Proficiency testing
Drinking water Microbiology

September 2026

Linnea Blom

Livsmedelsverket
Swedish Food Agency

PT micro
Since 1981

This report is available at: www.livsmedelsverket.se/en/PT-micro

© Swedish Food Agency, 2026.

Author
Linnea Blom

Recommended citation
Blom, L. 2026. PT Drinking water Microbiology – September 2026, Swedish Food Agency, Uppsala, Sweden.

Edition
Final report, version 1.0 (2026-11-02)

Editor in chief
Maria Sitell, head of the Unit for Microbiology, Swedish Food Agency

Responsible for the scheme
Linnea Blom, microbiologist, Unit for Microbiology, Swedish Food Agency

Unique identification
PT Drinking water September 2026 is registered as no. 2025/04368 at the Swedish Food Agency

Confidentiality
The Swedish Food Agency is a government agency. This means that according to the principle of publicity, all communication to us is in principle considered to be public documents. In accordance with ISO 17043:2023, participant identities and PT results are treated as confidential, and are not shared with third parties, unless permission to do so is given by the participant or when Swedish law requires handing out documents or information about a participant. In the latter case, the principle of publicity is tried against the participant's need for confidentiality on an individual basis.

Accred. no. 1457
Proficiency testing
ISO/IEC 17043

Contents

Abbreviations 4
Analyses in this PT round 5
Method 6
Results 9
Coliform bacteria 10
Suspected thermotolerant coliform bacteria 13
Escherichia coli 15
Intestinal enterococci 18
Pseudomonas aeruginosa 20
Culturable microorganisms, 22 ± 2 °C for 68 ± 4 hours 22
Culturable microorganisms, 36 ± 2 °C for 44 ± 4 hours 24
Outcome of the results of individual participants - assessment 26
Test material and quality control 29
References 31

Abbreviations

Culture media

BEAA	Bile Esculin Azide Agar (EN ISO 7899-2:2000)
CCA	Chromogenic Coliform Agar (EN ISO 9308-1:2014)
Colilert	Colilert® Quanti-Tray® (IDEXX Inc.; EN ISO 9308-2:2014)
Enterolert	Enterolert® Quanti-Tray® (IDEXX Inc.)
LES	m-Endo Agar LES (SS 028167)
LTLSB	Lactose Tryptone Lauryl Sulphate Broth (SS 028167)
m-Ent	m-Enterococcus Agar (EN ISO 7899-2:2000)
m-FC	m-FC Agar (SS 028167)
PACN	Pseudomonas Agar base/CN agar (EN ISO 16266:2008)
PCA	Plate Count Agar
Pseudalert	Pseudalert® Quanti-Tray® (IDEXX Inc.; ISO 16266-2:2018)
YEA	Yeast Extract Agar (EN ISO 6222:1999)

Other abbreviations

MF	Membrane filtration (method)
MPN	Most Probable Number (a statistical method for estimating microbial concentrations)
ISO	International Organization for Standardization
EN	European Standard developed by the European Committee for Standardisation
DS, NS, SFS, SS	National standards from Denmark, Norway, Finland and Sweden
SLV	Swedish Food Agency (Livsmedelsverket)

Analyses in this PT round

Quantitative analyses

Coliform bacteria

Suspected thermotolerant coliform bacteria (not assessed)

Escherichia coli

Intestinal enterococci

Pseudomonas aeruginosa

Culturable microorganisms, incubated at 22 ± 2 °C for 68 ± 4 hours

Culturable microorganisms, incubated at 36 ± 2 °C for 44 ± 4 hours

Method

Reporting of results and method information

It is the responsibility of each participant to report results in accordance with the provided instructions. Results that are incorrectly reported, for example results reported for the wrong sample, cannot be processed correctly. As a general rule, such results are excluded, but may be assessed on a case-by-case basis by the Swedish Food Agency and may still be included in the evaluation.

Participants are also required to report method information for all analyses. In some cases, this information may be contradictory or difficult to interpret, for example when manual comments provided by the participant conflict with the reported method details. In such instances, the reported method information is generally used "as is" in method comparisons. Alternatively, method data that are difficult to interpret may be excluded or categorised under "Other", together with results from methods and media used by only one or two participants.

Standard deviation and assigned value

The evaluation of the participants' results, and all statistical calculations are performed on square-root-transformed data. Results reported as "> value" or "< value" are not included in the evaluation.

A robust statistical approach is applied to determine the mean value and standard deviation. Algorithm A with iterated scale as described in ISO 13528:2022 [1], is used to determine the robust mean (m_{PT}) and robust standard deviation (s_{PT}) of the participants' results. Results that are obviously erroneous are excluded prior to determining m_{PT} and s_{PT}. For evaluated parameters, the assigned value is defined as m_{PT}. It is regarded as the true, normative value.

For small datasets, there is an increased uncertainty associated with determining the robust mean (m_{PT}) and robust standard deviation (s_{PT}) of the participants' results. Therefore, when fewer than 12 participants have reported evaluated results, the statistical measures for performance evaluation are provided for information purposes only.

Outliers

Outliers are results that deviate from the other results in a way that cannot be explained by normal variation. Results within $m_{PT} \pm 3s_{PT}$ are considered acceptable, whereas results outside this interval are considered as outliers. When fewer than 12 participants have reported results, or in certain individual cases, subjective adjustments may be applied to establish acceptance limits based on prior knowledge of the sample composition.

Results from different methods

Non-robust median values (*Med*) and coefficients of variation (*CV*) are calculated to assist in the evaluation of the results from different methods. These are presented in tables in the report, alongside the corresponding analyses. In these instances, *Med* and *CV* are calculated from the respective method

groups' results, with outliers and false results excluded. For method groups with fewer than five results, only the number of erroneous results and outliers are provided.

Coefficient of variation

The coefficient of variation (*CV*) is a relative measure calculated as follows:

$$CV = 100 \times \frac{s_{\mathrm{PT}}}{m_{\mathrm{PT}}}$$

The *CV* for square root transformed results is used as a measure of dispersion. A *CV* of less than 10 % it is regarded as very small; 10–20 % as small; 20–30 % as moderate, 30–40 % as large and greater than 40 % as very large.

Measurement uncertainty for the assigned value

The standard uncertainty (u_{PT}) of the assigned value (m_{PT}) is estimated from the standard deviation (s_{PT}) and the number of evaluated results (n):

$$u_{\mathrm{PT}} = 1.25 \times \frac{s_{\mathrm{PT}}}{\sqrt{n}}$$

The measurement uncertainty is considered negligible in relation to the standard deviation (used for performance evaluation) when:

$$u_{\mathrm{PT}} < 0.3 s_{\mathrm{PT}}$$

The relative standard uncertainty (u_{rel}) of m_{PT} is also provided in Appendix 1.

$$u_{\mathrm{rel,mPT}}(\%) = 100 \times \frac{s_{\mathrm{PT}}}{\sqrt{n} \cdot m_{\mathrm{PT}}}$$

Z-scores

To enable comparison of the results from different analyses and samples, results are transformed into standard values (*z*-scores). *Z*-scores are calculated as:

$$z = \frac{x_{\mathrm{lab}} - m_{\mathrm{PT}}}{s_{\mathrm{PT}}}$$

where x_{lab} is the square-root-transformed result reported by the individual participant.

Z-scores for individual analyses are presented in Appendix 2 and may be used by participants to follow up on their results. For quantitative analyses, the *z*-score is either positive or negative, depending on whether the participants result is higher or lower than m_{PT}.

In the evaluation of analytical results, the following guidelines may be applied:

$\lvert z \rvert \leq 2$	indicates that the result is acceptable
$2 < \lvert z \rvert < 3$	indicates a warning that the result may deviate from the assigned value and may require follow-up actions.
$\lvert z \rvert \geq 3$	indicates that the result is considered deviating and requires follow-up actions.

Table legends

N	number of participants reporting results for the analysis
n	number of participants with acceptable results (excluding erroneous results and outliers)
m_{PT}	assigned value, i.e. the robust mean, expressed in cfu or MPN per 100 ml or cfu per ml, after back-transformation to the original scale
Med	median, expressed in cfu or MPN per 100 ml
CV	coefficient of variation, expressed as a percentage
F	number of false-positive or false-negative results
<	number of low outliers
>	number of high outliers

Figure legends

▒	results within the acceptance interval
■	outlier
□	false-negative result
*	value outside the x-axis scale

Web portal

Individual results can also be viewed on the web portal: https://laboratory.livsmedelsverket.se



Statistical measures shown on the web portal may occasionally differ from the statistics shown in this report. In these cases, the statistics presented in this report take precedence over those displayed on the web portal.

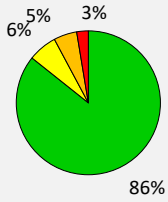
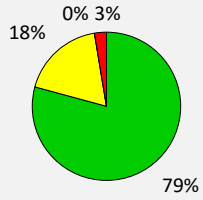
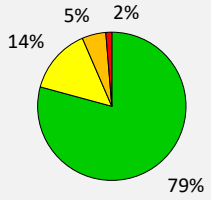
Results

General outcome

Samples were distributed to 77 participants: 31 in Sweden, 44 in other European countries, and two outside Europe. Of the 76 participants who reported results, 36 (47 %) provided at least one result that received an annotation.

Individual results are presented in Appendix 1. *Z*-scores for individual results are presented in Appendix 2.

Table 1. Composition of the test material and number of reported and deviating results (*N* = number of reported results, *F* = false positive or false negative results, *X* = outliers)

	Sample A				Sample B				Sample C			
% participants with 0 annotations 1 annotation 2 annotations >2 annotations												
Microorganisms	*Escherichia coli* *Citrobacter freundii* *Enterococcus faecalis* *Pseudomonas aeruginosa* *(Clostridium perfringens)*				*Klebsiella pneumoniae* *Klebsiella aerogenes* *Enterococcus hirae* *Burkholderia cepacia complex* *Staphylococcus capitis*				*Escherichia coli* *Aeromonas caviae* *Pseudomonas aeruginosa* *Bacillus subtilis*			
Analysis	**Target organism**	***N***	***F***	***X***	**Target organism**	***N***	***F***	***X***	**Target organism**	***N***	***F***	***X***
Coliform bacteria	***E. coli*** ***C. freundii***	111	0	6	***K. pneumoniae*** ***K. aerogenes***	111	0	1	***E. coli*** *(A. caviae)*	112	1	5
Suspected thermotolerant coliform bacteria	***E. coli***	19	0	0	***K. pneumoniae*** *K. aerogenes*	16	0	0	***E. coli***	18	0	0
E. coli	***E. coli***	116	2	5	*(K. pneumoniae)*	113	2	0	***E. coli***	116	0	6
Intestinal enterococci	***E. faecalis***	91	1	1	***E. hirae***	91	2	5	-	87	2	0
P. aeruginosa	***P. aeruginosa***	56	0	1	*(B. cepacia complex)*	56	2	0	***P. aeruginosa***	57	6	0
Culturable microorganisms at 22°C for 3 days	***All except C. perfringens***	75	0	3	***All except S. capitis***	75	0	3	***All***	75	0	3
Culturable microorganisms at 36 °C for 2 days	***All except C. perfringens***	57	1	3	***All***	57	1	6	***All***	57	0	2

- no target organism or no value

microorganism = main target organism

microorganism = The microorganism may yield different results depending on method or definition used

(*microorganism*) = false-positive result before confirmation

Results not evaluated

Coliform bacteria

Sample A

The strains of *E. coli* and *C. freundii* were the target organisms. Both form typical colonies with a metallic sheen on LES. On CCA, *E. coli* produces blue colonies, whereas *C. freundii* forms pink colonies. Both strains possess the enzyme β-galactosidase and are detected as coliform bacteria using the most probable number (MPN) method according to ISO 9308-2.

In total, 111 results were reported. One high outlier and five low outliers were identified.

Sample B

The strains of *K. pneumoniae* and *K. aerogenes* were the target organisms. *K. pneumoniae* forms typical colonies on most membrane filtration media incubated at 35/36/37 °C. The strain of *K. aerogenes* forms pink colonies on CCA. However, its colonies do not exhibit a distinct metallic sheen on LES. Both strains possess the enzyme β-galactosidase and are detected as coliform bacteria with MPN-methods.

On CCA, *S. capitis* may form small, atypical pink colonies that should not be included in the result.

In total, 111 results were reported. One low outlier was identified. The outlier was reported for ISO 9308-1 using CCA and was therefore not related to the colony morphology of *K. aerogenes* on LES.

Sample C

The strain of *E. coli* was the target organism. The oxidase-positive strain of *A. hydrophila* was included as a non-target organism that could potentially cause false-positive results.

In total, 112 results were reported. One false-negative result, three high outliers and two low outliers were identified.

General remarks

MPN-based method

Twenty-seven per cent of participants used the MPN-based method, (EN) ISO 9308-2:2012. This standard was last reviewed and confirmed by ISO in 2023 and remains current. It should be noted, however, that a new edition is under development. The main changes compared with the previous edition include the removal of specific trademarks and manufacturer names in favour of generic terms where appropriate, changes to quality control cultures, the addition of criteria for the performance testing of culture media, and revised definitions of coliform bacteria and *E. coli.*

With ISO 9308-2:2012, coliform bacteria are defined as organisms that possess β-D-galactosidase and cleave ortho-nitrophenyl-β-D-galactoside, producing a yellow colour within 20 ± 2 h. The MPN of coliform bacteria per 100 ml of sample is then determined using statistical tables or appropriate software.

Membrane filtration methods

For membrane filtration (MF) methods, most participants followed (EN) ISO 9308-1:2014 using the enzyme-based chromogenic medium CCA. Due to its relatively low selectivity, CCA is particularly suitable for waters with low background bacterial flora. On CCA, β-D-galactosidase-positive colonies (pink to red) are enumerated as presumptive coliform bacteria, while colonies positive for both β-D-galactosidase and β-D-glucuronidase (dark blue to violet) are identified as *E. coli.* The total coliform count is calculated as the sum of oxidase-negative presumptive coliform bacteria and *E. coli*. ISO 9308-1:2014 was last reviewed and confirmed in 2019 and remains current. An amendment addressing incubation time and performance testing of CCA is available (ISO 9308-1:2014/Amd 1:2016).

In addition, the Nordic national standards SS 028167 and SFS 3016 are based on incubation on LES agar. On LES, coliform bacteria form red colonies with a characteristic metallic sheen due to aldehyde production from lactose fermentation. Presumptive coliform bacteria are subsequently confirmed by a negative oxidase test.

Comparison of results obtained using different methods

Most of the deviations were observed among participants that used ISO 9308-1 with CCA. This was true in particular for low outliers for Sample A. The median result for Sample A was also lower for ISO 9308-1 (CCA) than for ISO 9308-2 (MPN), 226 cfu/100 ml and 272 cfu/100 ml, respectively. Participants that used CCA without specifying the method reported an even lower median of 199 cfu/100 ml.

Note: Three results were excluded from the calculations of m_{PT} and s_{PT} as they could be caused by conversion errors. These results are highlighted in blue in Appendix 1.

Table 2. Results from analysis of coliform bacteria.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>
All results	**111**	**105**	**244**	**15**	**0**	**5**	**1**	**111**	**110**	**370**	**14**	**0**	**1**	**0**	**112**	**106**	**156**	**12**	**1**	**2**	**3**
ISO 9308-2 (MPN)	30	29	272	12	0	1	0	30	30	394	13	0	0	0	30	29	160	12	0	0	1
ISO 9308-1 (CCA)	27	23	226	16	0	4	0	26	25	350	14	0	1	0	27	24	151	13	1	1	1
Colilert-18	19	18	250	11	0	0	1	19	19	410	11	0	0	0	19	19	145	8	0	0	0
SFS 3016 (LES)	11	11	260	17	0	0	0	11	11	315	13	0	0	0	11	11	170	11	0	0	0
Coliform Chromogenic Agar	6	6	199	22	0	0	0	8	8	384	12	0	0	0	7	6	149	14	0	1	0
Other	6	6	210	27	0	0	0	5	5	350	19	0	0	0	6	5	150	17	0	0	1
SS 028167 (LES)	5	5	250	10	0	0	0	5	5	395	17	0	0	0	5	5	168	7	0	0	0
ISO 9308-1:1990 (old edition, LES)	3	3	-	-	0	0	0	3	3	-	-	0	0	0	3	3	-	-	0	0	0
Colilert	2	2	-	-	0	0	0	2	2	-	-	0	0	0	2	2	-	-	0	0	0
m-Endo Agar LES (LES)	2	2	-	-	0	0	0	2	2	-	-	0	0	0	2	2	-	-	0	0	0

For "All results", m_{PT} = assigned value (robust mean), back-transformed to the original cfu / 100 ml or MPN / 100 ml scale, as applicable.
For individual methods, m_{PT} = median value, expressed in cfu / 100 ml or MPN / 100 ml, as applicable.

