Summary of Results

External Quality Assessment of Water Microbiology

Drinking Water Scheme

Distribution Number: W218   **Sample Numbers: W218A, W218B**

Distribution Date:	**January 2025**
Results Due:	**07 February 2025**
Report Date:	**13 February 2025**
Samples prepared and quality control tested by:	**Divya George** **Nafeesa Hussain** **Afifa Halim** **Sabine Naujokat** **Zak Prior** **Jake Videlefsky**
Data analysed by:	**Nita Patel** **Zak Prior**
Report compiled by:	**Nita Patel** **Zak Prior**
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For further information on the scheme please refer to:

Scheme Guide: https://www.feptu.org.uk/schemes/scheme-guide/

Guide to Scoring and Statistics: https://www.feptu.org.uk/schemes/scoring/

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 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 Drinking 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.

UKHSA uses methods stipulated in the Environmental Agency Standing Committee of Analysts series of documents: Microbiology of Water and Associated Materials (2017) - Practices and Procedures for Laboratories. However for *Escherichia coli* and coliform examinations, ISO 9308-1:2014 Water quality - Enumeration of *Escherichia coli* and coliform bacteria Part 1: Membrane filtration method for waters with low bacterial background flora is followed.

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 19.0 of the Scheme Guide if you have experienced difficulties with any of the examinations.

https://www.feptu.org.uk/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 drinking water samples. Performance assessment cannot be undertaken as effectively if laboratories do not participate in all distributions for the Drinking 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 Drinking Water is accredited by the United Kingdom Accreditation Service (UKAS) to ISO/IEC 17043:2010.

UKAS
PROFICIENCY
TESTING

0006

Sample: W218A

Contents: *Enterobacter cloacae* (58) (wild strain), *Pseudomonas aeruginosa* (53) (wild strain), *Clostridium perfringens* (40) (wild strain) ,
Micrococcus sp. (40 per mL) (wild strain), *Staphylococcus saprophyticus* (3 per mL) (wild strain)

Expected Results:

All counts are expressed as colony forming units (cfu) per 100mL except the colony counts at 37ºC/48h and 22ºC/72h which are cfu per mL.

Parameter	Coliform bacteria	E.coli	Enterococci	P.aeruginosa	C.perfringens	Colony count 37ºC/48h	Colony count 22ºC/72h
FEPTU median	60	0	0	51	40	37	40
No. results returned	77	80	70	64	49	72	74
Assigned value (Participants median all results)	74	0	0	32	44	41	40
Uncertainty of assigned value*	0.02	N/A	N/A	0.04	0.02	0.01	0.01
Participants Algorithm A mean (all results)	73	0	0	33	43	40	40
Expected Range	23 - 234	N/A	N/A	10 - 101	14 - 139	13 - 128	13 - 126
Standard deviation** ($\log_{10}$)	0.16	N/A	N/A	0.25	0.12	0.1	0.1
No of outlying counts	2	N/A	N/A	3	6	4	6
False positives	N/A	1	3	N/A	N/A	N/A	N/A
False negatives	0	N/A	N/A	0	2	1	0
Your result							
Score for performance assessment							
Z-score							
Analyst 2 Result							
Analyst 2 Z-score							
Analyst 3 Result							
Analyst 3 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*) and is based on logged data

Total sent samples	88
Not examined	5
Non returns	1
Late returns	0

Sample: W218B

Contents: *Klebsiella pneumoniae* (57) (wild strain), *Escherichia coli* (39) (wild strain), *Enterococcus hirae* (58) (wild strain), *Pseudomonas aeruginosa* (1.04x10²) (wild strain) , *Clostridium perfringens* (33) (wild strain) , *Microbacterium* sp. (58 per mL) (wild strain)

Expected Results:

All counts are expressed as colony forming units (cfu) per 100mL except the colony counts at 37ºC/48h and 22ºC/72h which are cfu per mL.

Parameter	Coliform bacteria	E.coli	Enterococci	P.aeruginosa	C.perfringens	Colony count 37ºC/48h	Colony count 22ºC/72h
FEPTU median	99	38	58	104	34	2	59
No. results returned	77	80	70	64	49	72	74
Assigned value (Participants median all results)	140	45	56	73	33	3	57
Uncertainty of assigned value*	0.02	0.02	0.01	0.04	0.03	0.04	0.02
Participants Algorithm A mean (all results)	131	44	56	70	33	3	56
Expected Range	44 - 443	14 - 141	18 - 177	23 - 231	10 - 103	0 - 9	18 - 180
Standard deviation** ($\log_{10}$)	0.13	0.11	0.09	0.23	0.16	0.27	0.11
No of outlying counts	1	4	0	3	5	7	5
False positives	N/A	N/A	N/A	N/A	N/A	N/A	N/A
False negatives	0	1	0	0	4	0	1
Your result							
Score for performance assessment							
Z-score							
Analyst 2 Result							
Analyst 2 Z-score							
Analyst 3 Result							
Analyst 3 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*) and is based on logged data

Total sent samples	88
Not examined	5
Non returns	1
Late returns	0

W218A: Coliform bacteria

UKHSA score: 0, 2, 0

74 Participant Median
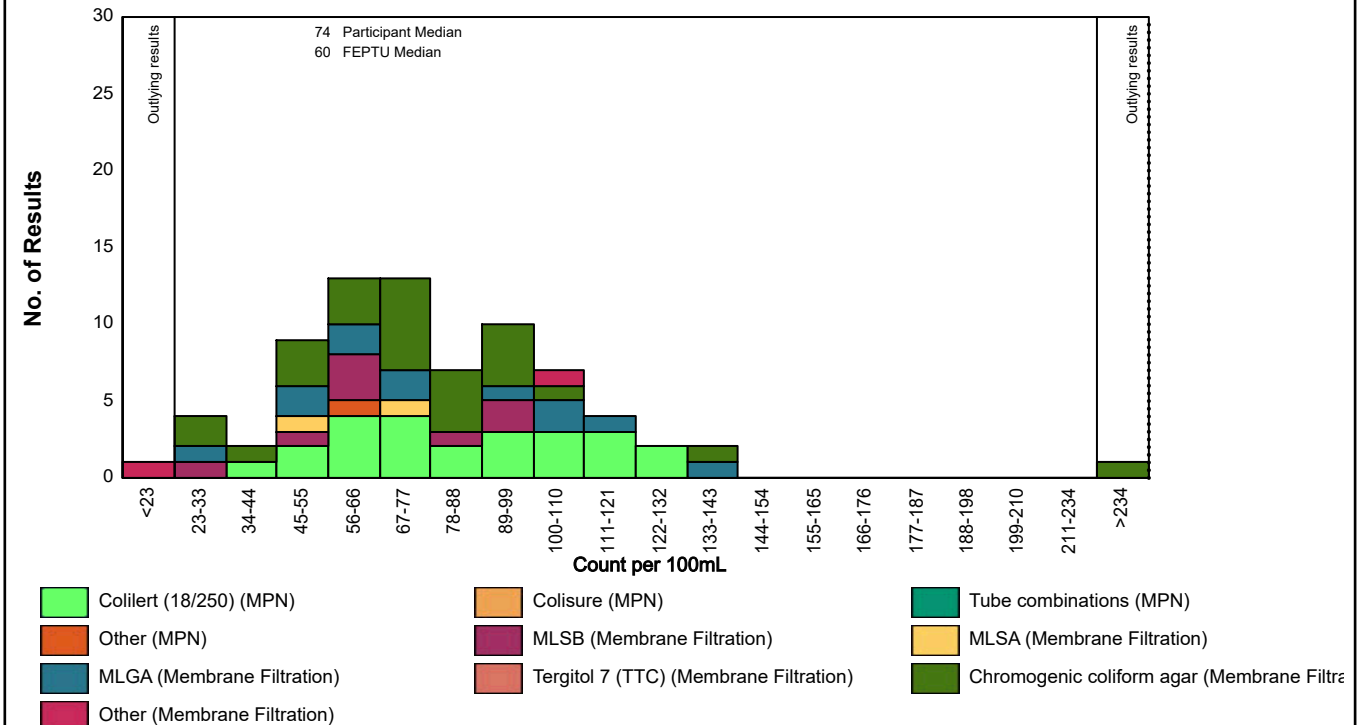60 FEPTU Median

No. of Results / Count per 100mL
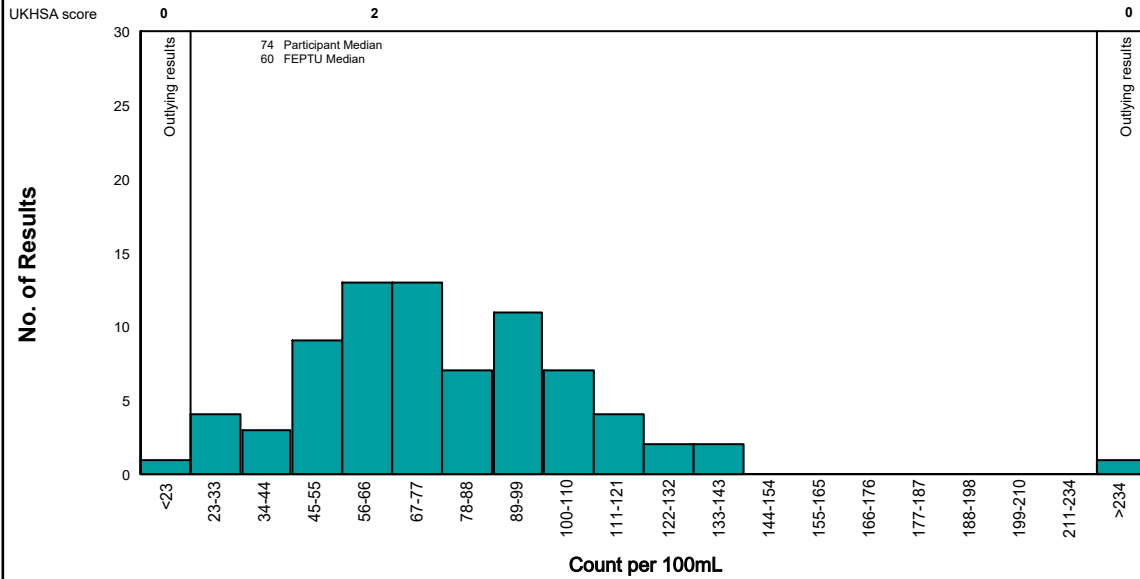
Method based presentation

