



WATERS (BIO)

PROFICIENCY TESTING PROGRAM

ROUND 30

JANUARY 2008

REPORT NO. 564

ACKNOWLEDGMENTS

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1. **FOREWORD**

This report summarises the results of a microbiological proficiency testing program on water.

The program was conducted in September 2007 by Proficiency Testing Australia. The program coordinator was Charlotte Nohra. This is the thirtieth round in a series of on-going water proficiency testing programs.

The aim of the program was to assess laboratories' ability to competently perform the tests examined.

2. **FEATURES OF THE PROGRAM**

- (a) A total of 57 laboratories participated in the program, with all laboratories returning results for inclusion in the final report.

To ensure confidentiality, each laboratory was allocated a random code number. Reference to each laboratory in this report is by its code number. Please note that some laboratories reported more than one set of results and, therefore, one code number (with letter) could appear several times in the same data set.

- (b) One sample of concentrated bacterial mix was supplied to each participant. This was to be re-hydrated according to the instructions supplied (refer Appendix C3), and would be representative of an ambient drinking water sample.

- (c) The re-hydrated sample was to be tested as follows:

E.coli, faecal coliforms, total coliforms, enterococci and 37°C (or 35°C) plate count.

Laboratories were requested to perform the tests according to the "Instructions to Participants" and to record their results on the accompanying "Results Sheet", both of which were distributed to participants with the sample.

Duplicate results were requested for the MF technique and plate count only. Single results were requested for MPN and Colilert.

Copies of the "Instructions to Participants", "Results Sheet" and "Instructions for Re-hydration of Sample" are given in Appendix C of this report.

- (d) The results, as reported by the laboratories, are presented in Appendix A, together with calculated z-scores, summary statistics and graphical presentations of the data.

As is the convention with microbiological count data, the raw results were transformed (\log_{10}) before being analysed statistically.

3. FORMAT OF THE APPENDICES

- (a) Appendix A is divided into sections for *E.coli*, Faecal Coliforms, Total Coliforms, Enterococci and 37°C (or 35°C) Plate Count.

For each section the following information is given:

- (i) A table of the results and the calculated z-scores.

For plate count, all techniques are tabled and analysed together (pooled). For MF technique and plate count, each of these tables contains the results returned by each laboratory, including the transformed log values and the two z-scores calculated for each pair of results.

For MPN and Colilert, each table contains the single result returned by each laboratory, its transformed log value and a single robust z-score.

Outliers are identified in the table by a marker (§) next to the relevant score. Please see reference [1] for details on how these z-scores are calculated;

- (ii) A listing of the (robust) summary statistics;

The list of summary statistics appears at the bottom of the table of results and consists of:

- * the number of results for that test/ technique (*No. of Results*);
- * the median of laboratory's results - i.e. the middle value (*Median*);
- * the normalised interquartile range of the results (*Normalised IQR*) - the interquartile range multiplied by 0.7413;
- * the robust coefficient of variation, expressed as a percentage (*Robust CV*) - i.e. $100 \times \text{Normalised IQR} \div \text{Median}$;
- * the minimum and maximum laboratory results; and
- * the range (*Maximum - Minimum*).

For MF technique and plate count, the statistics are based on the average of result 1 and result 2 for each laboratory. For MPN and Colilert they are derived from each laboratory's single result. The median is a measure of the centre of the data and the Normalised IQR is a measure of the spread of the results.

- (iii) Ordered z-score charts (between-laboratories, within-laboratory and robust z-score).

The first chart in the sub-sections displays the between-laboratories z-scores for results 1 and 2 while the second shows the within-laboratory z-scores. For MPN and Colilert techniques, only a robust z-score chart is given. These charts contain solid lines at +3 and -3, so the outliers are clearly identifiable as those laboratories whose “bar” extends beyond these “cutoff” lines.

- (iv) A Youden diagram of laboratories’ results (expressed as a log value) for result 1 and 2. These are provided for MF technique and plate count only.

Further details of the z-score charts and Youden diagrams are given in reference [1]. Please also refer to this document for a glossary of terms.

- (b) Appendix B contains details of the samples used in the program - including sample source, preparation, and homogeneity and stability testing results.
- (c) Appendix C contains a copy of the “Instructions to Participants”, “Results Sheet”, and “Protocol for Reconstitution of Sample” as supplied to participants.

4. **STATISTICAL DESIGN OF THE PROGRAM**

For this proficiency testing program a uniform level statistical design, as outlined in reference [1], was used. The duplicate results for MF technique and plate count were treated as a uniform pair.

5. **EXTREME RESULTS**

In order to achieve the program’s aim of assessing laboratories’ testing performance, use has been made of a robust z-scores technique. These scores are used to detect excessively large between-laboratories or within-laboratory variations.

For each laboratory, the between-laboratories z-score calculated for result 1 and 2 was based on the (standardised) sum of the results reported and the within-laboratory z-score calculated for result 1 and 2 was based on the (standardised) difference between the results.

A pair of results is classified as an outlier if it has an absolute z-score value greater than three (i.e. $z < -3$ or $z > 3$). Tables listing all of the statistical outliers for this program are provided on the following page. Also included in these tables are the laboratories that reported false results and incomplete results. For further details on the calculation and interpretation of robust z-scores, please see reference [1].

TABLE A – SUMMARY STATISTICS

Test	Technique	No. of Results	Median	Normalised IQR
<i>E.coli</i> orgs/100mL	MF	45	1.699	0.269
	MPN	38	1.690	0.267
	Colilert	21	1.568	0.101
Faecal Coliforms orgs/100mL	MF	48	2.188	0.207
	MPN	38	2.362	0.293
Total Coliforms orgs/100mL	MF	46	2.399	0.116
	MPN	36	2.414	0.145
	Colilert	21	2.497	0.098
Enterococci orgs/100mL	MF	38	2.114	0.104
	MPN	12	2.041	0.277
Plate Count orgs/mL	ALL	52	2.625	0.058

Notes:

- 1) Results were transformed to log₁₀ values before they were analysed.

**TABLE B – SUMMARY OF EXTREME RESULTS
Outlier Results (Between-Laboratories/ Single Robust Z-Score) And False Results**

Code numbers of the laboratories whose results have been identified as extreme for between-laboratories z-scores or single robust z-scores are shown in the table below.

Test	Technique	Between-Laboratories/ Single Robust Z-Score
<i>E.coli</i>	MF	-
	MPN	34
	Colilert	5
Faecal Coliforms	MF	5
	MPN	-
Total Coliforms	MF	5, 32
	MPN	43, 51
	Colilert	5
Enterococci	MF	5, 38
	MPN	-
Plate Count	All	12, 38, 47

**TABLE C – SUMMARY OF EXTREME RESULTS
Outlier Results (Within-Laboratory Z-Score) And Incomplete Results**

Code numbers of the laboratories whose results have been identified as extreme for within-laboratory z-scores are shown in the table below. Also listed are those laboratories which reported incomplete results (i.e. > / < and single results).

Test	Technique	Within-Laboratory Z-Scores	Incomplete results
<i>E.coli</i>	MF	3, 10, 13, 19, 32, 48, 53, 54	14, 16, 18, 33, 34
	MPN		-
	Colilert		-
Faecal Coliforms	MF	19, 33	14, 16, 34
	MPN		-
Total Coliforms	MF	17	14, 16, 18, 34
	MPN		-
	Colilert		-
Enterococci	MF	5, 54	16, 34
	MPN		-
Plate Count	All	10, 22, 31, 38, 47	14, 16, 18, 49

6. PTA & TECHNICAL ADVISER'S COMMENTS

One sample, representative of an ambient drinking water sample was distributed this round. The sample contained three members of the coliform group including *Escherichia coli*, *Klebsiella pneumoniae* and *Enterobacter cloacae*. All three organisms produce acid and gas from lactose at 37°C and would therefore contribute to the Total coliform count. The strain of *K pneumoniae* incorporated in this sample has the ability to grow and produce acid and gas from lactose at 44°C and would therefore contribute to the Faecal coliform count, in addition to the *E coli* present in the sample.

One of the defining characteristics of *E coli* used to differentiate it from other Faecal coliforms is its ability to produce the enzyme β-glucuronidase. This is the basis of the Chromogenic Substrate techniques for coliforms, which incorporate MUG as the substrate. Organisms such as *K pneumoniae* and *E coli* are included in proficiency samples to assess laboratories abilities to differentiate between the three coliform groups using various test methods and principles.

Enterococcus faecalis was incorporated in the sample as a member of the Enterococci group, and other mesophilic organisms, which did not interfere with the coliform or enterococci tests were included in the samples to contribute to the Heterotrophic Plate Count at 35-37°C.

In 2007, amendments to several Australian/New Zealand Water Microbiology Standards were issued and are summarised below:

1. AS/NZS 4276.5:2007: Water Microbiology Method 5: Coliforms – Membrane filtration method. Included the option to employ an alternative selective medium, mEndo agar. Laboratories have the option to choose either mEndo agar, or mLS agar as previously listed.
2. AS/NZS 4276.7:2007: Water Microbiology Method 7: *Escherichia coli* and thermotolerant coliforms – Membrane filtration method. Included the option to employ an alternative selective medium, mFC agar. Laboratories have the option to choose either mFC agar, or mLS agar as previously listed.
3. AS/NZS 4276.9:2007: Water Microbiology Method 9: Enterococci – Membrane filtration method (ISO 7899-2:2000, MOD). This method superseded the previous method for Faecal Streptococci and resulted in a reduction in the number of biochemical tests required to confirm presumptive isolates.

The method for Heterotrophic Plate Count testing remained unchanged.

E. coli - MF Technique

Five laboratories (lab codes 14, 16, 18 and 34) reported single results and lab code 33 reported incomplete results, i.e. a result of <1 for Result 1. As this result constitutes a false-negative, it is important that this result is investigated.

Eight laboratories (lab codes 3, 10, 13, 19, 32, 48, 53 and 54) recorded a within-laboratory outlier. The results reported by lab codes 10, 13, 19 and 53 were lower than expected while lab codes 3, 32, 48 and 54 reported results higher than the expected value.

No laboratories returned a between-laboratories outlier.

E. coli – MPN Technique

Lab code 34 returned a between-laboratories outlier result, which was lower than the expected value.

E. coli – Colilert Technique

Lab code 5 recorded a between-laboratories outlier, the result being lower than the expected value.

Faecal Coliforms – MF Technique

One laboratory (lab code 5) returned a between-laboratory outlier. The result reported was lower than the expected value.

Two laboratories (lab codes 19 and 33) reported within-laboratory outliers. Lab code 33 reported results lower than expected while lab code 19 reported results higher than the expected value.

Three laboratories (lab codes 14, 16 and 34) reported single results.

Faecal Coliforms – MPN Technique

No laboratories returned an outlier result for MPN technique.

Total Coliforms – MF Technique

Two laboratories (lab codes 5 and 32) reported between-laboratory outliers. Both laboratories reported results lower than the expected value.

Lab code 17 reported a within-laboratory outlier, which was higher than the expected value.

Four laboratories (lab codes 14, 16, 18 and 34) reported single results.

Total Coliforms – MPN Technique

Two laboratories (lab code 43 and 51) reported between-laboratory outliers, with the results for both being higher than the expected value.

Total Coliforms – Colilert Technique

Lab code 5 reported an outlier result for Colilert technique. Lab code 5 reported a result lower than the expected value.

Enterococci – MF Technique

Two laboratories (lab code 16 and 34) reported single results.

Two laboratories (lab code 5 and 38) returned a between-laboratories outlier. The results reported by lab code 5 was lower than expected while lab code 38 reported results higher than the expected value.

Two laboratories (lab code 5 and 54) returned a within-laboratory outlier. The results reported by lab code 5 was lower than expected while lab code 54 reported results higher than the expected value.

Enterococci – MPN Technique

No laboratories returned an outlier result for MPN technique.

Plate Count – All Techniques

Three laboratories (lab codes 12, 38 and 47) returned between-laboratories outliers. All three labs returned results lower than the expected value. One lab (lab code 8A and B) submitted two sets of results for plate count technique. For one set of results (8A) spiral technique was used, while spread plate technique was used for the other set (8B).

Five laboratories (lab codes 10, 22, 31, 38 and 47) returned within-laboratory outliers. The results reported by lab codes 31, 38 and 47 were lower than expected while lab codes 10 and 22 reported results higher than the expected value.

Four laboratories (lab codes 14, 16, 18 and 49) reported single results.

General Comments

Excluding within-laboratory outliers, a total of 8 laboratories (14% of participants) returned one or more outliers for this round. This is an improvement over the results reported in round 28 of this program when an ambient sample was last used, where 20% of the participants returned one or more outliers.

A total of 395 results were submitted for analysis in this round of the program. Of these results, 13 (3.3%) were outlier results (excluding within-laboratory outliers). This is an improvement compared to 4.9% of results, which were outlier results in round 28.

Of the laboratories that reported outliers (excluding within-laboratory outliers) 6 reported one outlier, one laboratory (lab code 38) reported 2 outliers and one laboratory (lab code 5) reported 5 outliers.

