Fapas® – Food Microbiology Proficiency Test Report 300

September 2024

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SUMMARY

1. The test materials for Fapas® – Food Microbiology proficiency test Distribution 300 were dispatched in September 2024. The test materials available in this Distribution were for the following proficiency tests:

M299e25	Enumeration of Aciduric Bacteria / Yeast / Mould (equivalent to 100 ml Soft Drink),
M300e01	Enumeration of Lactic Acid Bacteria (equivalent to 10 g Beef),
M300e02	Enumeration of *Listeria monocytogenes* (equivalent to 10 g Smoked Fish),
M300e06	Enumeration of *Clostridium* spp. / *Clostridium perfringens* / Sulphite Reducing Clostridia (equivalent to 10 g Beef),
M300e12	Enumeration of *Bacillus cereus* (equivalent to 10 g Cooked Rice),
M300e23	Enumeration of APC / Lactic Acid Bacteria (equivalent to 10 ml Fruit Juice),
M300e24	Enumeration of APC / Enterobacteriaceae / Coliforms / *Escherichia coli* (equivalent to 10 g Pet Food),
M300d02	Detection of *Listeria monocytogenes* / *Listeria* spp. (equivalent to 25 g Mixed Vegetables, x2),
M300d071	Detection of *Salmonella* spp. (equivalent to 25 g Chicken, x2),
M300d072	Detection of *Salmonella* spp. (equivalent to 25 g Milk Powder, x2),
M300d11	Detection of *Escherichia coli* O157:H7 (equivalent to 25 g Cheese, x2).

2. An assigned value (x_a) was determined for each proficiency test in enumeration and in conjunction with the standard deviation for proficiency (σ_p) was used to calculate a z-score for each result. However those for aciduric bacteria in soft drink are given *for information only.*

3. Results and assessments for the proficiency tests in enumeration are summarised as follows:

Proficiency test in enumeration	assigned value, x_a	unit	number of scores, $\|z\| \leq 2$	total number of scores	% $\|z\| \leq 2$
Aciduric Bacteria in Soft Drink	*1.48*	$\log_{10}$ cfu/ml	*3*	3	*100*
Yeasts in Soft Drink	1.74	$\log_{10}$ cfu/ml	8	8	100
Moulds in Soft Drink	1.46	$\log_{10}$ cfu/ml	6	8	75
Lactic Acid Bacteria in Beef	3.95	$\log_{10}$ cfu/g	28	32	88
Listeria monocytogenes in Smoked Fish	3.41	$\log_{10}$ cfu/g	30	32	94
Clostridium perfringens in Beef	3.71	$\log_{10}$ cfu/g	28	28	100
Clostridium spp. in Beef	3.74	$\log_{10}$ cfu/g	10	12	83
Sulphite Reducing Clostridia (SRC) in Beef	3.77	$\log_{10}$ cfu/g	17	18	94
Bacillus cereus in Cooked Rice	5.19	$\log_{10}$ cfu/g	50	57	88
Aerobic Plate Count in Fruit Juice	3.87	$\log_{10}$ cfu/ml	25	27	93
Lactic Acid Bacteria in Fruit Juice	3.77	$\log_{10}$ cfu/ml	18	19	95
Aerobic Plate Count in Pet Food	4.14	$\log_{10}$ cfu/g	21	23	91
Enterobacteriaceae in Pet Food	3.86	$\log_{10}$ cfu/g	23	25	92
Coliforms in Pet Food	3.79	$\log_{10}$ cfu/g	17	18	94
Escherichia coli in Pet Food	3.47	$\log_{10}$ cfu/g	18	19	95

italics indicate for information only

4. Qualitative results for the proficiency tests in detection are assessed based on the presence or absence of the target organism in **both** of the test materials issued.

5. Results for the proficiency tests in detection are summarised as follows:

Proficiency test in detection	intended result	number of satisfactory assessments	total number of assessments	satisfactory / agreement with intended result, %	false negatives, %	false positives, %
Listeria monocytogenes in Mixed Vegetables	test material A detected test material B not detected	42	44	95	5	2
Listeria spp. in Mixed Vegetables	test material A detected test material B not detected	28	31	90	10	3
Salmonella spp. in Chicken	test material A not detected test material B detected	75	76	99	0	1
Salmonella spp. in Milk Powder	test material A not detected test material B detected	38	42	90	10	0
Escherichia coli O157:H7 in Cheese	test material A not detected test material B detected	8	9	89	11	0

6. Quality control materials are available for purchase from fapas.com. On the home page, click on ‘Quality Control Materials’ then, under the heading ‘Analyte groups’, click on ‘Microbiology’.

   FMOE6-MRP2 - M300e12 – Enumeration *Clostridium* spp. / *Clostridium perfringens* / Sulphite Reducing Clostridia in Beef

   FMOE12-CCP22 - Enumeration of *Bacillus cereus* in Cooked Rice

   FMOD7-DRY14 - Detection of Salmonella spp. in Milk Powder

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1. INTRODUCTION

1.1. Proficiency Testing

Proficiency testing aims to provide an independent assessment of the competence of participating laboratories. Together with the use of validated methods, proficiency testing is an essential element of laboratory quality assurance.

Further details of the Fapas® – Food Microbiology proficiency tests are available in our protocols [7, 8].

2. TEST MATERIAL

2.1. Preparation

Preparation of the samples for this proficiency test was sub-contracted to a laboratory meeting the quality requirements of the scheme's accreditation [3].

Fapas® – Food Microbiology test materials include background flora to simulate real conditions. Information for these organisms is given in APPENDIX I.

The test materials were stored at +4°C ±2°C until dispatch.

2.2. Homogeneity and Validation

For each proficiency test in enumeration, randomly selected test materials were analysed in duplicate by a laboratory meeting the quality requirements of the scheme's accreditation [3].

These data showed sufficient homogeneity and were not included in the subsequent calculation of the assigned values.

For each proficiency test in detection, ten percent of the test materials were analysed to verify the presence/absence of the target organism. In addition, two of each of the test materials positive for the target organism were also analysed by the most probable number technique to verify the level of organisms present. The data obtained is given in APPENDIX II.

2.3. Dispatch

The start date was 02 September 2024. Test materials were sent to 345 participants.

2.4. Storage and Preparation Instructions

Instructions regarding sample storage and preparation were made available on the Fapas® website [9].

Participants are reminded that it is crucial to the outcome of the proficiency tests that the instructions for the preparation of the test materials are followed exactly.

3. RESULTS

The instructions for reporting results were as follows:

- Start the analysis between 02 September and 11 September 2024.

- The results for enumeration tests must be reported as cfu/g or cfu/ml as appropriate.
- The results for detection tests must be reported as detected/not detected in 25 g (in English).

Results were submitted by 323 participants (94%) before the closing date for this test, 23 September 2024.

Each participant was given a laboratory number, assigned in order of receipt of results. The reported results are given in Tables 1 to 12.

The methods used by each participant are summarised in APPENDIX III.

4. STATISTICAL EVALUATION OF RESULTS

The results submitted by participants were statistically analysed in order to provide an assigned value for each proficiency test in enumeration. The assigned values were then used in combination with the standard deviation for proficiency, σ_p, to calculate a z-score [10] for each result. The procedure is detailed in the relevant protocols [7, 8].

Further background on the procedure followed can be found in the IUPAC International Harmonised Protocol for the Proficiency Testing of Analytical Chemistry Laboratories [11].

4.1. Calculation of the Assigned Value, x_a

The assigned value, x_a, for each test in enumeration was derived from the consensus of the results submitted by participants.

The procedure used to derive this consensus involved:

i) exclusion, if present, of any non numerical results i.e. qualitative or semi-quantitative results or results reported as zero,

ii) a $\log_{10}$ transformation of submitted results to obtain a normal distribution,

iii) exclusion, if present, of any results that were approximately 10, 100 or 1000 × greater or smaller than the majority of submitted results (as these were considered to be reporting errors).

For lactic acid bacteria (beef), *Clostridium perfringens*, sulphite reducing clostridia, *Bacillus cereus* (cooked rice), lactic acid bacteria (fruit juice), aerobic plate count (pet food), Enterobacteriaceae, coliforms and *E. coli* this procedure was straightforward, and the robust mean was chosen as the assigned value.

For aciduric bacteria, yeasts, moulds and *Clostridium* spp. the median was chosen as the assigned value as this was considered the best measure of consensus due to the low number of data points. However, the assigned value for aciduric acid bacteria is given for information only due to the very limited data set.

For *Listeria monocytogenes* and aerobic plate count (fruit juice) the mode was chosen because the distribution was skewed/multi-modal. Kernel density plots of the distributions are shown as inserts to Figures 5 and 10 respectively.

The assigned values for all proficiency tests in enumeration, together with their uncertainties are shown in Table 13.

4.2. Standard Deviation for Proficiency, σ_p

The standard deviation for proficiency, σ_p, was set at a value that reflects fitness-for-purpose for the analyses in question. The appropriate members of the Fapas® Advisory Committee have agreed this value corresponds to 0.25 $\log_{10}$ cfu/g.

The values for σ_p used to calculate z-scores from the reported results of this test are given in Table 15.

4.3. Individual z-Scores and Assessments

Participants' z-scores were calculated as:

$$z = \frac{(x - x_a)}{\sigma_p}$$

where x = the participant's reported result expressed as $\log_{10}$,
x_a = the assigned value, see Table 13,
and σ_p = the standard deviation for proficiency, see Table 13.

Participants' z-scores for all proficiency tests in enumeration are given in Tables 1 to 9 and shown as histograms in Figures 1 to 15. Those for aciduric bacteria in soft drink are given *for information only*. It is possible for the z-scores published in this report to differ slightly from the z-score that can be calculated using the formula given above. These differences arise from the necessary rounding of the actual assigned values and standard deviations for proficiency prior to their publication in Table 13.

The number and percentage of z-scores in the range $-2 \leq z \leq 2$ for all proficiency tests in enumeration are given in Table 14.

Participants' results for the proficiency tests in detection are assessed based on the presence or absence of the target organism in **both** of the test materials issued. Assessments are given in Tables 9 to12.

Intended results for these detection tests are shown in Table 15.

The number and percentage of satisfactory assessments are given in Table 16.

5. INTERPRETATION OF SCORES AND ASSESSMENTS

In normal circumstances, over time, about 95% of z-scores will lie in the range $-2 \leq z \leq 2$. Occasional scores in the range $2 < |z| < 3$ are to be expected, at a rate of 1 in 20. Whether or not such scores are of importance can only be decided by considering them in the context of the other scores obtained by that laboratory.

Scores where $|z| > 3$ are to be expected at a rate of about 1 in 300. Given this rarity, such z-scores very strongly indicate that the result is not fit-for-purpose and almost certainly requires investigation.

The consideration of a set or sequence of z-scores over time provides more useful information than a single z-score. Examples of suitable methods of comparison are provided in the IUPAC International Harmonised Protocol for the Proficiency Testing of Analytical Chemistry Laboratories [11].

Results submitted by participants for detections tests are assessed as either satisfactory (S) or not satisfactory (NS) as compared to the intended result.

6. REFERENCES

1 Adobe Approved Trust List, https://helpx.adobe.com/acrobat/kb/approved-trust-list2.html#Whatisit accessed 23/02/2024.

2 GlobalSign AATL Document Signing FAQs, https://support.globalsign.com/aatl-document/aatl-document-signing-faqs accessed 23/02/2024.

3 ISO/IEC 17043:2010, Conformity assessment – General requirements for proficiency testing.

4 The ILAC Mutual Recognition Arrangement, https://ilac.org/ilac-mra-and-signatories/ accessed 23/02/2024.

5 Fera Science Ltd, Standards & Accreditations, https://www.fera.co.uk/about-us/standards-and-accreditation accessed 23/02/2024.

6 Lloyd's Register, Learn about ISO 9001 Quality Management Systems (QMS), https://www.lrqa.com/en-gb/iso-9001/?epslanguage=en-GB#accordion-whatarethebenefitsofiso9001certification accessed 23/02/2024.

7 Fapas®, 2023, Protocol for Proficiency Testing Schemes, Version 8, January 2023, Part 1 – Common Principles.

8 Fapas®, 2023, Protocol for Proficiency Testing Schemes, Version 6, January 2023, Part 3 – Fapas® Food Microbiology scheme (FEPAS).

9 Fapas® – Food Microbiology safety data sheet and preparation instructions, https://fapas.com/technical-documentation, accessed 23/02/2024.

10 AMC Tech Brief No. 74, z-Scores and other scores in chemical proficiency testing – their meanings, and some common misconceptions, *Anal. Methods*, 2016, **8**, 5553.

11 Thompson, M., Ellison, S.L.R. and Wood, R., 2006, The International Harmonised Protocol for the Proficiency Testing of Analytical Chemistry Laboratories, *Pure Appl. Chem.*, **78**, No. 1, 145–196.

Table 1: Results and z-Scores for Enumeration of Aciduric Bacteria / Yeasts / Moulds in Soft Drink

laboratory number	proficiency test								
	Aciduric Bacteria assigned value: *1.48* $\log_{10}$ cfu/ml			Yeasts assigned value: 1.74 $\log_{10}$ cfu/ml			Moulds assigned value: 1.46 $\log_{10}$ cfu/ml		
	result	$\log_{10}$	z-score	result	$\log_{10}$	z-score	result	$\log_{10}$	z-score
038				50	1.7	-0.2	250	2.4	**3.7**
049				6.5E+1	1.8	0.3	1.7E+1	1.2	-0.9
168				40 *	1.6	-0.6	5 *	0.7	**-3.1**
218	37	1.6	*0.4*	57	1.8	0.1	24	1.4	-0.3
270				53	1.7	-0.1	33	1.5	0.2
277	30	1.5	*0.0*	53	1.7	-0.1	28	1.4	-0.1
305	30	1.5	*0.0*	80	1.9	0.7	50	1.7	0.9
313				1.0E+2	2.0	1.0	3.0E+1	1.5	0.1

z-scores outside |z| >2 are shown in **bold,** see Section 5
italics indicate for information only
* samples analysed outside of the required time frame

Table 2: Results and z-Scores for Enumeration of Lactic Acid Bacteria in Beef

laboratory number	proficiency test		
	Lactic Acid Bacteria assigned value: 3.95 $\log_{10}$ cfu/g		
	result	$\log_{10}$	z-score
002	4.0E+4	4.6	**2.6**
007	8000	3.9	-0.2
012	16000	4.2	1.0
017	3.74E+04	4.6	**2.5**
018	11917	4.1	0.5
028	1.1775E+2	2.1	**-7.5**
043	9.6E+3	4.0	0.1
051	6.5E+3	3.8	-0.6
071	6800	3.8	-0.5
074	5.9E+3	3.8	-0.7
082	6.8E+3	3.8	-0.5
092	7820	3.9	-0.2
129	9.0E+3	4.0	0.0
136	1.1E+4	4.0	0.3
137	8500	3.9	-0.1
138	9.1E+3	4.0	0.0
152	4600	3.7	-1.2
165	7.8E+3	3.9	-0.3
174	4.1E+3	3.6	-1.4
189	14000	4.1	0.8
203	1.0E+4	4.0	0.2

z-scores outside |z| >2 are shown in **bold,** see Section 5
* samples analysed outside of the required time frame

Table 2 (continued): Results and z-Scores for Enumeration of Lactic Acid Bacteria in Beef

laboratory number	proficiency test		
	Lactic Acid Bacteria assigned value: 3.95 $\log_{10}$ cfu/g		
	result	$\log_{10}$	z-score
217	5.6E+3	3.7	-0.8
258	15000 *	4.2	0.9
273	47000	4.7	**2.9**
278	8500 *	3.9	-0.1
279	8.9E+3 *	3.9	0.0
293	8.4E+3	3.9	-0.1
300	5600	3.7	-0.8
312	9.2E+3	4.0	0.0
318	1.0E+4	4.0	0.2
320	9100	4.0	0.0
321	8.7E+3	3.9	-0.1

z-scores outside |z| >2 are shown in **bold,** see Section 5
* samples analysed outside of the required time frame

Table 3: Results and z-Scores for Enumeration of *Listeria monocytogenes* in Smoked Fish

laboratory number	proficiency test		
	Listeria monocytogenes assigned value: 3.41 $\log_{10}$ cfu/g		
	result	$\log_{10}$	z-score
027	3.6E+03	3.6	0.6
041	2.9E+3	3.5	0.2
045	3900	3.6	0.7
053	2.8E+3	3.4	0.1
058	300	2.5	**-3.7**
072	2.4E+3	3.4	-0.1
081	1400	3.1	-1.1
095	4.3E+3	3.6	0.9
106	2350	3.4	-0.2
108	2.2E+3	3.3	-0.3
114	3.2E+3	3.5	0.4
119	2.6E+3	3.4	0.0
120	1.3E+3	3.1	-1.2
132	2.5E+3	3.4	0.0
134	2800	3.4	0.1
137	3400	3.5	0.5
143	3.4E+3	3.5	0.5
144	3.8E+3	3.6	0.7
151	1.4E+3	3.1	-1.1
157	1.4E+3	3.1	-1.1
167	3.6E+3	3.6	0.6

z-scores outside |z| >2 are shown in bold, see Section 5
* samples analysed outside of the required time frame

Table 3 (continued): Results and z-Scores for Enumeration of *Listeria monocytogenes* in Smoked Fish

laboratory number	proficiency test		
	Listeria monocytogenes assigned value: 3.41 $\log_{10}$ cfu/g		
	result	$\log_{10}$	z-score
209	2.4E+3	3.4	-0.1
219	2500	3.4	0.0
225	1.5E+3	3.2	-0.9
226	7.6E+2	2.9	**-2.1**
237	2.2E+3	3.3	-0.3
239	4.2E+3	3.6	0.9
259	2.3E+3	3.4	-0.2
276	2100	3.3	-0.3
281	4500	3.7	1.0
314	1.6E+3 *	3.2	-0.8
319	1.5E+3	3.2	-0.9

z-scores outside |z| >2 are shown in **bold,** see Section 5
* samples analysed outside of the required time frame

Table 4: Results and z-Scores for Enumeration of *Clostridium perfringens* / *Clostridium* spp. / Sulphite Reducing Clostridia (SRC) in Beef

laboratory number	proficiency test								
	Clostridium perfringens assigned value: 3.71 $\log_{10}$ cfu/g			*Clostridium* spp. assigned value: 3.74 $\log_{10}$ cfu/g			Sulphite Reducing Clostridia (SRC) assigned value: 3.77 $\log_{10}$ cfu/g		
	result	$\log_{10}$	z-score	result	$\log_{10}$	z-score	result	$\log_{10}$	z-score
021	5.5E+3	3.7	0.1				5.6E+3	3.7	-0.1
035	5300	3.7	0.1						
060	2900	3.5	-1.0						
070							6400	3.8	0.1
078				5.0E+3	3.7	-0.2	5.0E+3	3.7	-0.3
092	3450	3.5	-0.7				5450	3.7	-0.2
101	3.5E+3	3.5	-0.7						
105	6.0E+3	3.8	0.3				6.1E+3	3.8	0.0
112	9100	4.0	1.0	6900	3.8	0.4	6900	3.8	0.3
113	6320	3.8	0.4						
114	6.7E+3	3.8	0.5						
129	8E+3	3.9	0.8	8E+3	3.9	0.7	8E+3	3.9	0.5
160	6.3E+3	3.8	0.4	5.5E+3	3.7	0.0	5.5E+3	3.7	-0.1
163	5400	3.7	0.1						
170	1.3E+4	4.1	1.6						
188	5.0E+3	3.7	0.0						
192	3909	3.6	-0.5				4545	3.7	-0.5

z-scores outside |z| >2 are shown in **bold,** see Section 5
* samples analysed outside of the required time frame