W218A : Coliform bacteria

FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported		
Colilert (18/250)	24	0	32	83	0.14	43	-	127
Colisure	0	0	0					
Tube combinations	0	0	0					
Other (MPN)	1	0	1					
MLSB	8	0	10					
MLSA	2	0	2					
MLGA	12	0	16	74	0.20	33	-	143
Tergitol 7 (TTC)	0	0	0					
Chromogenic coliform agar	26	0	34	74	0.14	29	-	380
Other (Membrane filtration)	2	0	2					

W218A: Coliform bacteria

74 Participant Median
60 FEPTU Median

No. of Results / Count per 100mL

- Colilert (18/250) (MPN)
- Colisure (MPN)
- Tube combinations (MPN)
- Other (MPN)
- MLSB (Membrane Filtration)
- MLSA (Membrane Filtration)
- MLGA (Membrane Filtration)
- Tergitol 7 (TTC) (Membrane Filtration)
- Chromogenic coliform agar (Membrane Filtra...
- Other (Membrane Filtration)

W218A: *Escherichia coli*

No data for graph

Method based presentation

W218A : *Escherichia coli*   FEPTU Method: Chromogenic coliform

agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported		
Colilert (18/250)	17	7	25	0	0.00	0	-	0
Colisure	0	0	0					
Tube combinations	0	0	0					
Other (MPN)	1	0	1					
TBX	1	0	1					
MLGA	13	0	19	0	0.00	0	-	0
MLSB	8	0	11					
MLSA	1	0	1					
Tergitol 7 (TTC)	0	0	0					
Chromogenic coliform agar	25	3	36	0	0.00	0	-	0
Other (Membrane filtration)	2	0	2					

W218A: *Escherichia coli*

No data for graph

W218A: Enterococci

No data for graph

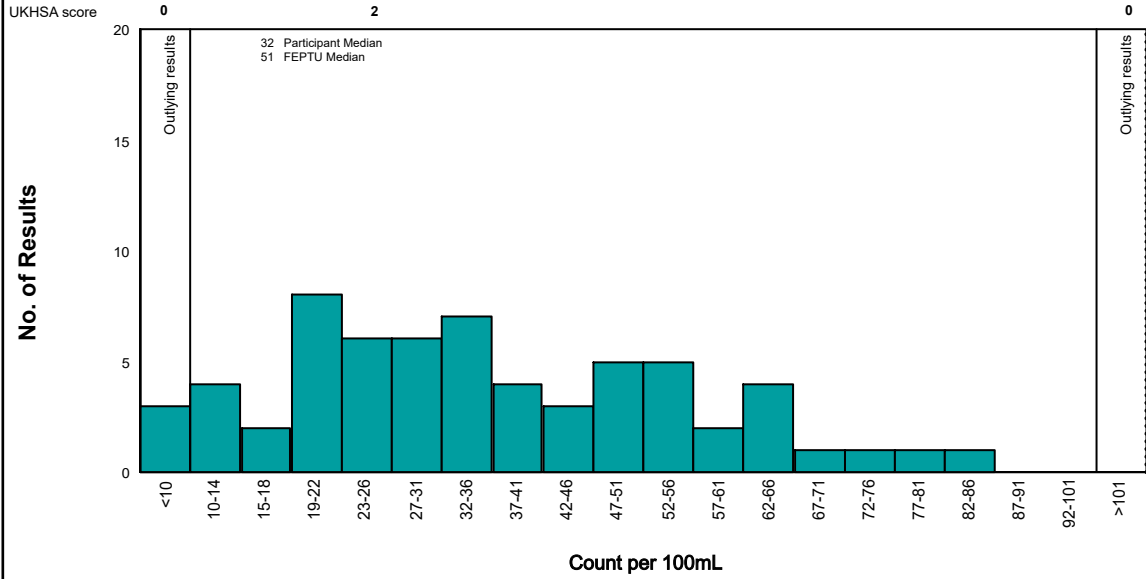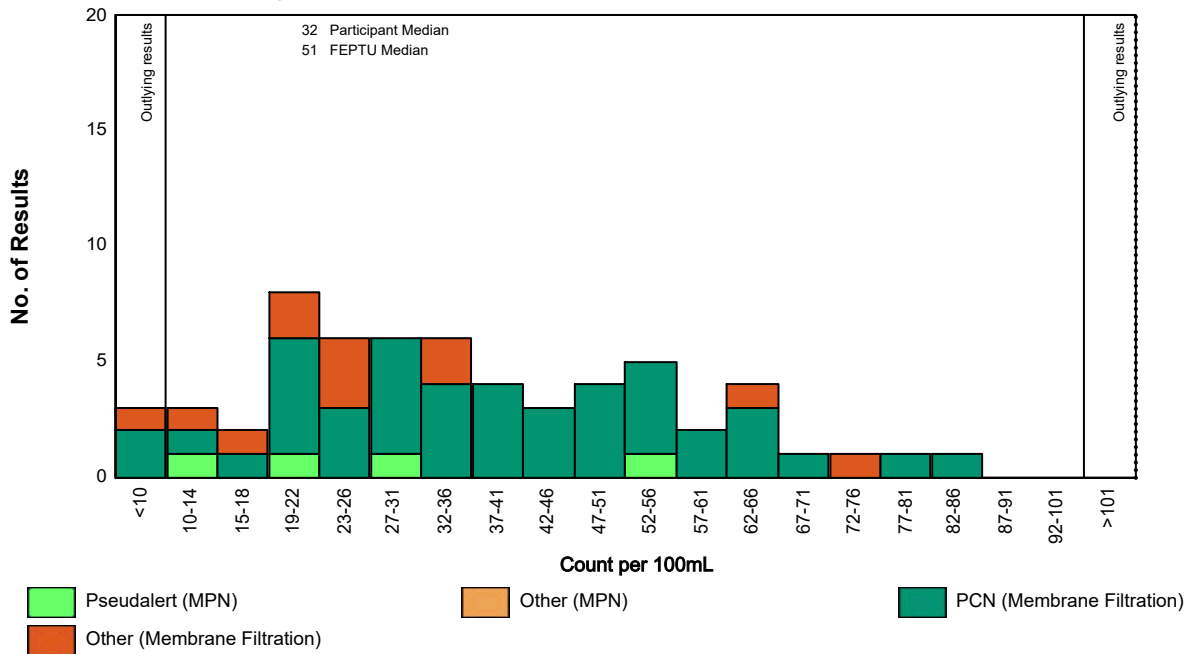## Method based presentation

W218A : Enterococci   FEPTU Method: S+B

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported	
Enterolert (E/DW/250)	4	2	6				
Other (MPN)	1	0	1				
Enterococcus agar	6	1	9				
Other (Membrane filtration)	2	2	3				
S+B	48	3	78	0	0.00	0 -	20

