

8 Step Guide to Root Cause Analysis for Food Safety Teams

Date



ALT Text for Images

Images top to bottom

Food safety technician swabbing equipment

Table showing examples of questions commonly used by food safety teams when using the 5W2H tool

Figure showing an example of an Ishikawa Fishbone Diagram used by food safety teams when conducting a Root Cause Analysis

Pathogen nonconformance report over time

Neogen Environmental Monitoring Handbook cover and inside spread

How quickly can your quality and food safety team identify and resolve a problem before it compromises product integrity? Root Cause Analysis provides your food and beverage team with a standard, documented, and systematic framework for solving problems that impact your products. When integrated into your Environmental Monitoring Program, this structured approach can help your team identify the root cause of an issue, take corrective action, and prevent recurrences.

This article introduces eight steps for a successful Root Cause Analysis and explains how this process can help your team respond more effectively to food and beverage safety issues. This process draws from the problem-solving methodology of Total Quality Management (TQM), valued for its broad applicability and simple framework. For a complete guide, be sure to download the **Neogen Environmental Monitoring Handbook for the Food and Beverage Industries** (2nd Edition, 2025).

Steps 1–3: Creating a Plan

Who	Who discovered the issue: internal control, supplier, operator, audited customer?
What	Describe the issue: add pictures, videos, data that show differences among standard and defective products or conditions.
When	Where is the issue located: line or lines, facilities, etc.
Why	Why is the issue a problem? Quality? Food safety? Regulatory?
How	How was the issue detected: organoleptic evaluation, microbial test, other assay?
How many/much	Describe, when is possible, all the lots, batches, units involved.

Table 1. 5W2H Tool—Who, What, When, Where, Why, How, and How Much from Neogen’s Environmental Monitoring Handbook, Chapter 9.

As a best practice, assemble a small, committed cross-functional team to support initiatives and act as a change management tool. With your team in place, the Root Cause Analysis process begins by completing the first three steps: clarifying the problem, breaking it down, and setting measurable targets. To guide these early steps, your team can use tools such as the 5W2H

tool (Table 1) to frame key questions such as: What is our purpose? Where is the issue occurring? How often does it happen? These questions help your team build a clear plan and lay the groundwork for a Root Cause Analysis that addresses immediate issues and supports long-term food safety goals.

