Proficiency testing Food Microbiology

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Abbreviations

Media

ALOA	Agar for Listeria according to Ottaviani & Agosti
APW 2%	Alcaline peptone water, 2 % NaCl
BA	Blood agar
BcsA	*Bacillus cereus* selective agar
BEA	Bile esculin agar
BGA	Brilliant green agar
BGLB	Brilliant green lactose bile broth
BP	Baird-Parker agar
BPW	Buffered peptone water
BS	Bromthymol blue saccharose agar
CBC	Oxoid Brilliance™ *Bacillus cereus* agar
CIN	Cefsulodin irgasan novobiocin agar
Compact Dry EC	Compact Dry™ *E. coli* and coliforms
Compact Dry ETB	Compact Dry™ Enterobacteriaceae
Compact Dry ETC	Compact Dry™ Enterococcus
Compact Dry TC	Compact Dry™ Total Count
COMPASS	COMPASS® Enterococcus agar
CT-SMAC	Cefixime tellurite sorbitol MacConkey agar
DG18	Dikloran glycerol agar
DRBC	Dikloran Rose-Bengal chloramphenicol agar
EC	*E. coli* broth
EMB	Eosin Methylene Blue agar
ENT	Slanetz & Bartley *Enterococcus* agar
HEA	Hektoen enteric agar
IA	Iron agar
ISA	Iron sulphite agar
ITC	Irgasan ticarcillin potassium chlorate broth
KEAA	Kanamycin esculin azide agar
LMBA	*Listeria monocytogenes* blood agar
LSB	Lauryl sulphate broth
LTLSB	Lactose tryptone lauryl sulphate broth
mCCDA	Modified charcoal cephoperazone deoxycholate agar
mCP	Membrane *Clostridium perfringens* agar
MKTTn	Muller-Kauffmann tetrathionate/novobiocin broth
MLCB	Manitol Lysine Crystal violet Brilliant green agar
MPCA	Milk plate count agar
MRB	Modified Rappaport broth
MRS	de Man, Rogosa and Sharpe agar
MRS-aB	de Man, Rogosa and Sharpe agar with amphotericin
MRS-S	de Man, Rogosa and Sharpe agar with sorbic acid

MSRV	Modified semi-solid Rappaport-Vassiliadis enrichment media
mTSB	Modified tryptone soya broth
MYP	Mannitol egg yolk polymyxin agar
NAP	Nitrite actidione Polymyxin agar
OCLA	Oxoid Brilliance™ Listeria agar
OGYE	Oxytetracyclin glucose yeast extract agar
OPSP	Oleandomycin, Polymixin, Sulphadiazine, Perfringens agar
PAB	Perfringens agar base
PDA	Potato dextrose agar
PALCAM	Polymyxin acriflavine lithium chloride ceftazidime aesculin mannitol agar
Petrifilm AC	Neogen® Petrifilm® Aerobic Count
Petrifilm BC	Neogen® Petrifilm® Bacillus cereus
Petrifilm CC	Neogen® Petrifilm® Coliform count
Petrifilm Disk	Neogen® Petrifilm® Staph Express Disk
Petrifilm EB	Neogen® Petrifilm® Enterobacteriaceae
Petrifilm EC/CC	Neogen® Petrifilm® *E. coli*/Coliform count
Petrifilm EL	Neogen® Petrifilm® Environmental Listeria
Petrifilm LAB	Neogen® Petrifilm® Lactic acid bacteria
Petrifilm RAC	Neogen® Petrifilm® Rapid Aerobic Count
Petrifilm REC	Neogen® Petrifilm® Rapid *E. coli*/Coliform count
Petrifilm RYM	Neogen® Petrifilm® Rapid Yeast and Mold
Petrifilm SEC	Neogen® Petrifilm® Select *E. coli*
Petrifilm Staph	Neogen® Petrifilm® Staph Express
Petrifilm YM	Neogen® Petrifilm® Yeast and Mold
PEMBA	Polymyxin pyruvate egg yolk mannitol bromothymol blue agar
PSB	Peptone sorbitol bile salts broth
PCA	Plate count agar
RPFA	Baird-Parker agar with rabbit plasma fibrinogen
SFA	Sugar-free agar
RVS	Rappaport-Vassiliadis Soy peptone broth
Saubouraud	Saubouraud chloramphenicol agar
SC	Sulphite cycloserine agar
SCD	Soyabean Casein Digest agar
SFP	Shahidi-Ferguson Perfringens agar
SMAC	Sorbitol MacConkey agar
SP	Salt Polymyxin broth
SSDC	Salmonella/Shigella sodium deoxycholate calcium chloride agar
TBX	Tryptone bile X-glucuronide agar
TCBS	Thiosulphate citrate bile salts sucrose agar
TGE	Tryptone glucose extract agar
TEMPO AC	TEMPO® Aerobic count
TEMPO BC	TEMPO® *Bacillus cereus*
TEMPO CAM	TEMPO® Campylobacter
TEMPO CC	TEMPO® Coliform count
TEMPO EB	TEMPO® Enterobacteriaceae

TEMPO EC	TEMPO® E. coli
TEMPO RYM	TEMPO® Rapid Yeast/Mould
TEMPO STA	TEMPO® Coagulase-positive staphylocci
TEMPO YM	TEMPO® Yeast/Mould
TGE	Tryptone glucose extract agar
TS	Tryptose sulphite agar
TSA	Tryptic soya agar
TSC	Tryptose sulphite cycloserine agar
TSBY	Tryptone soya broth with yeast extract
XLD	Xylose lysine deoxycholate agar
VIDAS CAM	VIDAS® Campylobacter
VIDAS ECPT	VIDAS® UP E. coli O157 (including H7)
VIDAS LMX	VIDAS® Listeria monocytogens Xpress
VRB	Violet red bile agar
VRBG	Violet red bile glucose agar
YGC	Yeast extract glucose chloramphenicol agar

Organisations

AFNOR	French National Standardization Association
AOAC	AOAC INTERNATIONAL
ATCC	American Type Culture Collection
CBS	Centraalbureau voor Schimmelcultures (Westerdijk Institute)
CCUG	Culture Collection University of Gothenburg
IDF	International Dairy Foundation
ISO	International Organization for Standardization
NMKL	Nordic-Baltic Committee on Food Analyses
NordVal	NordVal International - NMKL
SLV	Livsmedelsverket/Swedish Food Agency, Sweden
Fohm	Public Health Agency of Sweden

Analyses in this PT round

Quantitative analyses

Aerobic microorganisms, 30 °C

Aerobic microorganisms, 20 °C

Contaminating microorganisms

Enterobacteriaceae

Coliform bacteria, 30 °C

Coliform bacteria, 37 °C

Thermotolerant coliform bacteria

Escherichia coli

Presumptive *Bacillus cereus*

Coagulase-positive staphylococci

Enterococci

Gram-negative bacteria in pasteurised milk and cream

Method

Reporting of results

It is the responsibility of the individual participants to correctly report results according to the instructions. Incorrectly reported results, for example results reported for the wrong sample, cannot be correctly processed. Incorrectly reported results are as a general rule excluded but may – after manual assessment by the Swedish Food Agency in each individual case – still be included and processed.

Incorrectly reported results are generally treated as follows:

- Results reported as e.g. 1, 10 or 100 are likely due to attempts to report results as "less than", e.g. <1 or <10. Due to technical limitations in the web portal, such results must be reported as 0 (zero), which is clearly stated in the instructions. These results are therefore typically left unadjusted in the evaluation.
- Results reported as a single value, e.g. "4", are likely due to attempts to report "<4" or "4.00 $\log_{10}$ cfu ml^{-1}". Since this cannot normally be verified, these results are typically left unadjusted in the evaluation.
- Sometimes participants appear to report qualitative results for quantitative analyses. This is not the intended reporting format, and such results are generally left unadjusted, and may also be considered as outliers or erroneous results.
- When participants clearly state in the comments during reporting that the intention is to report results as "less than", results are typically adjusted accordingly to reflect this.

Reporting of method information

It is also mandatory for the participants to report method information for all analyses. This method information is sometimes contradictory or difficult to interpret. For example, when participants state a medium that is not included in the standard method they refer to, or when manual comments by the participant contradict the reported method information. In such cases, the reported method information provided by the participants is generally used in method comparisons "as it is". Alternatively, method data that are difficult to interpret may be excluded or added to the group "Other", together with results from methods and media that are only used by 1–2 participants.

Standard deviation and assigned value

Evaluation of the participants' results and statistical calculations are carried out on the $\log_{10}$ transformed results. Results reported by participants as "> value" are not evaluated. Results reported as "< value" are excluded from the evaluation or occasionally treated as zero (negative result).

A robust statistical approach is used 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 consists of 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 will be provided *only as an information* to the participants.

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, as well as in some individual cases, subjective adjustments are made to set acceptance limits based on prior knowledge of the samples contents.

Results from different methods

Non-robust median values (*Med*) and standard deviations (s) are calculated to assist in the evaluation of the results from different methods. These are shown in tables in the report, in connection with the respective analyses. In these instances, *Med* and s 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 false results and outliers are provided.

Measurement uncertainty for the assigned values

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):

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

The measurement uncertainty is considered negligible compared to the standard deviation (which is used for evaluating the participants' results) when:

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

Z-scores

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

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

where x_{lab} is the result of the individual participant.

Z-scores for individual analyses are shown in Appendix 2 and can be used as a tool by participants when following up on the results. For quantitative analyses, a z-score is either positive or negative, depending on whether the participants result is higher or lower than m_{PT}.

In evaluations of the analytical results, the following guidelines can be used:

$\|z\| \leq 2$	indicates that the result is acceptable
$2 < \|z\| < 3$	indicates a warning that the result may be deviating, and might motivate an action in the follow-up process
$\|z\| \geq 3$	indicates that the result is regarded as deviating and should lead to an action in the follow-up process

Table legends

N	number of participants that reported results for the analysis
n	number of participants with satisfactory result (false results and outliers excluded)
m_{PT}	assigned value, robust mean value in $\log_{10}$ cfu ml^{-1}
s_{PT}	robust standard deviation
u_{PT}	standard uncertainty of the assigned value
F	number of false positive or false negative results
<	number of low outliers
>	number of high outliers
▭	results deviating more than 1 s_{PT} from m_{PT}, or unusually many deviating results.

Figure legends

▭	results within the interval of acceptance
■	Outlier
□	false negative result
*	value outside the x-axis scale

Web portal

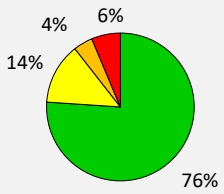
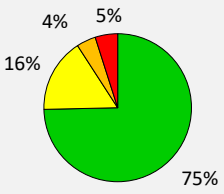
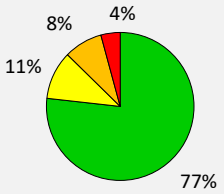
Individual results can also be viewed on the web portal: https://laboratory.livsmedelsverket.se

⚠ Statistical measures presented on the web portal may in some instances differ from those shown in this report. In such cases, the statistics shown in this report take precedence over the statistics shown on the web portal.

Results

Samples were sent to 142 participants: 36 in Sweden, 93 in other European countries, and 13 outside of Europe. Of the 137 participants that reported results, 67 (49 %) provided at least one result that received an annotation. Individual results are listed in Appendix 1. Z-scores for individual results are listed 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, *X*: outliers).

	Sample A				Sample B				Sample C			
% participants with 0 annotations 1 annotation 2 annotations >2 annotations												
Microorganisms	*Escherichia coli* *Klebsiella michiganensis* *Staphylococcus aureus*				*Bacillus cereus* group *Escherichia coli* *Enterococcus durans* *Staphylococcus aureus*				*Enterococcus faecalis* *Hafnia alvei* *Staphylococcus warnerii*			
Analysis	**Target organism**	**N**	**F**	**X**	**Target organism**	**N**	**F**	**X**	**Target organism**	**N**	**F**	**X**
Aerobic microorganisms 30 °C	**All**	164	0	7	**All**	162	0	10	**All**	162	0	15
Aerobic microorganisms 20 °C	**All**	19	0	1	**All**	19	0	1	**All**	19	0	3
Contaminating microorganisms	**All**	20	0	3	**All**	21	0	2	**All**	20	0	2
Enterobacteriaceae	***E. coli*** ***K. michiganensis***	136	0	9	***E. coli***	136	0	10	***H. alvei***	135	1	13
Coliform bacteria 30 °C	***E. coli*** ***K. michiganensis***	41	0	2	***E. coli***	43	1	0	*(H. alvei)*	45	0	0
Coliform bacteria 37 °C	***E. coli*** ***K. michiganensis***	79	0	11	***E. coli***	73	2	3	*(H. alvei)*	69	0	0
Thermotolerant coliform bacteria	***E. coli***	28	0	0	***E. coli***	29	2	2	-	27	2	0
Escherichia coli	***E. coli***	118	1	8	***E. coli***	117	4	9	-	112	11	0
Presumptive *Bacillus cereus*	-	92	13	0	***B. cereus* group**	94	2	4	-	90	13	0
Coagulase-positive Staphylococci	***S. aureus***	91	1	9	***S. aureus***	91	3	11	*(S. warnerii)*	84	7	0
Enterococci	-	52	5	0	***E. durans***	53	1	4	***E. faecalis***	53	1	2
Gram-neg. bacteria in dairy products	***E. coli*** ***K. michiganensis***	8	0	0	***E. coli***	8	0	0	***H. alvei***	8	0	0

- no target organism or no value; ***microorganism*** = main target organism; (*microorganism*) = false positive before confirmation

The results are not evaluated.

Aerobic microorganisms, 30 °C and 20 °C

Sample A

All strains in the sample were target organisms. *K. michiganensis* was present in a slightly higher concentration than *E. coli* and *S. aureus*.

For the analysis at 30 °C, 164 results were reported. Two low and five high outliers were identified.

For the analysis at 20 °C, 19 results were reported. One high outlier was identified.

Sample B

All strains in the sample were target organisms and were present in similar concentrations.

For the analysis at 30 °C, 162 results were reported. Three low and seven high outliers were identified.

For the analysis at 20 °C, 19 results were reported. One high outlier was identified.

Sample C

All strains in the sample were target organisms and were present in similar concentrations.

For the analysis at 30 °C, 162 results were reported. Five low and ten high outliers were identified.

For the analysis at 20 °C, 19 results were reported. Three high outliers were identified.

General comments

Most participants followed either NMKL 86:2013, ISO 4833-1:2013 or a method with Petrifilm AC. ISO 4833-1:2013 was last reviewed by ISO in 2019 and remains current. An amendment with a clarification on the scope of the method is available (ISO 4833-1:2013/Amd 1:2022). NMKL 86:2013 was last reviewed by NMKL in 2022 and remains current. Both NMKL 86:2013 and ISO 4833-1:2013 are based on incubation on PCA or MPCA at 30 °C for 72 h. Users of Petrifilm™ AC can use different incubation times/temperatures, depending on the method validation. There is also a "rapid" version of Petrifilm that gives results in 24 h.

For samples A and B, the results for TEMPO® AC were somewhat higher compared to other methods. Differences of this magnitude are not uncommon for TEMPO® methods and can be considered normal.

Table 2. Results from analysis of aerobic microorganisms, 30 °C.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**164**	**157**	**5.14**	**0.12**	**0**	**2**	**5**	**162**	**152**	**5.06**	**0.15**	**0**	**3**	**7**	**162**	**147**	**4.73**	**0.15**	**0**	**5**	**10**
NMKL 86:2013	41	39	5.11	0.14	0	1	1	39	35	5.00	0.13	0	1	3	39	35	4.70	0.12	0	2	2

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
Petrifilm® AC (72 h)	36	32	5.19	0.12	0	1	3	36	32	5.08	0.13	0	1	3	36	30	4.80	0.14	0	2	4
ISO 4833-1:2013	33	33	5.10	0.08	0	0	0	32	32	5.04	0.10	0	0	0	32	32	4.68	0.09	0	0	0
Other	20	20	5.14	0.11	0	0	0	20	19	5.04	0.16	0	1	0	19	18	4.77	0.11	0	0	1
Petrifilm® AC (48 h)*	11	11	5.17	0.15	0	0	0	10	10	5.09	0.14	0	0	0	10	10	4.76	0.18	0	0	0
TEMPO® AC	10	10	5.32	0.14	0	0	0	10	10	5.25	0.16	0	0	0	10	10	4.75	0.14	0	0	0
ISO 4833-2:2013	4	4	-	-	0	0	0	5	5	4.95	0.14	0	0	0	5	3	-	-	0	0	2
NMKL 86:2006	3	3	-	-	0	0	0	4	4	-	-	0	0	0	5	4	-	-	0	1	0
Petrifilm® RAC (24 h)	4	4	-	-	0	0	0	4	4	-	-	0	0	0	4	4	-	-	0	0	0
Compact Dry™ TC	2	1	-	-	0	0	1	2	1	-	-	0	0	1	2	1	-	-	0	0	1

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).

* Petrifilm AC (48 h) includes one participant that incubated at 35 °C.

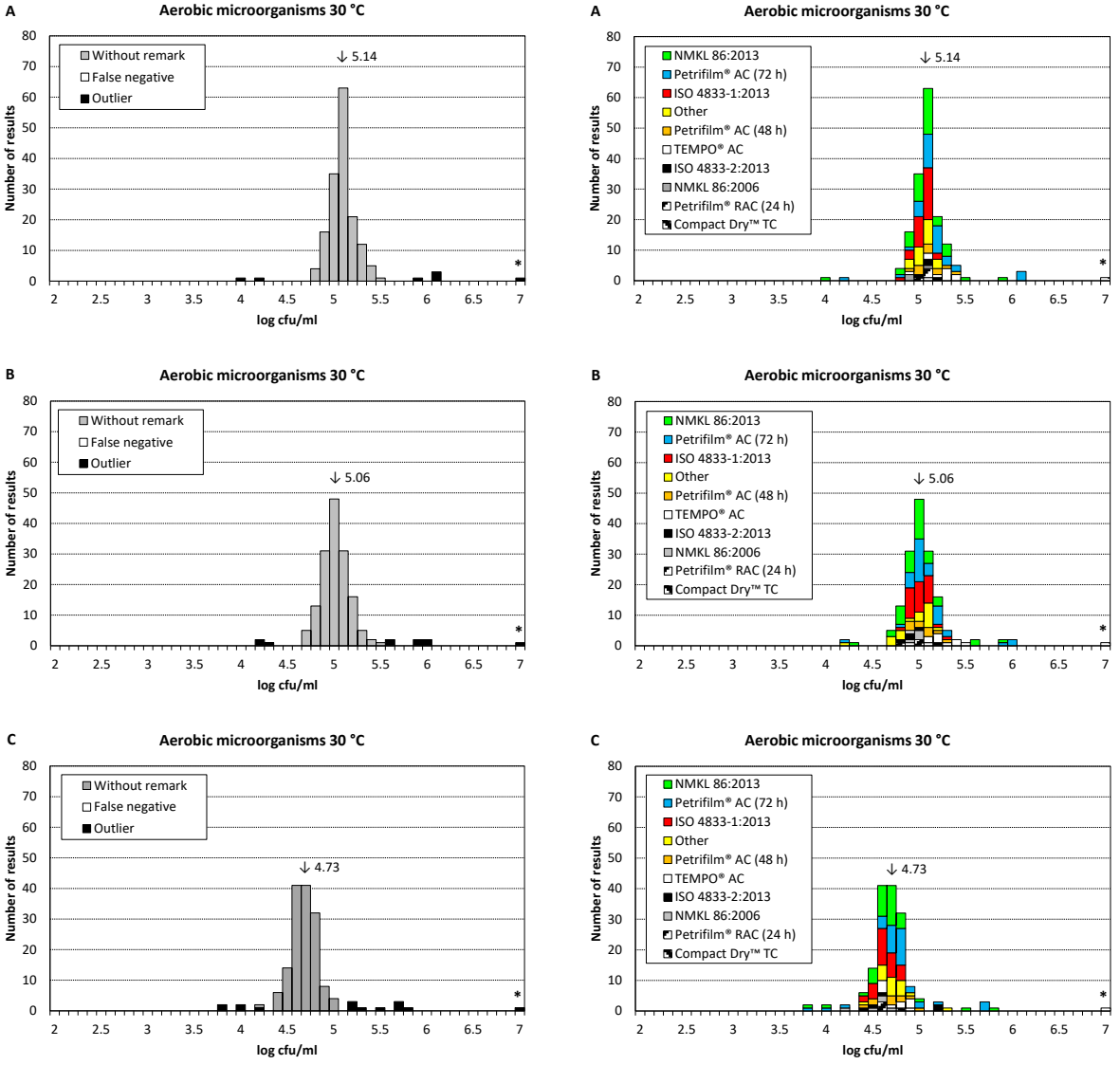


Figure 1. Results from analysis of aerobic microorganisms, 30 °C.

Table 3. Results from analysis of aerobic microorganisms, 20 °C.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**19**	**18**	**5.14**	**0.15**	**0**	**0**	**1**	**19**	**18**	**5.07**	**0.17**	**0**	**0**	**1**	**19**	**16**	**4.76**	**0.12**	**0**	**0**	**3**
NMKL 86:2013	8	8	5.13	0.11	0	0	0	8	8	5.05	0.13	0	0	0	8	7	4.72	0.08	0	0	1
Other	3	3	-	-	0	0	0	3	3	-	-	0	0	0	3	3	-	-	0	0	0
ISO 4833-1:2013	2	2	-	-	0	0	0	2	2	-	-	0	0	0	2	2	-	-	0	0	0
Petrifilm® AC (72 h)	2	2	-	-	0	0	0	2	2	-	-	0	0	0	2	2	-	-	0	0	0
NMKL 86:2006	1	0	-	-	0	0	1	1	0	-	-	0	0	1	1	0	-	-	0	0	1
Petrifilm® AC (48 h)	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	0	0
ISO 4833-2:2013	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	0	-	-	0	0	1
TEMPO® AC	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	0	0

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).