Table 4 (continued): Results and z-Scores for Enumeration of *Clostridium perfringens* / *Clostridium* spp. / Sulphite Reducing Clostridia (SRC) in Beef

laboratory number	proficiency test								
	Clostridium perfringens assigned value: 3.71 $\log_{10}$ cfu/g			*Clostridium* spp. assigned value: 3.74 $\log_{10}$ cfu/g			Sulphite Reducing Clostridia (SRC) assigned value: 3.77 $\log_{10}$ cfu/g		
	result	$\log_{10}$	z-score	result	$\log_{10}$	z-score	result	$\log_{10}$	z-score
193	5091 *	3.7	0.0	5455 *	3.7	0.0	5091 *	3.7	-0.3
223	5.3E+3	3.7	0.1						
238	6.5E+3	3.8	0.4				6.6E+3	3.8	0.2
246	6100 *	3.8	0.3						
249	3.5E+3	3.5	-0.7						
250	5600	3.7	0.2	5400	3.7	0.0	5800	3.8	0.0
263							5.8E+3	3.8	0.0
264	4400 *	3.6	-0.3	4400 *	3.6	-0.4			
268	9200	4.0	1.0	10000	4.0	1.0	11000	4.0	1.1
278							5800	3.8	0.0
289	4700	3.7	-0.2	18454	4.3	**2.1**	14000	4.1	1.5
294	2.3E+3	3.4	-1.4	5.6E+3	3.7	0.0	5.6E+3	3.7	-0.1
299	3.5E+3	3.5	-0.7	3.6E+3	3.6	-0.7			
303	5.9E+3	3.8	0.2						
311	1600 *	3.2	-2.0	1600 *	3.2	**-2.1**	1600 *	3.2	**-2.3**

z-scores outside |z| >2 are shown in **bold,** see Section 5
* samples analysed outside of the required time frame

Table 5: Results and z-Scores for Enumeration of *Bacillus cereus* in Cooked Rice

laboratory number	proficiency test		
	Bacillus cereus assigned value: 5.19 $\log_{10}$ cfu/g		
	result	$\log_{10}$	z-score
001	2.0E+4	4.3	**-3.6**
002	4.0E+5	5.6	1.6
006	214000	5.3	0.5
022	1.4E+4	4.1	**-4.2**
023	9.4E+4	5.0	-0.9
026	1.6E+5	5.2	0.0
029	153000	5.2	0.0
040	1.6E+5	5.2	0.0
043	1.2E+5	5.1	-0.5
047	1.9E+5	5.3	0.3
056	175000	5.2	0.2
061	1.6E+5 *	5.2	0.0
067	210000	5.3	0.5
078	1.9E+5	5.3	0.3
084	74000	4.9	-1.3
085	1.8E+5	5.3	0.2
086	2.1E+5	5.3	0.5
094	72000	4.9	-1.3
097	3.5E+4	4.5	**-2.6**
100	1.1E+5	5.0	-0.6
105	8.6E+3	3.9	**-5.0**
130	1.5E+5	5.2	-0.1
132	1.6E+5	5.2	0.0
134	130000	5.1	-0.3
137	170000	5.2	0.2
147	3.7E+3	3.6	**-6.5**
153	1.9E+5	5.3	0.3
159	1.9E+5	5.3	0.3

z-scores outside |z| >2 are shown in **bold,** see Section 5
* samples analysed outside of the required time frame

Table 5 (continued): Results and z-Scores for Enumeration of *Bacillus cereus* in Cooked Rice

laboratory number	proficiency test		
	Bacillus cereus assigned value: 5.19 $\log_{10}$ cfu/g		
	result	$\log_{10}$	z-score
162	140000	5.1	-0.2
163	206000	5.3	0.5
164	199500	5.3	0.4
165	1.1E+5	5.0	-0.6
166	1.97E+5	5.3	0.4
173	2.1E+5	5.3	0.5
176	2.1E+5	5.3	0.5
179	1.2E+5	5.1	-0.5
183	1.9E+5	5.3	0.3
187	1.2E+5	5.1	-0.5
190	180000	5.3	0.2
192	126364	5.1	-0.4
214	2.0E+5 *	5.3	0.4
215	3.3E+4 *	4.5	**-2.7**
219	140000	5.1	-0.2
222	1.83E+5	5.3	0.3
224	190000	5.3	0.3
225	1.4E+5	5.1	-0.2
229	99000	5.0	-0.8
230	6.2E+5	5.8	**2.4**
249	1.4E+5	5.1	-0.2
255	3.2E+5	5.5	1.2
256	190000	5.3	0.3
271	110000	5.0	-0.6
286	1.1E+5	5.0	-0.6
287	1.2E+5	5.1	-0.5
298	240000	5.4	0.7
304	3.0E+5	5.5	1.1
312	1.2E+5	5.1	-0.5

z-scores outside |z| >2 are shown in **bold,** see Section 5
* samples analysed outside of the required time frame

Table 6: Results and z-Scores for Aerobic Plate Count / Lactic Acid Bacteria in Fruit Juice

laboratory number	proficiency test					
	Aerobic Plate Count assigned value: 3.87 $\log_{10}$ cfu/ml			Lactic Acid Bacteria assigned value: 3.77 $\log_{10}$ cfu/ml		
	result	$\log_{10}$	z-score	result	$\log_{10}$	z-score
010	7.3E+4	4.9	**4.0**	6.4E+4	4.8	**4.1**
062	2.34E+3	3.4	-2.0	5.37E+3	3.7	-0.2
063	2.71E+3	3.4	-1.8	4.94E+3	3.7	-0.3
064	2.57E+3	3.4	-1.9	6.47E+3	3.8	0.1
069	8400	3.9	0.2			
076				1.4E+4	4.1	1.5
110	8.4E+3	3.9	0.2	6.7E+3	3.8	0.2
115	6.1E+3	3.8	-0.3	6.1E+3	3.8	0.0
119	7.2E+3	3.9	-0.1	6.5E+3	3.8	0.2
138	8.6E+3	3.9	0.2	6.8E+3	3.8	0.2
143	4.5E+3	3.7	-0.9	6.5E+3	3.8	0.2
156	9500	4.0	0.4			
158	9.0E+3	4.0	0.3			
177	5.9E+3	3.8	-0.4			
194	17000	4.2	1.4			
195	6.3E+3	3.8	-0.3			
196	2.2E+3	3.3	**-2.1**	6.1E+3	3.8	0.0
204	2457	3.4	-1.9	3220	3.5	-1.1
205	7.7E+3	3.9	0.1	3.5E+3	3.5	-0.9
207	18000	4.3	1.5			
208	3167	3.5	-1.5	4562	3.7	-0.5
213	19000	4.3	1.6			
231	8.3E+3	3.9	0.2			
256	8000	3.9	0.1	5600	3.7	-0.1
257				6800	3.8	0.2
267	7.5E+3 *	3.9	0.0	5.5E+3 *	3.7	-0.1
271	7500 *	3.9	0.0	8300 *	3.9	0.6
291	7.5E+3	3.9	0.0	5.8E+3	3.8	0.0
306	7600 *	3.9	0.0			

z-scores outside |z| >2 are shown in **bold,** see Section 5
* samples analysed outside of the required time frame

Table 7: Results and z-Scores for Aerobic Plate Count / Enterobacteriaceae in Pet Food

laboratory number	proficiency test						
	Aerobic Plate Count assigned value: 4.14 log_{10} cfu/g			Enterobacteriaceae assigned value: 3.86 log_{10} cfu/g			
	result	log_{10}	z-score	result	log_{10}	MPN method (yes/no)	z-score
003	2.0E+4	4.3	0.7				
005	54000	4.7	**2.4**	20000	4.3	no	1.7
008	1.7E+4	4.2	0.4	8.4E+3	3.9	yes	0.2
014	1.1E+4	4.0	-0.4	5.9E+3	3.8	no	-0.4
024	9900	4.0	-0.6	7500	3.9	no	0.0
025	29000	4.5	1.3	16000	4.2	yes	1.4
040	1.9E+4	4.3	0.6	1.0E+4	4.0	NO	0.5
050				9.8E+4	5.0	No	**4.5**
054	9.6E+3	4.0	-0.6	5.4E+3	3.7	NO	-0.5
057				4.4E+3	3.6	yes	-0.9
068	1.0E+4	4.0	-0.5				
105				9.5E+3	4.0	no	0.5
122	15000	4.2	0.2	7600	3.9	No	0.1
125	9.6E+3	4.0	-0.6	7.9E+3	3.9	no	0.1
129	1.8E+4	4.3	0.5	8.3E+3	3.9	no	0.2
133	13909	4.1	0.0	6546	3.8	yes	-0.2
137	24000	4.4	1.0	11000	4.0	no	0.7
140	1.4E+4	4.1	0.0	7.1E+3	3.9	N	0.0
147	1.6E+3	3.2	**-3.7**	7.7E+2	2.9	NO	**-3.9**
148	9900	4.0	-0.6	6350	3.8	no	-0.2
171	5100	3.7	-1.7	3200	3.5	no	-1.4
272	10000	4.0	-0.5	4500	3.7	No	-0.8
281	15000	4.2	0.2	4900	3.7	no	-0.7
289	22000	4.3	0.8	19000	4.3	no	1.7
290	1.2E+4	4.1	-0.2	6.7E+3	3.8	No	-0.2
310				11900	4.1	no	0.8
316	12000	4.1	-0.2	5200	3.7	no	-0.6

z-scores outside |z| >2 are shown in **bold,** see Section 5
* samples analysed outside of the required time frame

Table 8: Results and z-Scores for Enumeration of Coliforms / *Escherichia coli* in Pet Food

laboratory number	proficiency test							
	Coliforms assigned value: 3.79 log_{10} cfu/g				*Escherichia coli* assigned value: 3.47 log_{10} cfu/g			
	result	log_{10}	MPN method (yes/no)	z-score	result	log_{10}	MPN method (yes/no)	z-score
003	6.0E+3	3.8	YES	0.0	3.5E+3	3.5	YES	0.3
005								
008	7.6E+3	3.9	yes	0.4	3.2E+3	3.5	yes	0.1
014								
024					3700	3.6	no	0.4
025	17000	4.2	yes	1.8	4500	3.7	yes	0.7
040	7.5E+3	3.9	NO	0.3	5.0E+3	3.7	NO	0.9
050								
054	5.5E+3	3.7	NO	-0.2	2.7E+3	3.4	NO	-0.2
057	8764	3.9	yes	0.6	2291	3.4	yes	-0.4
068								
105								
122	8000	3.9	No	0.5	3000	3.5	No	0.0
125								
129	8.5E+3	3.9	no	0.6	3.5E+3	3.5	no	0.3
133	5591	3.7	yes	-0.2	1564	3.2	yes	-1.1
137	9100	4.0	no	0.7	2200	3.3	no	-0.5
140	7.7E+3	3.9	N	0.4	3.4E+3	3.5	N	0.2
147	7.5E+2	2.9	NO	**-3.7**	6.2E+2	2.8	NO	**-2.7**
148	4950	3.7	no	-0.4	4600	3.7	no	0.8
171								
272	3900	3.6	No	-0.8	1900	3.3	No	-0.8
281	4200	3.6	yes	-0.7	4200	3.6	yes	0.6
289					detected		yes	
290	5.5E+3	3.7	No	-0.2	2.8E+3	3.4	No	-0.1
310	4400	3.6	no	-0.6	3200	3.5	no	0.1
316	5000	3.7	no	-0.4	2200	3.3	no	-0.5

z-scores outside |z| >2 are shown in **bold,** see Section 5
* samples analysed outside of the required time frame

Table 9: Results and Assessments for *Listeria monocytogenes* / *Listeria* spp. in Mixed Vegetables

laboratory number	proficiency test					
	Listeria monocytogenes TMA consensus: 95% detected (positive) (intended result: detected) TMB consensus: 98% not detected (negative) (intended result: not detected)			*Listeria* spp. TMA consensus: 90% detected (positive) (intended result: detected) TMB consensus: 97% not detected (negative) (intended result: not detected)		
	result, TMA	result, TMB	assessment	result, TMA	result, TMB	assessment
023	detected	not detected	S			
028	detected	not detected	S			
036				detected	not detected	S
061	detected	not detected	S			
094	detected	not detected	S	detected	not detected	S
103	detected	not detected	S	detected	not detected	S
105	detected	not detected	S	detected	not detected	S
107	detected	not detected	S	detected	not detected	S
111	detected	not detected	S	detected	not detected	S
114	detected	not detected	S	not detected	not detected	NS
116	detected	not detected	S	detected	not detected	S
117	detected	not detected	S	detected	not detected	S
118	detected	not detected	S			
131	detected	not detected	S			
134	detected	not detected	S			
163	detected	not detected	S			
175	detected	not detected	S	detected	not detected	S
185	detected	not detected	S	detected	not detected	S
191	detected	not detected	S	detected	not detected	S
207	detected	not detected	S	detected	not detected	S
210	detected *	not detected *	S	detected *	not detected *	S
211	detected	not detected	S	detected	not detected	S
212	detected	not detected	S			

S = satisfactory
NS = not satisfactory
* samples analysed outside of the required time frame

Table 9 (continued): Results and Assessments for *Listeria monocytogenes* / *Listeria* spp. in Mixed Vegetables

laboratory number	proficiency test					
	Listeria monocytogenes TMA consensus: 95% detected (positive) (intended result: detected) TMB consensus: 98% not detected (negative) (intended result: not detected)			*Listeria* spp. TMA consensus: 90% detected (positive) (intended result: detected) TMB consensus: 97% not detected (negative) (intended result: not detected)		
	result, TMA	result, TMB	assessment	result, TMA	result, TMB	assessment
213	detected	not detected	S			
219	detected	not detected	S	detected	not detected	S
227	detected	not detected	S	detected	not detected	S
233	detected	not detected	S	detected	not detected	S
235	detected	not detected	S			
243	detected	not detected	S			
245	detected *	not detected *	S	detected *	not detected *	S
247	detected	not detected	S			
249	detected	not detected	S	detected	not detected	S
252	detected	not detected	S	detected	not detected	S
253	detected	not detected	S			
260	detected	not detected	S			
274	detected *	not detected *	S	detected *	not detected *	S
285	detected	not detected	S	detected	not detected	S
293	detected	not detected	S	detected	not detected	S
296	detected	not detected	S	detected	not detected	S
297	detected	not detected	S	detected	not detected	S
302	detected	not detected	S	detected	not detected	S
309	not detected *	detected *	NS	not detected *	detected *	NS
315	detected *	not detected *	S	detected *	not detected *	S
317	detected	not detected	S	detected	not detected	S
322	not detected	not detected	NS	not detected	not detected	NS

S = satisfactory
NS = not satisfactory
* samples analysed outside of the required time frame

Table 10: Results and Assessments for *Salmonella* spp. in Chicken

laboratory number	proficiency test		
	Salmonella spp. TMA consensus: 99% not detected (negative) (intended result: not detected) TMB consensus: 100% detected (positive) (intended result: detected)		
	result, TMA	result, TMB	assessment
002	not detected	detected	S
004	not detected	detected	S
013	not detected	detected	S
027	not detected	detected	S
030	not detected	detected	S
032	not detected	detected	S
033	not detected	detected	S
037	not detected *	detected *	S
042	not detected	detected	S
046	not detected	detected	S
059	not detected	detected	S
073	not detected	detected	S
079	not detected	detected	S
080	not detected	detected	S
087	not detected	detected	S
088	not detected	detected	S
089	not detected *	detected *	S
091	not detected	detected	S
093	not detected	detected	S

S = satisfactory
NS = not satisfactory
* samples analysed outside of the required time frame

Table 10 (continued): Results and Assessments for *Salmonella* spp. in Chicken

laboratory number	proficiency test		
	Salmonella spp. TMA consensus: 99% not detected (negative) (intended result: not detected) TMB consensus: 100% detected (positive) (intended result: detected)		
	result, TMA	result, TMB	assessment
096	not detected	detected	S
098	not detected	detected	S
099	not detected	detected	S
102	not detected	detected	S
104	not detected	detected	S
109	not detected	detected	S
116	not detected	detected	S
121	not detected	detected	S
123	not detected	detected	S
126	not detected	detected	S
127	not detected	detected	S
135	not detected	detected	S
136	not detected	detected	S
139	not detected	detected	S
141	not detected	detected	S
142	not detected	detected	S
145	not detected	detected	S
149	not detected	detected	S
169	not detected	detected	S
172	not detected	detected	S

S = satisfactory
NS = not satisfactory
* samples analysed outside of the required time frame

Table 10 (continued): Results and Assessments for *Salmonella* spp. in Chicken

laboratory number	proficiency test		
	Salmonella spp. TMA consensus: 99% not detected (negative) (intended result: not detected) TMB consensus: 100% detected (positive) (intended result: detected)		
	result, TMA	result, TMB	assessment
175	not detected	detected	S
181	not detected *	detected *	S
182	not detected	detected	S
186	not detected	detected	S
187	not detected	detected	S
188	not detected	detected	S
197	not detected *	detected *	S
198	not detected *	detected *	S
199	not detected	detected	S
200	not detected	detected	S
201	not detected	detected	S
202	not detected	detected	S
216	not detected	detected	S
220	not detected	detected	S
222	not detected	detected	S
236	not detected	detected	S
240	not detected *	detected *	S
241	not detected *	detected *	S
242	not detected *	detected *	S
244	not detected	detected	S

S = satisfactory
NS = not satisfactory
* samples analysed outside of the required time frame

Table 10 (continued): Results and Assessments for *Salmonella* spp. in Chicken

laboratory number	proficiency test		
	Salmonella spp. TMA consensus: 99% not detected (negative) (intended result: not detected) TMB consensus: 100% detected (positive) (intended result: detected)		
	result, TMA	result, TMB	assessment
249	not detected	detected	S
255	not detected	detected	S
261	not detected *	detected *	S
263	not detected	detected	S
265	not detected	detected	S
266	not detected	detected	S
269	not detected *	detected *	S
275	not detected	detected	S
277	detected	detected	NS
280	not detected	detected	S
282	not detected	detected	S
283	not detected	detected	S
284	not detected	detected	S
308	not detected *	detected *	S
311	not detected	detected	S
313	not detected	detected	S
323	not detected *	detected *	S

S = satisfactory
NS = not satisfactory
* samples analysed outside of the required time frame

Table 11: Results and Assessments for *Salmonella* spp. in Milk Powder

laboratory number	proficiency test		
	Salmonella spp. TMA consensus: 100% not detected (negative) (intended result: not detected) TMB consensus: 90% detected (positive) (intended result: detected)		
	result, TMA	result, TMB	assessment
009	not detected	detected	S
011	not detected	detected	S
015	not detected	detected	S
016	not detected	not detected	NS
019	not detected	detected	S
020	not detected	detected	S
031	not detected	detected	S
034	not detected	detected	S
039	not detected	detected	S
048	not detected	detected	S
052	not detected	detected	S
055	not detected	detected	S
065	not detected	detected	S
066	not detected	detected	S
075	not detected	detected	S
077	not detected	detected	S
083	not detected	detected	S
090	not detected	detected	S
124	not detected	detected	S
125	not detected	detected	S
129	not detected	detected	S

