



Summary of Results

External Quality Assessment of Water Microbiology Recreational and Surface Water Scheme

Distribution Number: S112

Sample Numbers: S112A, S112B

Distribution Date:	June 2023
Results Due:	07 July 2023
Report Date:	14 July 2023
Samples prepared and quality control tested by:	Ellie Castello Divya George Nafeesa Hussain Zak Prior Jake Videlefsky
Data analysed by:	Nita Patel Hiten Pragji
Report compiled by:	Nita Patel Hiten Pragji
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For further information on 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 Recreational and Surface 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 Microbiology of Recreational and Environmental Waters (2000) and the DWI's series of documents: The Microbiology of Drinking Water (2002) - Methods for the Examination of Waters and Associated Materials.

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 for water samples could have serious public health implications.

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 Recreational and Surface Water is accredited by the United Kingdom Accreditation Service (UKAS) to ISO/IEC 17043:2010.



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Sample: S112A

Water sample from river, lake and stream

Contents: *Enterobacter cloacae* (38) (wild strain), *Escherichia coli* (35) (wild strain), *Enterococcus faecalis* (69) (wild strain), *Clostridium perfringens* (24) (wild strain), *Salmonella* Infantis 6,7,14:r:1,5 (1.7x10² per disc) (wild strain)

Expected Results:

All counts are expressed as colony forming units (cfu) per 100mL except the colony count at 37°C/24h which is 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>Escherichia coli</i>	Enterococci	Faecal coliforms	<i>Clostridium perfringens</i>	<i>Salmonella</i> spp.
FEPTU median	73	35	69	35	24	Detected in 1L
No. results returned	86	96	94	43	58	44
Assigned value (Participants median all)	67	33	68	33	42	N/A
Uncertainty of assigned value*	0.02	0.02	0.01	0.03	0.02	N/A
Participants mean (all results)	65	32	68	33	41	N/A
Expected Range	21 - 212	10 - 103	22 - 215	10 - 104	13 - 133	N/A
Standard deviation**	0.13	0.14	0.08	0.16	0.12	N/A
No of outlying counts	0	1	0	1	3	N/A
False positives	N/A	N/A	N/A	N/A	N/A	N/A
False negatives	0	1	0	1	2	1
Your result						
Score for performance assessment						
Z-score						

* $U(X_{pt})$ is based on results transformed to a log₁₀ scale

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

Total sent samples	104
Not examined	3
Non returns	2
Late returns	0

Sample: S112B

Water sample from river, lake and stream

Contents: *Klebsiella pneumoniae* (1.6x10²) (wild strain), *Escherichia coli* (82) (wild strain), *Salmonella* Enteritidis 1,9,12:g,m:- (17 per disc) (wild strain)

Expected Results:

All counts are expressed as colony forming units (cfu) per 100mL except the colony count at 37°C/24h which is cfu per mL.

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

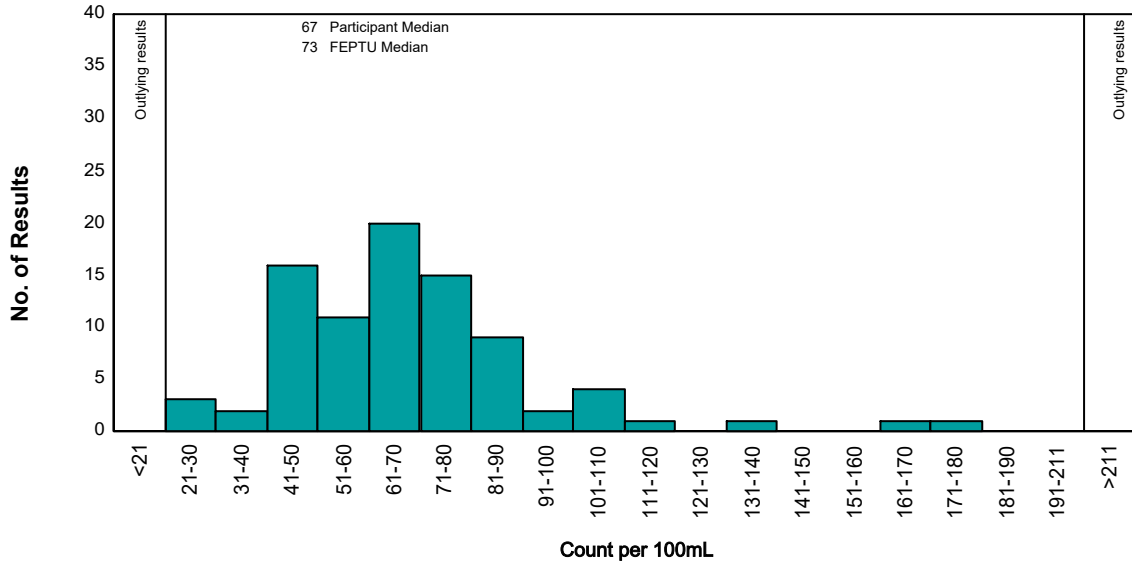
Parameter	Coliform bacteria	<i>Escherichia coli</i>	Enterococci	Faecal coliforms	<i>Clostridium perfringens</i>	<i>Salmonella</i> spp.
FEPTU median	2.29x10 ² (2.36 log ₁₀)	82	0	2.40x10 ² (2.38 log ₁₀)	0	Detected in 1L
No. results returned	86	95	93	42	57	42
Assigned value (Participants median all)	2.85x10 ² (2.45 log ₁₀)	80	0	1.40x10 ² (2.15 log ₁₀)	0	N/A
Uncertainty of assigned value*	0.03	0.02	N/A	0.07	N/A	N/A
Participants mean (all results)	2.71x10 ² (2.43 log ₁₀)	77	0	1.51x10 ² (2.18 log ₁₀)	0	N/A
Expected Range	90 - 9.01x10 ²	25 - 253	N/A	44 - 4.43x10 ²	N/A	N/A
Standard deviation**	0.2	0.16	N/A	0.29	N/A	N/A
No of outlying counts	5	8	N/A	4	N/A	N/A
False positives	N/A	N/A	3	N/A	6	N/A
False negatives	1	2	N/A	2	N/A	2
Your result						
Score for performance assessment						
Z-score						