W218A: Enterococci

No data for graph

W218A: *Pseudomonas aeruginosa*

UKHSA score   0   2   0

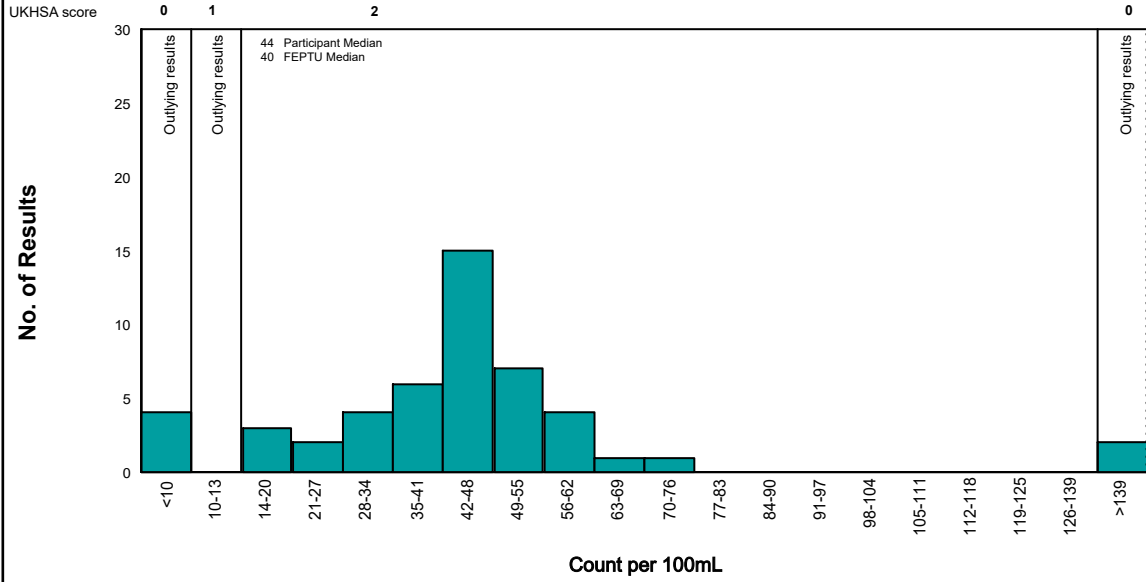## Method based presentation

W218A : *Pseudomonas aeruginosa*   FEPTU Method: PCN

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported	
Pseudalert	4	0	6				
Other (MPN)	0	0	0				
PCN	44	1	73	39	0.22	6	- 86
Other (Membrane filtration)	12	0	20	24	0.21	9	- 75

- Pseudalert (MPN)
- Other (MPN)
- PCN (Membrane Filtration)
- Other (Membrane Filtration)

W218A: *Clostridium perfringens*

UKHSA score   0   1   2   0

44 Participant Median
40 FEPTU Median

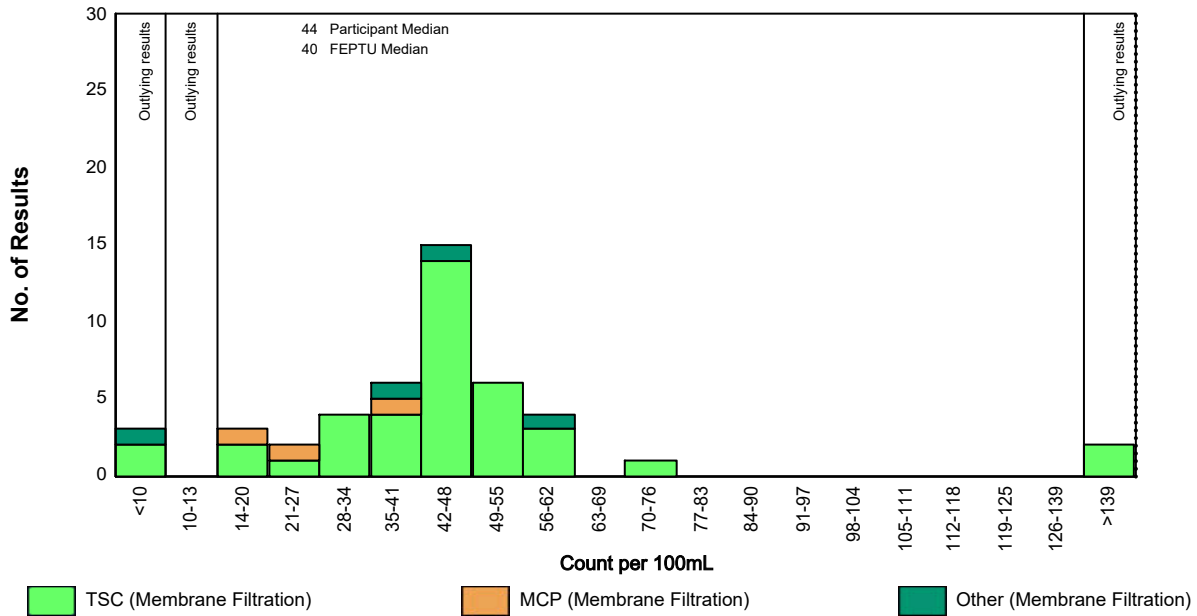Count per 100mL — No. of Results

Method based presentation

W218A : *Clostridium perfringens*   FEPTU Method: TSC

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported	
TSC	39	1	84	44	0.11	0 -	230
MCP	3	0	6				
Other (Membrane filtration)	4	0	8				

W218A: *Clostridium perfringens*
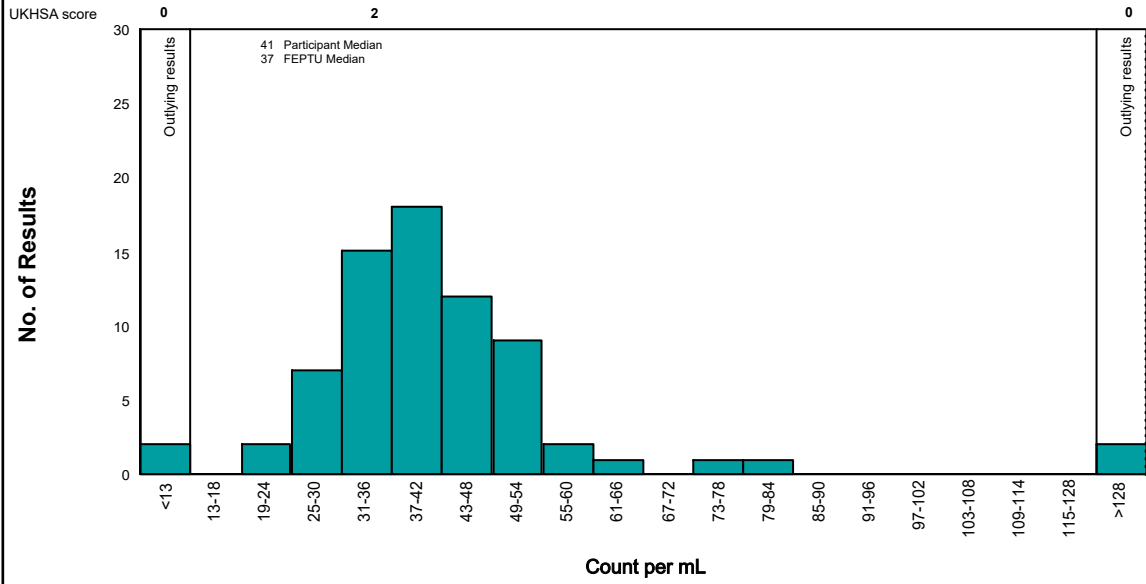
44 Participant Median
40 FEPTU Median

Count per 100mL — No. of Results

■ TSC (Membrane Filtration)   ■ MCP (Membrane Filtration)   ■ Other (Membrane Filtration)

