UK Health Security Agency

Summary of Results

External Quality Assessment of Water Microbiology

Bottled and Mineral Water Scheme

Distribution Number: BMW31 **Sample Numbers: BMW31A, BMW31B**

Distribution Date:	**January 2023**
Results Due:	**03 February 2023**
Report Date:	**08 February 2023**
Samples prepared and quality control tested by:	**Divya George** **Nafeesa Hussain** **Cansev Katar** **Margaret Njenga** **Zak Prior** **Jake Videlefsky**
Data analysed by:	**Joanna Donn** **Nita Patel**
Report compiled by:	**Joanna Donn** **Nita Patel**
Authorised by:	**Nita Patel**

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Fax:

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 $\log_{10}$ value)
X_{pt} = assigned value (participants' consensus median (expressed as a $\log_{10}$ value))
σ_{pt} = the fixed standard deviation for the examination (calculated by FEPTU)

The σpt-value expresses the acceptable difference between the individual participant's result and the participants' consensus median. The σpt-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, UKHSA 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.

UK Health Security Agency 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	Nita Patel	**Fax:**
Microbiological advice	Nita Patel or Zak Prior	**Email:** **foodeqa@ukhsa.gov.uk**
General comments and complaints	Nita Patel or Zak Prior	FEPTU's website
Scheme consultants	Stephen Bullock	
Scheme Co-ordinator	Nita Patel	

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

UKAS PROFICIENCY TESTING
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Sample: BMW31A

Contents:

Leclercia adecarboxylata (13) (NCTC 10599), *Escherichia coli* (39) (wild strain), *Enterococcus casseliflavus* (66) (wild strain), *Pseudomonas aeruginosa* (61) (wild strain), *Clostridium perfringens* (51 per 50mL) (wild strain) - all levels shown are per 250mL unless otherwise stated

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 37ºC/24h and 22ºC/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	*E.coli*	Enterococci	*P.aeruginosa*	Sporulated sulphite-reducing anaerobes	Colony count 37ºC/24h	Colony count 22ºC/72h
FEPTU median	49	36	65	60	48	2	2
No. results returned	44	44	43	43	35	44	39
Assigned value (Participants median all	60	43	64	54	63	2	1
Uncertainty of assigned value*	0.04	0.04	0.01	0.02	0.03	0.08	0.09
Participants mean (all results)	58	41	64	52	64	2	0
Participants median (MPN only)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Participants median (MF only)	59 (n=40)	41 (n=40)	N/A	N/A	N/A	N/A	N/A
Expected Range	18 - 190	13 - 134	20 - 202	17 - 171	20 - 199	0 - 10	0 - 5
Standard deviation**	0.23	0.21	0.07	0.13	0.16	0.33	0.45
No of outlying counts	7	3	4	3	3	5	3
False positives	N/A	N/A	N/A	N/A	N/A	N/A	N/A
False negatives	1	0	3	0	1	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	50
Not examined	1
Non returns	4

Sample: BMW31B

Contents:

Kluyvera cryocrescens (too low for count to be determined) (wild strain), *Escherichia coli* (10) (wild strain), *Enterococcus durans* (31) (wild strain), *Pseudomonas aeruginosa* (17) (wild strain), *Chryseobacterium indologenes* (8 per mL), *Clostridium perfringens* (25 per 50mL) (wild strain), *Microbacterium luteolum* (17 per mL) (wild strain) - all levels shown are per 250mL unless otherwise stated

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 37ºC/24h and 22ºC/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	*E.coli*	Enterococci	*P.aeruginosa*	Sporulated sulphite-reducing anaerobes	Colony count 37ºC/24h	Colony count 22ºC/72h
FEPTU median	8	8	26	18	25	4	28
No. results returned	42	42	43	43	35	44	39
Assigned value (Participants median all	11	11	36	11	33	8	38
Uncertainty of assigned value*	0.05	0.03	0.02	0.05	0.02	0.07	0.04
Participants mean (all results)	12	10	35	11	30	8	36
Participants median (MPN only)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Participants median (MF only)	11 (n=39)	11 (n=39)	N/A	N/A	N/A	N/A	N/A
Expected Range	3 - 35	3 - 33	11 - 114	1 - 35	10 - 104	1 - 25	12 - 119
Standard deviation**	0.26	0.19	0.1	0.26	0.11	0.41	0.19
No of outlying counts	3	3	4	1	2	9	5
False positives	N/A	N/A	N/A	N/A	N/A	N/A	N/A
False negatives	2	2	3	2	1	6	3
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	50
Not examined	1
Non returns	4