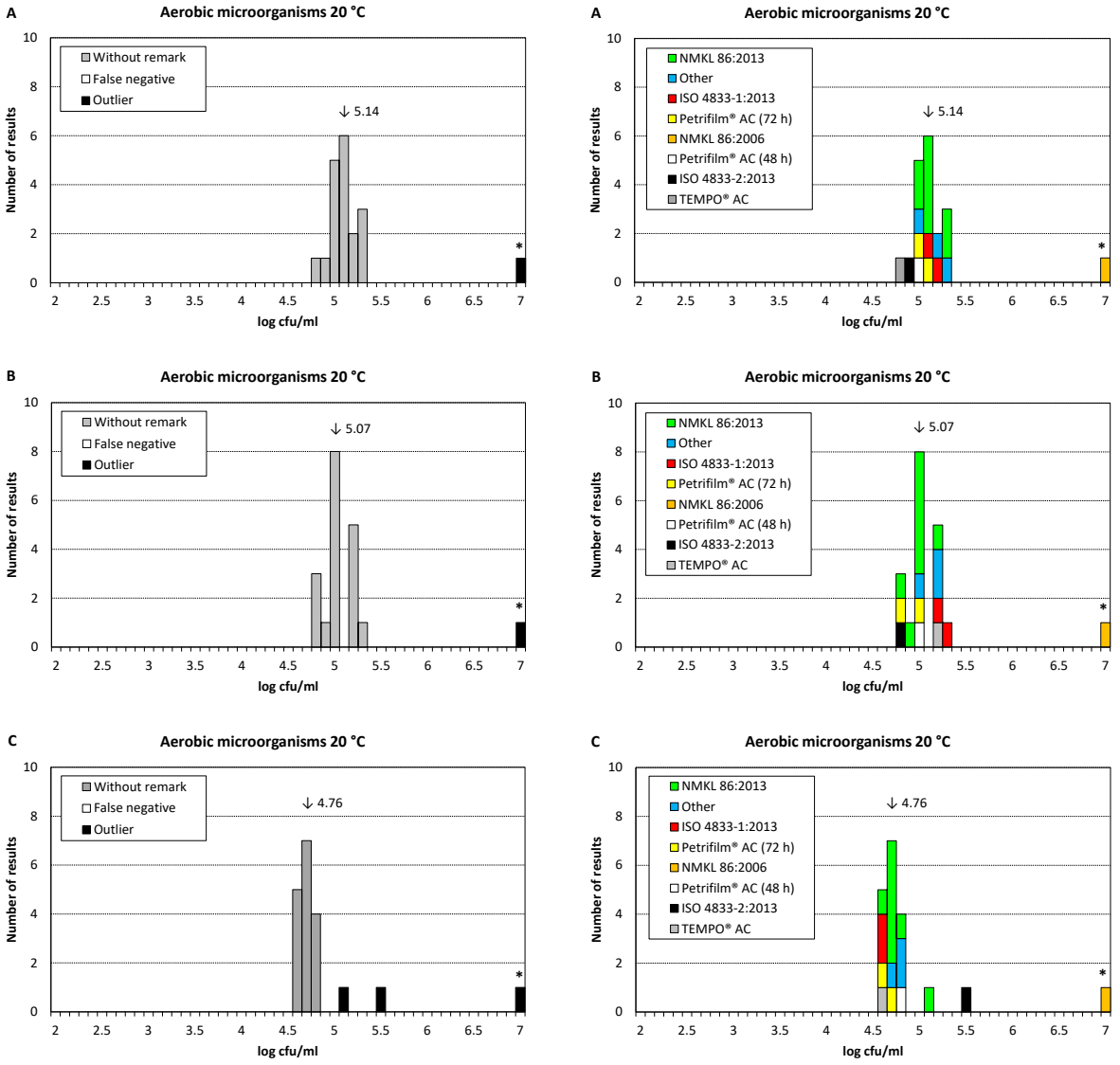


Figure 2. Results from analysis of aerobic microorganisms, 20 °C.

Contaminating microorganisms

Sample A

All strains in the sample were target organisms. *K. michiganensis* was present in a slightly higher concentration than *E. coli* and *S. aureus*. All three strains are catalase-positive.

In total, 20 results were reported. Two low and one high outlier were identified.

Sample B

All strains in the sample were target organisms and were present in similar concentrations. In contrast to the other strains, *E. durans* is catalase-negative. It may therefore be excluded if a catalase test is performed.

In total, 21 results were reported. One low and one high outlier were identified.

Sample C

All strains in the sample were target organisms and present in similar concentrations. In contrast to the other strains, *E. faecalis* is catalase-negative. It may therefore be excluded if a catalase test is performed.

In total, 20 results were reported. Two high outliers were identified.

General comments

The only method specified by the participants was ISO 13559:2002 / IDF 153:2002. This was last reviewed by ISO in 2025 and remains current.

The purpose of the analysis is to detect potential contaminating microorganisms in dairy products. For these products, lactic acid bacteria are generally not regarded as contaminating microorganisms. Lactic acid bacteria are catalase-negative and some participants therefore use confirmation with a catalase test. However, such confirmation is not required according to ISO 13559:2002 / IDF 153:2002.

Table 4. Results from analysis of contaminating microorganisms.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**20**	**17**	**5.05**	**0.13**	**0**	**2**	**1**	**21**	**19**	**4.87**	**0.24**	**0**	**1**	**1**	**20**	**18**	**4.60**	**0.12**	**0**	**0**	**2**
ISO 13559:2002 / IDF 153:2002	16	14	5.05	0.13	0	1	1	17	15	4.89	0.19	0	1	1	16	15	4.62	0.15	0	0	1
Other	4	3	-	-	0	1	0	4	4	-	-	0	0	0	4	3	-	-	0	0	1

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).

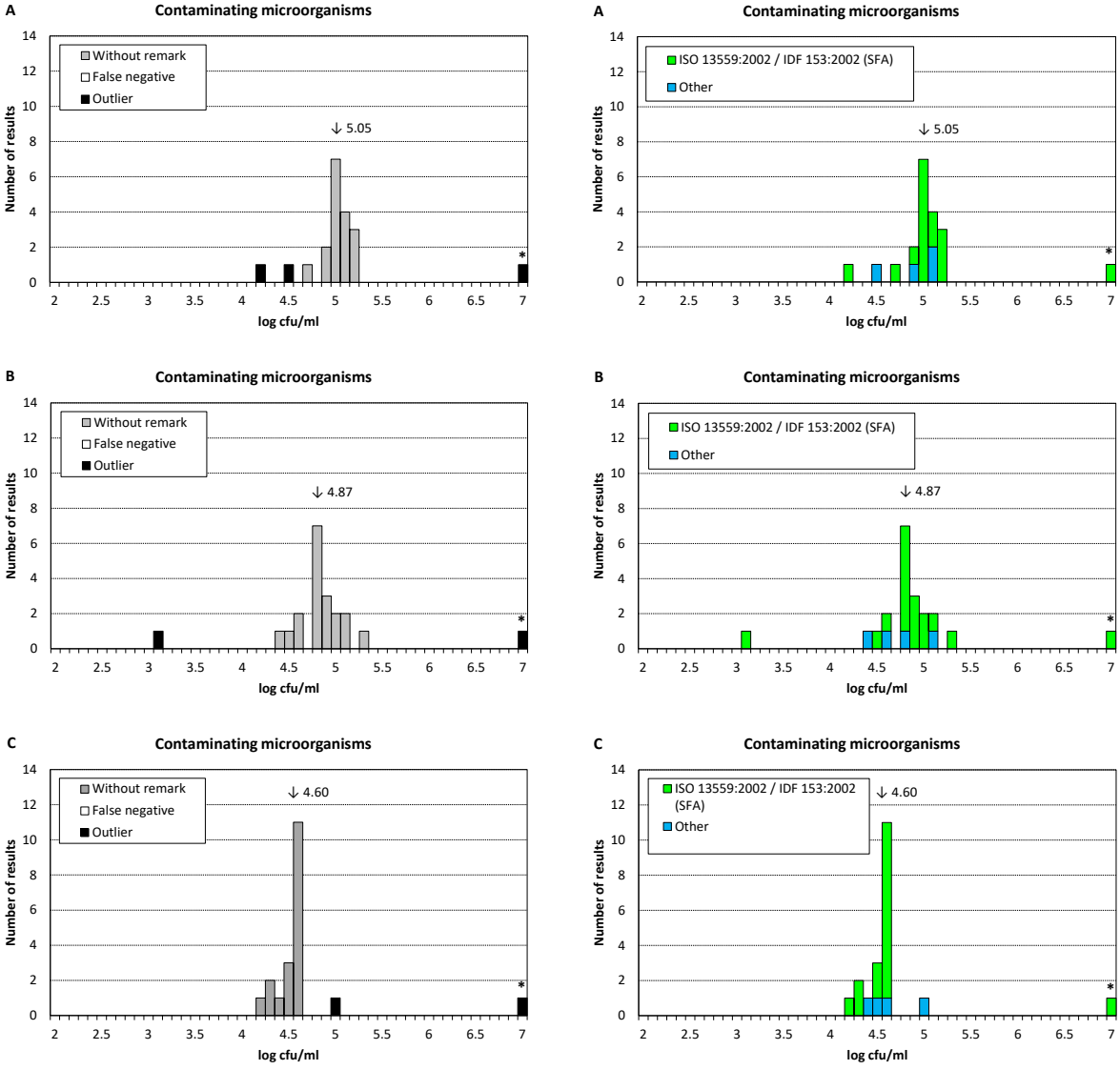


Figure 3. Results from analysis of contaminating microorganisms.

Enterobacteriaceae

Sample A

K. michiganensis and *E. coli* were target organisms. *K. michiganensis* was present in a higher concentration than *E. coli*. On VRBG, both form typical purple/pink colonies that are surrounded by a bile salt precipitation zone. Both are oxidase-negative.

In total, 136 results were reported. Two low and seven high outliers were identified.

Sample B

E. coli was target organism. On VRBG, it forms typical red colonies surrounded by a bile salt precipitation zone. The strain is oxidase-negative.

In total, 136 results were reported. Five low and five high outliers were identified.

Sample C

H. alvei was target organism. On VRBG, it forms typical red/purple colonies surrounded by a bile salt precipitation zone. The strain is oxidase-negative.

In total, 135 results were reported. Six low and seven high outliers were identified, as well as one false negative result.

General comments

Enterobacteriaceae are Gram-negative and oxidase-negative bacteria that ferment glucose with the production of acid by-products. On VRBG they therefore form pink/red colonies, with or without a bile salt precipitation zone. The appearance is similar on Petrifilm EB, which also includes a colour indicator for acid by-products and a plastic film for detection of gas production.

The most common methods were Petrifilm EB (37 °C), NMKL 144:2005 and ISO 21528-2:2017. Both NMKL 144:2005 and ISO 21528-2:2017 was last reviewed in 2025 by NMKL and ISO, respectively, and remain current.

Most methods reported by the participants specify incubation at 37 °C. For Petrifilm EB, both 30 °C and 37 °C are acceptable incubation temperatures. In this PT round, three participants incubated Petrifilm EB at 30 °C, and one participant at 35 °C. No apparent differences could be seen for the different incubation temperatures.

For samples A and B, the results for TEMPO® AC were somewhat higher compared to other methods. Differences of this magnitude are not uncommon for TEMPO® methods and can be considered normal.

Table 5. Results from analysis of Enterobacteriaceae.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**136**	**127**	**4.95**	**0.13**	**0**	**2**	**7**	**136**	**126**	**4.38**	**0.22**	**0**	**5**	**5**	**135**	**121**	**4.38**	**0.20**	**1**	**6**	**7**
Petrifilm® EB (37 °C)	45	41	4.94	0.10	0	1	3	44	41	4.46	0.20	0	0	3	43	37	4.46	0.12	0	3	3
NMKL 144:2005 (VRBG)	42	40	4.96	0.15	0	0	2	41	40	4.35	0.20	0	0	1	41	37	4.35	0.16	1	0	3
ISO 21528-2:2017 (VRBG)	25	24	4.91	0.10	0	1	0	26	25	4.34	0.21	0	1	0	25	25	4.30	0.17	0	0	0
Other	11	11	4.97	0.12	0	0	0	12	9	4.22	0.18	0	3	0	12	12	4.38	0.17	0	0	0
TEMPO® EB	7	6	5.06	0.16	0	0	1	7	7	4.49	0.06	0	0	0	7	5	4.08	0.20	0	2	0
Petrifilm® EB (30 °C)	3	3	-	-	0	0	0	3	2	-	-	0	1	0	4	3	-	-	0	1	0
Compact Dry™ ETB	2	1	-	-	0	0	1	2	1	-	-	0	0	1	2	1	-	-	0	0	1
Petrifilm® EB (35 °C)	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	0	0

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).

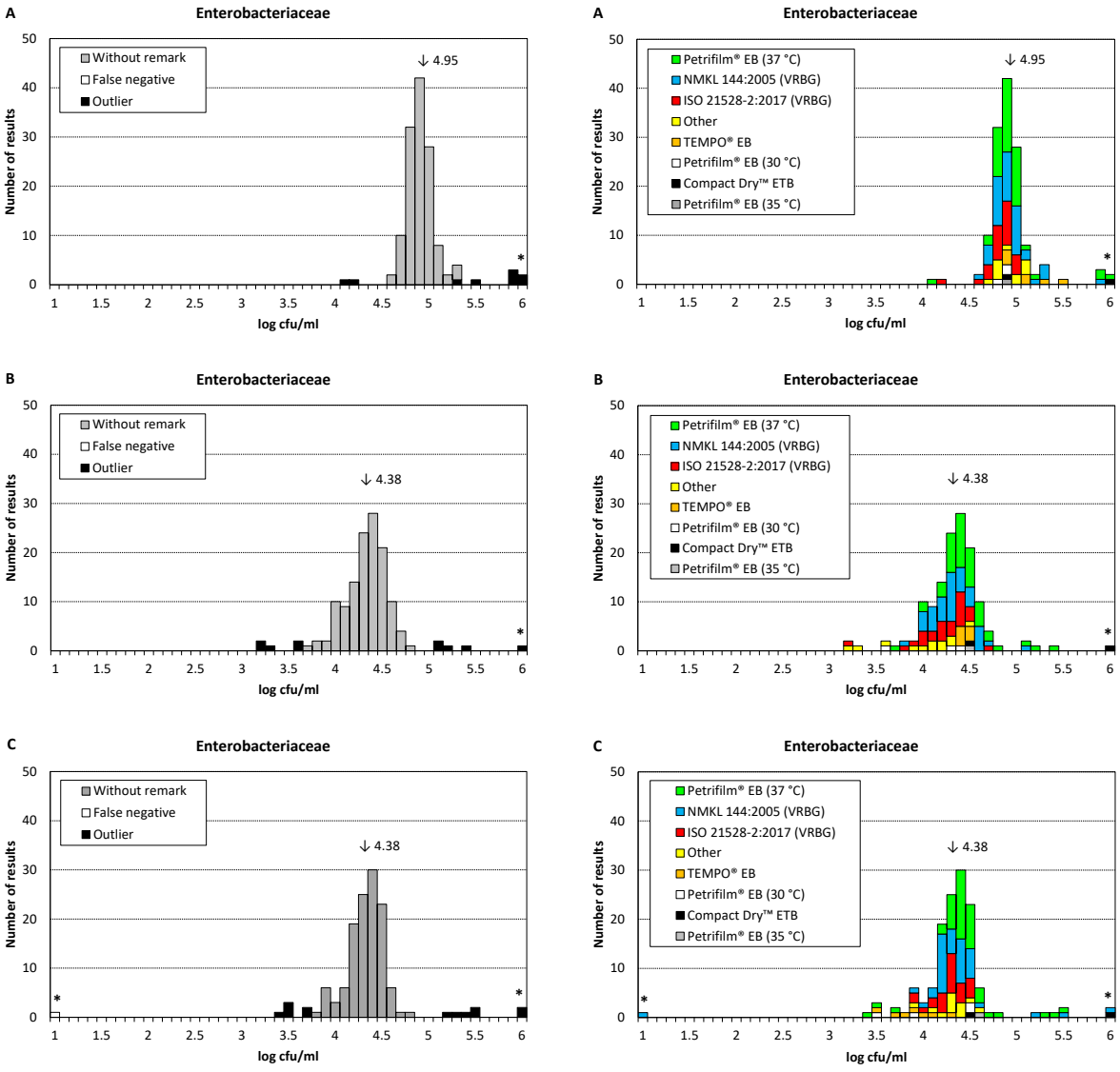


Figure 4. Results from analysis of Enterobacteriaceae.

Coliform bacteria, 30 °C and 37 °C

Sample A

K. michiganensis and *E. coli* were target organisms. *K. michiganensis* was present in a higher concentration than *E. coli*. On VRB, both form typical red colonies that are surrounded by a bile salt precipitation zone. Both are oxidase-negative and produce gas from lactose fermentation in BGLB.

For the analysis at 30 °C, 41 results were reported. Two low outliers were identified.

For the analysis at 37 °C, 79 results were reported. Nine low and two high outliers were identified.

Sample B

E. coli was target organism. On VRB, it forms typical red colonies surrounded by a bile salt precipitation zone. The strain is oxidase-negative and produces gas from lactose fermentation in BGLB.

For the analysis at 30 °C, 43 results were reported. One false negative result was reported.

For the analysis at 37 °C, 73 results were reported. Three high outliers were identified, as well as two false negative results.

Sample C

H. alvei belongs to the coliform group. However, depending on the analytical method used, it may not always be identified as a coliform bacterium. On VRB, it forms very small pink/red colonies. The strain is oxidase-negative but does not produce gas from lactose fermentation in BGLB. Therefore, it should not be counted as a coliform bacterium according to, for example, NMKL 44:2004 or ISO 4832:2006, or when using other methods that require lactose fermentation as a confirmation criterion such as Petrifilm CC and Petrifilm EC/CC.

For the analysis at 30 °C, 45 results were reported. Twenty-one of these were zero results.

For the analysis at 37 °C, 69 results were reported. Twenty-eight of these were zero results.

Overall, approximately half of the participants reported a negative result, while the other half reported concentrations corresponding to that of *H. alvei* in the sample. The differences may therefore either reflect differences in the interpretation of colony morphology and/or the confirmation tests performed.

Due to the characteristics of the strain, and the lack of a consensus among participant results, the results for sample C are not evaluated. Participants are encouraged to self-evaluate if the strain should be identified as a coliform bacterium when using their respective analytical methods.

Comment: The statistical measures shown in Appendix 1 and 2 should be treated as informative only. They are based on the positive results reported and include m_{PT}, s_{PT} etc. These values may be used by participants to support their self-evaluation.

General comments

Coliform bacteria are Gram-negative rods that ferment lactose with the production of gas and acid by-products. On VRB, they form characteristic red colonies due to uptake of crystal violet and neutral red from the medium. The colonies are normally surrounded by a red/pink precipitation zone, which is formed due to the precipitation of bile salts when the pH decreases. Petrifilm CC and Petrifilm EC/CC are based on VRB but also have a plastic film that facilitates detection of gas production.

Most participants followed ISO 4832:2006 or NMKL 44:2004, which both use VRB as the primary medium. ISO 4832:2006 was last reviewed by ISO in 2026 and remains current. NMKL 44 was reviewed by NMKL in 2024 and remains current. In addition to ISO 4832:2006 and NMKL 44:2004, Petrifilm CC and Petrifilm EC/CC were used by many participants.

Since the majority of the methods are based on media of similar composition, differences in results are likely due to whether presumptive colonies and/or atypical colonies are confirmed or not. This varies between both methods and individual participants that use a particular method. Participants may also perform a pre-incubation on TSA prior to incubation on VRB when stressed coliform bacteria are suspected. This is recommended by some methods, and may contribute to differences in results.

The many low results at 37 °C for sample A are likely due to the participants having excluded *K. michiganensis*. Notably, all three participants that used TEMPO® CC reported low outliers for this sample. The TEMPO® CC method has been validated by AOAC (AOAC certificate #060702), and the inclusion study included several strains of *K. michiganensis*.

Several methods were used by only a few participants each, meaning that the group "Other" is fairly large, in particular for 37 °C. Among the methods used be only a few participants were the MPN-based ISO 4831:2006 and NMKL 96:2009. They are adapted for use when the expected concentration of coliform bacteria is low, in the range of 100–300 cfu g^{-1}. This is normally not a problem, even though the concentrations of coliform bacteria in the PT samples are usually significantly higher.

A few participants used methods/media that detect β-galactosidase and β-glucuronidase activity; RAPID'E.coli 2 and Compact Dry EC. For example, on RAPID'E.coli 2 agar, coliform bacteria (Gal+/Gluc-) form blue/green colonies, while *E. coli* (Gal+/Gluc+) form pink/purple colonies.

Table 6. Results from analysis of coliform bacteria, 30 °C.

Method	Sample A							Sample B							Sample C[1]						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**41**	**39**	**4.86**	**0.20**	**0**	**2**	**0**	**43**	**42**	**4.29**	**0.32**	**1**	**0**	**0**	**45**	**23**	**4.32**	**0.19**	**21**	**0**	**1**
ISO 4832:2006 (VRB)	18	16	4.94	0.22	0	2	0	19	19	4.18	0.22	0	0	0	18	11	4.34	0.15	7	0	0
NMKL 44:2004 (VRB)	9	9	4.92	0.19	0	0	0	9	8	4.21	0.35	1	0	0	9	4	-	-	5	0	0
Petrifilm® CC	9	9	4.94	0.10	0	0	0	8	8	4.51	0.39	0	0	0	9	4	-	-	5	0	0
Petrifilm® REC	1	1	-	-	0	0	0	2	2	-	-	0	0	0	2	2	-	-	0	0	0
Petrifilm® EC/CC	1	1	-	-	0	0	0	2	2	-	-	0	0	0	2	0	-	-	2	0	0
TEMPO® CC	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	0	-	-	1	0	0
NMKL 96:2009 (MPN)	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	0	-	-	1	0	0
ISO 4831:2006 (MPN)	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	0	0
Compact Dry™ EC	0	0	-	-	0	0	0	0	0	-	-	0	0	0	1	0	-	-	0	0	1
Other	0	0	-	-	0	0	0	0	0	-	-	0	0	0	1	1	-	-	0	0	0

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).

[1] Not evaluated. Values are only informational.

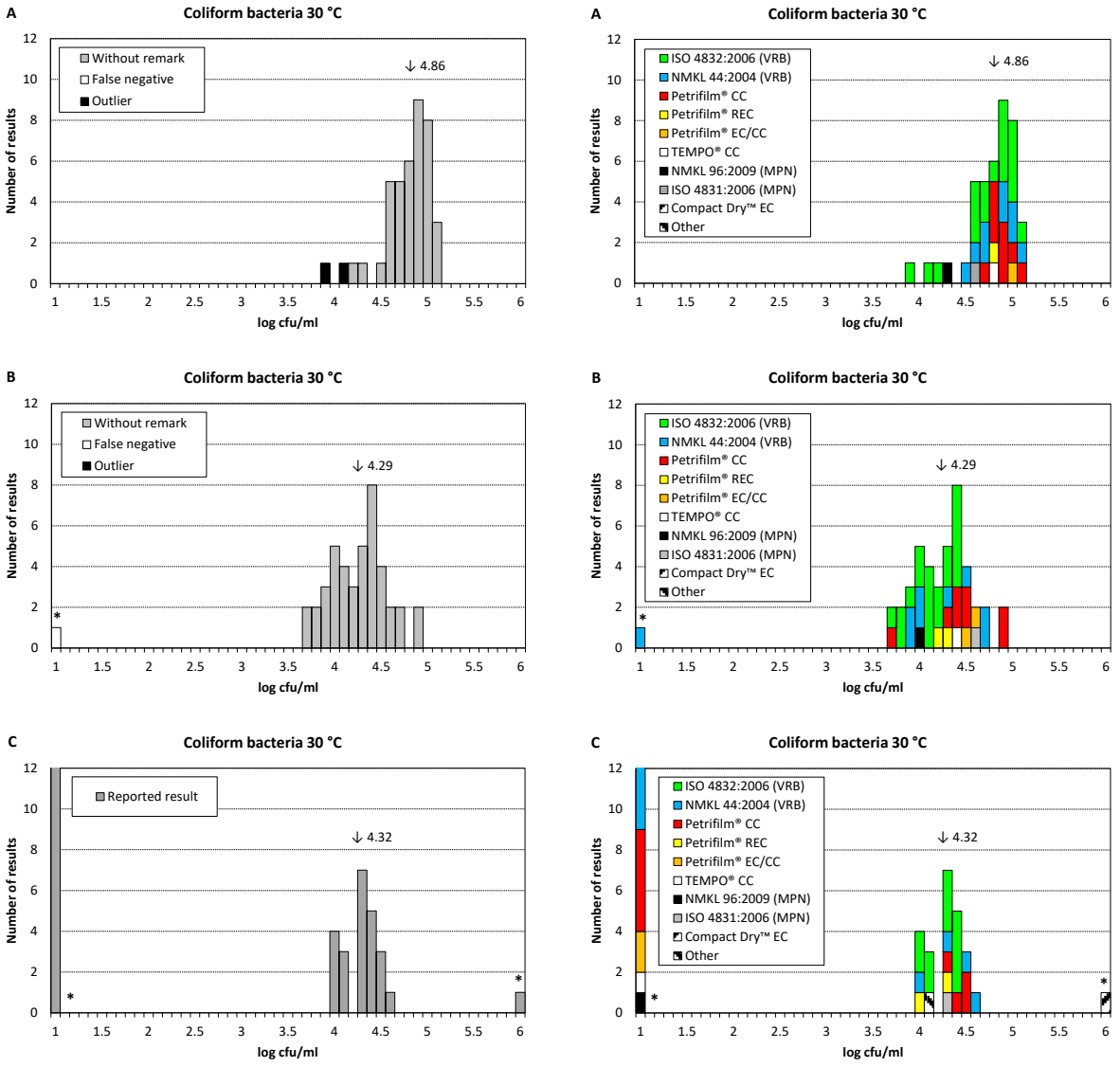


Figure 5. Results from analysis of coliform bacteria, 30 °C.