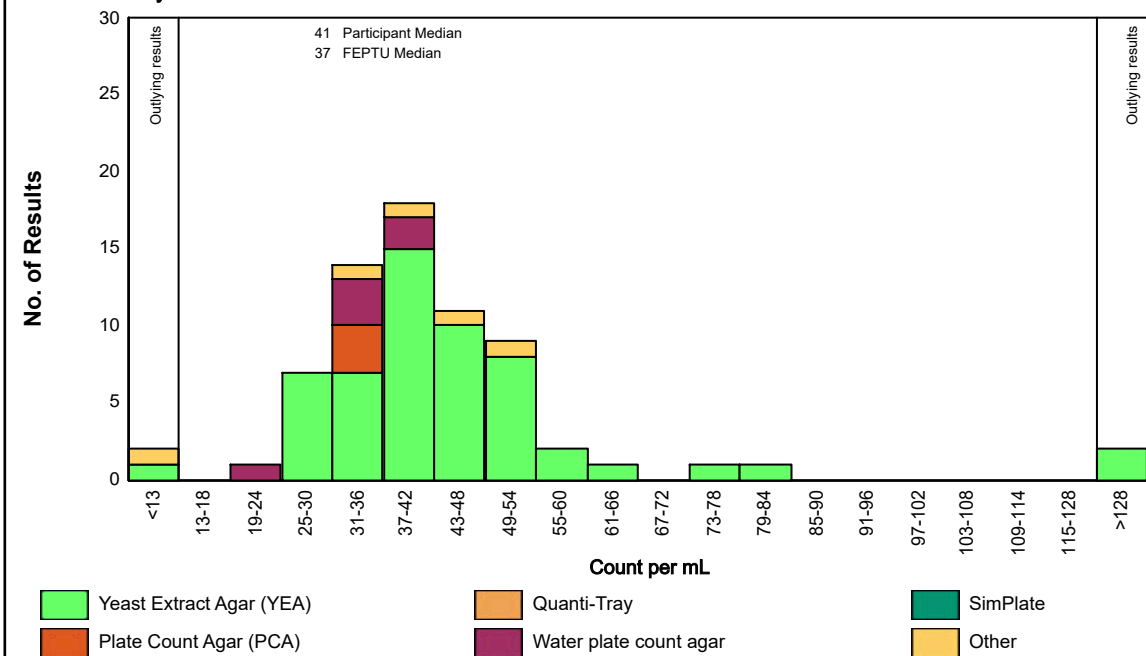## W218A: Colony Count 37ºC/48 h

Method based presentation

W218A : Colony Count 37ºC/48 h

FEPTU Method: Yeast Extract Agar (YEA)
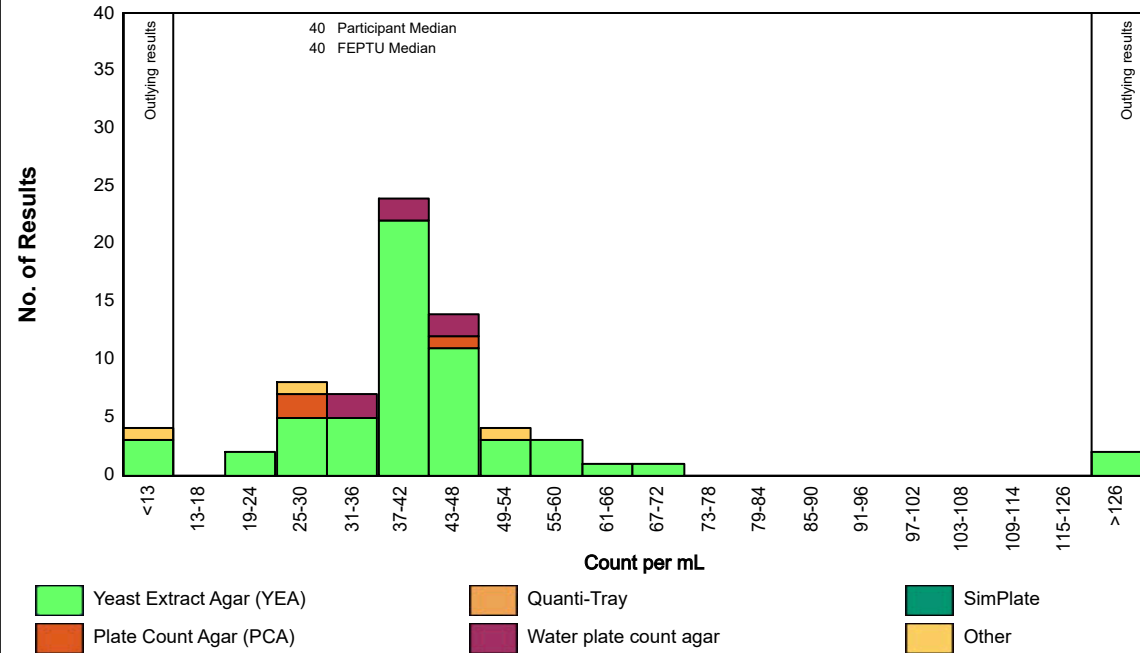
Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported		
Yeast Extract Agar (YEA)	55	0	79	42	0.11	8	-	475
Quanti-Tray	0	0	0					
SimPlate	0	0	0					
Plate Count Agar (PCA)	3	0	4					
Water plate count agar	6	0	8					
Other	5	0	7					

W218A: Colony Count 22ºC/72 h
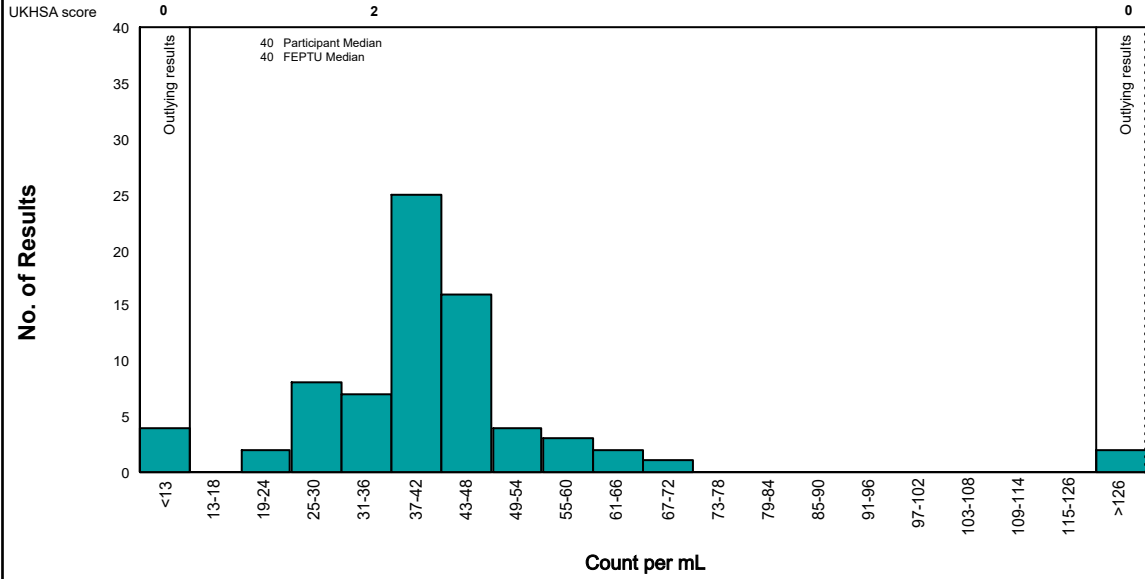
Method based presentation

W218A : Colony Count 22ºC/72 h

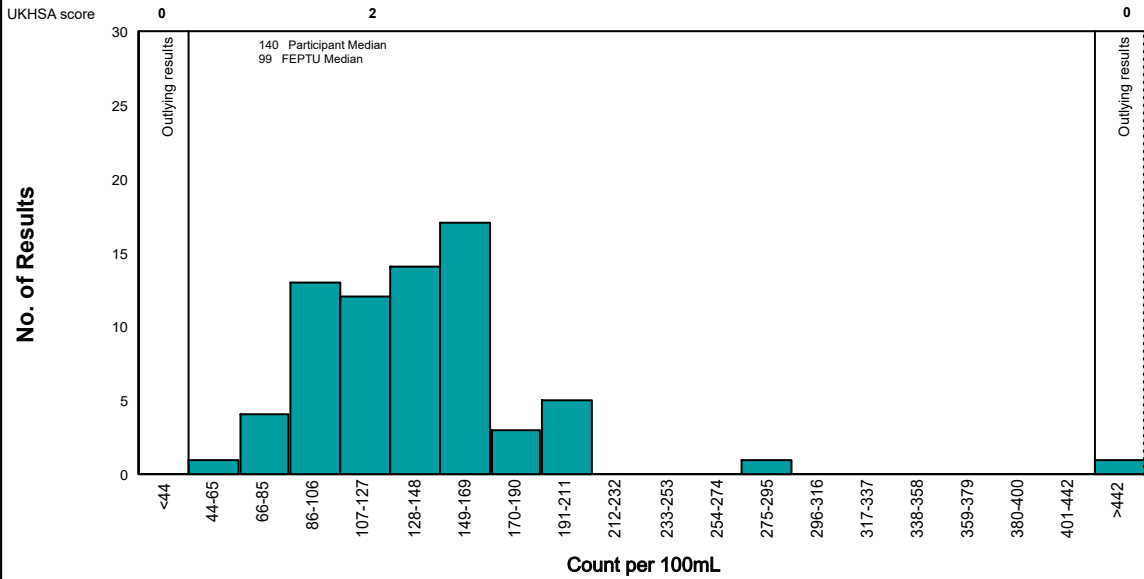FEPTU Method: Yeast Extract Agar (YEA)

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported		
Yeast Extract Agar (YEA)	58	0	82	40	0.09	6	-	349
Quanti-Tray	0	0	0					
SimPlate	0	0	0					
Plate Count Agar (PCA)	3	0	4					
Water plate count agar	6	0	8					
Other	3	0	4					

