

SPOILER INVESTIGATION - SWOLLEN KETCHUP BOTTLES

How proactive and targeted risk monitoring enables long-term reductions in consumer complaints

A ketchup leading company in Brazil faced a persistent and costly quality issue: random swelling of ketchup bottles. The swelling led to customer complaints that peaked 13-16 weeks after production, **affecting up to 2% of total output.**

Complaints were highly variable, spiking on certain dates, but recurring throughout the year and across all ketchup flavors. The issue was especially problematic for a facility which produces 4,200 tons of ketchup per month.

The swelling problem not only risked significant financial loss but also threatened the brand reputation and customer trust.

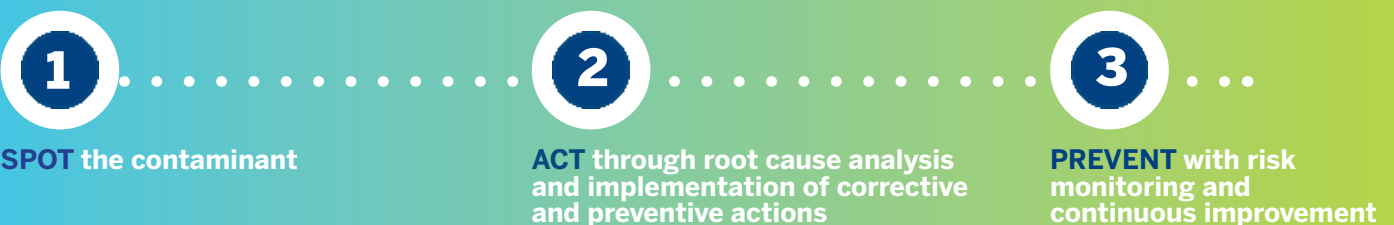
Leveraging the SMARTBIOME™ platform, bioMérieux helped the customer **identify the root cause of the problem** and **implement targeted corrective and preventive measures.**



METHODOLOGY - POWERED BY SMARTBIOME™

The factory's internal lab resources were limited, relying mainly on basic Gram staining and simple tests, with occasional external analyses. To address these challenges, the company sought a comprehensive microbiological mapping of their production environment and raw materials to identify contamination sources and implement corrective actions to mitigate these risks.

To this end, a close collaboration has been established with key milestones:



OUTCOMES

YEAR 1 - SPOT the contaminant & ACT

Mapping and profiling the microbiome distribution to reveal the root causes of swelling.

- **Sampling:** A sampling across raw materials (including tomato pulp, Gludex, vinegar), process water, equipment, and finished products has been done with a special focus given to acidophilic and thermotolerant organisms (e.g., tomato broth incubation at 46°C for 120 hours).
- **Advanced Diagnostics:** Thanks to DNA extraction and next-generation sequencing, the client identified a range of spoilage organisms, including lactic acid bacteria (notably *Lactobacillus namurensis*), enterobacteria, and yeasts (*Pichia*, *Candida*, *Torulaspota*).

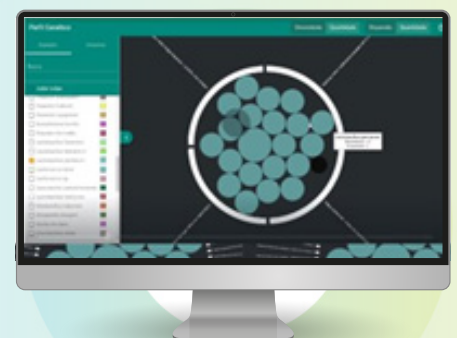


Fig. 1: Illustrative screenshot of the software showing the genetic profile of *Lactobacillus plantarum*

- **Root Cause Analysis:** Thanks to the unique SMARTBIOMETM knowledge base, the main causes of swelling were identified to be lactic acid bacteria and enterobacteria, both gas producers. This revealed two main root causes: tomato pulp (raw material) and operational failures related to sanitation and GMP compliance. Yeasts were also present but less central to the issue.
- **Action Plan and Recommendations:** After investigation, a corrective action plan was co-defined by the bioMérieux experts and the customer with over 30 corrective actions; including for example biofilm inspection and removal, enhanced water treatment and monitoring, improved sanitation protocols (CIP Clean-In-Place / COP Clean-Out-Of-Place).

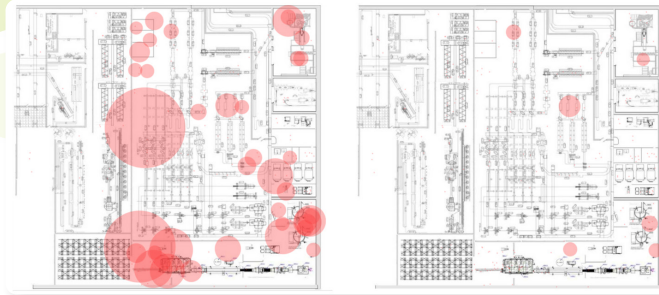


Fig. 2: Illustrative examples of the risk maps before and after corrective actions were implemented



YEAR 2 AND 3 - PREVENT the risk

Following the investigation, the factory decided to send additional samples regularly (several times per year) for metagenomic analysis using the SMARTBIOMETM platform in order to monitor the risk and prevent any further crisis. The project made microbiological knowledge tangible through risk metrics, leading to **greater awareness and engagement of teams for controlling deviations and reducing customer complaints.**

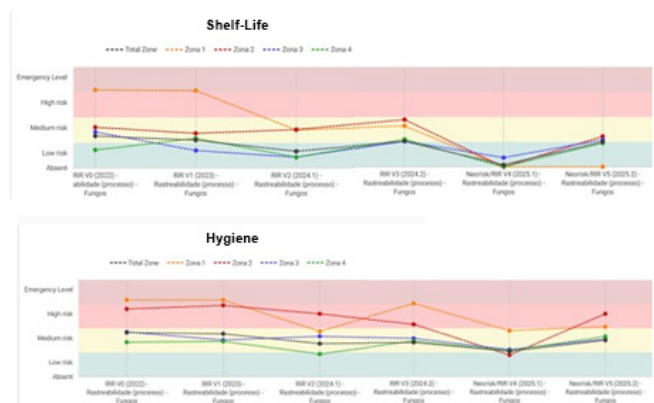


Fig. 3: Illustrative examples of monitoring over time

CONCLUSION & CREATED VALUE

- **Complaint Reduction:** The risk of swelling and related complaints decreased over subsequent years, with spikes becoming less frequent and severe.
- **Continuous Improvement:** Ongoing monitoring and data-driven adjustments led to better process control and knowledge transfer to factory teams.
- **Scalability:** The project is being presented for rollout to other factories facing similar challenges.
- **Business Value:** This project allows the company to reduce drastically customer complaints, to recover customer satisfaction over time and to prevent new issues.

Our Augmented Diagnostics Approach helps to move from reactive troubleshooting to proactive risk management. By identifying root causes and implementing targeted interventions, the company not only resolved a critical quality issue but also established a model for continuous improvement and regional scalability.



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Learn more about our
Augmented Diagnostics Approach