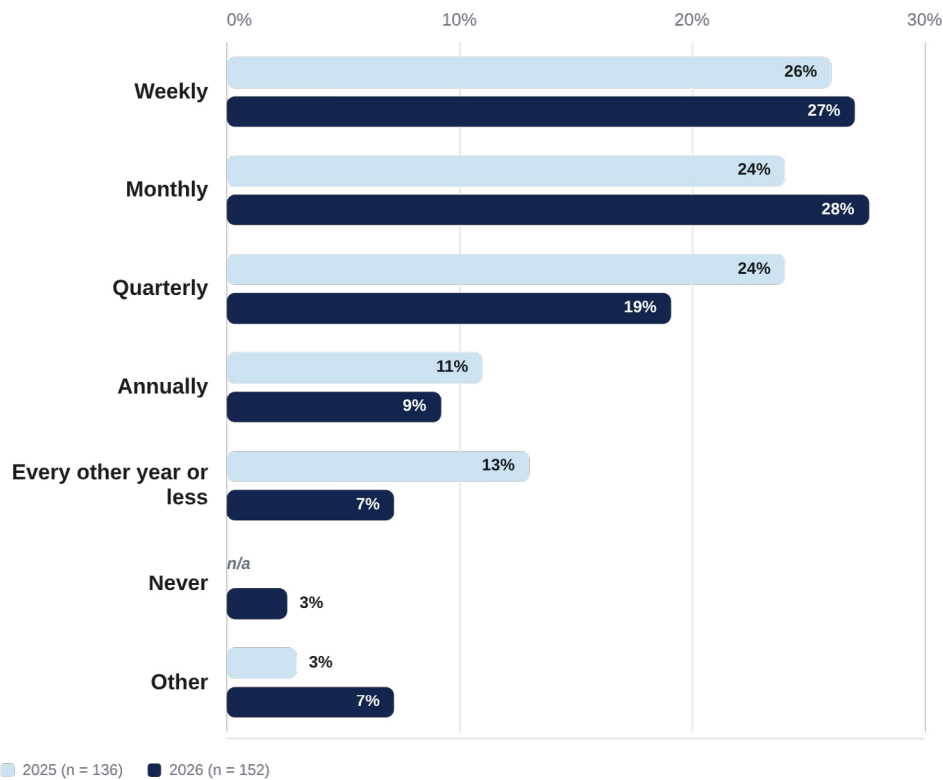


On average, how frequently do you have foreign material contamination events at your facility?

73.7% of respondents experience a foreign material event at least quarterly, something we've tracked for the purposes of this report for several years.

Frequency of FM events

Natural frequency order, 2025 vs. 2026 FM Benchmark



The data holds essentially flat against 2025 at 74%. Neither this rate nor the monthly-or-more rate moved enough to mark a real change this year.

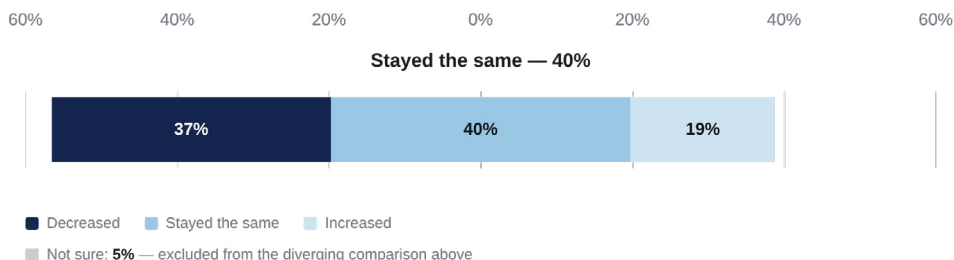
One pattern worth flagging: facilities experiencing events monthly or more often are somewhat more likely to say the problem is getting worse (21.7%) than facilities with less frequent events (16.7%). The facilities already under the most pressure aren't catching a break — they're slightly more likely to be losing ground.



How has the frequency of foreign material contamination events at your facility changed in the past year?

Change in frequency of FM events, past year

2026 FM Benchmark (n = 152)



36.8% of respondents say events have decreased over the past year, 19.1% report an increase, and the remainder report no real change.

Asked what's driving the shift, the reasons split into recognizable patterns depending on direction:

AMONG FACILITIES REPORTING A DECREASE

Employee training & awareness — the most frequently cited factor

"Employee education, improved preventative practices"

New or added detection equipment (X-ray, metal detectors, filters and screens)

"Addition of screens, metal detectors, increased x-ray verification frequencies"

Tighter supplier oversight and incoming-material inspection

"Increased vigilance upstream in, production, more effective CAPAs provided by suppliers"

Preventive maintenance program improvements

"Better maintenance PM completion"

AMONG FACILITIES REPORTING AN INCREASE

Aging equipment and deferred preventive maintenance

"Older equipment, lack of preventive maintenance"

Rising production volume, speed, or complexity

"Labor force/increased speeds"

Supplier or raw-material issues

"Suppliers cutting corners (especially for imported raw products)"

Training gaps or process errors

"Poor implementation of SOP"