W218A: Colony Count 22ºC/72 h

W218B: Coliform bacteria

140 Participant Median
99 FEPTU Median
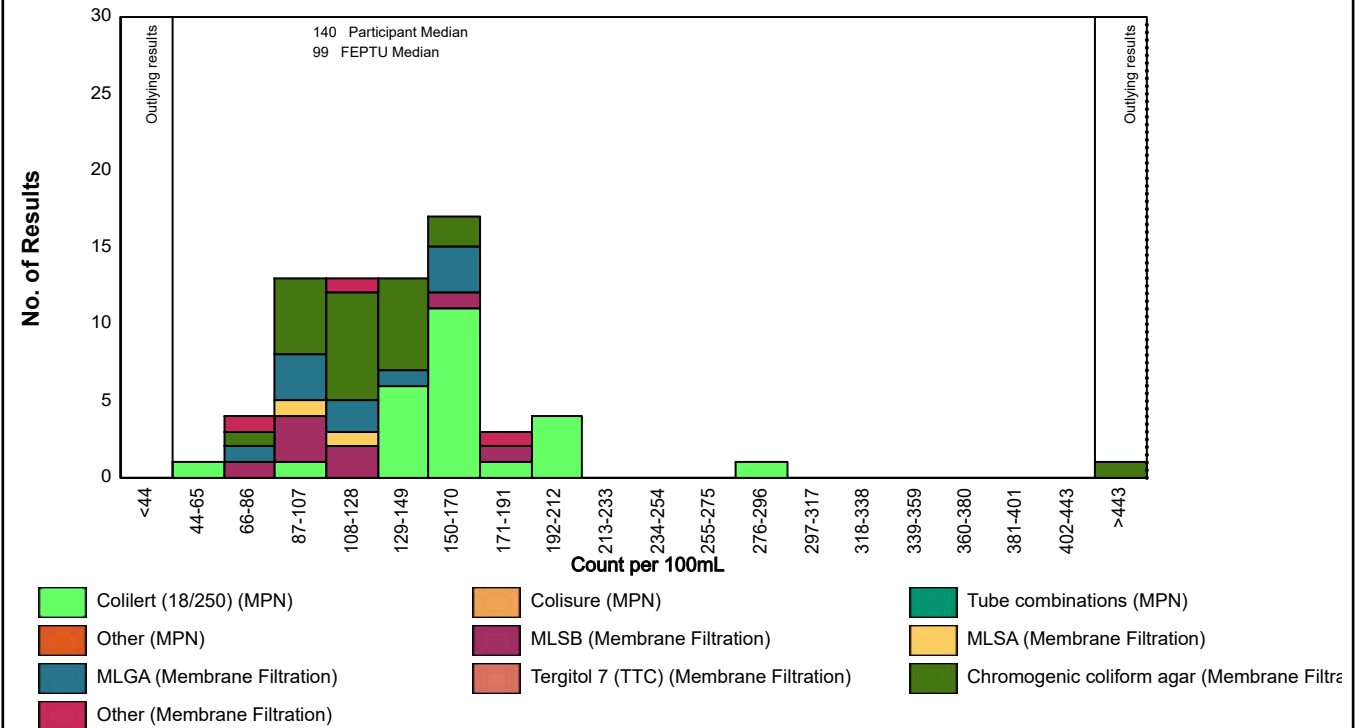
No. of Results vs Count per 100mL
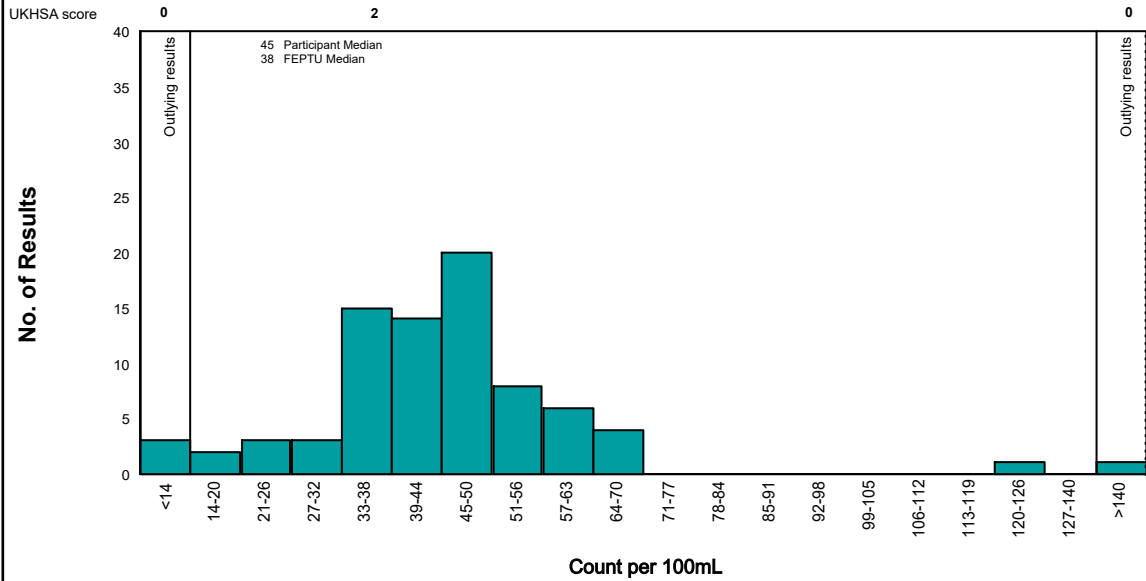
Method based presentation

W218B : Coliform bacteria

FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported		
Colilert (18/250)	25	1	35	159	0.06	49	-	291
Colisure	0	0	0					
Tube combinations	0	0	0					
Other (MPN)	0	1	0					
MLSB	8	0	11					
MLSA	2	0	2					
MLGA	10	1	14	109	0.13	79	-	163
Tergitol 7 (TTC)	0	0	0					
Chromogenic coliform agar	22	3	31	120	0.10	77	-	580
Other (Membrane filtration)	3	0	4					

W218B: Coliform bacteria

140 Participant Median
99 FEPTU Median

No. of Results vs Count per 100mL

Legend:
- Colilert (18/250) (MPN)
- Colisure (MPN)
- Tube combinations (MPN)
- Other (MPN)
- MLSB (Membrane Filtration)
- MLSA (Membrane Filtration)
- MLGA (Membrane Filtration)
- Tergitol 7 (TTC) (Membrane Filtration)
- Chromogenic coliform agar (Membrane Filtra
- Other (Membrane Filtration)

W218B: *Escherichia coli*

UKHSA score   0   2   0

45 Participant Median
38 FEPTU Median

No. of Results (y-axis), Count per 100mL (x-axis)
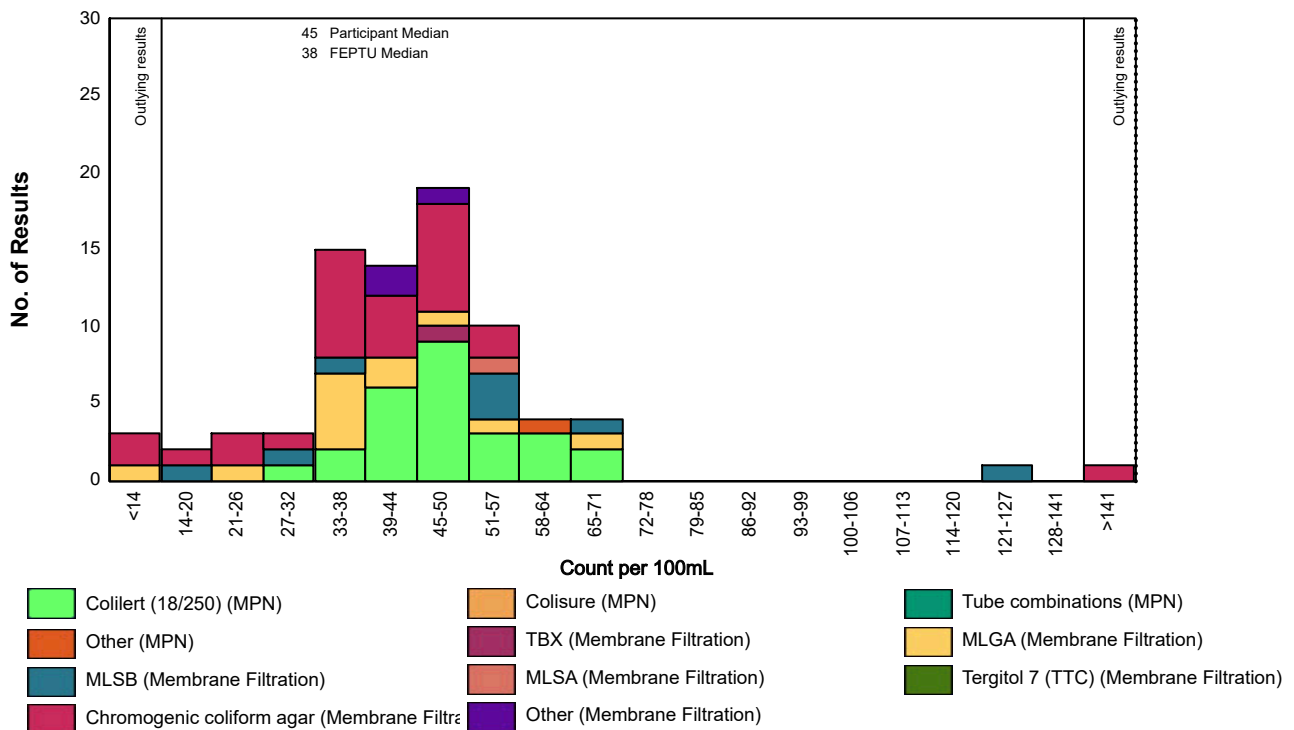
Method based presentation
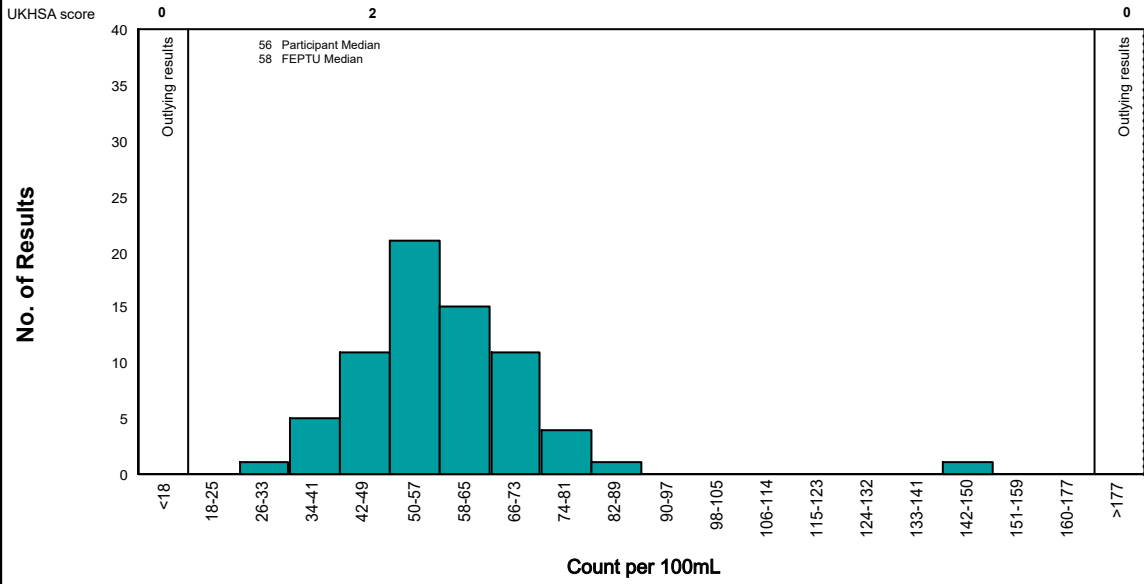
W218B : *Escherichia coli*   FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported		
Colilert (18/250)	26	0	32	46	0.07	32	-	69
Colisure	0	0	0					
Tube combinations	0	0	0					
Other (MPN)	1	0	1					
TBX	1	0	1					
MLGA	12	0	15	37	0.06	0	-	70
MLSB	8	0	10					
MLSA	1	0	1					
Tergitol 7 (TTC)	0	0	0					
Chromogenic coliform agar	27	0	34	40	0.11	4	-	210
Other (Membrane filtration)	3	0	3					

