



APLAC T097
Proficiency Testing Programme
Food Microbiology Quantitative Scheme
Final Report

December 25, 2015

Summary

This program was organized by China National Accreditation Service for Conformity Assessment (CNAS), with Analysis Capability Assessment System (ACAS) of Chinese Academy of Inspection and Quarantine as the collaborator, under the auspices of Asia Pacific Laboratory Accreditation Cooperation (APLAC).

A total of 106 laboratories from 47 economies registered for the programme. 75 labs submitted results on time.

Before data analysis, the testing results were $\log_{10}$ transformed. The assigned values are determined by the simple robust analysis. The standard deviations are used the experience value 0.25 $\log_{10}$ unit. The z-score or z'-score is used as the numerical indicator to assess individual participants' performance in the programme.

Summary of participants' statistical results was listed in below.

Testing items	Results number	Robust median $\bar{X}$ (in $\log_{10}$ form)	Standard deviation ($\sigma_{pt}, \sigma'_{pt}$)
Aerobic Plate Count	75	4.491	0.25
<i>Staphylococcus aureus</i>	74	4.301	0.267
Sulphite-reducing <i>Clostridium</i>	49	3.279	0.25

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1. Foreword

- 1.1. This program was organized by China National Accreditation Service for Conformity Assessment (CNAS), with Analysis Capability Assessment System (ACAS) of Chinese Academy of Inspection and Quarantine as the collaborator, under the auspices of Asia Pacific Laboratory Accreditation Cooperation (APLAC).
- 1.2. This report summarizes the results of the APLAC T097 proficiency testing programme on the analysis of the Aerobic Plate Count, *Staphylococcus aureus* and Sulphite-reducing *Clostridium*. This program was organized by China National Accreditation Service for Conformity Assessment (CNAS), with Analysis Capability Assessment System (ACAS) of Chinese Academy of Inspection and Quarantine as the collaborator, under the auspices of Asia Pacific Laboratory Accreditation Cooperation (APLAC). ACAS has been accredited with ISO/IEC 17043(CNAS PT0026) for the scope of this PT program.
- 1.3. During this proficiency testing program, CNAS has been responsible for proposing this program to be approved by APLAC Proficiency Testing Committee, inviting participants, circulating the draft report and final report to participants and acting as a contact point among APLAC, participating accreditation bodies / participants, preparing, packaging and dispatching samples, handling participants' queries, receiving samples, evaluation of the receipt status for the samples, statistical analysis, and issuing interim and final reports.
- 1.4. The programme was carried out as the schedule listed in table 1. Economic body's results submission summary were listed in table 2.

Table1 Schedule of the programme

Event	Planned	Responsible
Invitation	Dec. 2014 ---Jan.2015	CNAS
Program Registration& Sample Preparation	Jan.---Feb. 2015	ACAS
Sample Distribution	Mar. --- Apr. 2015	ACAS
Results collection	Mar. --- May. 2015	ACAS
Data Analysis	May. --- July. 2015	ACAS
Drafting report	July. ---Nov. 2015	ACAS & CNAS

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Table 2 Economic body's results submission summary