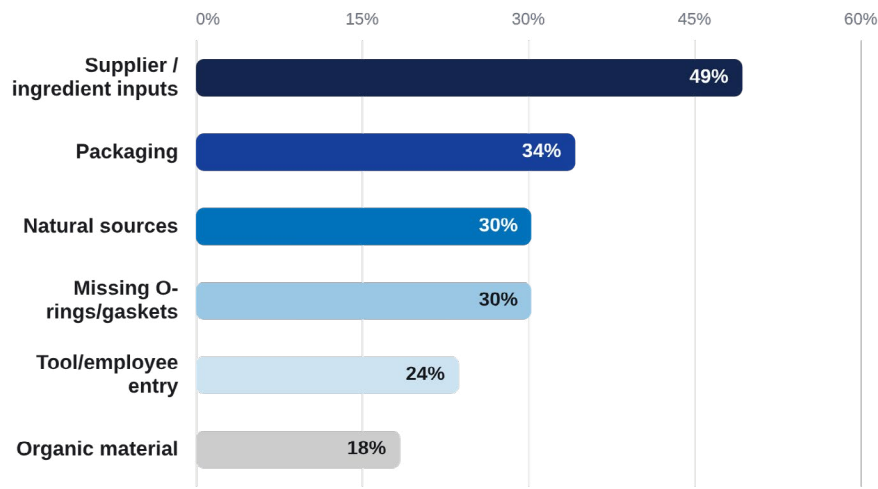


What are your most common sources of foreign material contamination?

Supplier and ingredient inputs are the single largest source named by producers, at 49.3% — ahead of packaging (34.2%), natural sources and lost or missing O-rings/gaskets (30.3% each), tool or employee contact with production equipment (23.7%), and organic material (18.4%).

Sources of foreign material contamination

Choose up to 3, 2026 FM Benchmark (n = 152)



Combined, supplier inputs, natural sources, and organic material — the three categories tied most directly to the supply chain — account for 67.8% of respondents citing at least one, making the supply chain the biggest source of foreign material in this year's survey. One respondent put it plainly: "insects/pests from suppliers at field level."

For producers whose incoming materials are a recurring source of contamination, a more frequent or more technical supplier-verification process — beyond an annual audit or certification review — is worth considering as a next step. While not a replacement for existing inspection, it can be an added layer at the point where the largest share of contamination is already entering the plant.

A QUICK GUIDE TO CONTAMINANT TYPES ATTRIBUTED TO UPSTREAM SOURCES:

Supplier & Ingredient Inputs

Contaminants originating at an upstream supply chain member, sometimes including a producer's own facility

Natural Sources

Naturally occurring contaminants (such as stone and wood) that aren't part of the original ingredient

Organic Material

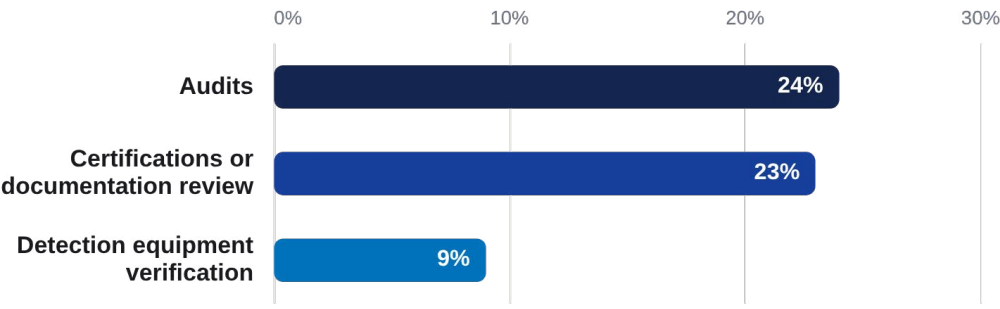
Naturally occurring contaminants (bone and similar) that are part of the original ingredient



What have you found to be some of the most effective supplier audit or validation tactics for preventing foreign material from input ingredients/packagers?

Most effective supplier audit or validation tactics

Top-cited themes, open-ended responses, 2026 FM Benchmark (n = 75)



Audits (24%) and certifications or documentation review (23%) are the two most common tactics producers cite as effective. Both of them confirm that a supplier follows the right processes and paperwork — but they don’t confirm the supplier can actually catch contamination themselves. In fact, only 9% of respondents said their supplier validation process includes checking whether the supplier itself actually runs foreign material detection equipment.