In total 6 laboratories reported incomplete results. These consisted either of single results where duplicates were requested or open ended results. It is requested for future rounds that laboratories provide duplicate results where requested and MPN determinations include a range of dilutions appropriate to the described sample type.

Outlying results, either between laboratories or within a laboratory, are indicative of a problem but are not diagnostic, so further information is usually required to determine the origin of a poor result. As a first step it is advisable to re-examine the records for the run in question. The following potential problems should be examined:

- *Systematic or sporadic mistakes in calculations (are the units correct);*
- *Incorrect volumes used;*
- *Out-of-control indications from your routine Internal Quality Control;*
- *Unusually high blanks;*
- *Poor recoveries, etc.*

If these actions yield no insight, then further measurements such as carrying out a re-test of the proficiency sample may be required. If the poor result persists, a more extensive investigation is called for. Consideration should also be made on performance in previous rounds and whether there may be trends becoming apparent.

7. REFERENCE

- [1] Guide to Proficiency Testing Australia (2006).

APPENDIX A

Tables of Results & Z-Scores

Summary Statistics

and

Graphical Displays

SECTIONS A1 to A3

E. coli

A1.1

***E. coli* (orgs/100mL) – MF Technique**

Lab Code	Result 1	Result 2	Log ₁₀ Result 1	Log ₁₀ Result 2	Average	Between Labs Z-Score	Within Lab Z-Score
1	23	22	1.36	1.34	1.35	-1.29	0.30
2	100	120	2.00	2.08	2.04	1.26	-1.23
3	60	20	1.78	1.30	1.54	-0.59	7.39 §
4	52	50	1.72	1.70	1.71	0.03	0.26
5	22	24	1.34	1.38	1.36	-1.25	-0.58
6	38	52	1.58	1.72	1.65	-0.19	-2.11
7	42	45	1.62	1.65	1.64	-0.23	-0.46
8A	50	50	1.70	1.70	1.70	0.00	0.00
8B	50	50	1.70	1.70	1.70	0.00	0.00
10	70	150	1.85	2.18	2.01	1.16	-5.12 §
13	10	20	1.00	1.30	1.15	-2.04	-4.66 §
14	140		2.15			#	#
15	55	42	1.74	1.62	1.68	-0.06	1.81
16	17		1.23			#	#
17	9	10	0.95	1.00	0.98	-2.68	-0.71
18	40		1.60			#	#
19	60	110	1.78	2.04	1.91	0.78	-4.07 §
20	110	120	2.04	2.08	2.06	1.34	-0.58
21	34	35	1.53	1.54	1.54	-0.60	-0.19
22	50	76	1.70	1.88	1.79	0.34	-2.81
23	220	240	2.34	2.38	2.36	2.46	-0.58
24	19	20	1.28	1.30	1.29	-1.52	-0.34
26	77	77	1.89	1.89	1.89	0.70	0.00
27	30	30	1.48	1.48	1.48	-0.82	0.00
28	100	70	2.00	1.85	1.92	0.83	2.40
29	38	46	1.58	1.66	1.62	-0.29	-1.28
30	46	51	1.66	1.71	1.69	-0.05	-0.69
31	90	110	1.95	2.04	2.00	1.11	-1.35
32	100	60	2.00	1.78	1.89	0.71	3.43 §
33	<1	33		1.52		#	#
34	14		1.15			#	#
35	50	60	1.70	1.78	1.74	0.15	-1.23
36	50	52	1.70	1.72	1.71	0.03	-0.26
38	140	130	2.15	2.11	2.13	1.60	0.50
40	50	60	1.70	1.78	1.74	0.15	-1.23
41	80	60	1.90	1.78	1.84	0.53	1.93
42	72	72	1.86	1.86	1.86	0.59	0.00
43	50	50	1.70	1.70	1.70	0.00	0.00
44	38	25	1.58	1.40	1.49	-0.78	2.81
45	30	30	1.48	1.48	1.48	-0.82	0.00
46	110	100	2.04	2.00	2.02	1.19	0.64
47	50	40	1.70	1.60	1.65	-0.18	1.50
48	50	30	1.70	1.48	1.59	-0.41	3.43 §
50	50	42	1.70	1.62	1.66	-0.14	1.17
51	80	80	1.90	1.90	1.90	0.76	0.00

A1.2

E. coli (orgs/100mL) – MF Technique

Lab Code	Result 1	Result 2	Log ₁₀ Result 1	Log ₁₀ Result 2	Average	Between Labs Z-Score	Within Lab Z-Score
53	20	40	1.30	1.60	1.45	-0.92	-4.66 §
54	150	70	2.18	1.85	2.01	1.16	5.12 §
55	110	80	2.04	1.90	1.97	1.01	2.14
56	48	50	1.68	1.70	1.69	-0.03	-0.27
57	34	34	1.53	1.53	1.53	-0.62	0.00

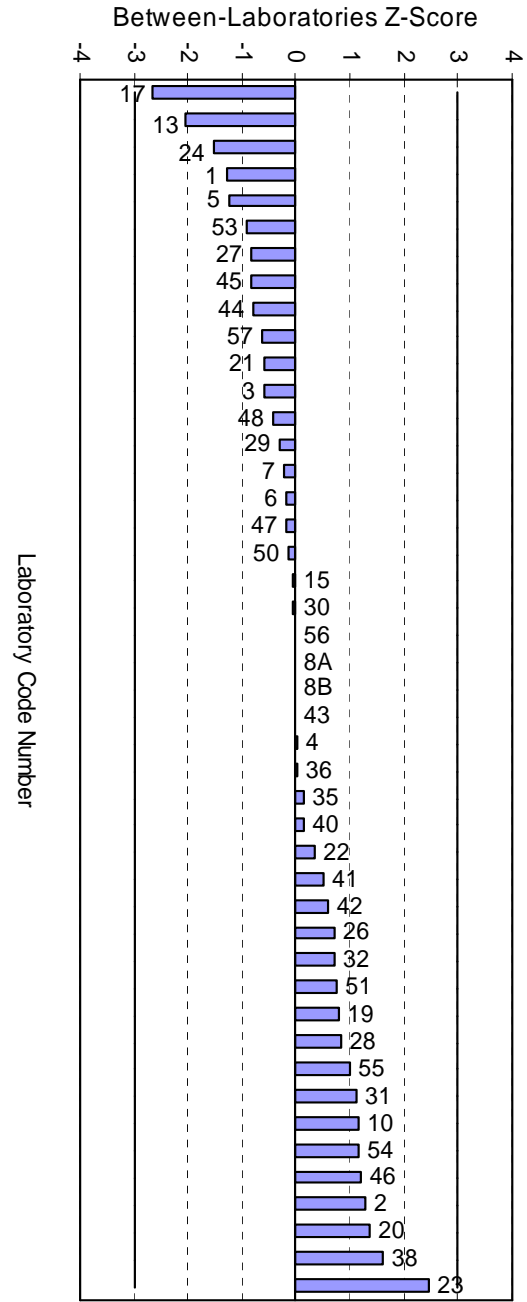
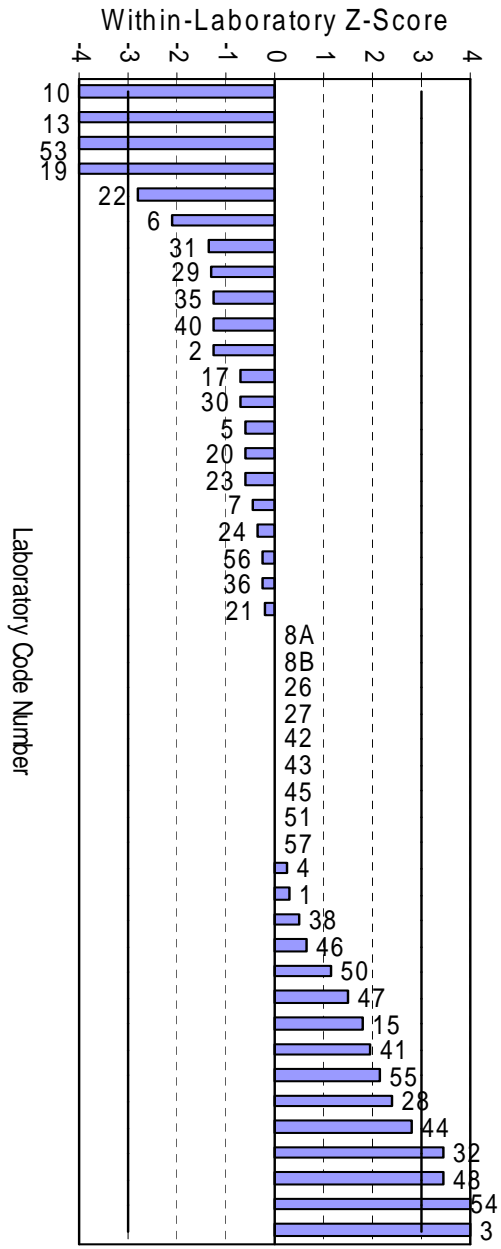
Summary Statistics

No of Results	45
Median	1.699
Norm IQR	0.269
Robust CV	15.9%
Minimum	0.977
Maximum	2.361
Range	1.384

Notes:

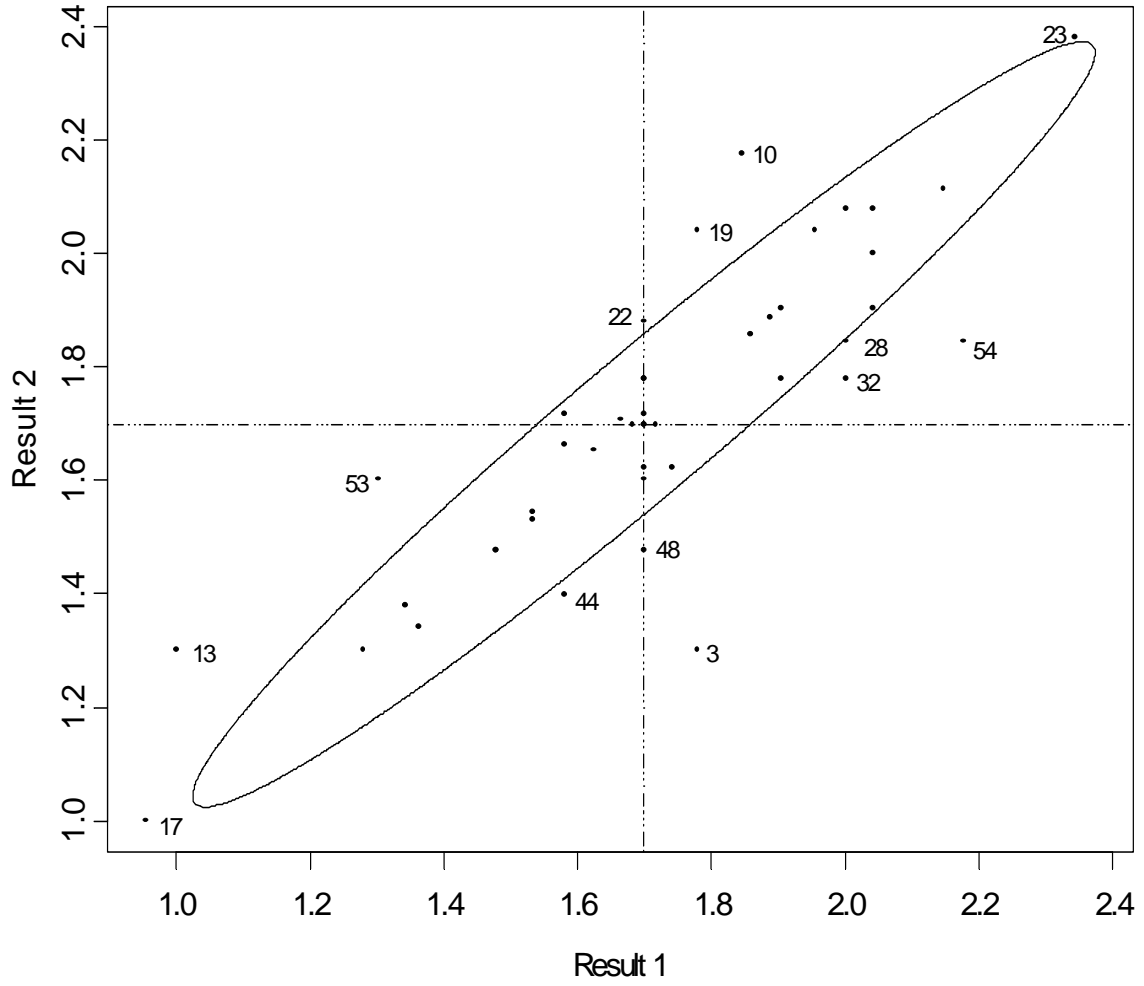
1. § denotes an outlier (i.e. |z-score| > 3).
2. # denotes incomplete results (i.e. > / < and single results).