Performance Assessment Sheet

Distribution	Sample	Coliform bacteria score	*Escherichia coli* score	Enterococci score	*Pseudomonas aeruginosa* score	Sporulated sulphite-reducing anaerobes	Colony Count 37ºC/24 h score	Colony Count 22ºC/72 h score
BMW31	BMW31A							
	BMW31B							
BMW30	BMW30A							
	BMW30B							
BMW29	BMW29A							
	BMW29B							
Total maximum possible score								
Total percentage								

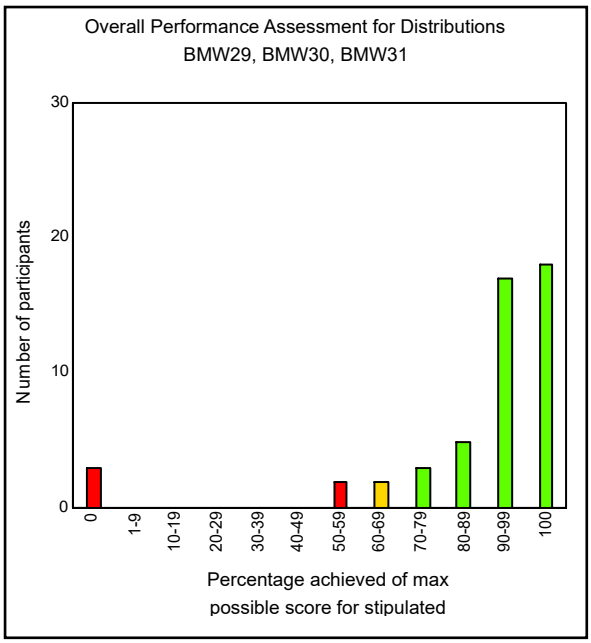
Performance Assessment Comment:

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' cummulative 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



Performance Assessment Comment:

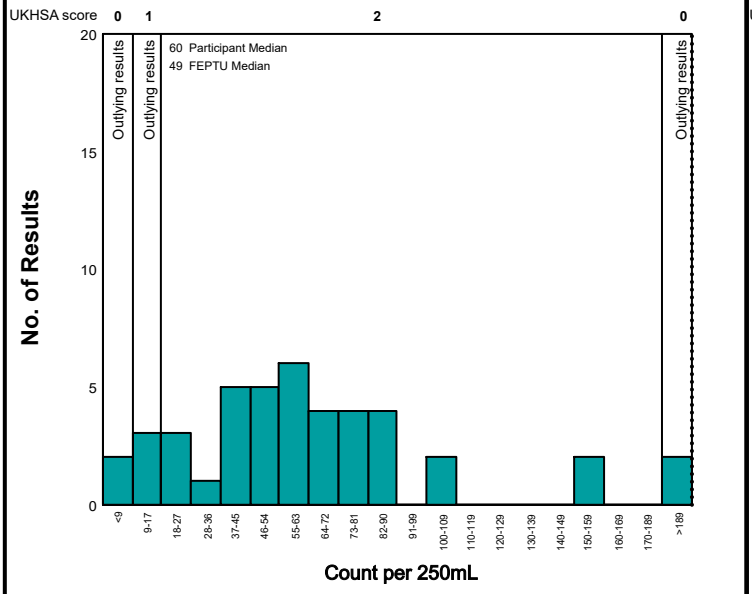
Laboratories that achieve less than 70% of the maximum possible score are likely to be experiencing significant problems with their examinations and are advised to:

a) refer to the relevant distribution reports for sample-specific comments

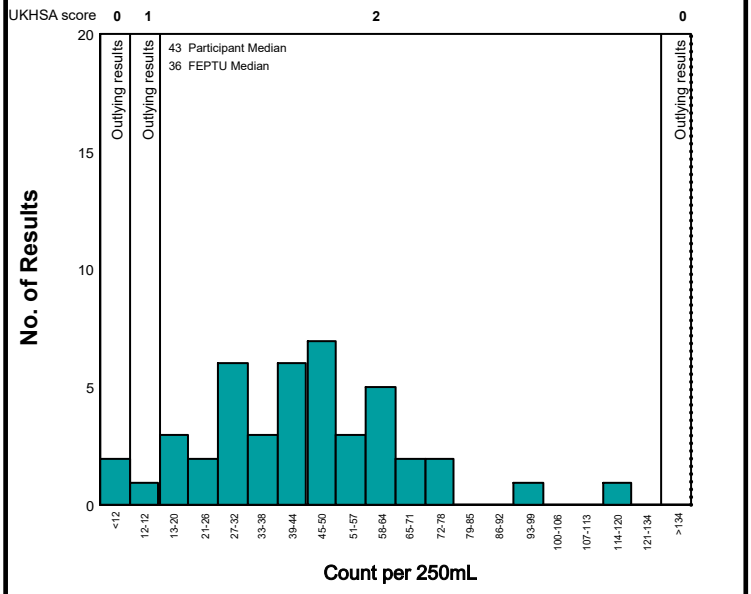
b) refer to the website guidance documents:
https://www.gov.uk/government/collections/external-quality-assessment-eqa-and-proficiency-testing-pt-for-food-water-and-environmental-microbiology