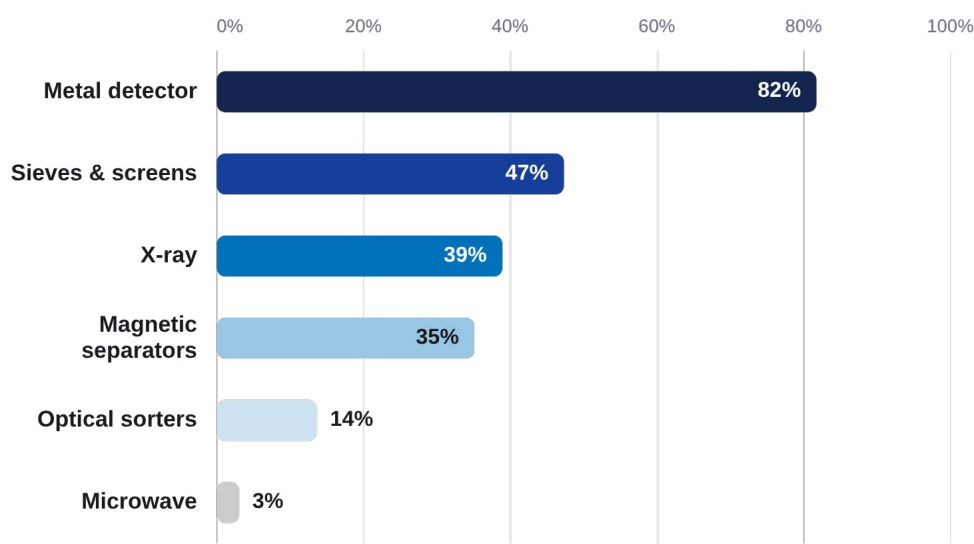


Detection

Metal detection didn't become the industry standard by accident. It's had decades to mature, and the data shows it: 82% of respondents run metal detectors, the most widely used piece of equipment in the industry by a wide margin.

Detection equipment in use

Share of respondents, choose-all-that-apply, 2026 FM Benchmark (n = 131)



Plastic-capable detection hasn't reached that same point. Only 39% of respondents run X-ray, the method actually capable of reading density on some types of dense plastics. Sieves and screens, the second most common method at 47%, sort by physical size rather than material — also not built to identify plastic specifically. Magnetic separators (35%), optical sorters (14%), and microwave-based systems (3%) round out what's in use, and none of them close the gap either.

The problem of finding metal contaminants in food products has generally been addressed at scale. The same can't be said for plastic, despite its prevalence.

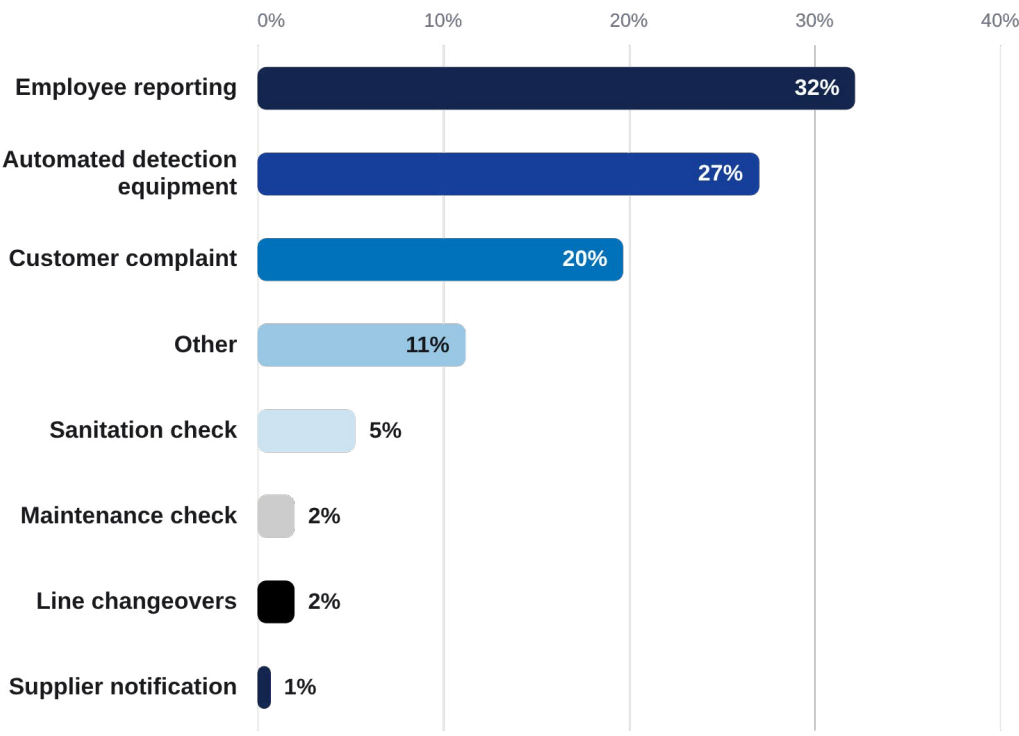


What is your most common signal that you have a potential foreign material event?

Employee reporting remains the top signal, named by 32.2% of respondents. Automated detection equipment follows closely at 27%, with customer complaints third at 19.7%.

Most common signal of a potential FM event

2026 FM Benchmark (n = 152)



Most of the write-in “Other” responses describe a more specific version of automated detection rather than a separate way of finding a problem — a metal detector catching it, an in-line filter inspection, a hole discovered in a processing screen. Grouped together, that puts equipment-based detection closer to employee reporting than the numbers suggest on their own.