Economy	Regis. No	Results No.	Aerobic Plate Count		<i>Staphylococcus aureus</i>		Sulphite-reducing <i>Clostridium</i>	
			Regis. No	Results No.	Regis. No	Results No.	Regis. No	Results No.
Argentina	2	0	2	0	2	0	0	0
Australia	1	1	1	1	1	1	1	0
Austria	2	0	0	0	0	0	0	0
Bangladesh	4	4	4	4	4	4	2	1
Belgium	2	2	2	2	2	2	2	2
Botswana	1	0	0	0	0	0	0	0
Brunei Darussalam	1	0	0	0	0	0	0	0
Canada	4	4	4	4	4	4	2	2
China	4	4	4	4	4	4	3	3
Czech Republic	2	2	2	2	2	2	2	2
Denmark	2	2	2	2	2	2	1	1
Egypt	2	0	2	0	2	0	2	0
Ethiopia	2	0	1	0	1	0	0	0
Finland	2	2	2	2	2	2	2	2
France	2	2	2	2	2	2	2	2
Germany	1	1	1	1	1	1	1	1
Greece	1	1	1	1	1	1	1	1
Hungary	2	1	1	1	1	1	1	1
India	4	4	4	4	4	4	4	3
Ireland	2	2	2	2	2	2	2	2
Israel	2	2	2	2	2	2	2	2
Italy	2	2	2	2	2	2	2	2
Viet Nam	7	6	7	6	7	6	5	4
Sultanate of Oman	2	2	2	2	2	2	0	0
Japan	2	2	2	2	1	1	1	1
Jordan	2	2	2	2	2	2	0	0
Latvia	2	2	2	2	2	2	2	2
Lithuania	2	0	2	0	2	0	1	0
Malaysia	3	3	3	3	3	3	3	3
Montenegro	2	0	1	0	1	0	0	0
New Zealand	4	2	2	2	2	2	2	2
Palestine	2	0	2	0	2	0	0	0
Pakistan	3	3	3	3	3	3	1	1
Poland	2	2	2	2	2	2	2	2

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Economy	Regis. No	Results No.	Aerobic Plate Count		<i>Staphylococcus aureus</i>		Sulphite-reducing <i>Clostridium</i>	
			Regis. No	Results No.	Regis. No	Results No.	Regis. No	Results No.
Portugal	2	0	2	0	2	0	2	0
Republic of Yemen	1	0	1	0	1	0	1	0
Russian Federation	2	0	0	0	0	0	0	0
Slovenia	2	0	2	0	2	0	2	0
Spain	2	0	1	0	1	0	1	0
Seychelles	1	0	0	0	0	0	0	0
Switzerland	2	2	2	2	2	2	2	2
Chinese Taipei	4	4	4	4	4	4	0	0
Tunisia	3	3	3	3	3	3	2	2
Turkey	2	1	2	1	2	1	2	1
United Arab Emirates	2	2	2	2	2	2	1	0
United Kingdom	2	2	2	2	2	2	1	1
USA	1	1	1	1	1	1	0	0

2. Objective

2.1 This program is designed for the evaluation of the performance of participating labs on the food microbiology testing in different economies, to create opportunities for laboratories to improve technical competence and to enhance the testing results recognition.

2.2 Test results (transform to log₁₀ format) from participants were evaluated according to the statistical techniques outlined. The z-score or z'-score was used as a numerical indicator to assess individual participant's performance in the scheme. The returned results and performance evaluation can be referred to APPENDIX A.

3. Proficiency Testing Items

3.1 Each registered participant was provided with Sample A (Aerobic Plate Count), Sample B (*Staphylococcus aureus*) and Sample C (Sulphite-reducing *Clostridium*). Each vial contains about 1.2g powder which consists of freeze-dried bacteria and cryoprotectants (a kind of food). The testing material was prepared by ACAS.

3.2 The homogeneity and stability check of the test material was carried out in accordance with the procedures. The data is shown in APPENDIX B. The results indicated that the test

material was considered to be sufficiently homogeneous for the proficiency testing programme. According to the stability test results and the past experience, the testing samples are stable enough for the operation period of this programme.

3.3 The samples along with relevant documents were distributed by EMS in March 2015. These documents were also provided via e-mail, which can be referred to APPENDIX C.

3.4 Upon receipt of the proficiency test samples, participants were required to immediately check the physical conditions of the vials and promptly acknowledge by returning the “Sample Receipt Form” to the coordinator via e-mail or submit through website of ACAS.

4. Test Required

The samples consist of freeze-dried bacteria and cryoprotectants in small glass vials, which are similar in nature to the routine food testing by participating laboratories.

