Rapid diagnostic technologies for foodborne pathogens

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INTRODUCTION

Point-of-care (POC) diagnostics for foodborne pathogens could play an important role in safeguarding public health and ensuring food safety. These rapid and efficient testing methods are indispensable in identifying harmful pathogens like *Salmonella* or, *Escherichia coli* at the earliest stages of food production and distribution. By providing quick and on-site results, POC diagnostics enable interventions to prevent contaminated products from reaching consumers, reducing the risk of foodborne illnesses and outbreaks. For the adoption of on-site diagnostic methods, they need to be rapid, validated, sensitive, specific, portable, affordable, integrated to provide sample-to-answer, and accepted by regulations.

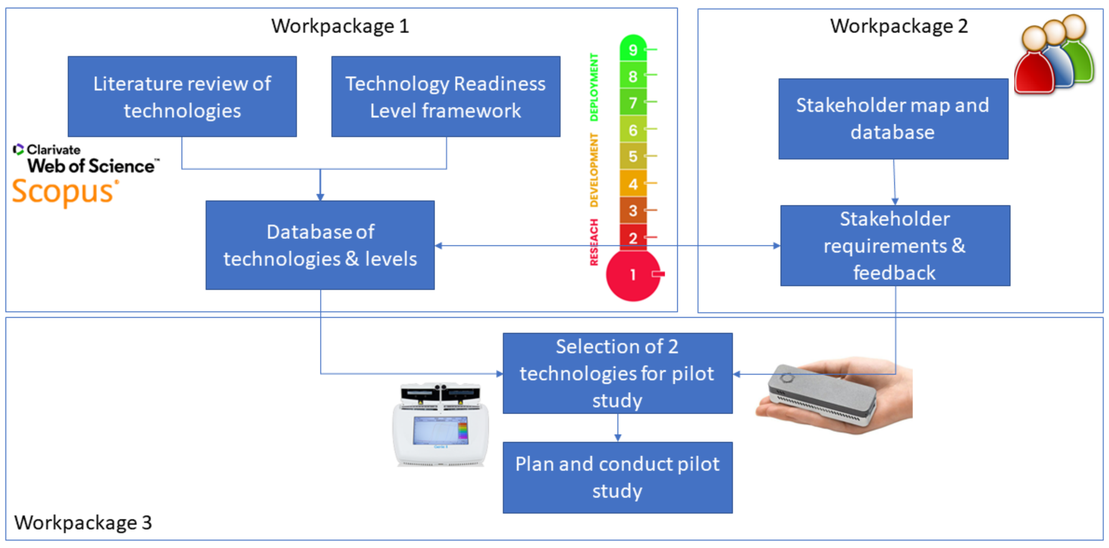


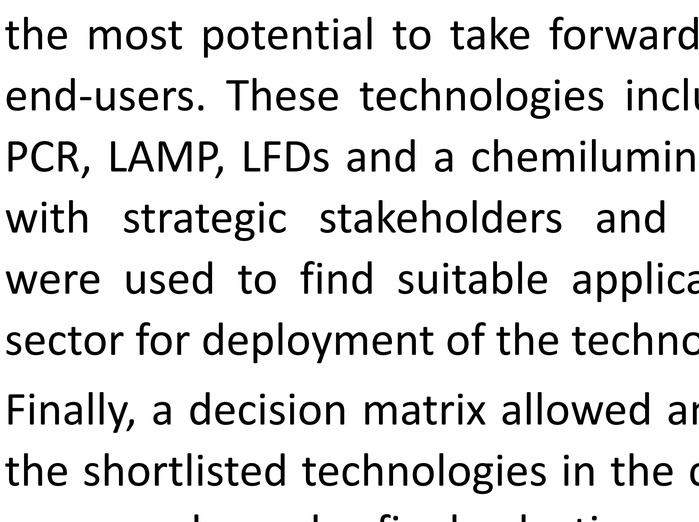
Figure 1. Summary of WS3a project

We aimed to identify a shortlist of the technologies with the most potential to take forward for a pilot study with end-users. These technologies include portable real-time PCR, LAMP, LFDs and a chemiluminescence kit. Interviews with strategic stakeholders and operational end-users were used to find suitable applications within the food sector for deployment of the technologies.

Finally, a decision matrix allowed an evaluation of each of the shortlisted technologies in the context of specific end-user needs, and a final selection was made based on the outcome. The two technologies to be taken forward are

- Portable real-time PCR for monitoring of *E. coli* in irrigation water.
- LAMP for detection of *Salmonella* in sesame seeds at ports.

The work on the pilot study is currently ongoing.