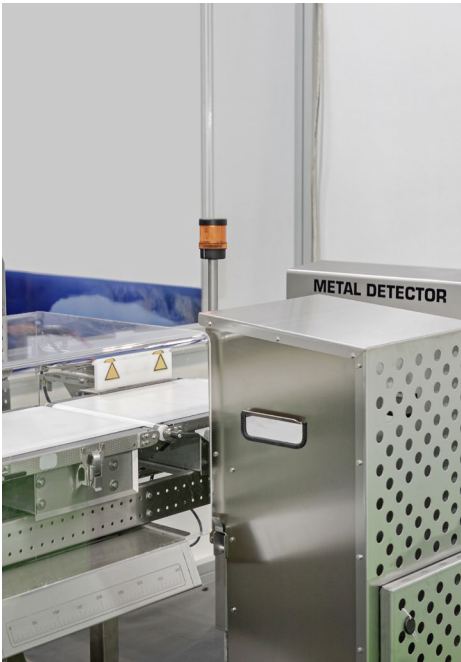
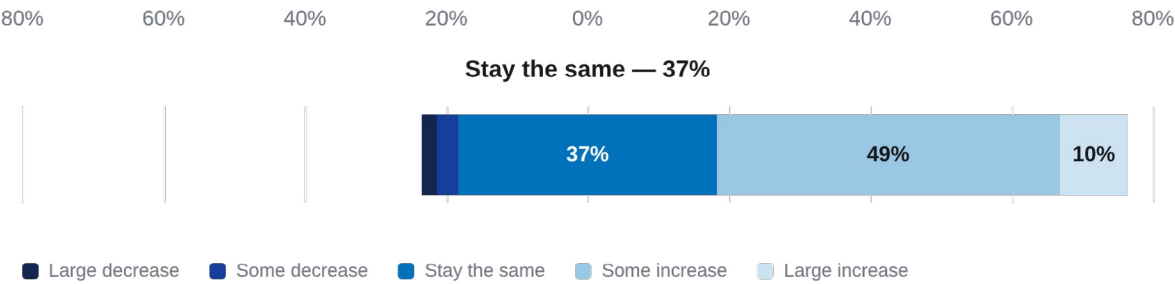
How do you plan to change your level of investment in in-line foreign material detection equipment by the end of 2027?

58.2% of respondents plan at least some increase in detection investment by the end of 2027, down from 70% in 2025. It's worth noting that those two figures aren't directly comparable: 2025 asked about the next three years, while this year provides a better pulse on short-term plans, roughly a year and a half out. That difference likely explains part of the gap. But the direction still holds — less investment intent than last year.

Most of the group still planning an increase describes it as “modest,” while only about one in six call it “large.” More than one-third of all respondents plan to hold steady at current levels, and a small number plan to invest less than they do today.

Planned change in detection investment

By end of 2027, 2026 FM Benchmark (n = 134)



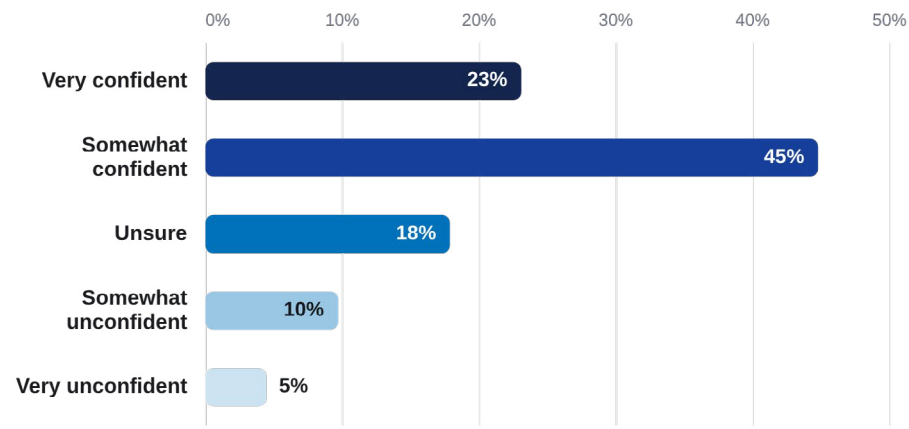


How confident are you that your current in-line detection equipment is finding all foreign material in your product?

23% of respondents say they’re very confident their current equipment finds all foreign material in their product, compared to 19% in 2025. A full third of respondents, however, are either unsure or lack confidence in their detection equipment’s capabilities to fully prevent foreign material in product.

Confidence that equipment finds all FM

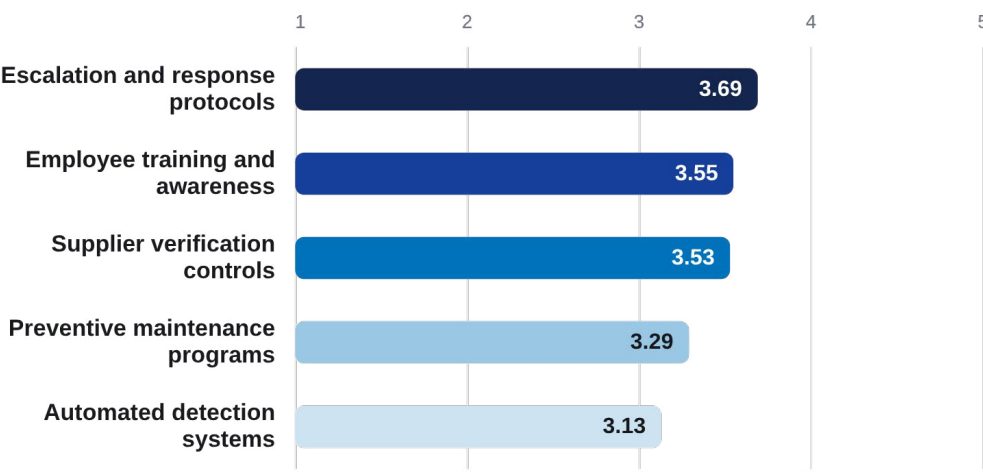
2026 FM Benchmark (n = 134)



Please rate the maturity of the following foreign material prevention areas within your organization.