A1.3
***E. coli* (orgs/100mL) – MF Technique**



A1.4

E.coli log (orgs/100mL) - MF Technique



A2.1

***E. coli* (orgs/100mL) – MPN Technique**

Lab Code	Result	Log ₁₀ Result	Robust Z-Score
2	130	2.11	1.59
4	50	1.70	0.03
5	13	1.11	-2.16
6	56	1.75	0.22
7	35	1.54	-0.55
8A	49	1.69	0.00
8B	49	1.69	0.00
11	130	2.11	1.59
12	50	1.70	0.03
13	20	1.30	-1.46
15	43	1.63	-0.21
17	13	1.11	-2.16
19	17	1.23	-1.72
20	13	1.11	-2.16
21	54	1.73	0.16
22	92	1.96	1.03
23	49	1.69	0.00
24	49	1.69	0.00
26	23	1.36	-1.23
27	23	1.36	-1.23
29	79	1.90	0.78
30	33	1.52	-0.64
34	7	0.85	-3.17 §
35	79	1.90	0.78
36	49	1.69	0.00
37	49	1.69	0.00
38	79	1.90	0.78
41	79	1.90	0.78
42	130	2.11	1.59
43	49	1.69	0.00
47	49	1.69	0.00
48	110	2.04	1.32
50	70	1.85	0.58
51	110	2.04	1.32
53	40	1.60	-0.33
54	49	1.69	0.00
55	26	1.41	-1.03
56	46	1.66	-0.10

A2.2

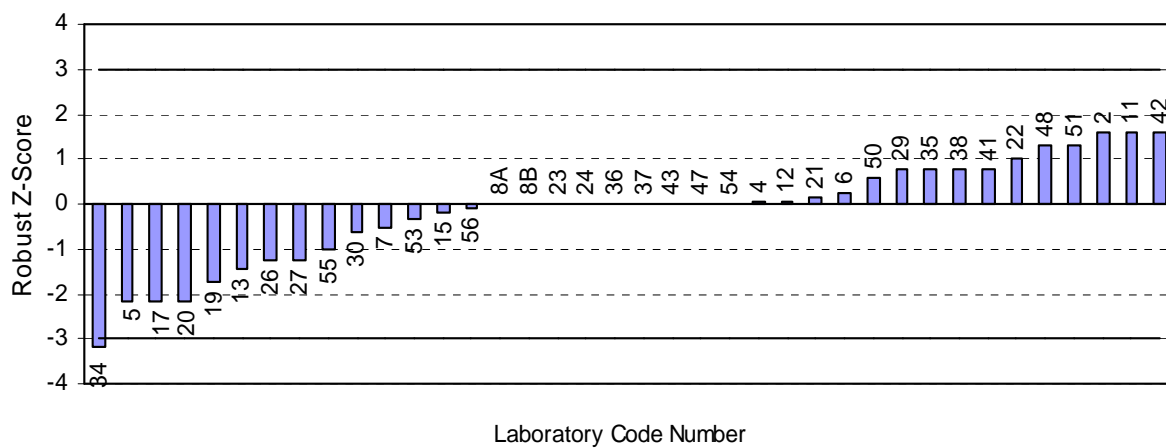
Summary Statistics

No of Results	38
Median	1.690
Norm IQR	0.267
Robust CV	15.8%
Minimum	0.85
Maximum	2.11
Range	1.27

Notes:

1. § denotes an outlier (i.e. |z-score| > 3).
2. # denotes an incomplete result (i.e. a > / < result).

E. coli (orgs/100mL) – MPN Technique



A3.1

E. coli (orgs/100mL) – Collert Technique

Lab Code	Result	Log ₁₀ Result	Robust Z-Score
4	47	1.67	1.02
5	7	0.85	-7.12 §
7	47	1.67	1.02
9	44	1.64	0.74
15	41	1.61	0.44
24	20	1.30	-2.63
25A	34	1.53	-0.36
25B	36	1.56	-0.12
26	34	1.53	-0.36
27	37	1.57	0.00
28	47	1.67	1.02
29	26	1.41	-1.51
30	46	1.66	0.93
32	46.6	1.67	0.99
39	33.6	1.53	-0.41
43	48	1.68	1.11
45	36	1.56	-0.12
49	44	1.64	0.74
51	48	1.68	1.11
52	33	1.52	-0.49
57	36	1.56	-0.12

Summary Statistics

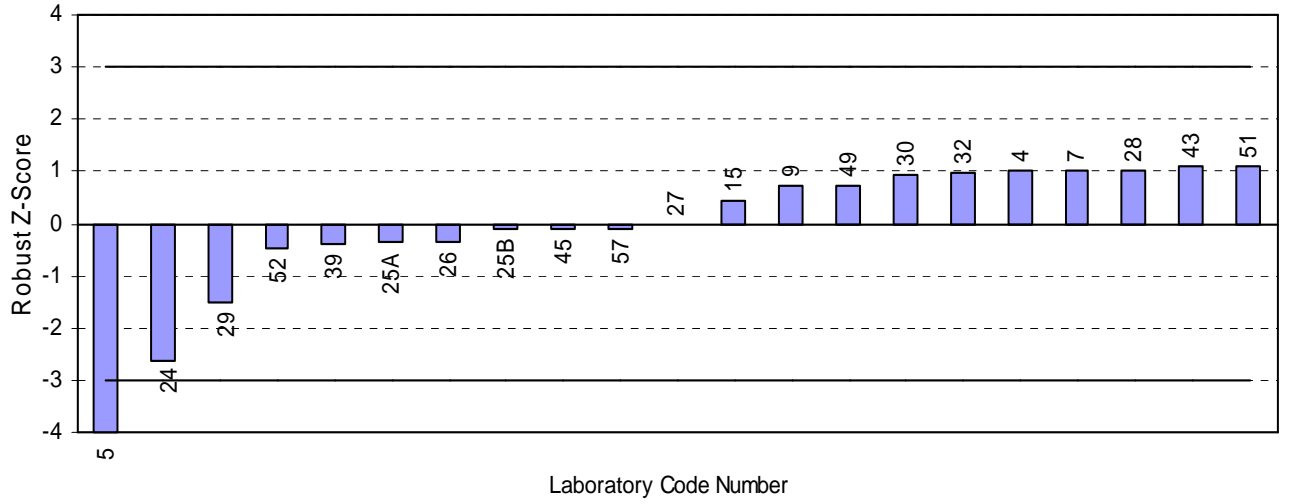
No of Results	21
Median	1.568
Norm IQR	0.101
Robust CV	6.5%
Minimum	0.85
Maximum	1.68
Range	0.84

Notes:

1. § denotes an outlier (i.e. |z-score| > 3).
2. # denotes incomplete results (i.e. > / < and single results).

A3.2

E. coli (orgs/100mL) – Colilert Technique



SECTIONS A4 to A5

Faecal Coliforms

A4.1

Faecal Coliforms (orgs/100mL) – MF Technique

Lab Code	Result 1	Result 2	Log ₁₀ Result 1	Log ₁₀ Result 2	Average	Between Labs Z-Score	Within Lab Z-Score
1	52	56	1.72	1.75	1.73	-2.20	0.45
2	150	170	2.18	2.23	2.20	0.07	0.76
3	208	250	2.32	2.40	2.36	0.82	1.12
4	130	140	2.11	2.15	2.13	-0.28	0.45
5	29	32	1.46	1.51	1.48	-3.40 §	0.60
6	95	130	1.98	2.11	2.05	-0.69	1.91
7	120	110	2.08	2.04	2.06	-0.62	-0.53
8A	140	110	2.15	2.04	2.09	-0.45	-1.47
8B	140	110	2.15	2.04	2.09	-0.45	-1.47
10	170	250	2.23	2.40	2.31	0.61	2.35
13	50	80	1.70	1.90	1.80	-1.87	2.87
14	250		2.40			#	#
15	220	170	2.34	2.23	2.29	0.48	-1.57
16	71		1.85			#	#
17	94	84	1.97	1.92	1.95	-1.16	-0.69
19	120	210	2.08	2.32	2.20	0.06	3.41 §
20	140	140	2.15	2.15	2.15	-0.20	0.00
22	250	380	2.40	2.58	2.49	1.45	2.55
23	220	240	2.34	2.38	2.36	0.84	0.53
24	160	160	2.20	2.20	2.20	0.08	0.00
25A	92	84	1.96	1.92	1.94	-1.18	-0.55
25B	92	84	1.96	1.92	1.94	-1.18	-0.55
26	92	97	1.96	1.99	1.98	-1.03	0.32
27	190	170	2.28	2.23	2.25	0.32	-0.68
28	100	70	2.00	1.85	1.92	-1.28	-2.18
29	120	140	2.08	2.15	2.11	-0.36	0.94
30	150	170	2.18	2.23	2.20	0.07	0.76
31	90	110	1.95	2.04	2.00	-0.92	1.22
32	300	200	2.48	2.30	2.39	0.97	-2.47
33	220	130	2.34	2.11	2.23	0.19	-3.21 §
34	60		1.78			#	#
35	280	310	2.45	2.49	2.47	1.36	0.62
36	156	172	2.19	2.24	2.21	0.13	0.60
38	240	220	2.38	2.34	2.36	0.84	-0.53
40	142	165	2.15	2.22	2.18	-0.01	0.92
41	210	220	2.32	2.34	2.33	0.70	0.28
42	120	120	2.08	2.08	2.08	-0.53	0.00
43	160	150	2.20	2.18	2.19	0.01	-0.39
44	96	80	1.98	1.90	1.94	-1.18	-1.11
45	114	112	2.06	2.05	2.05	-0.65	-0.11
46	240	220	2.38	2.34	2.36	0.84	-0.53
47	190	230	2.28	2.36	2.32	0.64	1.17
48	190	180	2.28	2.26	2.27	0.38	-0.33
50	157	151	2.20	2.18	2.19	0.00	-0.24
51	180	180	2.26	2.26	2.26	0.33	0.00

A4.2

Faecal Coliforms (orgs/100mL) – MF Technique

Lab Code	Result 1	Result 2	Log ₁₀ Result 1	Log ₁₀ Result 2	Average	Between Labs Z-Score	Within Lab Z-Score
52	90	100	1.95	2.00	1.98	-1.02	0.64
53	170	140	2.23	2.15	2.19	0.00	-1.18
54	210	150	2.32	2.18	2.25	0.30	-2.05
55	320	210	2.51	2.32	2.41	1.09	-2.57
56	72	84	1.86	1.92	1.89	-1.44	0.94
57	82	88	1.91	1.94	1.93	-1.25	0.43

Summary Statistics

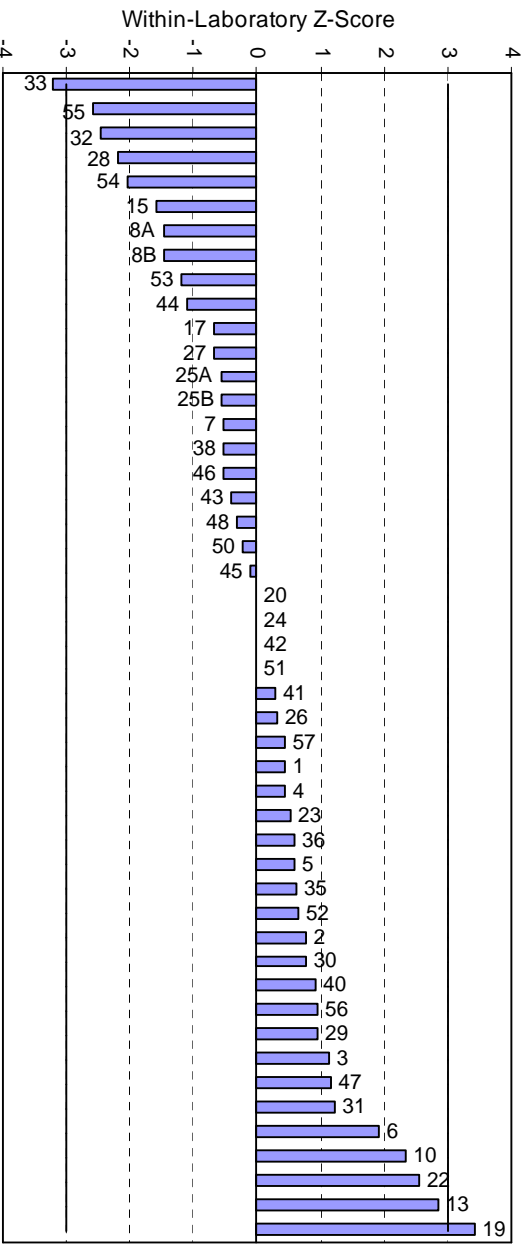
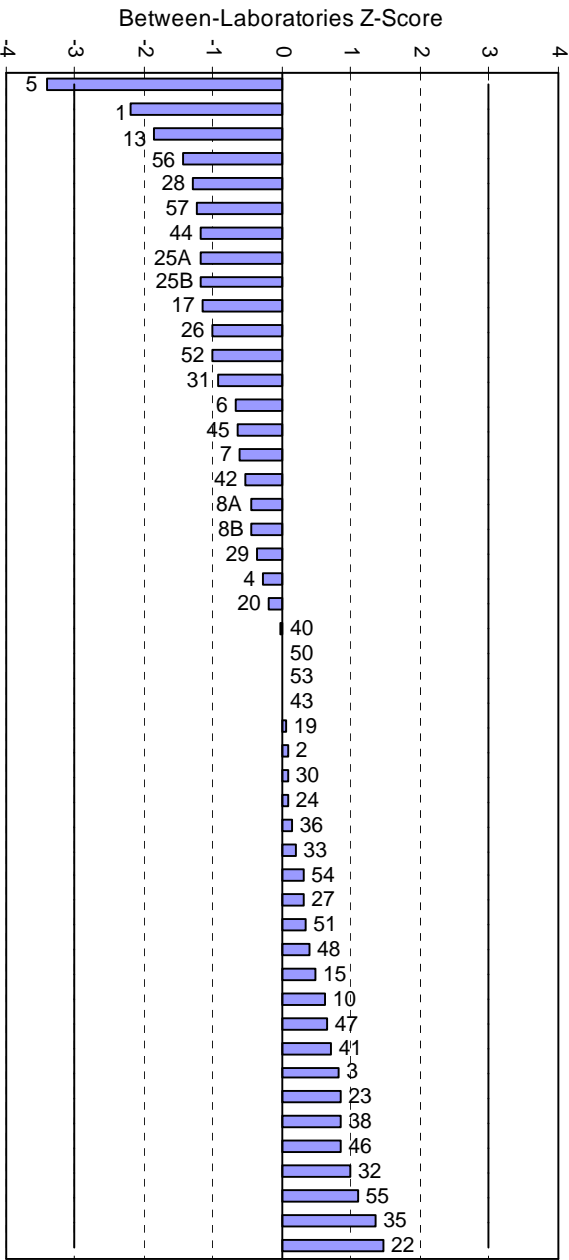
No of Results	48
Median	2.188
Norm IQR	0.207
Robust CV	9.5%
Minimum	1.48
Maximum	2.49
Range	1.01

Notes:

1. § denotes an outlier (i.e. $|z\text{-score}| > 3$).
2. # denotes incomplete results (i.e. $> / <$ and single results).