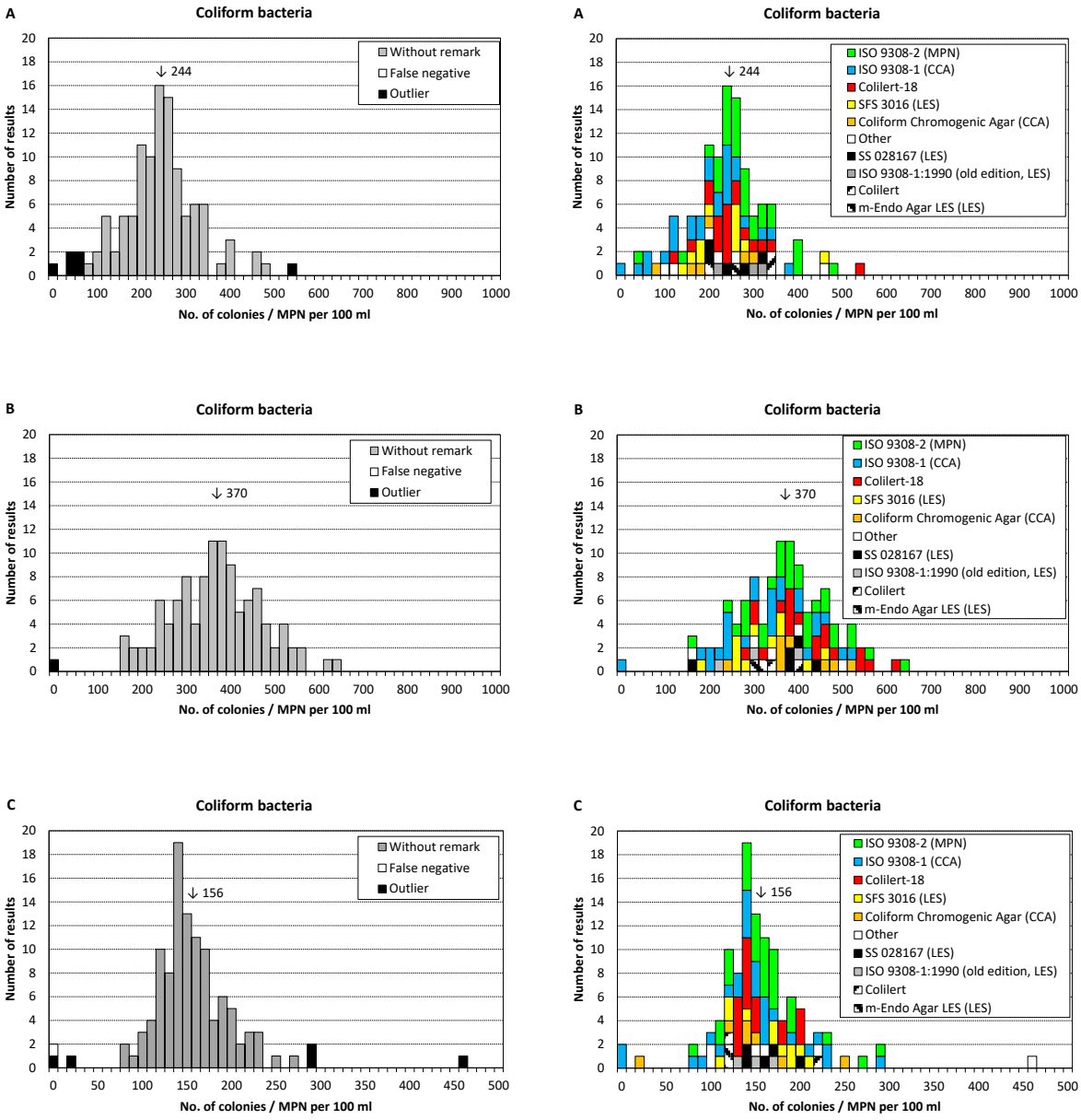


Figure 1. Results from analysis of coliform bacteria

Suspected thermotolerant coliform bacteria

Sample A

The strain of *E. coli* was the target organism. On m-FC agar, it forms typical blue colonies when incubated at 44 °C or 44.5 °C.

In total, 19 results were reported.

Sample B

The strain of *K. pneumoniae* was the target organism. On m-FC agar, it forms typical blue colonies when incubated at 44 °C or 44.5 °C.

The strain of *K. aerogenes* may also grow as a suspected thermotolerant coliform bacterium, forming small blue to grey colonies on m-FC agar.

In total, 16 results were reported, including two zero results.

Sample C

The strain of *E. coli* (different from the strain used in Sample A) was the target organism. On m-FC agar, it forms blue colonies when incubated at 44 °C or 44.5 °C.

In total, 18 results were reported.

General remarks

The parameter suspected thermotolerant coliform bacteria is not evaluated in this proficiency test. The performance statistics in Appendices 1 and 2 are provided for information only.

Most participants used methods based on m-FC agar. The elevated incubation temperature in combination with the addition of rosolic acid in m-FC agar provides selectivity for thermotolerant coliform bacteria.

Different standards specify slightly different incubation temperatures, for example 44.0 ± 0.5 °C and 44.5 ± 0.2 °C. Such variations may influence the detection of suspected thermotolerant coliform bacteria and contribute to differences between methods.

Note: The performance statistics in Appendices 1 and 2 are provided for information only. In addition, for Sample B, the uncertainty of the assigned value (u_{PT}) is not negligible. The z-scores presented in Appendix 2 should therefore be interpreted with particular caution.

Table 3. Results from analysis of suspected thermotolerant coliform bacteria.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>
All results	**19**	**19**	**114**	**25**	**0**	**0**	**0**	**16**	**16**	**264**	**13**	**0**	**0**	**0**	**18**	**18**	**125**	**15**	**0**	**0**	**0**
Other	6	6	158	19	0	0	0	3	3	-	-	0	0	0	5	5	170	17	0	0	0
SS 028167 (m-FC)	4	4	-	-	0	0	0	4	4	-	-	0	0	0	4	4	-	-	0	0	0
SFS 4088 (m-FC)	4	4	-	-	0	0	0	4	4	-	-	0	0	0	4	4	-	-	0	0	0
ISO 9308-1:1990 (old edition, m-FC)	2	2	-	-	0	0	0	2	2	-	-	0	0	0	2	2	-	-	0	0	0
NS 4792 (m-FC)	2	2	-	-	0	0	0	2	2	-	-	0	0	0	2	2	-	-	0	0	0
m-FC Agar (m-FC)	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	0	0

For "All results", m_{PT} = assigned value (robust mean), back-transformed to the original cfu / 100 ml scale.

For individual methods, mPT = median value, expressed in cfu / 100 ml.

The parameter suspected thermotolerant coliform bacteria is not evaluated and the performance statistics is provided for information only.

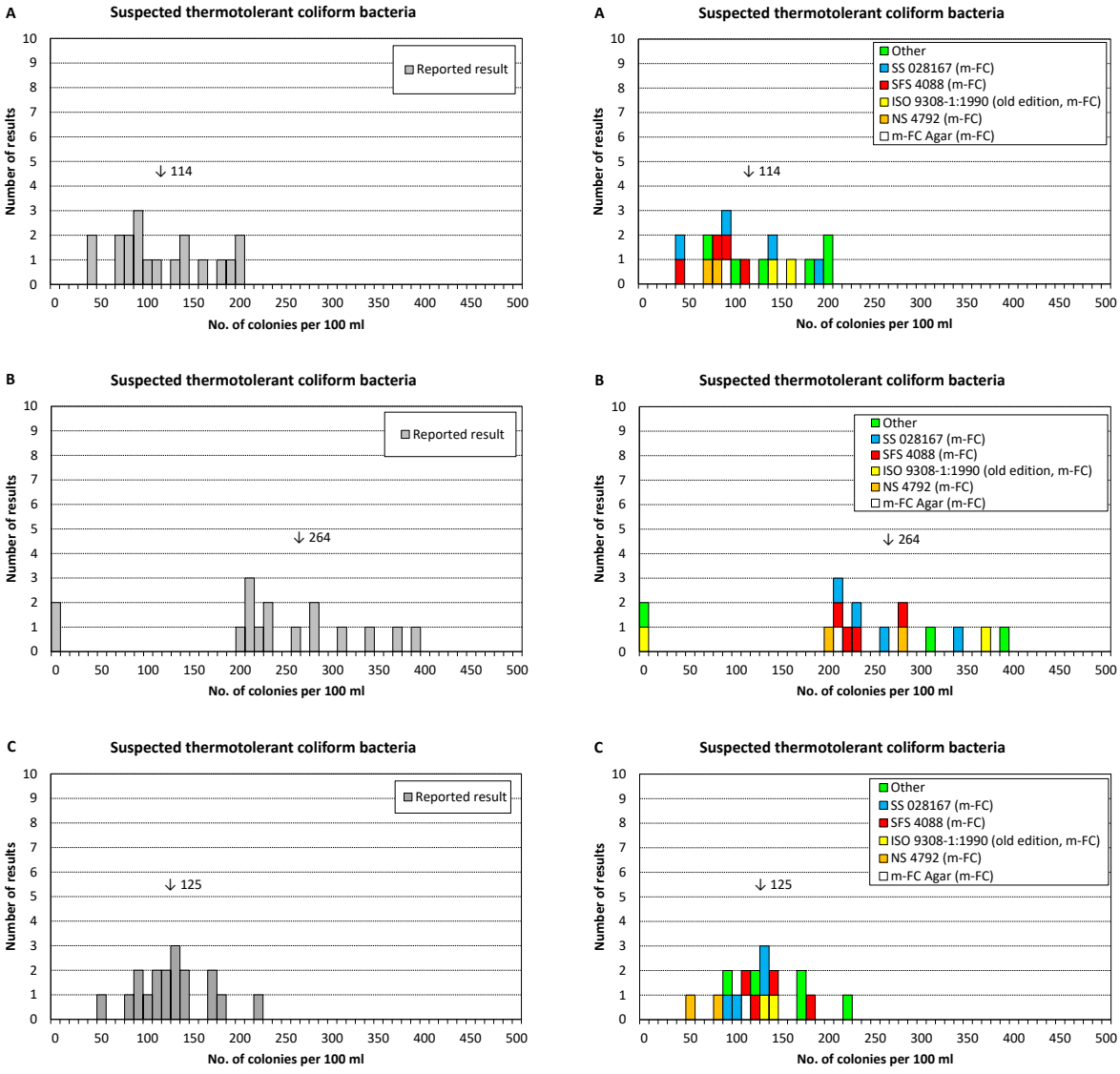


Figure 2. Results from analysis of suspected thermotolerant coliform bacteria

Escherichia coli

Sample A

The strain of *E. coli* was the target organism. It forms typical colonies with a metallic sheen on LES and blue colonies on CCA. It possesses the enzyme β-glucuronidase and is therefore detected as *E. coli* with the MPN-based method ISO 9308-2. The strain is positive for indole production and produces gas in Lactose-Tryptone-Lauryl Sulphate Broth (LTLSB).

In total, 116 results were reported. Two false-negative results, as well as one high and four low outliers were identified.

Sample B

No target organism was present in the sample. The thermotolerant strain of *K. pneumoniae* was included as a non-target organism that could potentially cause false-positive results.

In total, 113 results were reported. Two false-positive results were reported.

Sample C

The strain of *E. coli* (different from the strain used in Sample A) was the target organism. It has a typical appearance on most MF media, as well as in MPN methods at 35/36/37 °C. The strain is positive for indole production and produces gas in LTLSB.

In total, 116 results were reported. Three high outliers and three low outliers were identified.

General remarks

Most participants used (EN) ISO 9308-2:2012, (EN) ISO 9308-1:2014 and/or Nordic national standards (see table 4). According to (EN) ISO 9308, *E. coli* is defined as a member of the Enterobacteriaceae that possesses both β-D-galactosidase and β-D-glucuronidase enzymes. On CCA, strains positive for both enzymes appear as dark blue to violet colonies. In the MPN method, yellow wells exhibiting fluorescence are interpreted as positive for *E. coli*, with no further confirmation required.

For colonies isolated on LES or m-FC, confirmation is required. As (EN) ISO 9308-1:2014 only requires the detection of β-D-glucuronidase activity, some participants have adapted their confirmation procedures accordingly. Depending on the method applied, confirmation typically includes tests for gas production, indole production and/or β-D-glucuronidase activity performed on oxidase-negative presumptive colonies.

The primary MF growth media CCA and LES are incubated at 35/36/37 °C, whereas m-FC agar is incubated at 44/44.5 °C.

ISO is currently developing ISO/FDIS 9308-4, *Water quality — Enumeration of Escherichia coli and coliform bacteria — Part 4: Membrane filtration method for Escherichia coli in water with high levels of background bacteria.* The method is based on membrane filtration, followed by incubation at 44 °C

on a chromogenic agar medium containing a substrate for the detection of the enzyme β-D-glucuronidase. Due to its high specificity, the method is considered suitable for the analysis of water samples with elevated levels of background bacteria.

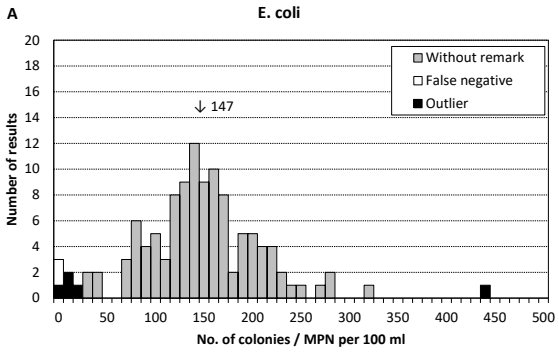
E. coli was present in samples A and C, and the methods showed relatively similar median results, although ISO 9308-2 (MPN) yielded somewhat higher values than ISO 9308-1 (CCA) in both samples. The CV values were generally low, indicating limited dispersion in the results.

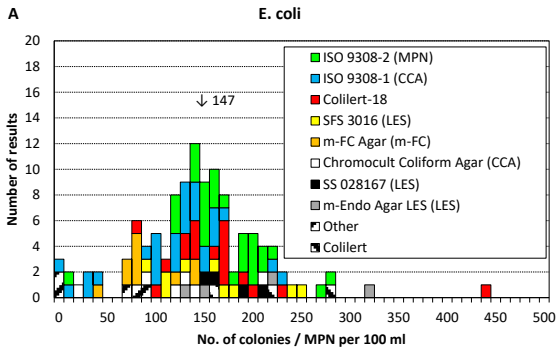
Note: Two results were excluded from m_{PT} and s_{PT} calculations but included in the evaluation. Excluded results are highlighted in blue in Appendix 1.

Table 4. Results from analysis of *Escherichia coli*.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>
All results	**116**	**109**	**147**	**18**	**2**	**4**	**1**	**113**	**111**	**-**	**-**	**2**	**-**	**-**	**116**	**110**	**149**	**11**	**0**	**3**	**3**
ISO 9308-2 (MPN)	29	28	171	11	0	1	0	30	29	-	-	1	-	-	30	27	160	9	0	1	2
ISO 9308-1 (CCA)	28	26	130	20	0	2	0	29	29	-	-	0	-	-	28	27	140	12	0	1	0
Colilert-18	18	17	160	12	0	0	1	18	18	-	-	0	-	-	19	19	145	8	0	0	0
SFS 3016 (LES)	9	9	160	17	0	0	0	10	9	-	-	1	-	-	10	10	175	11	0	0	0
Chromocult Coliform Agar	6	5	136	16	0	1	0	3	3	-	-	0	-	-	6	6	149	14	0	0	0
SS 028167 (LES)	4	4	-	-	0	0	0	4	4	-	-	0	-	-	4	4	-	-	0	0	0
SS 028167 (m-FC)	4	4	-	-	0	0	0	4	4	-	-	0	-	-	4	4	-	-	0	0	0
Other	5	3	-	-	2	0	0	3	3	-	-	0	-	-	3	2	-	-	0	0	1
Colilert	3	3	-	-	0	0	0	2	2	-	-	0	-	-	2	2	-	-	0	0	0
ISO 9308-1:1990 (old edition, LES)	2	2	-	-	0	0	0	2	2	-	-	0	-	-	2	2	-	-	0	0	0
m-Endo Agar LES (LES)	2	2	-	-	0	0	0	2	2	-	-	0	-	-	2	2	-	-	0	0	0
NS 4792 (m-FC)	2	2	-	-	0	0	0	2	2	-	-	0	-	-	2	1	-	-	0	1	0
SFS 4088 (m-FC)	2	2	-	-	0	0	0	2	2	-	-	0	-	-	2	2	-	-	0	0	0
m-FC Agar (m-FC)	1	1	-	-	0	0	0	1	1	-	-	0	-	-	1	1	-	-	0	0	0
ISO 9308-1:1990 (old edition, m-FC)	1	1	-	-	0	0	0	1	1	-	-	0	-	-	1	1	-	-	0	0	0

For "All results", m_{PT} = assigned value (robust mean), back-transformed to the original cfu / 100 ml or MPN / 100 ml scale, as applicable.
For individual methods, m_{PT} = median value, expressed in cfu / 100 ml or MPN / 100 ml, as applicable.





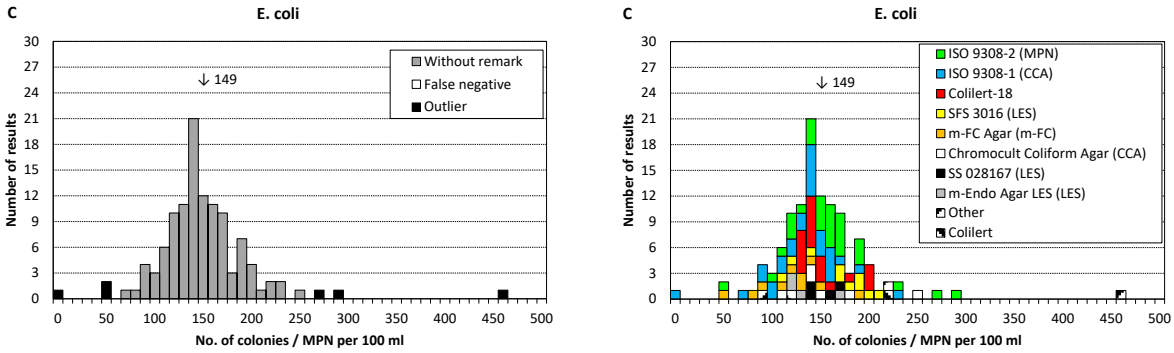


Figure 3. Results from analysis of *Escherichia coli*. The m-FC agar category includes results reported for SS 028167 (m-FC), SFS 4088 (m-FC), NS 4792 (m-FC), ISO 9308-1:1990 (old edition, m-FC) and m-FC agar (method not specified). The m-Endo agar LES category includes results reported for ISO 9308-1:1990 (old edition, LES) and m-Endo agar LES (method not specified).