W218B: *Escherichia coli*

45 Participant Median
38 FEPTU Median

No. of Results (y-axis), Count per 100mL (x-axis)

Legend:
- Colilert (18/250) (MPN)
- Colisure (MPN)
- Tube combinations (MPN)
- Other (MPN)
- TBX (Membrane Filtration)
- MLGA (Membrane Filtration)
- MLSB (Membrane Filtration)
- MLSA (Membrane Filtration)
- Tergitol 7 (TTC) (Membrane Filtration)
- Chromogenic coliform agar (Membrane Filtra
- Other (Membrane Filtration)

W218B: Enterococci

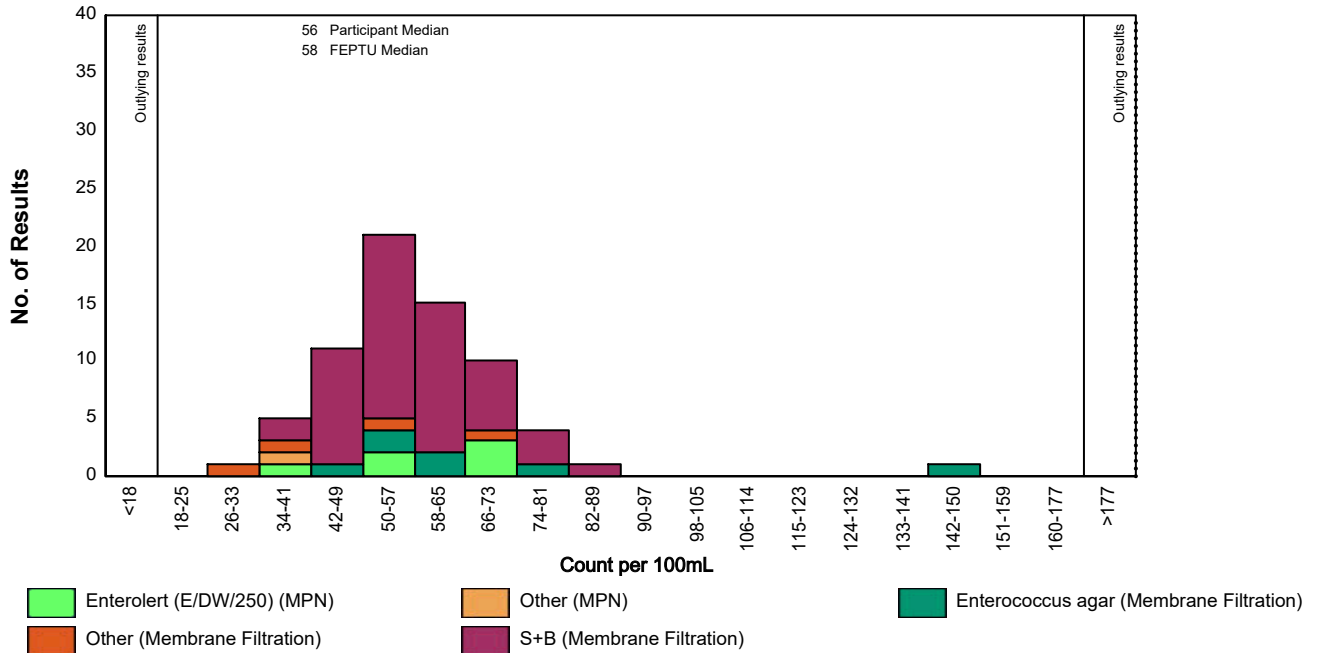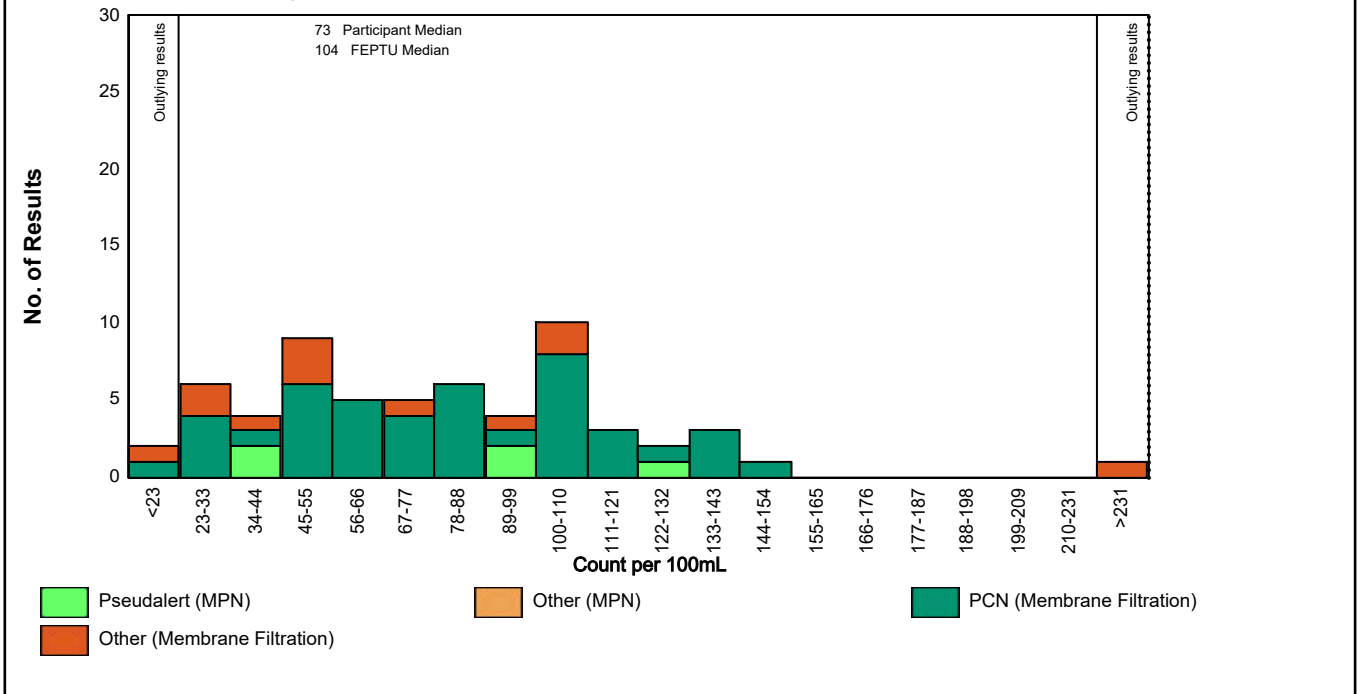## Method based presentation

W218B : Enterococci

FEPTU Method: S+B

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported	
Enterolert (E/DW/250)	6	0	8				
Other (MPN)	1	0	1				
Enterococcus agar	7	0	10				
Other (Membrane filtration)	4	0	5				
S+B	51	1	73	56	0.08	37 -	88

