REAL-TIME MICROBIOLOGY FOR SAFER URBAN WATERS

COMPARISON OF BACTcontrol WITH STANDARD LABORATORY METHODS

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OSD/ OPTI SENSE DATA

Understanding How Water Quality Changes in Real Time

A series of controlled spike tests were carried out near the floating basin of Rijnhaven, Rotterdam. Local water from the Rijnhaven was mixed with wastewater fractions (0%, 0,1%, 1%, and 10%) to create a wide range of *E.coli* concentrations. The setup allowed a direct comparison between real-time measurements and established microbiological methods across low and high contamination levels. The measurements and validation were conducted by Aquon, located in the Netherlands.

Real-Time Insight for Dynamic Urban Waters

Floating basins and urban waterfronts can experience sudden changes in microbiological quality due to weather, runoff, or daily activity. Traditional laboratory methods are accurate but take time to process. In the other side, real-time monitoring provides immediate awareness when conditions shift, supporting quicker responses and safer management of locations that attract swimmers, visitors, and floating facilities.

Laboratory results

BACTcontrol closely tracked the rise in *E.coli* as measured by qPCR and MPN (NEN-EN-ISO 9308-3), showing near-linear behaviour across all contamination levels. According to Aquon, MPN results (measured using Colilert) are the only properly standardized values and should be the main reference. Mobile qPCR also aligns to a certain extent, while TECTA showed more variability—especially at high contamination levels. These results confirm BACTcontrol's real-time sensitivity and suitability for environments with shifting water quality. *Note: Colony count data should be interpreted as MPN (Colilert) values.*

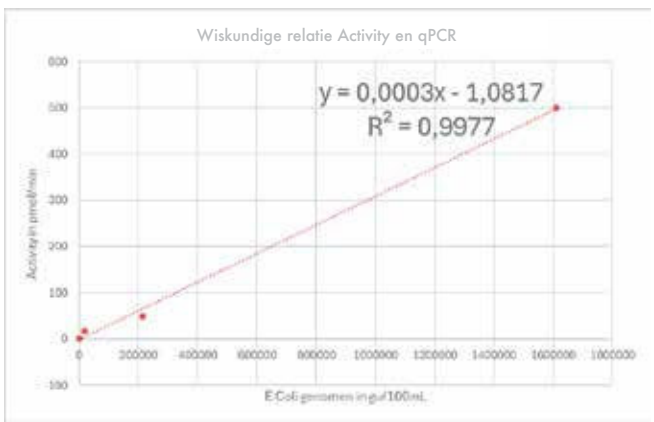


Figure 2: Strong linear correlation between BACTcontrol activity and qPCR *E.coli* counts (R^2=0,9977)

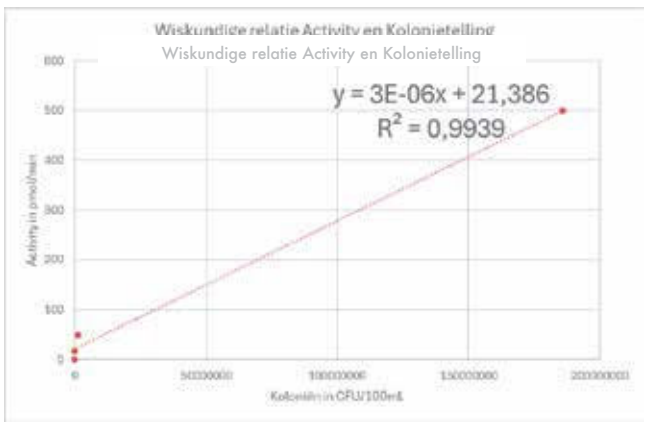


Figure 4: Activity correlates with MPN (Colilert) counts over several orders of magnitude (R^2=0,9939)

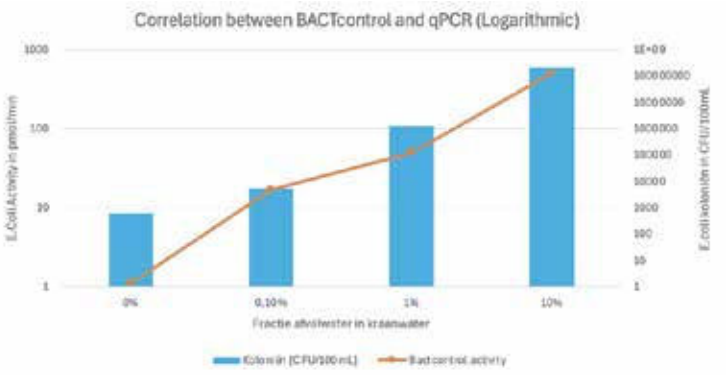


Figure 1: Both qPCR and enzyme activity rise proportionally across wastewater fractions (log scale)

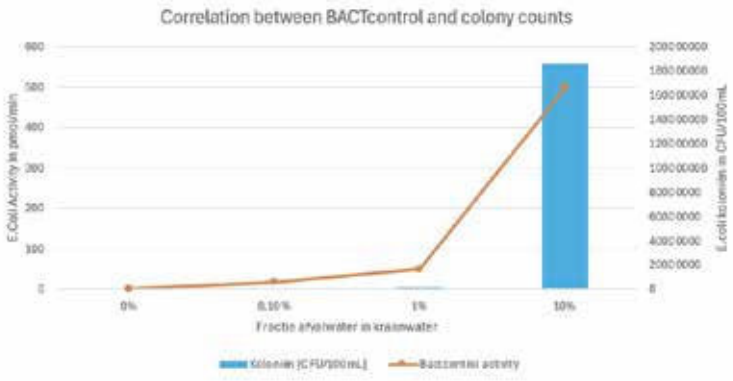


Figure 3: MPN (Colilert) counts and activity show the same response pattern in logarithmic view

Closing thoughts

The validation highlights how continuous microbiological insight can support safer and more responsive management of urban waters. Real-time information helps operators notice shifts sooner, communicate more effectively, and take timely action when conditions change. In places with increasing recreational use and bathing activity, having an immediate indication of water quality adds a meaningful layer of awareness for both users and decision-makers. These outcomes position BACTcontrol as a reliable and sensitive tool for early detection in dynamic urban waters.

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Digitaal inzicht in waterkwaliteit