Intestinal enterococci

Sample A

The strain of *E. faecalis* was the target organism. On m-Enterococcus Agar (m-Ent), it forms raised, red to maroon colonies. Upon confirmation on Bile Esculin Azide Agar (BEAA), a distinct black colour is typically seen.

In total, 91 results were reported. One false-negative result and one low outlier were identified.

Sample B

The strain of *E. hirae* was the target organism. On m-Ent, it forms raised, red colonies. Upon confirmation on BEAA, a distinct black colour is typically seen.

In total, 91 results were reported. Two false-negative results and five low outliers were identified.

Sample C

No target organism was present in the sample.

In total, 87 results were reported, including two false-positive results.

General remarks

Most participants used (EN) ISO 7899-2:2000 with m-Ent (Slanetz & Bartley) medium. In this method, presumptive intestinal enterococci are detected through the reduction of 2,3,5-triphenyltetrazolium chloride to formazan, resulting in red to maroon colonies. Confirmation is based on aesculin hydrolysis on BEAA at 44 °C, indicated by blackening of the medium. ISO 7899-2:2000 was last reviewed and confirmed by ISO in 2021 and remains current.

For MPN methods, 18 results were reported using Enterolert-E and 15 using Enterolert-DW, six of which were reported under ISO 7899-3:2025. This standard, which specifies an MPN method for the enumeration of intestinal enterococci, was published by ISO in July 2025.

Enterolert-DW detects intestinal enterococci using Defined Substrate Technology (DST). The nutrient indicator contains ortho-nitrophenyl-β-D-glucoside, and its metabolism by enterococci results in a colour change from blue to green, indicating a positive result. In contrast, Enterolert-E uses a proprietary DST nutrient indicator that fluoresces when metabolised by enterococci.

The m-Ent medium used for membrane filtration is incubated at 36 ± 2 °C, whereas Enterolert-E and Enterolert-DW are incubated at 41 ± 0.5 °C.

ISO 7899-2 (m-Ent) was the most frequently used method. For this method, the median results were higher than the overall assigned values (robust means) in both samples. Among the MPN-based methods, Enterolert-E yielded lower median results than Enterolert-DW, particularly in Sample B. The CV’s were generally low, indicating limited dispersion in the results.

Table 5. Results from analysis of intestinal enterococci.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>
All results	**91**	**89**	**579**	**9**	**1**	**1**	**0**	**91**	**84**	**573**	**9**	**2**	**5**	**0**	**87**	**85**	**-**	**-**	**2**	**-**	**-**
ISO 7899-2 (m-Ent)	55	53	590	8	1	1	0	55	51	595	7	2	2	0	53	51	-	-	2	-	-
Enterolert-E	18	18	548	9	0	0	0	18	15	520	9	0	3	0	16	16	-	-	0	-	-
Enterolert-DW	9	9	568	8	0	0	0	8	8	623	6	0	0	0	8	8	-	-	0	-	-
ISO 7899-3 (MPN)	6	6	539	5	0	0	0	7	7	565	14	0	0	0	7	7	-	-	0	-	-
Other	2	2	-	-	0	0	0	2	2	-	-	0	0	0	2	2	-	-	0	-	-
m-Enterococcus Agar (m-Ent)	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	-	-

For "All results", m_{PT} = assigned value (robust mean), back-transformed to the original cfu / 100 ml or MPN / 100 ml scale, as applicable.
For individual methods, m_{PT} = median value, expressed in cfu / 100 ml or MPN / 100 ml, as applicable.

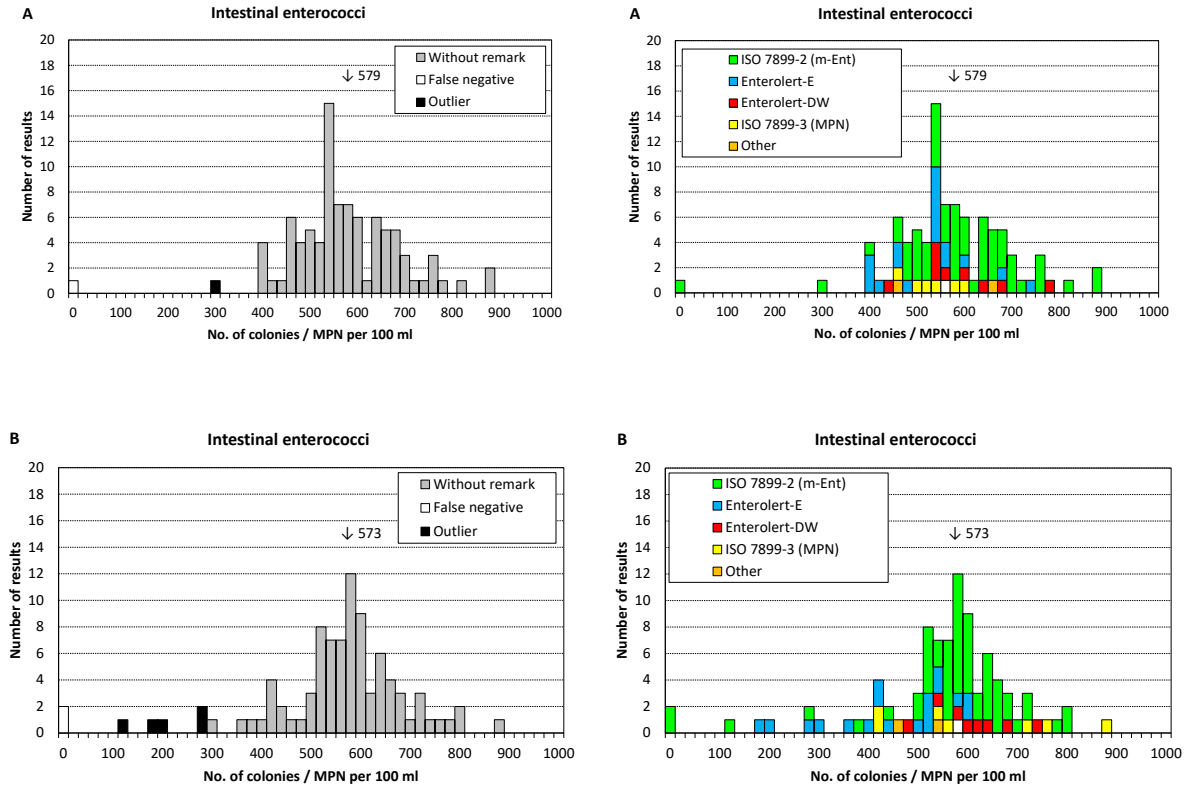


Figure 4. Results from analysis of intestinal enterococci.

Pseudomonas aeruginosa

Sample A

The strain of *P. aeruginosa* was the target organism. On Pseudomonas Agar base/CN agar (PACN), it forms typical blue-green colonies that fluoresce under UV light. Due to the presence of blue-green pigmentation and fluorescence observed on PACN, no further confirmation of the colonies was required, in accordance with (EN) ISO 16266.

In total, 56 results were reported. One low outlier was identified.

Note: One result was excluded from the m_{PT} and s_{PT} calculations but included in the evaluation. The excluded result is highlighted in blue in Appendix 1.

Sample B

No target organism was present in the sample. On PACN, *B. cepacia* complex may form transparent yellow colonies.

In total, 56 results were reported. Two false-positive results were reported.

Sample C

The strain of *P. aeruginosa* (which differed from the strain used in Sample A) was the target organism. On PACN agar, it forms small, light-green colonies that fluoresce under UV light. The strain is oxidase-positive.

In total, 57 results were reported, of which six were false negatives. All false-negative results were obtained using culture-based methods, either ISO 16266 (PACN) or PACN with an unspecified method. The strain exhibits atypical colony morphology on PACN, which may have contributed to the false-negative results observed with the culture-based methods.

General remarks

Most participants used the standard (EN) ISO 16266:2006. According to this, *P. aeruginosa* is identified by its ability to grow on selective media containing cetrimide and produce pyocyanin, or by its ability to grow on such media, exhibit oxidase activity and fluorescence under UV light, and produce ammonia from acetamide. ISO 16266:2006 was last reviewed and confirmed by ISO in 2021 and remains current.

Since some reagents used in the confirmation procedure are considered hazardous, some laboratories have modified the standard by replacing the prescribed confirmation tests with alternative methods. However, when typical blue-green, pyocyanin-producing colonies are observed, further confirmation is not required.

Nineteen participants reported results obtained using Pseudalert according to (EN) ISO 16266-2:2018. This method is based on the growth of *P. aeruginosa* in a liquid nutrient medium, combined with enzyme detection technology. An enzyme produced by actively growing *P. aeruginosa* cells hydrolyses

a substrate in the Pseudalert reagent, resulting in blue fluorescence under UV light. Enumeration is performed using MPN tables. ISO 16266-2:2018 was last reviewed and confirmed by ISO in 2024 and remains current.

For Sample A, the median obtained with Pseudalert was somewhat lower than that obtained with ISO 16266 (142 and 164 cfu/MPN per 100 ml, respectively). For sample C, Pseudalert yielded a higher median than ISO 16266 (488 and 340 cfu/MPN per 100 ml, respectively). All six false-negative results for Sample C were reported by participants that used culture-based methods. The strain of *P. aeruginosa* in Sample C exhibited atypical colony morphology on PACN, which may have contributed to the false-negative results. Background flora may also have affected the recovery of *P. aeruginosa* with culture-based methods. However, the observed differences in the median may reflect several factors, including differences in the analytical methods and the potential influence of atypical colony morphology and background flora.

Table 6. Results from analysis of *P. aeruginosa.*

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>
All results	**56**	**55**	**158**	**23**	**0**	**1**	**0**	**56**	**54**	-	-	**2**	-	-	**57**	**51**	**354**	**21**	**6**	**0**	**0**
ISO 16266 (PACN)	29	28	164	22	0	1	0	29	28	-	-	1	-	-	29	25	340	22	4	0	0
ISO 16266-2 (Pseudalert)	19	19	142	29	0	0	0	19	19	-	-	0	-	-	19	19	488	22	0	0	0
PACN	7	7	200	23	0	0	0	7	6	-	-	1	-	-	8	6	327	15	2	0	0
Other	1	1	-	-	0	0	0	1	1	-	-	0	-	-	1	1	-	-	0	0	0

For "All results", m_{PT} = assigned value (robust mean), back-transformed to the original cfu / 100 ml or MPN / 100 ml scale, as applicable.
For individual methods, m_{PT} = median value, expressed in cfu / 100 ml or MPN / 100 ml, as applicable.

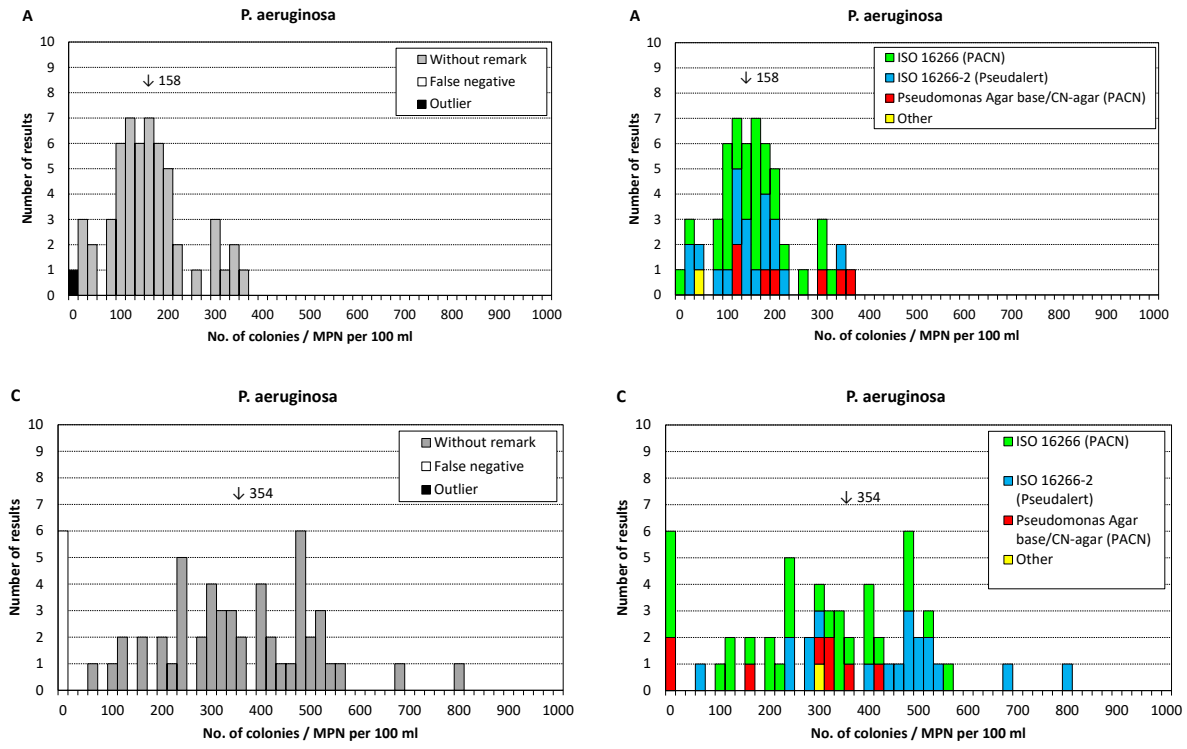


Figure 5. Results from analysis of *P. aeruginosa*.

Culturable microorganisms, 22 ± 2 °C for 68 ± 4 hours

Sample A

All the strains included in the sample, except *C. perfringens*, are capable of growing under the specified incubation conditions.

In total, 75 results were reported. Three high outliers were identified.

Sample B

The strains of *K. pneumoniae, K. aerogenes* and *E. hirae* were the main target organisms. The strain of *S. capitis* does not grow under the specified incubation conditions.

In total, 75 results were reported. One low and two high outliers were identified.

Sample C

All strains included in the sample were capable of growing under the specified incubation conditions.

In total, 75 results were reported. Three high outliers were identified.

General remarks

Most participants used the standard (EN) ISO 6222:1999, which specifies a pour-plate method using Yeast Extract Agar (YeA). With this method, culturable microorganisms are defined as microorganisms that form colonies on the specified medium under the prescribed incubation conditions. ISO 6222:1999 was last reviewed and confirmed by ISO in 2021 and remains current.

Some participants modified the standard by using Plate Count Agar (PCA) instead of YeA. The median results obtained using YeA and PCA were generally similar across the three samples, with no consistent differences apparent between the two media.

Table 7. Results from analysis of culturable microorganisms at 22 ± 2 °C for 68 ± 4 hours.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>
All results	**75**	**72**	**11**	**18**	**0**	**0**	**3**	**75**	**72**	**12**	**14**	**0**	**1**	**2**	**75**	**72**	**7**	**21**	**0**	**0**	**3**
ISO 6222 (YeA, pour plate)	51	50	10	17	0	0	1	51	50	11	15	0	0	1	50	48	6	23	0	0	2
ISO 6222 modified (PCA, pour plate)	14	13	11	16	0	0	1	14	13	13	15	0	1	0	15	15	7	15	0	0	0
Yeast extract Agar (YeA, pour plate)	5	5	9	7	0	0	0	5	5	11	15	0	0	0	5	5	6	21	0	0	0
Plate Count Agar (PCA, pour plate)	2	1	-	-	0	0	1	2	1	-	-	0	0	1	2	1	-	-	0	0	1
3M™ Petrifilm™	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	0	0

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>
Aerobic Count Plate																					
Compact Dry AQ	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	0	0
Yeast extract Agar (YeA, spread plate)	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	0	0

For "All results", m_{PT} = assigned value (robust mean), back-transformed to the original cfu per ml.

For individual methods, m_{PT} = median value, expressed in cfu per ml.

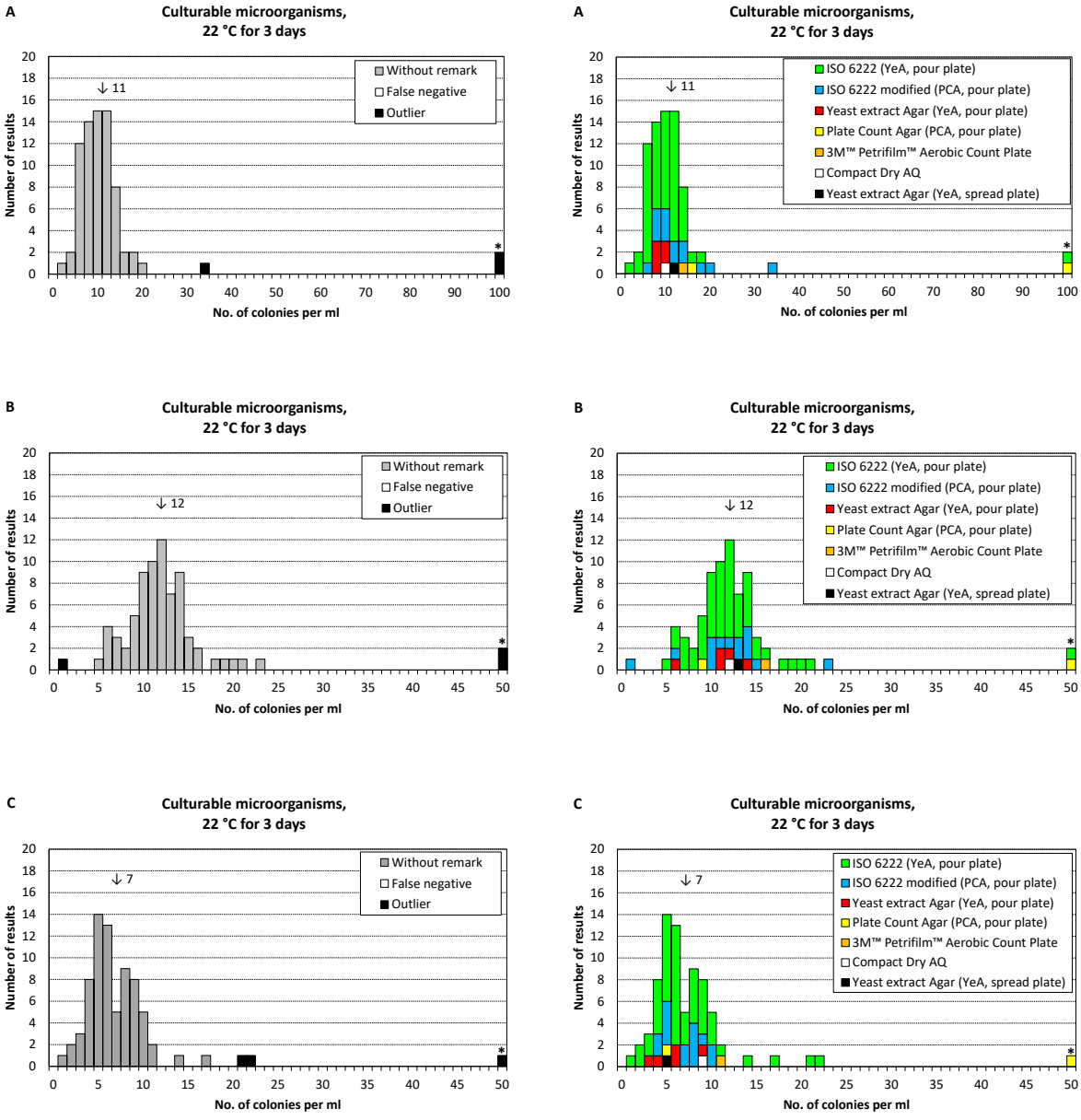


Figure 6. Results from analysis of culturable microorganisms at 22 ± 2 °C for 68 ± 4 hours.

