



Public Health  
England

# Proficiency testing for food and water microbiology



# Public Health England

Public Health England (PHE) is an executive agency of the United Kingdom's Department of Health.

PHE is the expert national public health agency which fulfils the Secretary of State for Health's statutory duty to protect health and address inequalities, and executes his power to promote the health and wellbeing of the nation.

Our mission is to protect and improve the nation's health and to address inequalities, working with national and local government, the NHS, industry, academia, the public and the voluntary and community sector.

Food and water examination laboratories play a vital role in protecting people's health by ensuring that food and waters are safe and do not pose a threat to health. One of PHE's goal is *protecting the country from infectious diseases and environmental hazards, including the growing problem of infections that resist treatment with antibiotics*. In support of this goal, PHE provides tools such as proficiency testing (PT) schemes and reference materials to support food and water microbiology laboratories in assuring their results. The PT schemes are used by laboratories that take quality seriously and understand the impact of the work they undertake.

The vision for the Food and Environmental Proficiency Testing Unit (FEPTU) aims to be: the leader in providing international PT schemes for food and water microbiology, supporting public health and raising awareness of:

- the importance of producing accurate laboratory results
- the impact of incorrect laboratory results on public health

PHE PT schemes are underpinned by professional, scientific and technical expertise, drawing on the resources of the entire Public Health England, and raising the profile of the organisation nationally and internationally.

## **The mission for FEPTU is:**

'To provide microbiology testing laboratories with reliable and robust proficiency testing samples to help to safeguard the public from potential harm that may be encountered from food and water sources. Our services will be exemplary, our resources will be used effectively and our experience and knowledge will be used to develop and foster success with our participants'.

Proficiency testing schemes are sometimes referred to as external quality assessment (EQA) schemes; the terms are generally considered to be interchangeable. 'EQA' tends to be used more commonly in the clinical field.

FEPTU has been providing international PT schemes for food and water microbiology for more than 20 years. All the schemes are accredited by the United Kingdom Accreditation Service (UKAS) to the international standard ISO 17043: 2010 *Competency assessment – General requirement for proficiency testing*.

PHE PT schemes are suitable for food and water microbiology laboratories worldwide in the food and water industries, private sector, and the public health and environmental health sectors.

The schemes are provided by experts and driven by impact on public health and quality of service. These are uncompromised by commercial pressures.

Participants' performances with PT samples are confidential; FEPTU staff never reveal results or details of performance to other departments within PHE or to any other organisation without a participant's written permission.



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# Proficiency testing for food and water microbiology laboratories

Food and water microbiology examination laboratories play a vital role in protecting people's health by helping to ensure that food is safe to consume, waters are safe to drink and use and that environmental and recreational waters do not make people ill. Many laboratory results confirm that the samples they test comply with relevant legislation or guidelines and do not present a risk.

However, if an error occurs during sample analysis, this can have serious implications for both the laboratory and the client who may be a food manufacturer, hospital, public health body, retailer or water treatment company.

There are many reasons why a microbiology laboratory might report incorrect results including:

- sample handling errors
- inadequate staff training
- lack of understanding of legislation/ guidelines
- inadequate methods
- equipment and culture media failures
- calculation errors
- reporting errors

These problems are less likely to arise if a laboratory has a robust quality system in place. Essential elements of a laboratory's quality system include external assessments of the routine procedures using proficiency testing schemes, and internal quality control processes using characterised authenticated reference materials.

Proficiency testing (PT) or external quality assessment (EQA) is an extremely effective tool in helping laboratories to assure themselves that they report correct results. It allows the introduction of samples of known but undisclosed content into the laboratory's routine procedures and, by providing an independent unbiased external assessment of a laboratory's performance, it reassures staff in the testing laboratory and also the clients who commission the tests.

Why laboratories take PT:

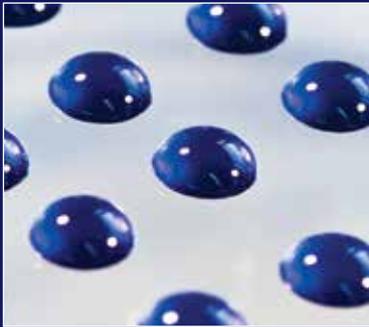
- demonstrates competence as part of accreditation requirement – such as ISO/ IEC 17025:2005 - *General requirements for the competence of testing and calibration laboratories*
- helps to provide assurance of the results obtained provided they are treated and processed the same as other samples
- helps to improve laboratory processes and understanding of regulation/legislation
- allows laboratories to remain up to date with new and emerging organisms – educational aspect
- challenges processes/media/training with difficult or atypical organisms
- allows inter-laboratory comparison of performance
- supports work tendered for as an accredited laboratory