S = satisfactory
NS = not satisfactory
* samples analysed outside of the required time frame

Table 11 (continued): Results and Assessments for *Salmonella* spp. in Milk Powder

laboratory number	proficiency test		
	Salmonella spp. TMA consensus: 100% not detected (negative) (intended result: not detected) TMB consensus: 90% detected (positive) (intended result: detected)		
	result, TMA	result, TMB	assessment
146	not detected	not detected	NS
150	not detected	detected	S
154	not detected	detected	S
155	not detected	detected	S
174	not detected	not detected	NS
178	not detected	detected	S
180	not detected	detected	S
206	not detected	detected	S
221	not detected	detected	S
228	not detected	detected	S
232	not detected	detected	S
234	not detected *	detected *	S
248	not detected	detected	S
251	not detected	not detected	NS
254	not detected	detected	S
262	not detected *	detected *	S
265	not detected	detected	S
288	not detected *	detected *	S
295	not detected *	detected *	S
301	not detected *	detected *	S
307	not detected	detected	S

S = satisfactory
NS = not satisfactory
* samples analysed outside of the required time frame

Table 12: Results and Assessments for *Escherichia coli* O157:H7 in Cheese

laboratory number	proficiency test		
	Escherichia coli O157:H7 TMA consensus: 100% not detected (negative) (intended result: not detected) TMB consensus: 89% detected (positive) (intended result: detected)		
	result, TMA	result, TMB	assessment
040	not detected	detected	S
044	not detected	detected	S
045	not detected	detected	S
113	not detected	detected	S
128	not detected	detected	S
161	not detected	detected	S
174	not detected	not detected	NS
184	not detected	detected	S
292	not detected	detected	S

S = satisfactory
NS = not satisfactory
* samples analysed outside of the required time frame

Table 13: Assigned Values and Standard Deviations for Proficiency

Proficiency test in enumeration	data points, *n*	assigned value, x_a	unit	uncertainty, *u*	standard deviation for proficiency, σ_p	
Aciduric Bacteria in Soft Drink	3	*1.48*	$\log_{10}$ cfu/ml	n/a	ffp	0.250
Yeasts in Soft Drink	8	1.74	$\log_{10}$ cfu/ml	0.03	ffp	0.250
Moulds in Soft Drink	8	1.46	$\log_{10}$ cfu/ml	0.08	ffp	0.250
Lactic Acid Bacteria in Beef	31	3.95	$\log_{10}$ cfu/g	0.03	ffp	0.250
Listeria monocytogenes in Smoked Fish	32	3.41	$\log_{10}$ cfu/g	0.04	ffp	0.250
Clostridium perfringens in Beef	28	3.71	$\log_{10}$ cfu/g	0.03	ffp	0.250
Clostridium spp. in Beef	12	3.74	$\log_{10}$ cfu/g	0.04	ffp	0.250
Sulphite Reducing Clostridia (SRC) in Beef	18	3.77	$\log_{10}$ cfu/g	0.02	ffp	0.250
Bacillus cereus in Cooked Rice	54	5.19	$\log_{10}$ cfu/g	0.02	ffp	0.250
Aerobic Plate Count in Fruit Juice	27	3.87	$\log_{10}$ cfu/ml	0.03	ffp	0.250
Lactic Acid Bacteria in Fruit Juice	18	3.77	$\log_{10}$ cfu/ml	0.02	ffp	0.250
Aerobic Plate Count in Pet Food	23	4.14	$\log_{10}$ cfu/g	0.04	ffp	0.250
Enterobacteriaceae in Pet Food	24	3.86	$\log_{10}$ cfu/g	0.04	ffp	0.250
Coliforms in Pet Food	18	3.79	$\log_{10}$ cfu/g	0.04	ffp	0.250
Escherichia coli in Pet Food	19	3.47	$\log_{10}$ cfu/g	0.04	ffp	0.250

ffp = fitness-for-purpose criteria
italics indicate for information only
n/a - not applicable

Table 14: Number and Percentage of z-Scores where |z| ≤2

Proficiency test in enumeration	number of scores where |z| ≤2	total number of scores	% |z|≤2
Aciduric Bacteria in Soft Drink	*3*	3	*100*
Yeasts in Soft Drink	8	8	100
Moulds in Soft Drink	6	8	75
Lactic Acid Bacteria in Beef	28	32	88
Listeria monocytogenes in Smoked Fish	30	32	94
Clostridium perfringens in Beef	28	28	100
Clostridium spp. in Beef	10	12	83
Sulphite Reducing Clostridia (SRC) in Beef	17	18	94
Bacillus cereus in Cooked Rice	50	57	88
Aerobic Plate Count in Fruit Juice	25	27	93
Lactic Acid Bacteria in Fruit Juice	18	19	95
Aerobic Plate Count in Pet Food	21	23	91
Enterobacteriaceae in Pet Food	23	25	92
Coliforms in Pet Food	17	18	94
Escherichia coli in Pet Food	18	19	95

italics indicate for information only

Table 15: Intended Results for Proficiency Tests in Detection

Proficiency test in detection	test material A	test material B
Listeria monocytogenes in Mixed Vegetables	detected	not detected
Listeria spp. in Mixed Vegetables	detected	not detected
Salmonella spp. in Chicken	not detected	detected
Salmonella spp. in Milk Powder	not detected	detected
Escherichia coli O157:H7 in Cheese	not detected	detected

Table 16: Number and Percentage of Satisfactory Assessments and False Results for Proficiency Tests in Detection

Proficiency test in detection	intended result	number of satisfactory assessments	total number of assessments	satisfactory / agreement with intended result, %	false negatives, %	false positives, %
Listeria monocytogenes in Mixed Vegetables	test material A detected test material B not detected	42	44	95	5	2
Listeria spp. in Mixed Vegetables	test material A detected test material B not detected	28	31	90	10	3
Salmonella spp. in Chicken	test material A not detected test material B detected	75	76	99	0	1
Salmonella spp. in Milk Powder	test material A not detected test material B detected	38	42	90	10	0
Escherichia coli O157:H7 in Cheese	test material A not detected test material B detected	8	9	89	11	0