* $U(X_{pt})$ is based on results transformed to a log₁₀ scale

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

Total sent samples	104
Not examined	5
Non returns	2
Late returns	0

S112A: Coliform bacteria



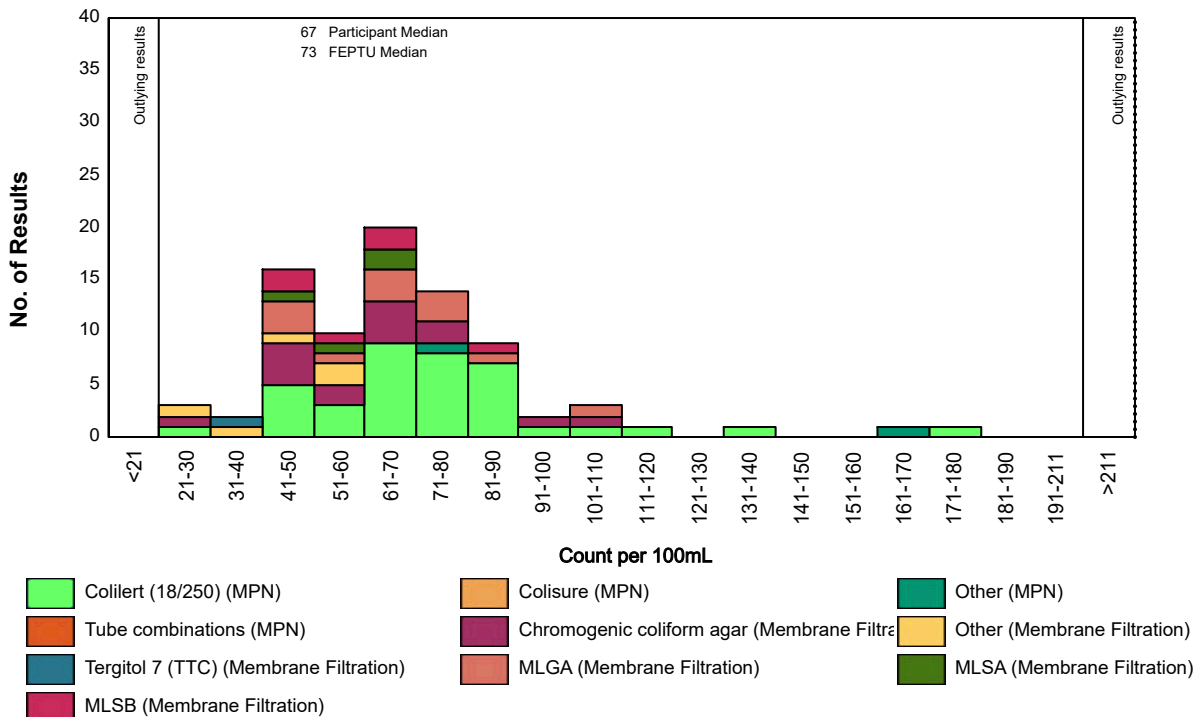
Method based presentation

S112A : Coliform bacteria

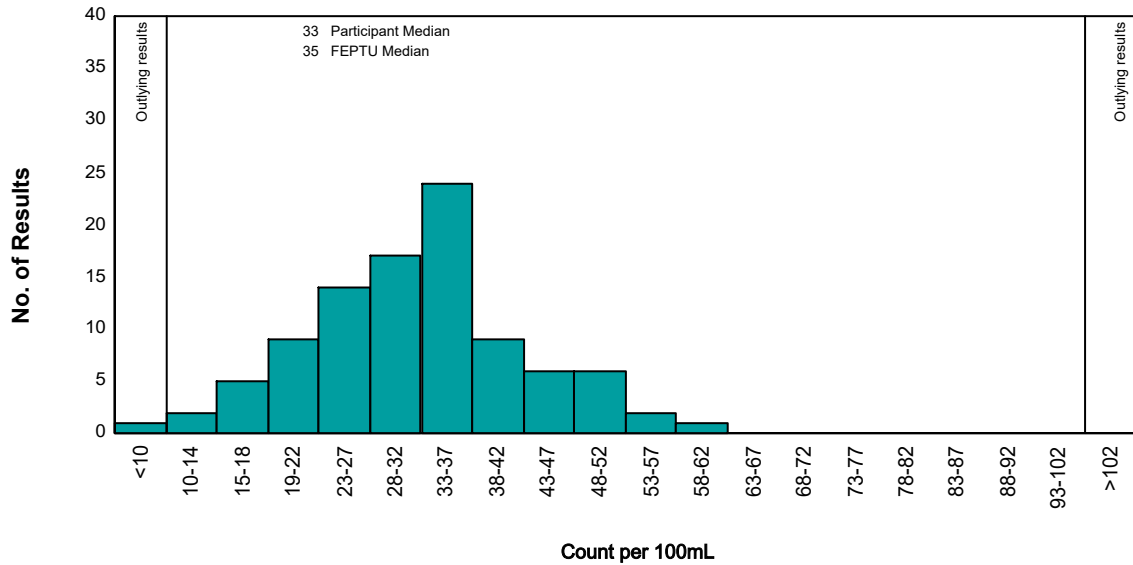
FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Colilert (18/250)	38	0	45	73	0.10	29 - 172
Colisure	0	0	0			-
Other (MPN)	2	0	2			-
Tube combinations	0	0	0			-
Chromogenic coliform agar	15	0	18	61	0.12	30 - 101
Other (Membrane filtration)	5	0	6			-
Tergitol 7 (TTC)	1	0	1			-
MLGA	12	0	14	68	0.11	46 - 101
MLSA	4	0	4			-
MLSB	6	0	7			-