Culturable microorganisms, 36 ± 2 °C for 44 ± 4 hours

Sample A

All strains included in the sample, except *C. perfringens*, were able to grow as culturable microorganisms under the specified incubation conditions.

In total, 57 results were reported. One false-negative result and three high outliers were identified.

Sample B

The strain of *S. capitis* was the main target organism. The strains of *K. pneumoniae*, *K. aerogenes*, and *E. hirae* were also able to grow as culturable microorganisms, but at low concentrations.

In total, 57 results were reported. One false-negative result, one high outlier, and five low outliers were identified.

Sample C

All strains included in the sample were able to grow as culturable microorganisms under the specified incubation conditions.

In total, 55 results were reported. Two high outliers were identified.

General remarks

Most participants used the standard (EN) ISO 6222:1999, although some participants used a modified method in which PCA was used instead of YeA. The median of the two media were generally comparable across the three samples.

In sample B, *S. capitis* was the main target organism. The strain was able to grow as a culturable micro-organism at 36 ± 2 °C but not at 22 ± 2 °C. The strains of *K. pneumoniae*, *K. aerogenes* and *E. hirae* were also able to grow under these conditions, although at low concentrations.

Table 8. Results from analysis of culturable microorganisms at 36 ± 2 °C for 44 ± 4 hours.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>
All results	**57**	**53**	**11**	**17**	**1**	**0**	**3**	**57**	**50**	**37**	**12**	**1**	**5**	**1**	**57**	**55**	**7**	**23**	**0**	**0**	**2**
ISO 6222 (YeA, pour plate)	35	34	11	15	0	0	1	35	33	40	10	0	2	0	35	35	6	18	0	0	0
ISO 6222 modified (PCA, pour plate)	13	12	9	17	1	0	0	13	10	33	10	1	1	1	13	12	5	25	0	0	1
Yeast extract Agar (YeA, pour plate)	4	4	-	-	0	0	0	4	4	-	-	0	0	0	4	4	-	-	0	0	0
Plate Count Agar	3	1	-	-	0	0	2	3	2	-	-	0	1	0	3	2	-	-	0	0	1

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>	*N*	*n*	m_{PT}	*CV*	*F*	<	>
(PCA, pour plate)																					
3M™ Petrifilm™ Aerobic Count Plate	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	0	0
Compact Dry AQ	1	1	-	-	0	0	0	1	0	-	-	0	1	0	1	1	-	-	0	0	0

For “All results”, m_{PT} represents the assigned value (robust mean), back-transformed to the original cfu / ml.

For individual methods, m_{PT} represents the median value, expressed in cfu / ml.

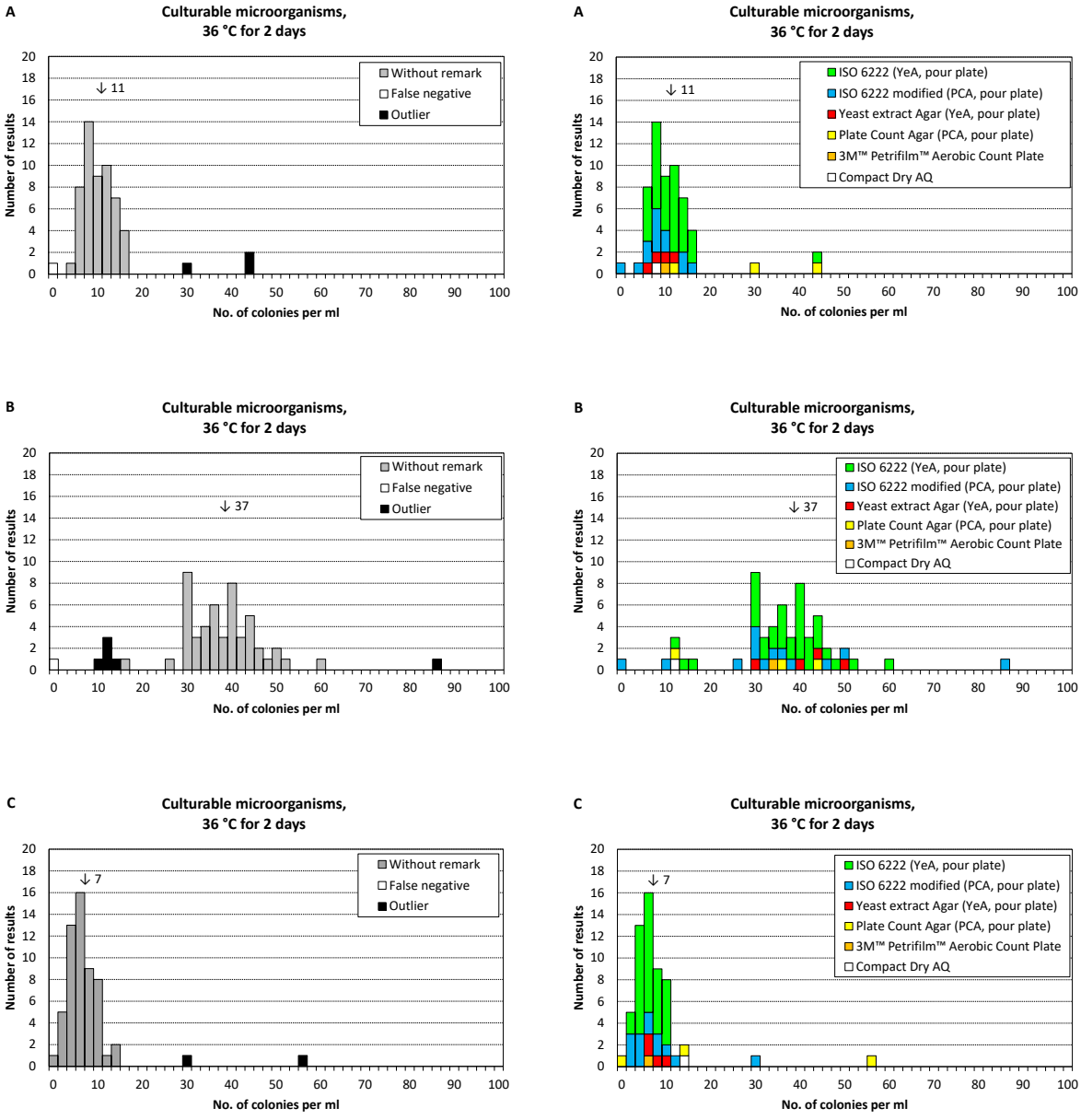


Figure 7. Results from analysis of culturable microorganisms, 36 ± 2 °C for 44 ± 4 hours.

Outcome of the results of individual participants - assessment

Reporting and evaluation of results

The results of all participants are listed in Appendix 1, together with the minimum and maximum accepted values for each analytical parameter. Outliers and false results are highlighted in yellow and red, respectively, and are shown in bold.

Participants are not grouped or ranked based on their results. The performance of an individual participant can be assessed in general terms by considering the number of outliers and false results, and by the *z*-scores.

Information on result processing and recommendations for follow-up actions are given in the Scheme Protocol [2].

Samples for follow-up analyses can be ordered at: **https://laboratory.livsmedelsverket.se**

Box plots and numbers of deviating results for each participant

Box plots are based on the *z*-scores listed in Appendix 2 and provide an overview of each participant's performance across the analytical parameters. The range of *z*-scores is indicated by the size of the box and, for most participants, by lines and/or circles above and beneath the box. A small spread of z-scores centred around zero indicates that the results of the individual participant are in general close to m_{PT} for the different analyses.

The different parts of a box plot are illustrated in Figure 8.

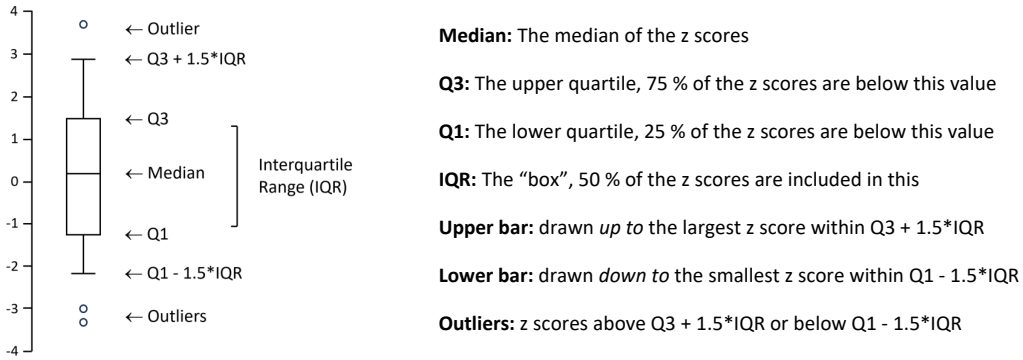
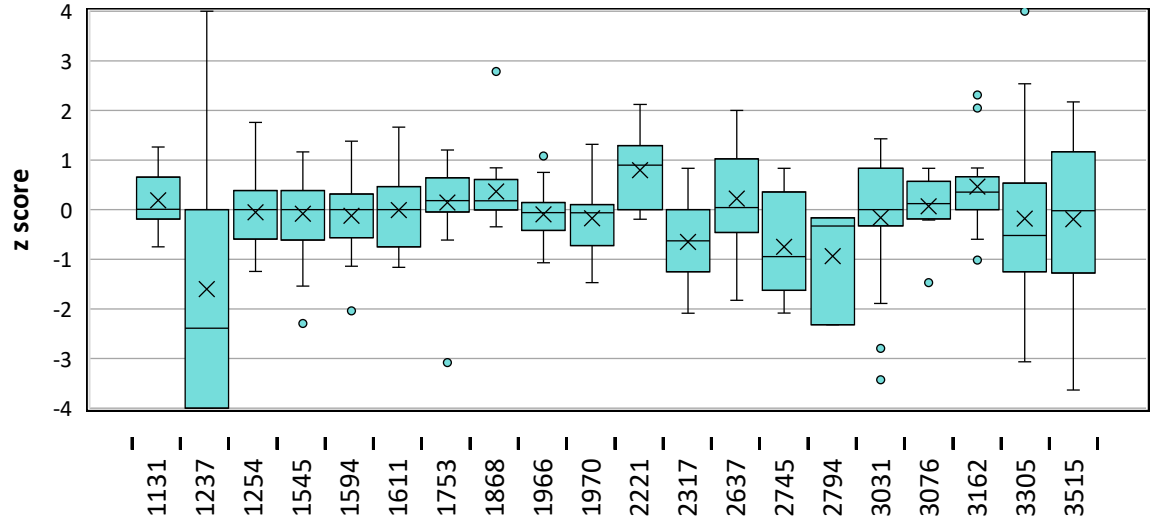
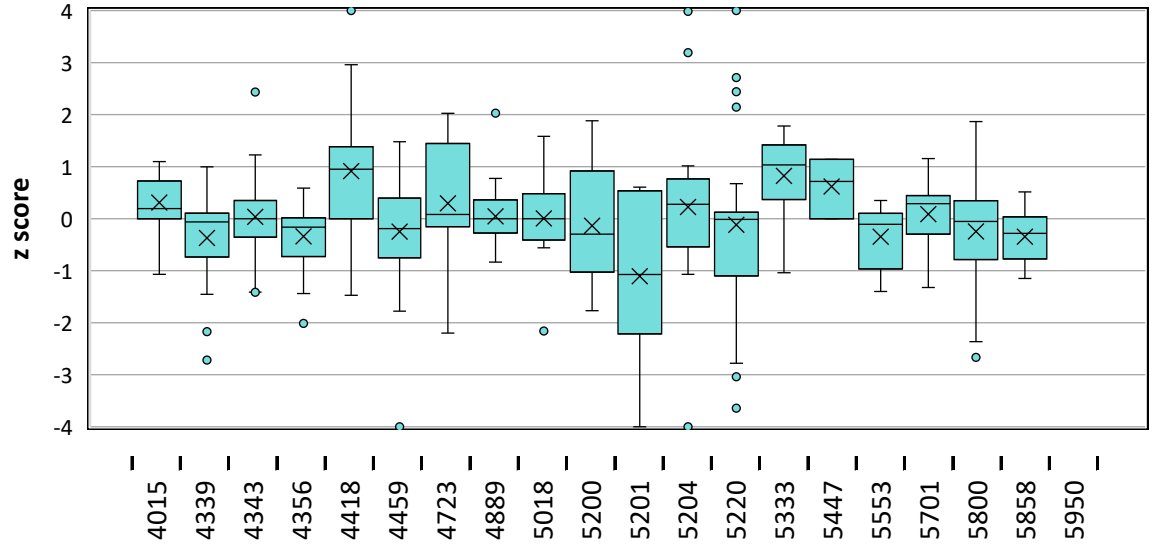
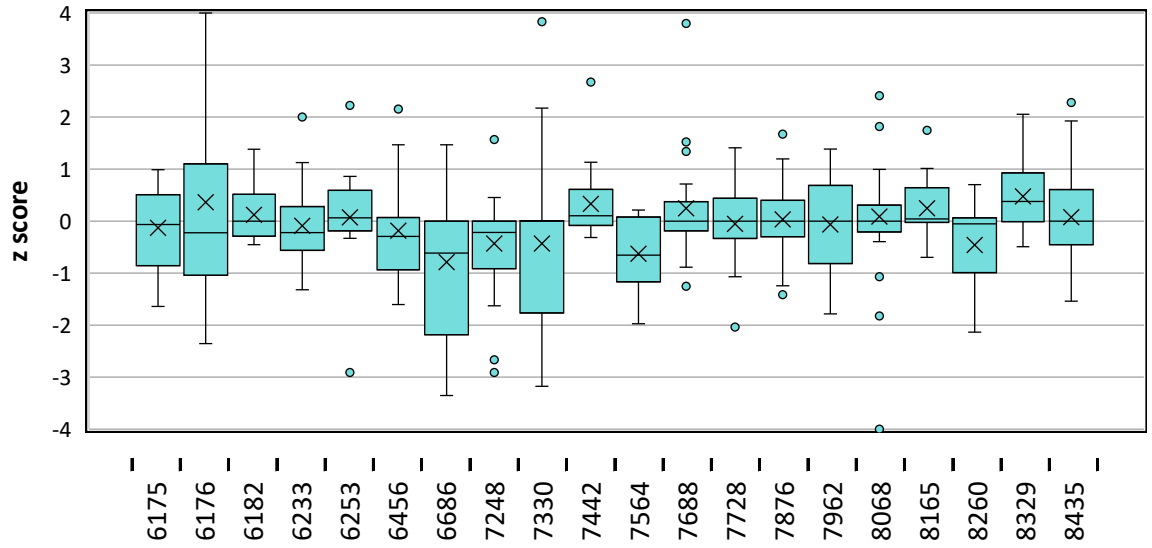


Figure 8. Schematic illustration of a box plot.


z score
4
3
2
1
0
-1
-2
-3
-4
1131
1237
1254
1545
1594
1611
1753
1868
1966
1970
2221
2317
2637
2745
2794
3031
3076
3162
3305
3515


z score
4
3
2
1
0
-1
-2
-3
-4
4015
4339
4343
4356
4418
4459
4723
4889
5018
5200
5201
5204
5220
5333
5447
5553
5701
5800
5858
5950


z score
4
3
2
1
0
-1
-2
-3
-4
6175
6176
6182
6233
6253
6456
6686
7248
7330
7442
7564
7688
7728
7876
7962
8068
8165
8260
8329
8435

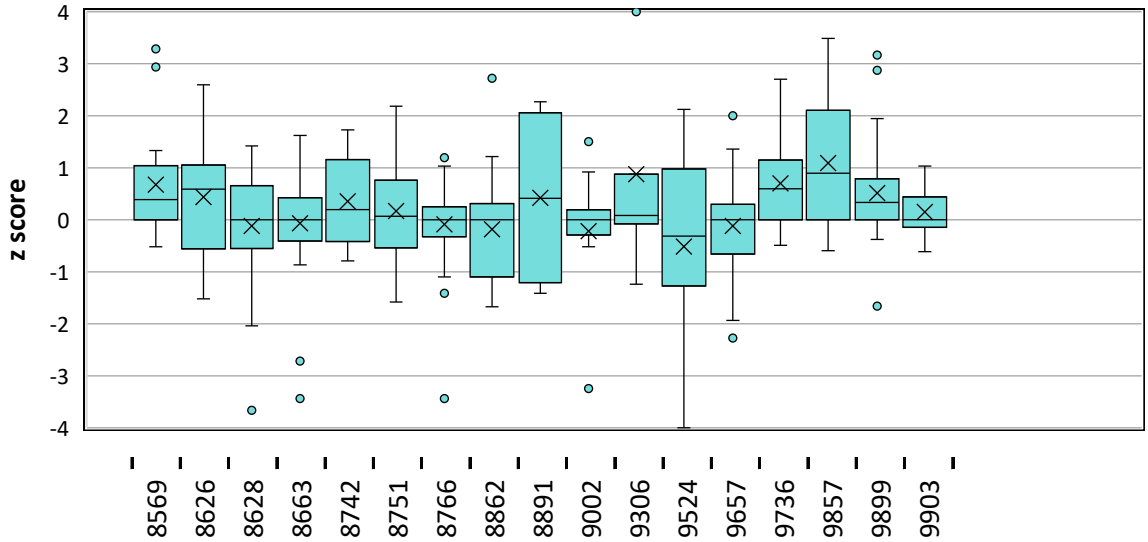


Figure 9. Box plots illustrating the distribution of z-scores for each participant.

