



Variable Influent. Predictable Outcomes.™

## Preventing costly digester upsets & stabilizing biogas production by conquering the variability of multiple feedstocks



**Location:** Roscommon, Ireland

**Client:** Biocore Environmental

**Type of Plant:** Anaerobic digestion plant

**Location of Sensors:** Feed to fermenter and post fermenter

**Problem Statement:** Inconsistent feedstocks disrupt microbial balance, putting process stability and biogas yields at risk

**Outcome:** Helped operations team act before a full upset occurred preventing costly downtime of potentially \$165,000 - \$212,000 USD per failure event while stabilizing biogas production and protecting continuous revenue streams

### Overview:

Biocore operates a large-scale anaerobic digestion (AD) facility in Ireland, processing over 30,000 tonnes of organic waste annually to generate renewable energy and nutrient-rich digestate. To ensure stable operations and maximize biogas production, the facility deployed SENTRY™ sensors to track microbial activity and volatile fatty acid (VFA) availability in real time. This data-driven approach reduces manual sampling while providing operators with early warnings of process imbalances safeguarding performance and revenue.

### Problem Statement:

The facility operates a co-digestion process with fermentation and post-fermentation digesters in series. Feedstocks include waste-activated sludge (WAS) from wastewater treatment plants across Ireland, glycerin, and other industrial organic by-products. The variability of these inputs made it difficult to maintain consistent microbial activity, risking process instability and reduced biogas yields.

### Deployment Experience:

To address this challenge, two SENTRY bioelectrode sensors were installed on the feed line into both the fermenter and post-fermenter tanks of the digester.



## Test Results and Values:

### Real-time Digester Health/Performance Monitoring

In February 2025, the SENTRY web dashboard alerted operators that the signal from Fermenter 1 had dropped into the low amber alarm range. Upon inspection, foam was observed in the digester, an early indicator of process imbalance. The drop in signal reflected reduced microbial respiration, likely caused by lower bioavailable VFAs or inhibited activity. Without intervention, these conditions could lead to acidification and significant process disruption. Thanks to a 2-day early warning by the SENTRY sensor, operators acted quickly to investigate and stabilize the system before a full upset occurred.

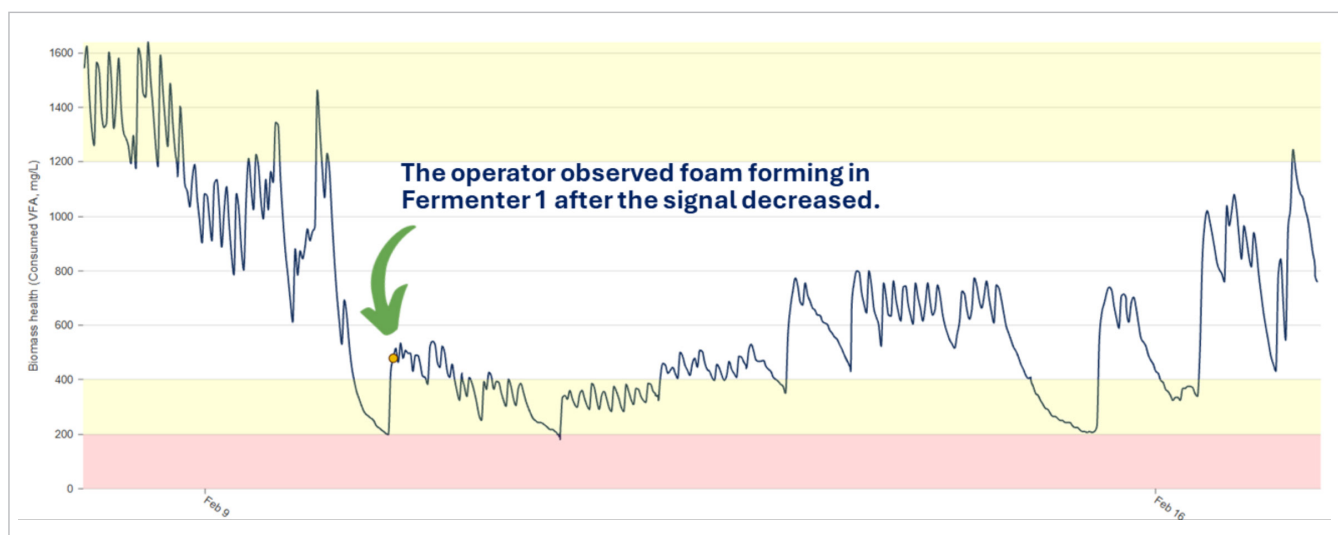


Figure 1: The SENTRY web dashboard indicated a 2-day early warning before foaming appeared. The digester required three days to fully recover from the process instability vs. a prolonged outage.

## Final Outcomes:

Recovering from an AD failure in Ireland is costly, with financial impacts from both lost revenue and direct recovery efforts. For example, at a facility like this, a 10-day outage can result in:

- ✓ Lost operating revenue (electricity sales, gate fees) = \$24,000 - \$82,000 USD
- ✓ Direct recovery costs (cleaning, disposal, etc.) = \$141,000 - \$177,000 USD
- ✓ Total cost per incident = \$165,000 - \$212,000 USD

This means by providing early detection of digester upset at this Biocore facility, SENTRY helped their operations team act before a full upset occurred preventing costly downtime - **potentially \$165,000 - \$212,000 USD per failure event**. The SENTRY sensors also stabilized biogas production and protected continuous revenue streams.

Visit the SENTRY website to see how other AD facilities are using our sensors to optimize digester performance for just a few dollars a day!