S112A: Coliform bacteria



S112A: *Escherichia coli*



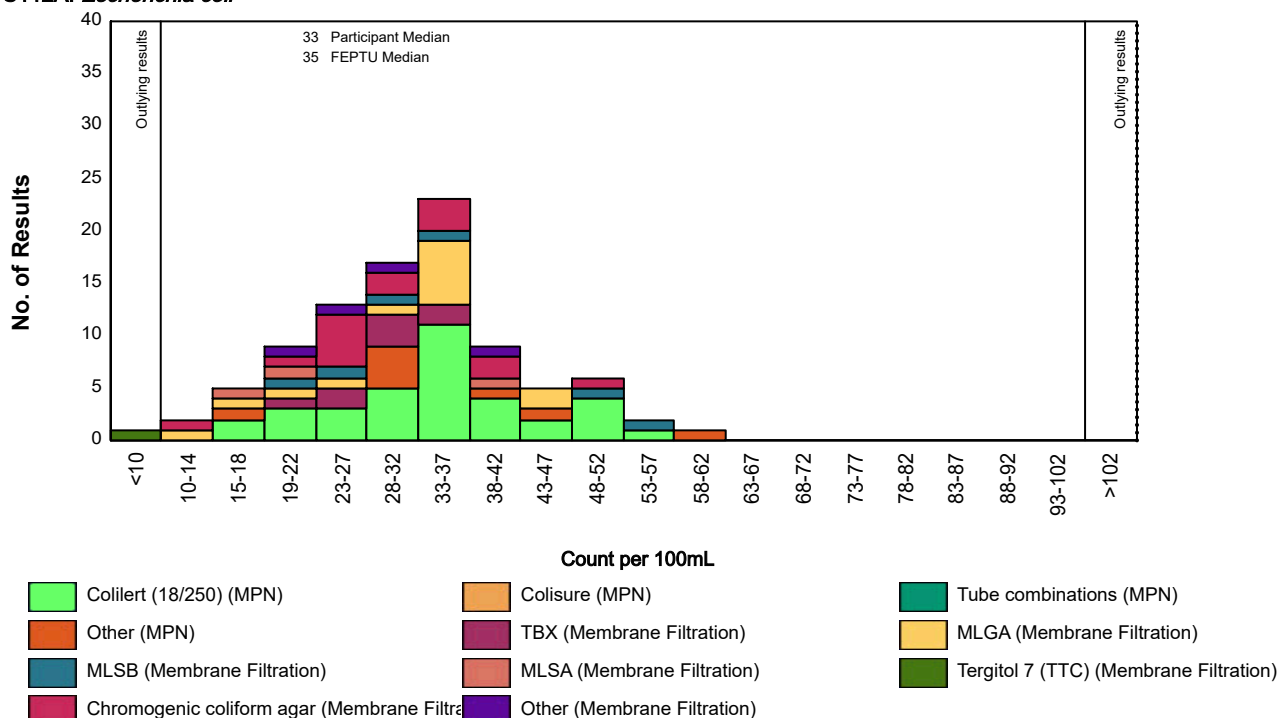
Method based presentation

S112A : *Escherichia coli*

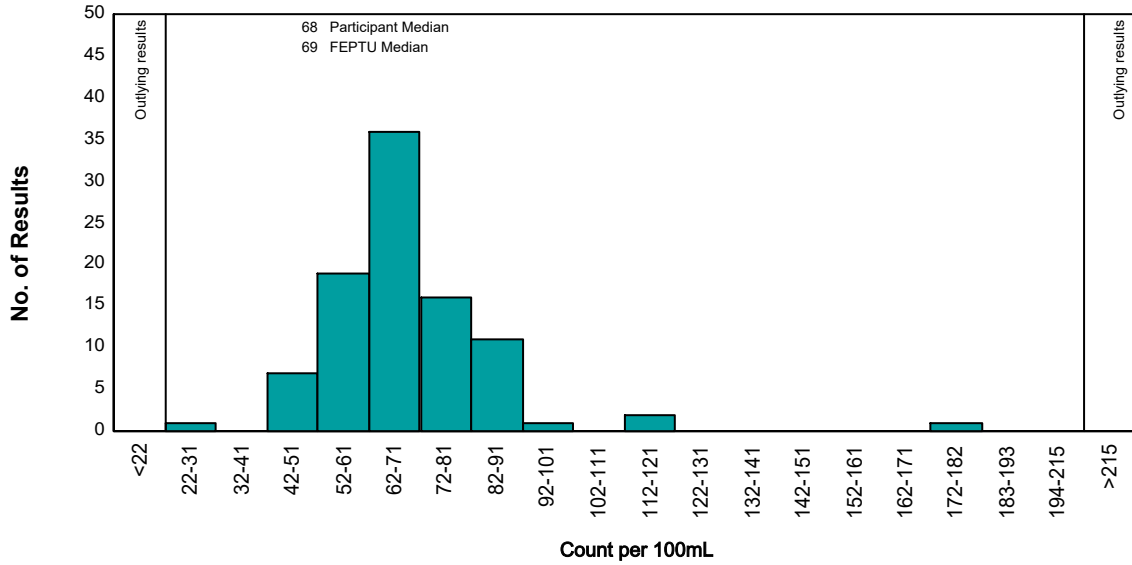
FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Colilert (18/250)	35	0	37	36	0.11	16 - 53
Colisure	0	0	0			-
Tube combinations	0	0	0			-
Other (MPN)	8	0	8			-
TBX	8	0	8			-
MLGA	13	0	13	34	0.07	12 - 47
MLSB	6	0	6			-
MLSA	3	0	3			-
Tergitol 7 (TTC)	1	0	1			-
Chromogenic coliform agar	15	0	16	28	0.12	14 - 50
Other (Membrane filtration)	4	0	4			-