The freeze-dried sample needs to be rehydrated with 40 mL sterile diluent. By using aseptic technique, open the vial and add 4 mL sterile diluent immediately. After the sample is dissolved, transfer the sample into a sterile bottle and rinse the vial thoroughly with the remaining 36 mL sterile diluent to ensure that all samples has been transferred to the bottle. This liquid was treated as the sample for testing, which is equivalent of 40 mL test sample.

Participants were instructed to use plate count for the quantitative determination of Aerobic Plate Count, *Staphylococcus aureus* and Sulphite-reducing *Clostridium*.

The Sulphite-reducing *Clostridium* is a total count and cannot be conducted heat treatment step in this PT programme.

Participants are expected to use the test method of their choice, which should be consistent with the routine testing.

5. Statistical Evaluation

Before data analysis, the testing results were $\log_{10}$ transformed. The simple robust statistics was applied to determine the assigned values. That's to say, the median of the participants' result (in $\log_{10}$ form) could be regarded as assigned values and experience values was adopted as standard deviation of proficiency assessment. The z-score is used as the numerical indicator to assess individual participant's performance in the programme.

5.1 Aerobic Plate Count & Sulphite-reducing *Clostridium*

The participants' performance were calculated by robust statistical method, which assessed

using z-scores, the z-scores were calculated by the following formulae:

$$z_i = \frac{x_i - x_{pt}}{\sigma_{pt}}$$

In the formulae:

x_i - participants' testing results (in log₁₀ form);

x_{pt} - assigned value (in log₁₀ form);

σ_{pt} - standard deviation of proficiency assessment (experience value 0.25 log₁₀ unit*)

*Note:

a) The standard deviation of our food microbiology PT has been about 0.25 log₁₀unit since 2000.

b) The standard deviation of Aerobic plate count in APLAC T030 (2002) is 0.180 log₁₀ unit and 0.251 log₁₀ unit.

c) Before this APLAC T097, the same batch of samples was applied for domestic PT scheme, and results show that the standard deviation of Aerobic plate count is 0.179 log₁₀ unit, and *Staphylococcus aureus* is 0.234 log₁₀ unit.

d) The experience value 0.25 log₁₀unit is often used for microbiology quantitative PT programme by FEPAS, LGC, etc.

The results were assessed according to the following standards, that is:

$|z| \leq 2.0$ indicates the result is satisfactory;

$2.0 < |z| < 3.0$ indicates the result is questionable, warning signal;

$|z| \geq 3.0$ indicates the result is unsatisfactory (an outlier), action signal.

5.2 *Staphylococcus aureus*

Due to $S_s > 0.3\sigma$ ($S_s = 0.094$ $\sigma_{pt} = 0.25$), the participants' performance were calculated by z'-scores and σ'_{pt} , the z'-scores and σ'_{pt} were calculated by the following formulae:

$$\sigma'_{pt} = \sqrt{\sigma_{pt}^2 + S_s^2}$$

$$z'_i = \frac{x_i - x_{pt}}{\sigma'_{pt}}$$

In the formulae:

x_i - participants' testing results (in log₁₀ form);

x_{pt} - assigned value(in log₁₀ form);

σ_{pt} - standard deviation of proficiency assessment

S_s^2 - heterogeneity standard deviation

The results were assessed according to the following standards, that is:

$|z'| \leq 2.0$ indicates the result is satisfactory;

$2.0 < |z'| < 3.0$ indicates the result is questionable, warning signal;

$|z'| \geq 3.0$ indicates the result is unsatisfactory (an outlier), action signal.

6. Results Reported by Participants

6.1A total of 106 laboratories from 47 economies participated in the programme. 75 laboratories submitted their results on time. Testing statistical results were summarized in table 3. The evaluation of results were summarized in table 4~6.