Test material and quality control

Test material

Each participant received three samples with freeze-dried microorganisms, designated A–C. The test material was freeze-dried in 0.5 ml portions in glass vials, as described by Peterz and Steneryd [3]. Before analysing the samples, the contents of each vial were to be reconstituted in 1000 ml of sterile diluent. The microorganisms included in each sample and the corresponding concentrations determined by the Swedish Food Agency are listed in the table below.

Table 9. Microorganisms and approximate concentrations in the samples.

Sample	Microorganism	Strain			
		SLV no.[1]	Origin	Reference[2]	cfu / 100 ml[3]
A	*Escherichia coli*	SLV-082	Drinking water	CCUG 45097	180
	Citrobacter freundii	SLV-424	Well water	-	120
	Enterococcus faecalis	SLV-051	-	CCUG 45101	630
	Pseudomonas aeruginosa	SLV-395	Drinking water	CCUG 43596	200
	Clostridium perfringens	SLV-442	-	CCUG 43593	230
B	*Klebsiella pneumoniae*	SLV-537	-	-	310
	Klebsiella aerogenes	SLV-099	Sputum	ATCC 13 048	170
	Enterococcus hirae	SLV-536	Water	CCUG 46536	620
	Burkholderia cepacia complex	SLV-042	-	-	11
	Staphylococcus capitis	SLV-463	-	CCUG 35173	33*
C	*Escherichia coli*	SLV-558	-	-	160
	Aeromonas caviae	SLV-533	Water	CCUG 48 892	120
	Pseudomonas aeruginosa	SLV-538	-	-	460
	Bacillus subtilis	SLV-440	-	CCUG 45145	2*

[1] Internal strain identification no. at the Swedish Food Agency

[2] Culture collection. ATCC: American Type Culture Collection, CCUG: Culture Collection University of Gothenburg, Sweden

[3] cfu = colony forming units

* indicates cfu per ml

Quality control of the samples

Quality control and evaluation of sample homogeneity are performed on a minimum of 10 randomly selected vials during manufacture, or on 5 vials if the batch has previously been approved for homogeneity. Homogeneity of a test material is approved if, for each analysis, the p value of a one-way analysis of variance (ANOVA) is ≥ 0.05. If the ANOVA yields a p-value < 0.05, the PT test item batch is still considered homogenous, if $s_{bb} < s_R/3$, where:

s_{bu}: the between-vial standard deviation from the ANOVA

s_R: the expected laboratory variation, generally assumed to be 1.25 for the Drinking Water Scheme.

See the Scheme protocol [2] for more information regarding the evaluation of homogeneity.

Table 10. Concentration mean (m), between-vial variation (s_{bu}) and p values from the quality control of the samples; m is expressed in square root cfu (colony forming units) per 10 ml of sample for MF methods and per 1 ml for pour plate methods.

Analysis and method	A[1]			B[1]			C		
	m	s_{bu}	*P*	*m*	s_{bu}	*p*	*m*	s_{bu}	*p*
Coliform bacteria (MF) SS-EN ISO 9308-1:2014	5.46	0.00	0.95	6.51	0.00	0.90	3.96	0.00	0.72
Suspected thermotolerant colif. bact. (MF) m-FC Agar, 44 °C according to SS 028167	2.53	0.14	0.45	4.96	0.00	0.97	3.54	0.00	0.64
Escherichia coli (MF) SS-EN ISO 9308-1:2014	4.20	0.00	0.85	-	-	-	3.96	0.00	0.72
Intestinal enterococci (MF) SS-EN ISO 7899-2:2000	7.91	0.37	0.27	7.89	0.00	0.59	-	-	-
Pseudomonas aeruginosa (MF) SS-EN ISO 16288:2008	4.48	0.05	0.48	-	-	-	6.79	0.00	0.75
Culturable microorg., 48 h 37 °C (pour plate) SS-EN ISO 6222:1999	3.18	0.09	0.41	6.58	0.00	0.71	2.82	0.00	0.85
Culturable microorg., 72 h 22 °C (pour plate) SS-EN ISO 6222:1999	3.61	0.14	0.42	2.97	0.16	0.40	2.80	0.35	0.09

– No target organism or no value

[1] n = 5 vials analysed in duplicate

References

1. ISO 13528:2022 Statistical methods for use in proficiency testing by interlaboratory comparison.
2. Ilbäck J and Blom L. 2026. Protocol – Microbiological Proficiency Testing, Swedish Food Agency.
3. Peterz, M., Steneryd. A.C. 1993. Freeze-dried mixed cultures as reference samples in quantitative and qualitative microbiological examinations of food. *Journal of Applied Bacteriology*. 74:143–148

Appendix 1. Results of the participating laboratories

Lab no.	Coliform bacteria			Suspected thermotolerant coliform bacteria*			E. coli			Intestinal enterococci			P. aeruginosa			Culturable microorganisms, 22°C for 3 days (cfu/ml)			Culturable microorganisms, 36 °C for 2 days (cfu/ml)			Lab no.
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
1131-1	280	390	150	-	-	-	130	0	150	690	650	0	-	-	-	8	16	-	-	-	-	1131-1
1131-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	1131-2
1131-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1131-3
1237-1	6	11	5	-	-	-	6	0	5	0	0	31	7	0	0	34	1	8	0	0	-	1237-1
1237-2	140	170	80	-	-	-	140	0	56	-	-	-	-	-	-	-	-	-	-	-	30	1237-2
1237-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1237-3
1254-1	210	290	130	-	-	-	170	0	130	770	730	0	93	0	490	11	11	5	13	40	6	1254-1
1254-2	160	260	170	-	-	-	130	0	170	-	-	-	130	0	350	-	-	-	-	-	-	1254-2
1254-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1254-3
1545-1	250	395	170	188	395	170	156	0	170	660	645	0	170	0	250	8	9	3	7	33	5	1545-1
1545-2	267	492	170	49	235	136	216	0	170	-	-	-	-	-	-	-	-	-	-	-	-	1545-2
1545-3	-	-	-	-	-	-	49	0	136	-	-	-	-	-	-	-	-	-	-	-	-	1545-3
1594-1	275	315	140	-	-	-	95	0	140	695	660	0	175	0	220	13	6	5	8	50	5	1594-1
1594-2	240	330	160	-	-	-	190	0	160	470	550	0	185	0	285	-	-	-	-	-	-	1594-2
1594-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1594-3
1611-1	280	370	180	-	-	-	250	0	180	470	590	0	90	0	200	8	15	5	7	38	4	1611-1
1611-2	240	280	170	-	-	-	200	0	170	-	-	-	190	0	410	-	-	-	-	-	-	1611-2
1611-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1611-3
1753-1	320	439	193	-	-	-	157	0	193	645	591	0	178	0	503	9	11	8	14	40	5	1753-1
1753-2	-	-	-	-	-	-	-	-	-	546	634	0	-	-	-	-	-	-	-	-	-	1753-2
1753-3	-	-	-	-	-	-	-	-	-	573	297	0	-	-	-	-	-	-	-	-	-	1753-3
1868-1	219	343	155	-	-	-	150	0	155	894	600	0	-	-	-	14	11	9	-	-	-	1868-1
1868-2	287	429	163	-	-	-	191	0	163	-	-	-	-	-	-	-	-	-	-	-	-	1868-2
1868-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1868-3
1966-1	231	342	176	-	-	-	156	0	176	549	530	0	154	0	536	7	10	6	9	38	6	1966-1
1966-2	205	354	161	-	-	-	120	0	161	491	595	0	-	-	-	-	-	-	-	-	-	1966-2
1966-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1966-3
1970-1	230	300	130	160	370	130	150	0	130	590	560	0	270	0	570	11	13	5	7	30	3	1970-1
1970-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1970-2
1970-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1970-3
2221-1	340	490	230	-	-	-	160	0	230	710	690	0	200	0	420	10	11	9	17	53	10	2221-1
2221-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2221-2
2221-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2221-3
2317-1	122	191	114	-	-	-	106	0	103	582	391	0	115	0	109	7	14	9	8	36	9	2317-1
2317-2	129	246	147	-	-	-	106	0	129	518	509	0	102	0	136	12	12	4	10	27	3	2317-2
2317-3	126	219	131	-	-	-	106	0	116	550	450	0	109	0	123	10	13	7	9	32	6	2317-3
2637-1	250	380	200	-	-	-	170	0	200	580	800	0	-	-	-	9	14	4	5	46	5	2637-1
2637-2	200	560	200	-	-	-	130	0	200	500	720	0	-	-	-	14	11	7	9	31	8	2637-2
2637-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2637-3
2745-1	160	250	90	100	0	90	100	0	90	-	-	-	-	-	-	8	14	9	-	-	-	2745-1
2745-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2745-2
2745-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2745-3
2794-1	220	170	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2794-1
2794-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2794-2
2794-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2794-3
3031-1	80	460	180	-	-	-	20	0	180	660	540	0	50	0	310	14	16	11	10	34	6	3031-1
3031-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3031-2
3031-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3031-3
3076-1	-	-	-	-	-	-	-	-	-	-	-	-	200	0	330	13	12	9	10	40	3	3076-1
3076-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3076-2
3076-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3076-3
3162-1	272	461	238	-	-	-	150	0	238	820	610	0	184	0	410	13	10	5	13	41	4	3162-1
3162-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3162-2
3162-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3162-3
3305-1	470	260	110	-	-	-	-	140	110	590	630	-	-	100	340	8	8	4	45	15	11	3305-1
3305-2	410	250	150	-	-	-	-	160	150	410	520	-	-	-	-	-	-	-	-	-	-	3305-2
3305-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3305-3
3515-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	12	9	9	12	15	3515-1
3515-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3515-2
3515-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3515-3
4015-1	300	390	175	-	-	-	200	0	175	615	565	0	-	-	-	7	12	7	-	-	-	4015-1
4015-2	-	-	-	-	-	-	-	-	-	695	682	0	-	-	-	-	-	-	-	-	-	4015-2
4015-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4015-3
4339-1	250	310	140	44	220	120	140	0	140	490	610	0	39	0	520	9	9	7	6	17	7	4339-1
4339-2	190	190	170	-	-	-	110	0	170	540	600	0	130	0	410	-	-	-	-	-	-	4339-2
4339-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4339-3
4343-1	285	361	140	-	-	-	126	0	140	582	591	0	142	0	816	6	9	10	13	38	11	4343-1
4343-2	-	-	-	-	-	-	-	-	-	548	435	0	-	-	-	-	-	-	-	-	-	4343-2
4343-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4343-3
4356-1	220	310	150	98	210	110	110	0	150	640	550	0	120	0	250	12	12	5	9	37	2	4356-1
4356-2	270	270	120	-	-	-	160	0	120	-	-	-	160	0	170	-	-	-	-	-	-	4356-2
4356-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4356-3
4418-1	320	410	210	200	310	170	230	0	150	670	530	0	340	0	0	15	23	10	16	87	3	4418-1
4418-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4418-2
4418-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4418-3
4459-1	345	345	125	-	-	-	228	0	125	414	192	0	-	-	-	11	11	6	10	51	8	4459-1
4459-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4459-2
4459-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4459-3
4723-1	411	291	155	-	-	-	276	0	155	773	618	0	-	-	-	4	13	6	-	-	-	4723-1
4723-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4723-2
4723-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4723-3
4889-1	250	300	150	-	-	-	130	0	150	610	640	0	140	0	480	13	19	6	8	30	6	4889-1
4889-2	250	410	140	-	-	-	170	0	140	-	-	-	-	-	-	-	-	-	-	-	-	4889-2
4889-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4889-3
5018-1	310	550	140	-	-	-	160	0	140	610	370	0	120	0	440	-	-	-	-	-	-	5018-1
5018-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5018-2
5018-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5018-3
5200-1	203	330	120	203	-	120	79	0	120	-	-	-	-	-	-	-	-	-	-	-	-	5200-1
5200-2	130	350	220	79	-	220	220	0	220	-	-	-	-	-	-	-	-	-	-	-	-	5200-2

Appendix 1. Results of the participating laboratories

Lab no.	Coliform bacteria			Suspected thermotolerant coliform bacteria*			E. coli			Intestinal enterococci			P. aeruginosa			Culturable microorganisms, 22°C for 3 days (cfu/ml)			Culturable microorganisms, 36 °C for 2 days (cfu/ml)			Lab no.
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
5200-3	-	-	-	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5200-3
5201-1	-	-	**24**	-	-	-	92	-	117	-	-	-	-	-	-	13	7	8	-	-	-	5201-1
5201-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5201-2
5201-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5201-3
5204-1	280	310	160	-	-	-	160	-	160	630	**133**	-	170	-	240	7	10	8	14	30	6	5204-1
5204-2	**540**	460	184	-	-	-	**440**	-	161	686	558	-	-	-	-	-	-	-	-	-	-	5204-2
5204-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5204-3
5220-1	**70**	251	141	-	-	-	**16**	0	141	640	570	0	26	0	210	-	-	-	-	-	-	5220-1
5220-2	488	387	147	-	-	-	285	0	147	649	488	0	20	0	249	-	-	-	-	-	-	5220-2
5220-3	460	-	**460**	-	-	-	93	0	**460**	460	460	0	-	-	-	-	-	-	-	-	-	5220-3
5333-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	18	4	-	-	-	5333-1
5333-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	15	9	-	-	-	5333-2
5333-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5333-3
5447-1	-	-	-	-	-	-	-	-	-	700	650	0	-	-	-	-	-	-	-	-	-	5447-1
5447-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5447-2
5447-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5447-3
5553-1	188	240	152	-	-	-	92	0	142	600	610	0	-	-	-	-	-	-	-	-	-	5553-1
5553-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5553-2
5553-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5553-3
5701-1	280	400	200	-	-	-	84	0	150	-	-	-	-	-	-	12	13	5	-	-	-	5701-1
5701-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5701-2
5701-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5701-3
5800-1	306	406	124	70	200	80	124	0	124	670	520	0	40,6	0	65,9	11	11	6	7	45	10	5800-1
5800-2	240	350	230	-	-	-	130	0	190	-	-	-	-	-	-	-	-	-	-	-	-	5800-2
5800-3	-	-	-	-	-	-	70	0	80	-	-	-	-	-	-	-	-	-	-	-	-	5800-3
5858-1	196	295	160	-	-	-	124	0	113	525	585	0	121	0	335	7	12	8	8	37	4	5858-1
5858-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5858-2
5858-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5858-3
5950-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5950-1
5950-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5950-2
5950-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5950-3
6175-1	137	478	145	-	-	-	87	0	145	-	-	-	-	-	-	10	12	4	13	40	10	6175-1
6175-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6175-2
6175-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6175-3
6176-1	100	500	100	-	-	-	**0**	-	-	-	-	-	-	-	-	8	11	3	8	30	7	6176-1
6176-2	200	400	100	-	-	-	**0**	-	-	-	-	-	-	-	-	9	6	6	7	45	6	6176-2
6176-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**175**	**62**	**131**	**45**	45	**57**	6176-3
6182-1	240	525	140	-	-	-	162	0	137	564	673	0	-	-	-	9	14	8	-	-	-	6182-1
6182-2	-	-	-	-	-	-	-	-	-	558	543	0	-	-	-	-	-	-	-	-	-	6182-2
6182-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6182-3
6233-1	201	291	190	-	-	-	175	0	190	548	517	0	105	0	308	9	10	8	15	35	6	6233-1
6233-2	228	261	115	-	-	-	194	0	108	600	800	0	110	0	310	-	-	-	-	-	-	6233-2
6233-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6233-3
6253-1	220	390	180	-	-	-	170	0	180	560	310	0	-	-	-	10	12	14	-	-	-	6253-1
6253-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6253-2
6253-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6253-3
6456-1	254	624	134	-	-	-	147	0	134	429	453	0	-	-	-	7	15	4	17	30	5	6456-1
6456-2	190	340	120	-	-	-	140	0	190	-	-	-	-	-	-	-	-	-	-	-	-	6456-2
6456-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6456-3
6686-1	165	364	201	-	-	-	109	0	201	530	500	0	-	-	-	9	5	2	17	43	5	6686-1
6686-2	**58**	220	86	-	-	-	38	0	77	-	-	-	-	-	-	-	-	-	-	-	-	6686-2
6686-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6686-3
7248-1	270	310	120	90	210	110	162	0	133	570	560	0	120	0	300	3	8	1	12	41	6	7248-1
7248-2	276	548	133	-	-	-	135	0	120	-	-	-	-	-	-	-	-	-	-	-	-	7248-2
7248-3	-	-	-	-	-	-	72	0	110	-	-	-	-	-	-	-	-	-	-	-	-	7248-3
7330-1	-	-	-	-	-	-	30	0	97	415	**290**	0	87	0	**0**	-	-	-	**30**	37	15	7330-1
7330-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7330-2
7330-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7330-3
7442-1	250	435	145	-	-	-	130	0	145	880	650	0	-	-	-	13	12	6	-	-	-	7442-1
7442-2	261	495	167	-	-	-	143	0	167	-	-	-	-	-	-	-	-	-	-	-	-	7442-2
7442-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7442-3
7564-1	260	300	160	-	-	-	89	0	90	-	-	-	-	-	-	7	7	5	11	30	7	7564-1
7564-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7564-2
7564-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7564-3
7688-1	270	420	210	-	-	-	240	0	210	460	600	0	100	0	340	11	14	**21**	12	37	5	7688-1
7688-2	250	520	150	-	-	-	140	0	150	550	520	0	140	0	290	-	-	-	-	-	-	7688-2
7688-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7688-3
7728-1	220	440	170	-	-	-	140	0	170	730	590	0	180	0	320	7	6	4	11	34	9	7728-1
7728-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7728-2
7728-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7728-3
7876-1	210	450	140	96	260	100	160	0	140	760	540	0	145	0	480	12	10	4	15	35	9	7876-1
7876-2	262	365	172	-	-	-	218	0	172	591	435	0	-	-	-	-	-	-	-	-	-	7876-2
7876-3	160	370	140	-	-	-	140	0	140	-	-	-	-	-	-	-	-	-	-	-	-	7876-3
7962-1	150	470	200	80	280	140	110	0	200	500	560	0	180	0	490	5	9	6	7	40	9	7962-1
7962-2	350	440	130	-	-	-	230	0	130	-	-	-	-	-	-	-	-	-	-	-	-	7962-2
7962-3	-	-	-	-	-	-	80	0	120	-	-	-	-	-	-	-	-	-	-	-	-	7962-3
8068-1	261	399	160	-	-	-	205	0	160	540	580	0	157	0	517	7	21	6	10	61	6	8068-1
8068-2	-	-	-	-	-	-	-	-	-	410	**214**	0	132	0	461	-	-	-	-	-	-	8068-2
8068-3	-	-	-	-	-	-	-	-	-	-	-	-	320	0	400	-	-	-	-	-	-	8068-3
8165-1	300	396	155	-	-	-	145	0	155	511	769	0	209	0	523	-	-	-	-	-	-	8165-1
8165-2	282	439	143	-	-	-	151	0	143	-	-	-	-	-	-	-	-	-	-	-	-	8165-2
8165-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8165-3
8260-1	240	445	120	-	-	-	145	0	120	-	-	-	-	-	-	8	12	2	-	-	-	8260-1
8260-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8260-2
8260-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8260-3
8329-1	248	488	148	-	-	-	179	0	148	655	700	0	345	0	488	12	11	11	9	45	8	8329-1
8329-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8329-2
8329-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8329-3
8435-1	206	243	143	-	-	-	136	0	143	490	670	0	310	-	160	19	12	3	13	48	10	8435-1