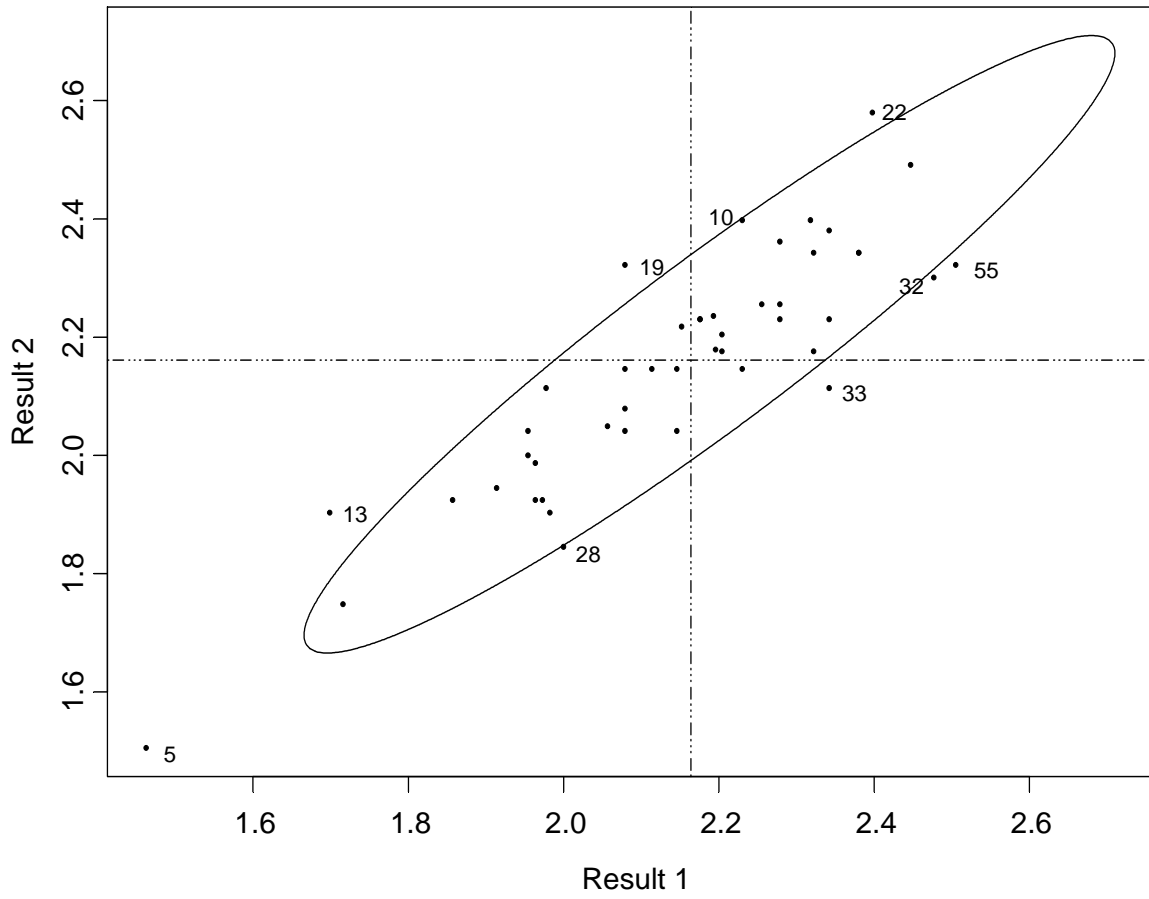
A4.3

Faecal Coliforms (orgs/100mL) – MF Technique



A4.4

Faecal Coliforms log (orgs/100mL) - MF Technique



A5.1

Faecal Coliforms (orgs/100mL) – MPN Technique

Lab Code	Result	Log ₁₀ Result	Robust Z-Score
2	350	2.54	0.62
4	230	2.36	0.00
5	50	1.70	-2.27
6	330	2.52	0.54
7	230	2.36	0.00
8A	240	2.38	0.06
8B	240	2.38	0.06
11	310	2.49	0.44
12	50	1.70	-2.27
13	170	2.23	-0.45
15	240	2.38	0.06
17	170	2.23	-0.45
19	230	2.36	0.00
20	350	2.54	0.62
21	240	2.38	0.06
22	350	2.54	0.62
23	49	1.69	-2.30
24	240	2.38	0.06
26	130	2.11	-0.85
27	130	2.11	-0.85
29	170	2.23	-0.45
30	350	2.54	0.62
34	92	1.96	-1.36
35	170	2.23	-0.45
36	110	2.04	-1.10
38	350	2.54	0.62
41	170	2.23	-0.45
42	350	2.54	0.62
43	1600	3.20	2.88
47	350	2.54	0.62
48	110	2.04	-1.10
50	170	2.23	-0.45
51	490	2.69	1.12
52	79	1.90	-1.59
53	200	2.30	-0.21
54	310	2.49	0.44
55	500	2.70	1.15
56	70	1.85	-1.77

A5.2

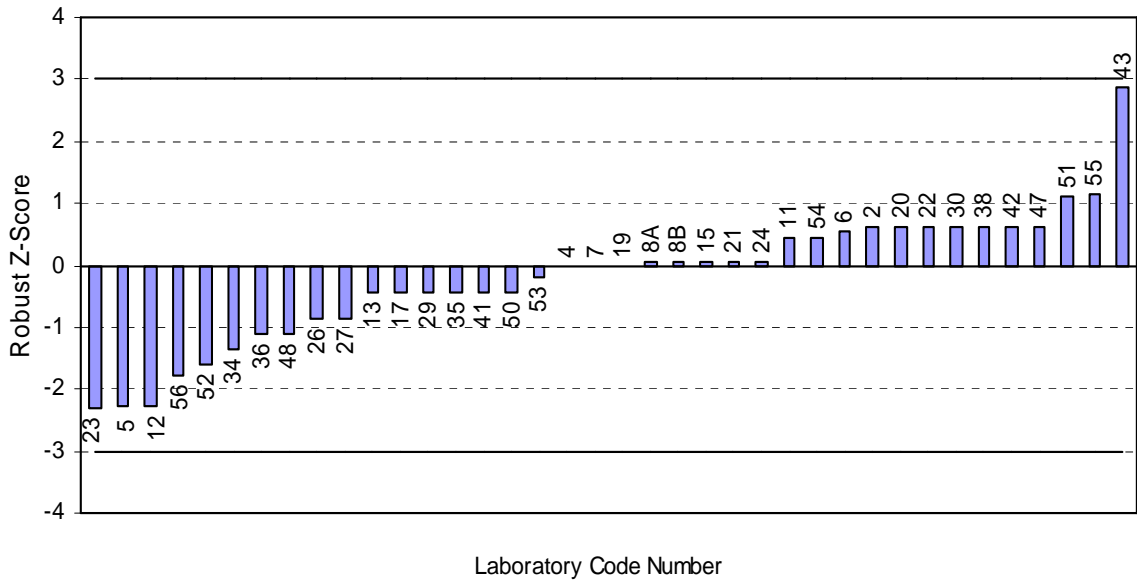
Summary Statistics

No of Results	38
Median	2.362
Norm IQR	0.293
Robust CV	12.4%
Minimum	1.69
Maximum	3.20
Range	1.51

Notes:

1. § denotes an outlier (i.e. $|z\text{-score}| > 3$).
2. # denotes an incomplete result (i.e. a $> / <$ result).

Faecal Coliforms (orgs/100mL) – MPN Technique



SECTIONS A6 to A8

Total Coliforms

A6.1

Total Coliforms (orgs/100mL) – MF Technique

Lab Code	Result 1	Result 2	Log ₁₀ Result 1	Log ₁₀ Result 2	Average	Between Labs Z-Score	Within Lab Z-Score
2	210	240	2.32	2.38	2.35	-0.41	-0.75
4	320	290	2.51	2.46	2.48	0.73	0.82
5	76	60	1.88	1.78	1.83	-4.89 §	1.76
6	200	210	2.30	2.32	2.31	-0.75	-0.18
7	260	240	2.41	2.38	2.40	-0.01	0.70
8A	210	190	2.32	2.28	2.30	-0.84	0.83
8B	210	190	2.32	2.28	2.30	-0.84	0.83
10	170	250	2.23	2.40	2.31	-0.73	-2.46
13	160	180	2.20	2.26	2.23	-1.45	-0.64
14	350		2.54			#	#
15	250	290	2.40	2.46	2.43	0.27	-0.85
16	240		2.38			#	#
17	220	120	2.34	2.08	2.21	-1.62	4.26 §
18	360		2.56			#	#
19	310	210	2.49	2.32	2.41	0.07	2.80
20	150	140	2.18	2.15	2.16	-2.04	0.62
21	200	220	2.30	2.34	2.32	-0.66	-0.49
22	300	320	2.48	2.51	2.49	0.80	-0.28
23	320	330	2.51	2.52	2.51	0.97	-0.05
24	190	180	2.28	2.26	2.27	-1.13	0.52
25A	251	253	2.40	2.40	2.40	0.02	0.10
25B	251	253	2.40	2.40	2.40	0.02	0.10
26	310	260	2.49	2.41	2.45	0.47	1.35
27	220	260	2.34	2.41	2.38	-0.17	-0.98
28	310	360	2.49	2.56	2.52	1.08	-0.86
29	290	230	2.46	2.36	2.41	0.12	1.73
30	280	290	2.45	2.46	2.45	0.48	-0.08
31	170	150	2.23	2.18	2.20	-1.68	1.00
32	66	94	1.82	1.97	1.90	-4.32 §	-2.24
33	300	210	2.48	2.32	2.40	0.01	2.57
34	150		2.18			#	#
35	250	330	2.40	2.52	2.46	0.51	-1.73
36	320	300	2.51	2.48	2.49	0.80	0.59
38	300	350	2.48	2.54	2.51	0.96	-0.89
40	290	310	2.46	2.49	2.48	0.67	-0.30
41	310	320	2.49	2.51	2.50	0.86	-0.06
42	190	210	2.28	2.32	2.30	-0.84	-0.52
43	270	220	2.43	2.34	2.39	-0.10	1.54
44	180	160	2.26	2.20	2.23	-1.45	0.95
45	300	300	2.48	2.48	2.48	0.67	0.16
46	270	230	2.43	2.36	2.40	-0.02	1.24
47	260	280	2.41	2.45	2.43	0.28	-0.35
48	210	180	2.32	2.26	2.29	-0.94	1.20

A6.2

Total Coliforms (orgs/100mL) – MF Technique

Lab Code	Result 1	Result 2	Log ₁₀ Result 1	Log ₁₀ Result 2	Average	Between Labs Z-Score	Within Lab Z-Score
50	250	280	2.40	2.45	2.42	0.21	-0.61
51	350	360	2.54	2.56	2.55	1.30	-0.04
53	340	310	2.53	2.49	2.51	0.97	0.78
54	210	280	2.32	2.45	2.38	-0.12	-1.79
55	270	280	2.43	2.45	2.44	0.35	-0.09
56	112	114	2.05	2.06	2.05	-2.97	0.04
57	140	148	2.15	2.17	2.16	-2.07	-0.22