Prevention area maturity

Self-rated, 1–5 scale, 2026 FM Benchmark (n = 131–134)



Producers rate escalation and response protocols as their most mature prevention area (3.69 on a 5-point scale), followed by employee training (3.55) and supplier verification (3.53). Preventive maintenance programs come in lower (3.29), and automated detection systems rank lowest of all five areas (3.13).

That ranking aligns with other questions around detection: investment in detection technology is slowing, confidence hasn't moved in two years, and producers rate their own automated detection as the least mature part of their prevention program — all pointing at the same gap from different angles.

Facilities that rate their automated detection as immature also rate every other prevention area lower, suggesting overall program maturity — not a detection-specific blind spot — may be the more accurate takeaway for at least part of the industry.

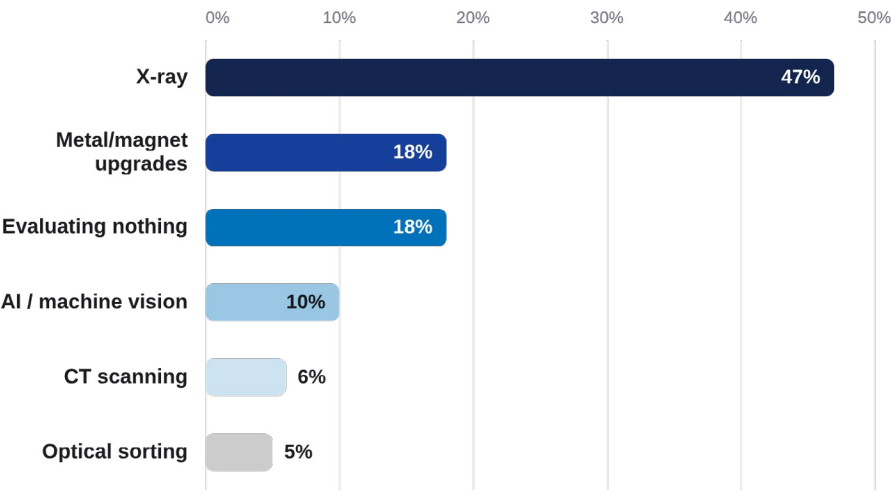


What emerging technologies are you evaluating or implementing?

Among producers evaluating new technology, 47% are looking specifically at X-ray — more than double the next most common answer, metal detector or magnet upgrades (18%). AI or vision systems account for 10%, CT for 6%, and optical sorting for 5%.

What producers are evaluating next

Themed from open-ended verbatims, 2026 FM Benchmark (n = 83)



Investment intent overall is cooling, as covered above. But among producers still investing, the direction is clear: X-ray — the same technology this section has already shown lags far behind metal detection in adoption.



What are some specific targets/goals your organization has been pursuing in the last year specific to foreign material?

Roughly a quarter of respondents (in an open-ended response section) set that goal as full elimination — adding comments including “zero defect,” “eliminate,” and “0 foreign material.”

Close to half set a specific numeric target instead: “a percentage reduction,” “a defect rate,” or a “rate against production volume.” Whatever the target, confirming it depends on being able to detect the contamination in the first place. A small handful specifically don’t set foreign material targets at all, adding, “We do not place targets around foreign material due to them being out of our control.”

A zero-defect target set against equipment that can’t reliably detect the industry’s most frequently reported contaminant can’t be confirmed as met, regardless of how the rest of the prevention program performs.



Mitigation

According to the data, most foreign material events never leave the plant. When a hold happens, producers overwhelmingly handle it with their own people and equipment rather than bringing in outside inspection — and that decision has more to do with cost and turnaround time than confidence in the result. Looking closely at how that internal process actually works reveals a real tension: the same equipment already shown earlier in this report to be poorly matched to plastic is also the equipment most commonly used to re-inspect product after a hold.

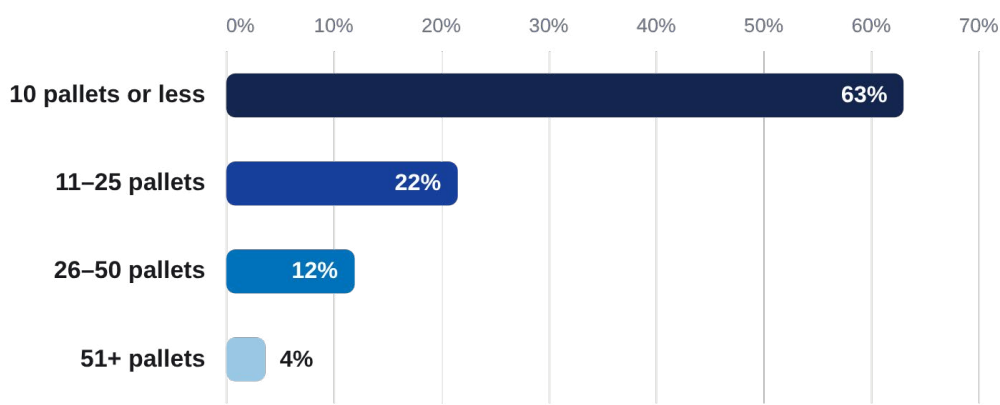


On average, how large a product hold do you typically have after discovering a potential FM event?