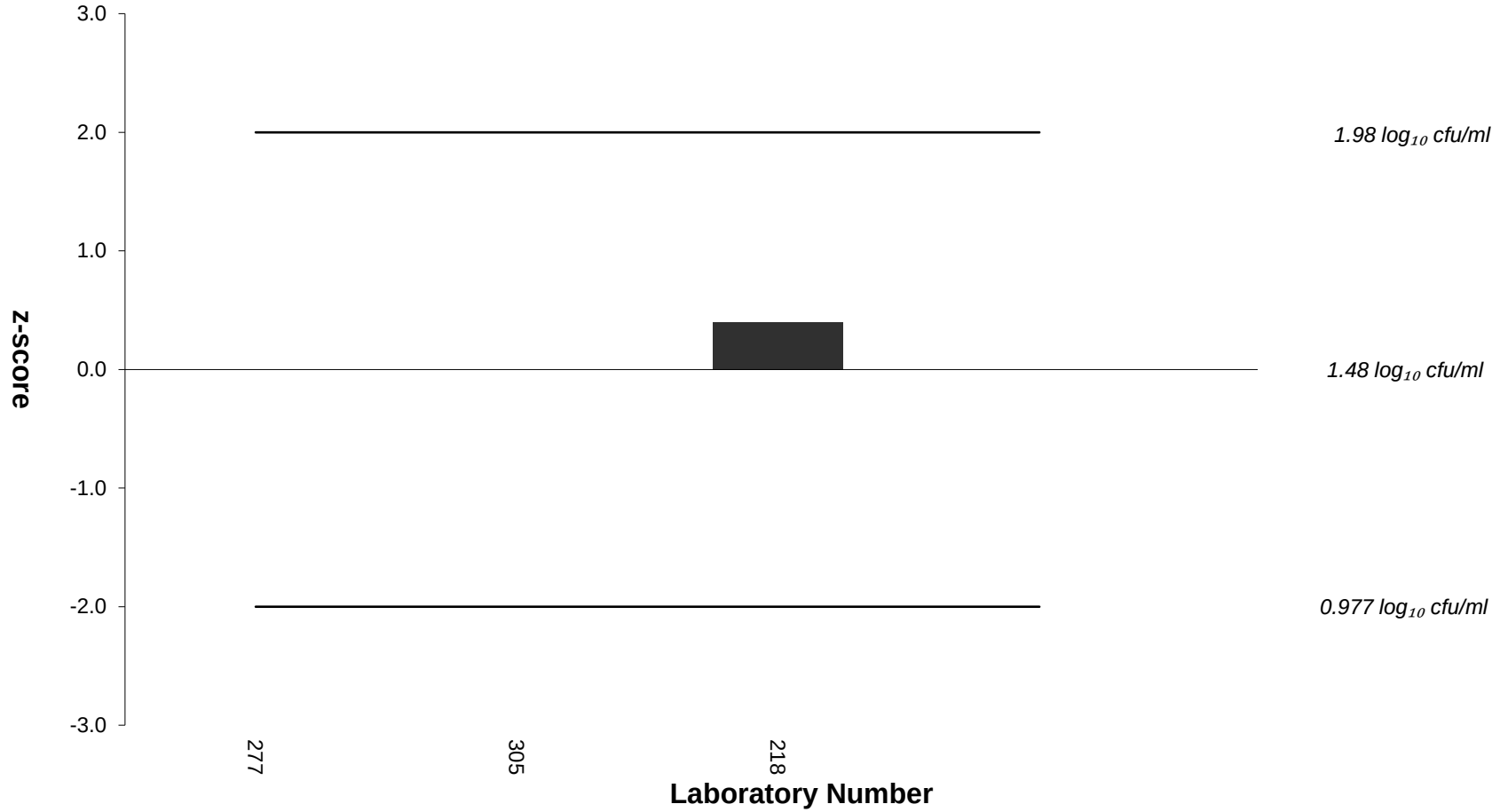

Figure 1: z-Scores for Enumeration of Aciduric Bacteria in Soft Drink

this histogram is given for information only

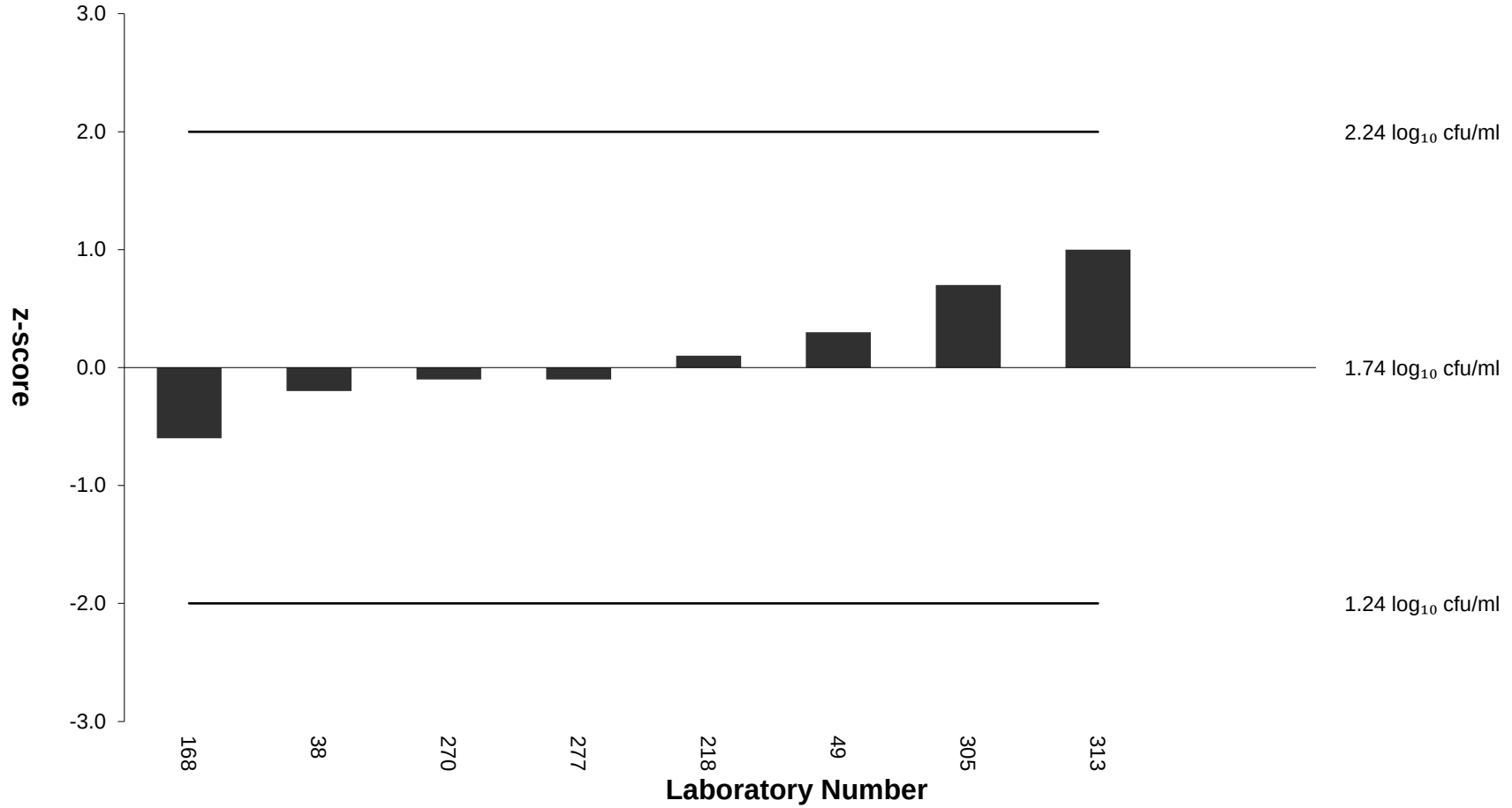

Figure 2: z-Scores for Enumeration of Yeasts in Soft Drink

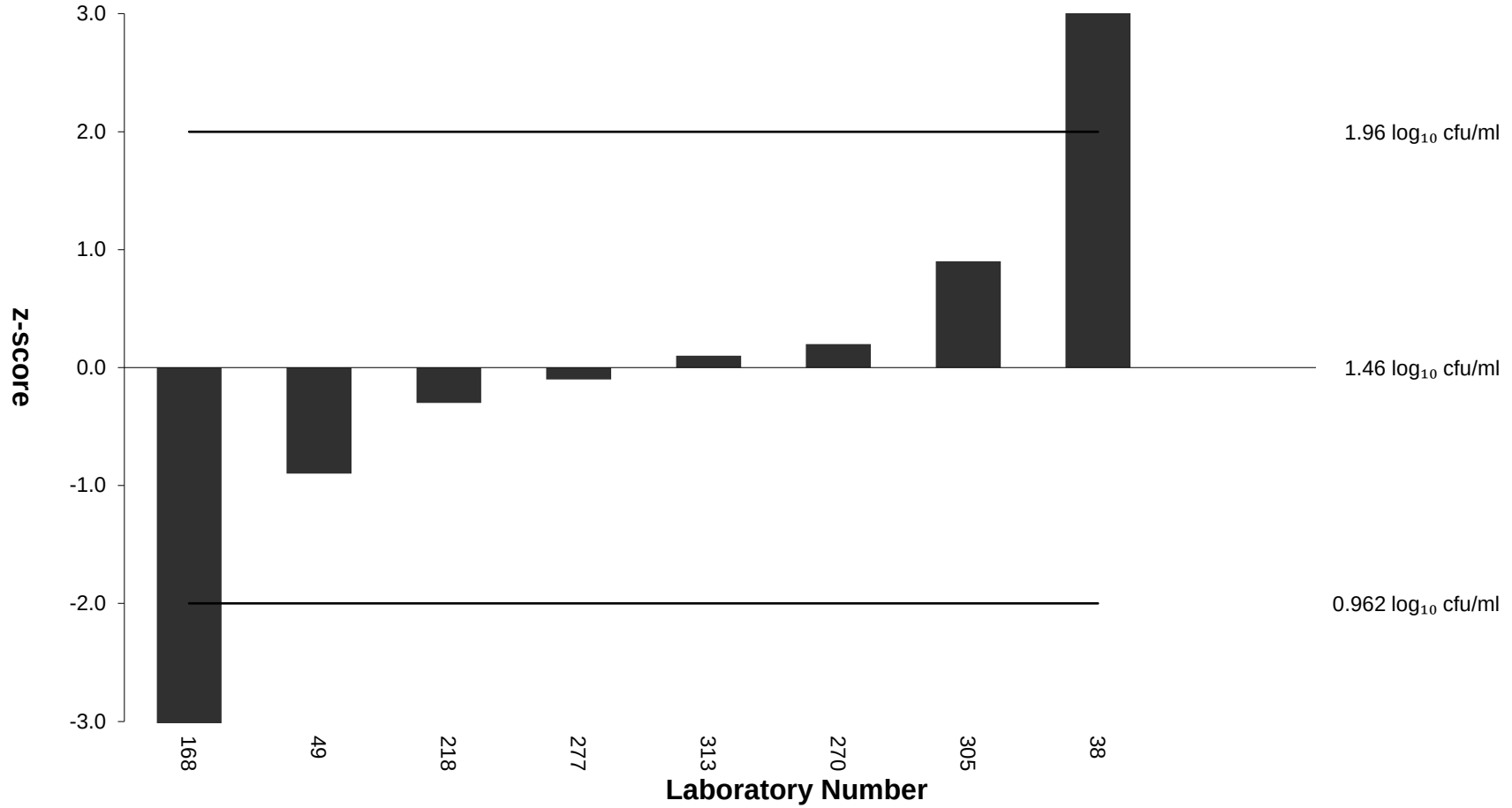

Figure 3: z-Scores for Enumeration of Moulds in Soft Drink

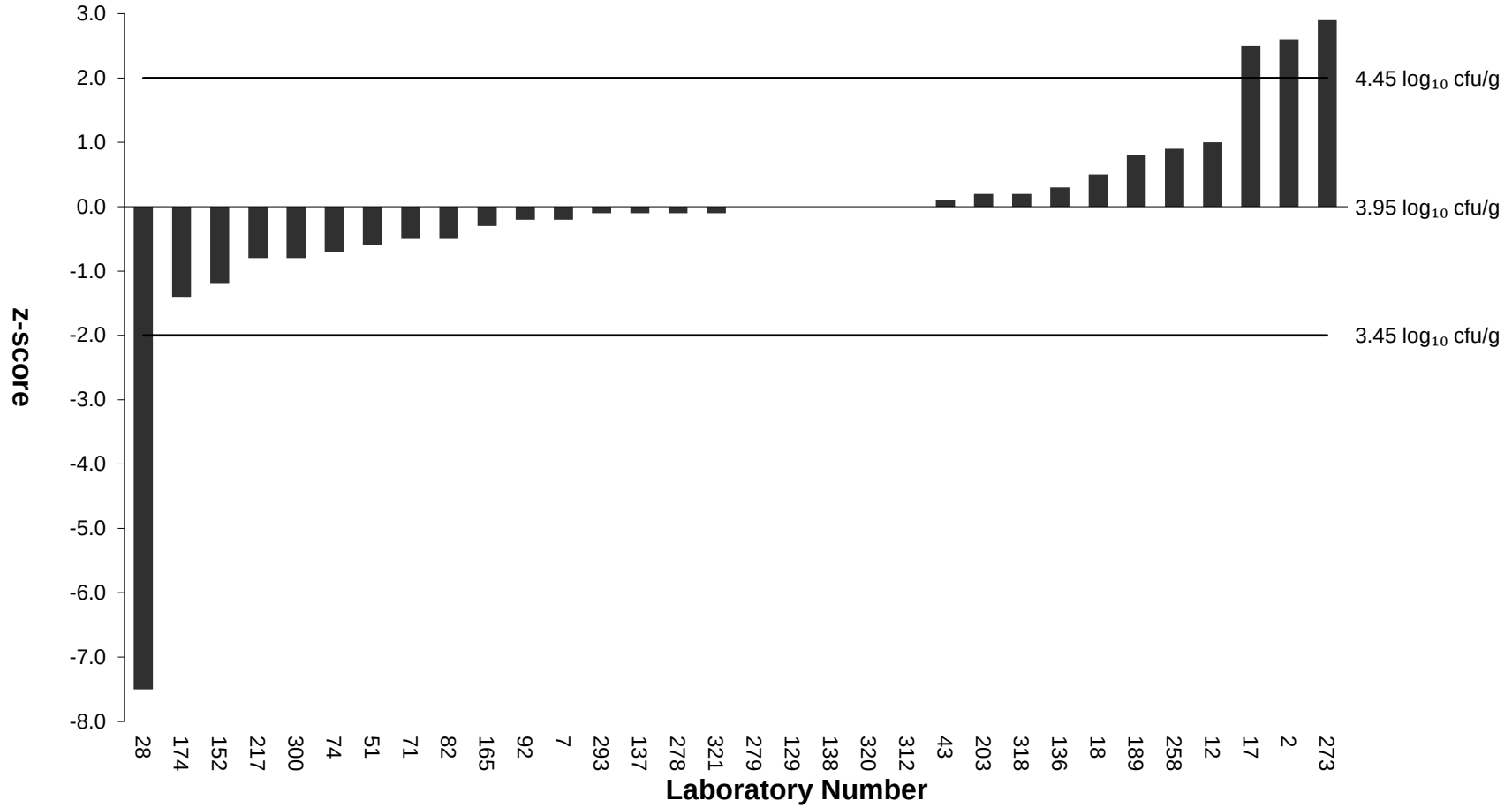

Figure 4: z-Scores for Enumeration of Lactic Acid Bacteria in Beef

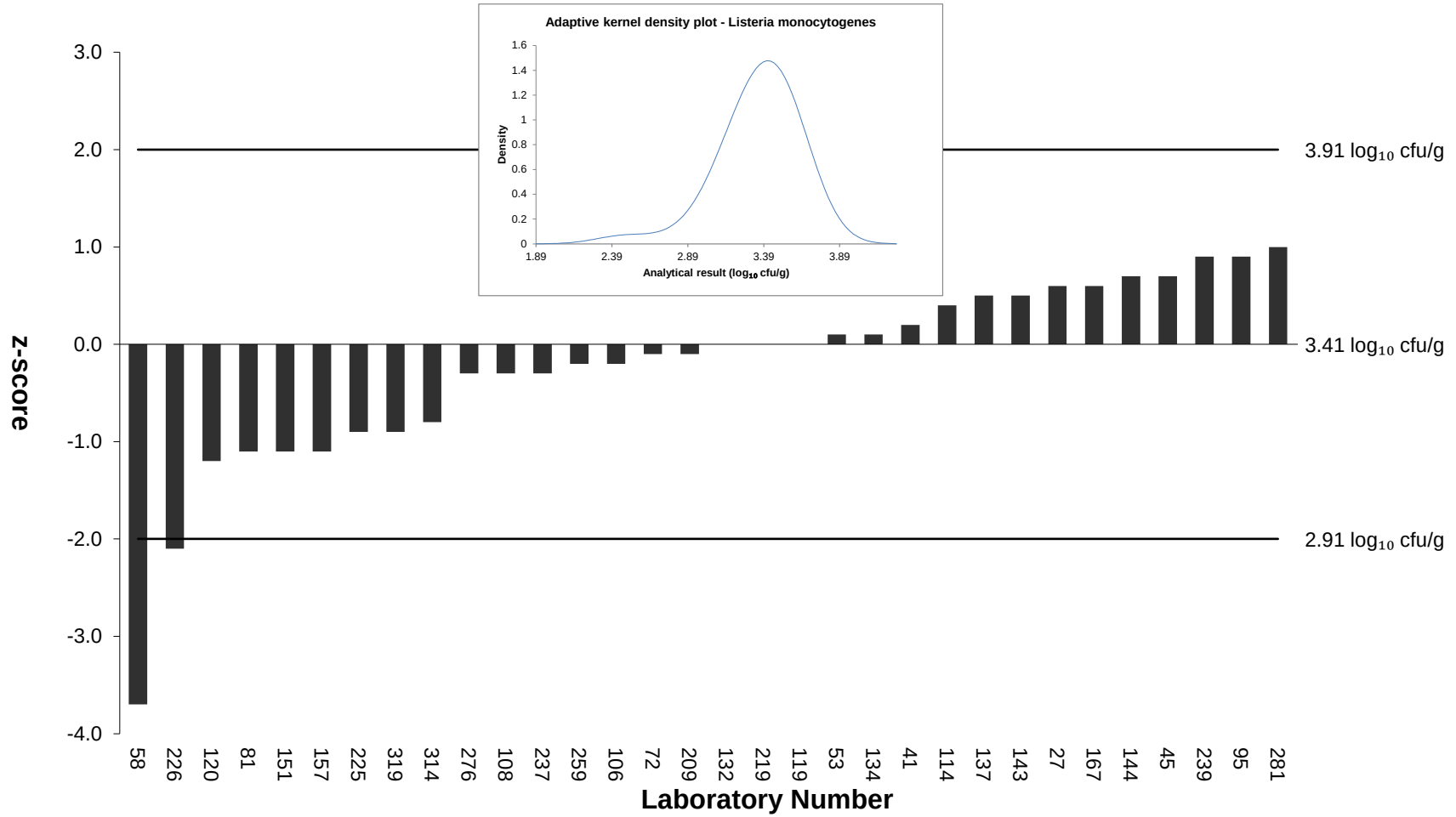

Figure 5: z-Scores for Enumeration of *Listeria monocytogenes* in Smoked Fish

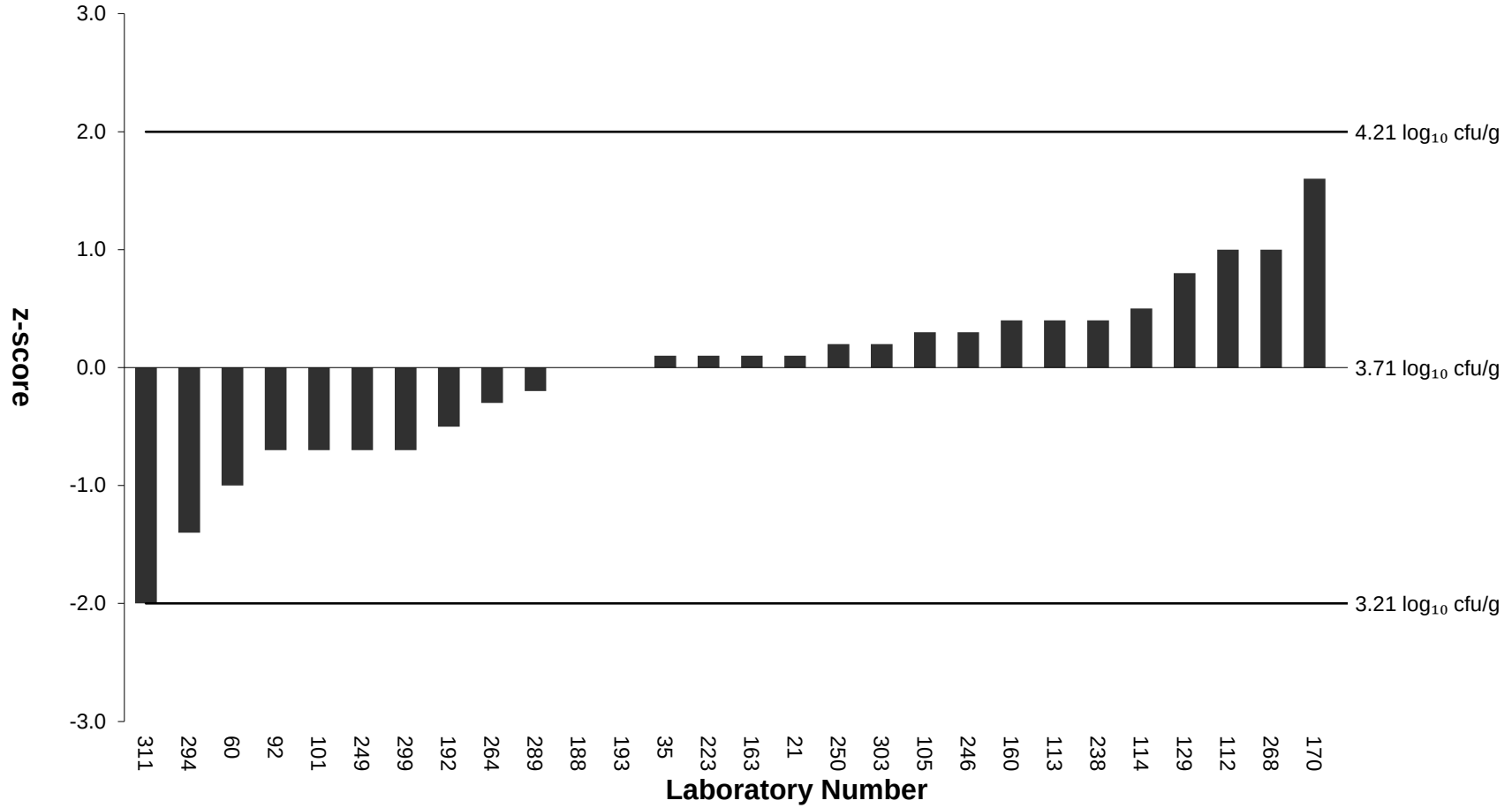

Figure 6: z-Scores for Enumeration of *Clostridium perfringens* in Beef

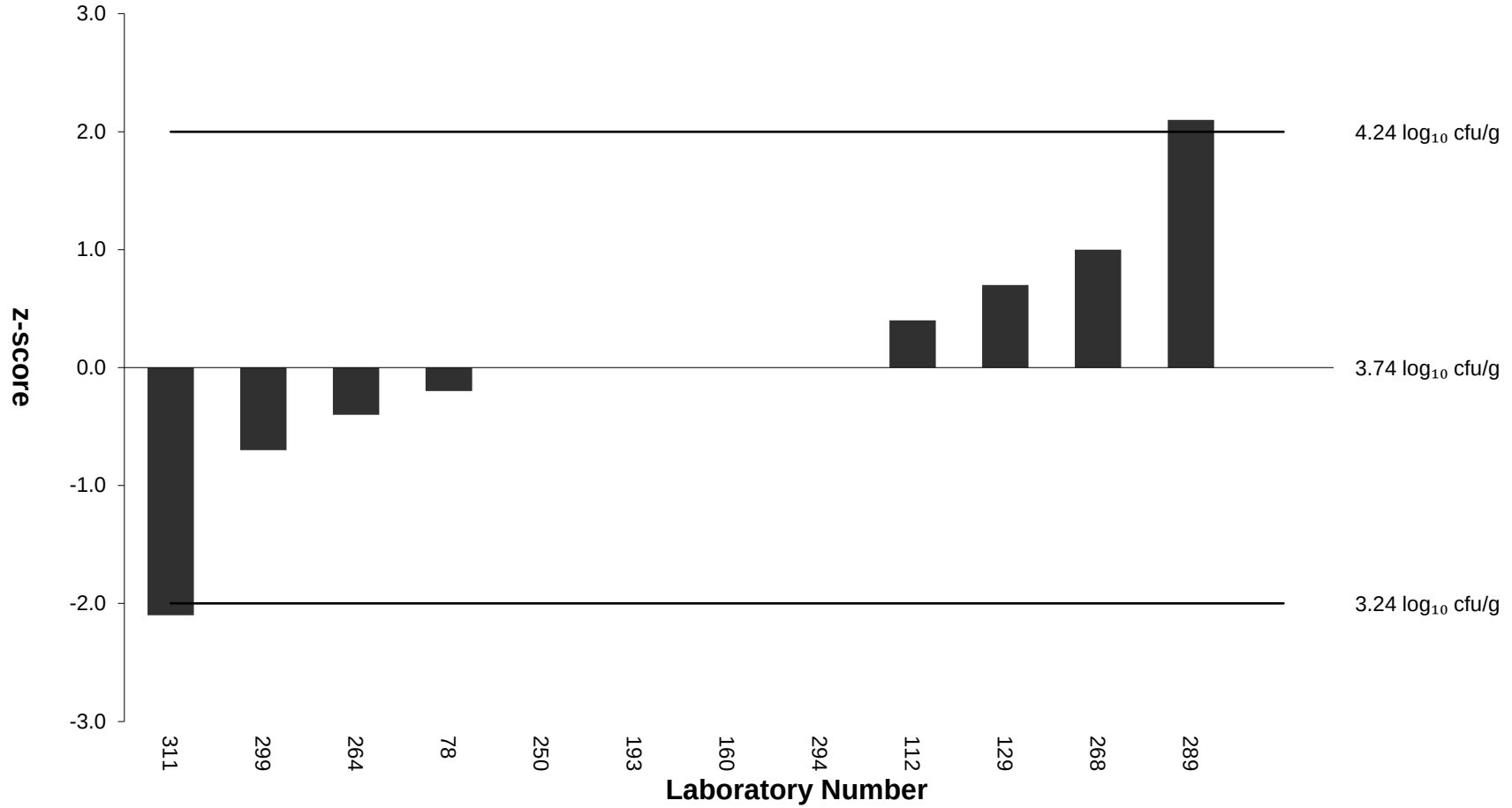

Figure 7: z-Scores for Enumeration of *Clostridium* spp. in Beef

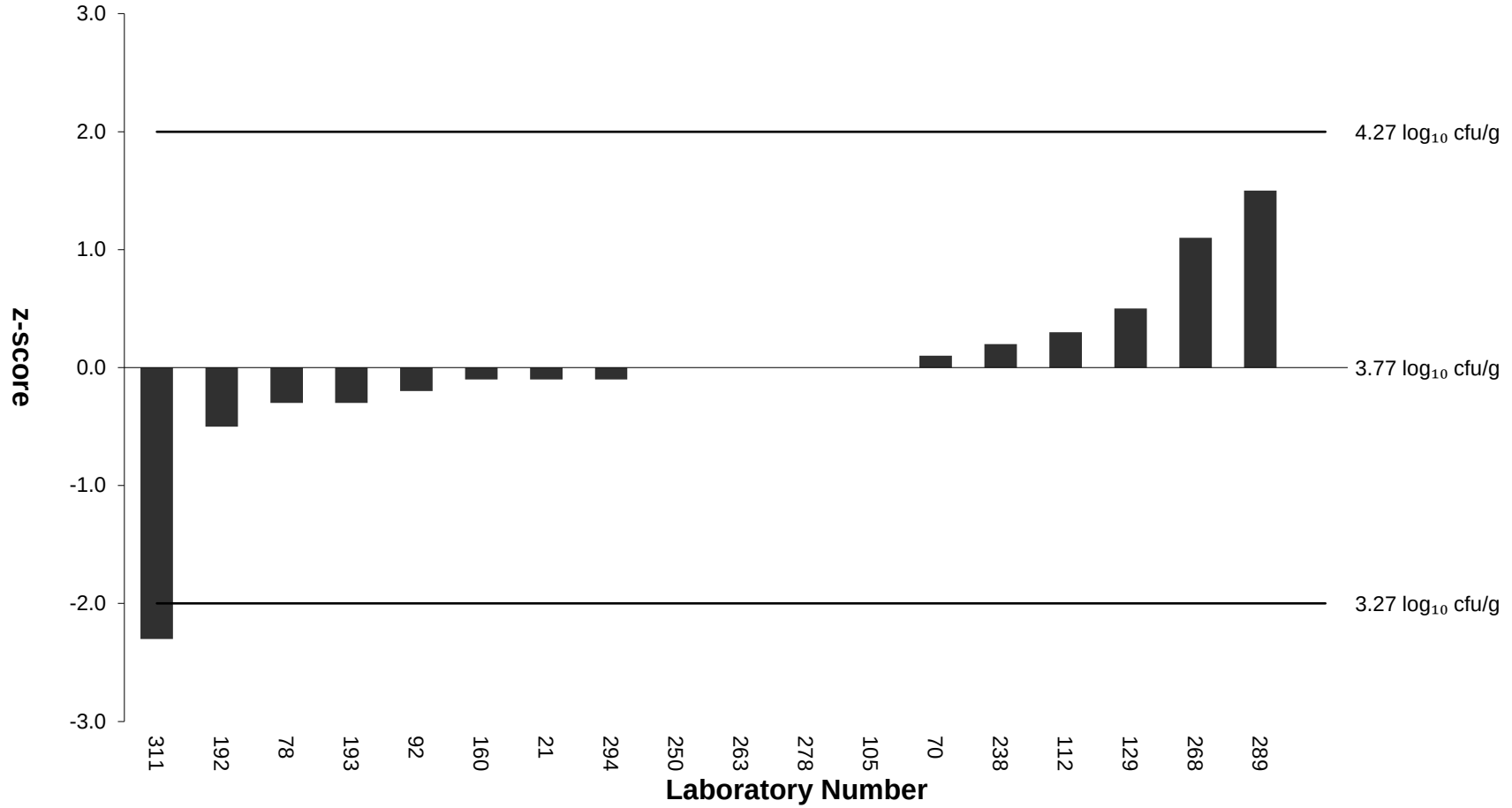

Figure 8: z-Scores for Enumeration of Sulphite Reducing Clostridia (SRC) in Beef

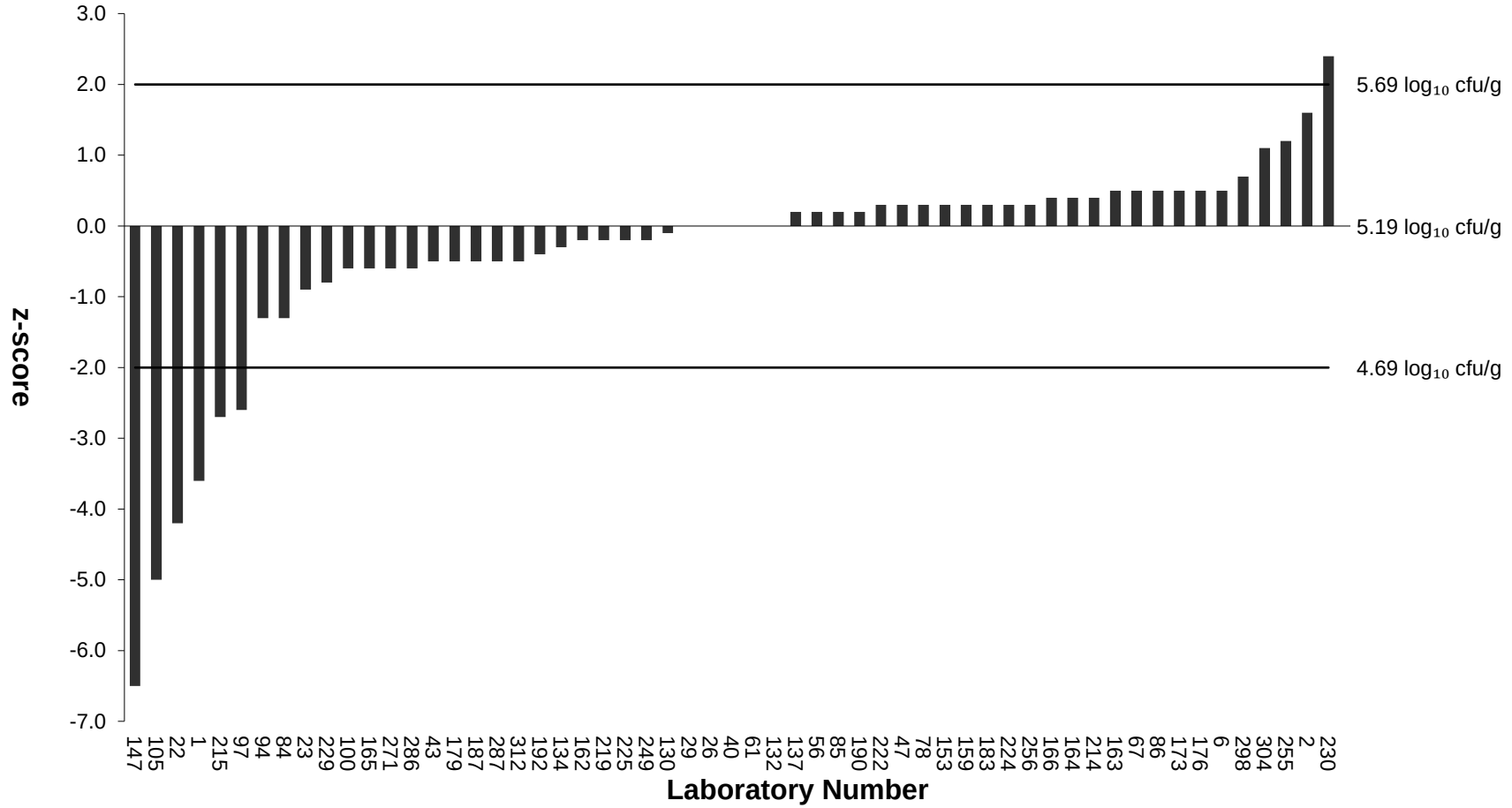

Figure 9: z-Scores for Enumeration of *Bacillus cereus* in Cooked Rice

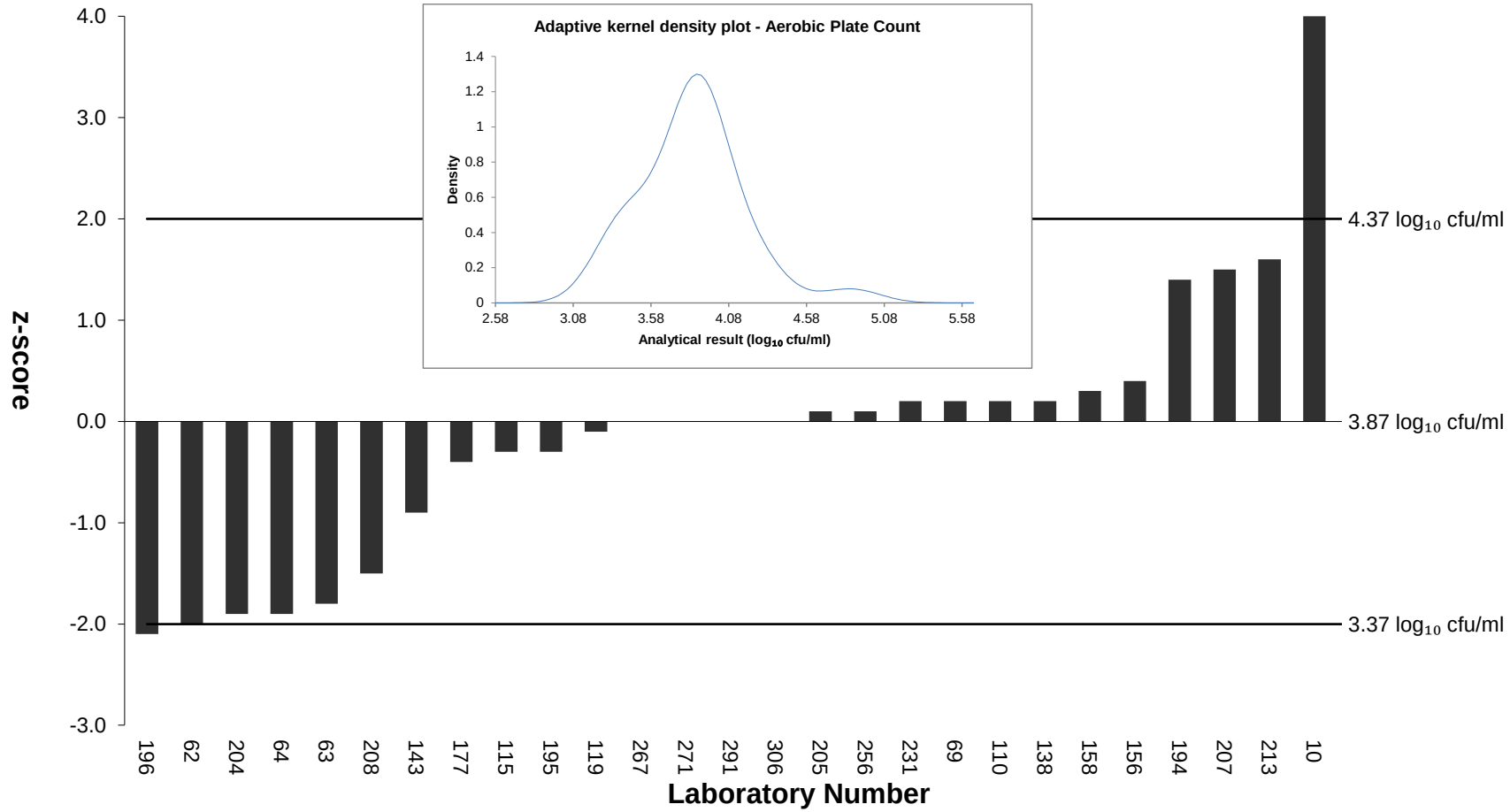

Figure 10: z-Scores for Aerobic Plate Count in Fruit Juice

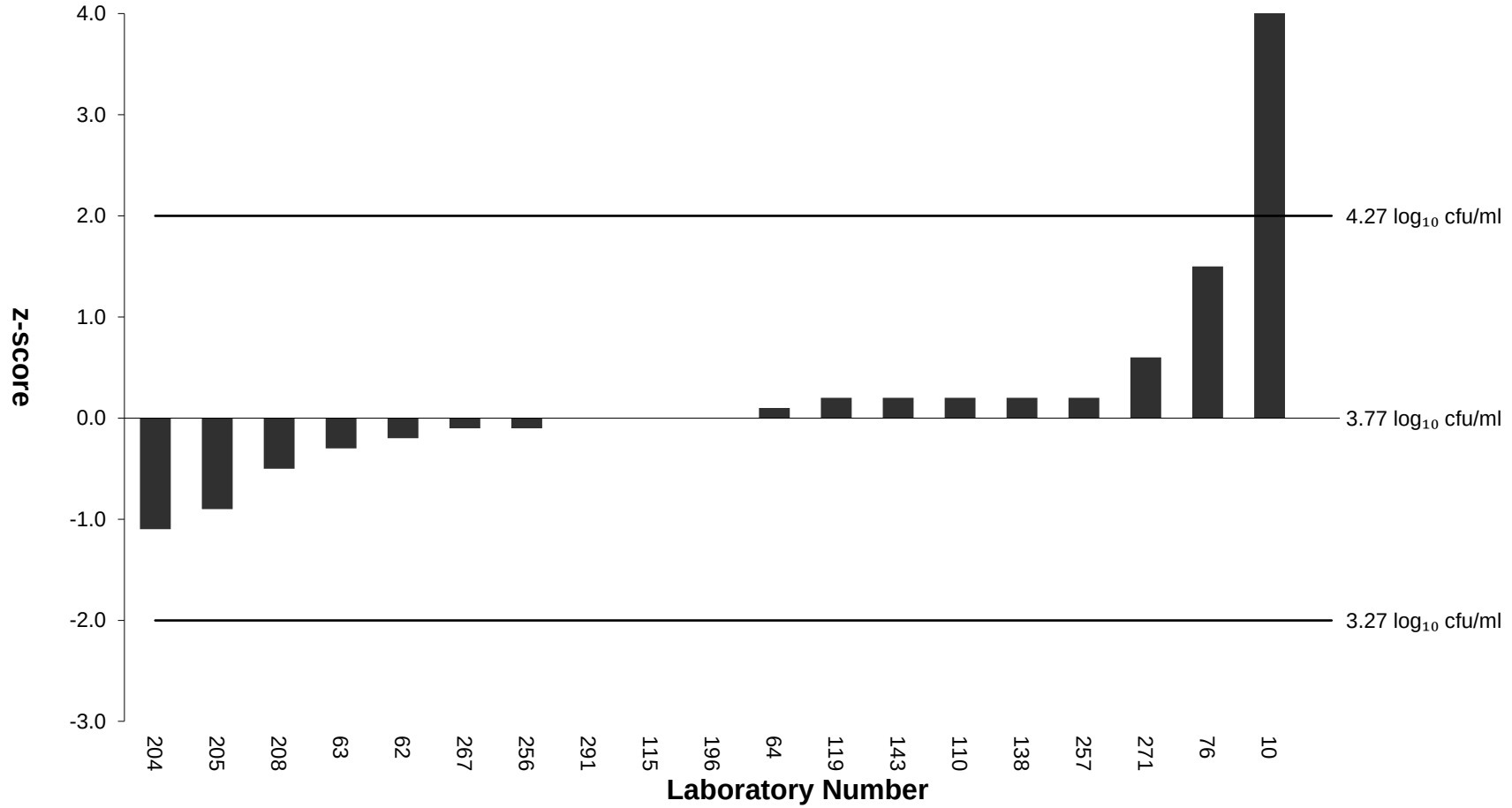

Figure 11: z-Scores for Enumeration of Lactic Acid Bacteria in Fruit Juice

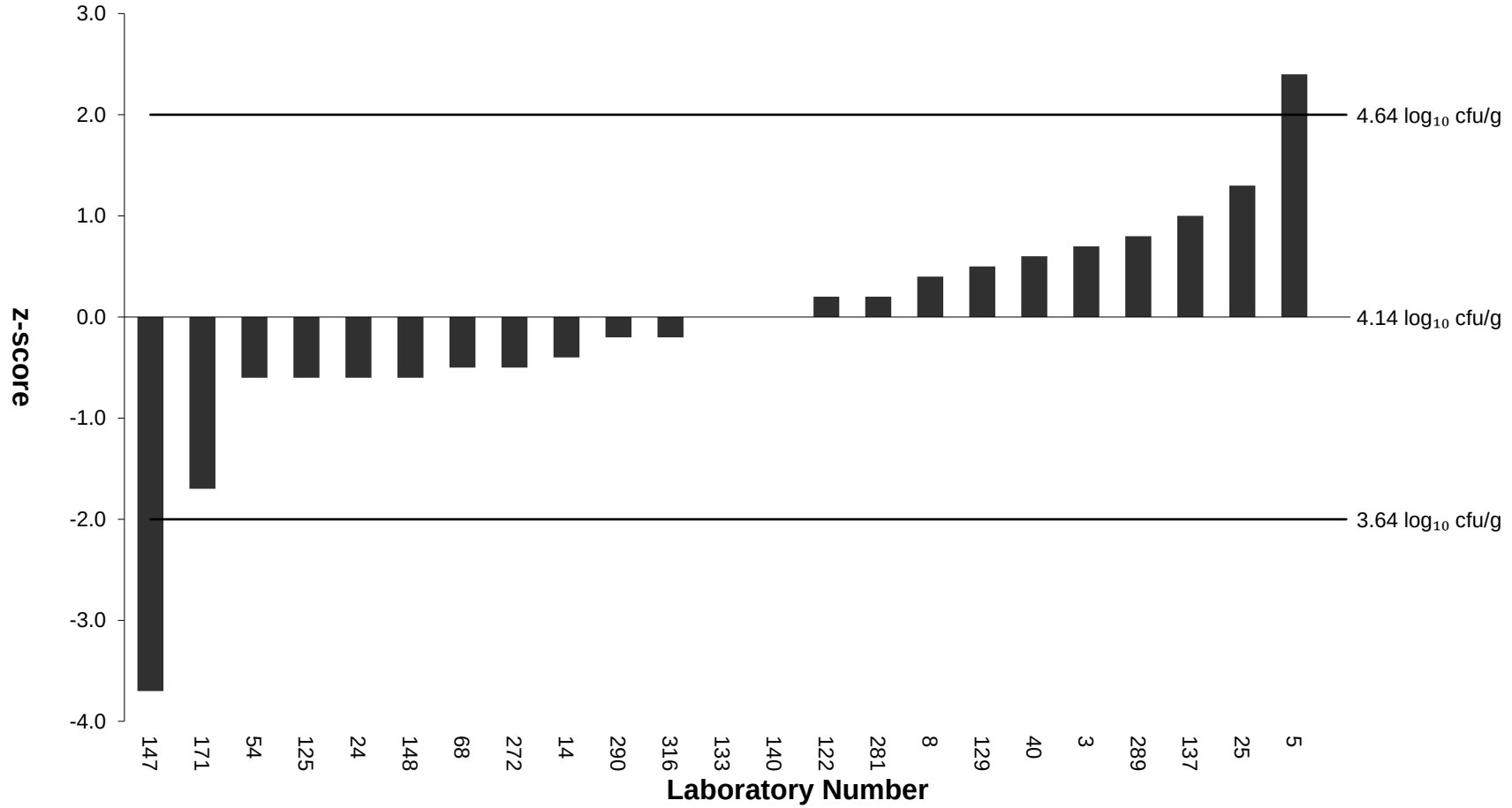

Figure 12: z-Scores for Aerobic Plate Count in Pet Food

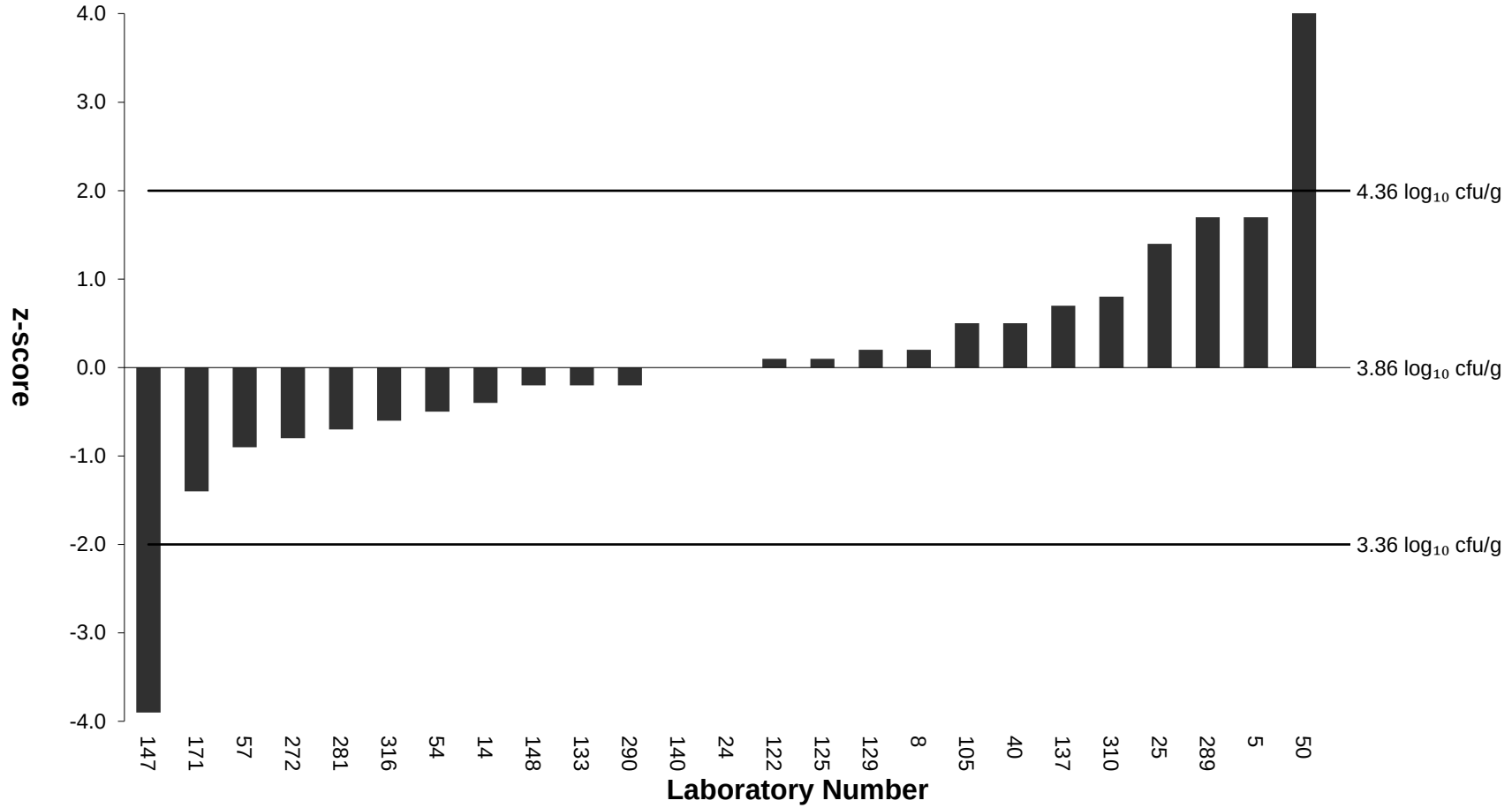

Figure 13: z-Scores for Enumeration of Enterobacteriaceae in Pet Food

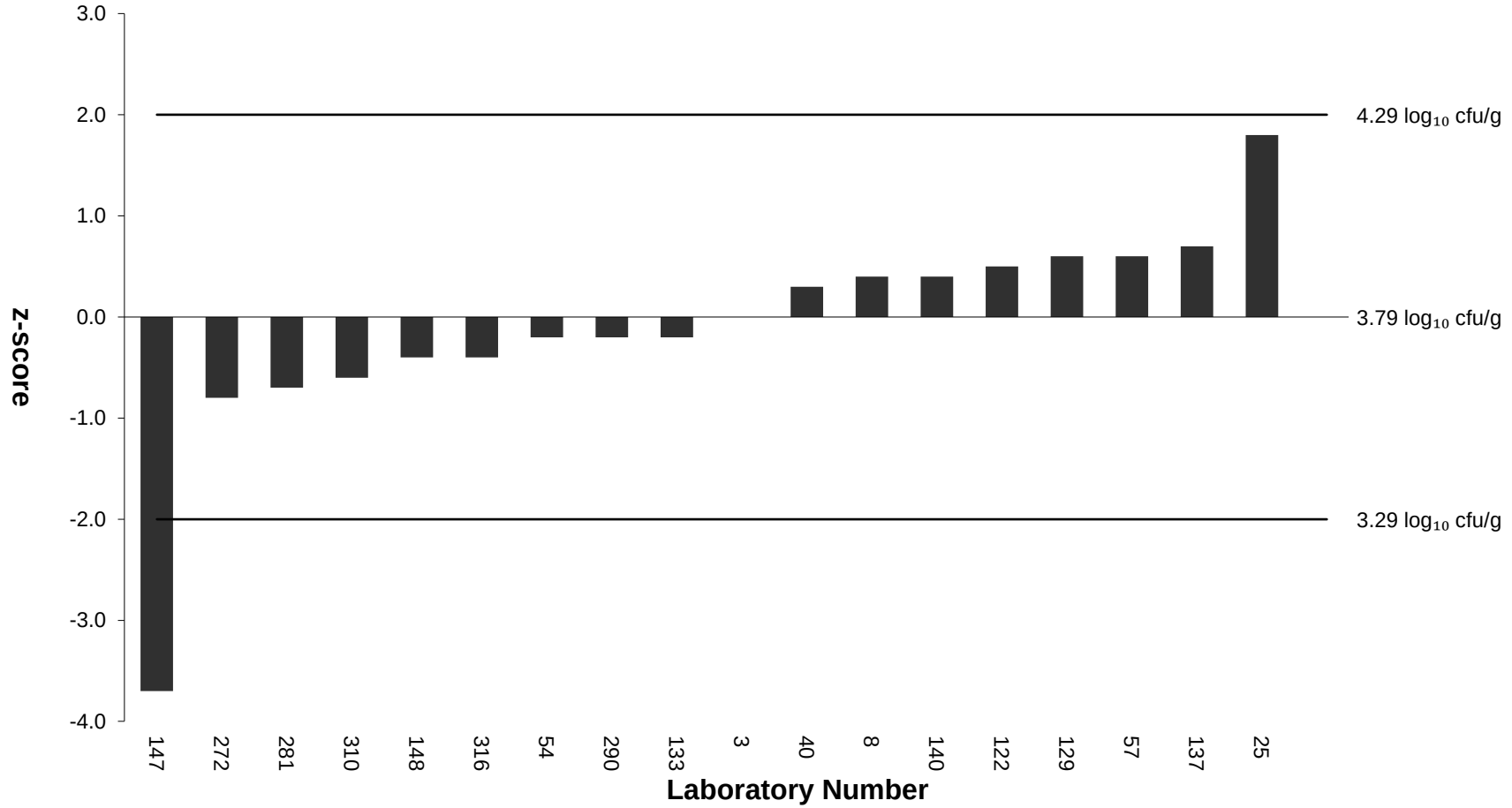

Figure 14: z-Scores for Enumeration of Coliforms in Pet Food

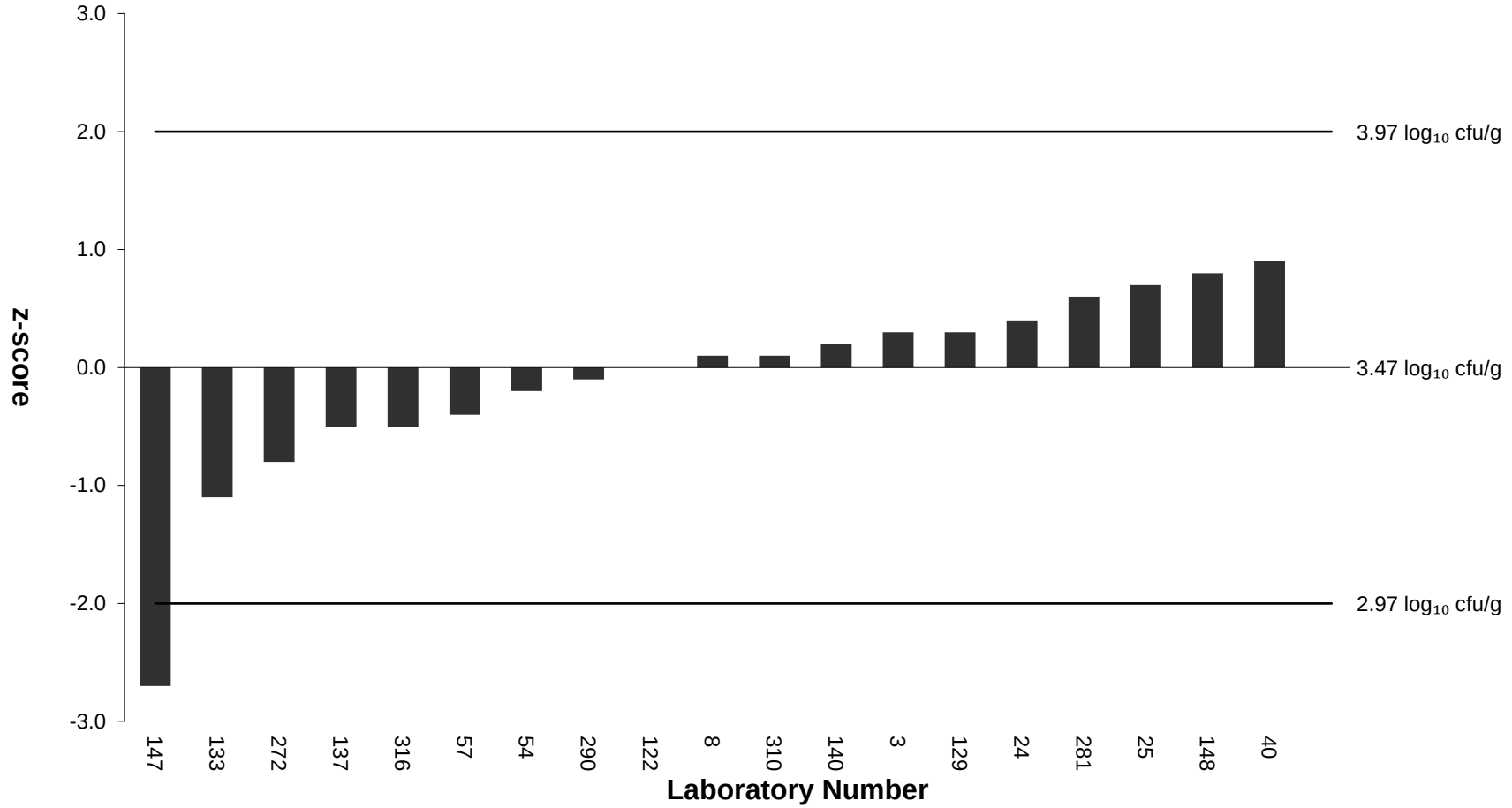

Figure 15: z-Scores for Enumeration of *Escherichia coli* in Pet Food

APPENDIX I: Organisms present in Fapas® – Food Microbiology Test Materials

proficiency test	matrix	target organism	background flora
enumeration of Aciduric Bacteria/ Yeasts, Moulds	Soft Drink	*Lactobacillus plantarum* *Saccharomyces cerevisiae* *Penicillium* spp.	not applicable
enumeration of Lactic Acid Bacteria	Beef	*Lactobacillus plantarum*	*Kocuria rhizophila* *Pseudomonas putida*
enumeration of *Listeria monocytogenes*	Smoked Fish	*Listeria monocytogenes*	*Staphylococcus aureus* *Bacillus cereus*
enumeration of *Clostridium perfringens* / *Clostridium* spp./ Sulphite Reducing Clostridia (SRC)	Beef	*Clostridium perfringens*	*P. putida* *K. rhizophila* *B. cereus*
enumeration of *Bacillus cereus*	Cooked Rice	*B. cereus*	*Bacillus subtilis*
Aerobic Plate Count	Fruit Juice	*L. plantarum* *Bacillus coagulans*	not applicable
Aerobic Plate Count / Enterobacteriaceae / coliforms / *Escherichia coli*	Pet Food	*Escherichia* coli *Klebsiella pneumoniae* *B. cereus*	not applicable
detection of *Listeria monocytogenes* / Listeria spp. test material A	Mixed Vegetables	*L. monocytogenes*	*B. cereus* *S. aureus* *K. rhizophila*
detection of *Listeria monocytogenes* / Listeria spp. test material B	Mixed Vegetables	not applicable	*B. cereus* *S. aureus* *K. rhizophila*
detection of *Salmonella* spp. test material A	Chicken	not applicable	*Citrobacter freundii* *Proteus vulgaris*
detection of *Salmonella* spp. test material B	Chicken	*Salmonella typhimurium*	*S. aureus* *E. coli*
detection of *Salmonella* spp. test material A	Milk Powder	not applicable	*B. coagulans* *L. plantarum* *Pseudomonas aeruginosa*
detection of *Salmonella* spp. test material B	Milk Powder	*Salmonella* Cerro	*B. coagulans* *L. plantarum* *P. aeruginosa*
detection of *Escherichia coli* O157:H7 test material A	Cheese	not applicable	not applicable
detection of *Escherichia coli* O157:H7 test material B	Cheese	*E. coli* O157:H7	not applicable

APPENDIX II: Verification of Positive Qualitative Test Materials

target organism	level of target organism, as assessed by the most probable number technique, MPN/g
Listeria monocytogenes in Mixed Vegetables	7.8 (2.5 to 25*) / 17 (6.3 to 45*)
Salmonella typhimurium in Chicken	13 (4.4 to 37*) / 2.2 (0.86 to 5.4*)
Salmonella Cerro in Milk Powder	1.1 (0.38 to 3*) / 1.3 (0.44 to 3.7*)
Escherichia coli O157:H7 in Cheese	33 (11 to 100*) / 31 (10 to 94*)