Table 3 Testing statistical results summary

Testing items	Results number	Robust median $\bar{X}$ (in $\log_{10}$ form)	Standard deviation ($\sigma_{\text{pt}}, \sigma'_{\text{pt}}$)
Aerobic Plate Count	75	4.491	0.25
<i>Staphylococcus aureus</i>	74	4.301	0.267
Sulphite-reducing <i>Clostridium</i>	49	3.279	0.25

Table 4 The summary of satisfactory results

Testing items	Results number	Satisfactory results number	Percent (%)
Aerobic Plate Count	75	46	61.3
<i>Staphylococcus aureus</i>	74	41	55.4
Sulphite-reducing <i>Clostridium</i>	49	37	75.5

Table 5 The summary of questionable results

Testing items	Results number	Questionable results number	Percent (%)	Lab code
Aerobic Plate Count	75	0	0.0	/
<i>Staphylococcus aureus</i>	74	5	6.8	T097-004, T097-018, T097-027, T097-054, T097-056
Sulphite-reducing <i>Clostridium</i>	49	1	2.0	T097-061

Table 6 The summary of unsatisfactory results

Testing items	Results number	unsatisfactory results number	Percent (%)	Lab code
Aerobic Plate Count	75	29	38.7	T097-002, T097-003, T097-004, T097-006, T097-012, T097-019, T097-023, T097-027, T097-030, T097-035, T097-036, T097-037, T097-039, T097-042, T097-044, T097-045, T097-046, T097-058, T097-061, T097-063, T097-064, T097-065, T097-066, T097-076, T097-077, T097-085, T097-088, T097-102, T097-104
<i>Staphylococcus aureus</i>	74	28	37.8	T097-002, T097-003, T097-007, T097-012, T097-022, T097-023, T097-026, T097-028, T097-030, T097-036, T097-042, T097-045, T097-051, T097-055, T097-058, T097-061, T097-062, T097-064, T097-065, T097-066, T097-076, T097-085, T097-087, T097-088, T097-093, T097-102, T097-104, T097-105
Sulphite-reducing <i>Clostridium</i>	49	11	22.4	T097-026, T097-027, T097-042, T097-044, T097-045, T097-050, T097-051, T097-067, T097-075, T097-079, T097-103

7. General comments

Total 106 labs were nominated or registered through accreditation bodies all over the world from 47 economies. 75 labs submitted results and 31 labs' results were not received. The reason why 31 labs did not submit results were listed in Table 7.

Table 7 The summary of the reason why labs did not submit results

Results number	Reason(s)	Percent (%)
14	Had not confirmed shipping address and testing items until the deadline of the samples delivery	13
1	Quit the T097 because they could not get import permission.	0.9

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Results number	Reason(s)	Percent (%)
8	Samples could not be delivered because the business scope of delivery company, including DHL, EMS or FedEx do not cover the area of the Montenegro, Palestine, etc.	7.5
6	Samples could not reach labs because of the problem of the import permission or missing during transfer of the delivery.	5.7
2	Labs did not submit results by the deadline.	1.9

8. Technical Comments

Total 75 participants submitted their results in this programme, but there was relatively high percent of unsatisfactory results

8.1 Aerobic Plate Count

75 participants submitted their results. 46 results are satisfactory and 29 unsatisfactory results. The methods used in this testing item include FDA-BAM chapter 3, ISO 4833 and GB 4789.2-2010, and incubation temperature mostly is 30°C. The predominant target bacteria, *Bacillus cereus*, chosen in sample A is fit for proficiency testing because of the following two reasons:

- (a) it survives easily at adverse environmental conditions;
- (b) it is well known that there is no significant difference under the incubation temperature 22~37°C on different non-selective media during total Aerobic plate count.

However, this strain grows quickly and can easily form spreading colonies. At the beginning of the testing, the participants should do an overall estimate of the Aerobic plate count and have some techniques to prevent unsatisfactory results from happening, such as blank control, actions to prevent spreading of colonies, daily observation of the plates etc.