Table 7. Results from analysis of coliform bacteria, 37 °C.

Method	Sample A							Sample B							Sample C[1]						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**79**	**68**	**4.90**	**0.19**	**0**	**9**	**2**	**73**	**68**	**4.36**	**0.31**	**2**	**0**	**3**	**69**	**35**	**4.44**	**0.35**	**28**	**1**	**5**
Other	16	15	4.99	0.12	0	0	1	16	14	4.35	0.35	0	0	2	16	10	4.46	0.23	6	0	0
ISO 4832:2006 (VRB)	16	12	4.97	0.12	0	4	0	15	15	4.29	0.32	0	0	0	15	9	4.40	0.26	1	0	5
NMKL 44:2004 (VRB)	13	13	4.96	0.25	0	0	0	11	10	4.48	0.27	1	0	0	10	6	4.23	0.36	4	0	0
Petrifilm® EC/CC[2]	11	10	4.93	0.07	0	1	0	10	10	4.49	0.24	0	0	0	9	1	-	-	8	0	0
Petrifilm® CC	10	10	4.96	0.11	0	0	0	9	9	4.43	0.21	0	0	0	8	3	-	-	5	0	0
Compact Dry™ EC	3	1	-	-	0	1	1	3	1	-	-	1	0	1	3	2	-	-	1	0	0
RAPID' E.coli2	3	3	-	-	0	0	0	3	3	-	-	0	0	0	3	0	-	-	3	0	0
TEMPO® CC	3	0	-	-	0	3	0	3	3	-	-	0	0	0	2	2	-	-	0	0	0
Petrifilm® REC	3	3	-	-	0	0	0	2	2	-	-	0	0	0	2	2	-	-	0	0	0
ISO 4831:2006 (MPN)	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	0	-	-	0	1	0

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).

[1] Not evaluated. Values are only informational.

[2] Includes both 35 °C and 37 °C incubation temperature.

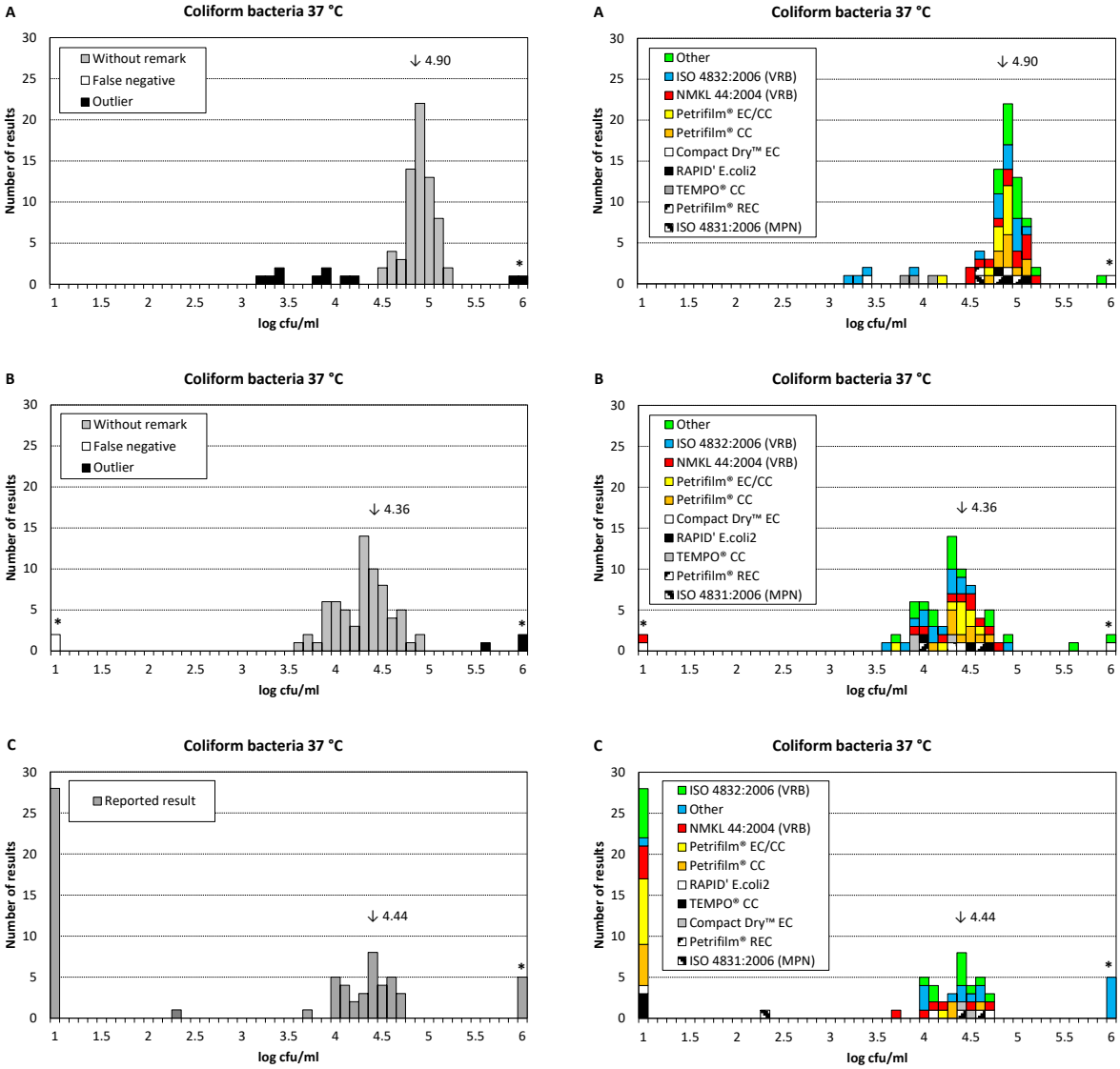


Figure 6. Results from analysis of coliform bacteria, 37 °C.

Thermotolerant coliform bacteria and *Escherichia coli*

Sample A

E. coli was target organism. On VRB, it forms typical red colonies that are surrounded by a bile salt precipitation zone. The strain is positive for indole production and β-glucuronidase activity and produces gas in LTLSB.

For thermotolerant coliform bacteria, 28 results were reported. No outliers or false-negative results were reported.

For *E. coli*, 118 results were reported. Seven low and one high outlier were reported, as well as one false positive result.

Sample B

The strain of *E. coli* was target organism for both analyses. On VRB, it forms typical red colonies surrounded by a bile salt precipitation zone. The strain is positive for indole production and β-glucuronidase activity and produces gas in LTLSB.

For thermotolerant coliform bacteria, 29 results were reported. Two low outliers were identified, as well as two false negative results.

For *E. coli*, 117 results were reported. Six low and three high outliers were identified, as well as four false negative results.

Sample C

No thermotolerant coliform bacterium or *E. coli* were present in the sample.

For thermotolerant coliform bacteria, 27 results were reported. Two false positive results were reported.

For *E. coli*, 112 results were reported. Eleven false positive results were reported; six of these may be due to attempts to report results as “less than” a value.

General comments

On VRB, thermotolerant coliform bacteria form dark red colonies, surrounded by a red zone of bile salt precipitation. They also produce gas as a consequence of lactose fermentation. *E. coli* can be distinguished from other thermotolerant coliform bacteria by their production of indole, and since they possess the enzyme β-glucuronidase.

NMKL 125 was among the most common method for both analyses. It is based on VRB and describes the analysis of both thermotolerant coliform bacteria and of *E. coli*. The new version of the method,

NMKL 125:2024, includes optional determination of β-glucuronidase positive *E. coli*. Compared to the previous PT round, NMKL 125:2024 was now used by more participants than NMKL 12:2005.

For *E. coli*, other common methods were Petrifilm SEC and Petrifilm EC/CC. Both of these are based on substrates that facilitate detection of β-glucuronidase, and *E. coli* therefore form blue-green colonies on these media. The plastic film in Petrifilm EC/CC and Petrifilm SEC also enables detection of gas production due to lactose fermentation. Petrifilm EC/CC was used by participants mainly with a 48 h incubation, even though a 24 h incubation is also used in some validations.

The ISO 16649-2:2001 method is based on TBX, on which β-glucuronidase-positive *E. coli* form blue colonies. Participants that use TBX often get somewhat lower results compared to participants that use other media. This was seen both for samples A and B in this PT round, though the differences were small. Lower results for TBX could be a consequence of participants not performing a pre-incubation at a lower temperature. ISO 16649-2:2001 was last reviewed by ISO in 2024 and remains current.

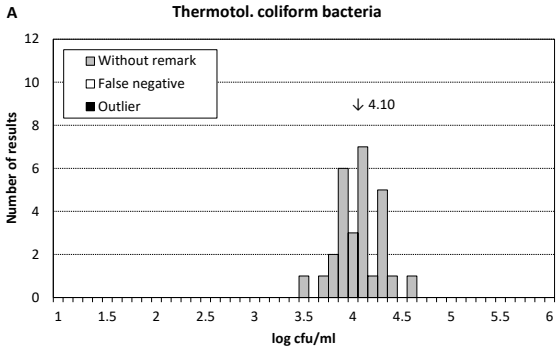
For *E. coli*, the mean value for the MPN-based TEMPO EC is often somewhat higher compared to other methods/media. This was the case both for samples A and B in this PT round but – similar to ISO 16649-2:2001 – the differences were small.

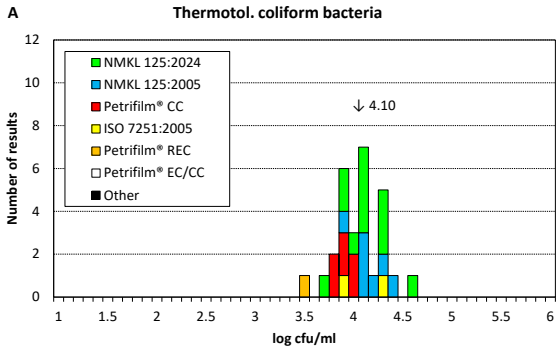
A few results were reported by participants that used the MPN-based methods ISO 7251:2005 and NMKL 96:2009 (not shown). All reported results from these methods were correct.

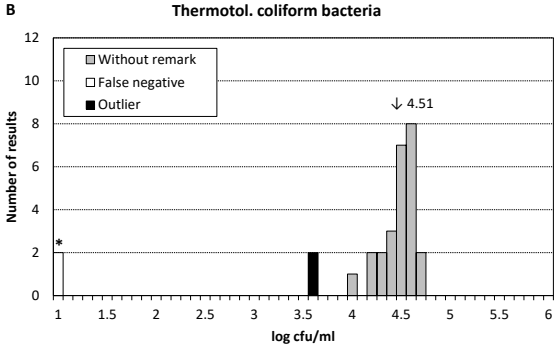
Table 8. Results from analysis of thermotolerant coliform bacteria.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**28**	**28**	**4.10**	**0.23**	**0**	**0**	**0**	**29**	**25**	**4.51**	**0.19**	**2**	**2**	**0**	**27**	**25**	**-**	**-**	**2**	**-**	**-**
NMKL 125:2024	12	12	4.15	0.23	0	0	0	12	10	4.55	0.13	2	0	0	11	9	-	-	2	-	-
NMKL 125:2005	7	7	4.15	0.16	0	0	0	7	7	4.56	0.11	0	0	0	7	7	-	-	0	-	-
Petrifilm® CC	6	6	3.94	0.09	0	0	0	6	5	4.56	0.18	0	1	0	5	5	-	-	0	-	-
ISO 7251:2005	2	2	-	-	0	0	0	2	2	-	-	0	0	0	2	2	-	-	0	-	-
Petrifilm® REC	1	1	-	-	0	0	0	1	1	-	-	0	0	0	1	1	-	-	0	-	-
Petrifilm® EC/CC	0	0	-	-	0	0	0	0	0	-	-	0	0	0	1	1	-	-	0	-	-
Other	0	0	-	-	0	0	0	1	0	-	-	0	1	0	0	0	-	-	0	-	-

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).







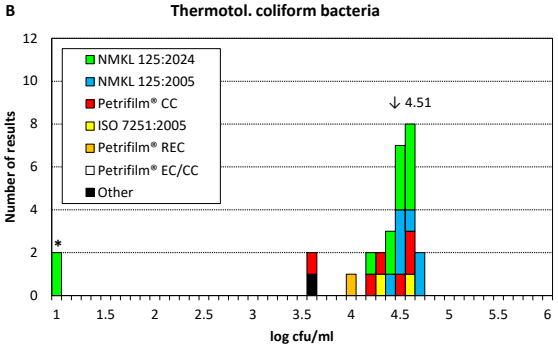
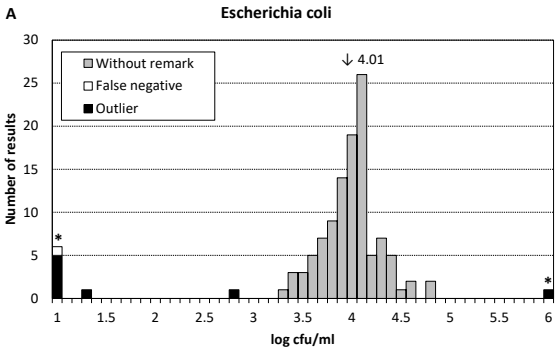


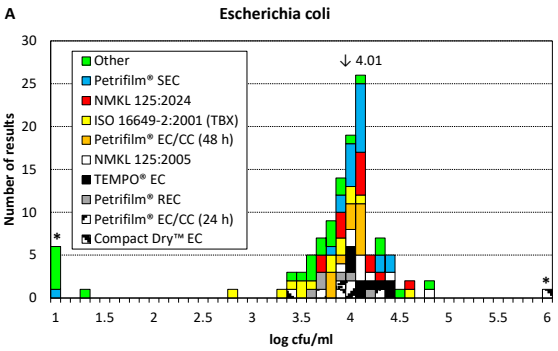
Figure 7. Results from analysis of thermotolerant coliform bacteria.

Table 9. Results from analysis of *Escherichia coli*.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**118**	**109**	**4.01**	**0.29**	**1**	**7**	**1**	**117**	**104**	**4.42**	**0.27**	**4**	**6**	**3**	**112**	**101**	**-**	**-**	**11**	**-**	**-**
Other	24	18	3.82	0.37	0	6	0	24	18	4.25	0.40	1	5	0	26	20	-	-	6	-	-
Petrifilm® SEC	21	20	4.12	0.14	1	0	0	20	17	4.49	0.17	1	0	2	18	16	-	-	2	-	-
NMKL 125:2024	14	14	4.15	0.24	0	0	0	15	13	4.54	0.20	2	0	0	14	12	-	-	2	-	-
ISO 16649-2:2001 (TBX)	14	13	3.81	0.35	0	1	0	14	13	4.34	0.31	0	1	0	14	13	-	-	1	-	-
Petrifilm® EC/CC (48 h)	13	13	4.08	0.14	0	0	0	13	13	4.52	0.24	0	0	0	12	12	-	-	0	-	-
NMKL 125:2005	9	9	4.15	0.29	0	0	0	8	8	4.55	0.17	0	0	0	8	8	-	-	0	-	-
TEMPO® EC	9	9	4.18	0.16	0	0	0	9	9	4.57	0.12	0	0	0	7	7	-	-	0	-	-
Petrifilm® REC	6	6	3.85	0.24	0	0	0	6	6	4.36	0.20	0	0	0	5	5	-	-	0	-	-
Petrifilm® EC/CC (24 h)	5	5	4.04	0.24	0	0	0	5	5	4.54	0.08	0	0	0	5	5	-	-	0	-	-
Compact Dry™ EC	3	2	-	-	0	0	1	3	2	-	-	0	0	1	3	3	-	-	0	-	-

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).





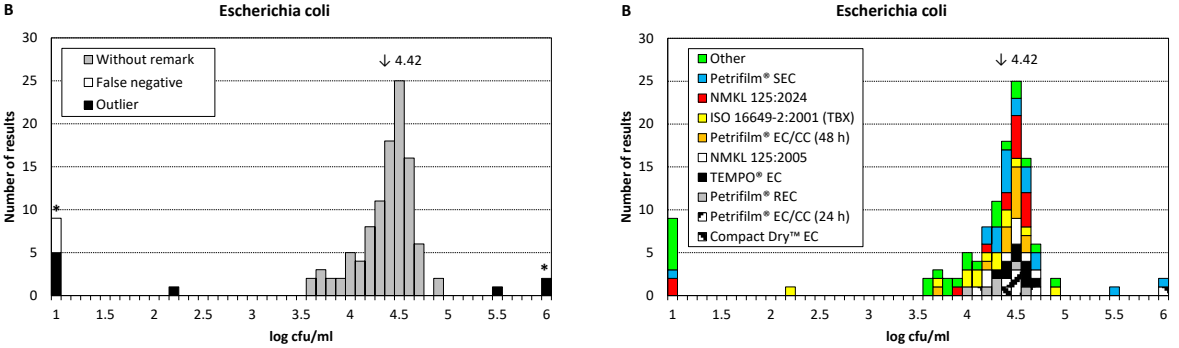


Figure 8. Results from analysis of *Escherichia coli*.

Presumptive *Bacillus cereus*

Sample A

No target organism was present in the sample.

In total, 92 results were reported. Thirteen false positive results were reported; eight of these may be due to attempts to reports results as “less than” a value.

Sample B

The strain of *B. cereus* group was target organism. On BA, it forms typical grey colonies surrounded by a zone of haemolysis. On BcsA, it forms typical blue colonies surrounded by a blue zone of precipitation.

In total, 94 results were reported. Four low outliers were reported, as well as two false-negative results.

Sample C

No target organism was present in the sample.

In total, 90 results were reported. Thirteen false positive results were reported. As for sample A, eight of these may be due to attempts to reports results as “less than” a value.

General comments

B. cereus is a Gram-positive bacterium that forms large, irregular grey colonies, surrounded by a distinct zone of haemolysis on BA. On the selective medium BcsA, presumptive *B. cereus* form bluish colonies are surrounded by a blue zone of precipitation, due to lecithinase activity on egg yolk present in the medium. On MYP, presumptive *B. cereus* form large pink colonies, usually also surrounded by a zone of precipitation as a result of lecithinase activity.

Most participants followed either NMKL 67:2021 or ISO 7932. The retracted NMKL 67:2010 is also still used by many participants. It differs from NMKL 67:2021 mainly in the order of the selective and non-selective medium. ISO 7932:2004 was last reviewed by ISO in 2026 and remains current. An amendment with optional tests was published in 2020.

A few participants used Compact Dry X-BC which contains chromogenic and selective agents that cause *B. cereus* to form blue/green colonies, whereas other bacteria normally form white colonies. According to both the NordVal 045 and MicroVal 2011-LR41 validation studies, Compact Dry X-BC may yield somewhat lower results compared to the reference method ISO 7932:2004. However, this tendency was not observed for the *B. cereus* group strain included in this PT round.

Table 10. Results from analysis of presumptive *Bacillus cereus*.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**92**	**79**	**-**	**-**	**13**	**-**	**-**	**94**	**88**	**4.45**	**0.26**	**2**	**4**	**0**	**90**	**77**	**-**	**-**	**13**	**-**	**-**
NMKL 67:2021	23	23	-	-	0	-	-	24	23	4.43	0.25	1	0	0	22	21	-	-	1	-	-
Other	19	10	-	-	9	-	-	20	19	4.62	0.27	0	1	0	19	10	-	-	9	-	-
ISO 7932:2004	18	18	-	-	0	-	-	19	17	4.36	0.14	0	2	0	19	19	-	-	0	-	-
NMKL 67:2010	9	8	-	-	1	-	-	11	10	4.34	0.28	1	0	0	10	8	-	-	2	-	-
TEMPO® BC	5	5	-	-	0	-	-	6	6	4.54	0.24	0	0	0	5	5	-	-	0	-	-
Petrifilm® BC	6	4	-	-	2	-	-	5	5	4.48	0.09	0	0	0	5	5	-	-	0	-	-
BACARA®	5	5	-	-	0	-	-	3	3	-	-	0	0	0	4	4	-	-	0	-	-
Compact Dry™ X-BC	3	3	-	-	0	-	-	3	2	-	-	0	1	0	3	3	-	-	0	-	-
RAPID'B. cereus	2	2	-	-	0	-	-	2	2	-	-	0	0	0	2	2	-	-	0	-	-
ISO 7932:2004, Amd 1:2020	2	1	-	-	1	-	-	1	1	-	-	0	0	0	1	0	-	-	1	-	-

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).

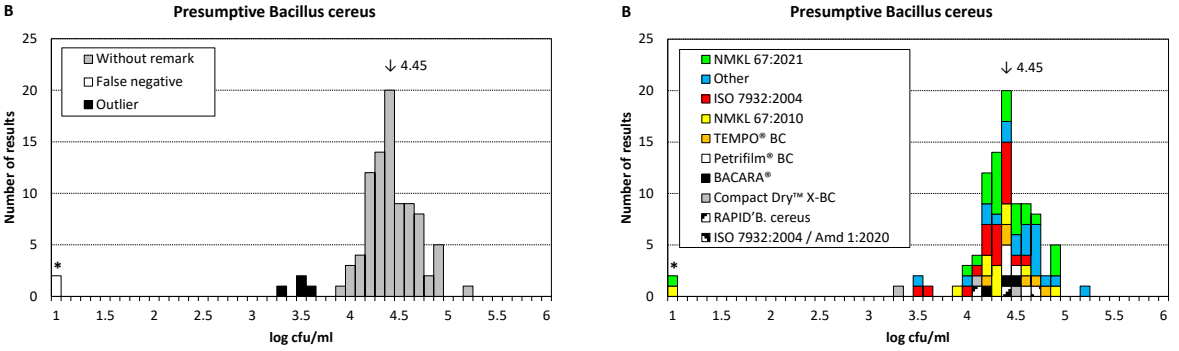


Figure 9. Results from analysis of presumptive *Bacillus cereus*.