*confidence limit at >95%

APPENDIX III: Methods Used by Participants

Methods are tabulated according to the information supplied by participants, but some responses may have been combined or edited for clarity. Text that appears as unreadable symbols are derived from entries made using non-Western characters.

Enumeration of Aciduric Bacteria in Soft Drink

Accredited Method Used	laboratory number
no	218 305
yes	277

Method Based on an International Standard	laboratory number
no	218 305
yes	277

Which Initial Suspension/Diluent Used	laboratory number
Peptone Water	218
Direct	277

Plating Method Used	laboratory number
Pour plate	277
Petrifilm (3M)	218

Inoculum Volume (ml)	laboratory number
1.0	277 305

Which Selective/Chromogenic Medium Used	laboratory number
Acidified PDA (potato dextrose agar)	277
OSA (orange serum agar)	305

Incubation Temperature (°C)	laboratory number
25	277
35	218 305

Time Incubated (hours) Approximately	laboratory number
48	218
120	277 305

Confirmation of Organism's Identity	laboratory number
Morphology	277
Microscopy	277

Enumeration of Yeasts in Soft Drink

Accredited Method Used	laboratory number
no	038 218 305
yes	049 168 277 313

Method Based on an International Standard	laboratory number
no	218 305
yes	038 049 168 277 313

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	313
Peptone Water	218
Phosphate Buffered Saline (PBS)	038 049
Direct	277
Potato Dextrose Agar	168

Plating Method Used	laboratory number
Pour plate	168 277
Spread plate	038 313
Petrifilm (3M)	049 218 277

Inoculum Volume (ml)	laboratory number
0.1	313
1.0	038 049 168 277 305

Which Selective/Chromogenic Medium Used	laboratory number
Dichloran Rose-Bengal Chloramphenicol Agar (DRBC)	313
Petrifilm (3M) Yeasts & Moulds	049 218 277
Potato Dextrose Agar (PDA)	168 277 305

Incubation Temperature (°C)	laboratory number
25	038 049 168 218 277 305 313

Time Incubated (hours) Approximately	laboratory number
120	038 049 168 218 277 305 313

Confirmation of Organism's Identity	laboratory number
Morphology	277
Microscopy	277

Enumeration of Moulds in Soft Drink

Accredited Method Used	laboratory number
no	038 218 305
yes	049 168 277 313

Method Based on an International Standard	laboratory number
no	218 305
yes	038 049 168 277 313

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	313
Peptone Water	218
Phosphate Buffered Saline (PBS)	038 049
Direct	277
Potato Dextrose Agar	168

Plating Method Used	laboratory number
Pour plate	168 277
Spread plate	038 313
Petrifilm (3M)	049 218 277

Inoculum Volume (ml)	laboratory number
0.1	313
1.0	038 049 168 277 305

Which Selective/Chromogenic Medium Used	laboratory number
Dichloran Rose-Bengal Chloramphenicol Agar (DRBC)	313
Petrifilm (3M) Yeasts & Moulds	049 218 277
Potato Dextrose Agar (PDA)	168 277 305

Incubation Temperature (°C)	laboratory number
25	038 049 168 218 277 305 313

Time Incubated (hours) Approximately	laboratory number
72	038
120	049 168 218 277 305 313

Confirmation of Organism's Identity	laboratory number
Morphology	277
Microscopy	277

Enumeration of Lactic Acid Bacteria in Beef

Accredited Method Used	laboratory number
no	018 152 217 312
yes	007 012 017 043 051 071 074 082 129 136 138 165 174 189 203 258 273 278 279 320 321

Method Based on an International Standard	laboratory number
no	018 138 203 258
yes	007 012 017 043 051 071 074 082 129 136 152 165 174 189 217 273 278 279 312 320 321

Which International Standard?	laboratory number
Lactic Acid Bacteria enumeration ISO 15214:1998	012 043 071 074 129 152 174 189 217 278 279 312 320
Health Functional Food code: korea	203
ISO 15214	017
MOHWM0013.01	082
TFDA MOHWM0013.01	165

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	043 074 082 129 189 203 258 278 279 312 320 321
Butterfield's Phosphate Buffer	007
Maximum Recovery Diluent (MRD)	217
Peptone Water	018 051 136 138 165
Ringer's Solution	017 174
Peptone saline solution	012
SALINE SOLUTION	071

Which Primary Enrichment Medium Used	laboratory number
Buffered Peptone Water (BPW)	074 189 203 258 278 279 312 321
MRS agar	082 174