8.2 *Staphylococcus aureus*

74 participants submitted their results. There are 41 satisfactory results, 5 questionable results and 28 unsatisfactory results. The methods used in this testing item are ISO 6888, GB 4789.10-2010, MFHPB-21, MOHW No.1021950329 and so on. The quality of Baird Parker and rabbit plasma has an important influence on the final results.

8.3 Sulphite-reducing *Clostridium*

49 participants submitted their results. There are 37 satisfactory results, 1 questionable result and 11 unsatisfactory results in this testing item. The percent of satisfactory results is 75.5

percent. The methods used in this item contain ISO 7937 and ISO 15213. Most participants kindly provided testing details. It can be seen that 22 participants added D-Cycloserine in culture medium, 5 results were unsatisfactory, and 22 participants didn't added D-Cycloserine in culture medium, 3 results were unsatisfactory.

9.References

- [1] ISO/IEC 17043:2010, Conformity assessment–General requirements for proficiency testing.
- [2] ISO/IEC 17025:2005, General requirements for the competence of testing and calibration laboratories.
- [3] ISO 13528:2015, “Statistical methods for use in proficiency testing by interlaboratory comparisons”.

APPENDIX A Results and Statistical Analysis

The testing results obtained from the participants with corresponding testing methods and the individual z-scores are listed in Table A.1~A.3.

Table A.1 Data analyze of Aerobic Plate Count

Lab code	Testing results (CFU/mL)	Testing results (log ₁₀ form)	z-score	Testing method
APLAC T097-001	4.87×10 ⁴	4.688	0.78	FDA/BAM 2001
APLAC T097-002	490	2.690	-7.20	ISO 4833
APLAC T097-003	260	2.415	-8.31	surface spread ISO 4833-2
APLAC T097-004	192000	5.283	3.17	ISO 4833-1
APLAC T097-006	550	2.740	-7.00	ISO 4833-1:2013
APLAC T097-007	7.1×10 ⁴	4.851	1.44	ISO 4833-1:2013
APLAC T097-010	55000	4.740	1.00	ISO 4833-1
APLAC T097-011	42000	4.623	0.53	ISO 4833
APLAC T097-012	180000	5.255	3.06	PN-EN ISO 4833-1:2013-12
APLAC T097-013	43000	4.633	0.57	zautomatyzowana NPL system Tempo
APLAC T097-016	28000	4.447	-0.18	UNI EN ISO 4833-1:2013
APLAC T097-017	41000	4.613	0.49	ISO 4833-1 2013
APLAC T097-018	50000	4.699	0.83	CCFRA 1.1.1
APLAC T097-019	245	2.389	-8.41	/
APLAC T097-022	2.6×10 ⁴	4.415	-0.31	ISO 4833-2:2013
APLAC T097-023	2300	3.362	-4.52	ISO 4833-1:2013
APLAC T097-026	31000	4.491	0.00	NF EN ISO 4833-1(2013)
APLAC T097-027	3080000	6.489	7.99	ISO 4833-1
APLAC T097-028	56000	4.748	1.03	ISO 4833-2
APLAC T097-029	49090	4.691	0.80	LVS EN ISO 4833-1:2014
APLAC T097-030	500	2.699	-7.17	ISO 4833-1
APLAC T097-033	52000	4.716	0.90	ČSN EN ISO 4833-2
APLAC T097-034	54100	4.733	0.97	EN ISO 4833-1
APLAC T097-035	3000	3.477	-4.06	ISO 4833:2003
APLAC T097-036	410	2.613	-7.51	NMKL 86:2013
APLAC T097-037	1.4×10 ³	3.146	-5.38	民國 102 年 9 月 6 日部授食字第 1021950329 號公告修正
APLAC T097-038	76000	4.881	1.56	MOHW 1021950329
APLAC T097-039	5.4×10 ⁵	5.732	4.96	MOHW Food No. 1021950329