c) contact the organisers for advice

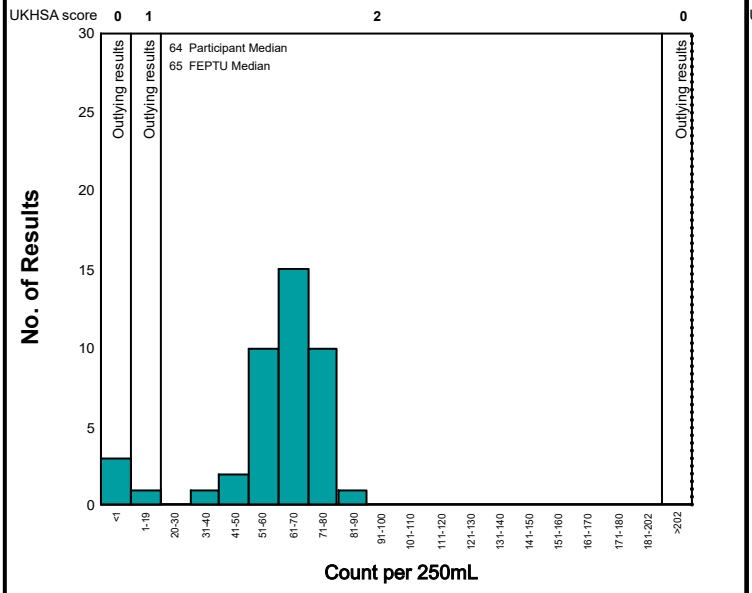
BMW31A: Coliform bacteria



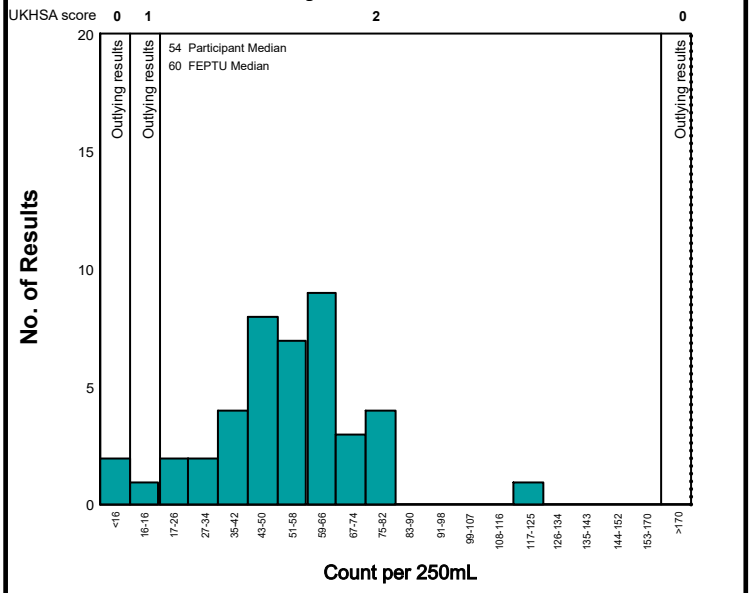
BMW31A: *Escherichia coli*



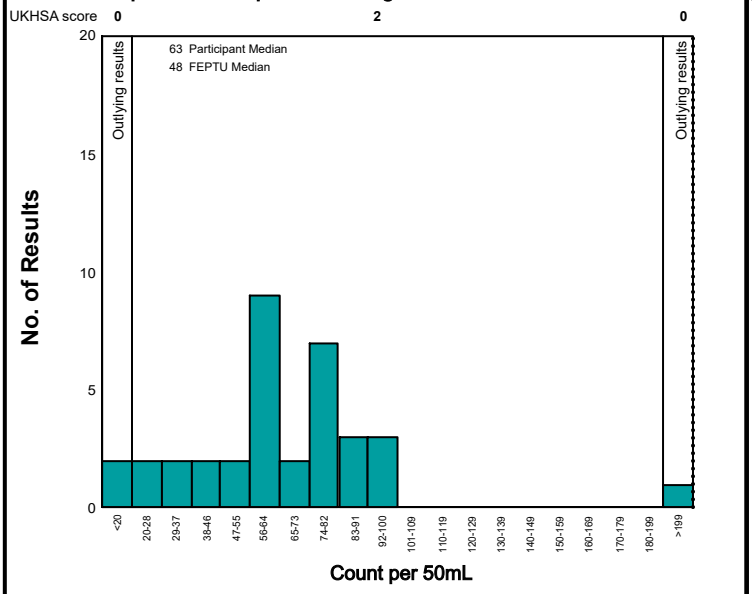
BMW31A: Enterococci



BMW31A: *Pseudomonas aeruginosa*



BMW31A: Sporulated sulphite-reducing anaerobes



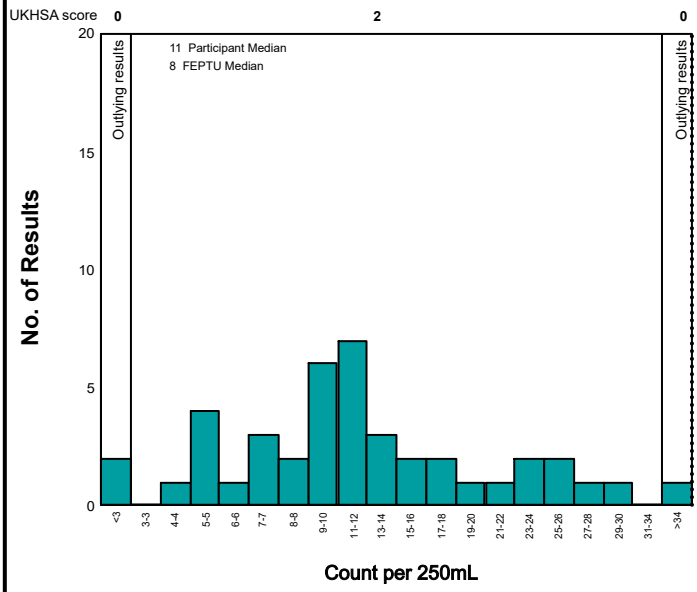
