



Summary of Results

External Quality Assessment of Water Microbiology Bottled and Mineral Water Scheme

Distribution Number: BMW21

Sample Numbers: BMW21A, BMW21B

Distribution Date:	January 2019
Results Due:	22 February 2019
Report Date:	06 March 2019
Samples prepared and quality control tested by:	Angela Appea Richard Borrill Thomas Harper Margaret Njenga Zak Prior Lili Tsegaye Vanessa Waite
Data analysed by:	Joanna Donn Manchari Rajkumar
Report compiled by:	Joanna Donn Manchari Rajkumar
Authorised by:	Nita Patel

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Public Health England
Food and Environmental Proficiency Testing Unit (FEPTU)
61 Colindale Avenue
London
NW9 5EQ
Tel: +44 (0)20 8327 7119
Fax: +44 (0)20 8200 8264
Email: foodeqa@phe.gov.uk

For further information about the scheme please refer to:

Scheme Guide: <https://www.gov.uk/government/publications/food-and-water-proficiency-testing-schemes-scheme-guide>

Guide to Scoring and Statistics:

<https://www.gov.uk/government/publications/food-and-water-proficiency-testing-schemes-scoring-systems-and-statistics>

General guidance for z-scores:

Participants' enumeration results are converted into z-scores using the following formula:

$$Z = \frac{(X_i - X_{pt})}{\sigma_{pt}}$$

X_i = participants' result expressed (expressed as a log₁₀ value)
 X_{pt} = assigned value (participants' consensus median (expressed as a log₁₀ value))
 σ_{pt} = the fixed standard deviation for the examination (calculated by FEPTU)

The σ_{pt} -value expresses the acceptable difference between the individual participant's result and the participants' consensus median. The σ_{pt} -value used for calculating z-scores for all parameters in the Bottled and Mineral Water Scheme is 0.35. A guide to interpreting z-scores follows, although laboratories must interpret their scores in the context of their own laboratory situation.

z = -1.99 to +1.99 **satisfactory**
z = -2 to -2.99 or +2 to +2.99 **questionable**
z = < -3.00 or > + 3.00 **unsatisfactory**

It is usually recommended that z-scores exceeding +/-2 are investigated to establish the possible cause. As a general rule, PHE recommends that all questionable and unsatisfactory results are investigated.

FEPTU Quality Control: To demonstrate homogeneity of the sample, a minimum of 10 LENTICULE® discs, selected randomly from a batch, are tested in duplicate for parameters requiring enumeration.

To demonstrate stability of the sample, a minimum of six LENTICULE discs selected randomly from a batch, are examined throughout the distribution period for enumeration parameters.

Public Health England uses methods stipulated in The Natural Mineral Water, Spring Water and Bottled Drinking Water (England) Regulations (2018).

The FEPTU results are used for guidance in the preliminary intended results notification, letters are posted on the website immediately after every distribution; electronic notification of their availability is sent to all participants.

Refer to section 17.0 of the Scheme Guide if you have experienced difficulties with any of the examinations.

<https://www.gov.uk/government/publications/food-and-water-proficiency-testing-schemes-scheme-guide>

Participants are reminded that reporting an incorrect or false negative results could have serious public health implications.

Results as summarised in the performance assessment sheet included in this report, provide a more effective indication of on-going problems with the enumeration of low levels of indicator organisms in bottled and mineral water samples. Performance assessment cannot be undertaken as effectively if laboratories do not participate in all distributions for the Bottled and Mineral Water Scheme.

Please contact FEPTU staff for advice and information:

Repeat samples	Carmen Gomes or Kermin Daruwalla	Tel: +44 (0)20 8327 7119
Data Analysis	Manchari Rajkumar or Nita Patel	Fax: +44 (0)20 8200 8264
Microbiological advice	Nita Patel or Zak Prior	Email: foodeqa@phe.gov.uk
General comments and complaints	Nita Patel or Zak Prior	FEPTU's website
Scheme consultants	Julie E. Russell	
Scheme Co-ordinator	Nita Patel	

Accreditation: PHE Water EQA Scheme for Bottled and Mineral Water is accredited by the United Kingdom Accreditation Service (UKAS) to ISO/IEC 17043:2010.