Coagulase-positive staphylococci

Sample A

S. aureus was target organism. On RPFA, it forms typical grey colonies surrounded by a distinct precipitation zone. The zone may sometimes only be visible after 24 h incubation and not after 48 h incubation.

In total, 91 results were reported. Eight low and one high outlier were reported, as well as one false-negative result. Five of the low outliers may be due to attempts to report results as "detected".

Sample B

S. aureus was target organism. It forms typical colonies on RPFA. The surrounding coagulase zone may be less prominent after 48 hours incubation, compared to after 24 hours incubation.

In total, 91 results were reported. Nine low and two high outliers were reported, as well as three false-negative results. Five of the low outliers may be due to attempts to report results as "detected".

Sample C

The coagulase-negative strain of *S. warneri* in the sample is false-positive for the analysis. It forms atypical colonies without a precipitation zone on RPFA.

In total, 84 results were reported. Seven false positive results were reported. The reported concentrations varied between 3.41 and 5.36 $\log_{10}$ cfu ml^{-1}, roughly corresponding to the concentration of *S. warneri* in the sample.

General comments

Most participants used methods based on incubation on BP or RPFA. On BP, *S. aureus* form characteristic convex, shiny colonies that have a grey/black colour due to reduction of tellurite in the medium. The colonies are usually surrounded by a clear zone, due to proteolysis of egg yolk in the medium (lecithinase activity). An opaque halo may also form near the colony, due to precipitation caused by lipase activity. When BP is used, confirmation is typically performed by demonstrating coagulase activity, for example by a tube coagulase test or by using RPFA as a secondary medium. With RPFA, the coagulase activity is tested directly in the medium.

Petrifilm Staph Express is based on a modified Baird-Parker agar. It contains a chromogenic indicator that causes *S. aureus* to form red/purple colonies. The associated Petrifilm Staph Express Disk facilitates detection of extracellular DNase, which is produced by the majority of coagulase-positive *S. aureus*, but also by the coagulase-positive staphylococci *S. intermedius* and *S. hyicus*. Toluidin blue O in the disks visualises DNase activity as a pink zone around the colonies.

NMKL 66:2009 allows incubation on either BP and/or RPFA. In comparison, ISO 6888-1:2021 stipulates BP, whereas 6888-2:2021 stipulates the use of RPFA. Amendments containing clarifications to both ISO 6888-1:2021 and ISO 6888- 2:2021 were published in 2023.

Table 11. Results from analysis of coagulase-positive staphylococci.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**91**	**81**	**4.33**	**0.17**	**1**	**8**	**1**	**91**	**77**	**4.46**	**0.16**	**3**	**9**	**2**	**84**	**77**	**-**	**-**	**7**	**-**	**-**
Petrifilm® Staph	25	25	4.27	0.16	0	0	0	23	22	4.42	0.13	1	0	0	21	20	-	-	1	-	-
NMKL 66:2009 (BP)	21	21	4.38	0.14	0	0	0	21	19	4.54	0.14	1	0	1	19	17	-	-	2	-	-
Other	10	4	-	-	1	5	0	11	5	4.42	0.07	1	5	0	11	11	-	-	0	-	-
ISO 6888-1:2021 (BP)	10	9	4.38	0.14	0	1	0	11	10	4.52	0.09	0	1	0	10	8	-	-	2	-	-
NMKL 66:2009 (RPFA)	7	7	4.38	0.08	0	0	0	7	7	4.53	0.06	0	0	0	7	7	-	-	0	-	-
TEMPO® STA	5	3	-	-	0	2	0	5	2	-	-	0	3	0	3	3	-	-	0	-	-
ISO 6888-2:2021, Amd 1:2023 (RPFA)	4	3	-	-	0	0	1	4	3	-	-	0	0	1	4	4	-	-	0	-	-
ISO 6888-2:2021 (RPFA)	4	4	-	-	0	0	0	4	4	-	-	0	0	0	4	3	-	-	1	-	-
Compact Dry™ X-SA	3	3	-	-	0	0	0	3	3	-	-	0	0	0	3	3	-	-	0	-	-
ISO 6888-1:2021, Amd 1:2023 (BP)	2	2	-	-	0	0	0	2	2	-	-	0	0	0	2	1	-	-	1	-	-

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).

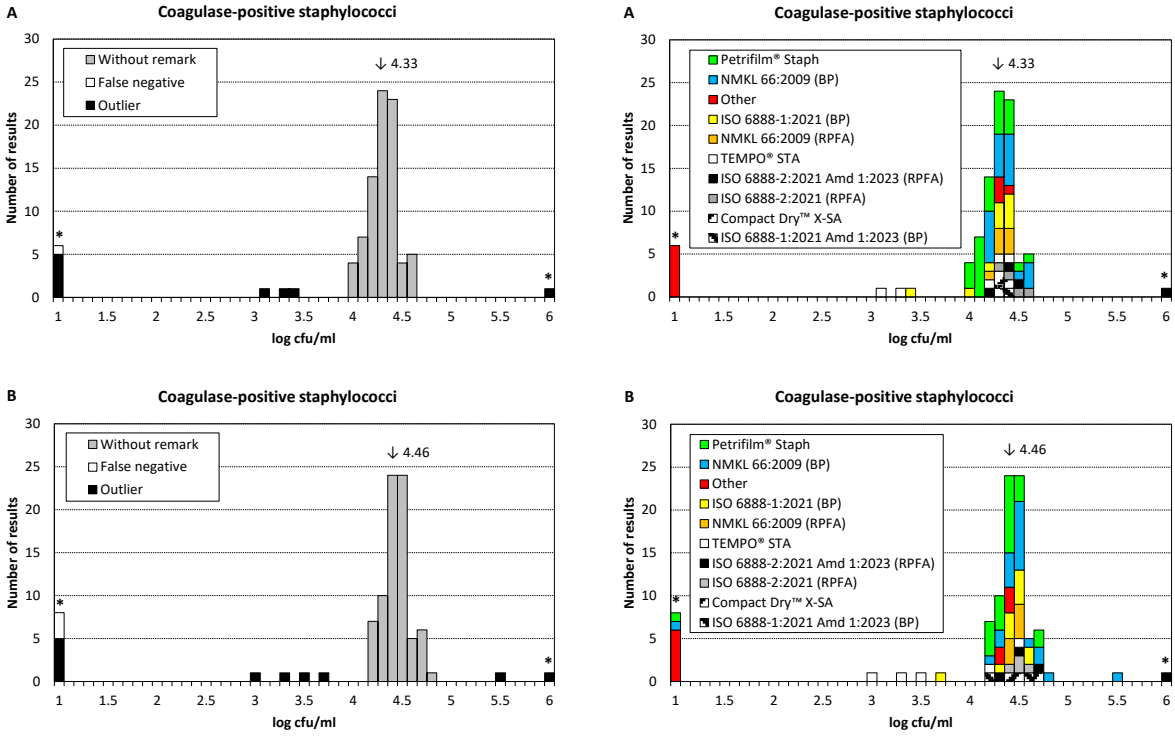


Figure 10. Results from analysis of coagulase-positive staphylococci.

Enterococci

Sample A

No target organism was present in the sample.

In total, 52 results were reported. Five false positive results were reported; three of these may be due to attempts to reports results as “less than” a value.

Sample B

The strain of *E. durans* was target organism. On ENT, it forms typical brown-red raised colonies. On BEA, a black colour is typically seen after both 2 h and 24 h incubation.

In total, 53 results were reported. Three low and one high outlier were reported, as well as one false-negative result.

Sample C

The strain of *E. faecalis* was target organism. On ENT, it forms typical dark red colonies. On BEA, a black colour is typically seen after both 2 h and 24 h incubation.

In total, 53 results were reported. One low and one high outlier were reported, as well as one false-negative result.

General comments

Enterococci are normally defined as Gram-positive, catalase-negative and oval cocci that hydrolyse esculin at 44 °C. On ENT they reduce the colourless substrate 2,3,5-trifenyltetrazolium chloride to red formazan and form slightly raised colonies with a pink/red/maroon colour. They can sometimes also have a colourless edge. Pre-incubation on TSA can be preferable if the presence of stressed enterococci is expected. On BEA, which is often used for confirmation, enterococci cause a tan/black colour in the medium after 2–24 hours. The colour comes from β-glucosidase hydrolysis of esculin in BEA. This produces esculetin and glucose, which together with iron ions in the medium form a black precipitate. Similar to BEA, Compact Dry ETC detects β-glucosidase activity but is instead based on the substrate X-Gluc. On this medium, enterococci therefore form blue colonies.

The majority of the participants followed NMKL 68:2011, which is based on ENT and BEA. The method is still current but is scheduled for revision in 2026–2027. A few participants followed the drinking water method ISO 7899-2:2000. This method is more suited for the drinking water PT.

Table 12. Results from analysis of enterococci.

Method	Sample A							Sample B							Sample C						
	N	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>	*N*	*n*	m_{PT}	s_{PT}	*F*	<	>
All results	**52**	**47**	**-**	**-**	**5**	**-**	**-**	**53**	**48**	**4.39**	**0.15**	**1**	**3**	**1**	**53**	**50**	**4.25**	**0.13**	**1**	**1**	**1**
NMKL 68:2011	28	28	-	-	0	-	-	28	25	4.36	0.15	1	2	0	28	28	4.25	0.16	0	0	0
Other	13	10	-	-	3	-	-	14	14	4.42	0.15	0	0	0	13	13	4.28	0.09	0	0	0
ISO 7899-2:2000	8	7	-	-	1	-	-	8	6	4.47	0.12	0	1	1	9	7	4.19	0.12	0	1	1
Compact Dry™ ETC	3	2	-	-	1	-	-	3	3	-	-	0	0	0	3	2	-	-	1	0	0

For individual methods: m_{PT} = median value and s_{PT} = standard deviation for the particular method (outliers and false results excluded).

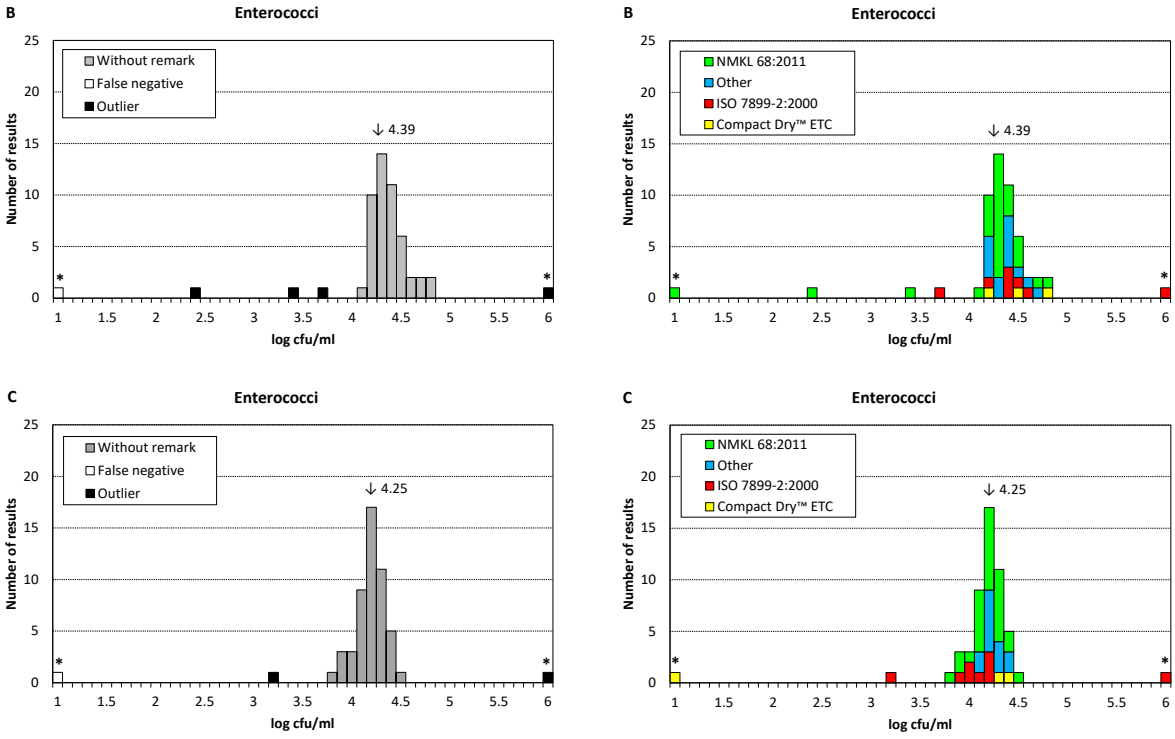


Figure 11. Results from analysis of enterococci.

Gram-negative bacteria in pasteurised milk and cream

Sample A

E. coli and *K. michiganensis* are Gram-negative.

In total, eight results were reported. All were correct positive.

Sample B

E. coli is Gram-negative. It forms colonies on VRBG.

In total, eight results were reported. All were correct positive.

Sample C

H. alvei is Gram-negative. It forms colonies on VRBG.

In total, eight results were reported. All were correct positive.

General comments

Most participants followed NMKL 192:2024 or the previous NMKL 192:2011, which mainly differ in the incubation temperatures. NMKL 192 is a qualitative method for detecting recontamination by Gram negative bacteria in pasteurised milk and cream. These bacteria do not survive high temperature/short time pasteurisation (HTST), where the temperature is raised to 72 °C for at least 15 seconds. Presence of Gram-negative bacteria therefore indicates recontamination, which may negatively affect the shelf-life of the product.

The remaining two participants followed a not specified method and ISO 21528-1:2017. The latter is based on incubation on VRBG, and thus the detection of Gram-negative microorganisms should not be problematic with this method.

Table 13. Results from analysis of Gram-negative bacteria in pasteurised milk and cream.

Method	Sample A			Sample B			Sample C		
	N	*n*	*F*	*N*	*n*	*F*	*N*	*n*	*F*
All results	**8**	**8**	**0**	**8**	**8**	**0**	**8**	**8**	**0**
NMKL 192:2011 (VRBG, 30 °C)	3	3	0	3	3	0	3	3	0
NMKL 192:2024 (VRBG, 25 °C)	3	3	0	3	3	0	3	3	0
ISO 21528-2:2017 (VRBG)	1	1	0	1	1	0	1	1	0
Other	1	1	0	1	1	0	1	1	0

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, with bold font.

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

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

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

Box plots

Box plots are based on the *z*-scores listed in Appendix 2 and give a comprehensive view of the performance of each participant. 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 range of values, 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 shown in figure 12.

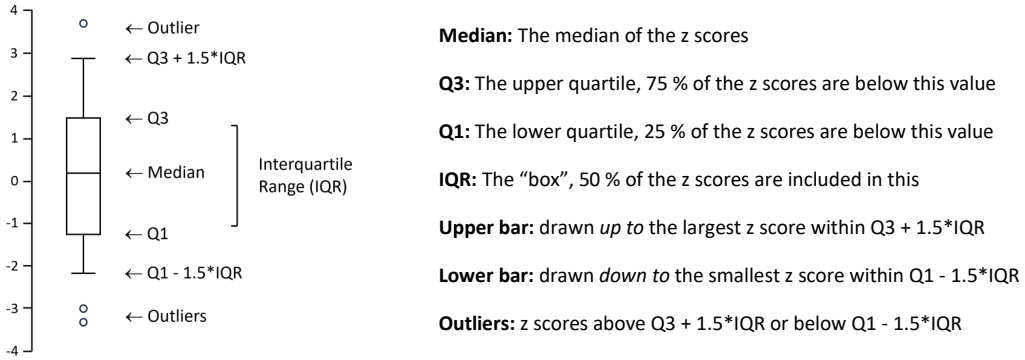
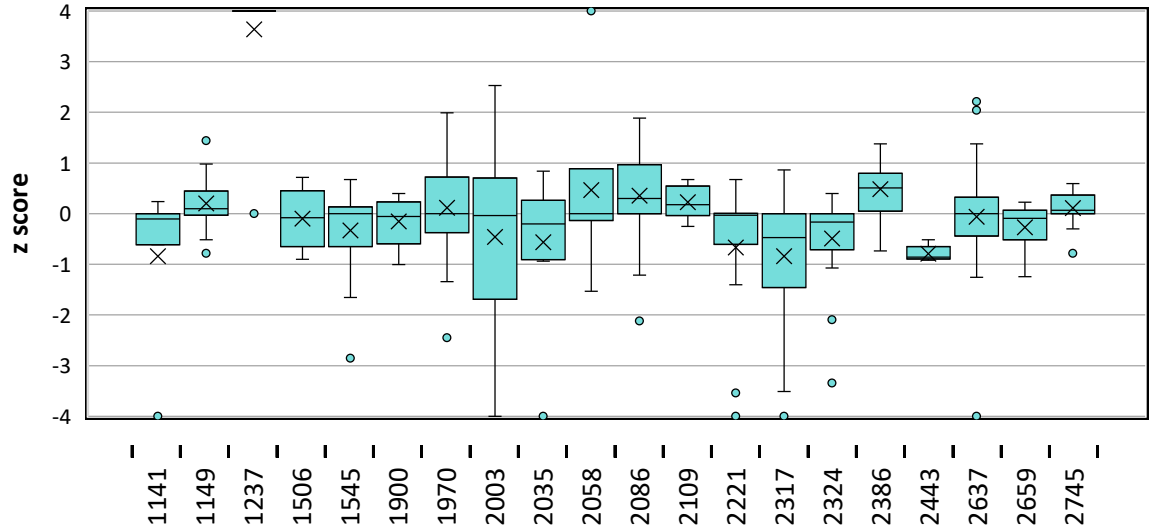
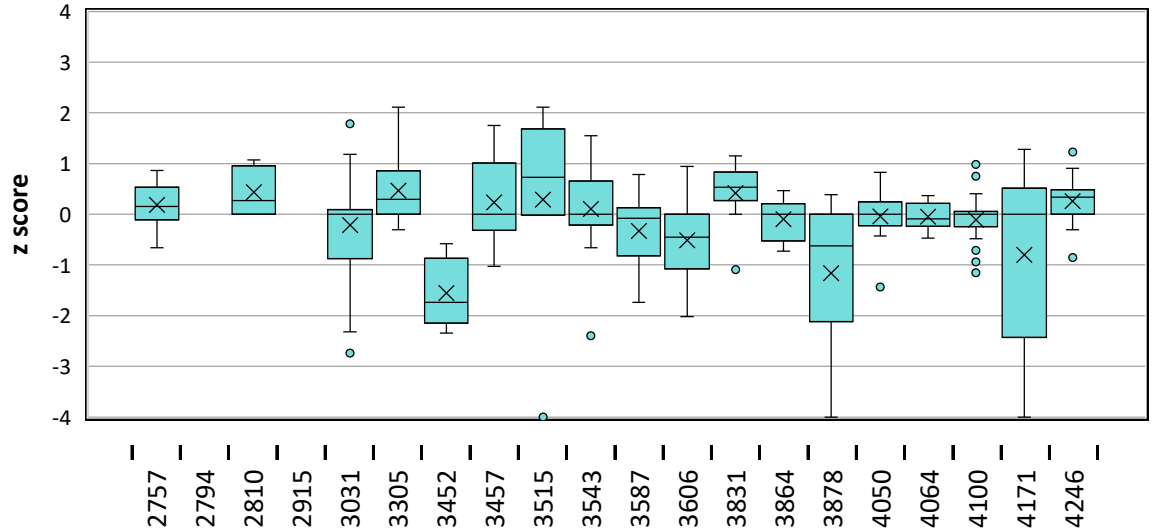
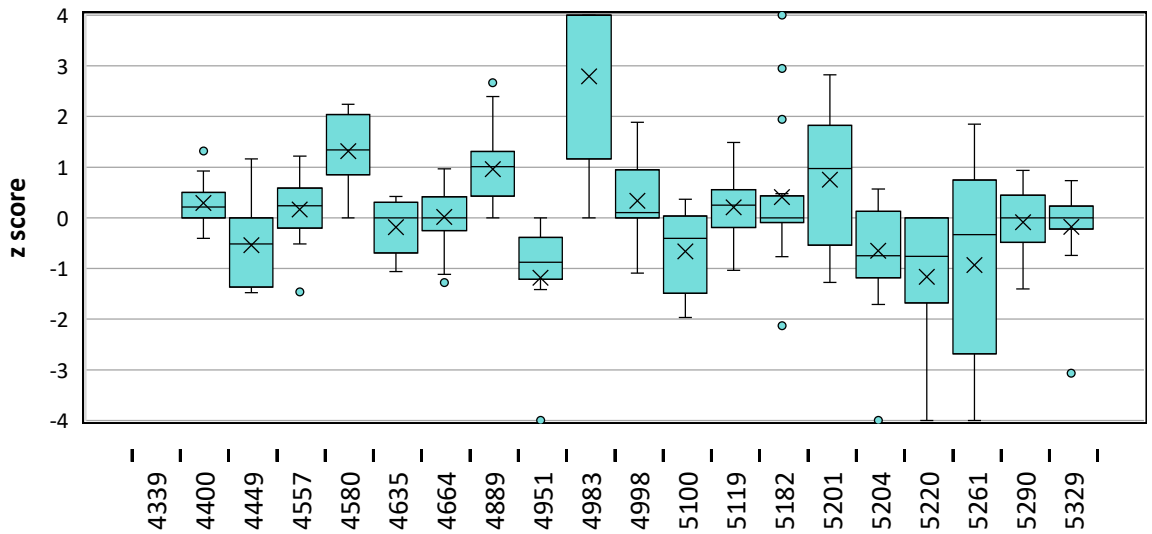
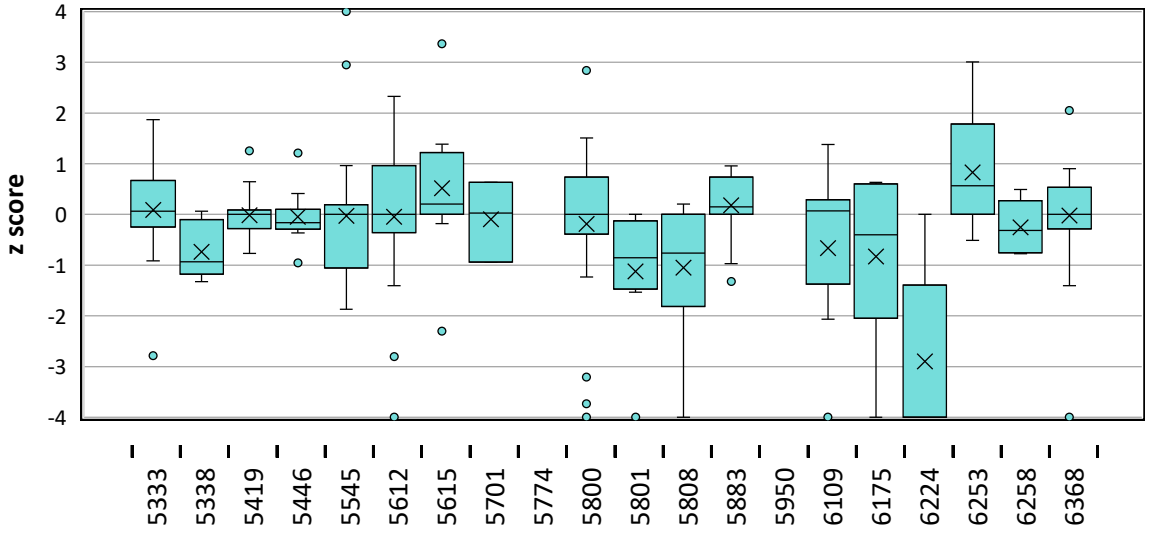


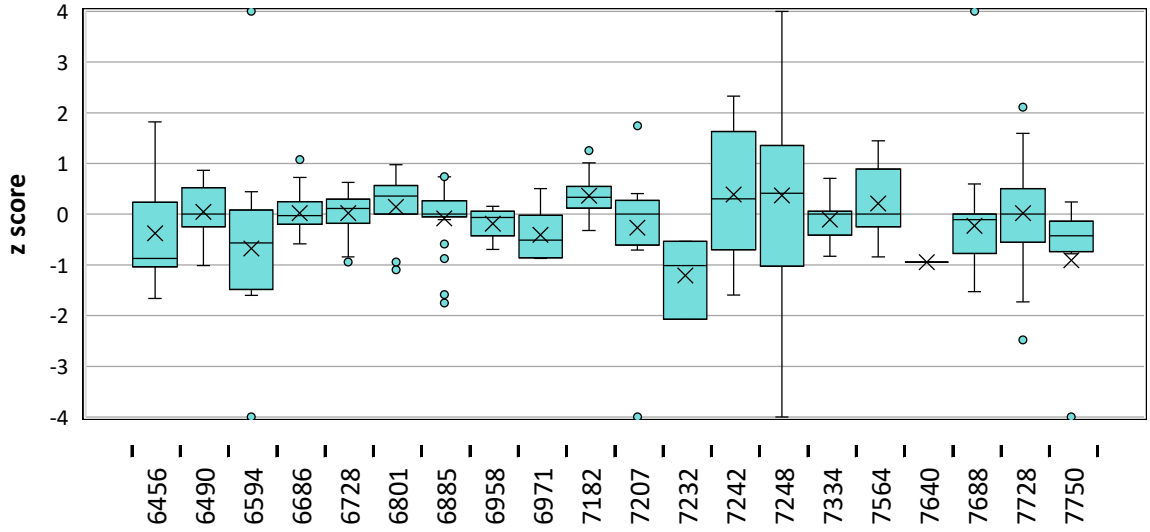
Figure 12. Schematic explanation of a box plot.