63.0% of respondents report holds of 10 pallets or less, with another 21.5% in the 11-to-25-pallet range. Larger holds — 26 pallets and up — make up the remaining 15.6%.

Product hold size

All respondents, 2026 FM Benchmark (n = 135)

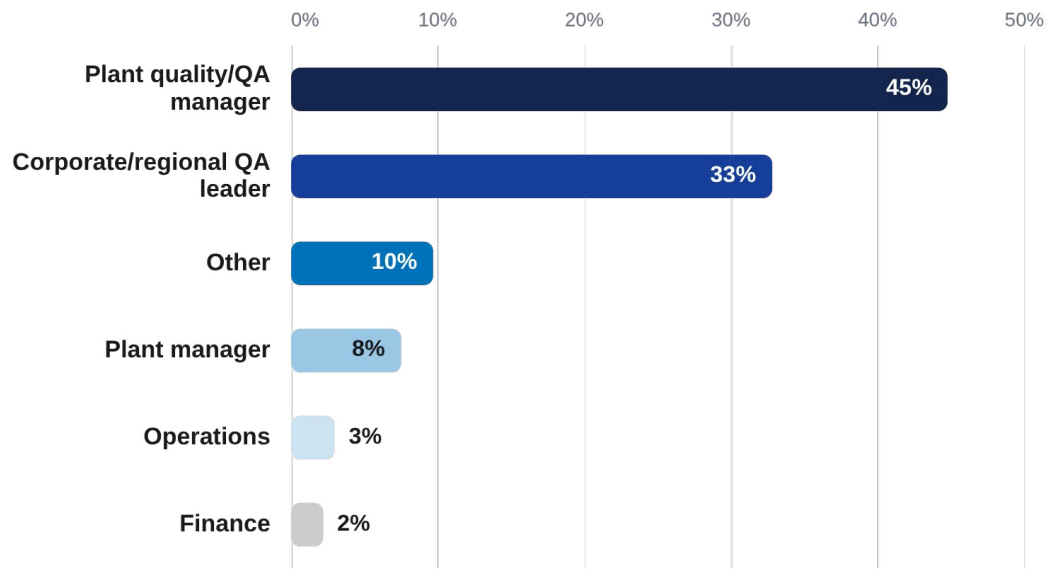


Who ultimately has decision-making authority over what to do with contaminated or on-hold product at your facility?

Plant-level quality/QA managers hold final authority most often, named by 44.8% of respondents. Corporate or regional QA leadership comes in second at 32.8%. Together, FSQA — at the plant or corporate level — accounts for more than three-quarters of where this decision lands. Plant management (7.5%), operations (3.0%), and finance (2.2%) make up the remainder.

Decision authority on contaminated / on-hold product

2026 FM Benchmark (n = 134)



A smaller group of respondents (9.7%) named authority outside this structure entirely: ownership or executive leadership directly, including a few respondents who described a smaller facility where the owner or CEO makes the final call. That pattern shows up almost exclusively among smaller operations, where a formal corporate-QA layer doesn't exist to make the decision in the first place.

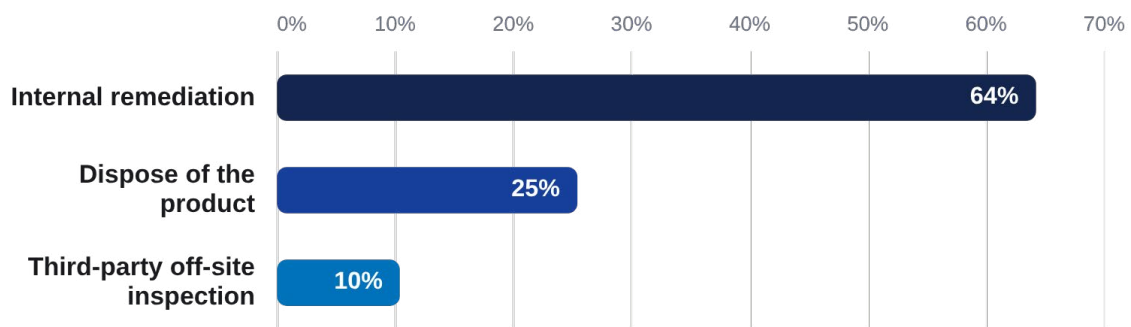


What is the most common action that your facility takes when faced with a product hold due to potential foreign material?

Internal remediation remains the default response, used by 64.2% of respondents. 25.4% dispose of the affected product, and 10.4% use a third party to inspect off-site.