## Sample Information



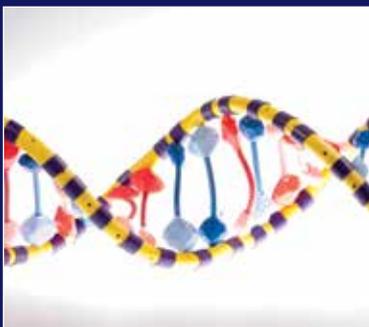
### *Freeze-dried samples*

Freeze-drying is a well-established process for preserving a wide range of micro-organisms and is used by many culture collections such as the United Kingdom's National Collection of Type Cultures (NCTC®). FEPTU use a freeze-drying process to prepare samples for a range of food EQA schemes. The samples are stable at ambient temperature although storage in refrigerated conditions is normally recommended



### *LENTICULE® discs*

LENTICULE discs consist of control-dried cultures of viable micro-organisms that require storage at -20°C. They can be prepared to contain a wide range of micro-organisms, in pure or mixed cultures, at levels between 10 and 10<sup>8</sup> cfu per LENTICULE disc. LENTICULE discs are used by PHE to prepare EQA samples for food and water microbiology schemes.



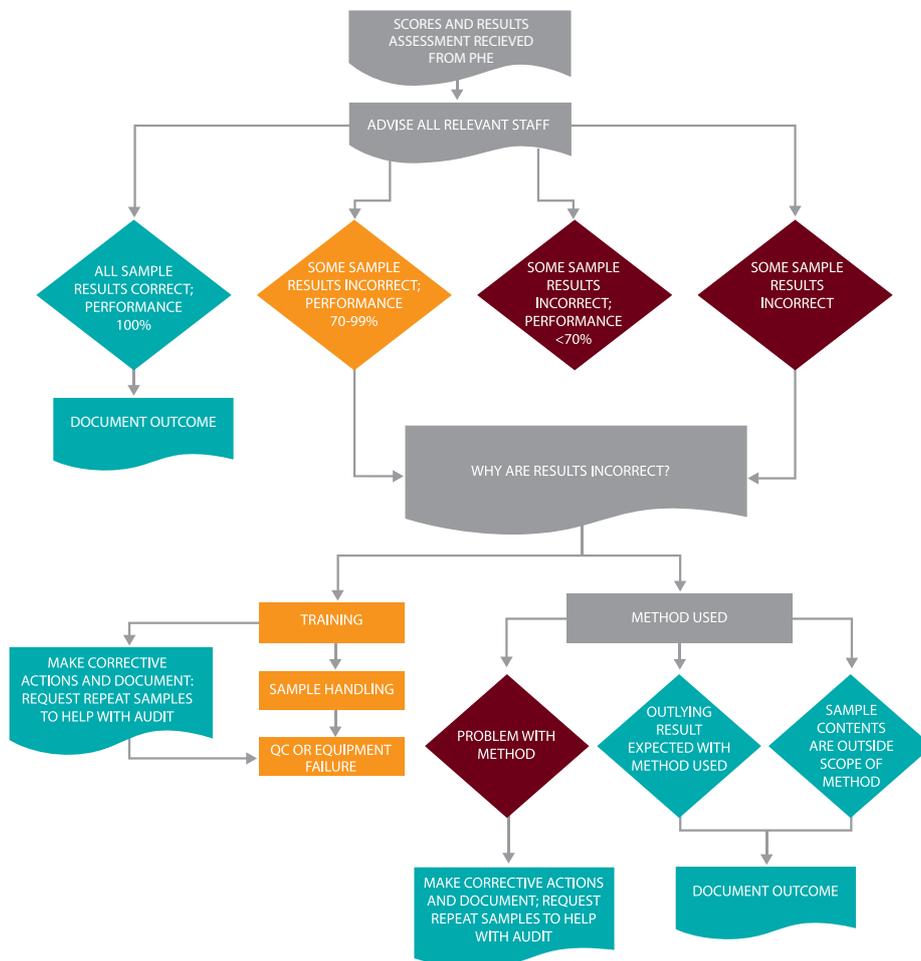
# Use of proficiency testing

PT results provide an effective insight into routine results if the PT samples are treated in the same way as routine samples. This means that each stage of testing from sample receipt, through all stages of the testing process, to reporting of results, is undertaken by the same people who would normally do the tests using the same procedures. If PT samples are treated differently from routine samples even though the PT results may be excellent, nothing will be learnt about the quality of the routine service.

PT is not a substitute for other components of the laboratory quality system and cannot replace the quality control programme. It is of limited value without the other quality components such as adequate documentation, internal quality control and a robust staff training programme. PT identifies problems with testing but it will not solve the problems; it can help to confirm that problems have been eliminated.

When used properly, PT helps laboratories to report accurate, reproducible results, demonstrates the effectiveness of the quality system and provides a reliable independent assessment of quality of service. However, laboratories should not amend their procedures based on PT results alone.

The role of testing laboratories is to help to identify whether food or water is safe, so the accuracy of the results is of paramount importance; the role that PT can play in helping to achieve accuracy should not be underestimated.