S112A: *Escherichia coli*



S112A: Enterococci



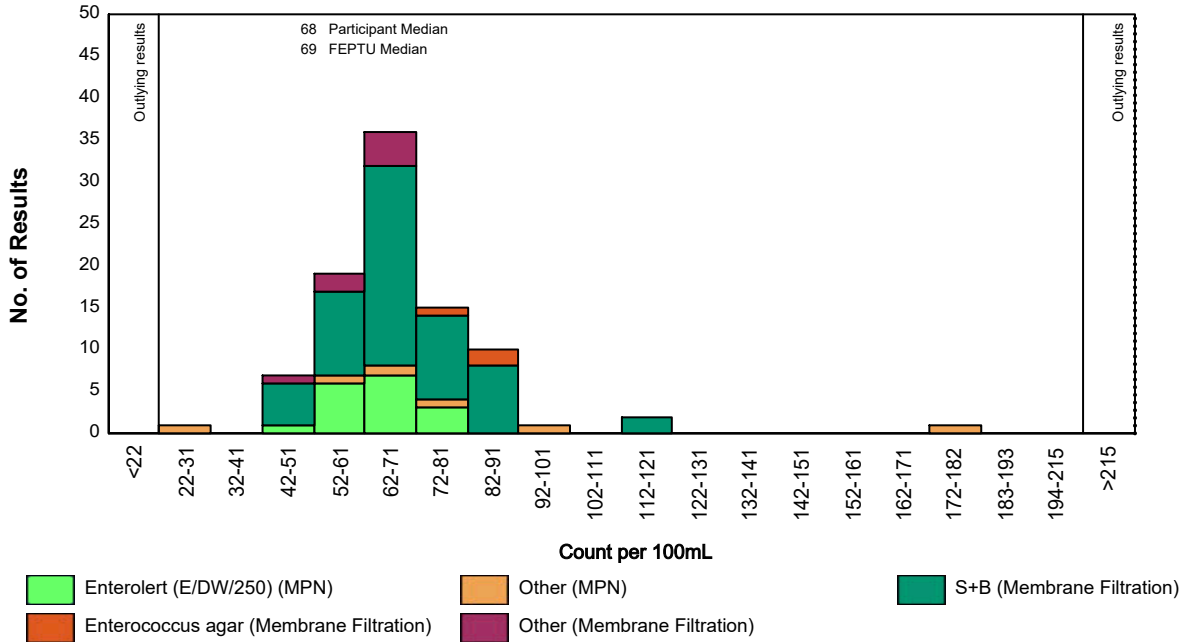
Method based presentation

S112A : Enterococci

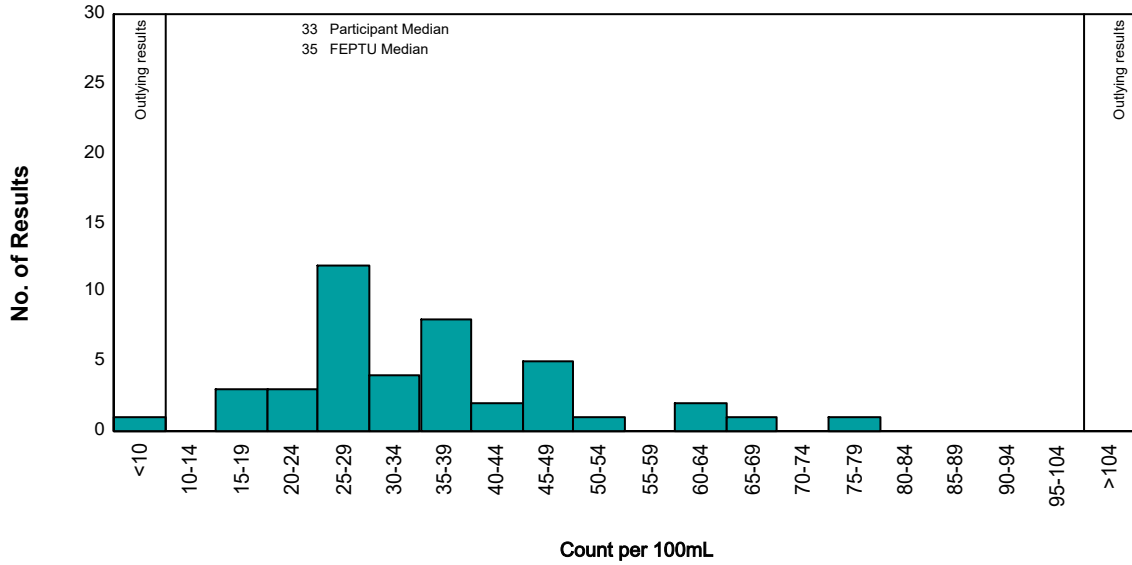
FEPTU Method: S+B

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Enterolert (E/DW/250)	17	0	18	62	0.06	46 - 80
Other (MPN)	6	0	6			-
S+B	59	0	64	68	0.07	46 - 120
Enterococcus agar	3	0	3			-
Other (Membrane filtration)	7	0	7			-