Most common action on a product hold

2026 FM Benchmark (n = 134)



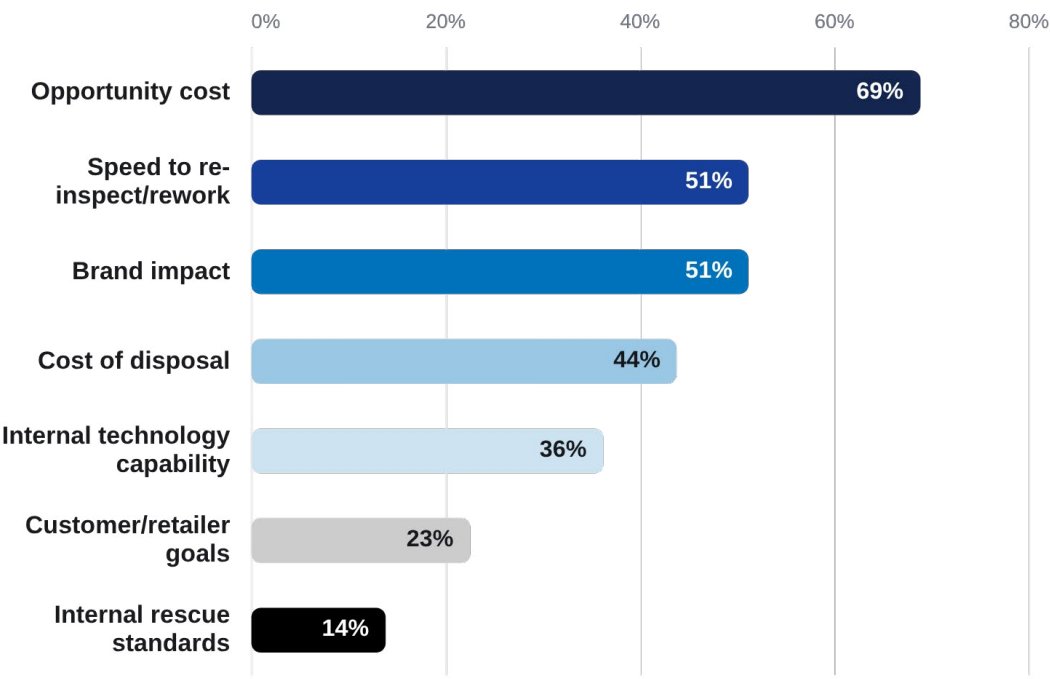


Please select your top 3 considerations when determining what to do with potentially contaminated product.

Opportunity cost — the labor, equipment, and downtime lost to inspecting affected product — is the runaway top consideration, selected by 68.8% of respondents. Brand impact and speed to re-inspect are tied for second at 51.2% each. Cost of disposal follows at 43.8%, then internal technology capability at 36.2%, customer or retailer goals at 22.5%, and adherence to internal rescue standards at 13.8%.

Top considerations when determining what to do with contaminated product

Select up to 3, 2026 FM Benchmark (n = 80)



Note: Consumer safety isn't included as one of the options above by design — in past versions of this survey, it came in as the clear and obvious top choice, which we assume to still be the case in 2026 as the mandate of FSQA organizations.

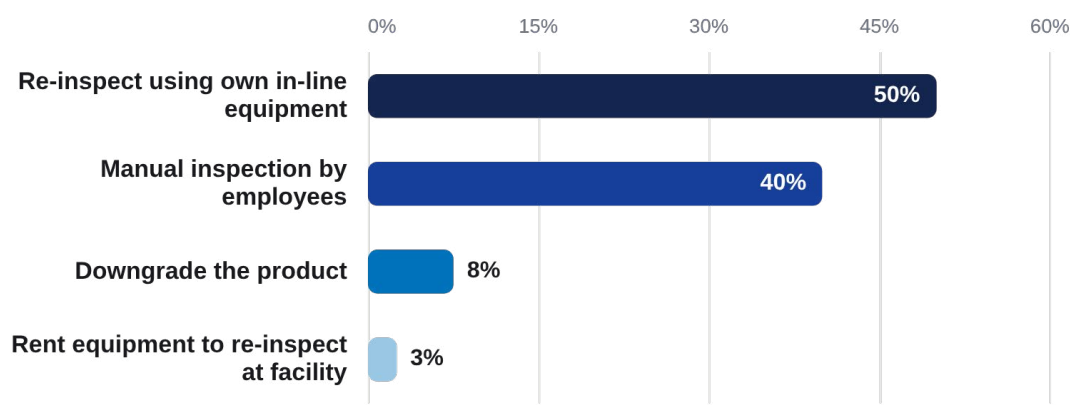


How do you most frequently remediate internally?

Among facilities that remediate internally, half re-inspect the product using their own in-line equipment (50%), and 40% rely on manual inspection by employees. A smaller number downgrade the product (7.5%) or rent equipment to re-inspect at their facility (2.5%). Half of internal remediation, in other words, relies on the same in-line equipment already shown earlier in this report to be concentrated on metal detection, not plastic — and without full marks on confidence.

How do you most frequently remediate internally?

Among facilities that remediate internally, 2026 FM Benchmark (n = 80)



What is the primary reason your organization chooses to handle foreign material rework internally instead of using a third-party inspection provider?