BMW31A: Colony Count 37ºC/24 h

No data for graph

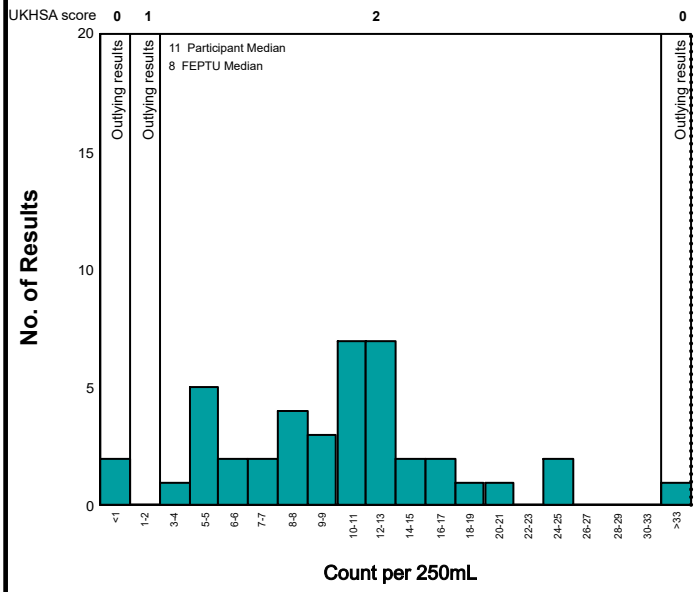
BMW31A: Colony Count 22ºC/72 h

No data for graph

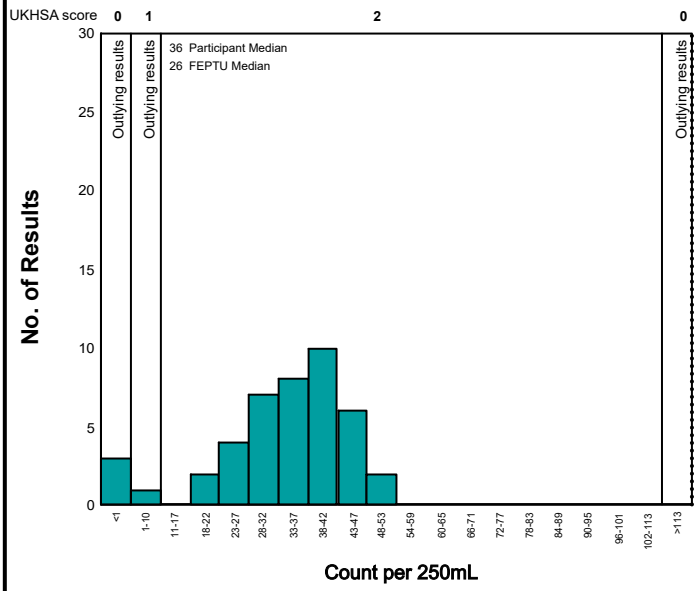
BMW31B: Coliform bacteria



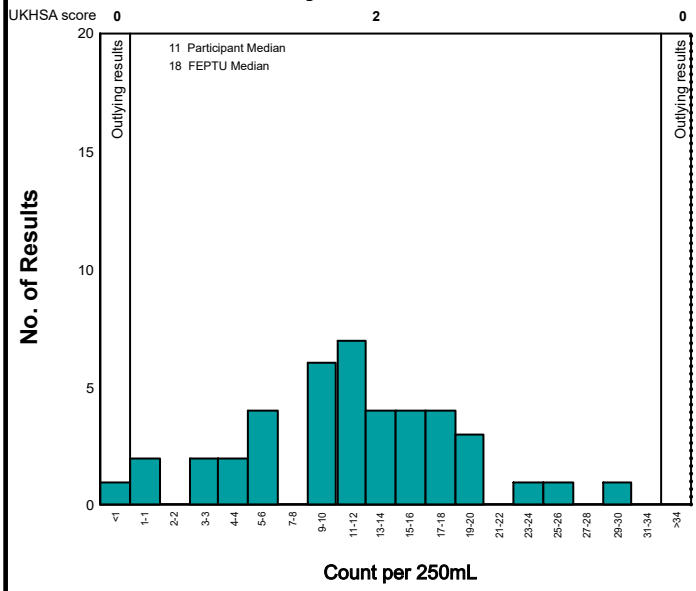
BMW31B: *Escherichia coli*



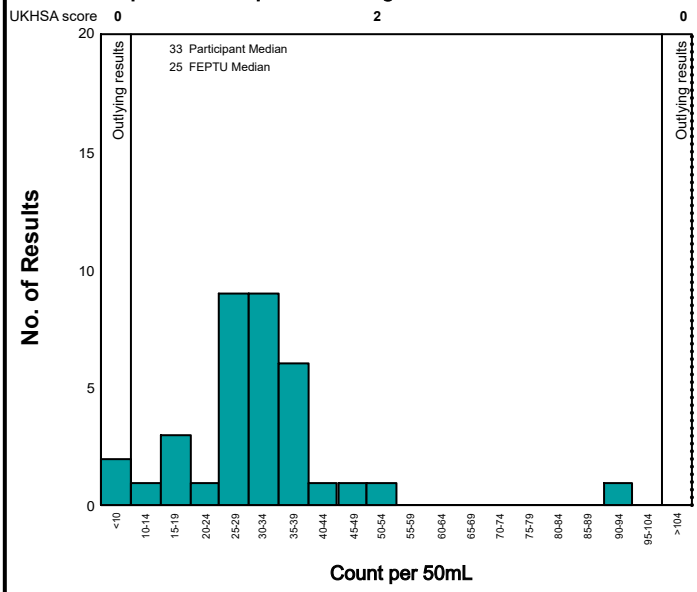
BMW31B: Enterococci