S112A: Enterococci



S112A: Faecal coliforms



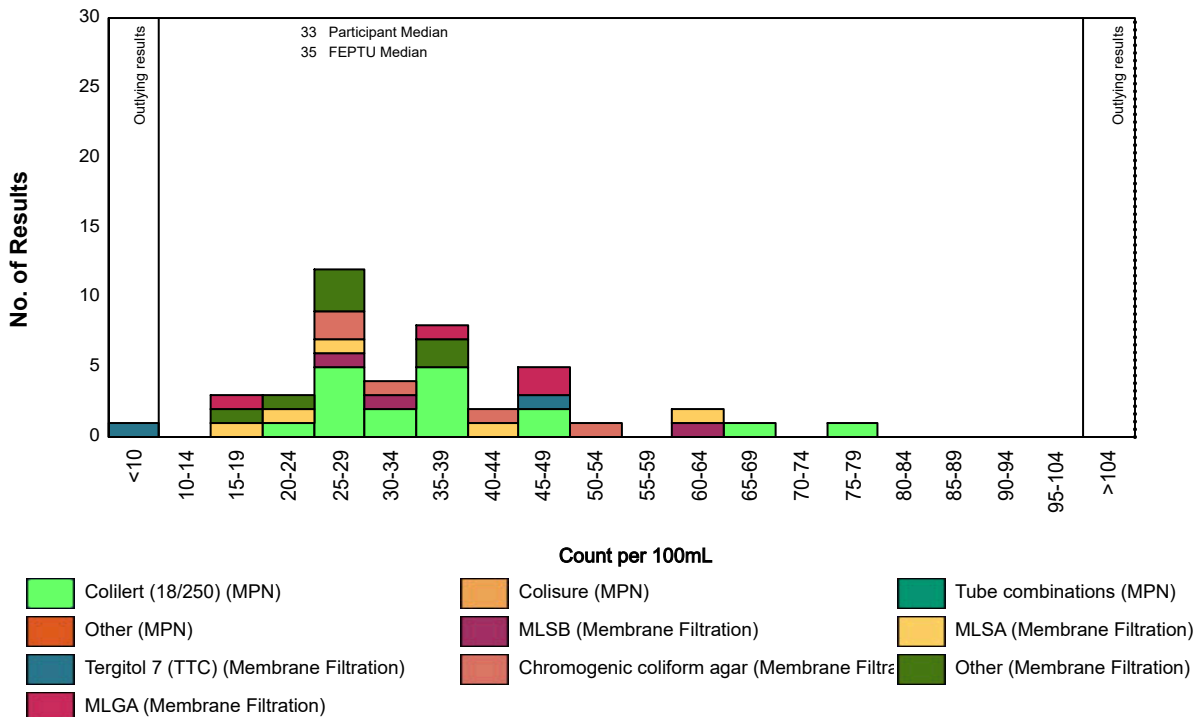
Method based presentation

S112A : Faecal coliforms

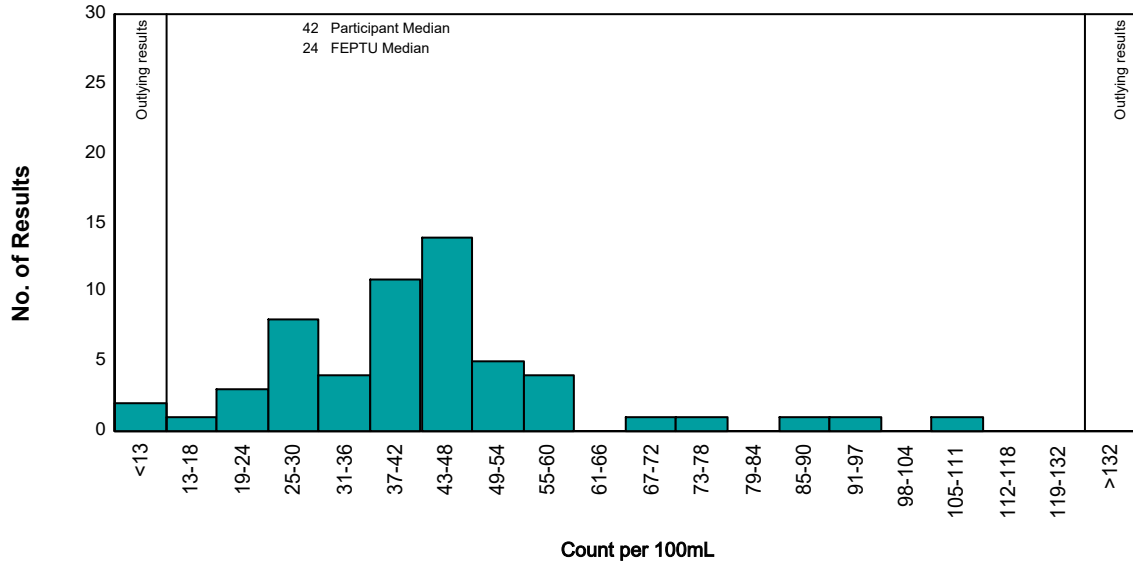
FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Colilert (18/250)	17	0	39	36	0.13	20 - 78
Colisure	0	0	0			-
Tube combinations	0	0	0			-
Other (MPN)	0	0	0			-
MLSB	3	0	6			-
MLSA	5	0	11			-
Tergitol 7 (TTC)	2	0	4			-
Chromogenic coliform agar	5	0	11			-
Other (Membrane filtration)	7	0	16			-
MLGA	4	0	9			-

S112A: Faecal coliforms



S112A: *Clostridium perfringens*



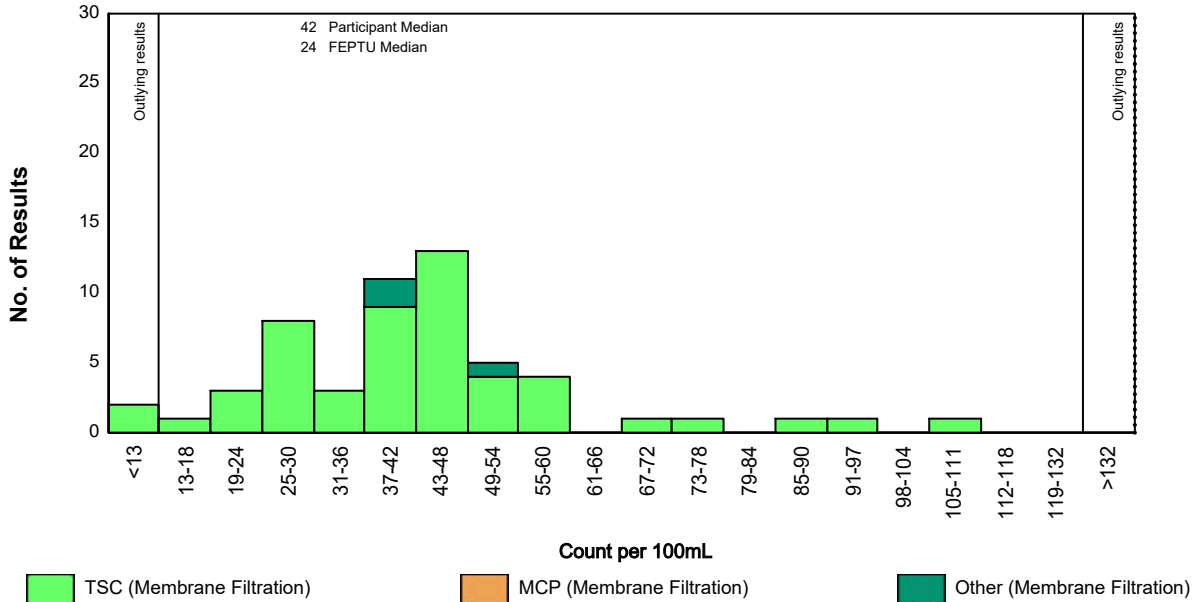
Method based presentation

S112A : *Clostridium perfringens*

FEPTU Method: TSC

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
TSC	52	1	94	43	0.12	0 - 110
MCP	0	0	0			-
Other (Membrane filtration)	3	0	5			-