Cost and turnaround explain most of the decision to stay internal. For nearly one in five producers, though, the reason is trust in their own equipment — worth noting, given what the rest of this report shows about that equipment.

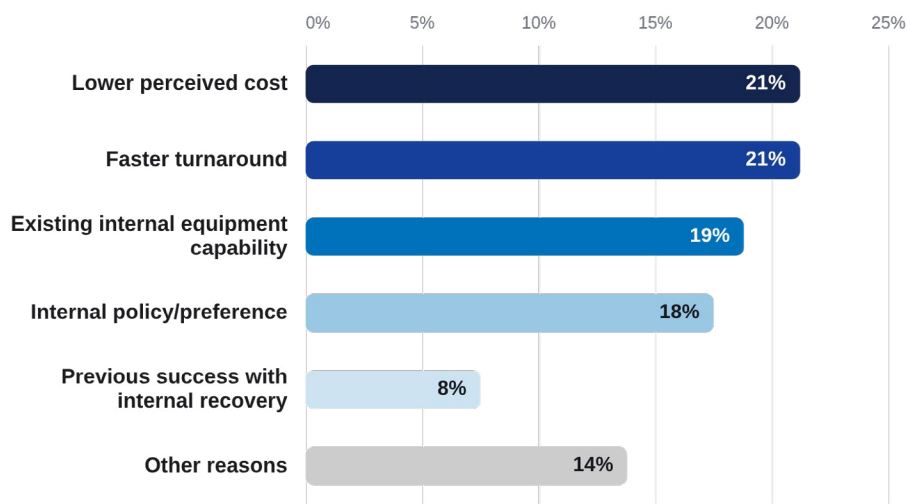
At FlexXray, we call that process The Rework Loop. [Click here to learn more about it.](#)

The reasons split fairly evenly across a few practical factors: lower perceived cost (21.2%), faster turnaround (21.2%), existing internal equipment capability (18.8%), and internal policy or preference (17.5%). A smaller group cited previous success with internal recovery (7.5%).

Trusting existing equipment assumes that equipment can catch what's actually causing today's problem. Most in-line equipment industry-wide is built around metal detection, not any other materials — so equipment capability and equipment match aren't necessarily the same thing.

Primary reason for handling rework internally vs. using a third party

Among facilities that remediate internally, 2026 FM Benchmark (n = 80)

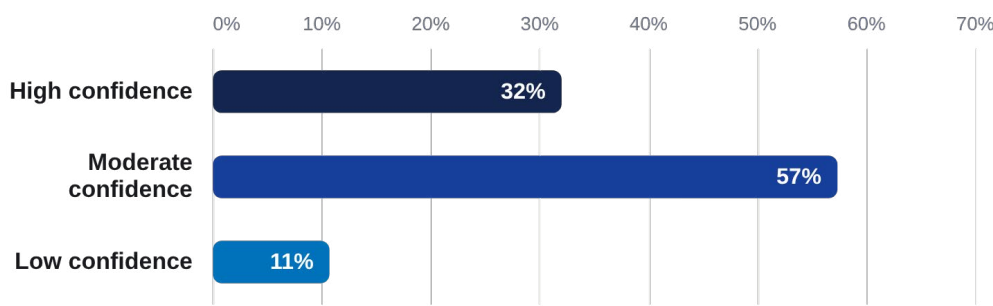


What is your level of confidence that equipment used for re-inspection will detect additional foreign material that may have been missed on the original inspection?

89.3% of respondents report at least moderate confidence in the equipment used for re-inspection — 57.3% moderate, 32.0% high. Only 10.7% report low confidence.

Confidence in re-inspection equipment detecting missed FM

Among facilities that remediate internally, 2026 FM Benchmark (n = 75)



That confidence doesn't track with how producers rate their own equipment elsewhere in this report. Automated detection is the lowest-rated prevention area industry-wide (3.13 on a 5-point scale) — yet the specific respondents who cite their own equipment capability as their reason for staying internal actually rate their automated detection higher than average (3.71), not lower. High confidence in re-inspection equipment doesn't mean that equipment is actually mature.

Summary & Takeaways

This year's data across frequency, detection, and mitigation describes an industry managing foreign material contamination reactively rather than closing the gaps that keep it recurring.

The frequency of events hasn't changed, and neither has oversight of the biggest source — suppliers. Most producers opt to handle those contamination events internally for the perceived opportunity cost benefits. At the same time, internal detection investment is slowing despite confidence in current internal inspection processes remaining low. .

Foreign material contamination shifts as products, packaging, and supply chains change, which is why tracking it year over year matters to FlexXray. The producers making real progress aren't necessarily the ones with the most equipment — they're the ones willing to look honestly at what their current program can and can't catch, and adjust from there.

If you're interested in what third-party inspection could look like as an addition to your current foreign material contamination response plan, [contact FlexXray](#).





FlexXray is the nation's leader in foreign material inspection and remediation services for the food industry. Using advanced X-ray and CT inspection technologies, FlexXray helps food manufacturers safeguard their products, reduce waste, and protect consumers. Headquartered in Arlington, Texas, FlexXray operates facilities across the U.S. and internationally, and partners with leading food brands to solve contamination challenges with speed and precision.