A CHIP TOOL FOR NON-INVASIVE DETECTION OF DISEASE-CAUSING ORGANISMS IN DANISH RAINBOW TROUT AQUACULTURE: A 12-MONTH STUDY

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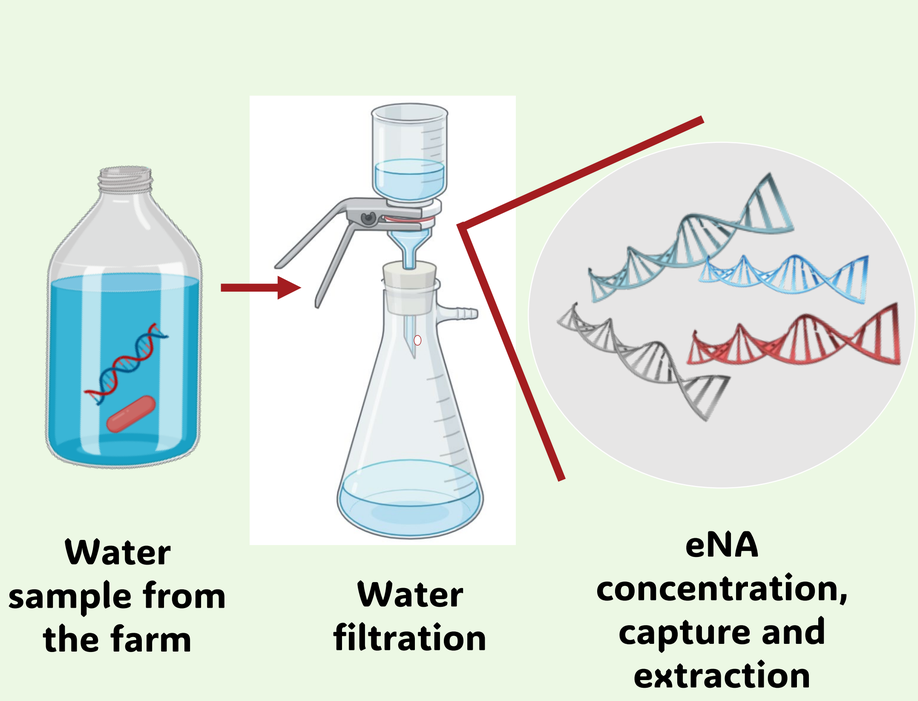
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Introduction

We have developed a non-invasive, chip-based tool for the early detection of disease-causing organisms in Danish aquaculture. Using environmental DNA and RNA (eNA) collected from water samples, the chip can simultaneously detect eNA from 20 pathogenic organisms, enabling faster diagnosis, improved disease management, and enhanced fish welfare.