S112A: *Clostridium perfringens*



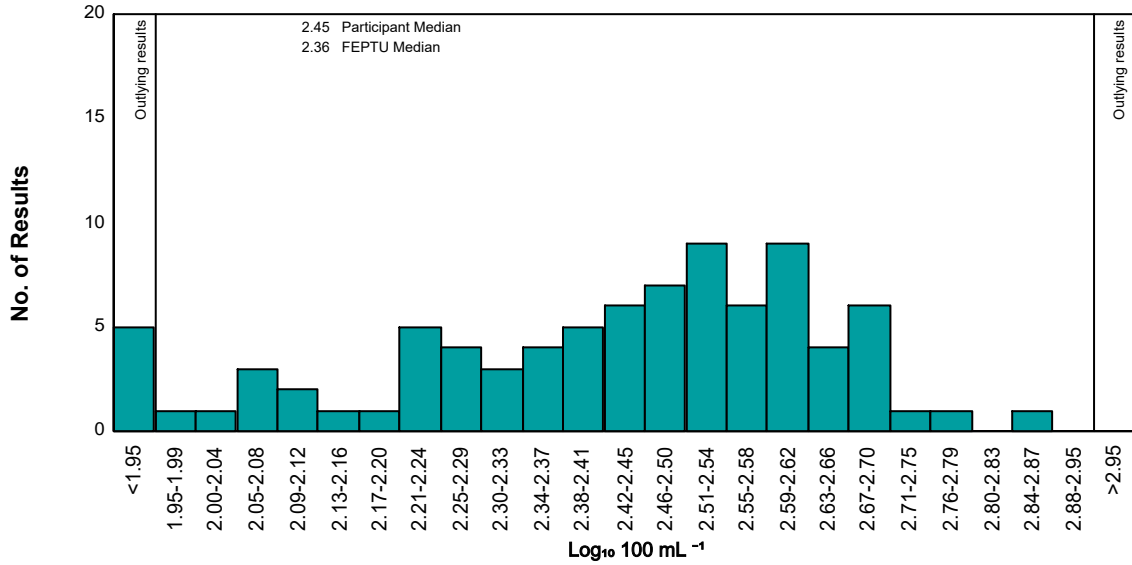
Method based presentation

S112A : *Salmonella* spp.

FEPTU Method: Enrichment XLD

Method	No. Participants Detected	No. Participants Not Detected
VIDAS	0	1
PCR	2	0
Other	1	0
Enrichment XLD	11	0
ISO 19250:2010	25	0
Enrichment BGA	0	0
Other (Membrane filtration)	2	0