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Sample: BMW21A

Contents:

Escherichia coli (wild strain), *Klebsiella pneumoniae* (wild strain), *Enterococcus faecium* (wild strain),
Pseudomonas aeruginosa (NCTC 10332), *Clostridium perfringens* (wild strain)

Expected Results:

All counts are expressed as colony forming units (cfu) in 250mL except sporulated sulphite-reducing anaerobes which is in 50 mL and the colony counts at 37°C/24h and 22°C/72h which are cfu per mL.

The fixed standard deviation value (σ_{pt} value) used for calculation of the z-scores is **0.35** for all parameters.

Parameter	Coliform bacteria	<i>E.coli</i>	Enterococci	<i>P.aeruginosa</i>	Sporulated sulphite-reducing anaerobes	Colony count 37°C/24h	Colony count 22°C/72h
FEPTU median	38	25	43	31	47	1	1
No. results returned	50	50	50	50	40	50	46
Assigned value (Participants median all results)	32	23	38	22	50	1	1
Uncertainty of assigned value*	0.04	0.04	0.02	0.03	0.03	0.08	0
Participants mean (all results)	31	23	39	23	45	0	0
Participants median (MPN only)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Participants median (MF only)	32 (n=42)	23 (n=42)	N/A	N/A	N/A	N/A	N/A
Expected Range	10 - 100	1 - 73	1 - 20	5 - 68	7 - 157	0 - 3	0 - 3
Standard deviation**	0.25	0.23	0.11	0.19	0.15	0.45	0
No of outlying counts	5	2	7	5	4	4	3
False positives	N/A	N/A	N/A	N/A	N/A	N/A	N/A
False negatives	1	2	7	2	0	0	0
Your result							
Score for performance assessment							
Z-score							

* $U(X_{pt})$ is based on results transformed to a \log_{10} scale

** Robust S^* based on median absolute deviation about the participants' median (MADe)

Total sent samples	52
Not examined	1
Non returns	0

Sample: BMW21B

Contents:

Enterobacter cloacae (wild strain), *Enterococcus faecalis* (wild strain), *Pseudomonas aeruginosa* (wild strain), *Clostridium bifementans* (wild strain), *Kocuria kristinae* (NCTC 11038)

Expected Results:

All counts are expressed as colony forming units (cfu) in 250mL except sporulated sulphite-reducing anaerobes which is in 50 mL and the colony counts at 37°C/24h and 22°C/72h which are cfu per mL.

The fixed standard deviation value (σ_{pt} value) used for calculation of the z-scores is **0.35** for all parameters.

Parameter	Coliform bacteria	<i>E.coli</i>	Enterococci	<i>P.aeruginosa</i>	Sporulated sulphite-reducing anaerobes	Colony count 37°C/24h	Colony count 22°C/72h
FEPTU median	18	0	103	19	20	114	121
No. results returned	50	50	50	49	40	50	46
Assigned value (Participants median all results)	14	0	94	8	20	104	109
Uncertainty of assigned value*	0.03	N/A	0.01	0.07	0.05	0.02	0.01
Participants mean (all results)	14	0	92	11	20	101	107
Participants median (MPN only)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Participants median (MF only)	14 (n=42)	N/A	N/A	N/A	N/A	N/A	N/A
Expected Range	4 - 44	N/A	30 - 297	1 - 25	4 - 62	33 - 327	34 - 345
Standard deviation**	0.2	N/A	0.07	0.26	0.27	0.09	0.08
No of outlying counts	3	N/A	1	0	5	2	0
False positives	N/A	0	N/A	N/A	N/A	N/A	N/A
False negatives	1	N/A	0	17	5	0	0
Your result							
Score for performance assessment							
Z-score							

* $U(X_{pt})$ is based on results transformed to a \log_{10} scale

** Robust S^* based on median absolute deviation about the participants' median ($MADe$)

Total sent samples	52
Not examined	1
Non returns	0

Performance Assessment Sheet

Distribution	Sample	Coliform bacteria score	<i>Escherichia coli</i> score	Enterococci score	<i>Pseudomonas aeruginosa</i> score	Sporulated sulphite-reducing anaerobes	Colony Count 37°C/24 h score	Colony Count 22°C/72 h score
BMW21	BMW21A							
	BMW21B							
BMW20	BMW20A							
	BMW20B							
BMW19	BMW19A							
	BMW19B							
Total maximum possible score								
Total percentage								