Summary Statistics

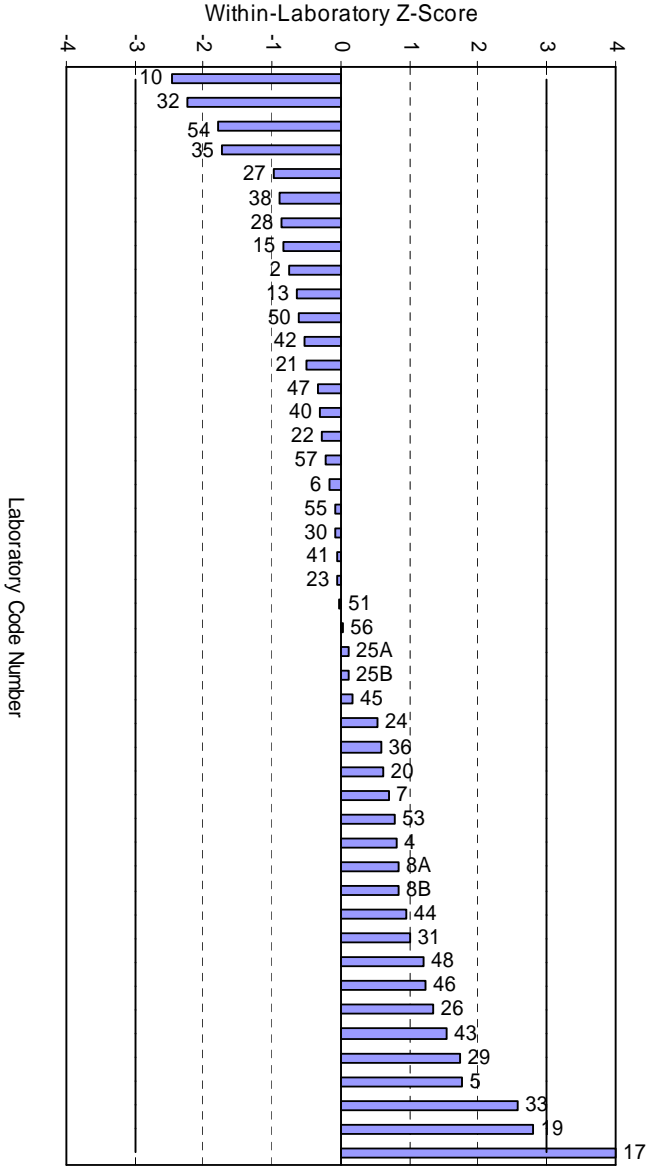
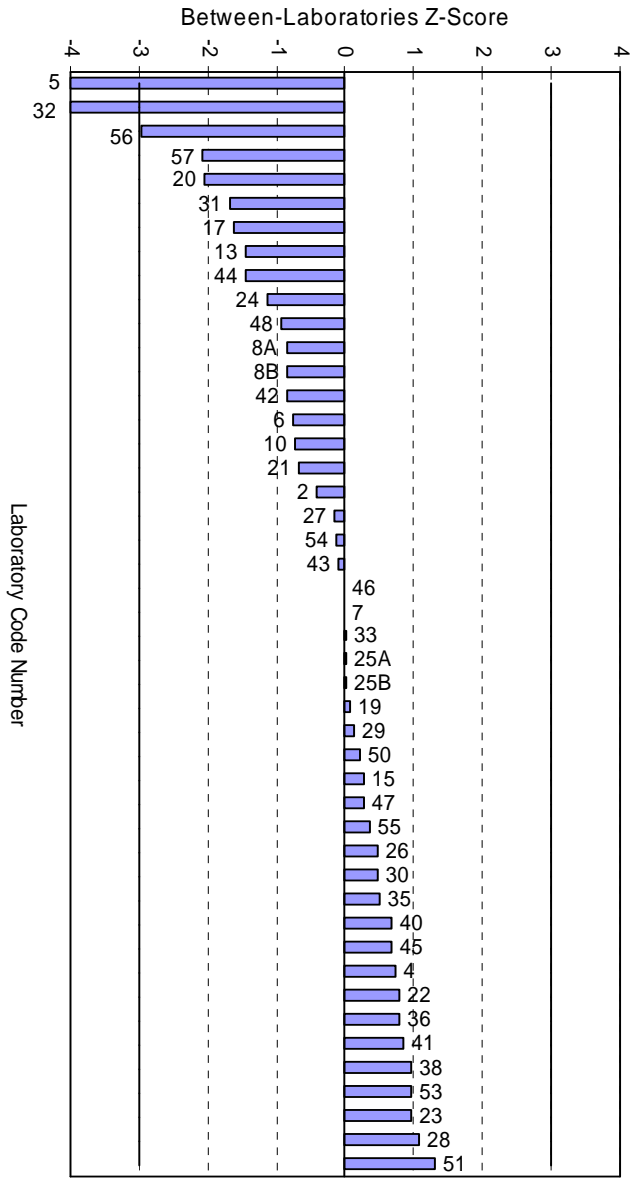
No of Results	46
Median	2.399
Norm IQR	0.116
Robust CV	4.8%
Minimum	1.83
Maximum	2.55
Range	0.72

Notes:

1. § denotes an outlier (i.e. |z-score| > 3).
2. # denotes incomplete results (i.e. > / < and single results).

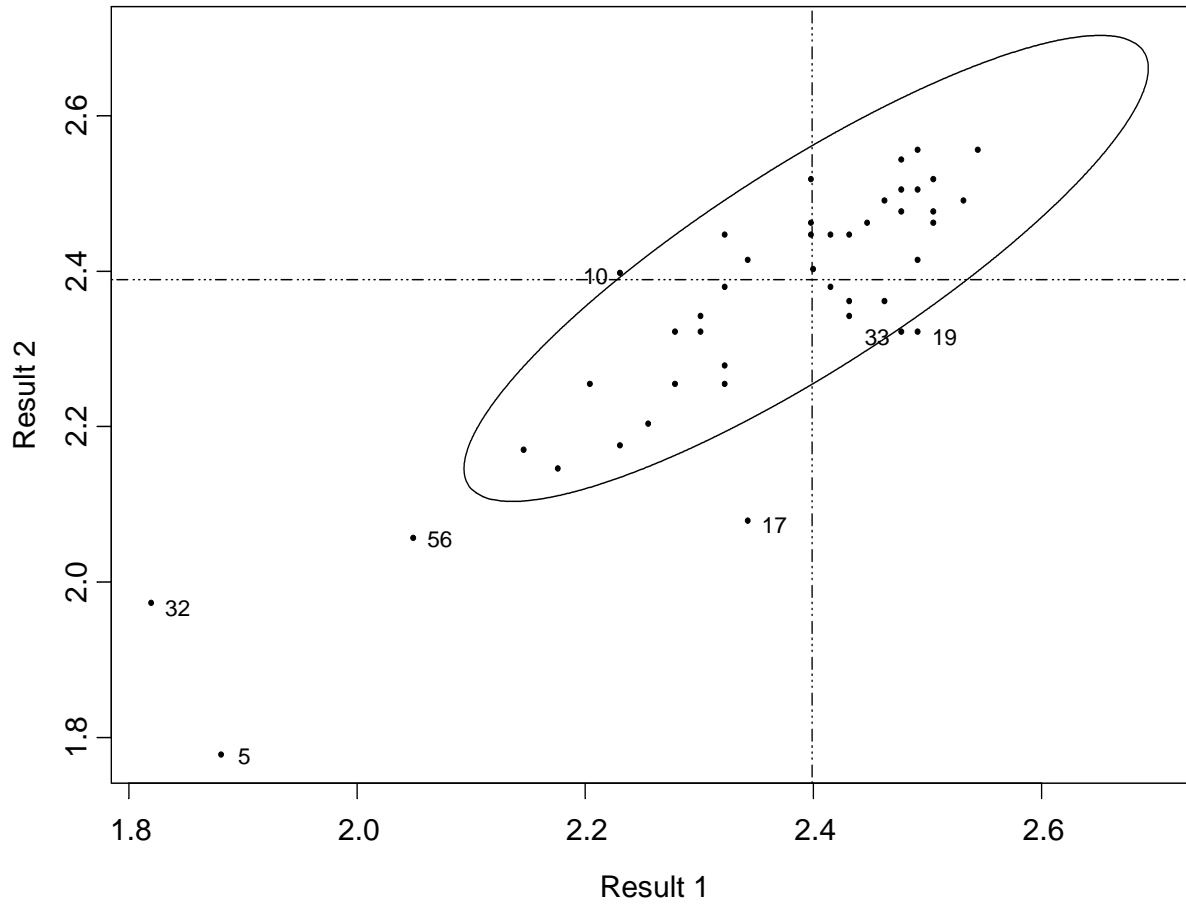
A6.3

Total Coliforms (orgs/100mL) – MF Technique



A6.4

Total Coliforms log (orgs/100mL) - MF Technique



A7.1

Total Coliforms (orgs/100mL) – MPN Technique

Lab Code	Result	Log ₁₀ Result	Robust Z-Score
2	350	2.54	0.90
4	230	2.36	-0.36
5	130	2.11	-2.07
6	330	2.52	0.72
7	230	2.36	-0.36
8A	240	2.38	-0.23
8B	240	2.38	-0.23
11	460	2.66	1.72
12	240	2.38	-0.23
13	170	2.23	-1.26
15	240	2.38	-0.23
17	280	2.45	0.23
19	450	2.65	1.65
20	350	2.54	0.90
21	240	2.38	-0.23
23	460	2.66	1.72
24	240	2.38	-0.23
26	240	2.38	-0.23
27	170	2.23	-1.26
29	330	2.52	0.72
30	540	2.73	2.20
34	240	2.38	-0.23
35	330	2.52	0.72
36	110	2.04	-2.57
37	240	2.38	-0.23
38	540	2.73	2.20
41	170	2.23	-1.26
42	350	2.54	0.90
43	1600	3.20	5.45 §
48	330	2.52	0.72
50	350	2.54	0.90
51	790	2.90	3.33 §
53	200	2.30	-0.78
54	460	2.66	1.72
55	500	2.70	1.97
56	110	2.04	-2.57

A7.2

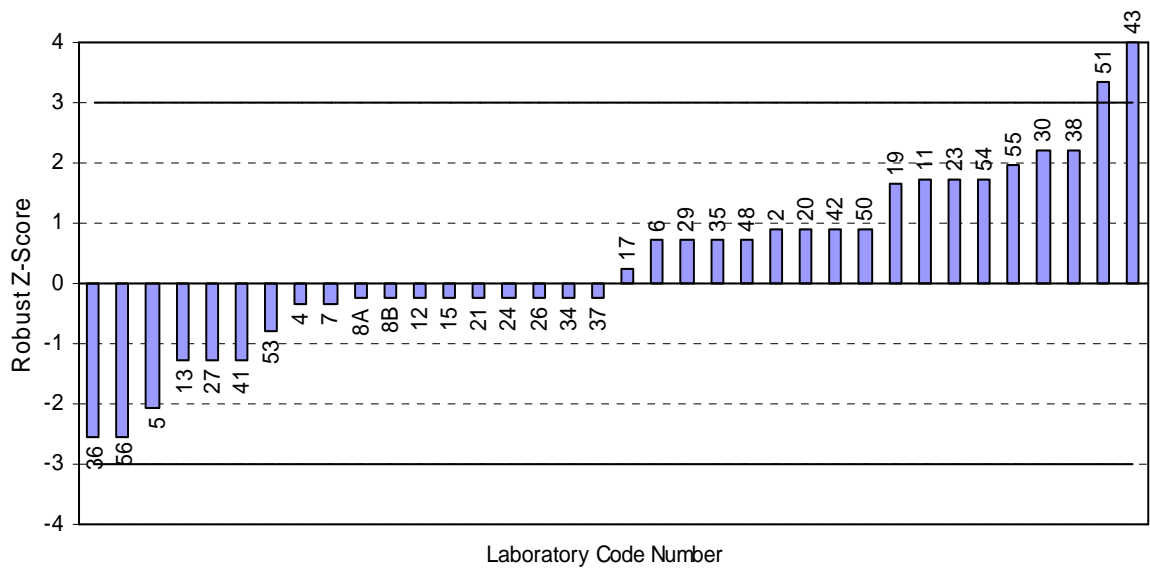
Summary Statistics

No of Results	36
Median	2.414
Norm IQR	0.145
Robust CV	6.0%
Minimum	2.04
Maximum	3.20
Range	1.16

Notes:

1. § denotes an outlier (i.e. |z-score| > 3).
2. # denotes an incomplete result (i.e. a > / < result).