Which Secondary Enrichment Medium Used	laboratory number
0.1% peptone diluent	165
BPW	258
MRS	174

Plating Method Used	laboratory number
Pour plate	012 017 018 051 071 082 129 136 138 165 174 189 203 217 258 278 279 312 320 321
Spread plate	017 043 074
Petrifilm (3M)	007

Inoculum Volume (ml)	laboratory number
0.05	017
0.1	043 074
0.5	017
1.0	007 012 018 051 071 082 129 136 138 165 174 189 203 217 258 278 279 312 320 321

Alternative/Rapid Method	laboratory number
Compact dry	174
MOLDI-TOF	043
Petrifilm (3M)	007 082

Incubation Temperature (°C)	laboratory number
30	012 017 043 071 074 129 136 189 217 278 279 312 320 321
35	007 051 138 165 203
37	018 082 174 258

Time Incubated (hours) Approximately	laboratory number
48	007 017 174 321
72	012 018 043 051 071 074 082 129 136 138 165 189 203 217 258 278 279 312 320

Confirmation of Organism's Identity	laboratory number
API 50 CH	174
Catalase reaction	017 189 217 279 320
Morphology	051 074
Microscopy	312

Which Selective/Chromogenic Medium Used	laboratory number
De Man, Rogosa and Sharpe (MRS) Agar	002 012 017 018 043 051 071 074 082 129 136 137 138 165 189 203 217 279 312 318 320
Rogosa Agar	278

Enumeration of *Listeria monocytogenes* in Smoked Fish

Accredited Method Used	laboratory number
no	072 106 226 239
yes	027 041 045 053 058 081 108 114 120 132 134 143 144 151 157 167 209 219 225 237 259 276 281 319

Method Based on an International Standard	laboratory number
no	106 132 144 151 167 226 239 259 319
yes	027 041 045 053 058 072 081 108 114 120 134 143 157 209 225 237 276 281

Which International Standard?	laboratory number
Listeria monocytogenes enumeration ISO 11290-2:2017	027 041 053 058 072 081 108 114 120 134 143 225 237 281
Chapter 10 Detection of Listeria monocytogenes in foods and environmental samples, and enumeration of Listeria monocytogenes in foods.	157
Health Canada Compendium	045
MOHWM0029.00	209 259 276
NIHSJ-09:2020	144
Official Method of Japanese Ministry of Health, Labour and Welfare	226
TFDA	151
TFDA(MOHWM0029.00)	167

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	027 041 045 053 072 081 106 108 114 120 132 134 143 144 157 225 226 237 239 259 319
Half Fraser Broth	058
BLEB	151
Buffered listeria enrichment broth(BLEB)	276
peptone salt solution	281

Which Primary Enrichment Medium Used	laboratory number
Buffered Peptone Water (BPW)	045 108 132 134 143 226 237 319
Lauryl Tryptose Broth	167
Listeria Enrichment Broth 1 (LEB)	157 225
Buffered listeria enrichment broth	259
MOX	151
None	072

Which Secondary Enrichment Medium Used	laboratory number
Rappaport Vassiliadis Soya Peptone(RVS)	167
0.1% Peptone Broth	045
None	072

Plating Method Used	laboratory number
Pour plate	058
Spread plate	027 041 045 053 072 081 106 108 114 120 132 134 143 144 151 157 167 209 225 226 237 239 259 276 281 319

Inoculum Volume (ml)	laboratory number
0.1	027 053 114 132 134 281
1.0	041 045 072 106 108 120 143 144 151 157 167 209 225 226 237 239 259 276 319
10	058

Alternative/Rapid Method	laboratory number
Compact dry	259
PCR	209
VIDAS (ELFA)	058

Incubation Temperature (°C)	laboratory number
35	151 157 167 209 225 259 276
37	027 041 045 053 058 072 081 106 108 114 120 132 134 143 144 226 237 239 281 319

Time Incubated (hours) Approximately	laboratory number
48	027 041 045 053 058 072 081 106 108 114 120 132 134 143 144 151 157 167 209 225 226 237 239 259 276 281 319

Confirmation of Organism's Identity	laboratory number
API Listeria	041 045 053 072 081 143 259
CAMP test	053 132 144 209 237
Catalase reaction	108 237 281
Fermentation of Carbohydrates	053 108 120 134 226
Haemolysis	053 108 226 281 319
Microscopy	108
Motility	053
PCR	027 106 114
VITEK	151 157 167 225

Which Selective/Chromogenic Medium Used	laboratory number
Agar Listeria Ottavani Agosti (ALOA)	027 041 053 058 072 081 106 114 120 134 137 143 144 281
PALCAM Agar	319
Chromogenic Listeria Agar (Oxoid)	157 226 276
Oxford Agar	045 134 209
Modified Oxford Agar (MOX)	225 259
Brilliance Listeria Agar (OCLA)	239
Rapid L. mono	045 219
CHROMagar Listeria	108 132
CHROMager Listeria	237