S112B: Coliform bacteria



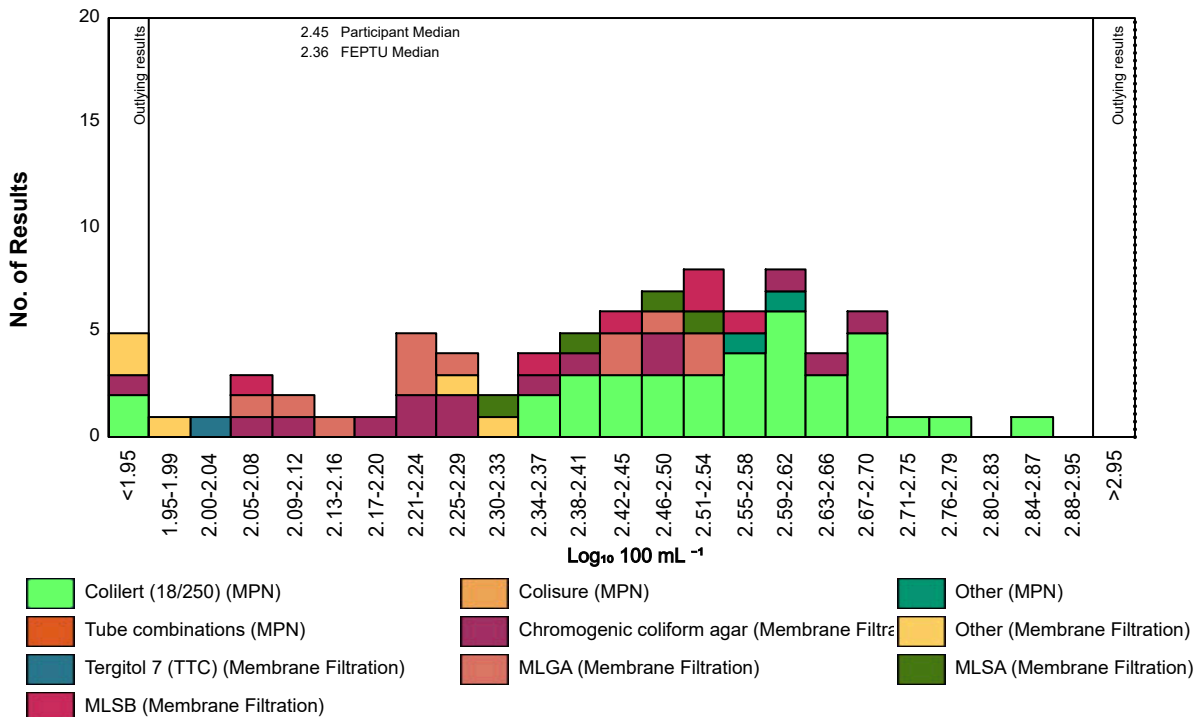
Method based presentation

S112B : Coliform bacteria

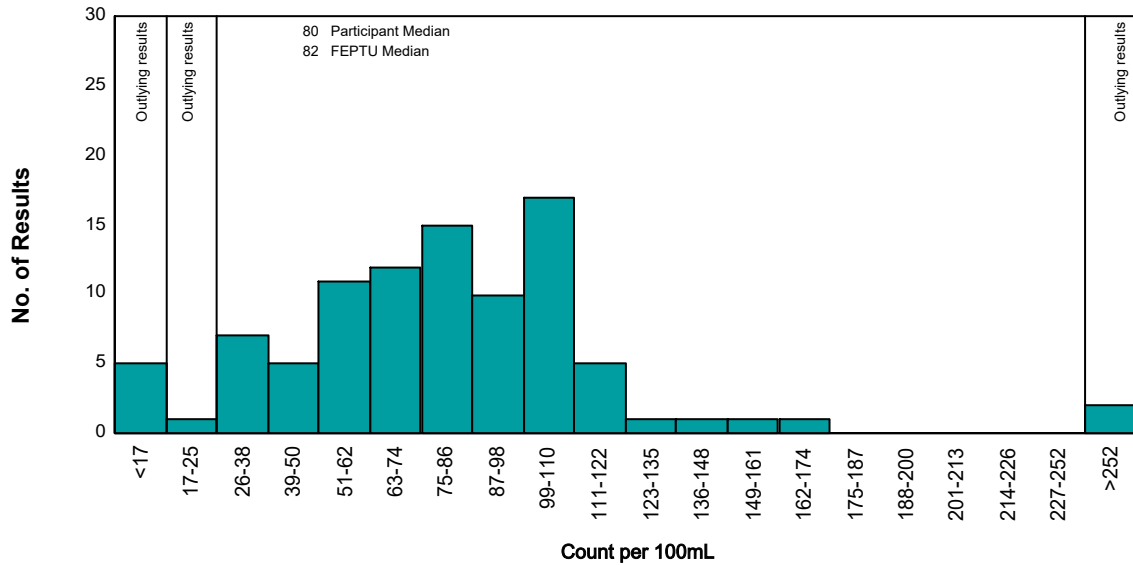
FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Colilert (18/250)	37	1	45	345	0.13	0 - 688
Colisure	0	0	0			-
Other (MPN)	2	0	2			-
Tube combinations	0	0	0			-
Chromogenic coliform agar	15	0	18	180	0.22	76 - 480
Other (Membrane filtration)	5	0	6			-
Tergitol 7 (TTC)	1	0	1			-
MLGA	12	0	14	183	0.19	110 - 330
MLSA	4	0	4			-
MLSB	6	0	7			-

S112B: Coliform bacteria



S112B: *Escherichia coli*



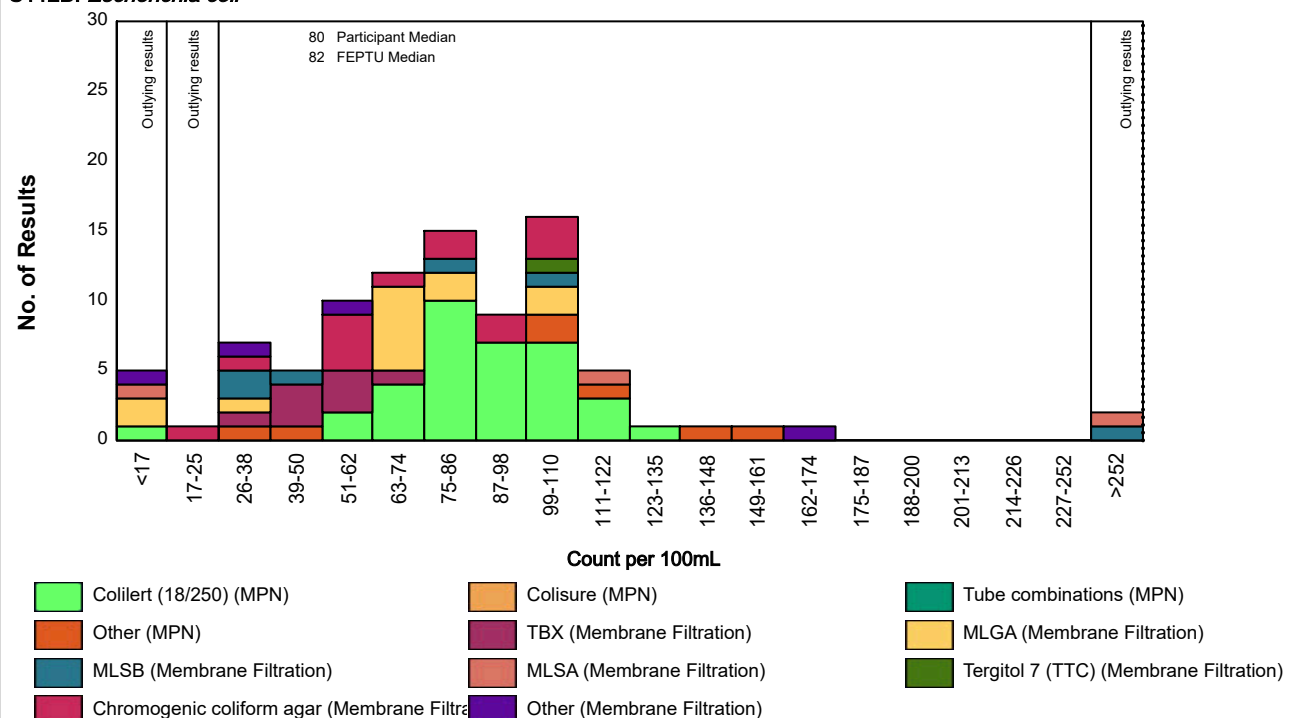
Method based presentation

S112B : *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)	35	1	38	88	0.08	0 - 125
Colisure	0	0	0			-
Tube combinations	0	0	0			-
Other (MPN)	7	0	7			-
TBX	8	0	8			-
MLGA	13	0	14	71	0.09	8 - 109
MLSB	6	0	6			-
MLSA	3	0	3			-
Tergitol 7 (TTC)	1	0	1			-
Chromogenic coliform agar	14	0	15	77	0.16	22 - 110
Other (Membrane filtration)	4	0	4			-