Total Coliforms (orgs/100mL) – MPN Technique



A8.1

Total Coliforms (orgs/100mL) – Colilert Technique

Lab Code	Result	Log ₁₀ Result	Robust Z-Score
4	300	2.48	-0.20
5	72	1.86	-6.51 §
7	490	2.69	1.97
9	280	2.45	-0.51
15	290	2.46	-0.35
24	320	2.51	0.08
25A	238	2.38	-1.22
25B	225	2.35	-1.47
26	390	2.59	0.96
27	270	2.43	-0.67
28	380	2.58	0.84
29	410	2.61	1.18
30	320	2.51	0.08
32	293.4	2.47	-0.30
39	325.5	2.51	0.16
43	340	2.53	0.35
45	488	2.69	1.95
49	387	2.59	0.92
51	308	2.49	-0.09
52	314	2.50	0.00
57	240	2.38	-1.19

Summary Statistics

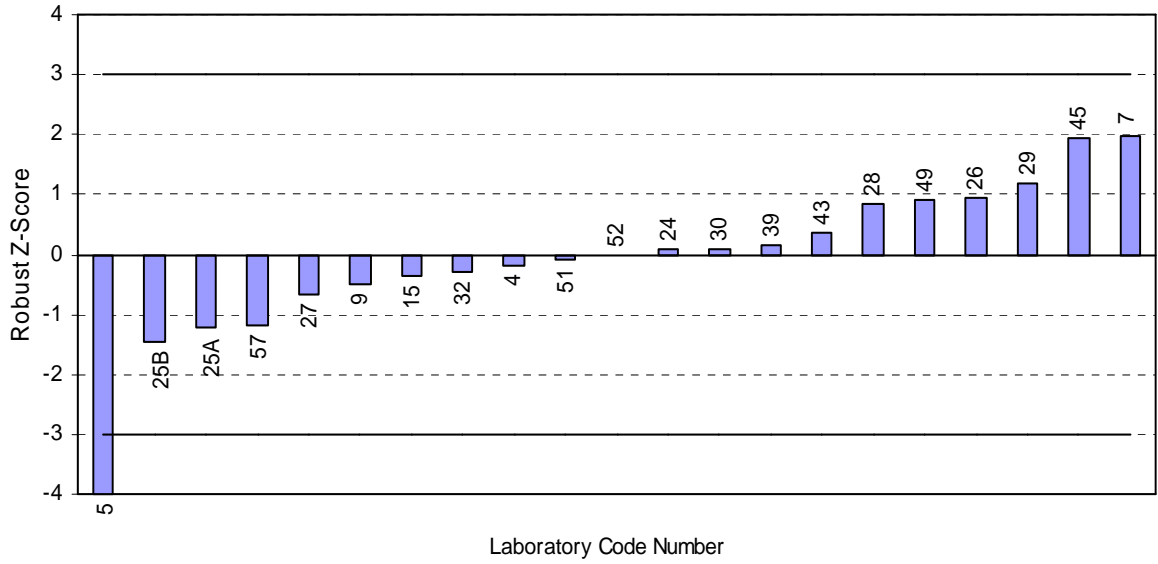
No of Results	21
Median	2.497
Norm IQR	0.098
Robust CV	3.9%
Minimum	1.86
Maximum	2.69
Range	0.83

Notes:

1. § denotes an outlier (i.e. $|z\text{-score}| > 3$).
2. # denotes an incomplete result (i.e. a $>$ / $<$ result).

A8.2

Total Coliforms (orgs/100mL) – Colilert Technique



SECTIONS A9 to A10

Enterococci

A9.1

Enterococci (orgs/100mL) – MF Technique

Lab Code	Result 1	Result 2	Log ₁₀ Result 1	Log ₁₀ Result 2	Average	Between Labs Z-Score	Within Lab Z-Score
2	180	200	2.26	2.30	2.28	1.58	0.48
3	114	130	2.06	2.11	2.09	-0.28	0.64
4	140	130	2.15	2.11	2.13	0.15	-0.66
5	60	20	1.78	1.30	1.54	-5.55 §	-7.19 §
6	120	138	2.08	2.14	2.11	-0.05	0.70
7	230	220	2.36	2.34	2.35	2.30	-0.48
8A	110	100	2.04	2.00	2.02	-0.90	-0.80
8B	110	100	2.04	2.00	2.02	-0.90	-0.80
13	130	120	2.11	2.08	2.10	-0.17	-0.70
16	90		1.95			#	#
17	130	140	2.11	2.15	2.13	0.15	0.28
19	100	110	2.00	2.04	2.02	-0.90	0.41
20	140	150	2.15	2.18	2.16	0.45	0.25
22	180	240	2.26	2.38	2.32	1.96	1.64
24	150	160	2.18	2.20	2.19	0.73	0.22
25A	100	120	2.00	2.08	2.04	-0.72	0.97
25B	100	120	2.00	2.08	2.04	-0.72	0.97
26	120	110	2.08	2.04	2.06	-0.52	-0.75
27	160	170	2.20	2.23	2.22	0.99	0.19
28	140	140	2.15	2.15	2.15	0.31	-0.19
29	120	140	2.08	2.15	2.11	-0.02	0.79
30	110	110	2.04	2.04	2.04	-0.70	-0.19
31	130	155	2.11	2.19	2.15	0.36	0.93
32	108	132	2.03	2.12	2.08	-0.36	1.08
33	170	150	2.23	2.18	2.20	0.86	-0.99
34	70		1.85			#	#
36	198	176	2.30	2.25	2.27	1.51	-0.94
38	300	300	2.48	2.48	2.48	3.50 §	-0.19
40	158	170	2.20	2.23	2.21	0.97	0.27
41	120	110	2.08	2.04	2.06	-0.52	-0.75
42	180	120	2.26	2.08	2.17	0.51	-2.77
43	120	120	2.08	2.08	2.08	-0.34	-0.19
45	108	104	2.03	2.02	2.03	-0.86	-0.43
47	120	100	2.08	2.00	2.04	-0.72	-1.35
50	160	200	2.20	2.30	2.25	1.33	1.23
51	134	148	2.13	2.17	2.15	0.33	0.44
54	100	170	2.00	2.23	2.12	0.01	3.19 §
55	210	170	2.32	2.23	2.28	1.56	-1.54
56	122	134	2.09	2.13	2.11	-0.07	0.40
57	136	124	2.13	2.09	2.11	-0.01	-0.78

A9.2

Summary Statistics

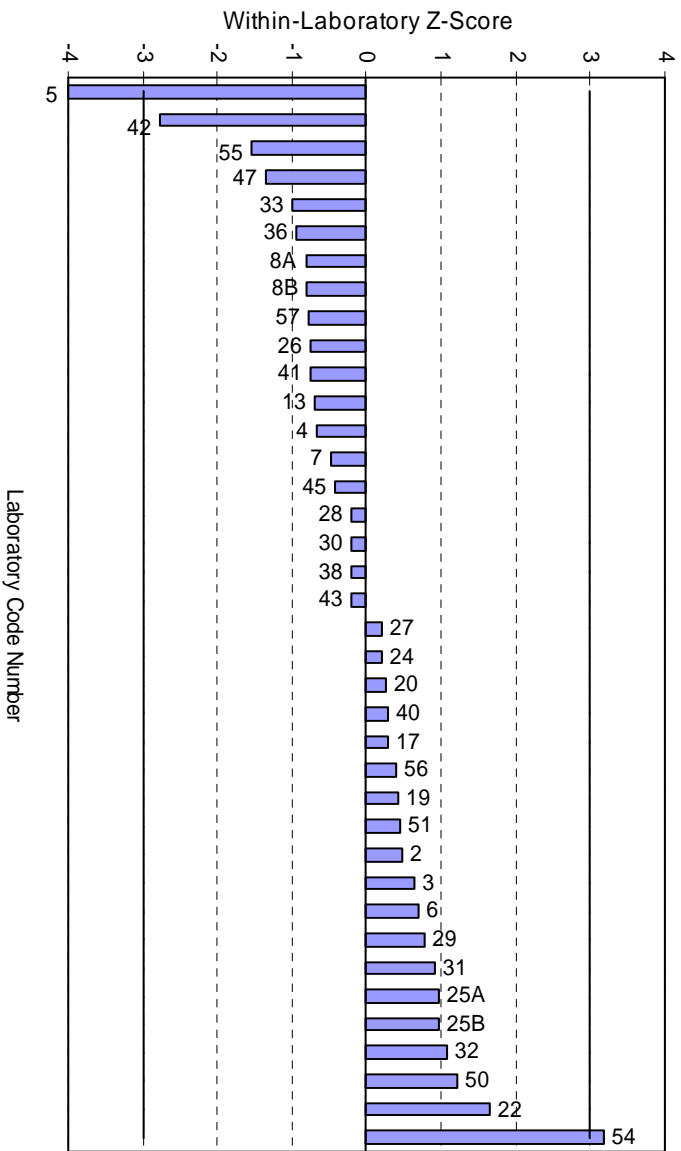
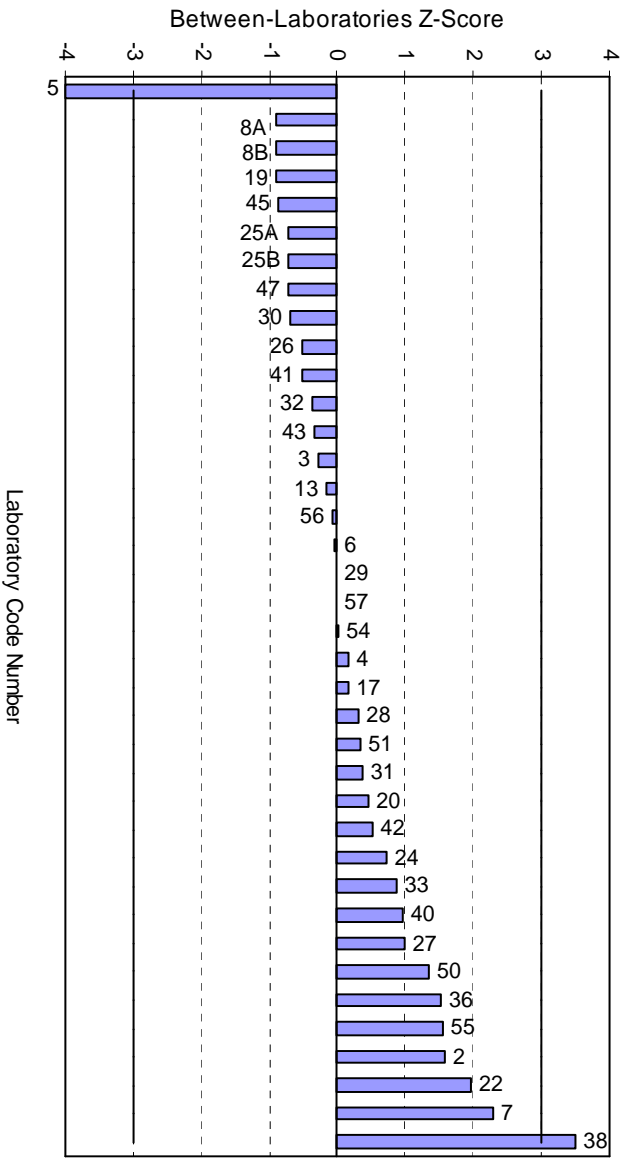
No of Results	38
Median	2.114
Norm IQR	0.104
Robust CV	4.9%
Minimum	1.54
Maximum	2.48
Range	0.94

Notes:

1. § denotes an outlier (i.e. $|z\text{-score}| > 3$).
2. # denotes an incomplete result (i.e. a $> / <$ result).

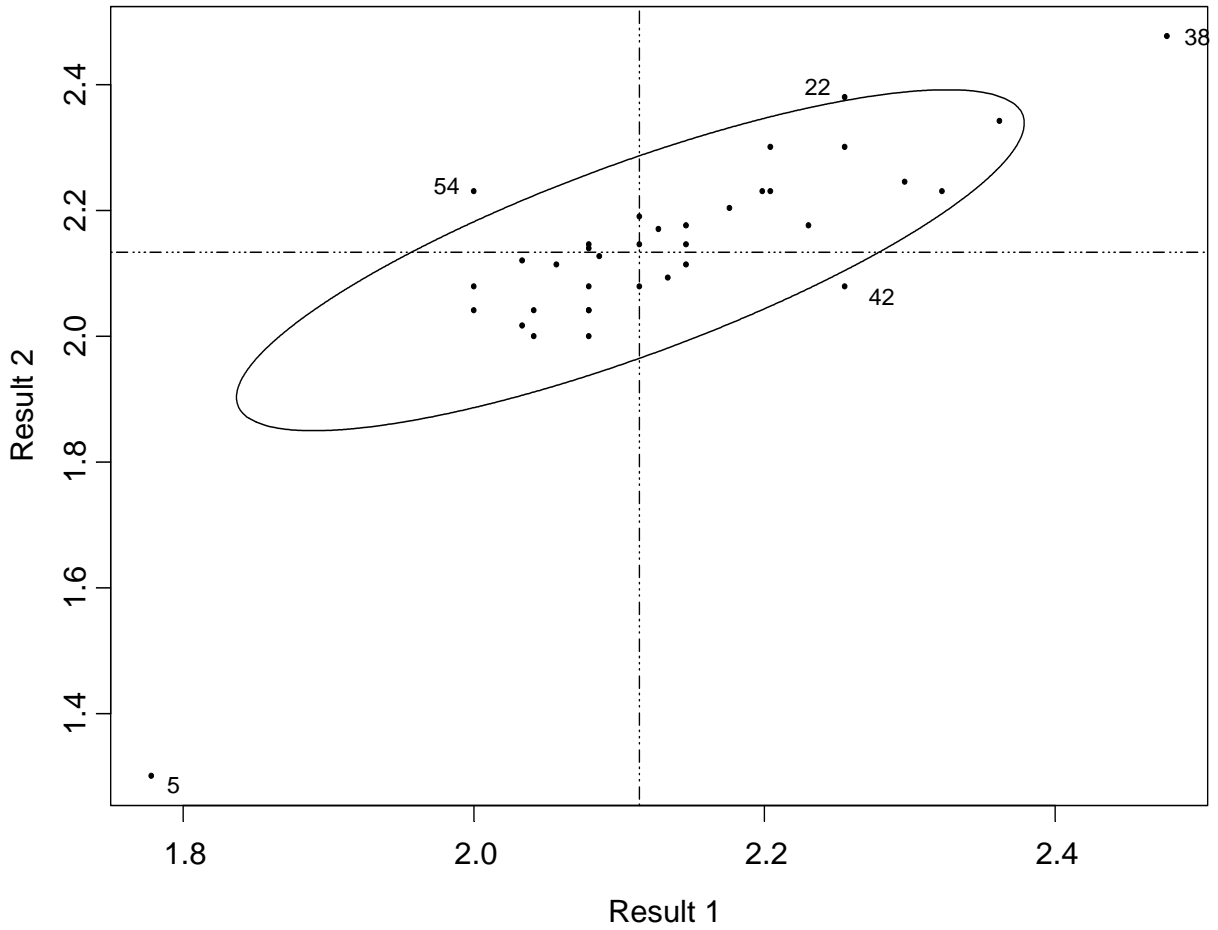
Enterococci (orgs/100 mL) – MF Technique