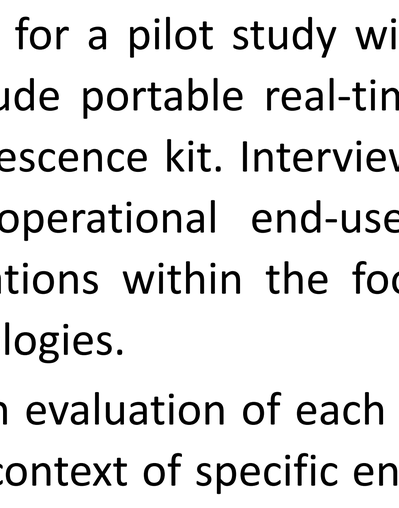


Figure 2. Visit to the Port Health Authorities at Felixstowe and showing their facilities for sampling and future testing as part of the pilot study.

As part of PATH-SAFE WS3a, a landscape study to identify promising technologies with on-site testing applications was performed. These technologies were assessed through a customised technology readiness level (TRL) framework (Figure 3), to determine the maturity of the technology and its readiness for deployment in diagnostic testing. An end-user study was included as part of the project, as their feedback is key to understand if technologies meet the specific needs and the preferences of those who rely on them daily.

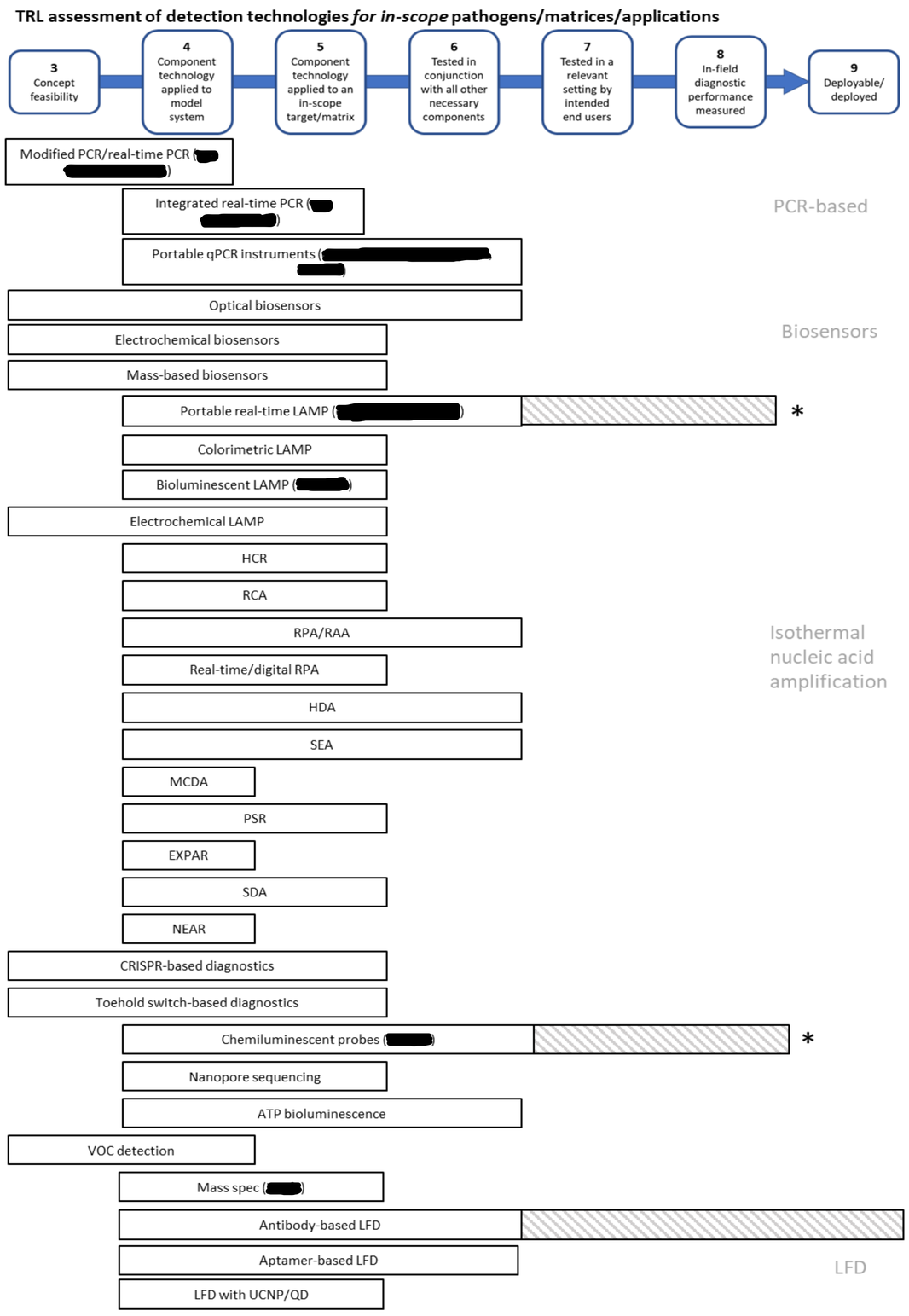


Figure 3. A summary of technology readiness levels (TRLs) reached for each technology for testing of in-scope pathogens, matrices and/or applications. * These technologies have commercially available kits which have the possibility of being used on-site and therefore could have reached TRL 8-9. However, the publicly available evidence was not present to fully support the TRL.

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