To be effective, PT schemes must provide samples that are mainly representative of the 'real' situation in a laboratory. However, the proportion of positive samples is likely to be far higher with PT than with routine examinations. Samples must be challenging and should be provided at regular intervals to ensure that the external assessment results allow an overview of performance over time.

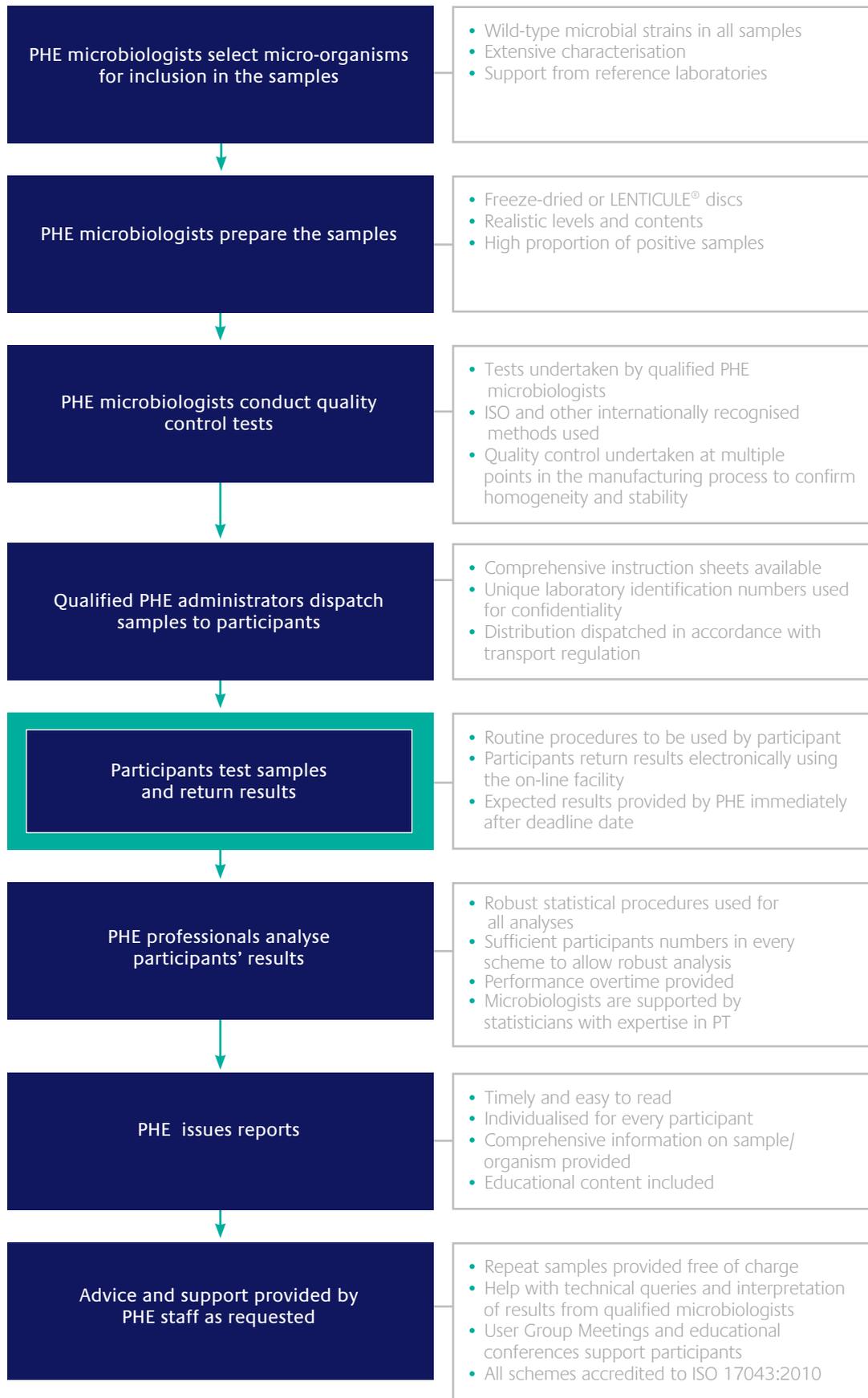
The PT requirements for a testing laboratory should not be viewed in isolation; the laboratory needs to consider other aspects also such as:

- the weekly workload
- the frequency with which each examination is undertaken
- the number of positive samples normally seen for each routine test
- the degree of expertise of the staff undertaking the examinations
- the accuracy of previous PT results
- the frequency and acceptability of internal quality control procedures

Any of these factors may change over time so a laboratory's PT requirements should be reviewed accordingly.