A9.3



A9.4

Enterococci log (orgs/100mL) - MF Technique



A10.1

Enterococci (orgs/100mL) – MPN Technique

Lab Code	Result	Log ₁₀ Result	Robust Z-Score
4	79	1.90	-0.52
6	400	2.60	2.02
11	35	1.54	-1.79
12	110	2.04	0.00
20	540	2.73	2.49
29	220	2.34	1.09
30	130	2.11	0.26
36	170	2.23	0.68
41	110	2.04	0.00
47	70	1.85	-0.71
50	22	1.34	-2.52
56	110	2.04	0.00

Summary Statistics

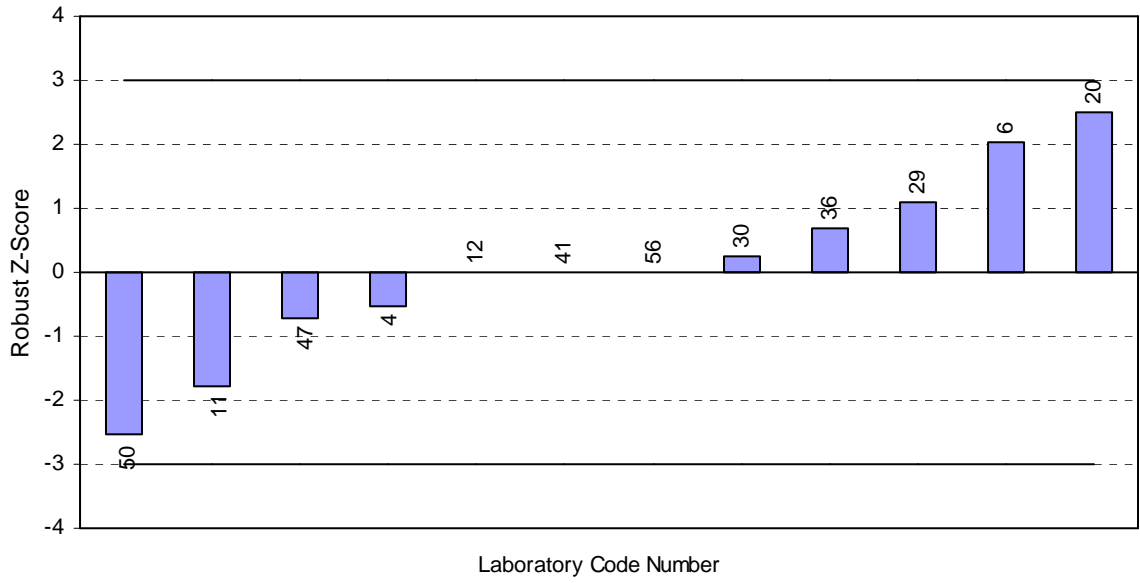
No of Results	12
Median	2.041
Norm IQR	0.277
Robust CV	13.6%
Minimum	1.34
Maximum	2.73
Range	1.39

Notes:

1. § denotes an outlier (i.e. |z-score| > 3).
2. # denotes an incomplete result (i.e. a > / < result).

A10.2

Enterococci (orgs/100mL) – MPN Technique



SECTION A11

Plate Count

A11.1

Plate Count (orgs/mL) – All Techniques

Lab Code	Result 1	Result 2	Log ₁₀ Result 1	Log ₁₀ Result 2	Average	Between Labs Z-Score	Within Lab Z-Score
1	400	380	2.60	2.58	2.59	-0.60	-1.25
2	350	400	2.54	2.60	2.57	-0.91	1.89
3	480	430	2.68	2.63	2.66	0.55	-2.25
4	380	380	2.58	2.58	2.58	-0.79	-0.38
5	410	420	2.61	2.62	2.62	-0.13	0.03
6	430	450	2.63	2.65	2.64	0.31	0.39
7	460	430	2.66	2.63	2.65	0.39	-1.53
8A	390	380	2.59	2.58	2.59	-0.70	-0.82
8B	390	380	2.59	2.58	2.59	-0.70	-0.82
9	430	480	2.63	2.68	2.66	0.55	1.49
10	360	500	2.56	2.70	2.63	0.04	5.21 §
11	380	380	2.58	2.58	2.58	-0.79	-0.38
12	46	41	1.66	1.61	1.64	-17.18 §	-2.34
13	420	440	2.62	2.64	2.63	0.14	0.41
14	330		2.52			#	#
15	380	360	2.58	2.56	2.57	-1.00	-1.30
16	310		2.49			#	#
17	510	530	2.71	2.72	2.72	1.57	0.27
18	400		2.60			#	#
19	300	320	2.48	2.51	2.49	-2.34	0.72
20	450	440	2.65	2.64	2.65	0.40	-0.76
21	460	450	2.66	2.65	2.66	0.57	-0.76
22	410	530	2.61	2.72	2.67	0.75	3.99 §
23	360	380	2.56	2.58	2.57	-1.00	0.54
24	530	550	2.72	2.74	2.73	1.86	0.25
26	290	310	2.46	2.49	2.48	-2.58	0.75
27	380	390	2.58	2.59	2.59	-0.70	0.06
28	420	420	2.62	2.62	2.62	-0.04	-0.38
29	480	520	2.68	2.72	2.70	1.27	0.98
30	480	490	2.68	2.69	2.69	1.05	-0.03
31	550	350	2.74	2.54	2.64	0.29	-8.07 §
32	430	460	2.63	2.66	2.65	0.39	0.77
33	370	380	2.57	2.58	2.57	-0.89	0.07
34	370	400	2.57	2.60	2.59	-0.70	0.94
35	446	435	2.65	2.64	2.64	0.32	-0.81
36	425	415	2.63	2.62	2.62	-0.04	-0.79
37	360	380	2.56	2.58	2.57	-1.00	0.54
38	340	80	2.53	1.90	2.22	-7.10 §	-25.00 §
39	540	470	2.73	2.67	2.70	1.34	-2.74
40	380	392	2.58	2.59	2.59	-0.68	0.15
41	380	390	2.58	2.59	2.59	-0.70	0.06
42	420	450	2.62	2.65	2.64	0.22	0.79

A11.2

Plate Count (orgs/mL) – All Techniques

Lab Code	Result 1	Result 2	Log ₁₀ Result 1	Log ₁₀ Result 2	Average	Between Labs Z-Score	Within Lab Z-Score
43	600	570	2.78	2.76	2.77	2.46	-1.25
44	530	570	2.72	2.76	2.74	1.99	0.86
45	450	450	2.65	2.65	2.65	0.48	-0.38
47	590	51	2.77	1.71	2.24	-6.72 §	-42.04 §
48	339	378	2.53	2.58	2.55	-1.25	1.47
49	470		2.67			#	#
50	420	440	2.62	2.64	2.63	0.14	0.41
51	380	388	2.58	2.59	2.58	-0.72	-0.03
52	470	460	2.67	2.66	2.67	0.73	-0.75
53	500	490	2.70	2.69	2.69	1.20	-0.73
54	400	420	2.60	2.62	2.61	-0.22	0.45
55	360	370	2.56	2.57	2.56	-1.10	0.08
56	440	430	2.64	2.63	2.64	0.23	-0.77
57	500	460	2.70	2.66	2.68	0.96	-1.80

Summary Statistics

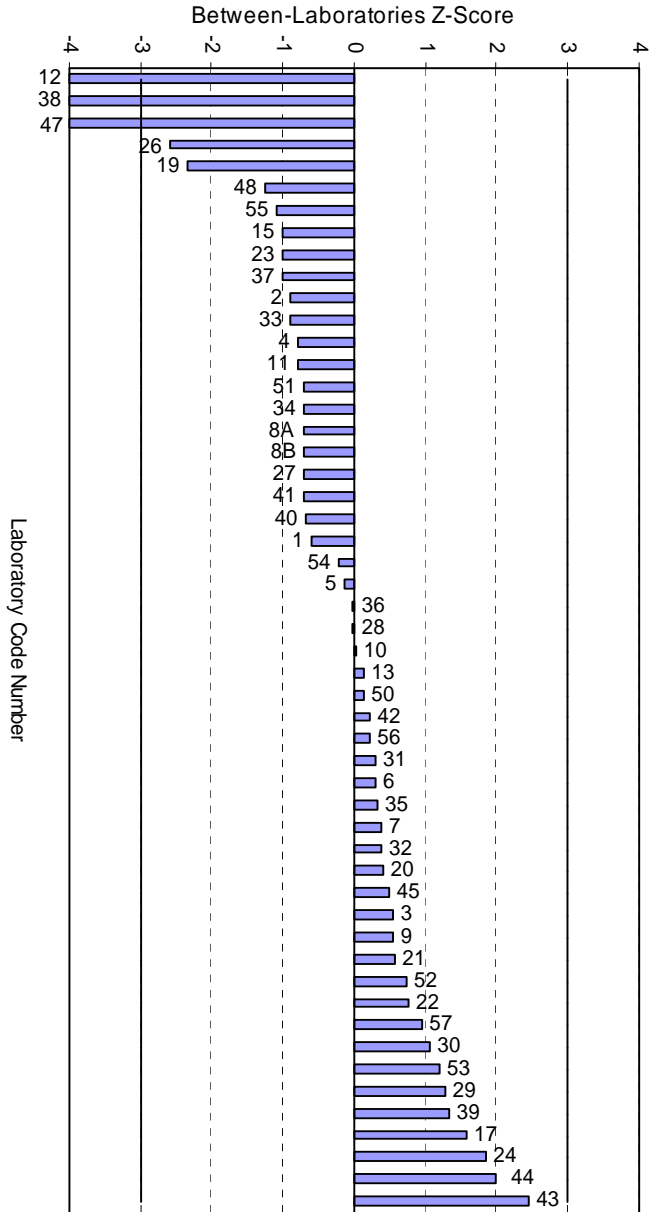
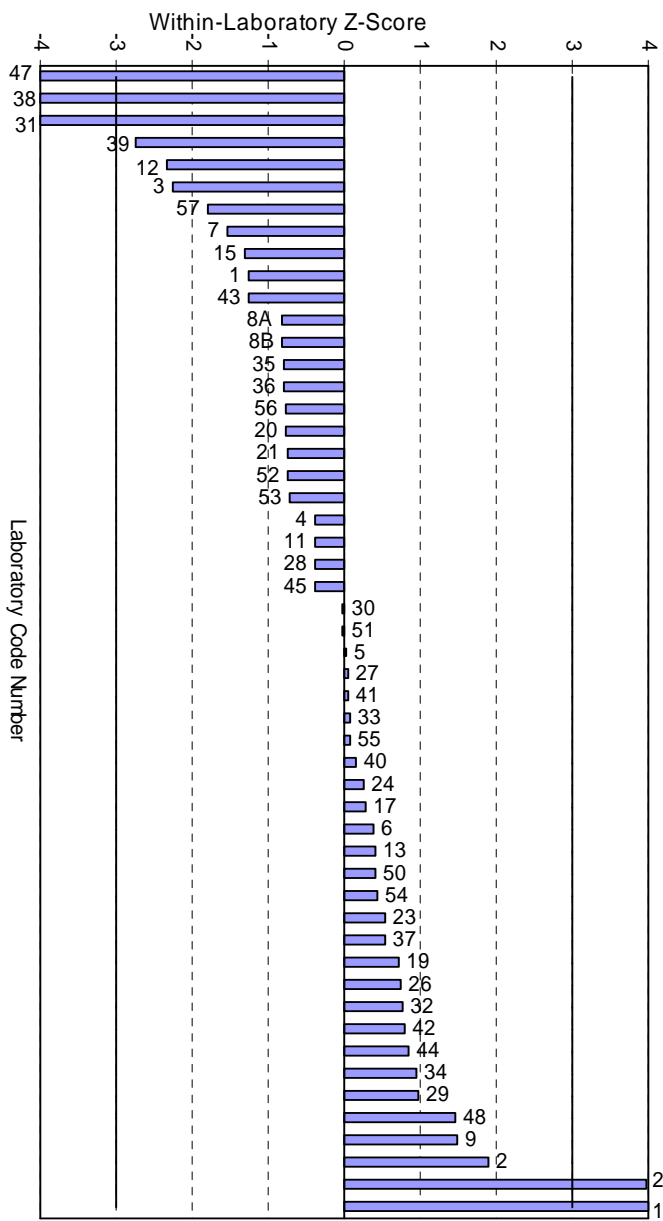
No of Results	52
Median	2.625
Norm IQR	0.058
Robust CV	2.2%
Minimum	1.64
Maximum	2.77
Range	1.13

Notes:

1. § denotes an outlier (i.e. |z-score| > 3).
2. # denotes incomplete results (i.e. > / < and single results).