W218B: *Pseudomonas aeruginosa*

UKHSA score
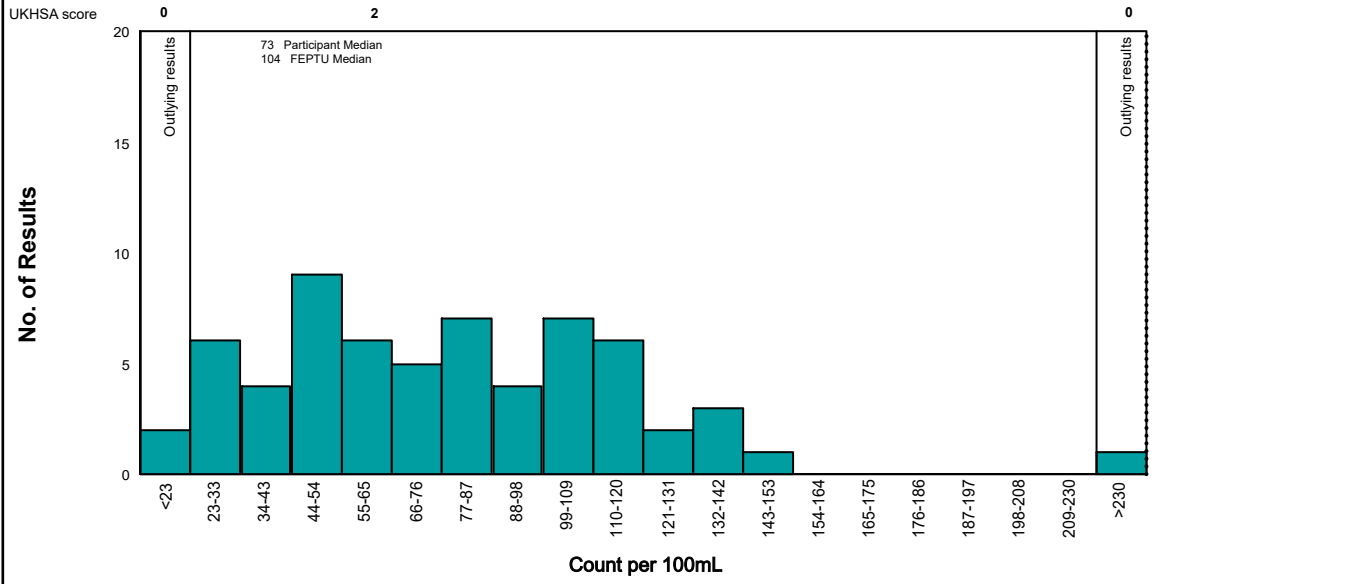
Method based presentation

W218B : *Pseudomonas aeruginosa*　　　　　　　　　　　FEPTU Method: PCN

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported		
Pseudalert	5	0	8					
Other (MPN)	0	0	0					
PCN	44	1	72	79	0.20	11	-	147
Other (Membrane filtration)	12	0	19	53	0.31	18	-	270

W218B: *Pseudomonas aeruginosa*

■ Pseudalert (MPN)　　　　■ Other (MPN)　　　　■ PCN (Membrane Filtration)
■ Other (Membrane Filtration)

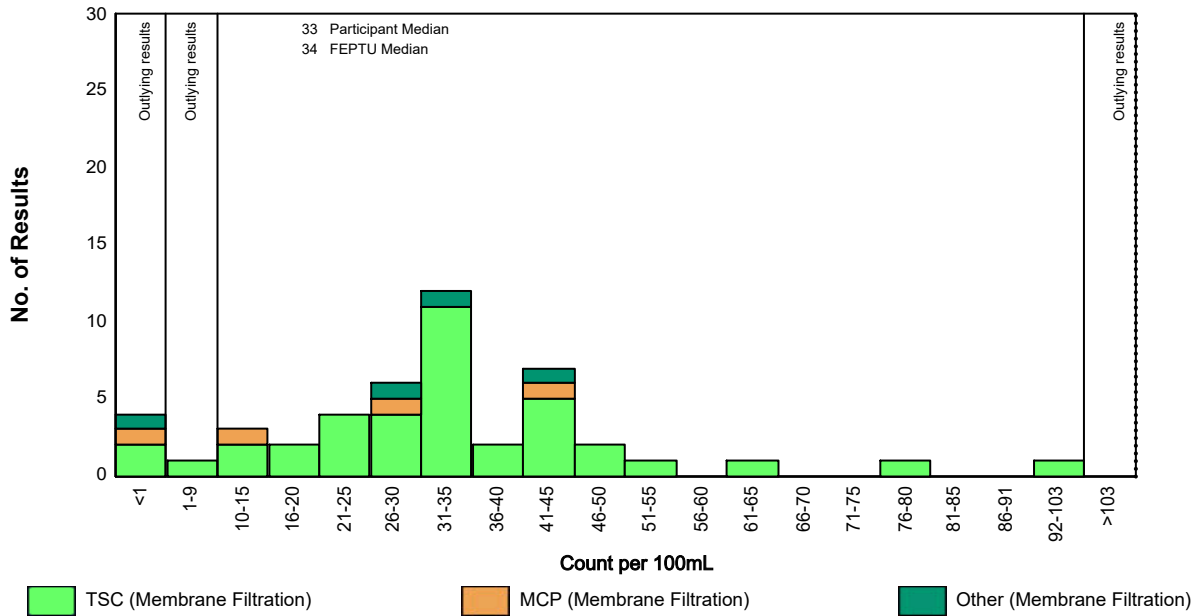## W218B: *Clostridium perfringens*
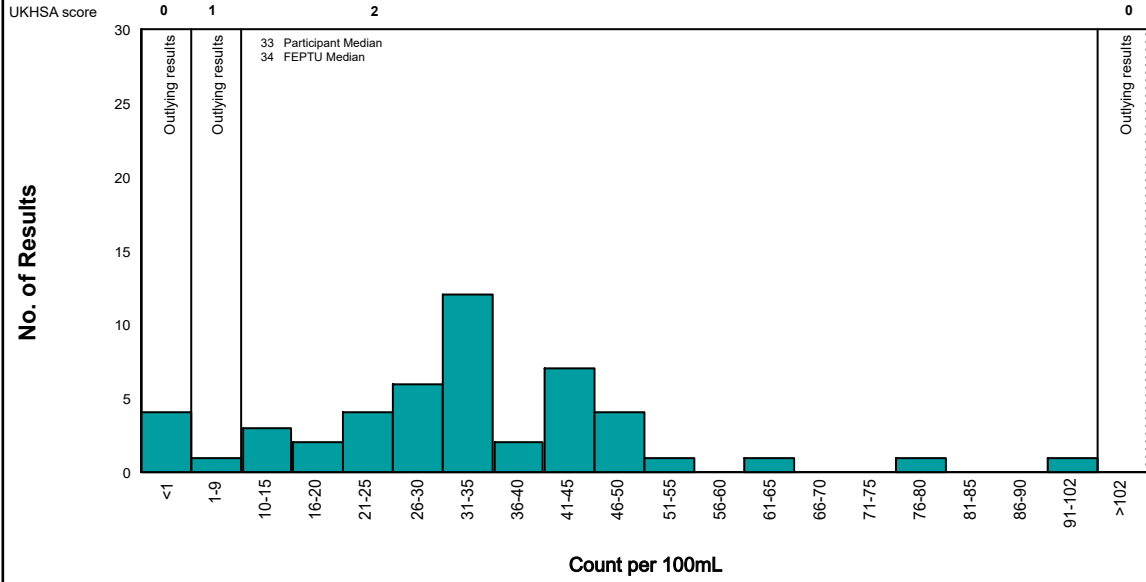
Method based presentation

W218B : *Clostridium perfringens*   FEPTU Method: TSC
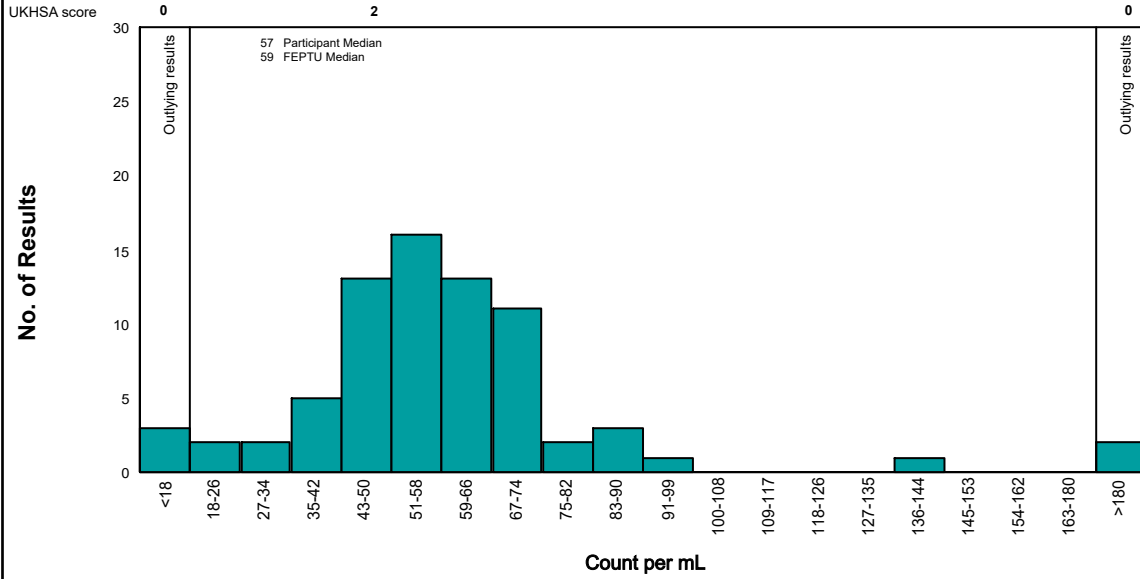
Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust *S** (Log₁₀)	Range Reported	
TSC	39	1	84	33	0.15	0 -	97
MCP	3	1	6				
Other (Membrane filtration)	4	0	8				