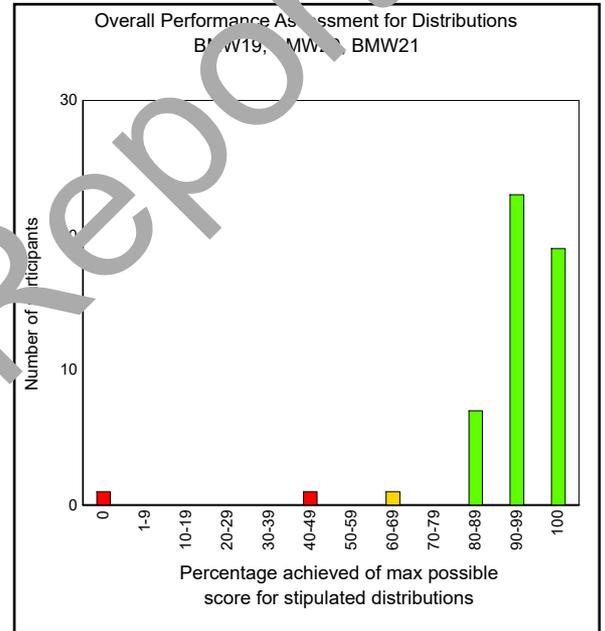
Performance Assessment Comment:

Participants are reminded that to take advantage of the performance assessment overtime tool provided in the reports they need to take part in more than one distribution a year.

Performance assessments are designed to alert participants to on-going problems with their examinations and are provided after every distribution. Scores are allocated to results reported for every parameter, for every sample to help assess performance.

Cumulative scores are calculated for the current and the previous two distributions for the Bottled and Mineral Water Scheme. Participants' cumulative scores for each of the examinations are compared with the maximum possible scores after every distribution.

Your overall performance with the enumerations of low levels of indicator organisms in Bottled and Mineral Water proficiency testing samples for the current and the previous two distributions are collated in the chart to the right.

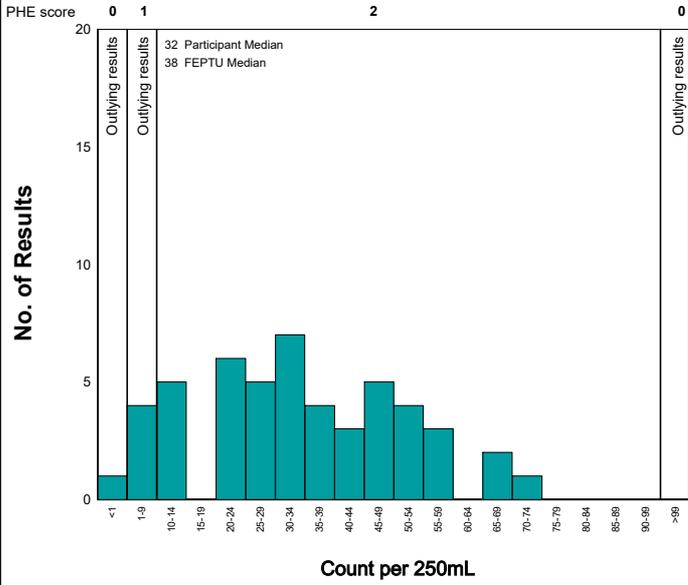


Performance Assessment Comment:

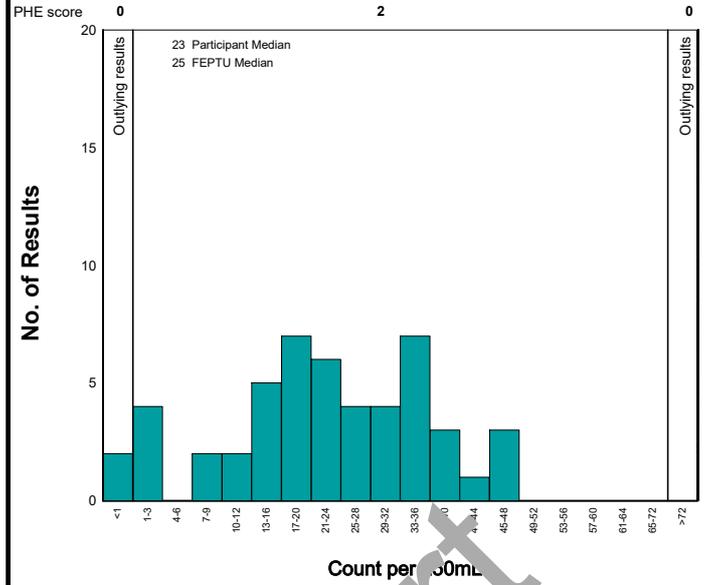
Laboratories that achieve less than 70% of the maximum possible score are likely to be experiencing significant problems with their examinations and are advised to:

- refer to the relevant distribution reports for sample-specific comments
- refer to the website guidance documents: <https://www.gov.uk/government/consultations/external-quality-assessment-ega-and-proficiency-testing-pt-for-food-water-and-environmental-microbiology>
- contact the organisers for advice

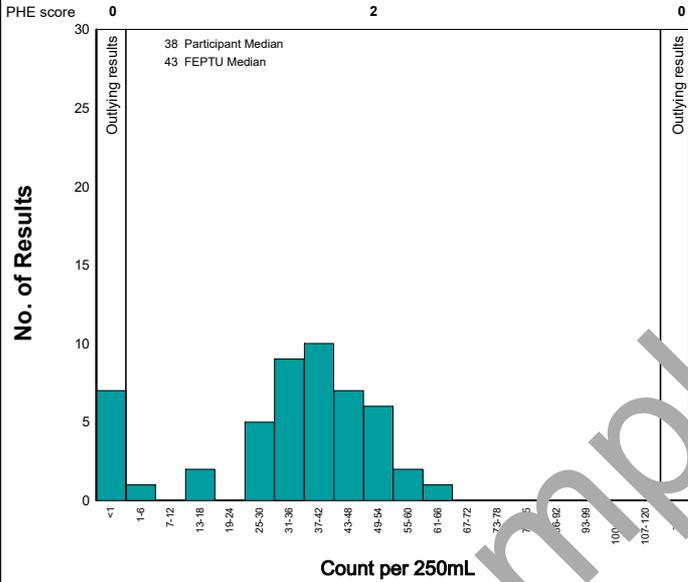
BMW21A: Coliform bacteria



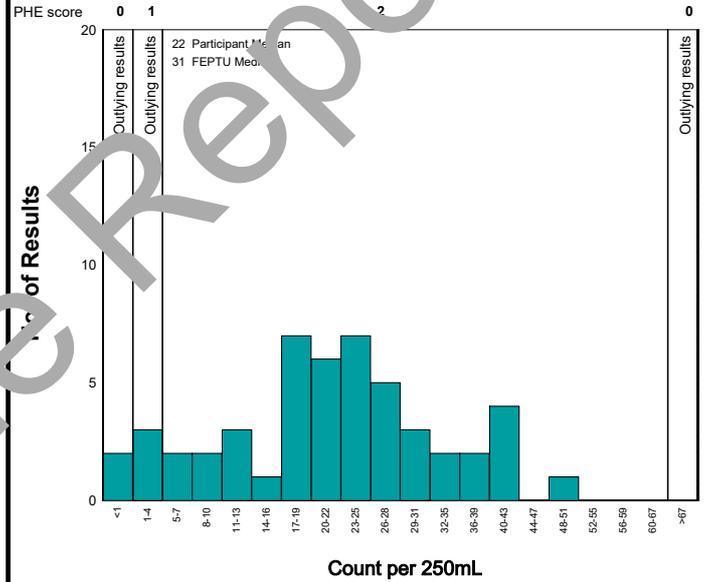
BMW21A: *Escherichia coli*



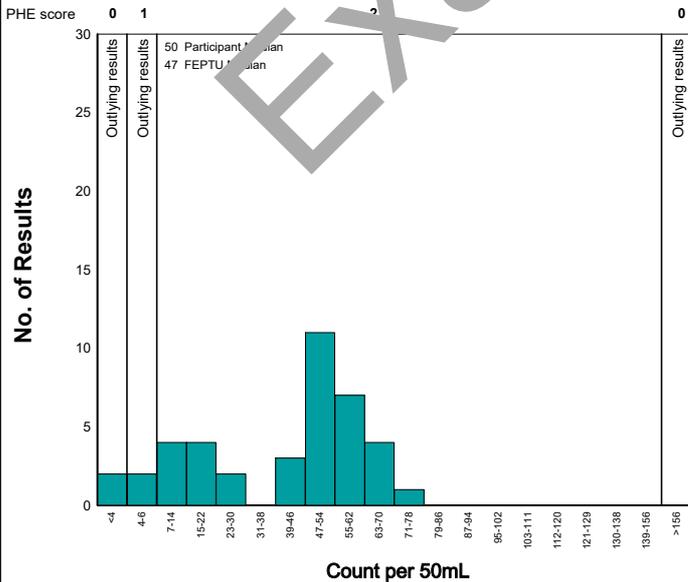
BMW21A: Enterococci



BMW21A: *Pseudomonas aeruginosa*



BMW21A: Sporulated sulphite-reducing anaerobe