Appendix 1. Results of the participating laboratories

Lab no.	Coliform bacteria			Suspected thermotolerant coliform bacteria*			E. coli			Intestinal enterococci			P. aeruginosa			Culturable microorganisms, 22°C for 3 days (cfu/ml)			Culturable microorganisms, 36 °C for 2 days (cfu/ml)			Lab no.
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
8435-2	193	370	140	-	-	-	121	0	140	660	590	0	370	**1**	370	13	14	6	12	31	6	**8435-2**
8435-3	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	**8435-3**
8569-1	247	360	**296**	-	-	-	160	0	168	572	636	0	-	-	-	11	10	17	-	-	-	**8569-1**
8569-2	326	450	198	-	-	-	201	0	198	-	-	-	-	-	-	-	-	-	-	-	-	**8569-2**
8569-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8569-3**
8626-1	320	230	170	140	0	140	320	0	170	700	-	**750**	-	-	-	18	10	5	14	30	10	**8626-1**
8626-2	-	-	-	-	-	-	-	-	-	-	**0**	-	-	-	-	-	-	-	-	-	-	**8626-2**
8626-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8626-3**
8628-1	226	530	197	87	280	51	155	0	130	536	640	0	181	0	**0**	14	6	9	13	43	5	**8628-1**
8628-2	-	-	-	-	-	-	87	0	**51**	-	-	-	-	-	-	-	-	-	-	-	-	**8628-2**
8628-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8628-3**
8663-1	260	360	190	110	230	180	180	0	190	540	530	0	300	0	**0**	17	9	5	12	**13**	1	**8663-1**
8663-2	210	290	150	-	-	-	160	0	150	550	580	0	200	0	550	-	-	-	-	-	-	**8663-2**
8663-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8663-3**
8742-1	390	400	220	-	-	-	220	0	140	-	-	-	-	-	-	11	13	5	8	33	10	**8742-1**
8742-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8742-2**
8742-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8742-3**
8751-1	254	406	111	-	-	-	164	0	111	531	420	0	-	-	-	13	10	5	-	-	-	**8751-1**
8751-2	344	406	222	-	-	-	288	0	222	-	-	-	-	-	-	-	-	-	-	-	-	**8751-2**
8751-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8751-3**
8766-1	327	387	168	140	214	136	218	0	168	564	582	0	168	0	495	6	11	-	9	**13**	6	**8766-1**
8766-2	325	446	130	-	-	-	203	0	130	568	590	0	-	-	-	-	-	6	-	-	-	**8766-2**
8766-3	169	373	124	-	-	-	140	0	136	-	-	-	-	-	-	-	-	-	-	-	-	**8766-3**
8862-1	263	218	109	-	-	-	127	0	109	491	536	0	-	-	-	13	7	6	-	-	-	**8862-1**
8862-2	343	370	168	-	-	-	185	0	168	468	891	0	-	-	-	-	-	-	-	-	-	**8862-2**
8862-3	-	-	-	-	-	-	-	-	-	550	437	0	-	-	-	-	-	-	-	-	-	**8862-3**
8891-1	-	530	-	-	-	-	-	-	-	-	-	-	-	-	-	6	20	5	-	-	-	**8891-1**
8891-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8891-2**
8891-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8891-3**
9002-1	**62**	470	**0**	-	-	-	131	0	140	**300**	590	0	-	-	-	10	10	8	-	-	-	**9002-1**
9002-2	271	384	145	-	-	-	145	0	145	600	740	0	-	-	-	-	-	-	-	-	-	**9002-2**
9002-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9002-3**
9306-1	238	326	152	-	-	-	192	0	152	461	613	0	-	-	-	**100**	**325**	**22**	14	45	7	**9306-1**
9306-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9306-2**
9306-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9306-3**
9524-1	105	500	130	-	-	-	46	0	130	500	530	0	-	-	-	20	14	10	10	**10**	13	**9524-1**
9524-2	**54**	565	122	-	-	-	**12**	0	122	450	689	0	-	-	-	-	-	-	-	-	-	**9524-2**
9524-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9524-3**
9657-1	200	173	145	191	345	91	191	0	145	582	564	0	173	0	245	13	14	10	6	47	5	**9657-1**
9657-2	416	386	124	-	-	-	229	0	124	552	559	0	-	-	-	-	-	-	-	-	-	**9657-2**
9657-3	-	-	-	-	-	-	87	0	91	-	-	-	-	-	-	-	-	-	-	-	-	**9657-3**
9736-1	232	469	198	-	-	-	129	0	198	682	793	0	309	0	436	14	13	8	9	36	9	**9736-1**
9736-2	297	364	255	-	-	-	216	0	255	-	-	-	-	-	-	-	-	-	-	-	-	**9736-2**
9736-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9736-3**
9857-1	344	649	**291**	-	-	-	179	0	**291**	548	727	0	-	-	-	15	14	5	-	-	-	**9857-1**
9857-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9857-2**
9857-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9857-3**
9899-1	260	358	168	-	-	-	177	0	168	650	670	0	212	0	367	10	12	10	10	42	8	**9899-1**
9899-2	281	332	276	-	-	-	152	0	**276**	749	413	0	239	0	681	-	-	-	-	-	-	**9899-2**
9899-3	-	-	-	-	-	-	-	-	-	792	612	0	-	-	-	-	-	-	-	-	-	**9899-3**
9903-1	314	404	150	-	-	-	123	0	145	545	564	0	235	0	**0**	-	13	7	15	41	5	**9903-1**
9903-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	**9903-2**
9903-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9903-3**
N	111	111	112	19	16	18	116	113	116	91	91	87	56	56	57	75	75	75	57	57	57	**N**
n	105	110	106	19	16	18	109	111	110	89	84	85	55	54	51	72	72	72	53	50	55	***n***
m_{PT}	**15,62**	**19,23**	**12,48**	**10,66**	**16,25**	**11,17**	**12,11**	**-**	**12,22**	**24,07**	**23,94**	**-**	**12,59**	**-**	**18,81**	**3,26**	**3,41**	**2,55**	**3,28**	**6,08**	**2,60**	m_{PT}
s_{PT}	**2,39**	**2,67**	**1,44**	**2,63**	**2,08**	**1,73**	**2,23**	**-**	**1,39**	**2,09**	**2,18**	**-**	**2,92**	**-**	**4,01**	**0,57**	**0,47**	**0,53**	**0,57**	**0,72**	**0,59**	s_{PT}
u_{PT}	0,284	0,318	0,171	0,753	0,693	0,510	0,262	-	0,162	0,276	0,288	-	0,492	-	0,702	0,083	0,068	0,077	0,096	0,120	0,097	u_{PT}
***CV* (%)**	15	14	12	25	13	15	18	-	11	9	9	-	23	-	21	18	14	21	17	12	23	***CV* (%)**
$u_{rel,mPT}$ (%	1,5	1,3	1,1	5,7	3,4	3,7	1,7	-	1,1	0,9	1,0	-	3,1	-	3,0	2,0	1,6	2,4	2,3	1,6	3,0	$u_{rel,mPT}$ (%
F+	0	0	0	0	0	0	0	2	0	0	0	2	0	2	0	0	0	0	0	0	0	***F+***
F-	0	0	1	0	0	0	2	0	0	1	2	0	0	0	6	0	0	0	1	1	0	***F-***
<	5	1	2	0	0	0	4	0	3	1	5	0	1	0	0	0	1	0	0	5	0	**<**
>	1	0	3	0	0	0	1	0	3	0	0	0	0	0	0	3	2	3	3	1	2	**>**
Min	6	11	0	44	0	51	0	0	5	0	0	0	7	0	0	3	1	1	0	0	1	***Min***
Max	540	649	460	203	395	220	440	160	460	894	891	750	370	100	816	175	325	131	45	87	57	***Max***
Med	250	371	150	100	232	125	150	0	146	570	590	0	160	0	350	10	12	6	10	38	6	***Med***
m_{PT}	**244**	**370**	**156**	**114**	**264**	**125**	**147**	**-**	**149**	**579**	**573**	**-**	**158**	**-**	**354**	**11**	**12**	**7**	**11**	**37**	**7**	m_{PT}
Lower	72	126	67	8	0	0	30	0	65	317	304	0	15	0	46	3	4	1	3	16	1	***Lower***
Upper	518	742	282	343	504	267	353	0	268	921	927	0	455	0	951	24	23	17	25	67	19	***Upper***

N = number of reported results
n = results without annotation
< = low outlier
> = high outlier

Min = lowest reported result
Max = highest reported result
Lower = lowest accepted value
Upper = highest accepted value

Med = median value
m_{PT} = assigned value
F+ = false positive
F- = false negative

s_{PT} = standard deviation
u_{PT} = measurement uncertainty
CV = coefficient of variation
$u_{rel,mPT}$ = relative standard uncertainty of m_{PT}

False positive or false negative
Outside the acceptance limits
Results "larger than" are not evalutated
The parameter is not evaluated
The result is not evaluated
u_{PT} > 0,3 s_{PT} and/or > 20 % outliers and/or fewer than 12 evaluated results
Result The result is excluded prior determining m_{PT} and s_{PT}
Limit Manually adjusted acceptance limits

* Suspected thermotolerant coliform bacteria is not evaluated. Performance statistics are provided for information only.

Appendix 2. Z-scores of all participants

Lab no.	Coliform bacteria			Suspected thermotolerant coliform bacteria*			E. coli			Intestinal enterococci			P. aeruginosa			Culturable microorganisms, 22°C for 3 days			Culturable microorganisms, 36 °C for 2 days			Lab no.
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
1131-1	0,466	0,195	-0,164				-0,317	0	0,018	1,051	0,717	0				-0,750	1,264					1131-1
1131-2																		-0,196				1131-2
1131-3																						1131-3
1237-1	-4,000	-4,000	-4,000				-4,000	0	-4,000				-3,406	0		4,000	-4,000	0,513				1237-1
1237-2	-1,587	-2,319	-2,461				-0,124	0	-3,418												4,000	1237-2
1237-3																						1237-3
1254-1	-0,473	-0,823	-0,752				0,418	0	-0,592	1,758	1,418	0	-1,008	0	0,830	0,102	-0,191	-0,596	0,564	0,344	-0,250	1254-1
1254-2	-1,245	-1,162	0,386				-0,317	0	0,588				-0,406	0	-0,025							1254-2
1254-3																						1254-3
1545-1	0,080	0,242	0,386	1,161	1,748	1,079	0,172	0	0,588	0,775	0,672	0	0,155	0	-0,747	-0,750	-0,866	-1,540	-1,111	-0,463	-0,614	1545-1
1545-2	0,302	1,106	0,386	-1,395	-0,441	0,284	1,163	0	0,588													1545-2
1545-3							-2,294	0	-0,405													1545-3
1594-1	0,404	-0,554	-0,453				-1,061	0	-0,282	1,096	0,807	0	0,220	0	-0,992	0,607	-2,038	-0,596	-0,792	1,382	-0,614	1594-1
1594-2	-0,054	-0,398	0,116				0,753	0	0,307	-1,141	-0,222	0	0,348	0	-0,481							1594-2
1594-3																						1594-3
1611-1	0,466	0,003	0,649				1,664	0	0,860	-1,141	0,163	0	-1,062	0	-1,164	-0,750	0,994	-0,596	-1,111	0,121	-1,015	1611-1
1611-2	-0,054	-0,934	0,386				0,914	0	0,588				0,410	0	0,359							1611-2
1611-3																						1611-3
1753-1	0,950	0,646	0,980				0,190	0	1,204	0,635	0,173	0	0,259	0	0,902	-0,451	-0,191	0,513	0,802	0,344	-0,614	1753-1
1753-2										-0,335	0,572	0										1753-2
1753-3										-0,062	-3,081	0										1753-3
1868-1	-0,344	-0,265	-0,023				0,063	0	0,163	2,786	0,257	0				0,845	-0,191	0,835				1868-1
1868-2	0,553	0,556	0,198				0,769	0	0,392													1868-2
1868-3																						1868-3
1966-1	-0,176	-0,275	0,545				0,172	0	0,752	-0,304	-0,420	0	-0,061	0	1,083	-1,070	-0,520	-0,196	-0,493	0,121	-0,250	1966-1
1966-2	-0,546	-0,155	0,143				-0,518	0	0,336	-0,912	0,210	0										1966-2
1966-3																						1966-3
1970-1	-0,190	-0,714	-0,752	0,757	1,440	0,133	0,063	0	-0,592	0,106	-0,124	0	1,317	0	1,263	0,102	0,424	-0,596	-1,111	-0,835	-1,471	1970-1
1970-2																						1970-2
1970-3																						1970-3
2221-1	1,181	1,089	1,866				0,243	0	2,122	1,231	1,073	0	0,533	0	0,420	-0,167	-0,191	0,835	1,468	1,672	0,963	2221-1
2221-2																						2221-2
2221-3																						2221-3
2317-1	-1,916	-2,026	-1,256				-0,814	0	-1,496	0,027	-1,913	0	-0,638	0	-2,087	-1,070	0,714	0,835	-0,792	-0,108	0,687	2317-1
2317-2	-1,786	-1,327	-0,249				-0,814	0	-0,624	-0,625	-0,632	0	-0,852	0	-1,782	0,360	0,123	-1,038	-0,209	-1,225	-1,471	2317-2
2317-3	-1,841	-1,659	-0,722				-0,814	0	-1,048	-0,294	-1,251	0	-0,735	0	-1,925	-0,167	0,424	0,171	-0,493	-0,585	-0,250	2317-3
2637-1	0,080	0,100	1,154				0,418	0	1,384	0,007	2,000	0				-0,451	0,714	-1,038	-1,826	0,980	-0,614	2637-1
2637-2	-0,619	1,662	1,154				-0,317	0	1,384	-0,816	1,332	0				0,845	-0,191	0,171	-0,493	-0,709	0,395	2637-2
2637-3																						2637-3
2745-1	-1,245	-1,280	-2,084	-0,252	-4,000	-0,973	-0,947	0	-1,973							-0,750	0,714	0,835				2745-1
2745-2																						2745-2
2745-3																						2745-3
2794-1	-0,330	-2,319	-0,164																			2794-1
2794-2																						2794-2
2794-3																						2794-3
3031-1	-2,797	0,832	0,649				-3,430	0	0,860	0,775	-0,321	0	-1,890	0	-0,300	0,845	1,264	1,428	-0,209	-0,343	-0,250	3031-1
3031-2																						3031-2
3031-3																						3031-3
3076-1													0,533	0	-0,160	0,607	0,123	0,835	-0,209	0,344	-1,471	3076-1
3076-2																						3076-2
3076-3																						3076-3
3162-1	0,366	0,840	2,048				0,063	0	2,311	2,182	0,351	0	0,335	0	0,359	0,607	-0,520	-0,596	0,564	0,453	-1,015	3162-1
3162-2																						3162-2
3162-3																						3162-3
3305-1	2,539	-1,162	-1,387						-1,251	0,106	0,535				-0,092	-0,750	-1,231	-1,038	4,000	-3,065	1,226	3305-1
3305-2	1,939	-1,280	-0,164						0,018	-1,825	-0,520											3305-2
3305-3																						3305-3
3515-1																-0,167	0,123	0,835	-0,493	-3,634	2,173	3515-1
3515-2																						3515-2
3515-3																						3515-3
4015-1	0,712	0,195	0,519				0,914	0	0,725	0,349	-0,076	0				-1,070	0,123	0,171				4015-1
4015-2										1,096	1,002	0										4015-2
4015-3																						4015-3
4339-1	0,080	-0,607	-0,453	-1,534	-0,681	-0,125	-0,124	0	-0,282	-0,923	0,351	0	-2,173	0	0,996	-0,451	-0,866	0,171	-1,454	-2,718	0,084	4339-1
4339-2	-0,769	-2,039	0,386				-0,728	0	0,588	-0,397	0,257	0	-0,406	0	0,359							4339-2
4339-3																						4339-3
4343-1	0,529	-0,085	-0,453				-0,397	0	-0,282	0,027	0,173	0	-0,230	0	2,433	-1,412	-0,866	1,139	0,564	0,121	1,226	4343-1
4343-2										-0,315	-1,415	0										4343-2
4343-3																						4343-3
4356-1	-0,330	-0,607	-0,164	-0,290	-0,845	-0,395	-0,728	0	0,018	0,588	-0,222	0	-0,559	0	-0,747	0,360	0,123	-0,596	-0,493	0,007	-2,012	4356-1
4356-2	0,340	-1,047	-1,063				0,243	0	-0,915				0,021	0	-1,439							4356-2
4356-3																						4356-3
4418-1	0,950	0,382	1,397	1,325	0,656	1,079	1,374	0	0,018	0,868	-0,420	0	2,005	0		1,074	2,959	1,139	1,253	4,000	-1,471	4418-1
4418-2																						4418-2
4418-3																						4418-3
4459-1	1,238	-0,245	-0,906				1,344	0	-0,752	-1,778	-4,000	0				0,102	-0,191	-0,196	-0,209	1,479	0,395	4459-1
4459-2																						4459-2
4459-3																						4459-3
4723-1	1,949	-0,813	-0,023				2,024	0	0,163	1,784	0,425	0				-2,198	0,424	-0,196				4723-1
4723-2																						4723-2
4723-3																						4723-3
4889-1	0,080	-0,714	-0,164				-0,317	0	0,018	0,301	0,627	0	-0,258	0	0,773	0,607	2,028	-0,196	-0,792	-0,835	-0,250	4889-1
4889-2	0,080	0,382	-0,453				0,418	0	-0,282													4889-2
4889-3																						4889-3
5018-1	0,832	1,582	-0,453				0,243	0	-0,282	0,301	-2,161	0	-0,559	0	0,540							5018-1
5018-2																						5018-2
5018-3																						5018-3
5200-1	-0,575	-0,398	-1,063	1,365		-0,125	-1,446	0	-0,915													5200-1
5200-2	-1,767	-0,195	1,634	-0,676		2,116	1,224	0	1,882													5200-2