# Proficiency Testing Explained



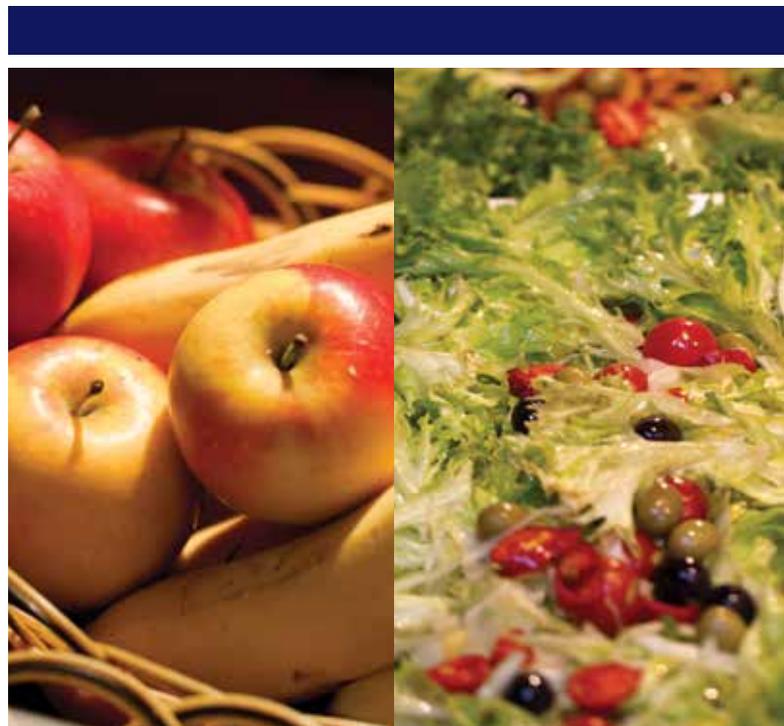
# Features and benefits of Public Health England PT schemes:

## Why choose PHE schemes?

- easy to use sample format such as LENTICULES disc reduces the safety risk for the operator
  - schemes samples contain wild type strains reflecting organisms' characteristics encountered routinely by the laboratory
  - free of charge repeat samples available to help participants investigate the root cause of reporting incorrect PT results
  - performance over time provides a tool to allow laboratories to assess and assure their reported results regularly
  - guaranteed low levels of organisms in appropriate water samples
  - wide range of scheme types provided for food and water microbiology
  - schemes operated and supported by expert food and water microbiologist who are available to advise participants
  - schemes support and improve understanding of guidelines and legislation
- some schemes to show the microbiology results obtained
  - flexible PT schedules with schemes available throughout the year
  - international participation in over 70 countries
  - excellent global sample delivery service
  - easy to follow instructions and request report forms
  - important documents provided in five languages (French, German, Italian, Portuguese and Spanish)
  - local distributors used in some countries
  - on-line reporting of results for all schemes
  - informative, educational and timely reports available electronically
  - easy-to-follow statistic and scoring systems applied including z-score information
  - trend analysis tools available electronically
  - total confidentiality of performance
  - individual continuous performance assessment reports provided
  - helps determine effectiveness of a laboratory's quality process and subsequent improvements
  - expert food and water microbiologists available to help with queries
  - over 20 years experience of providing acclaimed PT schemes
  - schemes accredited to ISO 17043

## Features:

- a significantly high proportion of positive samples
- samples that are easy to handle
- all samples prepared using wild type micro-organisms
- the micro-flora in the samples represents real food, water and environmental flora
- realistic levels of target organisms with background flora where appropriate
- samples occasionally contain organisms with characteristics that are atypical or those that are of new and emerging importance
- proven stable, homogeneous samples prepared and tested by qualified microbiologists
- proven and comparable results data validated when molecular methods are used alongside conventional methods for our samples
- reports include method based presentation of results for some schemes
- photographic images included in reports for



### Benefits:

- In many laboratories most samples do not contain pathogens or high levels of indicator organisms. PHE PT samples allow participants to remain familiar with the procedures required for those groups of microorganisms isolated
- samples prepared using wild-type micro-organisms
- PT sample contents reflect the micro-flora of real samples to allow effective assessment of performance with routine samples
- samples challenge processes/media/training with difficult or atypical organisms
- educational aspects of the schemes help participants to keep abreast of developments with new and emerging organisms
- qualified and experienced microbiologists design, prepare and test the PT samples who understand how they will benefit the participating laboratories to have sufficiently challenging samples that are realistic and meaningful
- flexible PT participation means we can respond to laboratories individual requirements which may change due to local factors such as staff turnover, staff experience and changes to workloads
- use of local distributors helps laboratories with understanding services in their local language
- experienced couriers and onwards distributors used so that samples are delivered to the laboratory within five days of dispatch
- robust statistical comparisons of PT results, applicable because of the large numbers of participants
- comparison of results with peers around the world due to high number of international participation
- some reports contain method based presentation of results allowing participants to determine whether outlying results may be associated with the method used or other factors
- individualised informative reports provide participants with readily accessible information about their own performance, their performance in comparison with others and advice for improving performance. This helps participants to make their own decisions about the quality of their service
- documents provided in local language allows participants to understand the PT services offered
- provides data to help to reassure quality of results to those who commission the examination or tests
- clear and concise detail of scoring and statistical analysis provided in most reports to help staff understand the accuracy of their PT results
- allows monitoring of continuous performance assessment over time. Identifying variations if more than one distribution is taken in performance such as changes in staff capability, problems with equipment or developing trends that could be overlooked with inadequate PT or internal quality control
- trend analysis tools available from our web-site help participants to prepare their own analysis charts to identify performance trends
- renowned microbiology expert scientists available to support and work with you to improve laboratory processes or understanding of legislation/guidelines
- UKAS accreditation is recognised by accreditation bodies in more than 50 countries worldwide which is ideal for multinational companies that require an external assessment of the effectiveness of their harmonised international standard operating procedures