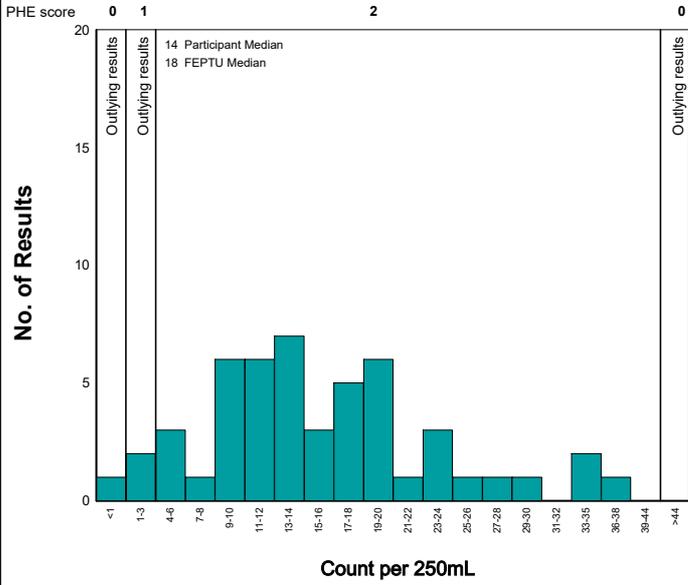
BMW21A: Colony Count 37°C/24 h

No data for graph

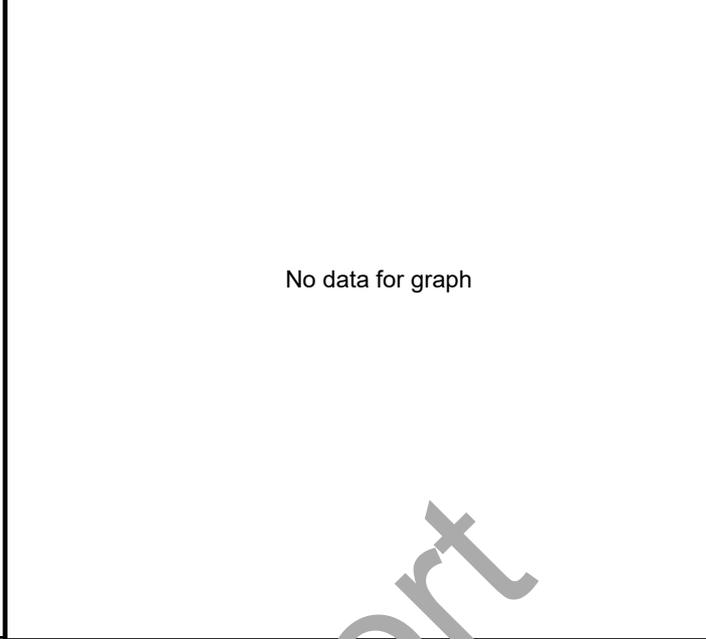
No data for graph

Example Report

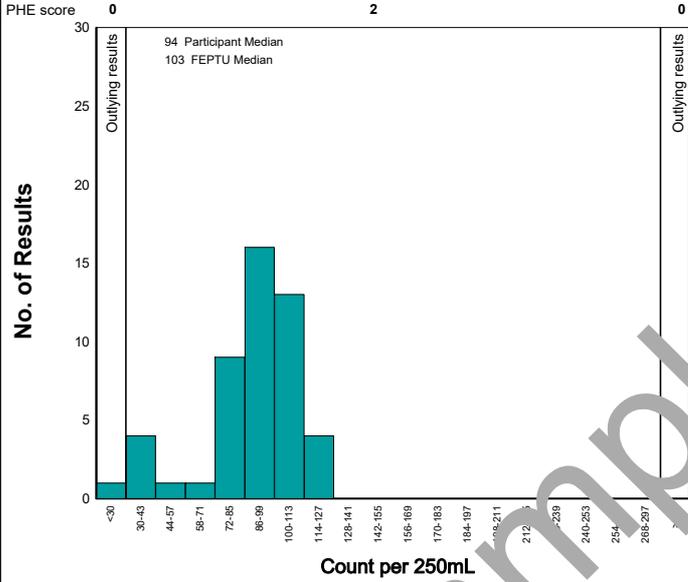
BMW21B: Coliform bacteria



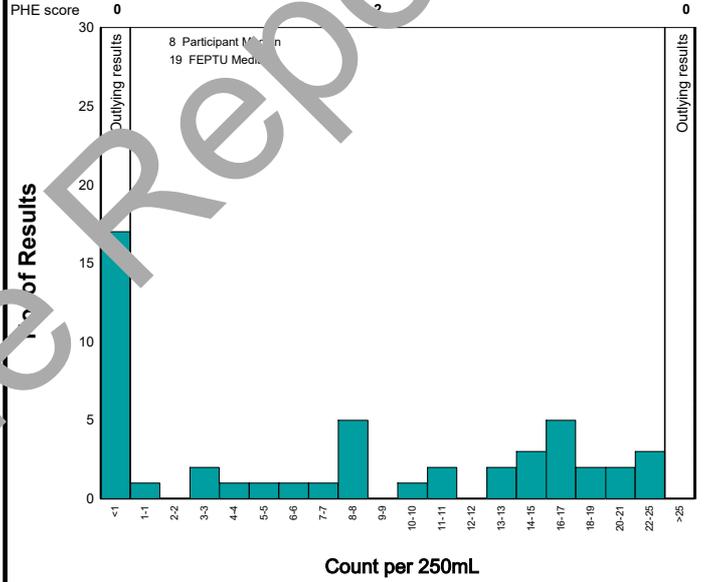
BMW21B: *Escherichia coli*



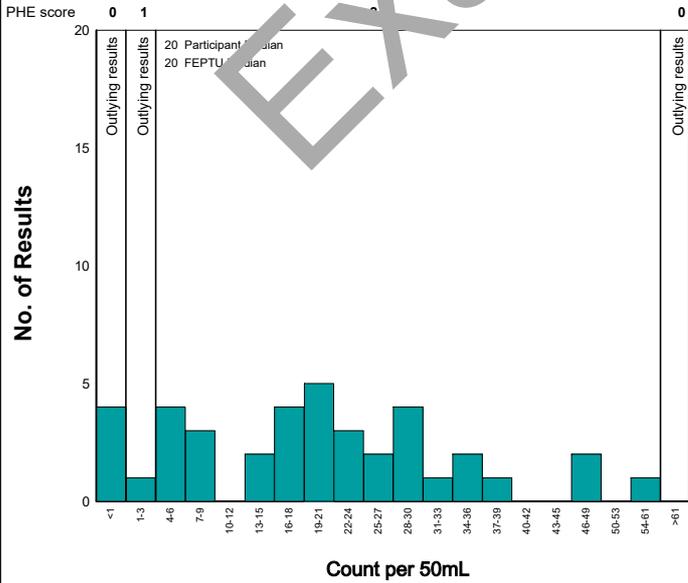
BMW21B: Enterococci



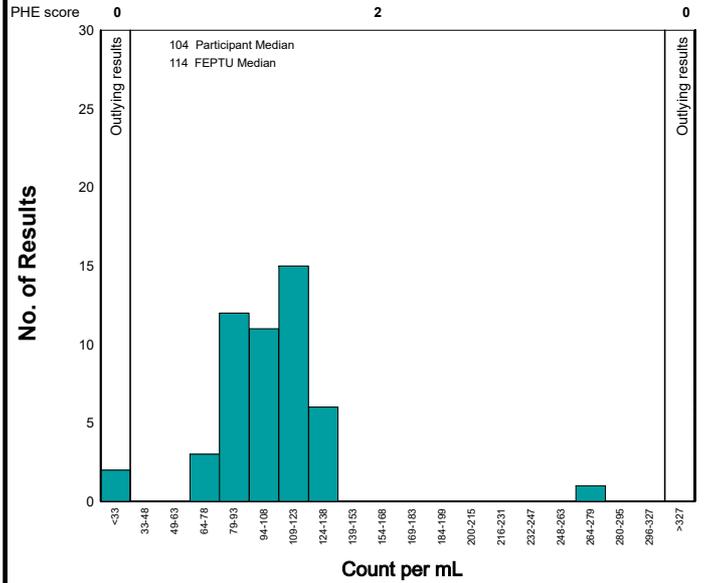
BMW21B: *Pseudomonas aeruginosa*



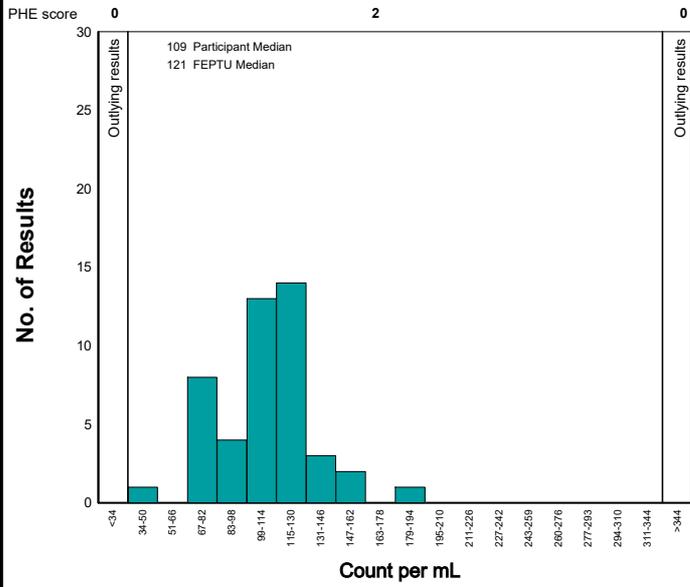
BMW21B: Sporulated sulphite-reducing anaerobes



BMW21B: Colony Count 37°C/24 h



BMW21B: Colony Count 22°C/72 h