Appendix 2. Z-scores of all participants

Lab no.	Coliform bacteria			Suspected thermotolerant coliform bacteria*			E. coli			Intestinal enterococci			P. aeruginosa			Culturable microorganisms, 22°C for 3 days			Culturable microorganisms, 36 °C for 2 days			Lab no.
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
5200-3				0,282																		5200-3
5201-1			-4,000				-1,130		-1,014							0,607	-1,620	0,513				5201-1
5201-2																						5201-2
5201-3																						5201-3
5204-1	0,466	-0,607	0,116				0,243		0,307	0,493	-4,000		0,155		-0,827	-1,070	-0,520	0,513	0,802	-0,835	-0,250	5204-1
5204-2	3,191	0,832	0,752				3,984		0,336	1,014	-0,144											5204-2
5204-3																						5204-3
5220-1	-3,039	-1,268	-0,423				-3,642	0	-0,252	0,588	-0,028	0	-2,565	0	-1,077							5220-1
5220-2	2,711	0,167	-0,249				2,145	0	-0,071	0,672	-0,848	0	-2,780	0	-0,755							5220-2
5220-3	2,441		4,000				-1,107	0	4,000	-1,252	-1,144	0										5220-3
5333-1																1,074	1,781	-1,038				5333-1
5333-2																1,296	0,994	0,835				5333-2
5333-3																						5333-3
5447-1										1,141	0,717	0										5447-1
5447-2																						5447-2
5447-3																						5447-3
5553-1	-0,800	-1,399	-0,107				-1,130	0	-0,221	0,204	0,351	0										5553-1
5553-2																						5553-2
5553-3																						5553-3
5701-1	0,466	0,289	1,154				-1,322	0	0,018							0,360	0,424	-0,596				5701-1
5701-2																						5701-2
5701-3																						5701-3
5800-1	0,785	0,345	-0,937	-0,874	-1,014	-1,287	-0,437	0	-0,784	0,868	-0,520	0	-2,129	0	-2,666	0,102	-0,191	-0,196	-1,111	0,877	0,963	5800-1
5800-2	-0,054	-0,195	1,866				-0,317	0	1,126													5800-2
5800-3							-1,681	0	-2,365													5800-3
5858-1	-0,679	-0,769	0,116				-0,437	0	-1,149	-0,552	0,116	0	-0,543	0	-0,126	-1,070	0,123	0,513	-0,792	0,007	-1,015	5858-1
5858-2																						5858-2
5858-3																						5858-3
5950-1																						5950-1
5950-2																						5950-2
5950-3																						5950-3
6175-1	-1,640	0,987	-0,307				-1,249	0	-0,131							-0,167	0,123	-1,038	0,564	0,344	0,963	6175-1
6175-2																						6175-2
6175-3																						6175-3
6176-1	-2,354	1,174	-1,727													-0,750	-0,191	-1,540	-0,792	-0,835	0,084	6176-1
6176-2	-0,619	0,289	-1,727													-0,451	-2,038	-0,196	-1,111	0,877	-0,250	6176-2
6176-3																4,000	4,000	4,000	4,000	0,877	4,000	6176-3
6182-1	-0,054	1,381	-0,453				0,279	0	-0,374	-0,153	0,923	0				-0,451	0,714	0,513				6182-1
6182-2										-0,213	-0,291	0										6182-2
6182-3																						6182-3
6233-1	-0,604	-0,813	0,905				0,504	0	1,126	-0,315	-0,551	0	-0,801	0	-0,314	-0,451	-0,520	0,513	1,031	-0,224	-0,250	6233-1
6233-2	-0,218	-1,151	-1,223				0,818	0	-1,320	0,204	2,000	0	-0,719	0	-0,300							6233-2
6233-3																						6233-3
6253-1	-0,330	0,195	0,649				0,418	0	0,860	-0,193	-2,909	0				-0,167	0,123	2,224				6253-1
6253-2																						6253-2
6253-3																						6253-3
6456-1	0,133	2,155	-0,631				0,008	0	-0,467	-1,603	-1,219	0				-1,070	0,994	-1,038	1,468	-0,835	-0,614	6456-1
6456-2	-0,769	-0,295	-1,063				-0,124	0	1,126													6456-2
6456-3																						6456-3
6686-1	-1,162	-0,056	1,179				-0,749	0	1,409	-0,500	-0,724	0				-0,451	-2,493	-2,135	1,468	0,667	-0,614	6686-1
6686-2	-3,353	-1,647	-2,232				-2,670	0	-2,487													6686-2
6686-3																						6686-3
7248-1	0,340	-0,607	-1,063	-0,448	-0,845	-0,395	0,279	0	-0,498	-0,092	-0,124	0	-0,559	0	-0,371	-2,666	-1,231	-2,911	0,317	0,453	-0,250	7248-1
7248-2	0,416	1,567	-0,661				-0,220	0	-0,915													7248-2
7248-3							-1,627	0	-1,251													7248-3
7330-1							-2,978	0	-1,712	-1,766	-3,175	0	-1,117	0					3,831	0,007	2,173	7330-1
7330-2																						7330-2
7330-3																						7330-3
7442-1	0,080	0,610	-0,307				-0,317	0	-0,131	2,673	0,717	0				0,607	0,123	-0,196				7442-1
7442-2	0,224	1,132	0,306				-0,067	0	0,505													7442-2
7442-3																						7442-3
7564-1	0,211	-0,714	0,116				-1,201	0	-1,973							-1,070	-1,620	-0,596	0,060	-0,835	0,084	7564-1
7564-2																						7564-2
7564-3																						7564-3
7688-1	0,340	0,474	1,397				1,520	0	1,636	-1,252	0,257	0	-0,886	0	-0,092	0,102	0,714	3,798	0,317	0,007	-0,614	7688-1
7688-2	0,080	1,340	-0,164				-0,124	0	0,018	-0,294	-0,520	0	-0,258	0	-0,444							7688-2
7688-3																						7688-3
7728-1	-0,330	0,655	0,386				-0,124	0	0,588	1,409	0,163	0	0,284	0	-0,230	-1,070	-2,038	-1,038	0,060	-0,343	0,687	7728-1
7728-2																						7728-2
7728-3																						7728-3
7876-1	-0,473	0,744	-0,453	-0,329	-0,058	-0,677	0,243	0	-0,282	1,672	-0,321	0	-0,187	0	0,773	0,360	-0,520	-1,038	1,031	-0,224	0,687	7876-1
7876-2	0,237	-0,046	0,440				1,194	0	0,643	0,116	-1,415	0										7876-2
7876-3	-1,245	0,003	-0,453				-0,124	0	-0,282													7876-3
7962-1	-1,413	0,918	1,154	-0,654	0,235	0,382	-0,728	0	1,384	-0,816	-0,124	0	0,284	0	0,830	-1,785	-0,866	-0,196	-1,111	0,344	0,687	7962-1
7962-2	1,294	0,655	-0,752				1,374	0	-0,592													7962-2
7962-3							-1,421	0	-0,915													7962-3
8068-1	0,224	0,280	0,116				0,993	0	0,307	-0,397	0,068	0	-0,019	0	0,980	-1,070	2,505	-0,196	-0,209	2,409	-0,250	8068-1
8068-2										-1,825	-4,000	0	-0,376	0	0,664							8068-2
8068-3													1,816	0	0,297							8068-3
8165-1	0,712	0,252	-0,023				-0,030	0	0,163	-0,699	1,745	0	0,641	0	1,012							8165-1
8165-2	0,491	0,646	-0,365				0,081	0	-0,191													8165-2
8165-3																						8165-3
8260-1	-0,054	0,700	-1,063				-0,030	0	-0,915							-0,750	0,123	-2,135				8260-1
8260-2																						8260-2
8260-3																						8260-3
8329-1	0,054	1,073	-0,221				0,571	0	-0,042	0,728	1,160	0	2,051	0	0,818	0,360	-0,191	1,428	-0,493	0,877	0,395	8329-1
8329-2																						8329-2
8329-3																						8329-3
8435-1	-0,531	-1,363	-0,365				-0,200	0	-0,191	-0,923	0,896	0	1,720		-1,536	1,923	0,123	-1,540	0,564	1,183	0,963	8435-1

Appendix 2. Z-scores of all participants

Lab no.	Coliform bacteria			Suspected thermotolerant coliform bacteria*			E. coli			Intestinal enterococci			P. aeruginosa			Culturable microorganisms, 22°C for 3 days			Culturable microorganisms, 36 °C for 2 days			Lab no.
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
8435-2	-0,724	0,003	-0,453				-0,498	0	-0,282	0,775	0,163	0	**2,278**		0,106	0,607	0,714	-0,196	0,317	-0,709	-0,250	**8435-2**
8435-3														0								**8435-3**
8569-1	0,040	-0,095	**3,284**				0,243	0	0,532	-0,072	0,590	0				0,102	-0,520	**2,938**				**8569-1**
8569-2	1,020	0,744	1,105				0,930	0	1,333													**8569-2**
8569-3																						**8569-3**
8626-1	0,950	-1,522	0,386	0,445	**-4,000**	0,382	**2,597**	0	0,588	1,141						1,720	-0,520	-0,596	0,802	-0,835	0,963	**8626-1**
8626-2																						**8626-2**
8626-3																						**8626-3**
8628-1	-0,246	1,421	1,080	-0,508	0,235	**-2,328**	0,154	0	-0,592	-0,438	0,627	0	0,297	0		0,845	**-2,038**	0,835	0,564	0,667	-0,614	**8628-1**
8628-2							-1,249	0	**-3,665**													**8628-2**
8628-3																						**8628-3**
8663-1	0,211	-0,095	0,905	-0,066	-0,520	1,297	0,588	0	1,126	-0,397	-0,420	0	1,622	0		1,511	-0,866	-0,596	0,317	**-3,437**	**-2,717**	**8663-1**
8663-2	-0,473	-0,823	-0,164				0,243	0	0,018	-0,294	0,068	0	0,533	0	1,158							**8663-2**
8663-3																						**8663-3**
8742-1	1,730	0,289	1,634				1,224	0	-0,282							0,102	0,424	-0,596	-0,792	-0,463	0,963	**8742-1**
8742-2																						**8742-2**
8742-3																						**8742-3**
8751-1	0,133	0,345	-1,354				0,314	0	-1,217	-0,489	-1,582	0				0,607	-0,520	-0,596				**8751-1**
8751-2	1,226	0,345	1,681				**2,185**	0	1,930													**8751-2**
8751-3																						**8751-3**
8766-1	1,032	0,167	0,333	0,445	-0,779	0,284	1,194	0	0,532	-0,153	0,087	0	0,128	0	0,858	-1,412	-0,191		-0,493	**-3,437**	-0,250	**8766-1**
8766-2	1,009	0,708	-0,752				0,961	0	-0,592	-0,112	0,163	0						-0,196				**8766-2**
8766-3	-1,098	0,032	-0,937				-0,124	0	-0,405													**8766-3**
8862-1	0,250	-1,672	-1,421				-0,377	0	-1,286	-0,912	-0,360	0				0,607	-1,620	-0,196				**8862-1**
8862-2	1,215	0,003	0,333				0,671	0	0,532	-1,163	**2,719**	0										**8862-2**
8862-3										-0,294	-1,393	0										**8862-3**
8891-1		1,421														-1,412	**2,270**	-0,596				**8891-1**
8891-2																						**8891-2**
8891-3																						**8891-3**
9002-1	**-3,245**	0,918					-0,297	0	-0,282	**-3,223**	0,163	0				-0,167	-0,520	0,513				**9002-1**
9002-2	0,353	0,138	-0,307				-0,030	0	-0,131	0,204	1,502	0										**9002-2**
9002-3																						**9002-3**
9306-1	-0,081	-0,439	-0,107				0,786	0	0,076	-1,241	0,379	0				**4,000**	**4,000**	**4,000**	0,802	0,877	0,084	**9306-1**
9306-2																						**9306-2**
9306-3																						**9306-3**
9524-1	**-2,251**	1,174	-0,752				**-2,392**	0	-0,592	-0,816	-0,420	0				**2,121**	0,714	1,139	-0,209	**-4,000**	1,717	**9524-1**
9524-2	**-3,465**	1,701	-1,000				**-3,883**	0	-0,849	-1,364	1,064	0										**9524-2**
9524-3																						**9524-3**
9657-1	-0,619	**-2,276**	-0,307	1,203	1,122	-0,943	0,769	0	-0,131	0,027	-0,086	0	0,194	0	-0,787	0,607	0,714	1,139	-1,454	1,082	-0,614	**9657-1**
9657-2	**2,001**	0,157	-0,937				1,359	0	-0,784	-0,274	-0,134	0										**9657-2**
9657-3							-1,249	0	-1,935													**9657-3**
9736-1	-0,163	0,910	1,105				-0,337	0	1,333	0,978	1,943	0	1,710	0	0,517	0,845	0,424	0,513	-0,493	-0,108	0,687	**9736-1**
9736-2	0,676	-0,056	**2,425**				1,163	0	**2,701**													**9736-2**
9736-3																						**9736-3**
9857-1	1,226	**2,340**	**3,183**				0,571	0	**3,487**	-0,315	1,392	0				1,074	0,714	-0,596				**9857-1**
9857-2																						**9857-2**
9857-3																						**9857-3**
9899-1	0,211	-0,115	0,333				0,537	0	0,532	0,682	0,896	0	0,676	0	0,087	-0,167	0,123	1,139	-0,209	0,561	0,395	**9899-1**
9899-2	0,479	-0,377	**2,873**				0,099	0	**3,166**	1,576	-1,661	0	0,984	0	1,817							**9899-2**
9899-3										1,946	0,369	0										**9899-3**
9903-1	0,880	0,327	-0,164				-0,457	0	-0,131	-0,345	-0,086	0	0,940	0			0,424	0,171	1,031	0,453	-0,614	**9903-1**
9903-2																0,102						**9903-2**
9903-3																						**9903-3**

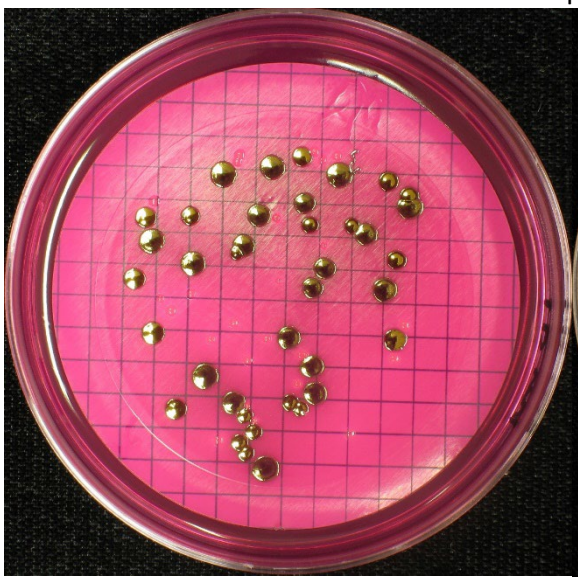
|z| ≥ 3,0 ("Unacceptable" or "Action")
2,0 < |z| < 3,0 ("Warning")
The parameter is not evaluated
The result is not evaluated

* Suspected thermotolerant coliform bacteria is not evaluated. Performance statistics are provided for information only.