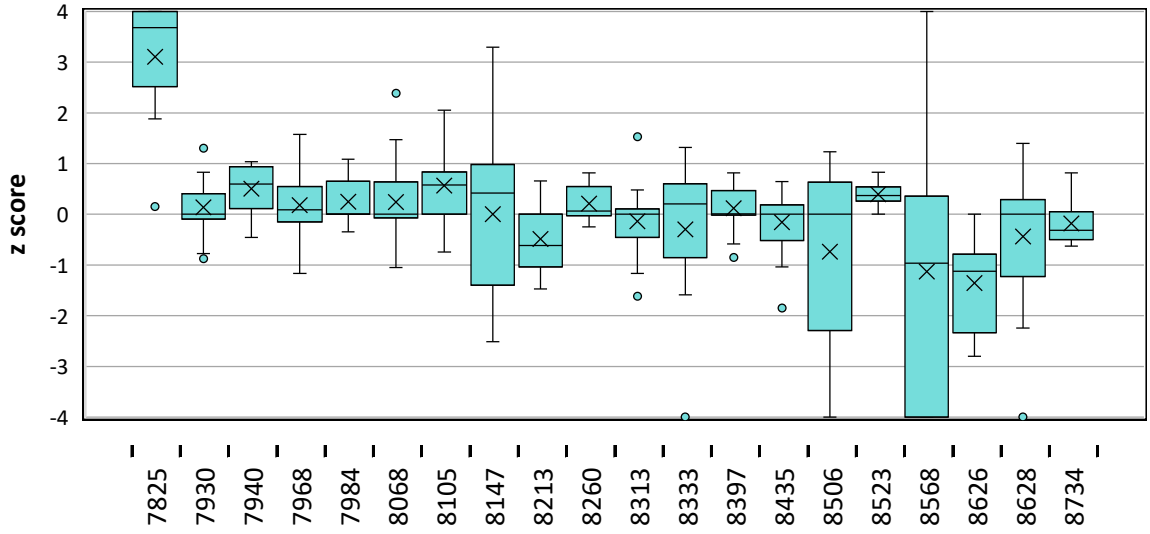

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3
2
1
0
-1
-2
-3
-4
1141
1149
1237
1506
1545
1900
1970
2003
2035
2058
2086
2109
2221
2317
2324
2386
2443
2637
2659
2745

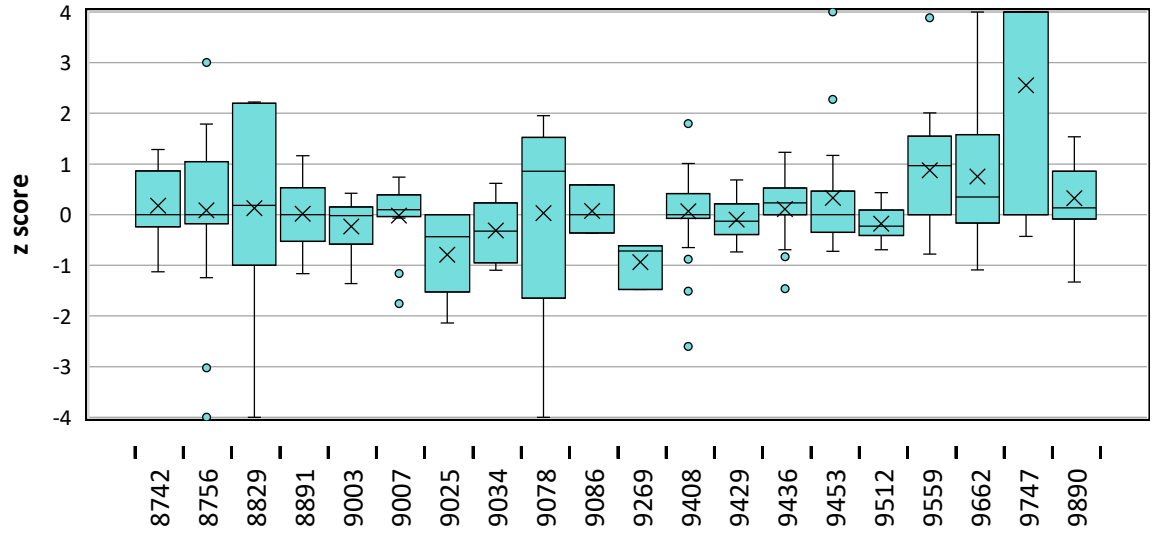

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0
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-3
-4
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2794
2810
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3031
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4064
4100
4171
4246

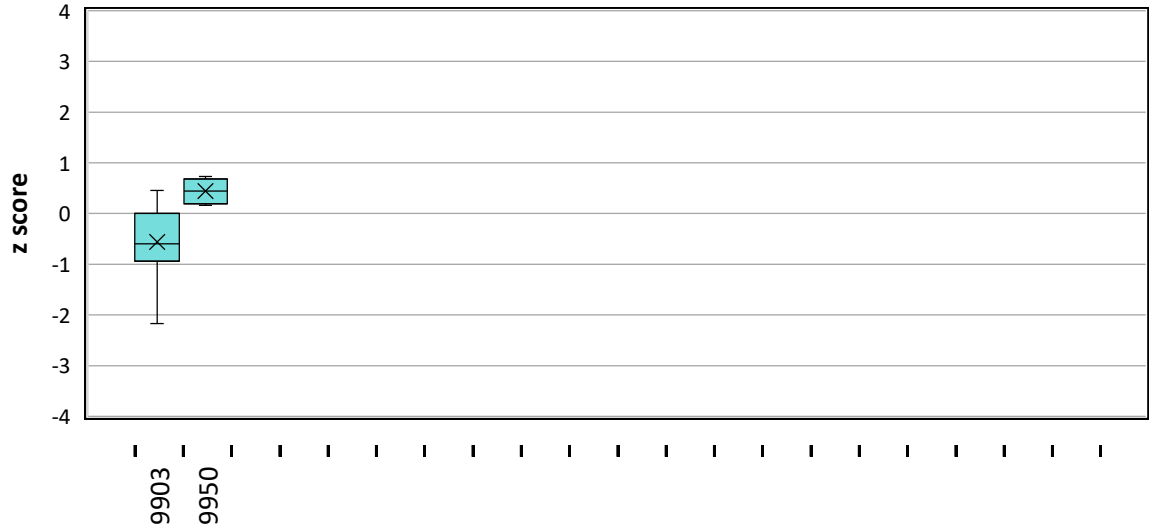

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-3
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4664
4889
4951
4983
4998
5100
5119
5182
5201
5204
5220
5261
5290
5329


z score
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3
2
1
0
-1
-2
-3
-4
5333
5338
5419
5446
5545
5612
5615
5701
5774
5800
5801
5808
5883
5950
6109
6175
6224
6253
6258
6368


z score
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2
1
0
-1
-2
-3
-4
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6490
6594
6686
6728
6801
6885
6958
6971
7182
7207
7232
7242
7248
7334
7564
7640
7688
7728
7750


z score
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3
2
1
0
-1
-2
-3
-4
7825
7930
7940
7968
7984
8068
8105
8147
8213
8260
8313
8333
8397
8435
8506
8523
8568
8626
8628
8734


z score
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2
1
0
-1
-2
-3
-4
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8756
8829
8891
9003
9007
9025
9034
9078
9086
9269
9408
9429
9436
9453
9512
9559
9662
9747
9890


z score
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3
2
1
0
-1
-2
-3
-4
9903
9950

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 should be reconstituted in 254 ml of sterile diluent. The microorganism content of the samples and the concentrations determined at the Swedish Food Agency are listed in table 14.

Table 14. Microorganisms and approximate concentrations in the samples.

Sample	Microorganism	Strain			
		SLV no.[1]	Isolated from	Reference[2]	$\log_{10}$ cfu ml^{-1}
A	*Escherichia coli*	SLV-165	Drinking water	CCUG 43600	4.1
	Klebsiella michiganensis[3]	SLV-553	Water	-	4.9
	Staphylococcus aureus	SLV-185	Chicken	CCUG 48090	4.5
B	*Bacillus cereus* group[3]	SLV-202	Chicken	CCUG 45144	4.4
	Escherichia coli	SLV-085	Water	-	4.5
	Enterococcus durans	SLV-078	Fresh meat	CCUG 44816	4.0
	Staphylococcus aureus	SLV-185	Chicken	CCUG 48090	4.6
C	*Enterococcus faecalis*	SLV-051	-	CCUG 45101	4.3
	Hafnia alvei	SLV-572	Water	-	4.3
	Staphylococcus warneri	SLV-189	Minced meat	CCUG 45143	3.5

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

[2] Culture collection. ATCC: American Type Culture Collection, CBS: Centraalbureau voor Schimmelcultures (Westerdijk Institute), CCUG: Culture Collection University of Gothenburg, Sweden; SMI: Public Health Agency of Sweden.

[3] Name changed since the preliminary report.

Quality control of the samples

Quality control and evaluation of sample homogeneity is performed on 10 randomly chosen vials in conjunction with manufacture, or on 5 vials if an "old" batch of samples is used (Table 15). Homogeneity of a test material is approved if, for each analysis, the p value of a one-way analysis of variance (ANOVA) fulfils the criterion $p \geq 0.05$. If the If the ANOVA yields $p < 0.05$, the PT test item batch is still considered homogenous, if $s_{bu} < s_R/3$, where:

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

s_R: the expected laboratory variation, generally assumed to be 0.25 for the Food scheme.

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

Table 15. Concentration mean (m), between-vial variation (s_{bu}) and p values from the quality control of the samples; m is expressed in $\log_{10}$ cfu (colony forming units) per ml of sample.

Analysis and method	A[1]			B[2]			C[1]		
	m	s_{bu}	*p*	*m*	s_{bu}	*p*	*m*	s_{bu}	*p*
Aerobic microorganisms, 30 °C NMKL method no. 86:2013	5.14	0.03	0.12	5.10	0.00	0.49	4.74	0.00	0.59
Aerobic microorganisms, 20 °C NMKL method no. 86:2013	5.12	0.03	0.21	5.10	0.03	0.32	4.70	0.06	0.03
Contaminating microorganisms ISO method no. 13559:2002 IDF method no. 153:2002	5.17	0.01	0.40	4.98	0.02	0.43	4.86	0.04	0.04
Enterobacteriaceae NMKL method no. 144:2005	4.90	0.00	0.60	4.29	0.05	0.22	4.32	0.06	0.27
Coliform bacteria, 30 °C NMKL method no. 44:2004	4.95	0.01	0.33	4.22	0.00	0.73	4.34	0.06	0.09
Coliform bacteria, 37 °C NMKL method no. 44:2004	4.99	0.00	0.49	4.20	0.02	0.45	4.35	0.00	0.65
Thermotolerant coliform bacteria NMKL method no. 125:2024	4.12	0.00	0.78	4.52	0.00	0.53	-	-	-
Escherichia coli NMKL method no. 125:2024	4.12	0.00	0.78	4.52	0.00	0.53	-	-	-
Presumptive *Bacillus cereus* NMKL method no. 67:2021	-	-	-	4.44	0.09	0.08	-	-	-
Coagulase-positive staphylococci NMKL method no. 66:2009	4.45	0.01	0.48	4.56	0.06	0.07	3.46	0.04	0.18
Enterococci NMKL method no. 68:2011	-	-	-	4.03	0.00	0.73	4.33	0.00	0.53
Gram-negative bacteria in milk and cream NMKL method no. 192:2024	Pos.	-	-	Pos.	-	-	Pos.	-	-

– No target organism or no value

[1] n = 5 vials analysed in duplicate

[2] n = 10 vials analysed in duplicate

References

1. ISO 13528:2022 Statistical methods for use in proficiency testing by interlaboratory comparison.
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3. Peterz M and Steneryd AC. 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.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1141-1	5.06	5.05	4.64	-	-	-	-	-	-	-	-	-	-	-	-	4.95	4.32	4.1	-	-	-	4.01	4.39	0	-	-	-	**3.4**	**3.74**	0	-	-	-	-	-	-
1141-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1141-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1149-1	5.12	4.98	4.74	-	-	-	-	-	-	5.08	4.7	4.52	-	-	-	4.95	4.45	0	-	-	-	4.11	4.45	0	0	4.25	0	-	-	-	-	-	-	-	-	-
1149-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1149-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1237-1	**6500**	**2E+05**	**3E+05**	**2E+05**	**90000**	**56000**	**10000**	**60000**	**5E+06**	**6500**	**11000**	**30000**	-	-	33000	**39000**	**9700**	-	-	-	-	**5300**	**9700**	0	-	-	-	**14000**	**27000**	0	**22000**	**1900**	**2200**	-	-	-
1237-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1237-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1506-1	-	-	-	-	-	-	5.041	5.041	4.623	-	-	-	-	-	-	4.826	4.079	4.431	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1506-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1506-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1545-1	5.15	5.08	4.78	-	-	-	-	-	-	4.91	4.24	4.51	-	-	-	-	-	-	3.72	4.23	0	3.72	4.23	0	0	4.32	0	4.43	4.57	0	0	4.32	3.87	-	-	-
1545-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1545-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1900-1	5.13	5.03	4.58	-	-	-	-	-	-	-	-	-	-	-	-	4.98	4.38	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1900-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1900-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1970-1	5.08	4.96	4.53	5.08	5	4.72	-	-	-	4.89	4.34	3.9	5.04	4.56	0	5.18	4.43	0	4.15	4.56	0	4.15	4.56	0	0	4.57	0	4.66	4.61	0	0	4.51	4.36	-	-	-
1970-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1970-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2003-1	5.36	5.43	4.66	-	-	-	5.08	4.85	4.3	4.93	4.56	**3.74**	4.92	4.18	4.15	-	-	-	-	-	-	4.2	4.75	-	-	4.77	-	**3.11**	**3**	-	-	-	-	Pos	Pos	Pos
2003-2	-	-	-	-	-	-	5.04	4.52	4.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2003-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2035-1	5.15	5.18	4.7	-	-	-	-	-	-	4.83	4.18	4.3	-	-	-	-	-	-	-	-	-	**1.38**	4.53	0	-	-	-	-	-	-	-	-	-	-	-	-
2035-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2035-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2058-1	5.12	4.83	4.72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.04	**28.67**	0	**4.08**	4.68	**4.32**	-	-	-	-	-	-	-	-	-
2058-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2058-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2086-1	5.275	5.307	4.667	5.279	5.242	4.651	5.228	4.996	4.602	4.992	4.404	4.536	5.055	4.403	4.409	5.015	4.417	4.616	-	-	-	4.092	4.517	0	0	4.634	0	4.568	4.653	0	0	4.579	3.967	-	-	-
2086-2	5.202	5.202	4.606	5.197	5.301	4.618	5.266	4.888	4.556	4.992	4.457	4.496	5.085	4.406	4.382	4.856	4.453	4.458	-	-	-	4.076	4.434	0	0	4.491	0	4.643	4.462	0	0	4.604	4.092	-	-	-
2086-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2109-1	5.199	5.156	4.813	-	-	-	-	-	-	-	-	-	-	-	-	4.943	4.405	4.535	-	-	-	3.934	4.405	0	-	-	-	-	-	-	-	-	-	-	-	-
2109-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2109-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2221-1	5.13	5.12	4.79	-	-	-	5.13	4.86	4.59	4.95	4.32	4.38	4.76	4.13	0	**3.92**	4.14	0	-	-	-	3.9	4.04	0	0	**3.54**	0	4.41	4.57	0	0	**3.78**	**3.29**	-	-	-
2221-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2221-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2317-1	5.1	5.11	4.63	-	-	-	-	-	-	4.92	4.04	4.2	4.28	3.75	0	**3.46**	3.62	0	-	-	-	3.45	4.65	0	0	**3.62**	0	4.38	4.41	**4.49**	0	4.48	4.08	-	-	-
2317-2	4.96	5.15	4.69	-	-	-	-	-	-	4.76	4.26	4.3	**3.93**	4.04	0	**3.23**	3.97	0	-	-	-	3.54	4.04	0	0	4.3	0	4.36	4.57	**4.04**	0	4.45	4.28	-	-	-
2317-3	5.03	5.13	4.66	-	-	-	-	-	-	4.85	4.16	4.26	**4.14**	3.92	0	**3.36**	3.83	0	-	-	-	3.5	4.45	0	0	4.08	0	-	-	-	0	4.46	4.19	-	-	-
2324-1	5.11	4.96	4.57	-	-	-	5.06	4.95	4.5	4.88	4.29	3.97	-	-	-	-	-	-	-	-	-	-	-	-	0	**3.59**	0	4.31	4.45	0	0	4.45	4.21	-	-	-
2324-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2324-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2386-1	5.3	5.26	4.83	-	-	-	-	-	-	-	-	-	-	-	-	4.98	4.66	0	3.93	4.66	0	4.18	4.52	0	-	-	-	4.45	4.56	0	-	-	-	-	-	-
2386-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.94	4.49	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2386-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2443-1	5.03	4.98	4.6	-	-	-	-	-	-	-	-	-	4.67	4.04	4.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2443-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2443-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2637-1	4.98	5.11	4.63	-	-	-	5.1	**3.18**	4.67	4.89	4.32	4.23	-	-	-	-	-	-	4.6	4.46	0	4.6	4.46	0	0	4.34	0	4.28	4.38	0	-	-	-	-	-	-
2637-2	5.18	5.26	4.7	-	-	-	4.98	5.15	4.69	4.97	4.42	4.33	-	-	-	-	-	-	4.15	4.54	0	4.1	4.51	0	0	4.41	0	4.28	4.3	0	-	-	-	-	-	-
2637-3	5	5.11	4.63	-	-	-	-	-	-	4.89	4.18	4.21	-	-	-	-	-	-	-	-	-	4.15	4.54	0	0	4.39	0	-	-	-	-	-	-	-	-	-
2659-1	5.14	4.98	4.74	-	-	-	-	-	-	4.79	4.41	4.18	-	-	-	4.86	4.43	4.33	-	-	-	3.98	4.33	0	-	-	-	-	-	-	-	-	-	-	-	-
2659-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2659-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2745-1	5.2	5.11	4.74	-	-	-	-	-	-	4.85	4.51	4.46	-	-	-	-	-	-	-	-	-	4.11	4.49	0	0	4.48	0	4.34	4.41	0	-	-	-	-	-	-