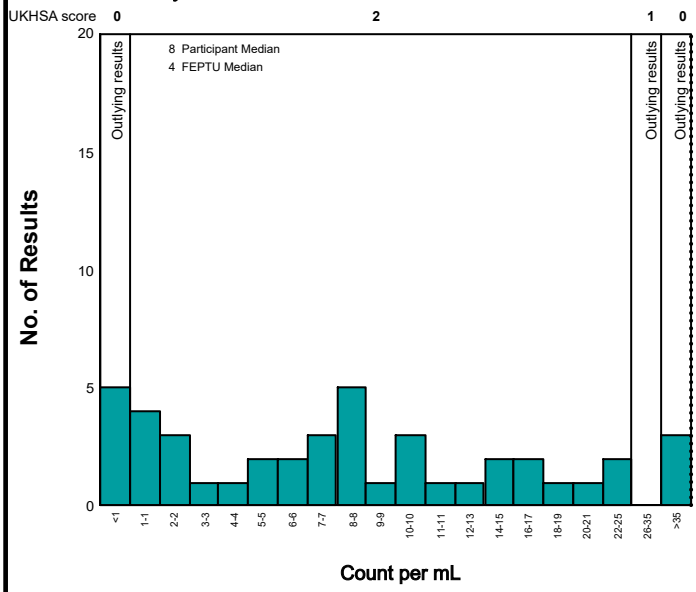
BMW31B: *Pseudomonas aeruginosa*



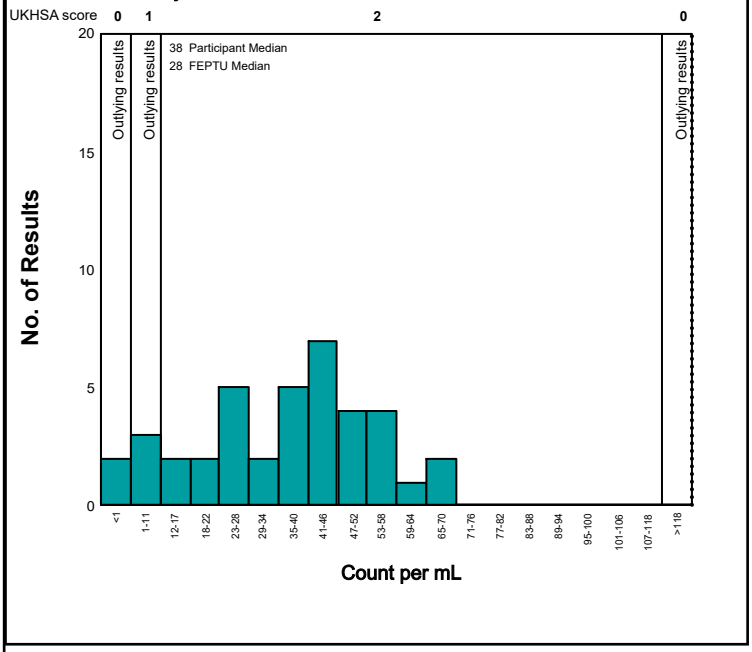
BMW31B: Sporulated sulphite-reducing anaerobes



BMW31B: Colony Count 37ºC/24 h



BMW31B: Colony Count 22ºC/72 h

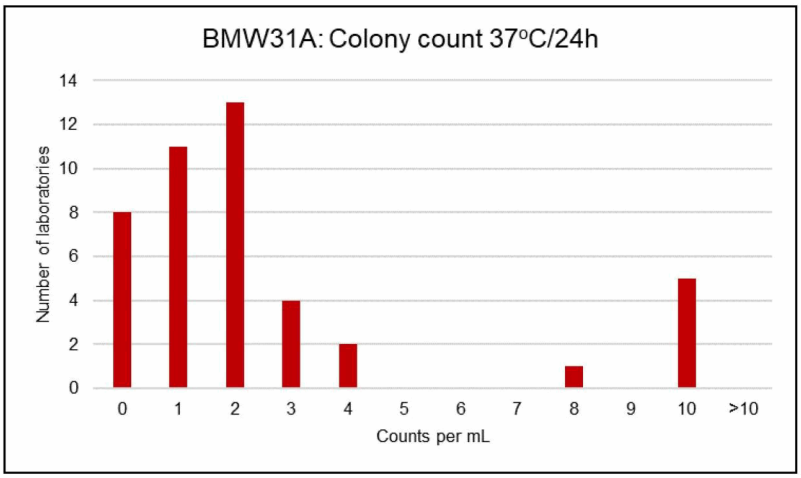


Sample specific comment

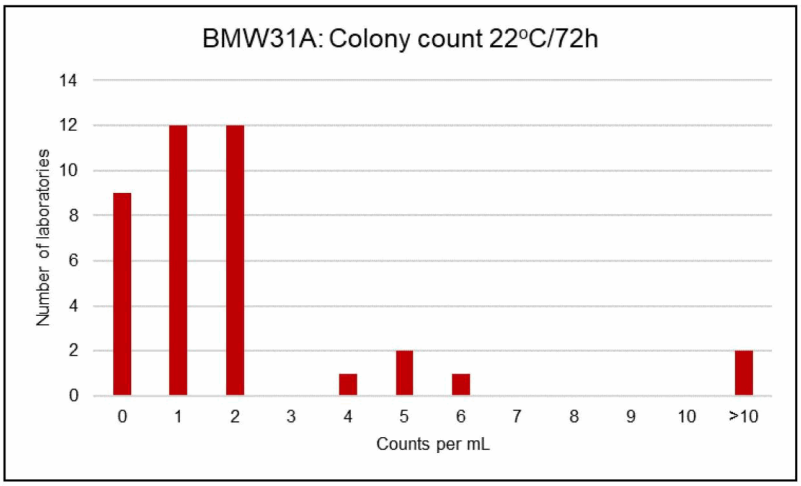
BMW31B
This sample contained a *Microbacterium luteolum* at levels of approximately 17 colony forming units per mL. This organism grows poorly when incubated at 37°C.

Below are the graphs of the colony counts which are not shown in the main scheme report.

BMW31A: Colony count 37°C/24h



BMW31A: Colony count 22°C/72h



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@ukhsa.gov.uk.

End of report