# Impact of laboratory results

The impact of incorrect laboratory results can be far-reaching and expensive.

Accurate laboratory results reported by microbiology laboratories help to protect people's health.

Inaccurate or incorrect laboratory results may contribute to people becoming ill and may also have very expensive consequences for the laboratory and the company commissioning the examinations.

- contaminated food and water samples may look, smell and taste normal
- there may be no clear indication that anything has gone wrong with the food production or water treatment process

A sample of food or water that is contaminated with human pathogens or have high levels of hygiene indicator organisms presents a potential hazard to peoples' health. There are many reasons why contamination may occur, such as a process failure, deviation from standard practices, cross-contamination or human error. Occasionally, the laboratory result may provide the only indication that something has gone wrong. Appropriate corrective actions may be omitted if a laboratory reports that a sample does not contain pathogens when, in fact, pathogens are present.

**For example,** the source of a water sample containing high levels of *Legionella pneumophila* must be treated to make it safe. An immediate response may be closure of the spa pool, or switching off the air-conditioning unit, for example, depending on the sample source. An investigation will be required to determine how the water was contaminated, whether there was a water treatment failure, how contamination will be prevented in the future and who has been affected. People who have been exposed to the water may need medical treatment.

**But,** if the laboratory reported that there were no *Legionella pneumophila* organisms in the sample then the hazard persists and there is a continued risk that people's health will be affected.

Clearly, this type of laboratory error could result in people becoming ill. In addition, the associated financial cost cannot be disregarded when negative publicity and loss of reputation for the laboratory and the client are considered.

Reporting the presence of a pathogen in a sample that does not contain pathogens may result in incorrect product withdrawal or inappropriate follow-up treatment.

**For example,** a ready-to-eat food sample reported incorrectly as contaminated with a *Salmonella* spp. is unlikely to be released for sale. Investigations will be required to confirm the result and identify how and why the sample became contaminated. If already released for sale, the product may have to be recalled, withdrawn and destroyed; the retailer may have to withdraw the product before the laboratory result can be verified. These processes are very expensive and could be unnecessary if a laboratory result is incorrect.

Most food and water microbiology laboratories need to enumerate some groups of micro-organisms to determine whether samples are likely to present a microbial hazard. Reporting incorrectly high or low results can give a misleading impression of the microbiological condition of a sample and of the quality of all the processes that preceded the sampling stage.





# PHE Water Microbiology PT Schemes

## Which is the best scheme for you?

|                                   | <i>Legionella</i> in Water   | Recreational and Surface Water  | Drinking Water   |
|-----------------------------------|--|---|--|
| Participants                      | Laboratories that examine waters for <i>Legionella</i> spp.<br><br><i>The scheme includes samples containing a range of different serogroups of Legionella pneumophila, and Legionella spp. other than L.pneumophila</i> | Laboratories that routinely monitor bathing beach (marine) waters, bathing pool waters and river, lake or stream waters   | Laboratories that routinely monitor drinking water, examining for low levels of indicator organisms.   |
| Request format                    | Specific request for <i>Legionella</i> spp.  | Specific requests for named enumerations only   | Specific requests for named enumerations only  |
| Examinations                      | Detection, enumeration and identification of <i>Legionella</i> spp.  | <p><b>Bathing Beach Waters</b><br/><i>Escherichia coli</i><br/>Enterococci<br/><i>Salmonella</i> spp.</p> <p><b>Swimming Pool Waters**</b><br/>Coagulase-positive staphylococci<br/>Coliform bacteria<br/><i>Escherichia coli</i><br/>Enterococci<br/><i>Pseudomonas aeruginosa</i><br/>Total staphylococci<br/>Colony count (37°C/24 hours)</p> <p><b>River, lake and stream waters</b><br/>Coliform bacteria<br/><i>Escherichia coli</i><br/>Enterococci<br/>Faecal coliforms<br/><i>Clostridium perfringens</i><br/><i>Salmonella</i> spp.</p> | Coliform bacteria<br><i>Escherichia coli</i><br>Enterococci<br><i>Clostridium perfringens</i><br><i>Pseudomonas aeruginosa</i><br>Colony count (37°C/48 hours)<br>Colony count (22°C/72 hours) |
| Sample format                     | LENTICULE discs  | LENTICULE discs   | LENTICULE discs  |
| No. of distributions per year     | Six  | Six   | Six  |
| No. of samples per distribution   | Two  | Two   | Three  |
| Scoring system used*              | PHE scores and z-scores  | PHE scores and z-scores   | PHE scores and z-scores  |
| Continuous performance assessment | Yes - using PHE scores   | None  | Yes - using PHE scores   |
| Statistics*                       | Percentiles and z-scores   | Percentiles and z-scores  | Percentiles and z-scores   |
| Report format                     | Individualised with scores for distribution examinations and cumulative scores   | Individualised with scores for distribution examinations  | Individualised with scores for distribution examinations and cumulative scores   |