Appendix 1. Results of the participating laboratories

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
2745-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2745-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2757-1	5.15	5.04	4.81	5.04	5.08	4.82	-	-	-	4.91	4.49	4.45	4.89	4.57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2757-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2757-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2794-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2794-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2794-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2810-1	5.27	5.18	4.77	-	-	-	-	-	-	>1	>1	>1	-	-	-	-	-	-	-	-	-	>1	>1	0	-	-	-	>1	>1	0	-	-	-	-	-	-
2810-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2810-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2915-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2915-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2915-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3031-1	5.15	5.18	4.86	5	5.04	4.73	-	-	-	4.86	4.38	4.61	-	-	-	4.65	4.04	4.46	3.57	4	0	3.63	4.04	0	0	4.41	0	4.08	4.38	0	0	4.51	4.48	-	-	-
3031-2	-	-	-	5.11	5.08	4.79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.32	4.76	0	-	-	-	-	-	-
3031-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3305-1	5.11	5.08	4.78	-	-	-	-	-	-	5.04	4.52	4.45	-	-	-	-	-	-	4.15	4.69	0	4.15	4.69	0	0	4.49	0	4.28	4.58	0	-	-	-	-	-	-
3305-2	5.4	5.23	4.96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.08	4.66	0	-	-	-	-	-	-	-	-	-	-	-	-
3305-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3452-1	4.92	4.71	4.44	-	-	-	-	-	-	-	-	-	4.74	3.92	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3452-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3452-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3457-1	5.19	5.04	4.99	-	-	-	-	-	-	5.08	4.74	4.72	-	4.2	4.02	4.84	-	-	-	-	-	4.04	4.2	0	-	-	-	4.18	4.41	0	0	4.3	4.42	-	-	-
3457-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4.23	4.38	-	-	-
3457-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3515-1	5.4	5.35	4.98	-	-	-	-	-	-	4.95	4.54	4.52	-	-	-	-	-	-	-	-	-	4.48	4.61	-	-	4.86	-	**3.33**	**3.51**	-	-	-	-	-	-	-
3515-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3515-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3543-1	5.33	5.18	4.88	-	-	-	-	-	-	4.95	4.57	3.91	-	-	-	-	-	-	-	-	-	-	-	-	0	4.28	0	4.38	4.53	0	0	4.34	4.18	-	-	-
3543-2	5.13	5.04	4.8	-	-	-	-	-	-	4.98	4.3	4.57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3543-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3587-1	4.92	4.81	4.59	-	-	-	-	-	-	4.9	4.08	4.48	-	-	-	-	-	-	-	-	-	3.97	4.54	0	0	4.43	0	4.46	4.36	**3.41**	0	4.28	4.28	-	-	-
3587-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3587-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3606-1	5.01	4.77	4.87	-	-	-	4.96	4.69	4.69	4.81	4.22	4.37	-	-	-	-	-	-	-	-	-	3.42	4.08	0	0	4.34	0	4.34	4.42	0	0	4.23	4.23	-	-	-
3606-2	5	4.87	4.66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3606-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3831-1	5.28	5.1	4.85	5.26	5.21	4.82	-	-	-	-	-	-	-	-	-	5.01	4.49	4.6	-	-	-	3.69	4.49	0	-	-	-	-	-	-	-	-	-	-	-	-
3831-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3831-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3864-1	5.188	5.057	4.799	-	-	-	-	-	-	4.857	4.255	4.279	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Pos	Pos	Pos
3864-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3864-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3878-1	5.08	5.103	4.451	-	-	-	-	-	-	4.842	**3.663**	3.978	-	-	0	4.794	3.792	-	3.836	**3.646**	0	3.804	3.736	0	0	4.55	0	4.182	4.459	0	-	-	-	-	-	-
3878-2	5.076	-	-	-	-	-	-	-	-	-	**3.691**	**3.562**	-	-	-	4.801	3.729	-	-	**3.66**	-	3.826	3.735	-	0	4.543	0	-	4.48	-	-	-	-	-	-	-
3878-3	-	-	-	-	-	-	-	-	-	-	-	3.952	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4050-1	5.124	5.033	4.667	-	-	-	-	-	-	4.977	4.562	4.296	4.966	3.833	0	-	-	-	-	-	-	-	-	-	0	4.556	0	-	-	-	-	-	-	Pos	Pos	Pos
4050-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4050-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4064-1	5.12	5.08	4.66	-	-	-	-	-	-	5	4.34	4.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4064-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4064-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4100-1	5.13	5.01	4.59	-	-	-	-	-	-	5.05	4.34	4.39	-	-	-	4.91	4	0	-	-	-	3.8	4.11	0	0	4.41	0	4.25	4.62	0	0	4.41	4.24	-	-	-
4100-2	5.13	5.03	4.79	-	-	-	-	-	-	4.89	4.39	4.39	-	-	-	-	-	-	-	-	-	-	-	-	0	4.49	0	-	-	-	-	-	-	-	-	-
4100-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4171-1	5.19	5.12	4.91	-	-	-	-	-	-	5.1	3.95	4.42	-	-	-	4.98	3.97	4.55	-	-	-	3.61	3.62	**4**	**10**	4.57	**10**	**1**	**1**	0	**100**	4.32	4.32	-	-	-
4171-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.09	4.76	10	-	-	-	**1**	**1**	0	-	-	-	-	-	-	-	-	-	-	-	-

Appendix 1. Results of the participating laboratories

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
4171-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4246-1	5.19	4.93	4.8	-	-	-	-	-	-	4.99	4.58	4.62	-	-	-	-	-	-	-	-	-	4.15	4.52	0	-	-	-	4.34	4.41	0	-	-	-	-	-	-
4246-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4246-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4339-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4339-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4339-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4400-1	5.15	5.13	4.67	-	-	-	-	-	-	4.98	4.43	4.56	-	-	-	-	-	-	-	-	-	4.39	4.51	0	0	**0**	0	-	-	-	-	-	-	-	-	-
4400-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4400-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4449-1	4.96	4.98	4.51	-	-	-	-	-	-	4.78	4.26	4.23	-	-	-	-	-	-	-	-	-	-	-	-	0	4.75	0	-	-	-	-	-	-	-	-	-
4449-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4449-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4557-1	5.17	4.99	4.82	-	-	-	-	-	-	4.98	4.65	4.5	-	4.53	0	4.93	-	-	-	-	-	4.15	4.53	0	-	-	-	4.27	4.57	0	-	-	-	-	-	-
4557-2	5.17	4.98	4.81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4557-3	5.15	4.84	4.69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4580-1	5.385	5.387	4.944	-	-	-	-	-	-	5.238	4.806	-	5.057	4.69	0	-	-	-	-	-	-	4.146	4.69	0	-	-	-	4.518	4.732	0	-	-	-	-	-	-
4580-2	-	-	-	-	-	-	-	-	-	-	-	4.806	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4580-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4635-1	5.17	4.9	4.61	-	-	-	-	-	-	5	4.22	4.45	-	-	-	-	-	-	-	-	-	-	-	-	0	4.2	0	4.4	4.51	0	0	4.32	4.18	-	-	-
4635-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4635-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4664-1	5.152	5.164	4.799	-	-	-	-	-	-	5	4.255	4.568	-	-	-	4.964	4.301	0	3.806	4.301	0	-	-	-	-	-	-	4.279	4.491	0	0	4.38	4.33	-	-	-
4664-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4664-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4889-1	5.3	5.2	4.82	5.3	5.23	4.88	-	-	-	5.3	4.6	4.52	-	-	-	5.26	4.83	4.18	4.46	4.7	0	4.46	4.7	0	0	4.93	0	4.46	4.59	0	0	4.73	4.56	-	-	-
4889-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.11	4.76	4.72	-	-	-	4.3	4.76	0	-	-	-	4.49	4.53	0	-	-	-	-	-	-
4889-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.15	4.57	4.66	-	-	-	4.4	4.72	0	-	-	-	-	-	-	-	-	-	-	-	-
4951-1	5.05	4.931	4.559	-	-	-	-	-	-	**4.266**	**3.258**	4.102	-	-	-	4.822	4.076	4.171	-	-	-	3.736	4.111	0	-	-	-	-	-	-	-	-	-	-	-	-
4951-2	-	-	-	-	-	-	-	-	-	4.866	4.345	4.322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4951-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4983-1	**6.12**	**6.03**	**5.76**	-	-	-	-	-	-	**6.02**	**5.41**	**5.45**	-	-	-	-	-	-	-	-	-	-	-	-	0	4.75	0	-	-	-	-	-	-	-	-	-
4983-2	**6.17**	**5.9**	**5.76**	-	-	-	-	-	-	**5.92**	**5.14**	**5.57**	-	-	-	-	-	-	-	-	-	-	-	-	0	4.94	0	-	-	-	-	-	-	-	-	-
4983-3	**6.14**	**6.05**	**5.77**	-	-	-	-	-	-	**5.94**	**5.2**	**5.34**	-	-	-	-	-	-	-	-	-	-	-	-	0	4.79	0	-	-	-	-	-	-	-	-	-
4998-1	5.29	5.08	5.01	-	-	-	-	-	-	4.96	4.4	4.51	-	-	-	-	-	-	-	-	-	-	-	-	0	4.17	0	-	-	-	-	-	-	-	-	-
4998-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4998-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5100-1	5.1	5.11	4.67	-	-	-	-	-	-	-	-	-	-	3.97	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5100-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5100-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5119-1	5.113	5.146	4.69	-	-	-	-	-	-	5.146	4.491	4.176	4.851	4.414	0	-	-	-	-	-	-	4.079	4.568	0	-	-	-	-	-	-	-	-	-	-	-	-
5119-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5119-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5182-1	5.153	5.001	4.768	-	-	-	-	-	-	4.675	4.427	4.229	-	-	-	**5.968**	4.968	0	-	-	-	3.992	4.285	0	0	4.552	0	-	-	-	-	-	-	-	-	-
5182-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.925	4.509	0	-	-	-	4.864	**0**	0	-	-	-	-	-	-	-	-	-	-	-	-
5182-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.968	4.968	0	-	-	-	-	-	-	-	-	-	-	-	-
5201-1	5.09	4.95	4.65	-	-	-	-	-	-	5.32	4.09	-	-	-	-	-	-	-	-	-	-	4.32	4.22	-	-	4.55	-	4.58	4.58	-	-	-	-	-	-	-
5201-2	5.42	5.2	5.05	-	-	-	-	-	-	5.19	4.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5201-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5204-1	4.99	4.88	4.57	-	-	-	**4.28**	4.85	4.62	4.82	4.06	4.23	4.58	-	-	4.57	3.99	-	4.07	4.56	-	4.07	4.56	-	-	4.46	-	4.26	4.43	-	-	4.2	4.11	-	-	-
5204-2	4.99	5.1	4.77	-	-	-	-	-	-	4.81	4.46	4.49	-	4.03	-	-	-	-	-	-	-	3.92	4.43	-	-	-	-	4.08	4.34	-	-	-	-	-	-	-
5204-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5220-1	4.93	4.92	4.48	-	-	-	-	-	-	4.86	3.96	4.23	-	-	-	-	-	-	-	-	-	**2.88**	**2.26**	0	-	-	-	-	4.29	0	-	-	-	-	-	-
5220-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.33	4.36	0	-	-	-	-	-	-
5220-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.27	-	-	-	-	-	-	-	-
5261-1	4.813	**4.398**	**4**	-	-	-	-	-	-	4.602	4.544	4.25	-	-	-	4.839	4.398	4.602	-	-	-	4.544	4.398	**4.602**	**4.845**	4.813	**4.301**	-	-	-	-	-	-	-	-	-
5261-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5261-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix 1. Results of the participating laboratories

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
5290-1	5.13	5.16	4.8	-	-	-	-	-	-	4.91	4.23	4.36	4.97	4.23	4.34	-	-	-	-	-	-	4.13	4.67	0	0	4.28	0	4.13	4.23	0	-	-	-	-	-	-
5290-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5290-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5329-1	5.182	5.029	**4.274**	-	-	-	-	-	-	4.987	4.318	**0**	-	-	-	-	-	-	-	-	-	4.025	4.272	0	0	4.26	0	4.362	4.58	0	0	4.362	4.29	-	-	-
5329-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5329-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5333-1	5.1	4.97	4.72	-	-	-	4.7	5.32	4.28	4.89	4.38	4.2	4.81	4.2	0	-	-	-	-	-	-	4.3	4.53	0	0	4.34	0	4.48	4.63	0	0	4.41	4.26	-	-	-
5333-2	5.22	5.08	4.85	-	-	-	-	-	-	5.09	4.53	4.57	4.97	4.49	0	-	-	-	-	-	-	-	-	-	-	-	-	4.43	4.48	0	-	-	-	-	-	-
5333-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5338-1	4.996	4.86	4.566	-	-	-	-	-	-	4.853	4.39	4.348	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5338-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5338-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5419-1	-	-	-	-	-	-	5.04	4.84	4.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4.26	0	-	-	-	0	4.27	4.41	-	-	-
5419-2	-	-	-	-	-	-	5.045	4.89	4.66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	-	-	-	0	4.27	4.2	-	-	-
5419-3	-	-	-	-	-	-	5.025	4.8	4.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	4.28	4.33	-	-	-
5446-1	5.13	5.03	4.91	-	-	-	-	-	-	4.93	4.34	4.46	4.87	4.33	4.39	-	-	-	-	-	-	3.73	4.33	-	-	-	-	4.27	4.43	-	-	-	-	-	-	-
5446-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5446-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5545-1	4.95	4.78	**5.38**	-	-	-	-	-	-	4.88	4.15	4.38	-	-	-	-	-	-	-	-	-	-	-	-	0	5.21	0	4.49	4.36	0	0	4.42	4.27	-	-	-
5545-2	4.92	4.88	4.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5545-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5612-1	5.1	5	4.65	-	-	-	-	-	-	5.18	4.48	3.83	-	-	-	4.63	4.53	3.78	4.32	4.49	0	4.32	4.49	0	0	4.61	0	4.48	**3.3**	0	-	-	-	-	-	-
5612-2	5.32	5.4	4.96	-	-	-	-	-	-	-	-	-	-	-	-	**3.96**	3.96	0	-	-	-	4.4	4.48	0	-	-	-	-	-	-	-	-	-	-	-	-
5612-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5615-1	4.85	5.23	**5.23**	-	-	-	-	-	-	5.04	4.65	4.65	-	-	0	4.93	4.79	-	-	-	-	4.08	4.75	0	0	4.49	0	4.3	**0**	**3.61**	-	-	-	-	-	-
5615-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4.66	0	-	-	-	-	-	-	-	-	-
5615-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5701-1	5.14	5.15	4.59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5701-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5701-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5774-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5774-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5774-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5800-1	5.322	5.23	4.672	-	-	-	-	-	-	5.322	4.568	**3.531**	-	-	-	**4.176**	4.322	0	4.041	4.279	0	4.041	4.398	0	0	4.477	0	4.398	4.568	0	-	-	-	-	-	-
5800-2	5.279	5.279	4.839	-	-	-	-	-	-	5.079	4.431	**3.556**	-	-	-	**4.279**	4.23	0	-	-	-	4	4.23	0	-	-	-	-	-	-	-	-	-	-	-	-
5800-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5801-1	**4.06**	4.83	4.52	-	-	-	-	-	-	4.78	4.32	4.23	-	-	-	-	-	-	-	-	-	-	-	-	0	4.23	0	-	-	-	-	-	-	-	-	-
5801-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5801-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5808-1	4.92	5	4.76	-	-	-	-	-	-	-	-	-	-	-	-	**3.41**	**0**	4.43	-	-	-	-	4.11	-	0	4.09	0	-	-	-	-	-	-	-	-	-
5808-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.41	-	0	-	-	-	-	-	-	-	-	-	-	-	-
5808-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5883-1	5.08	5.07	4.78	-	-	-	-	-	-	4.78	4.41	4.55	-	-	-	-	4.57	0	-	-	-	4.28	4.54	0	0	4.2	0	4.42	4.59	0	-	-	-	-	-	-
5883-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5883-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5950-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5950-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5950-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6109-1	5.16	5.26	4.81	-	-	-	-	-	-	4.97	4.12	4.42	-	-	-	5.01	4.17	4	-	-	-	3.82	3.86	**4**	**10**	4.49	**10**	**1**	**1**	0	-	-	-	-	-	-
6109-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6109-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6175-1	5.21	5.15	4.61	-	-	-	-	-	-	4.77	**3.39**	4.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6175-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6175-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6224-1	**4.29**	**4.24**	**4.01**	-	-	-	-	-	-	**4.19**	3.75	**3.73**	-	-	-	-	-	-	-	-	-	-	-	-	0	**3.36**	0	-	-	-	-	-	-	-	-	-
6224-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6224-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6253-1	-	-	-	-	-	-	-	-	-	5.08	4.46	4.49	5	4.41	4.4	-	-	-	-	-	-	4.88	4.28	0	-	-	-	-	-	-	0	4.67	4.48	-	-	-

Appendix 1. Results of the participating laboratories

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
6253-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6253-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6258-1	5.04	5.01	4.62	-	-	-	-	-	-	-	-	-	4.87	4.45	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6258-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6258-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6368-1	5.11	5.04	4.73	5.11	5.06	4.63	-	-	-	4.85	4.06	-	-	-	-	4.94	4.25	0	4.26	4.54	0	4.26	4.54	0	0	4.62	0	4.48	4.56	0	0	**2.47**	4.19	-	-	-
6368-2	-	-	-	-	-	-	-	-	-	-	-	4.22	-	-	-	-	-	-	-	-	-	4.63	4.97	0	-	-	-	-	-	-	-	-	-	-	-	-
6368-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6456-1	-	-	-	-	-	-	-	-	-	5.04	4.18	4.19	4.66	3.86	4	4.69	4.93	4.06	-	-	-	3.72	3.97	0	-	-	-	-	-	-	0	4.42	4.28	-	-	-
6456-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6456-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6490-1	5.15	5.01	4.7	-	-	-	-	-	-	5.02	4.57	4.41	-	-	-	-	-	-	-	-	-	-	-	-	0	4.19	0	4.42	4.56	0	0	4.35	4.2	-	-	-
6490-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6490-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6594-1	5.15	4.82	4.64	-	-	-	-	-	-	-	-	-	-	-	-	4.99	4	4.36	-	-	-	**1**	**1**	0	**10**	4.25	**10**	**0**	**0**	0	-	-	-	-	-	-
6594-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.8	**10**	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6594-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6686-1	5.18	5.08	4.7	5.08	5.08	4.79	-	-	-	4.93	4.36	4.59	-	-	-	4.83	4.3	4.28	-	-	-	4.15	4.26	0	-	-	-	4.45	4.43	0	0	4.38	4.18	-	-	-
6686-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6686-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6728-1	5.155	5.021	4.813	-	-	-	-	-	-	4.987	4.439	4.447	-	-	-	4.929	4.498	0	-	-	-	3.732	4.498	0	-	-	-	4.332	4.562	0	-	-	-	-	-	-
6728-2	5.106	5.07	4.613	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.371	4.322	0	-	-	-	-	-	-
6728-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6801-1	5.2	5.2	4.59	-	-	-	-	-	-	-	-	-	-	-	-	4.996	4.57	0	-	-	-	4.11	4.57	0	-	-	-	4.34	4.28	0	-	-	-	-	-	-
6801-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6801-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6885-1	5.2	5.04	4.84	-	-	-	-	-	-	4.98	4.02	4.44	-	-	-	-	-	-	-	-	-	4.02	4.43	0	0	4.3	0	4.04	4.58	0	0	4.48	4.13	Pos	Pos	Pos
6885-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6885-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6958-1	5.05	5	4.72	-	-	-	-	-	-	4.91	4.27	4.41	-	-	-	-	-	-	-	-	-	-	-	-	0	4.48	0	-	-	-	-	-	-	-	-	-
6958-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6958-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6971-1	5.04	4.93	4.6	-	-	-	-	-	-	4.92	4.49	4.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6971-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6971-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7182-1	5.193	5.206	4.817	-	-	-	-	-	-	5.001	4.658	4.471	-	-	-	4.961	4.617	0	-	-	-	4.082	4.617	0	-	-	-	-	-	-	-	-	-	-	-	-
7182-2	5.203	5.086	4.753	-	-	-	-	-	-	4.983	4.419	4.372	-	-	-	4.841	4.519	0	-	-	-	3.972	4.519	0	-	-	-	-	-	-	-	-	-	-	-	-
7182-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7207-1	-	-	-	-	-	-	-	-	-	4.86	4.37	4.25	-	-	-	-	-	-	-	-	-	-	-	-	0	4.9	0	-	-	-	0	**3.48**	4.27	-	-	-
7207-2	5.08	5.1	4.79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7207-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7232-1	5.01	4.75	4.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7232-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7232-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7242-1	4.938	5.07	4.67	-	-	-	-	-	-	5.256	4.69	4.48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7242-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7242-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7248-1	5.13	4.79	5.06	5.15	4.81	**5.12**	**4.52**	4.46	4.49	5.11	4.61	4.34	5.11	**0**	4.68	5.18	**0**	4.78	4.34	**0**	**4.83**	4.26	**0**	**4.57**	0	**0**	**3.92**	4.41	**0**	**4.49**	0	4.36	4	-	-	-
7248-2	5.18	4.85	**5.27**	4.96	4.81	**5.54**	-	-	-	5.13	4.51	4.53	-	-	-	-	-	-	-	-	-	4.4	**0**	**4.46**	-	-	-	-	-	-	-	-	-	-	-	-
7248-3	5.47	4.95	5.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7334-1	5.146	4.991	4.681	-	-	-	-	-	-	-	-	-	-	-	-	5.041	4.1	4.455	-	-	-	**>1**	**>1**	0	0	4.301	0	4.38	4.431	0	-	-	-	-	-	-
7334-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7334-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7564-1	-	-	-	5.161	5.037	4.716	-	-	-	-	-	-	5	4.756	4.505	-	-	-	4.301	4.708	0	3.813	4.19	0	-	-	-	-	-	-	0	4.362	4.362	-	-	-
7564-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7564-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7640-1	-	-	-	-	-	-	-	4.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7640-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix 1. Results of the participating laboratories

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
7640-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7688-1	4.99	5.04	4.74	-	-	-	-	-	-	4.88	4.36	4.23	4.6	4.04	0	4.74	4.08	4.78	3.95	4.4	0	3.95	4.4	0	0	4.41	**4.41**	4.36	4.49	0	0	4.38	4.18	-	-	-
7688-2	4.96	4.96	4.6	-	-	-	-	-	-	**5.57**	4.48	4.08	-	-	-	-	-	-	-	-	-	4.18	4.4	0	-	-	-	-	-	-	-	-	-	-	-	-
7688-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7728-1	5.18	5.26	4.88	5.36	5.08	4.74	-	-	-	4.83	3.82	4.04	-	-	-	4.66	4.38	2.3	3.97	4.38	0	3.97	4.38	0	0	4.58	0	4.68	4.72	0	-	-	-	-	-	-
7728-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7728-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7750-1	5.08	4.99	4.71	-	-	-	-	-	-	4.85	4.34	4.3	-	-	-	4.95	4.17	4.46	-	-	-	**1**	**1**	0	**1**	4.41	**1**	-	-	-	-	-	-	-	-	-
7750-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7750-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7825-1	5.5	**5.672**	**5.865**	-	-	-	-	-	-	**5.39**	4.411	**6.017**	-	-	-	-	-	-	-	-	-	**0**	**5.593**	**4.366**	-	-	-	4.642	**5.592**	**5.358**	**4.865**	4.81	**0**	-	-	-
7825-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7825-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7930-1	5.11	5.04	4.81	-	-	-	-	-	-	4.98	4.18	4.45	-	-	-	-	-	-	4.11	4.64	0	4.11	4.64	0	0	4.38	0	4.4	4.45	0	0	4.59	4.34	-	-	-
7930-2	5.04	5.04	4.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7930-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7940-1	5.08	5.05	4.88	-	-	-	-	-	-	5.03	4.51	4.52	5.07	4.48	4.43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7940-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7940-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7968-1	5.114	5.114	4.672	-	-	-	5.114	4.924	4.681	5.041	4.114	4.505	4.756	-	4.079	4.869	-	4	4.146	4.613	0	4.146	4.613	0	0	4.431	0	4.591	4.505	0	0	4.531	4.362	-	-	-
7968-2	5.079	5	4.756	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.146	4.342	0	-	-	-	-	-	-	-	-	-	-	-	-
7968-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7984-1	5.221	5.217	4.781	-	-	-	-	-	-	4.924	4.568	4.491	-	-	-	-	-	-	-	-	-	-	-	-	0	4.361	0	-	-	-	-	-	-	Pos	Pos	Pos
7984-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7984-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8068-1	5.09	5.07	4.7	-	-	-	-	-	-	4.94	4.3	4.41	-	-	-	-	-	-	3.95	4.66	0	3.95	4.66	0	0	4.18	0	4.3	4.7	0	-	-	-	-	-	-
8068-2	5.16	5	4.74	-	-	-	-	-	-	5.08	4.38	4.49	-	-	-	-	-	-	4.18	4.69	0	4.18	4.69	0	0	4.62	0	4.48	4.85	0	-	-	-	-	-	-
8068-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8105-1	5.36	5	4.89	-	-	-	-	-	-	5.06	4.49	4.49	5.11	4.94	4.53	-	-	-	-	-	-	3.9	4.38	0	-	-	-	4.46	4.4	0	-	-	-	-	-	-
8105-2	5.21	5.17	4.91	-	-	-	-	-	-	5.05	4.49	4.54	5.03	4.95	4.56	-	-	-	-	-	-	3.79	4.51	0	-	-	-	4.4	4.57	0	-	-	-	-	-	-
8105-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8147-1	5.24	5.22	**5.22**	-	-	-	-	-	-	4.91	3.83	4.32	4.98	4.11	4.19	-	-	-	-	-	-	3.36	3.74	**1**	**1**	4.78	**1**	4.4	4.6	**1**	-	-	-	-	-	-
8147-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8147-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8213-1	5.06	4.92	4.61	5.02	4.88	4.62	-	-	-	4.76	4.34	4.4	-	-	-	-	-	-	-	-	-	-	-	-	**3.97**	4.62	**4.43**	-	-	-	-	-	-	Pos	Pos	Pos
8213-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8213-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8260-1	5.16	5.04	4.84	-	-	-	-	-	-	4.92	4.56	4.48	-	-	-	5	4.56	4.48	-	-	-	-	-	-	0	4.4	0	4.33	4.48	0	-	-	-	-	-	-
8260-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8260-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8313-1	5.08	4.96	4.49	-	-	-	-	-	-	4.8	4.4	4.3	-	-	-	-	-	-	-	-	-	-	-	-	0	4.43	0	4.41	4.71	0	0	4.4	4.26	-	-	-
8313-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8313-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8333-1	5.19	5.1	4.76	-	-	-	-	-	-	5.1	4.04	4.42	-	-	-	5	4.35	4	-	-	-	3.82	3.99	**4**	**10**	4.79	**10**	**1**	**1**	0	**100**	4.53	4.28	-	-	-
8333-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.1	4.39	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8333-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8397-1	5.13	5.13	4.76	-	-	-	-	-	-	5.05	4.56	4.53	-	-	-	-	-	-	-	-	-	-	4.54	0	0	4.3	0	4.39	4.32	0	0	4.39	4.2	-	-	-
8397-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8397-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8435-1	5.18	5.08	4.76	-	-	-	-	-	-	4.85	4.26	4.4	4.99	3.7	0	5	4.32	0	-	-	-	4.06	4.59	0	**4.3**	4.48	0	4.26	4.29	0	0	**0**	4.25	-	-	-
8435-2	5.07	-	-	-	-	-	-	-	-	4.91	-	-	4.76	-	-	4.77	-	-	-	-	-	4.15	-	-	**4.15**	-	-	4.18	-	-	0	-	-	-	-	-
8435-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8506-1	5.17	5.15	4.82	-	-	-	-	-	-	5.01	4.26	4.62	-	-	-	4.95	4.35	4	-	-	-	3.59	3.8	**4**	**10**	4.69	**10**	**1**	**1**	0	-	-	-	-	-	-
8506-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.06	4.71	10	-	-	-	**1**	**1**	0	-	-	-	-	-	-	-	-	-	-	-	-
8506-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8523-1	5.24	5.11	4.8	-	-	-	-	-	-	5.05	4.45	4.45	-	-	-	-	-	-	-	-	-	4.17	4.54	0	-	-	-	4.37	4.52	0	-	-	-	-	-	-
8523-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8523-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix 1. Results of the participating laboratories