Example Report

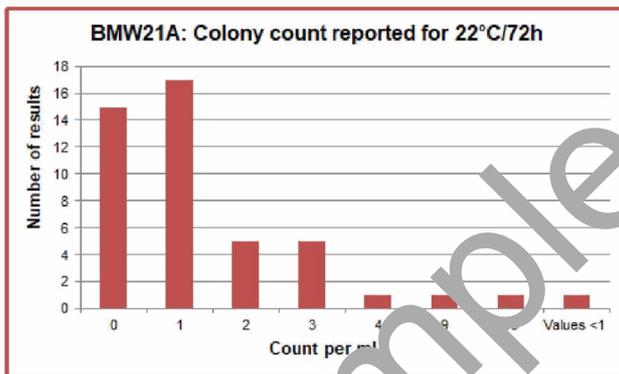
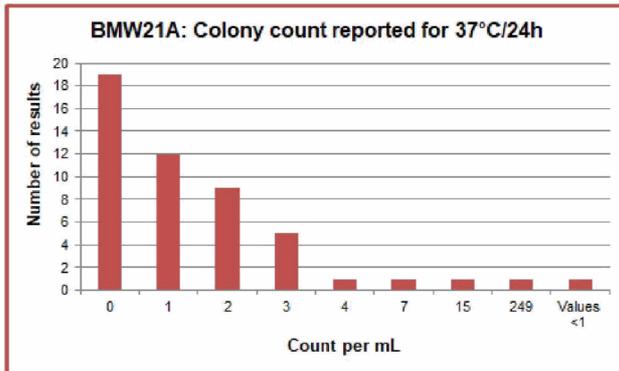
General comment:

If you do not return a result for a distribution, you will not be able to view all the participants' results data in your individualised report. Please contact us if you require this information on foodeqa@phe.gov.uk.

Sample specific comment

BMW21A – Colony counts 37°C/24h and 22°C/72h

Below are graphs of the colony counts 37°C/24h and 22°C/72h reported by participants for BMW21A which are not shown in the main report.



BMW12B: *Pseudomonas aeruginosa*

17/49 (35%) of the laboratories reported a false negative result for this examination. The sample contained a *Pseudomonas aeruginosa* at approximately 8 colony forming units per 250mL. This strain of *P. aeruginosa* was atypical as it produced <0.5mm translucent non-pigmented colonies on PCN agar, gave a fluorescence and casein hydrolysis that was weak. This examination has not been scored. This organism was included to raise awareness of the existence of such strains in the environment and for laboratories to have a greater understanding of the impact on laboratory testing and results.

End of report

Example Report