**PHE PT samples are made from wild type strains. The micro-flora in the PHE PT sample represents a real water sample which provide a realistic challenge for routine examinations**

| Bottled and Mineral Water  | Endoscope Rinse Water  | Dialysis Water   | Hospital Tap Water   |
|--|--|--|--|
| Laboratories that routinely monitor bottled and mineral waters, examining for low levels of indicator organisms.   | Laboratories in the water testing and clinical microbiology sectors that monitor the microbial quality of water used to rinse endoscopes | Laboratories in the water testing and clinical microbiology sectors that monitor the microbial quality of water used to prepare dialysis fluid | Laboratories in the water testing and clinical microbiology sectors that examine hospital tap waters |
| Specific requests for named examinations only  | Specific requests for named enumerations only  | Specific requests for named enumerations only  | Specific requests for named enumerations only  |
| Coliform bacteria<br><i>Escherichia coli</i><br>Enterococci<br><i>Pseudomonas aeruginosa</i><br>Sporulated sulphite-reducing anaerobes<br>Colony count (37°C/24 hours)<br>Colony count (22°C/72 hours) | Total Viable Count (28°C - 32°C for 5 days)<br><i>Pseudomonas aeruginosa</i><br>Yeasts<br>Moulds<br><i>Mycobacterium</i> spp.            | Total Viable Count (17°C - 23°C for 7 days)  | <i>Pseudomonas aeruginosa</i>  |
| LENTICULE discs  | LENTICULE discs  | LENTICULE discs  | LENTICULE discs  |
| Three  | Three  | Three  | Three  |
| Two  | Two  | Two  | Two  |
| PHE scores and z-scores  | PHE scores and z-scores  | PHE scores and z-scores  | PHE scores and z-scores  |
| Yes - using PHE scores   | Yes - using PHE scores   | Yes - using PHE scores   | Yes - using PHE scores   |
| Percentiles and z-scores   | Percentiles and z-scores   | Percentiles and z-scores   | Percentiles and z-scores   |
| Individualised with scores for distribution examinations and cumulative scores   | Individualised with scores for distribution examinations and cumulative scores   | Individualised with scores for distribution examinations and cumulative scores   | Individualised with scores for distribution examinations and cumulative scores                       |

\* For PHE Guide to Scoring and Statistics refer to [www.hpa.org.uk/leqa/docs](http://www.hpa.org.uk/leqa/docs)

\*\*This scheme sample type and parameters is suitable for those laboratories that examine Hydrotherapy pool waters