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
8568-1	4.9	**4.29**	4.46	-	-	-	-	-	-	5	**3.21**	4.19	-	-	-	5.24	3.92	4.4	-	-	-	**1**	**1**	**4**	**10**	4.79	**10**	**1**	**1**	0	**100**	4.43	4.3	-	-	-
8568-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.97	**5.61**	10	-	-	-	3.75	4.09	0	-	-	-	-	-	-	-	-	-	-	-	-
8568-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8626-1	4.813	4.908	4.613	-	-	-	-	-	-	4.806	-	4.188	4.38	4.041	0	-	-	-	-	-	-	3.663	3.663	0	-	-	-	-	-	-	-	-	-	-	-	-
8626-2	-	-	-	-	-	-	-	-	-	-	4.083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8626-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8628-1	5.05	5.02	4.51	4.81	5.2	4.69	-	-	-	4.73	4.1	3.94	4.96	4.74	0	4.96	4.73	0	4.1	4.56	0	4.1	4.56	0	0	4.23	0	-	-	-	0	4.32	4.23	-	-	-
8628-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3.83**	3.96	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8628-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8734-1	5.08	5	4.7	-	-	-	-	-	-	4.87	4.56	4.33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8734-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8734-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8742-1	5.11	4.89	4.69	-	-	-	-	-	-	4.91	4.36	4.36	4.66	4.66	4.38	-	-	-	4.38	4.66	0	4.38	4.66	0	-	-	-	4.4	4.51	0	-	-	-	-	-	-
8742-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8742-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8756-1	5.27	5.5	4.8	-	-	-	-	-	-	4.94	4.6	**3.41**	-	-	-	-	-	-	-	-	-	4.39	4.65	0	0	4.79	-	4.26	4.26	0	-	-	-	-	-	-
8756-2	5.3	5.32	4.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.09	4.7	0	0	4.13	0	4.17	4.43	0	-	-	-	-	-	-
8756-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-
8829-1	5.414	5.38	**3.845**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.544	0	-	-	-	-	-	-	-	-	-
8829-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8829-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-
8891-1	5.04	4.96	4.82	-	-	-	5.2	5.08	4.66	4.84	4.46	4.51	4.62	4.4	0	-	-	-	-	-	-	4	4.49	0	0	4.34	0	4.25	4.43	0	-	-	-	-	-	-
8891-2	5.11	4.96	4.88	-	-	-	-	-	-	4.84	4.38	4.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8891-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9003-1	5.079	5.02	4.635	-	-	-	-	-	-	4.779	4.414	4.435	4.851	4.322	4.316	4.822	4.491	0	-	-	-	3.825	4.491	0	-	-	-	4.105	4.476	0	-	-	-	-	-	-
9003-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9003-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9007-1	5.22	5.07	4.72	-	-	-	-	-	-	5	4.4	4.39	4.94	4.53	4.4	-	-	-	-	-	-	4.08	4.43	-	-	-	-	4.04	4.27	-	-	-	-	-	-	-	-
9007-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9007-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9025-1	5.09	4.82	4.68	-	-	-	-	-	-	4.85	4	4.23	-	-	-	4.86	4.11	4.38	-	-	-	3.88	4.3	0	0	3.9	0	-	-	-	-	-	-	Pos	Pos	Pos
9025-2	4.88	5	4.46	-	-	-	-	-	-	4.76	4.08	4.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9025-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9034-1	5	4.9	4.7	5.1	4.9	4.7	-	-	-	4.9	4.5	4.5	-	-	-	-	-	-	-	-	-	3.8	4.5	0	-	-	-	-	-	-	-	-	-	-	-	-
9034-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9034-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9078-1	5.38	5.26	**3.88**	-	-	-	-	-	-	5.04	4.61	4.21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9078-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9078-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9086-1	-	-	-	-	-	-	-	-	-	-	-	-	-	4.176	4.322	5.017	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
9086-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9086-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9269-1	5.06	4.95	4.51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9269-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9269-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9408-1	5.182	5.061	4.839	-	-	-	-	-	-	4.973	4.447	4.544	-	-	-	4.964	4.544	0	3.949	4.602	0	4.107	4.38	0	0	4.301	0	4.38	4.447	0	0	4.255	4.322	-	-	-
9408-2	5.241	4.929	4.716	-	-	-	-	-	-	4.964	4.531	4.505	-	-	-	5.1	4.398	0	4.004	4.556	0	4.127	4.69	0	0	4.914	0	4.322	4.447	0	0	4.155	3.903	-	-	-
9408-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.225	-	-	-	-	-	-	-	-	-	-
9429-1	-	-	-	-	-	-	-	-	-	4.98	4.53	4.32	4.76	4.36	4.08	4.89	4.32	4.18	3.93	**0**	**4.15**	3.93	**0**	**4.15**	-	-	-	-	-	-	-	-	-	-	-	-	-
9429-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9429-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9436-1	5.05	4.99	4.64	-	-	-	-	-	-	5.03	4.6	4.44	4.92	4.37	0	5.01	4.61	4.27	4.3	4.54	0	4.16	4.54	0	0	4.24	0	4.38	4.5	0	0	4.26	4.32	-	-	-
9436-2	5.29	4.84	4.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.13	4.48	0	-	-	-	-	-	-	-	-	-	-	-	-
9436-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9453-1	5.06	4.99	4.68	-	-	-	5.11	5.15	**5.08**	4.95	4.45	4.3	-	-	-	-	-	-	-	-	-	-	-	-	0	4.48	0	4.28	4.54	0	0	4.74	4.15	-	-	-
9453-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9453-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9512-1	5.098	4.954	4.708	-	-	-	-	-	-	5.009	4.37	4.317	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix 1. Results of the participating laboratories

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
9512-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9512-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9559-1	5.33	**5.63**	4.88	5.34	5.22	4.87	-	-	-	5.155	4.201	4.643	-	-	-	5.137	4.301	4.556	-	-	-	4.176	4.699	0	0	4.959	0	4.663	4.74	0	-	-	-	Pos	Pos	Pos
9559-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9559-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9662-1	5.11	5.15	4.82	-	-	-	-	-	-	4.95	4.78	**5.29**	5.1	4.32	4.43	5.13	4.29	4.51	-	-	-	3.69	4.35	0	-	-	-	-	-	-	0	4.8	4.47	-	-	-
9662-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9662-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9747-1	**5.92**	**5.91**	**5.53**	-	-	-	-	-	-	**5.99**	**5.14**	**5.55**	-	-	-	-	-	-	-	-	-	-	-	-	0	4.34	0	-	-	-	-	-	-	-	-	-
9747-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9747-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9890-1	5.3	5.03	4.75	-	-	-	-	-	-	4.91	4.7	4.68	-	-	-	5.02	4.6	4.64	-	-	-	4.28	4.6	0	0	4.62	0	4.11	4.34	0	-	-	-	-	-	-
9890-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9890-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9903-1	5.16	4.95	4.62	-	-	-	-	-	-	4.82	4.27	4.2	-	-	-	-	-	-	-	-	-	3.93	4.54	0	0	4.02	0	4.21	4.27	0	0	4.26	3.96	-	-	-
9903-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9903-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9950-1	5.22	5.08	4.76	-	-	-	-	-	-	5.02	4.54	4.45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9950-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9950-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	164	162	162	19	19	19	20	21	20	136	136	135	41	43	45	79	73	69	28	29	27	118	117	112	92	94	90	91	91	84	52	53	53	8	8	8
n	157	152	147	18	18	16	17	19	18	127	126	121	39	42	45	68	68	69	28	25	25	109	104	101	79	88	77	81	77	77	47	48	50	8	8	8
Min	4.06	4.24	3.85	4.81	4.81	4.62	4.28	3.18	4.28	4.19	3.21	0	3.93	0	0	3.23	0	0	3.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
Max	*6500*	*160000*	*260000*	*150000*	*90000*	*56000*	*10000*	*60000*	*4800000*	*6500*	*11000*	*30000*	5.11	4.95	*33000*	*39000*	*9700*	*10*	4.60	4.71	4.83	*5300*	*9700*	4.60	*10*	5.21	*10*	*14000*	*27000*	5.36	*22000*	*1900*	*2200*	-	-	-
Med	5.13	5.04	4.72	5.11	5.08	4.73	5.06	4.89	4.62	4.95	4.40	4.40	4.92	4.33	4.38	4.95	4.38	4.43	4.11	4.56	0	4.08	4.49	0	0	4.47	0	4.37	4.48	0	0	4.39	4.26	-	-	-
m_{PT}	**5.14**	**5.06**	**4.73**	**5.14**	**5.07**	**4.76**	**5.05**	**4.87**	**4.60**	**4.95**	**4.38**	**4.38**	**4.86**	**4.29**	4.32	**4.90**	**4.36**	4.44	**4.10**	**4.51**	-	**4.01**	**4.42**	-	-	**4.45**	-	**4.33**	**4.46**	-	-	**4.39**	**4.25**	**Pos**	**Pos**	**Pos**
s_{PT}	**0.12**	**0.15**	**0.15**	**0.15**	**0.17**	**0.12**	**0.13**	**0.24**	**0.12**	**0.13**	**0.22**	**0.20**	**0.20**	**0.32**	0.19	**0.19**	**0.31**	0.35	**0.23**	**0.19**	-	**0.29**	**0.27**	-	-	**0.26**	-	**0.17**	**0.16**	-	-	**0.15**	**0.13**	-	-	-
u_{PT}	0.012	0.015	0.015	0.043	0.049	0.034	0.037	0.068	0.033	0.014	0.024	0.021	0.040	0.062	-	0.028	0.047	-	0.054	0.045	-	0.034	0.032	-	-	0.034	-	0.022	0.022	-	-	0.027	0.023	-	-	-
F+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	-	0	0	2	0	0	11	13	0	13	0	0	7	5	0	0	0	0	0
F-	0	0	0	0	0	0	0	0	0	0	0	1	0	1	-	0	2	-	0	2	0	1	4	0	0	2	0	1	3	0	0	1	1	0	0	0
<	2	3	5	0	0	0	2	1	0	2	5	6	2	0	-	9	0	-	0	2	0	7	6	0	0	4	0	8	9	0	0	3	1	-	-	-
>	5	7	10	1	1	3	1	1	2	7	5	7	0	0	-	2	3	-	0	0	0	1	3	0	0	0	0	1	2	0	0	1	1	-	-	-
Lower	4.76	4.61	4.28	4.70	4.57	4.41	4.67	4.14	4.26	4.56	3.70	3.79	4.24	3.33	3.76	4.32	3.42	3.40	3.41	3.95	0	3.14	3.61	0	0	3.68	0	3.83	3.97	0	0	3.92	3.85	-	-	-
Upper	5.51	5.50	5.18	5.58	5.57	5.10	5.43	5.59	4.95	5.34	5.05	4.97	5.47	5.25	4.89	5.49	5.30	5.48	4.78	5.06	0	4.88	5.23	0	0	5.22	0	4.83	4.95	0	0	4.85	4.64	-	-	-

N = number of reported results
n = results without annotation
Min = lowest reported result
Max = highest reported result
Med = median value
m_{PT} = assigned value
s_{PT} = standard deviation
u_{PT} = measurement uncertainty
F+ = false positive
F- = false negative
< = low outlier
> = high outlier
Lower = lowest accepted value
Upper = highest accepted value

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

** Italicasied values represent likely non-log-transformed results.*

Appendix 2. Z-scores of all participants

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1141-1	-0.615	-0.043	-0.605													0.240	-0.128					0.011	-0.102	0				-4.000	-4.000	0						
1141-2																																				
1141-3																																				
1149-1	-0.134	-0.516	0.068							0.981	1.441	0.720				0.240	0.288					0.355	0.120	0	0	-0.780	0									
1149-2																																				
1149-3																																				
1237-1	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000				4.000	4.000					4.000	4.000	0				4.000	4.000	0		4.000	4.000			
1237-2																																				
1237-3																																				
1506-1							-0.084	0.716	0.183							-0.397	-0.899																			
1506-2																																				
1506-3																																				
1545-1	0.107	0.160	0.337							-0.324	-0.607	0.669							-1.657	-1.498	0	-0.988	-0.696	0	0	-0.508	0	0.601	0.675	0	0	-0.443	-2.853			
1545-2																																				
1545-3																																				
1900-1	-0.054	-0.178	-1.008													0.394	0.064																			
1900-2																																				
1900-3																																				
1970-1	-0.455	-0.652	-1.345	-0.387	-0.429	-0.331				-0.477	-0.162	-2.448	0.888	0.834		1.421	0.224		0.234	0.281	0	0.493	0.528	0	0	0.462	0	1.989	0.919	0	0	0.786	0.872			
1970-2																																				
1970-3																																				
2003-1	1.791	2.530	-0.470				0.222	-0.075	-2.613	-0.170	0.818	-3.266	0.301	-0.350								0.665	1.233			1.238		-4.000	-4.000					0	0	0
2003-2							-0.091	-1.441	-2.440																											
2003-3																																				
2035-1	0.107	0.837	-0.201							-0.937	-0.874	-0.404										-4.000	0.417	0												
2035-2																																				
2035-3																																				
2058-1	-0.134	-1.532	-0.067																			0.114	4.000	0		0.889										
2058-2																																				
2058-3																																				
2086-1	1.109	1.697	-0.423	0.971	1.029	-0.929	1.382	0.529	0.001	0.305	0.123	0.801	0.962	0.345		0.574	0.182					0.293	0.369	0	0	0.711	0	1.434	1.182	0	0	1.233	-2.115			
2086-2	0.524	0.986	-0.833	0.411	1.385	-1.215	1.680	0.082	-0.397	0.305	0.359	0.597	1.108	0.354		-0.243	0.297					0.238	0.061	0	0	0.155	0	1.886	0.014	0	0	1.394	-1.165			
2086-3																																				
2109-1	0.500	0.675	0.559													0.204	0.144					-0.251	-0.047	0												
2109-2																																				
2109-3																																				
2221-1	-0.054	0.431	0.404				0.614	-0.034	-0.103	-0.017	-0.251	0.004	-0.481	-0.506		-4.000	-0.704					-0.368	-1.401	0	0	-3.536	0	0.480	0.675	0	0	-3.936	-4.000			
2221-2																																				
2221-3																																				
2317-1	-0.294	0.364	-0.672							-0.247	-1.498	-0.915	-2.828	-1.691		-4.000	-2.366					-1.917	0.862	0	0	-3.225	0	0.299	-0.304		0	0.592	-1.256			
2317-2	-1.417	0.634	-0.268							-1.474	-0.518	-0.404	-4.000	-0.787		-4.000	-1.247					-1.607	-1.401	0	0	-0.586	0	0.178	0.675		0	0.398	0.264			
2317-3	-0.856	0.499	-0.470							-0.784	-0.963	-0.609	-3.512	-1.161		-4.000	-1.695					-1.745	0.120	0	0	-1.440	0				0	0.463	-0.420			
2324-1	-0.214	-0.652	-1.076				0.065	0.339	-0.882	-0.554	-0.384	-2.090													0	-3.342	0	-0.124	-0.059	0	0	0.398	-0.268			
2324-2																																				
2324-3																																				
2386-1	1.310	1.379	0.673													0.394	0.959		-0.734	0.820	0	0.596	0.380	0				0.721	0.614	0						
2386-2																0.189	0.415																			
2386-3																																				
2443-1	-0.856	-0.516	-0.874										-0.921	-0.787																						
2443-2																																				
2443-3																																				
2637-1	-1.257	0.364	-0.672				0.379	-4.000	0.590	-0.477	-0.251	-0.762							2.213	-0.258	0	2.042	0.157	0	0	-0.431	0	-0.305	-0.487	0						
2637-2	0.347	1.379	-0.201				-0.562	1.167	0.763	0.137	0.194	-0.251							0.234	0.173	0	0.320	0.343	0	0	-0.159	0	-0.305	-0.976	0						
2637-3	-1.096	0.364	-0.672							-0.477	-0.874	-0.864										0.493	0.454	0	0	-0.237	0									
2659-1	0.027	-0.516	0.068							-1.244	0.150	-1.018				-0.222	0.224					-0.093	-0.325	0												
2659-2																																				
2659-3																																				
2745-1	0.508	0.364	0.068							-0.784	0.595	0.413										0.355	0.269	0	0	0.113	0	0.057	-0.304	0						

Appendix 2. Z-scores of all participants

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
2745-2																																				
2745-3																																				
2757-1	0.107	-0.110	0.539	-0.659	0.053	0.535				-0.324	0.506	0.362	0.155	0.866																						
2757-2																																				
2757-3																																				
2794-1																																				
2794-2																																				
2794-3																																				
2810-1	1.069	0.837	0.270																					0						0						
2810-2																																				
2810-3																																				
2915-1																																				
2915-2																																				
2915-3																																				
3031-1	0.107	0.837	0.875	-0.932	-0.188	-0.244				-0.707	0.016	1.180				-1.300	-1.023		-2.317	-2.737	0	-1.297	-1.401	0	0	-0.159	0	-1.512	-0.487	0	0	0.786	1.784			
3031-2				-0.182	0.053	0.275																						-0.063	1.836	0						
3031-3																																				
3305-1	-0.214	0.160	0.337							0.674	0.640	0.362							0.234	0.982	0	0.493	1.011	0	0	0.152	0	-0.305	0.736	0						
3305-2	2.112	1.176	1.548																			0.252	0.899	0												
3305-3																																				
3452-1	-1.738	-2.344	-1.950										-0.579	-1.161																						
3452-2																																				
3452-3																																				
3457-1	0.428	-0.110	1.750							0.981	1.619	1.742		-0.288		-0.325						0.114	-0.807	0				-0.908	-0.304	0	0	-0.572	1.328			
3457-2																															0	-1.025	1.024			
3457-3																																				
3515-1	2.112	1.988	1.682							-0.017	0.729	0.720										1.628	0.714			1.588		-4.000	-4.000							
3515-2																																				
3515-3																																				
3543-1	1.550	0.837	1.010							-0.017	0.862	-2.397													0	-0.663	0	0.299	0.430	0	0	-0.313	-0.496			
3543-2	-0.054	-0.110	0.472							0.213	-0.340	0.975																								
3543-3																																				
3587-1	-1.738	-1.667	-0.941							-0.400	-1.319	0.515										-0.127	0.454	0	0	-0.081	0	0.782	-0.609		0	-0.701	0.264			
3587-2																																				
3587-3																																				
3606-1	-1.016	-1.938	0.942				-0.718	-0.738	0.763	-1.091	-0.696	-0.047										-2.020	-1.252	0	0	-0.431	0	0.057	-0.243	0	0	-1.025	-0.116			
3606-2	-1.096	-1.261	-0.470																																	
3606-3																																				
3831-1	1.149	0.296	0.808	0.841	0.836	0.535										0.548	0.415					-1.091	0.269	0												
3831-2																																				
3831-3																																				
3864-1	0.411	0.005	0.465							-0.730	-0.540	-0.512																						0	0	0
3864-2																																				
3864-3																																				
3878-1	-0.455	0.316	-1.876							-0.845	-3.176	-2.050				-0.561	-1.816		-1.147	-4.000	0	-0.698	-2.529	0	0	0.384	0	-0.896	-0.004	0						
3878-2	-0.487										-3.051	-4.000				-0.525	-2.018			-4.000		-0.623	-2.532		0	0.357	0		0.124							
3878-3												-2.182																								
4050-1	-0.102	-0.158	-0.423							0.190	0.827	-0.425	0.526	-1.433											0	0.408	0							0	0	0
4050-2																																				
4050-3																																				
4064-1	-0.134	0.160	-0.470							0.367	-0.162	-0.047																								
4064-2																																				
4064-3																																				
4100-1	-0.054	-0.313	-0.941							0.750	-0.162	0.055				0.035	-1.151					-0.712	-1.141	0	0	-0.159	0	-0.486	0.980	0	0	0.140	-0.040			
4100-2	-0.054	-0.178	0.404							-0.477	0.061	0.055													0	0.152	0									
4100-3																																				
4171-1	0.428	0.431	1.212							1.134	-1.898	0.209				0.394	-1.247					-1.366	-2.959			0.462		-4.000	-4.000	0		-0.443	0.568			
4171-2																0.959	1.279					-4.000	-4.000	0												