TSC (Membrane Filtration)   MCP (Membrane Filtration)   Other (Membrane Filtration)

W218B: Colony Count 37ºC/48 h

No data for graph
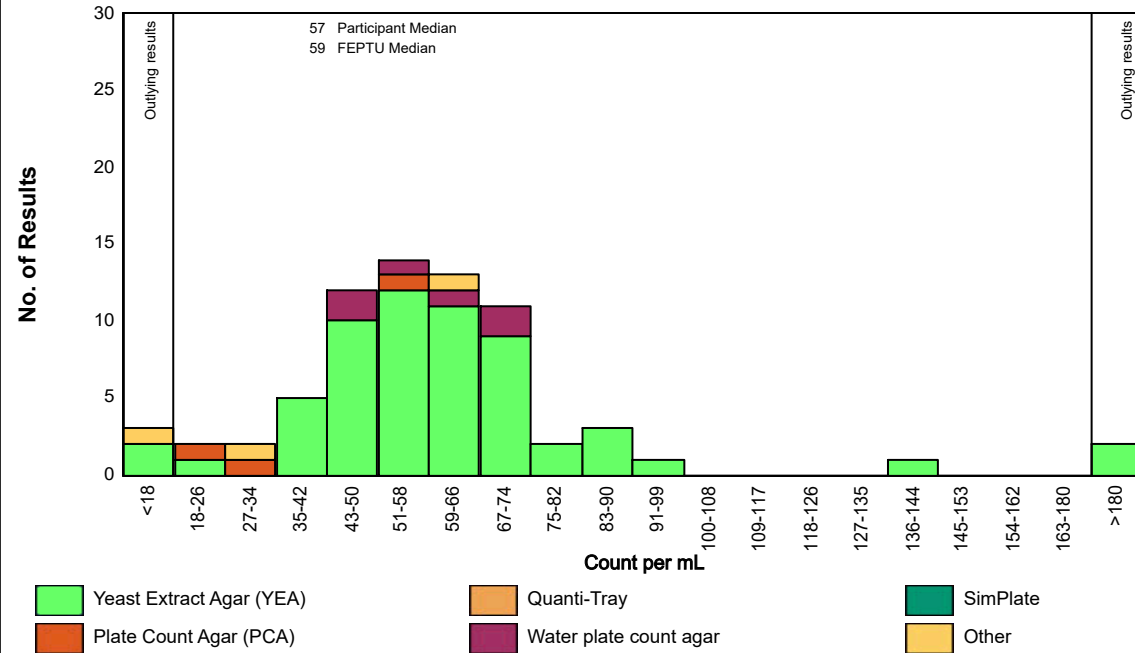
Method based presentation

W218B : Colony Count 37ºC/48 h   FEPTU Method: Yeast Extract Agar
(YEA)

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported		
Yeast Extract Agar (YEA)	56	0	81	3	0.28	0	-	308
Quanti-Tray	0	0	0					
SimPlate	0	0	0					
Plate Count Agar (PCA)	3	0	4					
Water plate count agar	5	1	7					
Other	5	0	7					

W218B: Colony Count 37ºC/48 h

No data for graph

W218B: Colony Count 22ºC/72 h

57 Participant Median
59 FEPTU Median

Method based presentation

W218B : Colony Count 22ºC/72 h   FEPTU Method: Yeast Extract Agar (YEA)

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S^* (Log$_{10}$)	Range Reported		
Yeast Extract Agar (YEA)	59	0	83	58	0.11	0	-	425
Quanti-Tray	0	0	0					
SimPlate	0	0	0					
Plate Count Agar (PCA)	3	0	4					
Water plate count agar	6	0	8					
Other	3	0	4					

W218B: Colony Count 22ºC/72 h

57 Participant Median
59 FEPTU Median

Legend:
- Yeast Extract Agar (YEA)
- Quanti-Tray
- SimPlate
- Plate Count Agar (PCA)
- Water plate count agar
- Other

Performance Assessment Sheet

| Distribution	Sample	Coliform bacteria score	*Escherichia coli* score	Enterococci score	*Pseudomonas aeruginosa* score	*Clostridium perfringens* score	Colony Count 37ºC/48 h score	Colony Count 22ºC/72 h score
W218	W218A							
	W218B							
W217	W217A							
	W217B							
W216	W216A							
	W216B							
W215	W215A							
	W215B							
W214	W214A							
	W214B							
W213	W213A							
	W213B							
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.

Cummulative scores are calculated for the current and previous **five** distributions for the Drinking 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 drinking water proficiency testing samples for the current and last five distributions is collated in the chart to the right.

Overall Performance Assessment for Distributions W218, W217, W216, W215, W214, W213
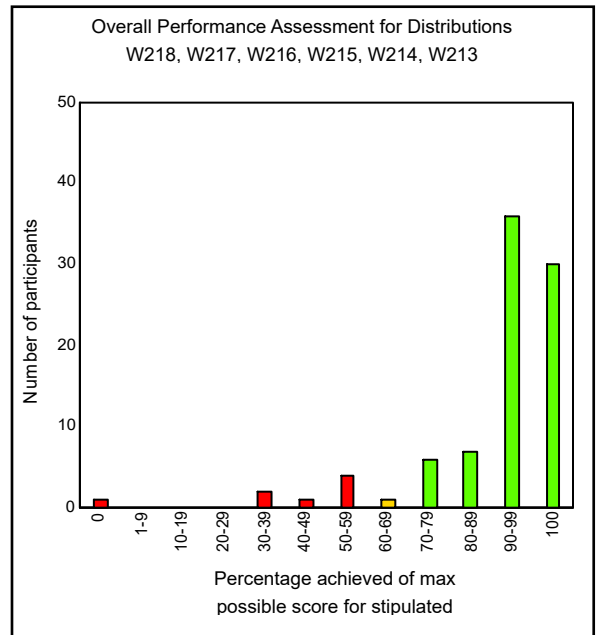
Performance Assessment Comment:
Laboratories that achieve less than 70% of the maximum possible score are likely to be experiencing significant problems with their examinations and are advised to:
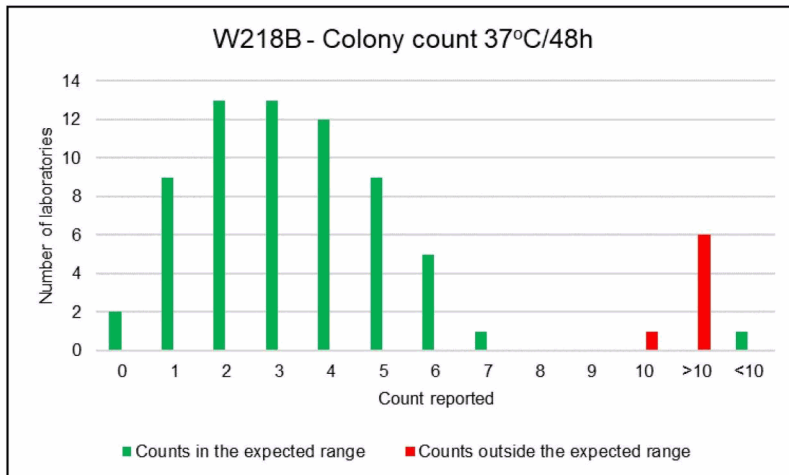a) refer to the relevant distribution reports for sample-specific comments
b) refer to the website guidance documents:

         Scheme Guide - FEPTU and Scoring - FEPTU

c) contact the organisers for advice

Sample specific comment:

Below is the graph of the colony count 37°C/48 hours for W218B which is not shown in the main scheme report.

W218B - Colony count 37°C/48h

General comments:

Method based presentation of results:
Participants are advised if less than 10 laboratories report a result for a method, no data is shown for the Median, Robust *S** and the Range Reported in the 'Method based presentation' tables.

Numbers shown in the 'Excluded Results' column are laboratories that reported a censored value.

Trend analysis:
Plotting your PT results over a period can help to identify potential problems. If you need the latest file, please email us on foodeqa@ukhsa.gov.uk.

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.

New website

We are pleased to announce the launch of our new website: https://www.feptu.org.uk/. Please refer to this website to obtain the latest information for your proficiency testing.

Information of importance

To understand more about the proficiency testing schemes, please use the following links for information on:

1. Report format explained: Annotated report

2. Performance rating: Performance-over-time and Scheme guide (section 16.0)

3. Scoring and statistics used: Scoring information and stats

4. Homogeneity and stability: Scheme guide (section 9.0)

5. Complaints and appeal process: Scheme guide (section 20.0 and 21.0)

For further information about the operation of the service including confidentiality and terms of participation, please refer to the Scheme Guide: Scheme guide

End of report