S112B: *Escherichia coli*



S112B: Enterococci

No data for graph

Method based presentation

S112B : Enterococci

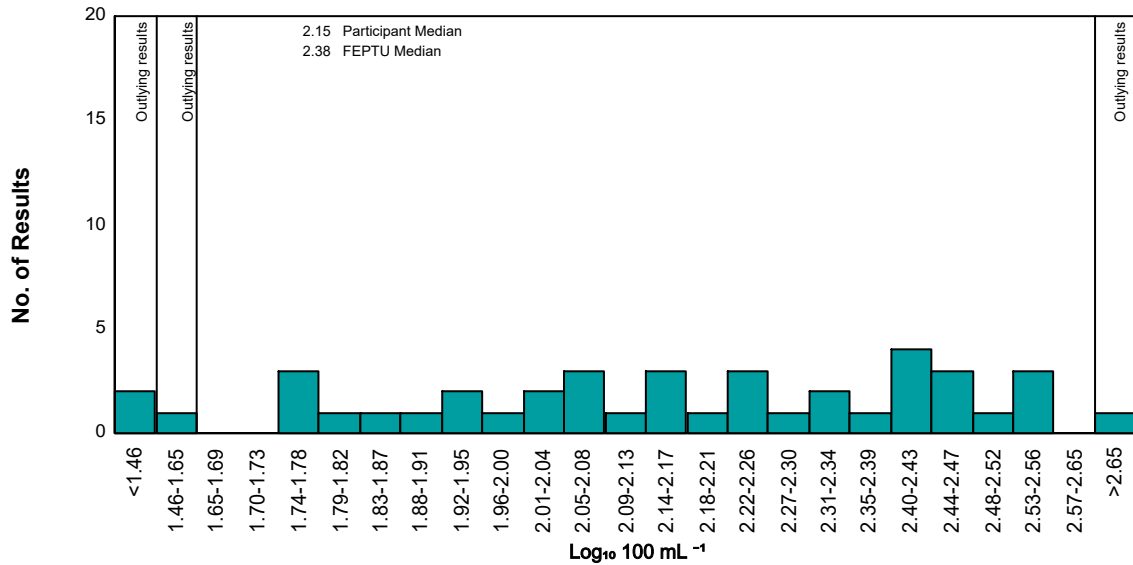
FEPTU Method: S+B

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Enterolert (E/DW/250)	14	3	19	0	0.00	0 - 115
Other (MPN)	1	4	1			-
S+B	51	8	70	0	0.00	0 - 7
Enterococcus agar	2	1	2			-
Other (Membrane filtration)	4	3	5			-

S112B: Enterococci

No data for graph

S112B: Faecal coliforms



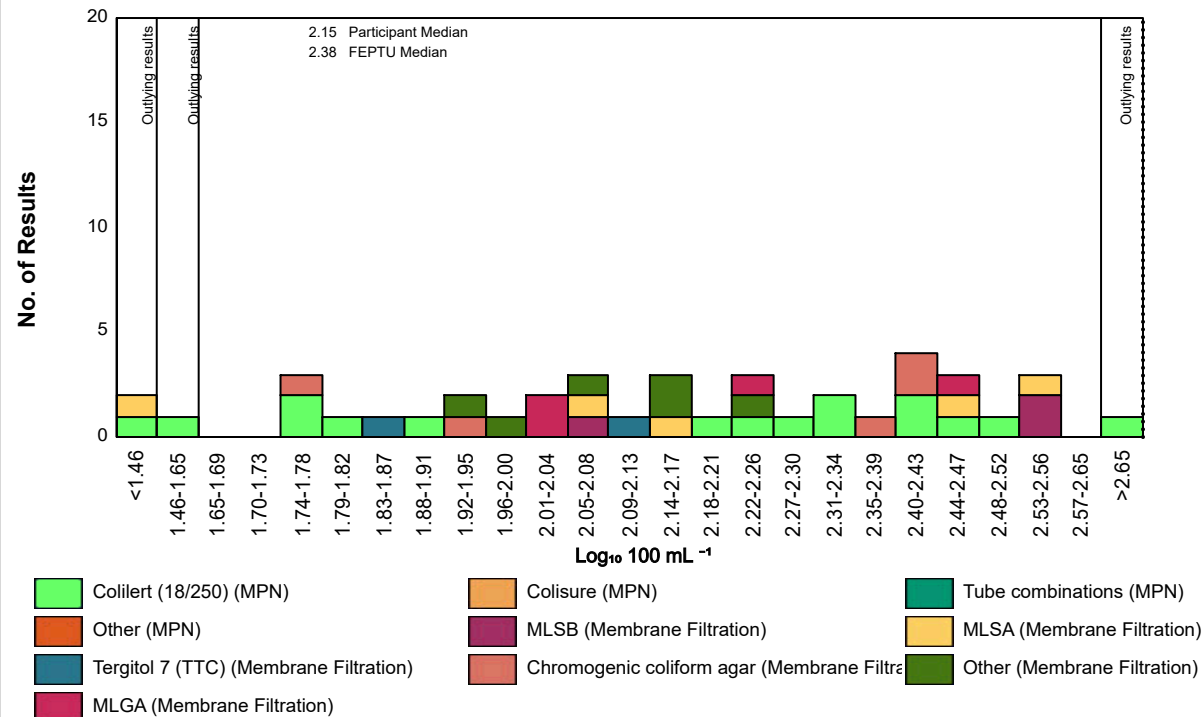
Method based presentation

S112B : Faecal coliforms

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)	16	1	39	184	0.31	0 - 461
Colisure	0	0	0			-
Tube combinations	0	0	0			-
Other (MPN)	0	0	0			-
MLSB	3	0	7			-
MLSA	5	0	12			-
Tergitol 7 (TTC)	2	0	4			-
Chromogenic coliform agar	5	0	12			-
Other (Membrane filtration)	6	0	14			-
MLGA	4	0	9			-

S112B: Faecal coliforms



S112B: *Clostridium perfringens*

No data for graph

Method based presentation

S112B : *Clostridium perfringens*

FEPTU Method: TSC

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
TSC	46	7	93	0	0.00	0 - 120
MCP	0	0	0			-
Other (Membrane filtration)	3	0	6			-

S112B: *Clostridium perfringens*

No data for graph

Method based presentation

S112B : *Salmonella* spp.

FEPTU Method: Enrichment XLD

Method	No. Participants Detected	No. Participants Not Detected
VIDAS	0	1
PCR	2	0
Other	1	0
Enrichment XLD	11	0
ISO 19250:2010	23	1
Enrichment BGA	0	0
Other (Membrane filtration)	1	0

General comments

Method based presentation of enumeration results:

Participants are advised if less than 10 laboratories report a result for a method, no data is shown for the Median, Robust SD and the Range Reported in the 'Method based presentation' tables. Numbers shown in the 'Excluded Results' column are laboratories that reported a censored value.

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.