# PHE Food Microbiology PT Schemes

## Which is the best scheme for you?

|                                   | Standard  | Public Health   | European Food Microbiology Legislation  |
|-----------------------------------|---|---|---|
| Participants                      | <p>Laboratories that routinely test for a range of food-borne pathogens and indicator organisms</p> <p><i>Participants are often private laboratories that test foods for clients in the food industry who may submit products routinely for microbial assessment, end product testing and customer complaints</i></p>  | <p>Laboratories that are involved in Public health investigations, such as Official Food Control Laboratories</p> <p><i>Participants are often public health laboratories</i></p> <p>Simulated food and swab samples are provided</p>   | <p>Laboratories that examine foods for compliance with Regulation (EC) 2073/2005, and subsequent amendments</p> <p><i>The scheme assesses participants' ability to test and interpret laboratory results in accordance with EU food safety and process hygiene criteria</i></p>   |
| Request format                    | <p>Specific requests for named examinations only</p>  | <p>Outbreak details will be provided as part of the examination request</p>   | <p>Description of product to be tested for compliance with legislation. Participants choose the tests and must offer interpretation of their results</p>  |
| Examinations                      | <p><b>Pathogens</b><br/> <i>Salmonella</i> spp.<br/> <i>Listeria</i> spp.<br/> <i>Escherichia coli</i> O157 (non-toxigenic strains)<br/> <i>Campylobacter</i> spp.</p> <p><b>Enumerations</b><br/> Presumptive <i>Bacillus cereus</i><br/> <i>Campylobacter</i> spp.<br/> <i>Clostridium perfringens</i><br/> Coagulase-positive staphylococci<br/> <i>Listeria monocytogenes</i><br/> <i>Listeria</i> spp.<br/> Aerobic colony count<br/> <i>Escherichia coli</i><br/> Enterobacteriaceae<br/> Coliforms</p> | <p><b>Pathogens</b><br/> <i>Bacillus</i> spp.<br/> <i>Campylobacter</i> spp.<br/> <i>Clostridium</i> spp.<br/> Coagulase-positive staphylococci<br/> <i>Escherichia coli</i> O157 (non-toxigenic strains)<br/> <i>Listeria</i> spp.<br/> <i>Salmonella</i> spp.<br/> <i>Vibrio</i> spp.<br/> <i>Yersinia</i> spp.</p> <p><b>Enumerations</b><br/> Aerobic colony count<br/> <i>Escherichia coli</i><br/> Enterobacteriaceae<br/> <i>Listeria</i> spp.</p> | <p><b>Pathogens</b><br/> <i>Cronobacter sakazakii</i><br/> <i>Salmonella</i> spp.<br/> <i>L.monocytogenes</i></p> <p><b>Enumerations</b><br/> Presumptive <i>Bacillus cereus</i><br/> Coagulase-positive staphylococci<br/> <i>Listeria monocytogenes</i><br/> Aerobic colony count<br/> <i>Escherichia coli</i><br/> <i>Escherichia coli</i> MPN<br/> Enterobacteriaceae</p> |
| Sample format                     | <p>Freeze-dried micro-organisms in glass vials</p>  | <p>LENTICULE discs</p>  | <p>LENTICULE discs</p>  |
| No. of distributions per year     | <p>Six</p>  | <p>Three</p>  | <p>Four</p>   |
| No. of samples per distribution   | <p>Two</p>  | <p>Six</p>  | <p>Three</p>  |
| Scoring system used*              | <p>PHE scores and z-scores</p>  | <p>PHE scores</p>   | <p>PHE scores</p>   |
| Continuous performance assessment | <p>Yes - using PHE scores</p>   | <p>Yes - using PHE scores</p>   | <p>Yes - using PHE scores</p>   |
| Statistics*                       | <p>Percentiles and z-scores</p>   | <p>MADD <math>\pm 2SD</math> and <math>\pm 3SD</math> or Participants' Median <math>\pm 0.5</math> log</p>  | <p>MADD <math>\pm 2SD</math> and <math>\pm 3SD</math> or Participants' Median <math>\pm 0.5</math> log</p>  |
| Report format                     | <p>Individualised with scores for distribution examinations and cumulative scores</p>   | <p>Individualised with scores for distribution examinations and cumulative scores</p>   | <p>Individualised with scores for distribution examinations and cumulative scores</p>   |

PHE PT samples are made from wild type strains. The micro-flora in the PHE PT sample represents a real food and which provide a realistic challenge for routine examinations

| Non-Pathogen  | Shellfish  | Pathogenic Vibrio   | <i>Staphylococcus aureus</i> enterotoxin  |
|---|--|---|---|
| Laboratories on production sites that do not want to introduce pathogens  | Laboratories testing raw bivalve molluscs from harvesting beds for classification or end product testing | Laboratories examining food samples for <i>Vibrio</i> spp.  | Laboratories that test food for <i>Staphylococcus aureus</i> enterotoxin (SET) using a range of kits<br><br><i>Participants reconstitute the samples, incubate, then test for SET</i> |
| Specific requests for named examinations only   | Specific requests for named enumerations only  | <i>V.parahaemolyticus</i><br><i>V.cholerae</i> (non-O1 strains only)  | Specific request to examine for SET and to indicate test kit used   |
| Aerobic colony count<br>Coliforms<br><i>Escherichia coli</i><br><i>Enterobacteriaceae</i><br>Enterococci<br>Lactic acid bacteria<br>Presumptive <i>Pseudomonas</i> spp.<br>Yeasts<br>Moulds<br><br><b>PYM option</b><br>Register for examinations for Presumptive <i>Pseudomonas</i> spp., yeasts and moulds only | <i>Escherichia coli</i> (most probable number (MPN))<br><i>Salmonella</i> spp.                           | <b>Presence/absence and enumerations</b><br><i>Vibrio parahaemolyticus</i><br><i>Vibrio cholerae</i> (non-O1)<br><i>Vibrio vulnificus</i> | Test for presence of SET  |
| Freeze-dried micro-organisms in glass vials   | LENTICULE discs  | Freeze-dried micro-organisms in glass vials   | Freeze-dried micro-organisms in glass vials   |
| Three   | Three  | Three   | Three   |
| Three   | Two  | Two   | Two   |
| PHE scores and z-scores   | PHE scores   | None  | None  |
| Yes - using PHE scores  | Yes - using PHE scores   | None  | None  |
| MADD $\pm 2SD$ and $\pm 3SD$ or Participants' Median $\pm 0.5$ log  | Participants' Median $\pm 2.68SD$ and $\pm 4SD$  | MADD $\pm 2SD$ and $\pm 3SD$ or Participants' Median $\pm 0.5$ log  | Not applicable  |
| Individualised with scores for distribution examinations and cumulative scores  | Individualised with scores for distribution examinations and cumulative scores                           | Individualised with comments on performance   | Individualised with comments on performance   |