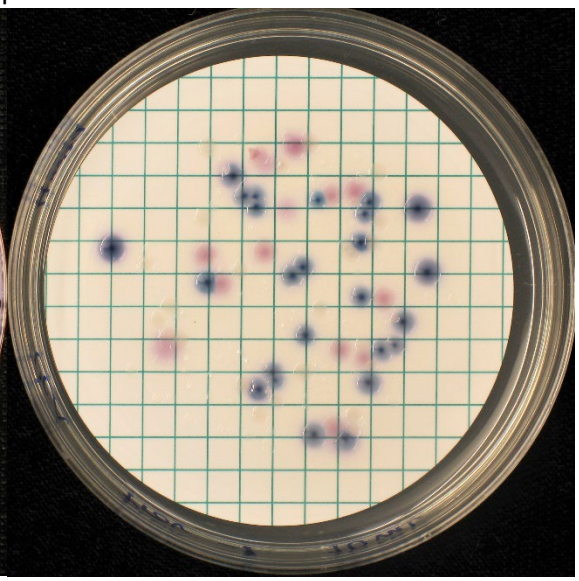
Appendix 3. Photos

Sample A

m-Endo Agar LES, 37 °C



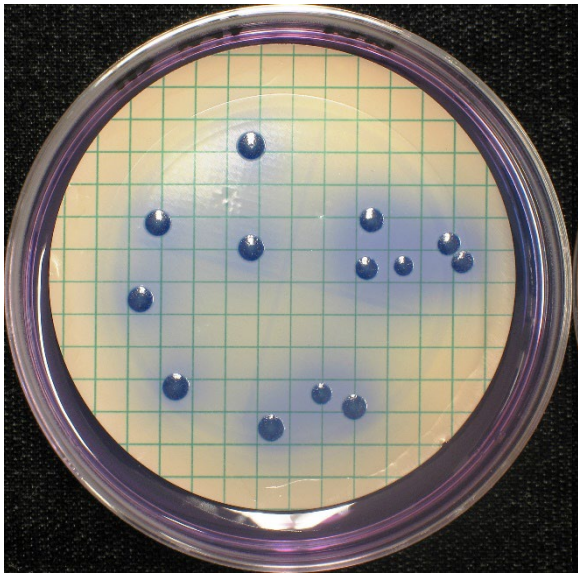
10 ml



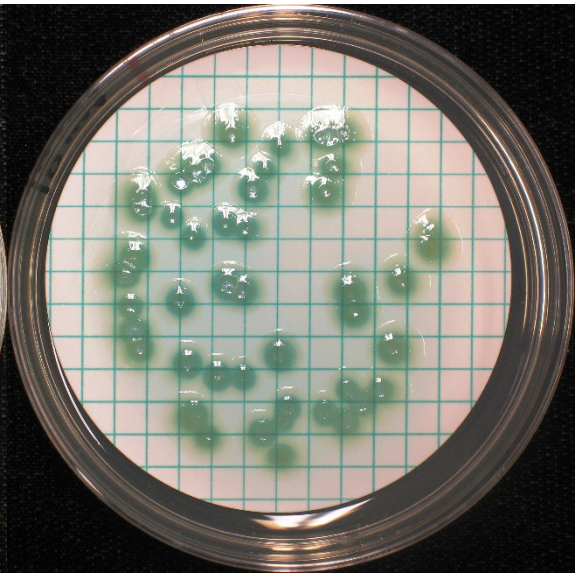
Chromocult Coliform Agar, 37 °C

10 ml

m-FC Agar, 44 °C



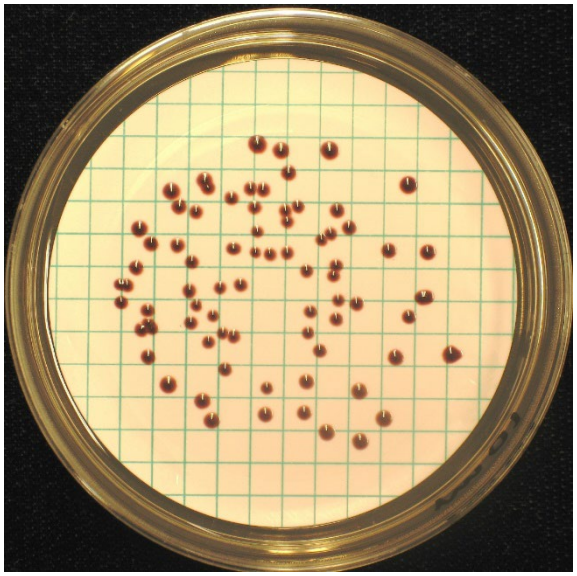
10 ml



m-Pseudomonas CN Agar, 37 °C

10 ml, 2 days

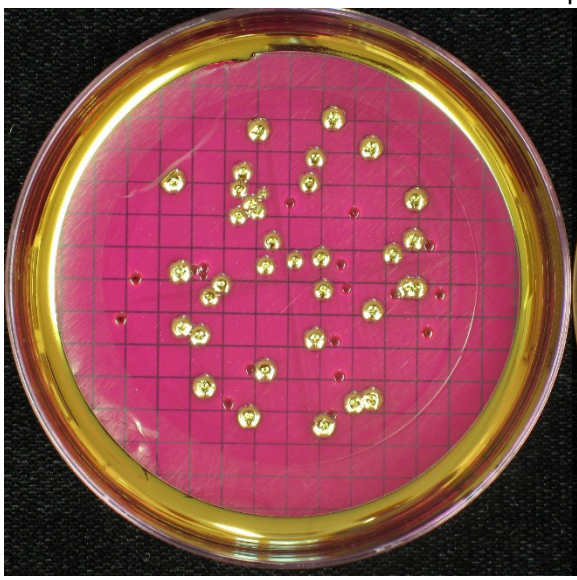
m-Enterococcus Agar, 37 °C



10 ml, 2 days

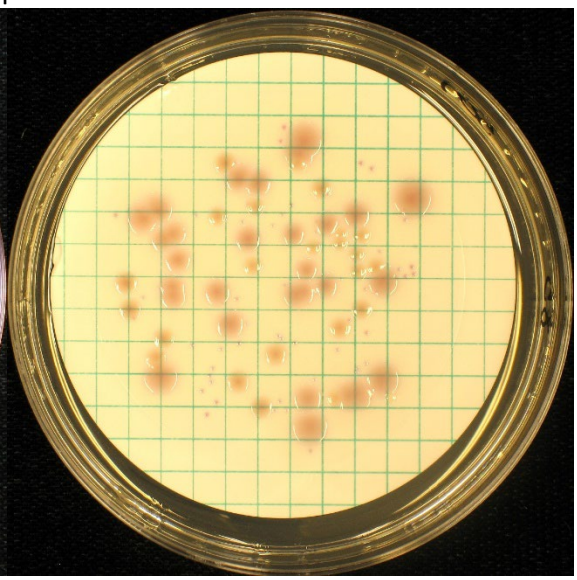
Sample B

m-Endo Agar LES, 37 °C



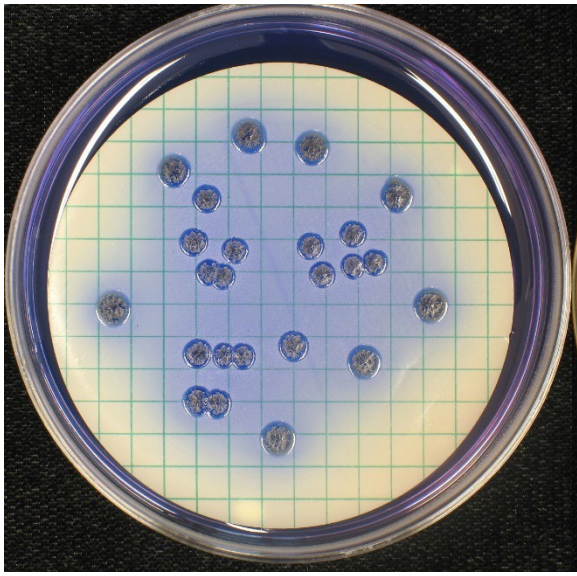
10 ml

Chromocult Coliform Agar, 37 °C



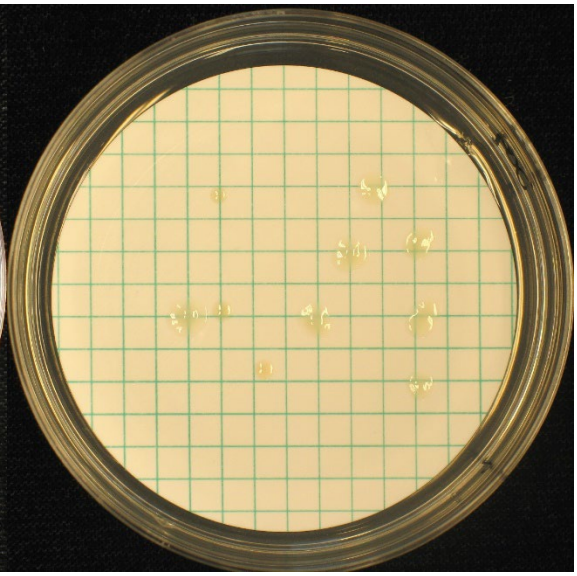
10 ml

m-FC Agar, 44 °C



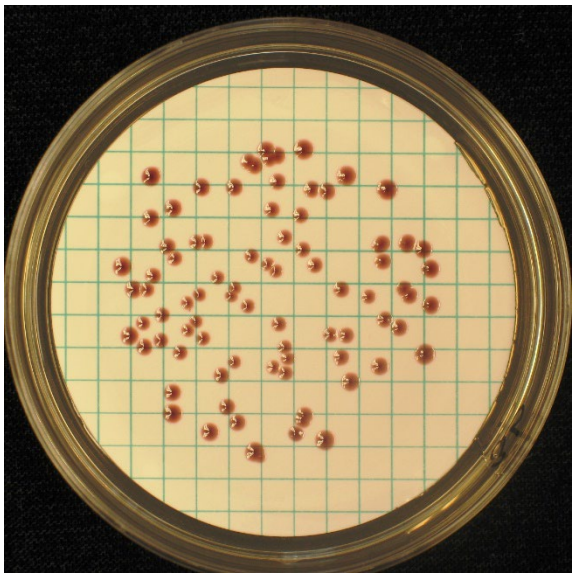
10 ml

m-Pseudomonas CN Agar, 37 °C °C



100 ml, 2 days

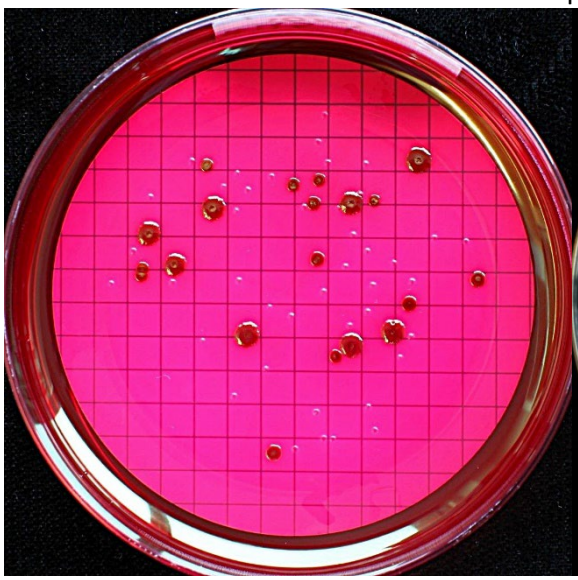
m-Enterococcus Agar, 37 °C



10 ml, 2 days

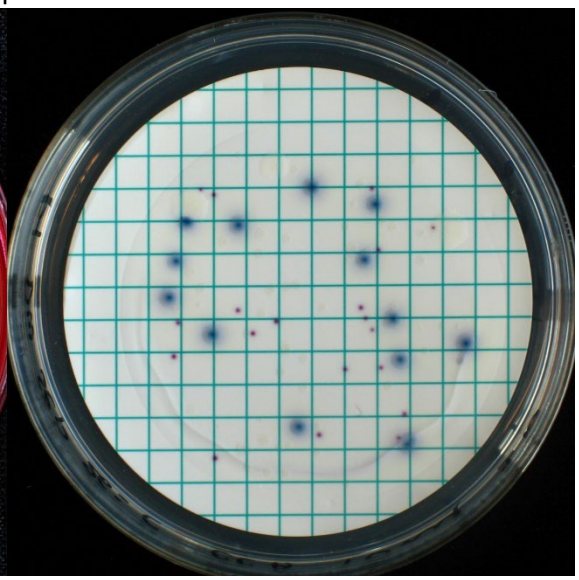
Sample C

m-Endo Agar LES, 37 °C



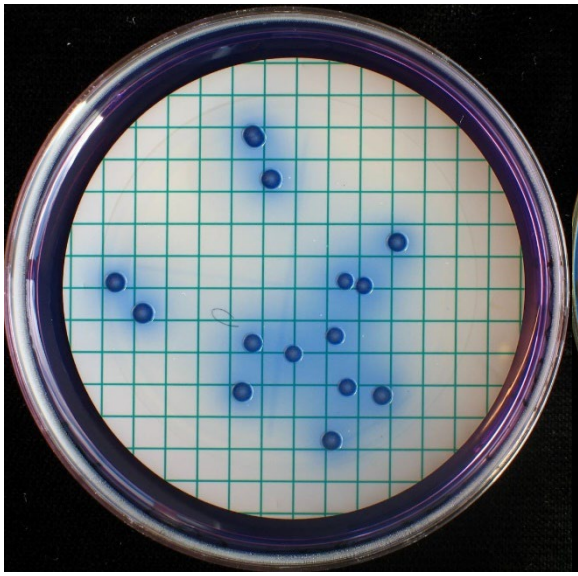
10 ml

Chromocult Coliform Agar, 37 °C



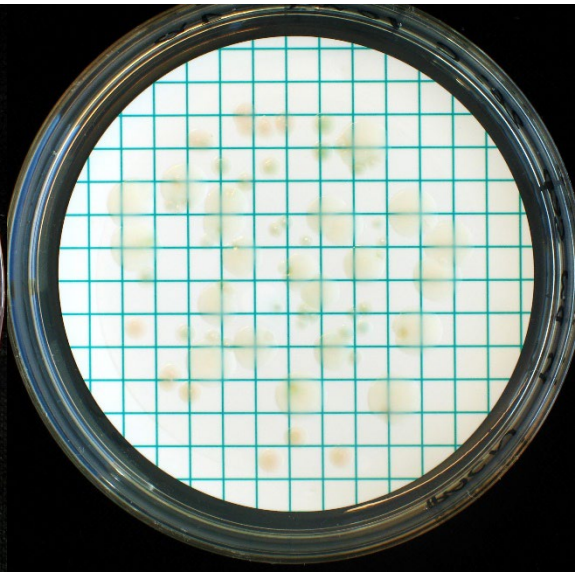
10 ml

m-FC Agar, 44 °C



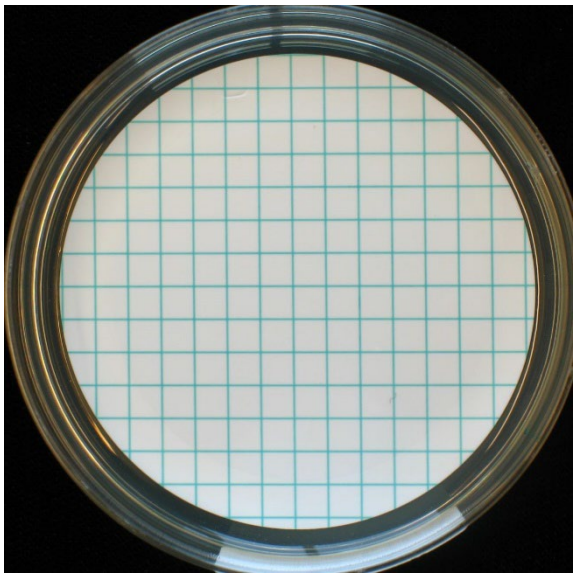
10 ml

m-Pseudomonas CN Agar, 37 °C



10 ml, 2 days

Enterococcus Agar, 37 °C



100 ml, 2 days

Internal and external control for microbiological analyses of food and drinking water

All analytical activities require high standards of performance and accurate documentation. For this purpose, most participants carry out some form of internal quality assurance, but the analytical work also needs to be evaluated by an independent party. Such external quality control of laboratory competence is commonly required by accreditation bodies and can be done by taking part in proficiency testing (PT).

In a PT scheme, identical test materials are analysed by multiple participants. After participants have submitted their results, the organiser evaluates the results and compiles them into a report.

The Swedish Food Agency's PT program offers

- Independent external assessment of participants' analytical competence.
- Improved knowledge of analytical methods for different types of microorganisms.
- Expert support.
- A tool to support accreditation assessments and inspections.

For more information, visit our website: www.livsmedelsverket.se/en/PT-micro

The Swedish Food Agency's certified reference materials

In addition to proficiency testing, the Swedish Food Agency manufactures a range of certified reference materials (CRMs) for internal quality control of microbiological analyses of food and drinking water, including analyses for pathogens.

For more information, visit our website: www.livsmedelsverket.se/en/RM-micro