Appendix 2. Z-scores of all participants

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
4171-3																																				
4246-1	0.428	-0.855	0.472							0.290	0.907	1.231										0.493	0.380	0				0.057	-0.304	0						
4246-2																																				
4246-3																																				
4339-1																																				
4339-2																																				
4339-3																																				
4400-1	0.107	0.499	-0.403							0.213	0.239	0.924										1.319	0.343	0	0		0									
4400-2																																				
4400-3																																				
4449-1	-1.417	-0.516	-1.479							-1.321	-0.518	-0.762													0	1.161	0									
4449-2																																				
4449-3																																				
4557-1	0.267	-0.449	0.606							0.213	1.219	0.617		0.741		0.137						0.493	0.417	0				-0.365	0.675	0						
4557-2	0.267	-0.516	0.539																																	
4557-3	0.107	-1.464	-0.268																																	
4580-1	1.991	**2.239**	1.440							**2.193**	1.913		0.971	1.240								0.479	1.011	0				1.132	1.665	0						
4580-2												**2.181**																								
4580-3																																				
4635-1	0.267	-1.058	-0.806							0.367	-0.696	0.362													0	-0.974	0	0.420	0.308	0	0	-0.443	-0.496			
4635-2																																				
4635-3																																				
4664-1	0.123	0.729	0.465							0.367	-0.540	0.965				0.312	-0.189		-1.279	-1.115	0							-0.311	0.192	0	0	-0.055	0.644			
4664-2																																				
4664-3																																				
4889-1	1.310	0.973	0.606	1.114	0.957	1.055				**2.668**	0.996	0.720				1.832	1.503		1.598	1.035	0	1.560	1.048	0	0	1.859	0	0.782	0.797	0	0	**2.209**	**2.392**			
4889-2																1.062	1.279					1.009	1.270	0				0.963	0.430	0						
4889-3																1.267	0.671					1.353	1.122	0												
4951-1	-0.695	-0.848	-1.150							**-4.000**	**-4.000**	-1.416				-0.417	-0.908					-0.932	-1.137	0												
4951-2										-0.661	-0.139	-0.292																								
4951-3																																				
4983-1	**4.000**	**4.000**	**4.000**							**4.000**	**4.000**	**4.000**													0	1.161	0									
4983-2	**4.000**	**4.000**	**4.000**							**4.000**	**3.400**	**4.000**													0	1.898	0									
4983-3	**4.000**	**4.000**	**4.000**							**4.000**	**3.668**	**4.000**													0	1.316	0									
4998-1	1.229	0.160	1.884							0.060	0.105	0.669													0	-1.090	0									
4998-2																																				
4998-3																																				
5100-1	-0.294	0.364	-0.403											-1.005																						
5100-2																-1.968																				
5100-3																																				
5119-1	-0.190	0.607	-0.268							1.487	0.511	-1.038	-0.036	0.379								0.248	0.558	0												
5119-2																																				
5119-3																																				
5182-1	0.131	-0.374	0.256							**-2.126**	0.226	-0.767				**4.000**	1.944					-0.051	-0.492	0	0	0.392	0									
5182-2																0.112	0.476					**2.950**		0												
5182-3																						-0.134	**2.042**	0												
5201-1	-0.374	-0.720	-0.537							**2.822**	-1.275											1.078	-0.733			0.384		1.506	0.736							
5201-2	**2.272**	0.973	**2.153**							1.824	1.219																									
5201-3																																				
5204-1	-1.176	-1.193	-1.076				**-4.000**	-0.075	0.157	-1.014	-1.408	-0.762	-1.361			-1.711	-1.183		-0.118	0.281		0.217	0.528			0.035		-0.425	-0.181			-1.219	-1.028			
5204-2	-1.176	0.296	0.270							-1.091	0.373	0.566		-0.818								-0.299	0.046					-1.512	-0.732							
5204-3																																				
5220-1	-1.658	-0.923	-1.681							-0.707	-1.854	-0.762										**-3.879**	**-4.000**	0					-1.037	0						
5220-2																													-0.003	-0.609	0						
5220-3																													-0.365								
5261-1	**-2.596**	**-4.000**	**-4.000**							**-2.686**	0.747	-0.660				-0.330	0.121					1.849	-0.073			1.405										
5261-2																																				
5261-3																																				

Appendix 2. Z-scores of all participants

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
5290-1	-0.054	0.702	0.472							-0.324	-0.652	-0.098	0.546	-0.195								0.424	0.937	0	0	-0.663	0	-1.210	-1.404	0						
5290-2																																				
5290-3																																				
5329-1	0.363	-0.185	-3.067							0.267	-0.260											0.062	-0.540	0	0	-0.741	0	0.190	0.736	0	0	-0.171	0.340			
5329-2																																				
5329-3																																				
5333-1	-0.294	-0.584	-0.067				-2.756	1.871	-2.786	-0.477	0.016	-0.915	-0.236	-0.288								1.009	0.417	0	0	-0.431	0	0.903	1.042	0	0	0.140	0.112			
5333-2	0.668	0.160	0.808							1.057	0.684	0.975	0.546	0.616														0.601	0.124	0						
5333-3																																				
5338-1	-1.128	-1.329	-1.102							-0.761	0.061	-0.159																								
5338-2																																				
5338-3																																				
5419-1							-0.091	-0.117	0.590																0	-0.741	0				0	-0.766	1.252			
5419-2							-0.052	0.090	0.503																0		0				0	-0.766	-0.344			
5419-3							-0.209	-0.282	0.590																0							-0.701	0.644			
5446-1	-0.054	-0.178	1.212							-0.170	-0.162	0.413	0.057	0.117								-0.953	-0.325					-0.365	-0.181							
5446-2																																				
5446-3																																				
5545-1	-1.497	-1.870	4.000							-0.554	-1.008	0.004													0	2.946	0	0.963	-0.609	0	0	0.204	0.188			
5545-2	-1.738	-1.193	-0.403																																	
5545-3																																				
5612-1	-0.294	-0.381	-0.537							1.748	0.462	-2.806				-1.403	0.543		0.982	-0.096	0	1.078	0.269	0	0	0.617	0	0.903	-4.000	0						
5612-2	1.470	2.327	1.548													-4.000	-1.279					1.353	0.232	0											
5612-3																																				
5615-1	-2.299	1.176	3.364							0.674	1.219	1.384				0.137	1.375					0.252	1.233	0	0	0.152	0	-0.184							
5615-2																									0	0.811	0									
5615-3																																				
5701-1	0.027	0.634	-0.941																																	
5701-2																																				
5701-3																																				
5774-1																																				
5774-2																																				
5774-3																																				
5800-1	1.486	1.176	-0.389							2.837	0.853	-4.000				-3.735	-0.122		-0.245	-1.234	0	0.117	-0.073	0	0	0.101	0	0.408	0.662	0						
5800-2	1.141	1.507	0.734							0.973	0.243	-4.000				-3.206	-0.416					-0.024	-0.696	0											
5800-3																																				
5801-1	-4.000	-1.532	-1.412							-1.321	-0.251	-0.762													0	-0.858	0									
5801-2																																				
5801-3																																				
5808-1	-1.738	-0.381	0.203													-4.000							-1.141		0	-1.401	0									
5808-2																						-2.055		0												
5808-3																																				
5883-1	-0.455	0.093	0.337							-1.321	0.150	0.873					0.671					0.940	0.454	0	0	-0.974	0	0.540	0.797	0						
5883-2																0.959																				
5883-3																																				
5950-1																																				
5950-2																																				
5950-3																																				
6109-1	0.187	1.379	0.539							0.137	-1.141	0.209				0.548	-0.608					-0.643	-2.069			0.152		-4.000	-4.000	0						
6109-2																																				
6109-3																																				
6175-1	0.588	0.634	-0.806							-1.398	-4.000	0.004																								
6175-2																																				
6175-3																																				
6224-1	-4.000	-4.000	-4.000							-4.000	-2.789	-3.317													0	-4.000	0									
6224-2																																				
6224-3																																				
6253-1										0.981	0.373	0.566	0.693	0.367								3.005	-0.510	0							0	1.821	1.784			

Appendix 2. Z-scores of all participants

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
6253-2																																				
6253-3																																				
6258-1	-0.775	-0.313	-0.739										0.057	0.491																						
6258-2																																				
6258-3																																				
6368-1	-0.214	-0.110	0.001	-0.182	-0.067	-1.111				-0.784	-1.408					0.189	-0.352		0.718	0.173	0	0.871	0.454	0	0	0.656	0	0.903	0.614	0	0	**-4.000**	-0.420			
6368-2												-0.813										**2.145**	**2.050**	0												
6368-3																																				
6456-1										0.674	-0.874	-0.966	-0.970	-1.348		-1.095	1.822					-0.988	-1.660	0							0	0.204	0.264			
6456-2																																				
6456-3																																				
6490-1	0.107	-0.313	-0.201							0.520	0.862	0.158													0	-1.013	0	0.540	0.614	0	0	-0.249	-0.344			
6490-2																																				
6490-3																																				
6594-1	0.107	-1.600	-0.605													0.446	-1.151					**-4.000**	**-4.000**	0		-0.780				0						
6594-2																-0.530	**4.000**																			
6594-3																																				
6686-1	0.347	0.160	-0.201	-0.387	0.053	0.275				-0.170	-0.073	1.077				-0.376	-0.192					0.493	-0.585	0				0.721	-0.181	0	0	-0.055	-0.496			
6686-2																																				
6686-3																																				
6728-1	0.147	-0.239	0.559							0.267	0.279	0.347				0.132	0.441					-0.946	0.298	0				0.009	0.626	0						
6728-2	-0.246	0.093	-0.786																									0.245	-0.842	0						
6728-3																																				
6801-1	0.508	0.973	-0.941													0.476	0.671					0.355	0.566	0				0.057	-1.099	0						
6801-2																																				
6801-3																																				
6885-1	0.508	-0.110	0.741							0.213	-1.587	0.311										0.045	0.046	0	0	-0.586	0	-1.753	0.736	0	0	0.592	-0.876	0	0	0
6885-2																																				
6885-3																																				
6958-1	-0.695	-0.381	-0.067							-0.324	-0.473	0.158													0	0.113	0									
6958-2																																				
6958-3																																				
6971-1	-0.775	-0.855	-0.874							-0.247	0.506	-0.200																								
6971-2																																				
6971-3																																				
7182-1	0.452	1.013	0.586							0.374	1.254	0.469				0.297	0.822					0.259	0.740	0												
7182-2	0.532	0.201	0.155							0.236	0.190	-0.037				-0.320	0.508					-0.120	0.376	0												
7182-3																																				
7207-1										-0.707	-0.028	-0.660													0	1.743	0				0	**-4.000**	0.188			
7207-2	-0.455	0.296	0.404																																	
7207-3																																				
7232-1	-1.016	**-2.073**	-0.537																																	
7232-2																																				
7232-3																																				
7242-1	-1.593	0.093	-0.403							**2.331**	1.397	0.515																								
7242-2																																				
7242-3																																				
7248-1	-0.054	-1.803	**2.221**	0.091	-1.574	**3.135**	**-4.000**	-1.690	-0.968	1.211	1.040	-0.200	1.230			1.421			1.070			0.871			0			0.480			0	-0.184	-1.865			
7248-2	0.347	-1.396	**3.633**	-1.205	-1.574	**4.000**				1.364	0.595	0.771										1.353														
7248-3	**2.673**	-0.720	**2.221**																																	
7334-1	0.075	-0.442	-0.329													0.707	-0.832							0	0	-0.582	0	0.299	-0.175	0						
7334-2																																				
7334-3																																				
7564-1				0.166	-0.206	-0.366							0.693	1.446					0.898	1.079	0	-0.667	-0.844	0							0	-0.171	0.887			
7564-2																																				
7564-3																																				
7640-1								-0.945																												
7640-2																																				

Appendix 2. Z-scores of all participants

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
7640-3																																				
7688-1	-1.176	-0.110	0.068							-0.554	-0.073	-0.762	-1.263	-0.787		-0.838	-0.896		-0.646	-0.582	0	-0.196	-0.065	0	0	-0.159		0.178	0.185	0	0	-0.055	-0.496			
7688-2	-1.417	-0.652	-0.874							**4.000**	0.462	-1.528										0.596	-0.065	0												
7688-3																																				
7728-1	0.347	1.379	1.010	1.523	0.053	-0.158				-0.937	**-2.477**	-1.733				-1.249	0.064		-0.558	-0.689	0	-0.127	-0.139	0	0	0.501	0	**2.110**	1.592	0						
7728-2																																				
7728-3																																				
7750-1	-0.455	-0.449	-0.134							-0.784	-0.162	-0.404				0.240	-0.608					**-4.000**	**-4.000**	0		-0.159										
7750-2																																				
7750-3																																				
7825-1	**2.914**	**4.000**	**4.000**							**3.359**	0.154	**4.000**											**4.000**					1.880	**4.000**			**2.727**				
7825-2																																				
7825-3																																				
7930-1	-0.214	-0.110	0.539							0.213	-0.874	0.362							0.058	0.712	0	0.355	0.825	0	0	-0.275	0	0.420	-0.059	0	0	1.304	0.720			
7930-2	-0.775	-0.110	0.135																																	
7930-3																																				
7940-1	-0.455	-0.043	1.010							0.597	0.595	0.720	1.035	0.585																						
7940-2																																				
7940-3																																				
7968-1	-0.182	0.391	-0.389				0.488	0.231	0.685	0.681	-1.168	0.643	-0.500			-0.176			0.216	0.566	0	0.479	0.725	0	0	-0.077	0	1.573	0.277	0	0	0.922	0.887			
7968-2	-0.463	-0.381	0.176																			0.479	-0.280	0												
7968-3																																				
7984-1	0.676	1.088	0.344							-0.216	0.853	0.572													0	-0.349	0							0	0	0
7984-2																																				
7984-3																																				
8068-1	-0.374	0.093	-0.201							-0.093	-0.340	0.158							-0.646	0.820	0	-0.196	0.899	0	0	-1.052	0	-0.184	1.470	0						
8068-2	0.187	-0.381	0.068							0.981	0.016	0.566							0.366	0.982	0	0.596	1.011	0	0	0.656	0	0.903	**2.387**	0						
8068-3																																				
8105-1	1.791	-0.381	1.077							0.827	0.506	0.566	1.230	**2.019**								-0.368	-0.139	0				0.782	-0.365	0						
8105-2	0.588	0.770	1.212							0.750	0.506	0.822	0.839	**2.051**								-0.747	0.343	0				0.420	0.675	0						
8105-3																																				
8147-1	0.829	1.108	**3.297**							-0.324	**-2.433**	-0.302	0.595	-0.569								**-2.227**	**-2.514**			1.277		0.420	0.858							
8147-2																																				
8147-3																																				
8213-1	-0.615	-0.923	-0.806	-0.796	-1.152	-1.198				-1.474	-0.162	0.107														0.656								0	0	0
8213-2																																				
8213-3																																				
8260-1	0.187	-0.110	0.741							-0.247	0.818	0.515				0.497	0.639								0	-0.198	0	-0.003	0.124	0						
8260-2																																				
8260-3																																				
8313-1	-0.455	-0.652	-1.614							-1.167	0.105	-0.404													0	-0.081	0	0.480	1.531	0	0	0.075	0.112			
8313-2																																				
8313-3																																				
8333-1	0.428	0.296	0.203							1.134	-1.498	0.209				0.497	-0.032					-0.643	-1.586			1.316		**-4.000**	**-4.000**	0		0.916	0.264			
8333-2																1.010	0.096																			
8333-3																																				
8397-1	-0.054	0.499	0.203							0.750	0.818	0.771											0.454	0	0	-0.586	0	0.359	-0.854	0	0	0.010	-0.344			
8397-2																						0.114														
8397-3																																				
8435-1	0.347	0.160	0.203							-0.784	-0.518	0.107	0.644	-1.847		0.497	-0.128					0.183	0.640	0		0.113	0	-0.425	-1.037	0	0		0.036			
8435-2	-0.535									-0.324			-0.481			-0.684						0.493						-0.908			0					
8435-3																																				
8506-1	0.267	0.634	0.606							0.444	-0.518	1.231				0.240	-0.032					-1.435	**-2.291**			0.928		**-4.000**	**-4.000**	0						
8506-2																0.805	1.119					**-4.000**	**-4.000**	0											
8506-3																																				
8523-1	0.829	0.364	0.472							0.750	0.328	0.362										0.561	0.454	0				0.239	0.369	0						
8523-2																																				
8523-3																																				

Appendix 2. Z-scores of all participants

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
8568-1	-1.898	-4.000	-1.815							0.367	-4.000	-0.966				1.729	-1.407					-4.000	-4.000			1.316		-4.000	-4.000	0		0.269	0.416			
8568-2																0.343	3.997					-0.884	-1.215	0												
8568-3																																				
8626-1	-2.596	-1.004	-0.786							-1.121		-0.977	-2.339	-0.784								-1.184	-2.799	0												
8626-2											-1.306																									
8626-3																																				
8628-1	-0.695	-0.246	-1.479	-2.228	0.776	-0.591				-1.704	-1.230	-2.244	0.497	1.396		0.291	1.183		0.014	0.281	0	0.320	0.528	0	0	-0.858	0				0	-0.443	-0.116			
8628-2																-4.000	-1.279																			
8628-3																																				
8734-1	-0.455	-0.381	-0.201							-0.630	0.818	-0.251																								
8734-2																																				
8734-3																																				
8742-1	-0.214	-1.126	-0.268							-0.324	-0.073	-0.098	-0.970	1.146					1.246	0.820	0	1.284	0.899	0				0.420	0.308	0						
8742-2																																				
8742-3																																				
8756-1	1.069	3.003	0.472							-0.093	0.996	-4.000										1.319	0.862	0	0	1.316		-0.425	-1.221	0						
8756-2	1.310	1.785	-3.026																			0.286	1.048	0	0	-1.246	0	-0.969	-0.181	0						
8756-3																											0									
8829-1	2.224	2.191	-4.000																							0.361	0									
8829-2																																				
8829-3																									0											
8891-1	-0.775	-0.652	0.606				1.162	0.877	0.503	-0.861	0.373	0.669	-1.165	0.336								-0.024	0.269	0	0	-0.431	0	-0.486	-0.181	0						
8891-2	-0.214	-0.652	1.010							-0.861	0.016	0.924																								
8891-3																																				
9003-1	-0.463	-0.246	-0.638							-1.329	0.168	0.285	-0.036	0.092		-0.417	0.419					-0.626	0.272	0				-1.361	0.100	0						
9003-2																																				
9003-3																																				
9007-1	0.668	0.093	-0.067							0.367	0.105	0.055	0.399	0.741								0.252	0.046					-1.753	-1.160							
9007-2																																				
9007-3																																				
9025-1	-0.374	-1.600	-0.336							-0.784	-1.676	-0.762				-0.222	-0.800					-0.437	-0.436	0	0	-2.138	0							0	0	0
9025-2	-2.059	-0.381	-1.815							-1.474	-1.319	-1.528																								
9025-3																																				
9034-1	-1.096	-1.058	-0.201	-0.250	-1.032	-0.504				-0.400	0.551	0.617										-0.712	0.306	0												
9034-2																																				
9034-3																																				
9078-1	1.951	1.379	-4.000							0.674	1.040	-0.864																								
9078-2																																				
9078-3																																				
9086-1														-0.363		0.584								0												
9086-2																																				
9086-3																																				
9269-1	-0.615	-0.720	-1.479																																	
9269-2																																				
9269-3																																				
9408-1	0.363	0.032	0.734							0.160	0.315	0.842				0.312	0.588		-0.650	0.507	0	0.345	-0.139	0	0	-0.582	0	0.299	-0.077	0	0	-0.863	0.583			
9408-2	0.837	-0.862	-0.093							0.091	0.689	0.643				1.010	0.121		-0.408	0.259	0	0.413	1.011	0	0	1.797	0	-0.051	-0.077	0	0	-1.510	-2.602			
9408-3																										-0.877										
9429-1										0.213	0.684	-0.302	-0.481	0.211		-0.068	-0.128		-0.734			-0.265														
9429-2																																				
9429-3																																				
9436-1	-0.695	-0.449	-0.605							0.597	0.996	0.311	0.301	0.242		0.548	0.799		0.894	0.173	0	0.527	0.454	0	0	-0.819	0	0.299	0.247	0	0	-0.831	0.568			
9436-2	1.229	-1.464	-0.605																			0.424	0.232	0												
9436-3																																				
9453-1	-0.615	-0.449	-0.336				0.457	1.167	4.000	-0.017	0.328	-0.404													0	0.113	0	-0.305	0.491	0	0	2.274	-0.724			
9453-2																																				
9453-3																																				
9512-1	-0.310	-0.692	-0.147							0.436	-0.028	-0.318																								

Appendix 2. Z-scores of all participants

Lab no.	Aerobic microorganisms 30 °C			Aerobic microorganisms 20 °C			Contaminating microorganisms			Enterobacteriaceae			Coliform bacteria 30 °C			Coliform bacteria 37 °C			Thermotol. coliform bacteria			Escherichia coli			Presumptive Bacillus cereus			Coagulase-positive staphylococci			Enterococci			Gram-neg. bacteria in dairy products		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
9512-2																																				
9512-3																																				
9559-1	1.550	**3.883**	1.010	1.386	0.897	0.969				1.556	-0.781	1.348				1.200	-0.189					0.582	1.044	0	0	1.972	0	**2.007**	1.714	0				0	0	0
9559-2																																				
9559-3																																				
9662-1	-0.214	0.634	0.606							-0.017	1.797	**4.000**	1.182	0.086		1.164	-0.224					-1.091	-0.251	0							0	**2.662**	1.708			
9662-2																																				
9662-3																																				
9747-1	**4.000**	**4.000**	**4.000**							**4.000**	**3.400**	**4.000**													0	-0.431	0									
9747-2																																				
9747-3																																				
9890-1	1.310	-0.178	0.135							-0.324	1.441	1.537				0.600	0.767					0.940	0.677	0	0	0.656	0	-1.331	-0.732	0						
9890-2																																				
9890-3																																				
9903-1	0.187	-0.720	-0.739							-1.014	-0.473	-0.915										-0.265	0.454	0	0	-1.673	0	-0.727	-1.160	0	0	-0.831	**-2.169**			
9903-2																																				
9903-3																																				
9950-1	0.668	0.160	0.203							0.520	0.729	0.362																								
9950-2																																				
9950-3																																				

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

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

All analytical activities require a high standard of work and accurate documentation. To ensure this, most laboratories implement internal quality assurance procedures. However, their analytical performance must also be evaluated by an independent party. Such external quality control of laboratory competence is commonly required by accreditation bodies and can be achieved through participation in proficiency testing (PT).

In a proficiency test, identical test materials are analysed by multiple laboratories using their routine methods. The organiser evaluates the results and compiles them into a report.

The Swedish Food Agency's PT program offers

- External and independent evaluation of laboratory analytical competence
- Improved understanding of analytical methods for different types of microorganisms
- Access to expert support
- A tool for inspections related to accreditation

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

The Swedish Food Agency's reference materials

As a complement to proficiency testing, the Swedish Food Agency also produces a range of certified reference materials (CRM) for internal quality control in microbiological analyses of food and drinking water, including pathogens.

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