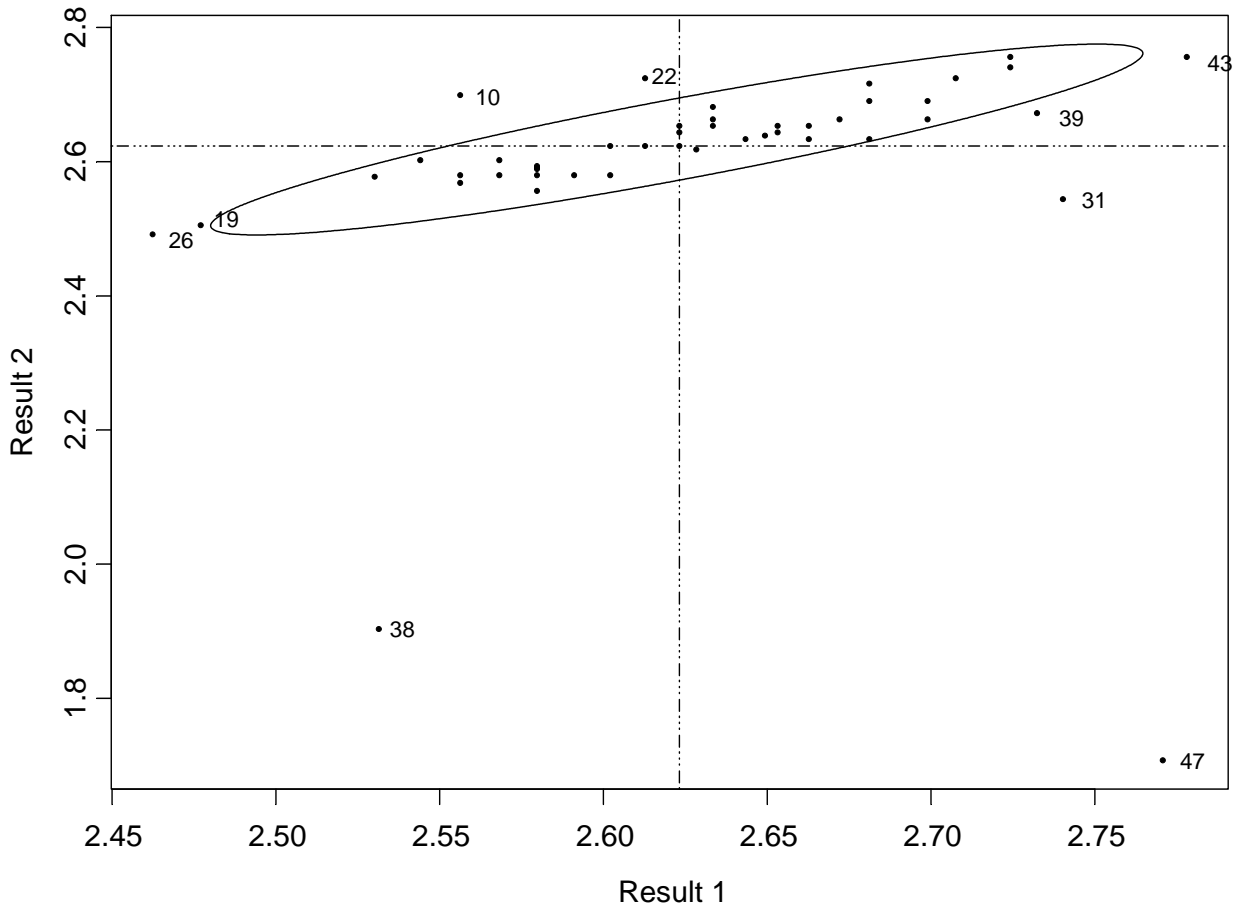
Plate Count (orgs/mL) – All Techniques

A11.3



A11.4

Plate Count log (orgs/mL) - All Techniques



APPENDIX B

Sample Preparation

and

Homogeneity and Stability Testing

SAMPLE PREPARATION

The samples were sent out to all laboratories on 24 September 2007. When reconstituted, each sample was representative of ambient water.

HOMOGENEITY AND STABILITY TESTING

A number of samples were selected for quality control sample analyses, to ensure that sample variability was not a contributing factor to the performance of the participants.

During sample preparation for this program, ten samples were randomly set aside for homogeneity testing and three other samples were randomly set aside for stability testing.

Samples were tested for homogeneity and stability using the following media and techniques:

1. Total coliforms: Spread plate using mEndo agar.
2. Faecal coliforms and *E coli*: Spread plate using mFC agar, with differentiation between *K. pneumoniae* and *E coli* via colony morphology and confirmatory testing.
3. Enterococci: Spread plate using mEnterococcus agar.
4. Heterotrophic Plate Count: Spread plate using Plate Count agar (at 35°C).

E. coli

The samples were tested for homogeneity and stability, in duplicate, via differentiation on mFC agar with incubation at 44°C. The results of this testing appear in the following table.

<i>E. coli</i> (orgs/100mL)							
Homogeneity Testing				Stability Testing			
Result A	Log A	Result B	Log B	Result A	Log A	Result B	Log B
260	2.4150	280	2.4472	390	2.5911	370	2.5682
180	2.2553	320	2.5051	240	2.3802	260	2.4150
300	2.4771	330	2.5185	240	2.3802	270	2.4314
290	2.4624	260	2.4150				
220	2.3424	270	2.4314				
310	2.4914	370	2.5682				
320	2.5051	360	2.5563				
280	2.4472	330	2.5185				
380	2.5798	350	2.5441				
340	2.5315	310	2.4914				

Faecal Coliforms

The samples were tested for homogeneity and stability, in duplicate, via mFC agar with incubation at 44°C. The results of this testing appear in the following table.

Faecal Coliforms (orgs/100mL)							
Homogeneity Testing				Stability Testing			
Result A	Log A	Result B	Log B	Result A	Log A	Result B	Log B
690	2.8388	790	2.8976	730	2.8633	700	2.8451
670	2.8261	840	2.9243	650	2.8129	630	2.7993
810	2.9085	1020	3.0086	730	2.8633	680	2.8325
810	2.9085	780	2.8921				
720	2.8573	780	2.8921				
890	2.9494	960	2.9823				
870	2.9395	940	2.9731				
800	2.9031	900	2.9542				
970	2.9868	930	2.9685				
960	2.9823	880	2.9445				

Total Coliforms

The samples were tested for homogeneity and stability, in duplicate, via mEndo agar. The results of this testing appear in the following table.

Total Coliforms (orgs/100mL)							
Homogeneity Testing				Stability Testing			
Result A	Log A	Result B	Log B	Result A	Log A	Result B	Log B
1560	3.1931	1540	3.1875	2100	3.3222	1700	3.2304
1470	3.1673	1380	3.1399	1400	3.1461	1200	3.0792
1610	3.2068	1640	3.2148	1300	3.1139	1400	3.1461
1650	3.2175	1540	3.1875				
1640	3.2148	1490	3.1732				
1640	3.2148	1460	3.1644				
1620	3.2095	1710	3.2330				
1720	3.2355	1580	3.1987				
1480	3.1703	1700	3.2304				
1710	3.2330	1550	3.1903				

Enterococci

The samples were tested for homogeneity and stability, in duplicate, via mEnterococcus agar. The results of this testing appear in the following table.

Enterococci (orgs/100mL)							
Homogeneity Testing				Stability Testing			
Result A	Log A	Result B	Log B	Result A	Log A	Result B	Log B
760	2.8808	670	2.8261	770	2.8865	670	2.8261
730	2.8633	660	2.8195	630	2.7993	590	2.7709
860	2.9345	750	2.8751	690	2.8388	550	2.7404
630	2.7993	730	2.8633				
840	2.9243	770	2.8865				
820	2.9138	700	2.8451				
690	2.8388	680	2.8325				
680	2.8325	660	2.8195				
820	2.9138	860	2.9345				
700	2.8451	730	2.8633				

Plate Count

The samples were tested for homogeneity and stability, in duplicate, at 35°C via Plate Count agar. The results of this testing appear in the following table.

Plate Count (orgs/100mL)							
Homogeneity Testing				Stability Testing			
Result A	Log A	Result B	Log B	Result A	Log A	Result B	Log B
250000	5.3979	230000	5.3617	75000	4.8751	150000	5.1761
230000	5.3617	220000	5.3424	100000	5.0000	140000	5.1461
210000	5.3222	200000	5.3010	130000	5.1139	50000	4.6990
220000	5.3424	230000	5.3617				
180000	5.2553	230000	5.3617				
250000	5.3979	160000	5.2041				
200000	5.3010	220000	5.3424				
230000	5.3617	290000	5.4624				
190000	5.2788	210000	5.3222				
300000	5.4771	190000	5.2788				

From the analysis of these results, it was concluded that the samples were both sufficiently homogenous and stable for use in this round of the program.

APPENDIX C

Instructions to Participants

Instructions for Re-hydration of Sample

and

Results Sheet

PROFICIENCY TESTING AUSTRALIA
MICROBIOLOGICAL WATERS PROFICIENCY TESTING PROGRAM



INSTRUCTIONS TO PARTICIPANTS

ROUND 30 – SEPTEMBER 2007

Please read instructions carefully **BEFORE** commencing testing.

To ensure that the results of this program can be analysed properly, participants are asked to adhere carefully to the following instructions.

1. For this round each participant will be supplied with one freeze-dried sample which is to be re-hydrated as outlined in the instructions below. When re-hydrated the sample will be representative of an 'ambient water' / drinking water supply reservoir sample.
2. To aid us with the statistical analyses of the results we ask that all laboratories set up methods such that you can report actual numerical results.
3. Please note that, where duplicate results are required, analysis of the sample should be performed twice i.e. two sets of dilutions to be prepared and analysed. Therefore, participants should not derive duplicate results from the same dilution set.
4. The re-hydrated sample is to be examined as follows:

Analyse for *E.coli*, faecal coliforms, total coliforms, enterococci and 37°C (or 35°C) plate count.
5. These tests are to be conducted by the methods used routinely in your laboratory.
6. Laboratories accredited for the full range of waters are required to perform both MF and MPN techniques.
7. On the *Results Sheet* provided, please report two results for each test performed by MF technique and for plate count, and single results only for each test performed by MPN technique. Please indicate the technique used for plate count in the blank entry of the *Technique* column for plate count on the results sheet. Please also complete the column *Method Source/ Year*.
8. All laboratories are to return their results **by Friday 5 October 2007 to:**

Charlotte Nohra
Proficiency Testing Australia
PO Box 7507
Silverwater NSW 2128
AUSTRALIA

Telephone: +61 2 9736 8397
Fax: +61 2 9743 6664

9. To allow for the confidential treatment of your results in the final report, you have been allocated a code number which appears on your results sheet.

MICROBIOLOGICAL WATERS PROFICIENCY TESTING PROGRAM

ROUND 30 – SEPTEMBER 2007

INSTRUCTIONS FOR RE-HYDRATION OF SAMPLE

- 1. Re-hydrate the freeze-dried matrix by adding 3.0mL of sterile diluent eg (0.1% (w/v) peptone or 0.85% (w/v) NaCl (ISO, 1988) at room temperature.**
- 2. Allow standing at room temperature for 10 minutes.**
- 3. Mix the vial contents using a vortex mixer or shake 25 times in about 7 seconds.**
- 4. Aseptically transfer 2.0mL of vial contents to 1000mL sterile deionised (or distilled) water. This will leave 1.0mL remaining in the vial, which may be used to prepare samples for intra-laboratory comparison purposes, if required by the laboratory.**
- 5. Shake the sample bottle 25 times to produce the simulated water sample.**
- 6. Examine the sample using your routine test methods.**

MICROBIOLOGICAL WATERS PROFICIENCY TESTING PROGRAM

ROUND 30 – SEPTEMBER 2007

RESULTS SHEET

Laboratory Code:

Test	Technique	Result 1	Result 2	Method Source/ Year
<i>E. coli</i> (orgs/100mL)	MF			
	MPN			
	Colilert			
Faecal Coliforms (orgs/100mL)	MF			
	MPN			
	Colilert			
Total Coliforms (orgs/100mL)	MF			
	MPN			
	Colilert			
Enterococci (orgs/100mL)	MF			
	MPN			
	Colilert			
Plate Count 37°C or 35°C (orgs/mL)				

Date Sample: Received

Date Sample: Processed

Comments

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-- End of Report --