Enumeration of *Clostridium* spp./ *C. perfringens* / Sulphite Reducing Clostridia in Beef

Accredited Method Used	laboratory number
no	078 160 188 192 193 249 303 311
yes	021 035 060 070 101 105 112 113 114 129 163 170 223 238 246 250 263 264 268 278 294

Method Based on an International Standard	laboratory number
yes	021 035 060 070 078 101 105 112 113 114 129 160 163 170 188 192 193 223 238 246 249 250 263 264 268 278 294 303 311

Which International Standard?	laboratory number
Clostridium perfringens enumeration ISO 7937:2004	021 113 129 163 170 188 223
Clostridium perfringens enumeration FDA/BAM Chapter 16	101 264 311
Clostridium perfringens: SR EN ISO 7937:2005; Bacterii anaerobe sulfito reducatoare - SR ISO 15213/2023	192
ISO 15213-2	250
ISO 15213	114
ISO 15213:2003	070
ISO 15213-1, ISO 15213-2	238
ISO 15213-1:2023	078
ISO 15213-1:2023 / UNI EN ISO 15213-2:2024	112
MFHPB-23	060

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	021 035 070 078 105 113 114 129 160 170 188 193 249 250 264 278
Butterfield's Phosphate Buffer	311
Maximum Recovery Diluent (MRD)	112 163 192 223 294 303
Peptone Water	060 101
0.1% Peptone Water	246

Which Primary Enrichment Medium Used	laboratory number
Buffered Peptone Water (BPW)	112 113 163 193 223 249 263 264 278
Cooked Meat Medium	170
No primary enrichment as quantitative method	060

Which Secondary Enrichment Medium Used	laboratory number
None	060

Plating Method Used	laboratory number
Pour plate	021 035 060 078 112 113 114 160 163 170 188 192 193 223 249 250 278 294 303 311
Spread plate	101 246
Overlay	070 105 263 264

Inoculum Volume (ml)	laboratory number
0.01	193 246
0.1	264 311
1.0	021 035 060 070 078 101 105 112 113 114 129 160 163 170 188 192 223 249 250 263 278 294 303

Alternative/Rapid Method	laboratory number
PCR	170 249

Incubation Temperature (°C)	laboratory number
30	129
35	060 101 170 246 264 311
37	021 035 070 078 105 112 113 114 160 163 188 192 193 223 249 250 263 278 294 303

Time Incubated (hours) Approximately	laboratory number
18	113 114 250
24	021 060 070 101 105 112 129 160 163 170 188 223 246 249 264 303 311
48	070 078 112 160 193 263 278 294

Confirmation of Organism's Identity	laboratory number
API 20A	101 163 294
Rapid ID 32A	035
Haemolysis	078
Indole production	193
Motility	113 160 250
PCR	170 249 311
VITEK	060 264

Clostridium perfringens

Which Selective/Chromogenic Medium Used	laboratory number
Tryptose Sulphite Cycloserine Agar (TSC)	035 101 105 112 114 129 160 163 188 223 246 249 250 294 303 311
TSC agar egg yolk free	170 311

Clostridium spp.

Which Selective/Chromogenic Medium Used	laboratory number
Tryptose Sulphite Cycloserine Agar (TSC) with egg and concentration of sulphite 1g/L (ISO 15213:2003)	129 311
TSC with egg and concentration of sulphite 0.5 g/L (ISO 15213-1:2023)	112
Iron Sulphite Agar (Modified)	078 160 193 294

Incubation Time (hours)	laboratory number
24	129 311
48	078 112 160 193
20 h ± 2 h	250

Incubation Temperature (°C)	laboratory number
37	078 112 129 160 193 250
35	311

Have you performed heat treatment?	laboratory number
no	078 112 129 160 193 250 311

Sulphite Reducing Clostridia (SRC)

Which Selective/Chromogenic Medium Used	laboratory number
Tryptose Sulphite Cycloserine Agar (TSC) with egg and concentration of sulphite 1g/L (ISO 15213:2003)	129
TSC with egg and concentration of sulphite 0.5 g/L (ISO 15213-1:2023)	105
TSC without egg concentration of sulphite 1g/L (ISO 15213:2003)	311
TSC without egg and concentration of sulphite 0.5 g/L (ISO 15213-1:2023)	193
Sulfite Iron Tryptose Sulfite (TS) with concentration of sulphite 0.5 g/L (ISO 15213-1:2023)	278
Iron Sulphite Agar (Modified)	078 112 160 250 294

Incubation Time (hours)	laboratory number
24	112 129 193 311
48	070 078 105 160 278
20 h ± 2 h	250

Incubation Temperature (°C)	laboratory number
37	078 105 112 129 160 193 278
44	250
35	311

Have you performed heat treatment?	laboratory number
no	078 105 112 129 160 193 250 278 311

Enumeration of *Bacillus cereus* in Cooked Rice

Accredited Method Used	laboratory number
no	023 026 078 094 097 100 192 230 249 312
yes	001 022 029 043 047 067 084 085 086 105 130 132 134 147 153 159 162 163 165 166 173 176 179 183 187 190 214 215 219 224 225 255 256 286 287 298 304

Method Based on an International Standard	laboratory number
no	047 067 100 130 132 165 215 230 304
yes	001 022 023 026 029 043 078 084 085 086 094 097 105 134 147 153 159 162 163 166 173 176 179 183 187 190 192 214 224 225 249 255 256 286 287 298 312

Which International Standard?	laboratory number
Bacillus cereus enumeration ISO 7932:2004	001 022 023 029 043 078 084 085 086 097 105 134 147 165 173 176 179 183 187 214 249 312
Bacillus cereus enumeration FDA/BAM Chapter 14	163 190 224 255 256
GB4789.14-2016	230
KFDA	153
Korea Food code	159 215
MFLP-42	298
MOHWM0016.02	225
NCh3116:2008 ISO 7932:2004	094

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	001 022 023 026 043 067 078 084 085 086 094 100 105 134 147 159 165 173 176 187 190 214 225 230 249 256 286 287 304 312
Butterfield's Phosphate Buffer	163 255
Maximum Recovery Diluent (MRD)	192
Peptone Water	097 132 179
Phosphate Buffered Saline (PBS)	166 224
Ringer's Solution	153
Tryptone Water	029
Nacl	215
Phosphate Buffered Saline(PBS)	047

Which Primary Enrichment Medium Used	laboratory number
Buffered Peptone Water (BPW)	001 023 026 085 134 166 187 190 214 224 249 312
Tryptone Soya Broth	153
-	215
Agar MYP	094
BACARA	047
Mannitol- egg yolkpolymyxin agar(MYP)	225
MYP	159 229
NA	097
Peptone Water	176

Which Secondary Enrichment Medium Used	laboratory number
-	215
aGAR SANGRE	094
Bacillus Cereus Agar	187
MYP	159
MYP Agar	224
NA	097
Nutrient agar(NA)	225

Plating Method Used	laboratory number
Pour plate	105 304
Spread plate	001 022 023 026 029 043 067 078 084 085 086 094 097 100 130 132 134 147 153 159 162 163 165 166 173 176 179 183 187 190 192 214 215 224 225 229 230 249 255 256 286 287 312
Petrifilm (3M)	047

Inoculum Volume (ml)	laboratory number
0.1	022 023 026 029 043 078 084 097 100 132 134 147 163 165 173 176 179 183 187 225 249 255 256 286 287 312
0.5	085
1.0	001 047 067 086 094 105 130 153 159 166 190 192 214 215 224 230 304

Alternative/Rapid Method	laboratory number
Compact dry	304
MOLDI-TOF	043
Most probable Number - Automated	085 187
PCR	047 153 159 214 224 225 249
Petrifilm (3M)	190 215

Incubation Temperature (°C)	laboratory number
30	001 022 023 026 029 043 047 067 078 084 085 086 094 100 105 130 132 134 147 153 159 163 165 166 173 176 179 183 187 192 214 215 224 225 229 249 255 256 286 287 312
37	097 190 230

Time Incubated (hours) Approximately	laboratory number
24	001 022 026 043 047 067 078 085 086 097 105 130 147 153 159 163 166 190 214 215 224 229 230 256 304 312
48	023 029 084 094 100 132 134 165 173 176 179 183 187 192 225 249 255 286 287

Confirmation of Organism's Identity	laboratory number
API 20E	176
API 50 CH	163 176 255 286 287
Catalase reaction	100 130
Haemolysis	023 029 078 084 094 097 105 130 134 147 173 179 183 187 192 249 256 312
Morphology	100 130 215 256
Microscopy	100 130
Motility	130 256
PCR	001
VITEK	022 047 085 153 159 162 166 190 214 224 225 229 230 256
Voges-Proskauer (VP) reaction	100 132

Which Selective/Chromogenic Medium Used	laboratory number
Bacillus Cereus Agar (BCA)	166 187 222
Mannitol Egg Yolk Polymixin B Agar (MYP)	001 002 022 023 026 029 043 056 078 085 094 097 105 130 134 137 147 153 159 162 163 165 176 179 190 192 214 215 224 225 229 230 249 255 256 286 287 312
Mossel Agar	084 183
BACARA2	067
NaCl-Glycine-Kim and Goopfert Agar (NGKG)	100
NGKG agar	132

Aerobic Plate Count and Enumeration of Lactic Acid Bacteria in Fruit Juice

Accredited Method Used	laboratory number
no	069 110 158 177 196 208 231 267
yes	010 062 063 064 076 119 138 143 156 194 195 204 207 213 256 257 291 306

Method Based on an International Standard	laboratory number
no	110 138 156 158 196 231 306
yes	010 062 063 064 069 076 119 143 177 194 195 204 207 208 213 256 257 291

Which International Standard?	laboratory number
APC (pour plate) ISO 4833-1:2013	069 143 177 194 195 196 231
APC (spread plate) ISO 4833-2:2013	010
APC ISO 4833:2003	267
APC FDA/BAM Chapter 3	119 204 208 256
APC AOAC 990.12	207 213
Lactic Acid Bacteria enumeration ISO 15214:1998	110 143 291
3M Petrifilm (Lactic Acid Bacteria -LAB)	257
Lactobacillus - PHLS Chapter 6.9 (2003)	256
Official Method of Japanese Ministry of Health,Labour and Welfare	158

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	010 062 063 064 076 110 143 177 195 196 207 213 231 257 291
Butterfield's Phosphate Buffer	204 208 306
Peptone Water	069 119 138
Phosphate Buffered Saline (PBS)	158
Ringer's Solution	267
Peptone saline	256
?????0.85%?	156

Which Primary Enrichment Medium Used	laboratory number
Buffered Peptone Water (BPW)	062 063 064 110 119 143 156 195 196 207 213 231 257 291
for aerobic plate count not used primary enrichment medium	177
none	306

Which Secondary Enrichment Medium Used	laboratory number
Buffer Phosphate	257
none	306
Ringer solution	110
saline	195

Plating Method Used	laboratory number
Pour plate	062 063 064 069 076 110 119 138 143 156 158 177 194 195 196 204 208 231 256 267 291 306
Spread plate	010
Petrifilm (3M)	207 213 257 267

Inoculum Volume (ml)	laboratory number
0.01	069
0.1	110 291
1.0	010 062 063 064 076 119 138 143 156 158 177 194 195 196 204 207 208 213 231 256 257 267 306

Alternative/Rapid Method	laboratory number
Petrifilm (3M)	195 257 267 306

Incubation Temperature (°C)	laboratory number
30	069 110 143 177 204 256 291
35	010 119 138 156 158 194 195 196 207 208 213 231 257 306
37	062 063 064 076 267

Time Incubated (hours) Approximately	laboratory number
24	196
48	062 063 064 076 119 156 158 194 195 204 207 208 213 231 256 257 267 306
72	010 069 110 138 143 177 291

Confirmation of Organism's Identity	laboratory number
Morphology	257
Oxidase reaction	291
VITEK	256

Aerobic Plate Count

Which Selective/Chromogenic Medium Used	laboratory number
Petrifilm (3M) Aerobic Plate Count	207 213
Plate Count Agar (PCA)	062 063 064 069 110 115 119 138 143 156 177 194 195 196 208 231 256 267 291
Tryptone Soy Agar (TSA)	010 306

Lactic Acid Bacteria

Which Selective/Chromogenic Medium Used (LAB)	laboratory number
De Man, Rogosa and Sharpe (MRS) Agar	010 062 063 064 110 115 119 138 143 196 208 256 291
NA	257

Aerobic Plate Count / Enterobacteriaceae / coliforms / *E. coli* in Pet Food

Accredited Method Used	laboratory number
no	133 281
yes	008 014 024 025 054 068 122 125 129 140 147 171 272 290 316

Method Based on an International Standard	laboratory number
no	014 025
yes	008 054 068 122 125 129 133 140 147 171 272 281 290 316

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	014 024 025 054 129 133 140 147 171 290
Butterfield's Phosphate Buffer	008 316
Maximum Recovery Diluent (MRD)	122 125
Peptone Water	272
Phosphate Buffered Saline (PBS)	068
peptone salt solution	281

Plating Method Used	laboratory number
Pour plate	024 054 068 122 125 129 133 140 147 171 272 281 290 316
Spread plate	014
Petrifilm (3M)	008 054

Inoculum Volume (ml)	laboratory number
0.1	014 025
1.0	008 024 054 068 122 125 129 133 140 147 171 272 281 290 316

Which Selective/Chromogenic Medium Used	laboratory number
Petrifilm (3M) Aerobic Plate Count	008 054
Plate Count Agar (PCA)	024 054 068 122 125 129 133 140 147 171 272 281 290 316
Tryptose Agar with TTC (Triphenyltetrazoliumchloride)	014

Incubation Temperature (°C)	laboratory number
30	014 024 025 122 125 129 133 147 171 272 281
35	008 054 068 140 316
37	290

Time Incubated (hours) Approximately	laboratory number
48	008 014 025 054 068 133 140 316
72	024 122 125 129 147 171 272 281 290

Enterobacteriaceae

Accredited Method Used	laboratory number
no	014 025 050 133 310
yes	008 024 054 057 105 122 125 129 140 147 171 272 281 290 316

Method Based on an International Standard	laboratory number
no	014 025 105
yes	008 050 054 057 122 125 129 133 140 147 171 272 281 290 310 316

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	014 024 025 050 054 057 105 129 133 140 147 171 290 310
Butterfield's Phosphate Buffer	008 316
Maximum Recovery Diluent (MRD)	122 125
Peptone Water	272
peptone salt solution	281

Plating Method Used	laboratory number
Pour plate	024 050 057 122 125 129 133 140 147 171 272 281 290 316
Spread plate	014
Overlay	054 105 316
Petrifilm (3M)	008 054 310

Inoculum Volume (ml)	laboratory number
0.1	014 025 057
1.0	008 024 050 054 105 122 125 129 133 140 147 171 272 281 290 310 316

Which Selective/Chromogenic Medium Used	laboratory number
Petrifilm (3M) Enterobacteriaceae	008 054
Violet Red Bile Dextrose Agar (VRBD)	057
Violet Red Bile Glucose Agar (VRBG)	014 024 050 054 122 125 129 133 140 147 272 281 290 316
Rapid enterobacteriaceae	171

Incubation Temperature (°C)	laboratory number
30	014 057 272
35	025
37	008 024 050 054 105 122 125 129 133 140 147 171 281 290 310 316

Time Incubated (hours) Approximately	laboratory number
24	008 024 025 050 054 105 122 125 129 133 140 147 171 272 281 290 310 316
48	014 057

Confirmation of Organism's Identity	laboratory number
Fermentation of Carbohydrates	125
Oxidase reaction	024 122 129 133 140 281 290 316

Coliforms

Accredited Method Used	laboratory number
no	008 133 310 316
yes	025 054 057 122 129 140 147 272 281 290

Method Based on an International Standard	laboratory number
no	025
yes	008 054 057 122 129 133 140 147 272 281 290 310 316

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	025 054 057 129 133 140 147 290 310
Butterfield's Phosphate Buffer	008 316
Maximum Recovery Diluent (MRD)	122
Peptone Water	272
peptone salt solution	281

Plating Method Used	laboratory number
Pour plate	054 057 122 129 133 140 147 272 290
Petrifilm (3M)	008 054 310 316

Inoculum Volume (ml)	laboratory number
0.1	025
1.0	008 054 122 129 133 140 147 272 281 290 310 316
0.1 and 1.0	057

Which Selective/Chromogenic Medium Used	laboratory number
Chromocult Coliform Agar	057
Lauryl Tryptose Broth	281
Petrifilm (3M) Colliforms	316
Violet Red Bile Agar (VRB)	122
Violet Red Bile Lactose Agar (VRBL)	129 133 140 147 272 290

Incubation Temperature (°C)	laboratory number
30	025 272
35	008 054 281 316
37	057 122 129 133 140 147 290
42	310

Time Incubated (hours) Approximately	laboratory number
24	008 025 054 057 122 129 133 140 147 272 290 310 316
48	281

Confirmation of Organism's Identity	laboratory number
Enterotube (BBL)	133

Escherichia coli

Accredited Method Used	laboratory number
no	008 133 310 316
yes	024 025 054 057 122 129 140 147 272 281 290

Method Based on an International Standard	laboratory number
no	025
yes	008 054 057 122 129 133 140 147 272 281 290 310 316

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	024 025 054 057 129 133 140 147 290 310
Butterfield's Phosphate Buffer	008 316
Maximum Recovery Diluent (MRD)	122
Peptone Water	272
peptone salt solution	281

Plating Method Used	laboratory number
Pour plate	024 054 057 122 129 133 140 147 272 290
Petrifilm (3M)	008 054 310 316

Inoculum Volume (ml)	laboratory number
1.0	008 024 025 054 122 129 133 140 147 272 281 290 310 316
0.1 and 1.0	057

Which Selective/Chromogenic Medium Used	laboratory number
Lauryl Sulphate Broth	281
Petrifilm (3M) E.Coli	316
Tryptone Bile Glucuronide Agar (TBX)	024 057 122 129 133 140 147 272 290

Incubation Temperature (°C)	laboratory number
35	008 054 281 316
37	025
42	310
44	024 057 122 129 133 140 147 272 290

Time Incubated (hours) Approximately	laboratory number
18	129 133
24	024 025 054 057 122 140 147 272 290 310
48	008 281 316

Confirmation of Organism's Identity	laboratory number
IMViC test	281
Morphology	147

Detection of *Listeria monocytogenes* / *Listeria* spp. in Mixed Vegetables

Accredited Method Used	laboratory number
no	036 111 117 118 191 210 235 243 253 274 302 322
yes	023 094 103 105 107 114 116 134 163 175 185 207 211 212 213 219 227 233 245 247 249 260 296 309 315

Method Based on an International Standard	laboratory number
no	185 227 243 253 296
yes	023 036 094 103 105 107 111 114 116 117 118 134 163 175 191 207 210 211 212 213 233 235 245 247 249 260 274 302 315 322