# Proficiency Testing - Frequently Asked Questions (FAQs)

## How will Public Health England PT schemes benefit my laboratory?

One of the key benefits is that the scheme gives you confidence that your laboratory is performing its routine microbiology examinations correctly. Participation provides an unbiased external assessment of your laboratory's performance which can be used to reassure clients and help demonstrate competence to accreditation assessors. PHE PT samples contain a realistic range of micro-organisms and are designed to challenge your routine methods; however, this is only effective if tested regularly and in accordance with your routine procedures. Our team is able to work with you to help improve procedures and ensure good results.

## Are Public Health England PT samples very difficult?

The samples are designed to provide a realistic challenge to routine examinations; laboratories with an effective quality system in place are unlikely to experience any difficulties with the samples. Experience has shown that correct results can increase staff confidence; laboratories often find that participation is motivational and as well as educational.

## Why are the samples not real foods or waters?

Every PT sample batch must be stable throughout the transit and testing periods and must be sufficiently homogenous. All participants have to receive similar sample material if valid comparisons of performance are to be undertaken. It is difficult to achieve an acceptable level of stability and homogeneity with real food and water samples; expensive and demanding transit conditions will usually be required. Some scheme providers organise local or national ring trials using real products but large international schemes, like Public Health England, normally use simulated samples containing preserved micro-organisms.

## How will I receive my PT samples?

Samples for participants in the United Kingdom are usually sent by post. Samples for other countries are dispatched by courier; and often sent via a forwarding laboratory. Normally you should receive samples within two to five days of dispatch. All samples are sent as diagnostic specimens (UN 3373) in packaging compliant with international air transport regulations.

## How do I store my PT samples?

You are advised to store freeze-dried samples in the refrigerator on receipt, but LENTICULE discs are more sensitive to ambient temperatures and must be stored at -20°C.

## How do I handle my PT samples?

Every distribution of PT samples has instructions for handling and sample preparation which are available electronically. Once the sample preparation stage is complete it is essential that you undertake all subsequent tests in accordance with routine procedures, including using the same staff. The use of routine procedures is essential to provide a realistic assessment of performance.

## Can I return more than one set of results?

Most microbiology laboratories, a single examiner does not usually test a real sample from start-to-finish, so examining PT samples in this way does not replicate the routine situation. It is very important that PT samples are examined in the same way as routine samples; for this reason Public Health England does not normally allow reporting of more than one set of results per sample. However, if you require additional samples to challenge a new method in addition to your routine method and want us to analyse both sets of results then this can be accommodated.

*Public Health England provides UKAS-accredited CompetencyCheck samples that can be used to prepare spiked samples for assessing individual performance and for staff training.*

### How soon will I know whether my results are correct?

The intended results are posted on our website immediately after the deadline date for return of results, participants are notified by email when these are available.

### How are my results assessed?

That depends on the scheme and the test required, the number of participants and the type of tests required. We always use robust statistical techniques and we allocate scores for most of our schemes. PHE scores acknowledge the microbiological significance of your results. Z-scores are also provided for some of the schemes.

### What is the format for the distribution reports?

The reports are very easy to follow. The pages at the front provide the sample details, the expected results, your own results and our microbiological comments for the samples. We may include photographs to illustrate some of the microbiological results. Results charts are included and examples may be printed from the web-site.

### What additional technical support is provided?

You can contact PHE PT microbiologists if you require additional advice. Their contact details are provided in each of the report. They will provide confidential advice and guidance and may refer your query to one of our specialist scheme consultants, depending on the nature of your query. PHE employs experts in many fields of microbiology; we can call upon their expertise to help you.

*One of the key reasons that participants select Public Health England PT schemes is the technical support behind the schemes.*

### My client says I must get all my PT results correct or I could lose their contract. How can you help with this?

It is very important to have a dialogue with your clients to ensure that they understand the purposes of PT. If you report incorrect results for your clients' samples it may affect people's health, impact on their reputation and have expensive consequences. Therefore, you must use PT to challenge your routine processes as robustly as possible. If clients pressurise laboratories in this way you may be tempted to pay special attention to PT samples rather than use the routine procedures. You might also look for the least challenging PT scheme you can find. This may mean that weaknesses in your system remain undetected. However, you can advise your clients that this approach is flawed and our senior microbiologists will be happy to discuss this with them, if this helps.

### Are my PT results really confidential?

**Yes.** PHE Organiser will not divulge any information about your performance to anyone else. If your clients or accreditation assessors want to see your PT results then they should contact you directly, not Public Health England.

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