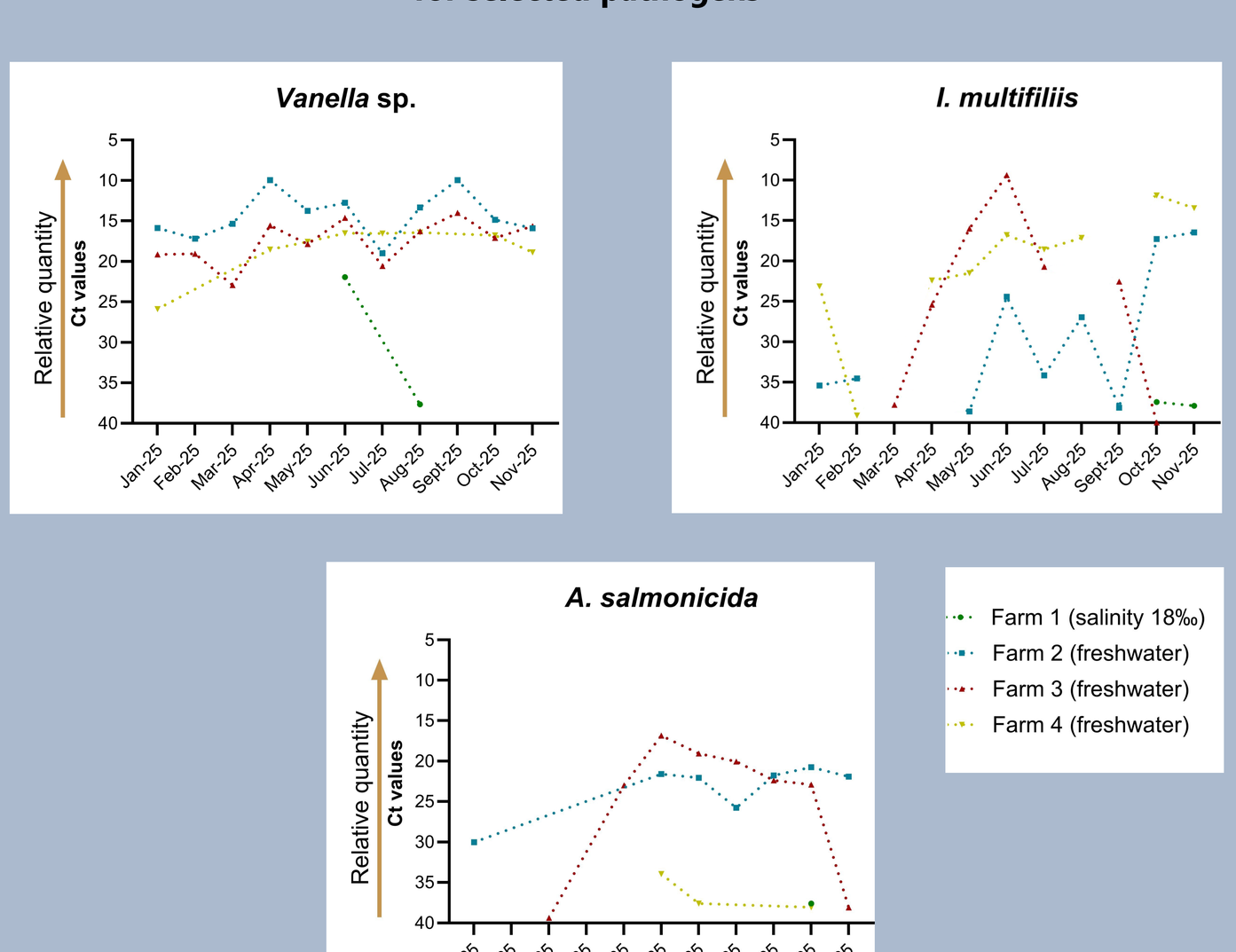
Methods

During this 12-month study, we collected monthly water samples from four rainbow trout farms and analyzed them using a high-throughput microfluidic chip-based qPCR platform to monitor the presence of selected pathogens.



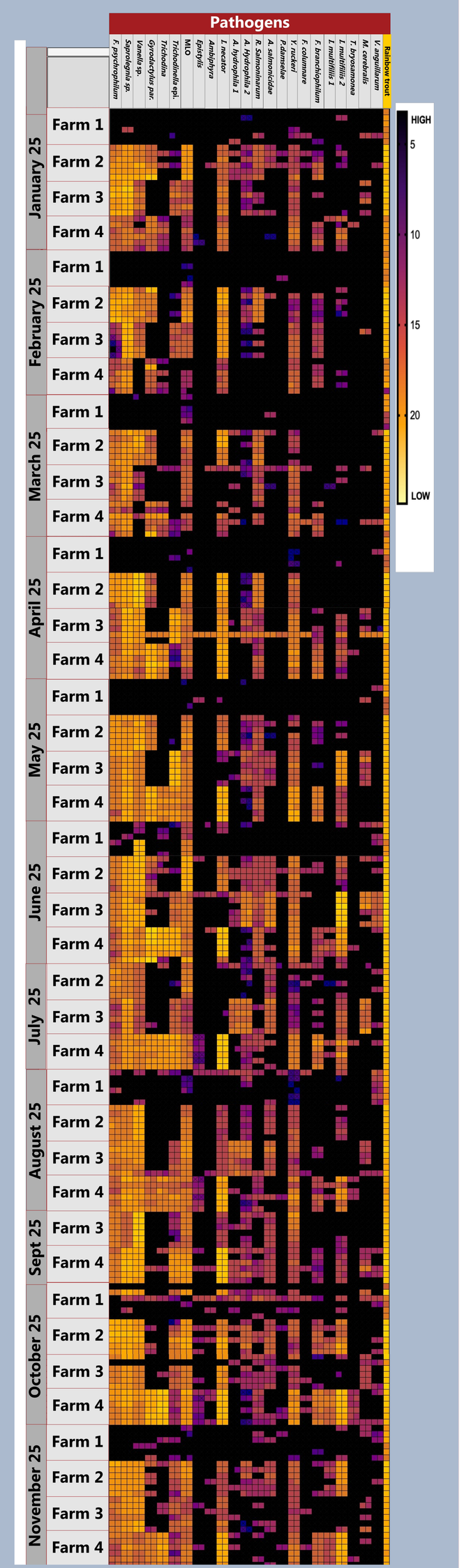
Results

Relative quantity of eNA in different farms from January to November 2025 illustrated for selected pathogens



Results

Heatmap of Ct values



Discussion

Our study demonstrates that a chip-based eDNA detection tool for farm water is a highly promising platform for monitoring disease-causing organisms in Danish aquaculture.
The next step is to further analyze and interpret the data to determine how the presence and abundance of pathogenic eNA in the water relate to infection risk. Ultimately, this approach could serve as an effective early warning system, enabling earlier intervention and improved fish health management.