Which International Standard?	laboratory number
APC AOAC 990.12	036
Listeria monocytogenes detection ISO 11290-1:2017	023 103 105 107 111 114 116 134 163 175 191 207 212 213 233 235 249 253 274 302 322
Listeria monocytogenes enumeration ISO 11290-2:2017	211
BAM capitulo 10	247
Detección de Listeria spp (A/P), AFNOR N° BIO-12/33-05/12 Detección de Listeria monocytogenes (A/P), AFNOR N° BIO-12/11-03/04	094
DETECCIÓN MOLECULAR 3M SEGUNDA GENERACIÓN BASADO EN AOAC 2016.08	118
SureTect Listeria monocytogenes PCR Assay, alternative method	210
TFDA MOHWM0029.00	260

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	094 103 114 116 163 191 207 211 212 213 243 249 253 260 274 296
Half Fraser Broth	023 105 107 117 134 175 185 235 247 302
Maximum Recovery Diluent (MRD)	111
24LEB	210
Buffered Listeria Enrichment Broth Base	233
Caldo Demi Fraser	118
Half Fraser Standard Broth	322
LMX+LMX suplement	227

Which Primary Enrichment Medium Used	laboratory number
Buffered Peptone Water (BPW)	253
Fraser Broth	023 107 118 247
Half Fraser Broth	103 105 111 116 117 134 163 175 185 191 212 235 249 274 296 302
Listeria Enrichment Broth 1 (LEB)	036 207 213 322
24 LEB	243
24LEB	210
Buffered listeria enrichment broth	260
Buffered Listeria Enrichment Broth Base	233
LMX Broth	315
LPT	114

Which Secondary Enrichment Medium Used	laboratory number
Fraser Broth	023 094 103 105 107 111 114 116 117 118 134 163 175 185 191 212 235 274 302
24 LEB	247
Buffered listeria enrichment broth	260
COMPASS LISTERIA	296

Plating Method Used	laboratory number
Pour plate	211 212 233
Spread plate	023 094 105 107 111 134 163 185 191 227 235 247 249 253 274 296 302 315 322
Overlay	114 207 213 260

Inoculum Volume (ml)	laboratory number
0.001	247
0.01	036 114 134 175 235 253 274
0.1	023 105 111 163 185 191 207 213 227 249 296 302 322
0.5	094 260
1.0	233

Alternative/Rapid Method	laboratory number
Compact dry	322
Enzyme Immunoassay	315
Impedance	211
Loop Mediated Isothermal Amplification (LAMP)	103 117
PCR	114 175 191 210 243 247 249
VIDAS (ELFA)	116 185
miniVIDAS (ELFA)	023 227

Incubation Temperature (°C)	laboratory number
30	105 116 191 211 247 249 260
35	207 213 233 253 302
37	023 036 094 103 107 111 114 117 118 134 163 175 185 210 212 227 235 243 274 296 315 322

Time Incubated (hours) Approximately	laboratory number
24	036 094 103 105 107 111 114 116 117 118 163 175 185 191 210 227 243 247 249 260 296 315
48	023 134 207 211 212 213 233 235 253 260 302 322
120	274

Confirmation of Organism's Identity	laboratory number
Aesculin hydrolysis	211
API Listeria	023 107 111 118 163 227 274
CAMP test	227 253 260 302
Catalase reaction	105 117 175 212 235 274 302
Fermentation of Carbohydrates	103 105 117 134 175 185 212 235 315 322
Haemolysis	105 117 175 212 227 235 260 274 302
Latex slide agglutination	243
Morphology	094 105 260
Microscopy	117 175
Motility	117 302
Oxidase reaction	235 274
PCR	114 191 249
VITEK	116 207 213 233 247 260

Listeria monocytogenes

Which Selective/Chromogenic Medium Used	laboratory number
Agar Listeria Ottavani Agosti (ALOA)	023 103 107 111 114 116 117 118 134 175 185 191 207 212 213 227 235 274 302 315
PALCAM Agar	210 212 235 274 302
Chromogenic Listeria Agar (Oxoid)	163 211 249 253 260
Ottavani Agosti Agar (OAA)	094
Oxford Agar	107 117 134 175 249
Modified Oxford Agar (MOX)	233 260
Brilliance Listeria Agar (OCLA)	243
ALOA y OXFORD	247
Compass agar	105
COMPASS LISTERIA	296
Compass Listeria agar	274

Detection of *Salmonella* spp. in Chicken

Accredited Method Used	laboratory number
no	172 220 222 311
yes	004 013 027 030 033 037 042 073 079 080 087 088 089 091 093 102 104 109 116 121 123 126 135 136 139 141 142 145 149 169 175 181 182 186 187 188 197 198 199 200 201 202 216 236 240 241 242 244 249 255 263 265 266 269 275 277 280 282 283 284 308 323

Method Based on an International Standard	laboratory number
no	123 135 136 139 216 220 249
yes	004 013 027 030 033 037 042 073 079 080 087 088 089 091 093 102 104 109 116 121 126 127 141 142 145 149 169 172 175 181 182 186 187 188 197 198 199 200 201 202 222 236 240 241 242 244 255 263 265 266 269 275 277 280 282 283 284 308 311 323

Which International Standard?	laboratory number
APC AOAC 990.12	145
Salmonella spp. detection ISO 6579-1:2017	004 013 027 042 073 087 091 093 104 116 141 142 149 172 175 181 182 186 187 188 197 198 199 200 201 222 244 263 269 275 280 282 283 284 311 323
Salmonella spp. detection ISO 6579-3:2014	323
Salmonella spp. detection FDA/BAM Chapter 5	037 109 121 126 127 145 169 202 265
AFNOR BIO-12/32-10/11	242
AFNOR Certificate No. 12/16-09/05. VIDAS® Easy Salmonella (SLM)	079
AOAC 2014.01 Salmonella in Selected Foods 3M Petrifilm Salmonella Express System	255
AOAC No. 020502	033
CCFRA	088
FDA/BAM Chapter 5	277
FSIS MLG 4.12	102
GB 4789.4-2024	123 216
MDS Salmonella – MDS/AFNOR Validation 3M 01/16 – 11/16	323
PCR test for detection of Salmonella spp	175
RT-PCR Detection of salmonella spp.	145
SALMONELLA SPP UNI EN ISO 6579-1:2020	266
USDA MLG 4.14	236

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	004 013 027 033 037 042 073 079 080 087 088 089 091 093 102 104 109 116 121 123 126 127 136 141 145 149 169 172 175 181 182 186 187 188 197 198 199 200 201 202 220 222 236 240 241 242 244 249 263 266 269 275 277 280 282 283 284 308 311 323
Peptone Water	030
Phosphate Buffered Saline (PBS)	216
Lactose broth	265
Lactose Broth?LB	135
One broth Salmonella	139

Which Primary Enrichment Medium Used	laboratory number
Buffered Peptone Water (BPW)	027 030 033 042 073 079 088 089 091 104 109 116 121 123 142 145 172 175 181 186 187 197 198 202 216 220 222 236 244 266 275 277 282 283 284 311 323
Mueller Kauffman Tetrathionate Novobiocin Broth (MKKTn)	013 087 093 141 182 188 199 200 201 263 269 280
Rappaport Vassiliadis Broth (RV)	037 080 087 135 269 280
Modified Semi-Solid Rappaport Vassiliadis (MSRV)	004 169
Rappaport Vassiliadis Soya Peptone(RVS)	013 141 182
Tryptone Soya Broth	102
3M Salmonella Enrichment Base + 3M Salmonella Enrichment Supplement	255
BPW+ Salmonella supplement (SPT)	186
Lactose broth	126 127 265
SALMONELLA SUPP TAB 25 g (ref.421202)	240
SALMONELLA SUPP TAB 25g	241 242
supplement	308

Which Secondary Enrichment Medium Used	laboratory number
Rappaport Vassiliadis Broth (RV)	088 104 109 126 145 181 187 197 198 244 263 265 282 283 284
Rappaport Vassiliadis Soya Peptone(RVS)	073 089 091 093 116 123 141 142 172 175 188 199 200 201 202 216 220 222 236 266 275 323
Selenite Cysteine Broth	033 080 127 169
Tetrathionate Broth	027 033 102 135 172 222 236 311 323
0.5 ml from enriched sample in SPT	186
Brilliance Salmonella+XLD	182
ChromoSalmonella Agar (CSA)	037
Muller Kauffmann tetrathionate-novobiocin broth	142
Muller-Kauffmann Tetrathionate-Novobiocin Broth (MKTTn)	175 275
Salmonella Xpress broth (SX2 broth)	079
SS , XLD	087
XLD Agar	269
XLD(Xylose Lysine Deoxycholate)	013

Plating Method Used	laboratory number
Pour plate	037 141
Spread plate	013 073 080 087 088 093 102 104 109 123 126 127 139 145 181 182 186 187 188 197 198 199 200 201 202 216 249 263 269 277 280 282 283 284 308 323
Overlay	033 222 275 311

Inoculum Volume (ml)	laboratory number
0.001	127 216 263 269
0.01	013 037 073 080 093 102 109 139 142 175 182 187 188 255 269 275 280 308 311
0.1	004 042 079 087 088 126 141 145 181 186 197 198 199 200 201 202 222 249 266 282 283 284
1.0	123 199 200 201
>2.0	033 323
an inoculation loop	135

Alternative/Rapid Method	laboratory number
Loop Mediated Isothermal Amplification (LAMP)	323
MOLDI-TOF	013 102 123 187
PCR	027 037 042 091 104 169 175 181 197 198 266 269 280
Petrifilm (3M)	255
RapidChek	080 149 202
VIDAS (ELFA)	089 116 145 186 216 249 277
miniVIDAS (ELFA)	093 136 222 240 241 242

Incubation Temperature (°C)	laboratory number
35	033 037 102 121 126 135 169 265
37	004 013 027 042 073 080 087 088 089 091 093 104 109 116 123 127 136 139 141 142 172 175 181 182 187 188 197 198 199 200 201 202 216 220 263 266 269 275 277 280 311
41.5	079 145 149 186 222 249 255 308 323
42	240 241 242 282 283 284

Time Incubated (hours) Approximately	laboratory number
18	042 087 091 116 220 323
24	004 027 030 033 037 073 079 080 088 089 093 104 109 121 123 126 136 139 141 142 145 149 169 172 181 182 186 188 197 198 199 200 201 202 216 240 241 242 249 255 263 265 266 269 275 277 282 283 284 308 311
36	102
48	222 280
60	175
72	013 135
120	187

Confirmation of Organism's Identity	laboratory number
API 20E	080 088 093 127 135 136 141 145 149 172 182 240 241 242 244 255 265 266
API RapidID 20E	280
Fermentation of Carbohydrates	027 187
Indole production	175
Latex slide agglutination	139 169 308
Lysine Decarboxylase	073 079 142 175 323
Lysine Iron Agar	109
Morphology	079 109
Microscopy	109 145
Microbact 24A	269
Oxidase reaction	186
Serological agglutination test	073 079 087 141 142 175 186 202 220 236 323
PCR	037 042 091 145 186 249 311
VITEK	033 104 121 123 126 145 181 186 197 198 199 200 201 216 222 275 282 283 284
Triple Sugar Iron Agar (TSI)	013 073 079 102 109 116 141 142 175 188 263 323

Salmonella spp. TM300d071TMA

Which Selective/Chromogenic Medium Used	laboratory number
Hektoen Agar	277
Salmonella Chromogenic Medium	277

Salmonella spp. TM300d071TMB

Which Selective/Chromogenic Medium Used	laboratory number
Bismuth Sulfite Agar (BSA)	123 216
Brilliant Green Agar (BGA)	142 175 275
Brilliance Salmonella Agar	042 139 182 186 240 242
Brilliant Green Phenol Red Lactose Sucrose Agar (BPLS)	202
Chromogenic Salmonella Agar (Oxoid)	037 091 121 216 249
ChromID Salmonella	141
Hektoen Agar	121 266 277 311
Modified Semi-Solid Rappaport Vassiliadis (MSRV)	127 311
Rambach Agar	149 323
Salmonella Chromogenic Medium	033 087 123 142 277
Salmonella Shigella Agar (SS)	002 087
Xylose Lysine Desoxycholate Agar (XLD)	013 027 087 088 093 109 116 121 126 127 135 136 142 169 175 182 187 188 197 198 199 200 201 202 220 222 241 244 263 265 266 269 275 282 283 284 311 323
XLT-4 Agar	004
BGS - DMLIA	236
XLD,ASAP	079

Detection of *Salmonella* spp. in Milk Powder

Accredited Method Used	laboratory number
no	016 019 154 174 221
yes	009 011 020 034 039 048 055 065 066 077 083 124 125 129 146 155 178 206 228 232 234 251 262 265 295 307

Method Based on an International Standard	laboratory number
no	034 065 077 083 155 174 206 221 228 251
yes	009 011 016 019 020 039 048 055 066 124 125 129 146 154 178 232 234 262 265 295 307

Which International Standard?	laboratory number
Salmonella spp. detection ISO 6579-1:2017	034 048 125 129 174 178 234 295 307
Salmonella spp. detection ISO 6579-2:2012	011 146
Salmonella spp. detection FDA/BAM Chapter 5	039 124 154 232 265
AOAC Official Method 2016.01	055 262
AOAC Official Methods of AnalysisSM 2016.01	016
GB 4789.4-2024	221
GB 4789.4-2024 National food safety standard of China Food microbiological examination:Salmonella	206
JP18	083
Salmonella spp. detection GB 4789.4-2024	077
TFDA1021951187	155

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	009 011 016 019 034 039 048 065 066 077 125 129 146 174 178 206 221 228 232 234 262 295 307
Lactose Broth	155 265

Which Primary Enrichment Medium Used	laboratory number
Buffered Peptone Water (BPW)	011 016 019 020 039 055 065 066 077 174 178 206 228 232 234 262 307
Mueller Kauffman Tetrathionate Novobiocin Broth (MKKTn)	125
Rappaport Vassiliadis Broth (RV)	034 048 129 146 155 265
Rappaport Vassiliadis Soya Peptone(RVS)	221
Tryptone Soya Broth	083
0.002% BG	251
Lactose Broth	154
Tetrathionate Broth Base?TTB?	221

Which Secondary Enrichment Medium Used	laboratory number
Rappaport Vassiliadis Broth (RV)	020 083 146 154 234 251
Rappaport Vassiliadis Soya Peptone(RVS)	039 077 125 129 174 178 232 307
Tetrathionate Broth	048 077 129 154 155 251 265
NA	016
Rappaport Vassiliadis Broth and Tetrathionate Broth	228
Tatrathionate Broth Base?TTB? and Rappaport-Vassiliadis Medium with Soya?RVS?	206
Xylose Lysine Desoxycholate Agar?XLD??Bismuth Sulfite Agar?BS??Salmonella Chromogenic Agar	221

Plating Method Used	laboratory number
Pour plate	034 174 234
Spread plate	011 039 048 066 077 083 154 178 221 228 307
Overlay	129 206

Inoculum Volume (ml)	laboratory number
0.001	011 154
0.01	016 034 039 065 077 206 221 251 307
0.05	083
0.1	077 129 146 174 178 232
1.0	077
10ul	048
20uL	262
25g	234

Alternative/Rapid Method	laboratory number
Enzyme Immunoassay	174
Loop Mediated Isothermal Amplification (LAMP)	019 020 055 232 262
MOLDI-TOF	154
PCR	039 066 129 155 178 221
Petrifilm (3M)	065 307
RapidChek	016
miniVIDAS (ELFA)	295

Incubation Temperature (°C)	laboratory number
35	011 039 048 066 083 124 154 155 234 251 265
37	016 019 020 034 055 065 077 125 129 146 178 206 221 228 232 262 307
41.5	174 295

Time Incubated (hours) Approximately	laboratory number
18	039 065 077 083 221
24	016 019 020 034 048 055 066 077 125 129 146 154 155 174 178 221 228 232 234 262 265 295 307
36	011
48	077 221
72	251
120	206

Confirmation of Organism's Identity	laboratory number
API 20E	039 048 146 174 251 265
DNase test	016
Indole production	020
Latex slide agglutination	129
Lysine Decarboxylase	020 077 129
Microscopy	083
Serological agglutination test	077 125
PCR	066
VITEK	077 155 206 221
Voges-Proskauer (VP) reaction	020
Triple Sugar Iron Agar (TSI)	020 034 077 178 232

Which Selective/Chromogenic Medium Used	laboratory number
Bismuth Sulfite Agar (BSA)	077 154 155 206 221
Brilliant Green Agar (BGA)	020 031
Brilliance Salmonella Agar	307
Hektoen Agar	154 155
Salmonella Chromogenic Medium	206 221
Xylose Lysine Desoxycholate Agar (XLD)	031 039 048 066 077 083 125 154 155 178 221 228 232 234 265
XLT-4 Agar	129

Detection of *E. coli* O157:H7 in Cheese

Accredited Method Used	laboratory number
no	292
yes	044 045 128 161

Method Based on an International Standard	laboratory number
no	161
yes	044 045 128 292

Which International Standard?	laboratory number
Escherichia coli O157:H7 detection ISO 16654:2001	292
Escherichia coli O157:H7 detection ISO/TS 13136:2012 (PCR)	044
Health Canada Compendium	045

Which Initial Suspension/Diluent Used	laboratory number
Buffered Peptone Water (BPW)	044 045 128
modified Tryptone Soya Broth (mTSB) supplemented ?? novobiocin, ????? 41.5°C ± 1°C ??? 18-24h.	292

Which Primary Enrichment Medium Used	laboratory number
Buffered Peptone Water (BPW)	161
Tryptone Soya Broth	292
Modified TSB with novobiocin	045

Plating Method Used	laboratory number
Pour plate	292
Spread plate	128

Inoculum Volume (ml)	laboratory number
1.0	045 128 292

Alternative/Rapid Method	laboratory number
PCR	045 292

Incubation Temperature (°C)	laboratory number
35	128
37	292
41.5	161
42	045

Time Incubated (hours) Approximately	laboratory number
24	045 128 161 292

Confirmation of Organism's Identity	laboratory number
PCR	292
VITEK	045 128

Which Selective/Chromogenic Medium Used	laboratory number
Cefixine Tellurite Sorbitol MacConkey agar (CT-SMAC)	045 128 184 292
Chrom ID O157:H7	184

APPENDIX IV: Fapas® SecureWeb, Protocol and Contact Details

1. Fapas® SECUREWEB

Access to the secure area of our website is only available to participants in our proficiency tests. Please contact us if you require a UserID and Password. Fapas® SecureWeb allows participants to:

- Obtain their laboratory numbers for the proficiency tests in which they have participated.
- View the results they submitted in past and current proficiency tests.
- Submit their results and methods for current tests.
- Review future tests they have ordered.
- Order proficiency tests, reference materials and quality control materials.
- Freely download copies of reports (PDF file), of proficiency tests in which they have participated.
- View charts of their z-scores obtained in previous Fapas® – Food Microbiology proficiency tests.

2. PROTOCOL

The Protocols [7, 8] set out how Fapas® – Food Microbiology is organised. Copies can be downloaded from our website.

3. CONTACT DETAILS

This report was prepared and authorised on behalf of Fapas® by Elaine Leach (Round Coordinator). Participants with any comments or concerns about this proficiency test should contact:

Fapas®

Fera Science Ltd (Fera)
York Biotech Campus
Sand Hutton
York
YO41 1LZ
UK

Tel: +44 (0)1904 462100

info@fapas.com

fapas.com