Step 4: Root Cause Analysis

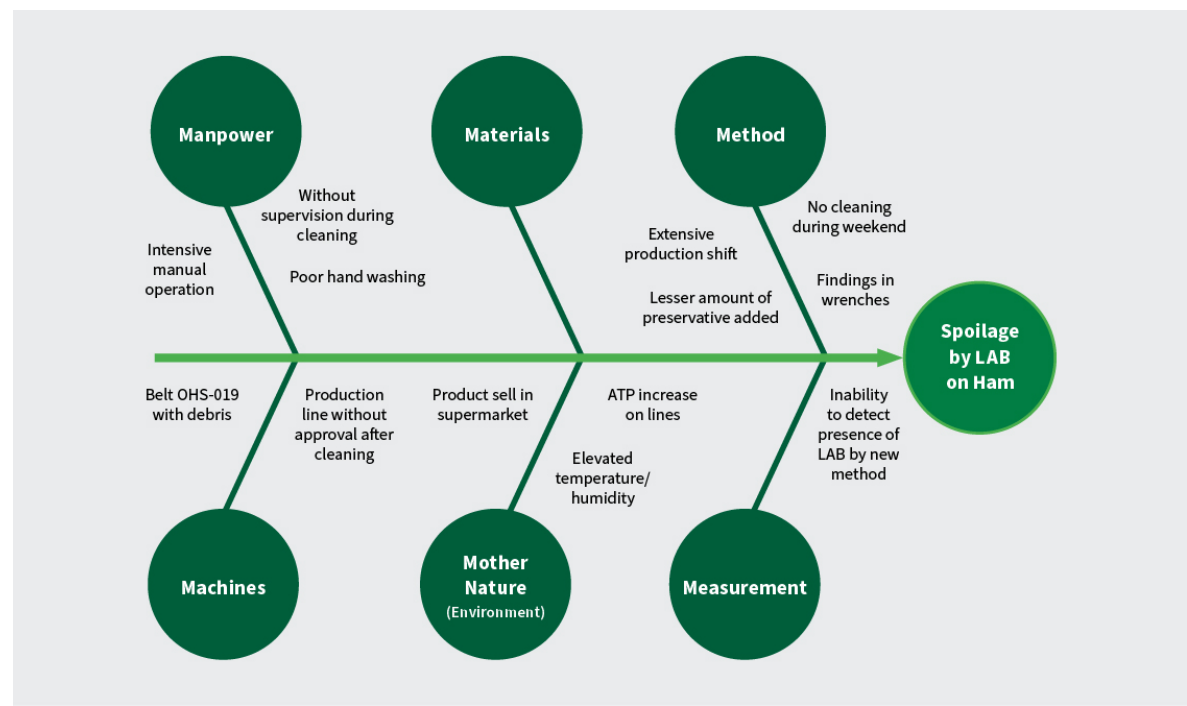


Figure 1. Ishikawa Diagram from Neogen’s Environmental Monitoring Handbook, Chapter 9.

With a plan in place, your team can now start the core investigative work of Root Cause Analysis, which includes reviewing historical data, gathering observations, organizing findings, and identifying and prioritizing root causes through collaborative analysis.

Reviewing existing data helps identify patterns, trends, and possible causes worth investigating. Observations in the environment help verify these insights, expose

overlooked conditions, and may reveal immediate issues that require correction. Once the findings are collected, your team should meet to review the data together, noting unusual pieces of information and following all clues. There are various methods used in these discussions, including the Ishikawa Diagram (Figure 1) and the KNOT & 4 P’s analysis, which are both tools that help teams examine potential causes from multiple angles.

Prioritizing the most likely causes ensures the team directs efforts where they will have the most impact. This step is crucial for turning your findings into actionable steps and avoiding assumptions that can derail progress.

With the root causes clearly defined, your team can now move forward by developing countermeasures and testing corrective actions—Steps 5 and 6 of the process.

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Steps 5–6: Develop Countermeasures and See Corrective Actions in Operation

Once your team identifies the root causes, the next step is to address them using corrective and preventative actions (known as CAPA). CAPA actions can be immediate, corrective, or preventative, with each type supporting sustained improvement. The right actions depend on the complexity and significance of the root cause and may involve multiple steps or overlap across findings.

The best practice is to assign actionable tasks to responsible individuals with clear deadlines and expectations. Countermeasures should address the root cause directly and may range from basic changes in personnel practices, revalidation of cleaning processes, changes in prerequisites or processes, structural changes to equipment or facilities, to revalidation of the entire safety management system.

Once corrective actions are in place, some may show immediate results. Others—such as equipment or system changes—require time, and the team may need to evaluate them while the plant is in operation. During this period, teams should apply stringent release criteria to minimize risk. Because improvements in one area can lead to challenges in another, it’s important to be on the lookout for unintended consequences. If unexpected issues arise, the team may need to return to Step 4 to reassess before moving on to monitor processes and results.

Step 7: Monitoring Process and Results



After implementing corrective actions, it’s important to monitor their effectiveness over time. Some improvements may be noticeable immediately, while others take more time. In this step, your team confirms whether changes are working and adjusts strategies if results fall short. Supervisory teams play a key role in maintaining accountability and supporting an effective change-management process.

Teams should compare before-and-after data and use visual tools to track progress. In some cases, a tightened

or investigational sampling plan can help detect persistent issues or revalidate a process. Sharing results across the team supports the evaluation of the Root Cause Analysis and CAPA outcomes and prepares the way for the final step.

Step 8: Standardize Successful Processes

In this final step, teams turn effective corrective actions into standard practice. To support ongoing improvements, your team may document successful changes as updated standard operating procedures (SOPs) that outline revised tasks, responsible roles, verification steps, record-keeping practices, and any digital tracking tools used to ensure long-term consistency. Standardizing what works helps prevent recurrence and reinforces a culture of accountability and improvement.

Root Cause Analysis in Action



Root Cause Analysis gives food safety and quality teams a simple, structured framework for addressing and preventing process challenges and product risks. As overviewed in this guide, the eight steps—from building your team and clarifying the problem to implementing solutions and standardizing what works—support a culture of continuous improvement. By applying this method consistently, your team can strengthen your overall food safety and quality management system and build long-term resilience across operations.

To explore each step in greater detail, download the *Neogen Environmental Monitoring Handbook for the Food and Beverage Industries* (2nd Edition, 2025). The handbook expands on methods your team can apply right away, including how to avoid classic errors and utilize additional cause-and-effect methodologies for complex investigations.

Download the Handbook