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Lab code	Testing results (CFU/mL)	Testing results (log ₁₀ form)	z-score	Testing method
APLAC T097-040	5.2×10 ⁴	4.716	0.90	MOHW No.1021950329 生菌數之檢驗
APLAC T097-042	240	2.380	-8.44	TS 7703 EN ISO 4833
APLAC T097-043	30000	4.477	-0.06	ISO 4833-1:2013
APLAC T097-044	2600000	6.415	7.69	ISO 4833:2003
APLAC T097-045	36	1.556	-11.7	ISO 4833:2003
APLAC T097-046	500	2.699	-7.17	TCVN 4884:2005
APLAC T097-049	16000	4.204	-1.15	pour plate method
APLAC T097-050	24000	4.380	-0.44	FDA-BAM chapter 3
APLAC T097-051	17500	4.243	-0.99	FDA, BAM Chapter 3
APLAC T097-053	47500	4.677	0.74	IS 885/3
APLAC T097-054	49500	4.695	0.81	methods of microbiology examination of food 3rd edition
APLAC T097-055	45000	4.653	0.65	ISO 4833-1:2013
APLAC T097-056	39000	4.591	0.40	DS/EN ISO 4833-1
APLAC T097-057	33000	4.519	0.11	Tempo TVC
APLAC T097-058	230	2.362	-8.52	AOAC 990.12
APLAC T097-061	1100	3.041	-5.80	I.S. EN ISO 4833
APLAC T097-062	73000	4.863	1.49	AC Petrifilm. AFNOR Certificate no 3M 01/1-09/89 (as compared to ISO 4833)
APLAC T097-063	5000	3.699	-3.17	MFHPB-18
APLAC T097-064	680	2.833	-6.64	MFHPB-18
APLAC T097-065	2700	3.431	-4.24	MFHPB-18, QA-9901-1001
APLAC T097-066	280	2.447	-8.18	MFHPB-18
APLAC T097-067	22000	4.342	-0.60	NF EN ISO 4833-1
APLAC T097-071	65000	4.813	1.29	GB4789.2-2010
APLAC T097-073	20000	4.301	-0.76	GB4789.2.2010
APLAC T097-074	50000	4.699	0.83	ISO 4833
APLAC T097-075	34000	4.531	0.16	ISO 4833-1:2013
APLAC T097-076	690	2.839	-6.61	Japanese Standard Methods
APLAC T097-077	460	2.663	-7.31	Japanese standard method
APLAC T097-079	63000	4.799	1.23	MSZ EN ISO 4833:2003
APLAC T097-085	120	2.079	-9.65	IS 5402:2012
APLAC T097-086	15000	4.176	-1.26	IS 5402:2012
APLAC T097-087	47000	4.672	0.72	ISO 4833-1:2013

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Lab code	Testing results (CFU/mL)	Testing results (log ₁₀ form)	z-score	Testing method
APLAC T097-088	225	2.352	-8.56	US FDA BAM CHAPTER 3
APLAC T097-089	45000	4.653	0.65	FAO,1992 (plating method)
APLAC T097-090	35000	4.544	0.21	MFHPB-18
APLAC T097-091	70000	4.845	1.41	Bacteriological analytical method chapter 03
APLAC T097-092	17000	4.230	-1.04	AS 5013.5
APLAC T097-093	43000	4.633	0.57	GB 4789.2.2010
APLAC T097-094	12000	4.079	-1.65	GB4789.2-2010
APLAC T097-095	38000	4.580	0.35	GB4789.2-2010
APLAC T097-096	6.1 × 10 ⁴	4.785	1.18	GB 4789.2-2010
APLAC T097-101	64000	4.806	1.26	NF EN ISO 4833-1
APLAC T097-102	1100	3.041	-5.80	ISO 4833
APLAC T097-103	21000	4.322	-0.68	Bacteriological Analytical Manual (BAM)
APLAC T097-104	750	2.875	-6.47	ISO 4833:2009
APLAC T097-105	26909	4.430	-0.25	BDS ISO 4833:2009
APLAC T097-106	42000	4.623	0.53	ISO 4833-1

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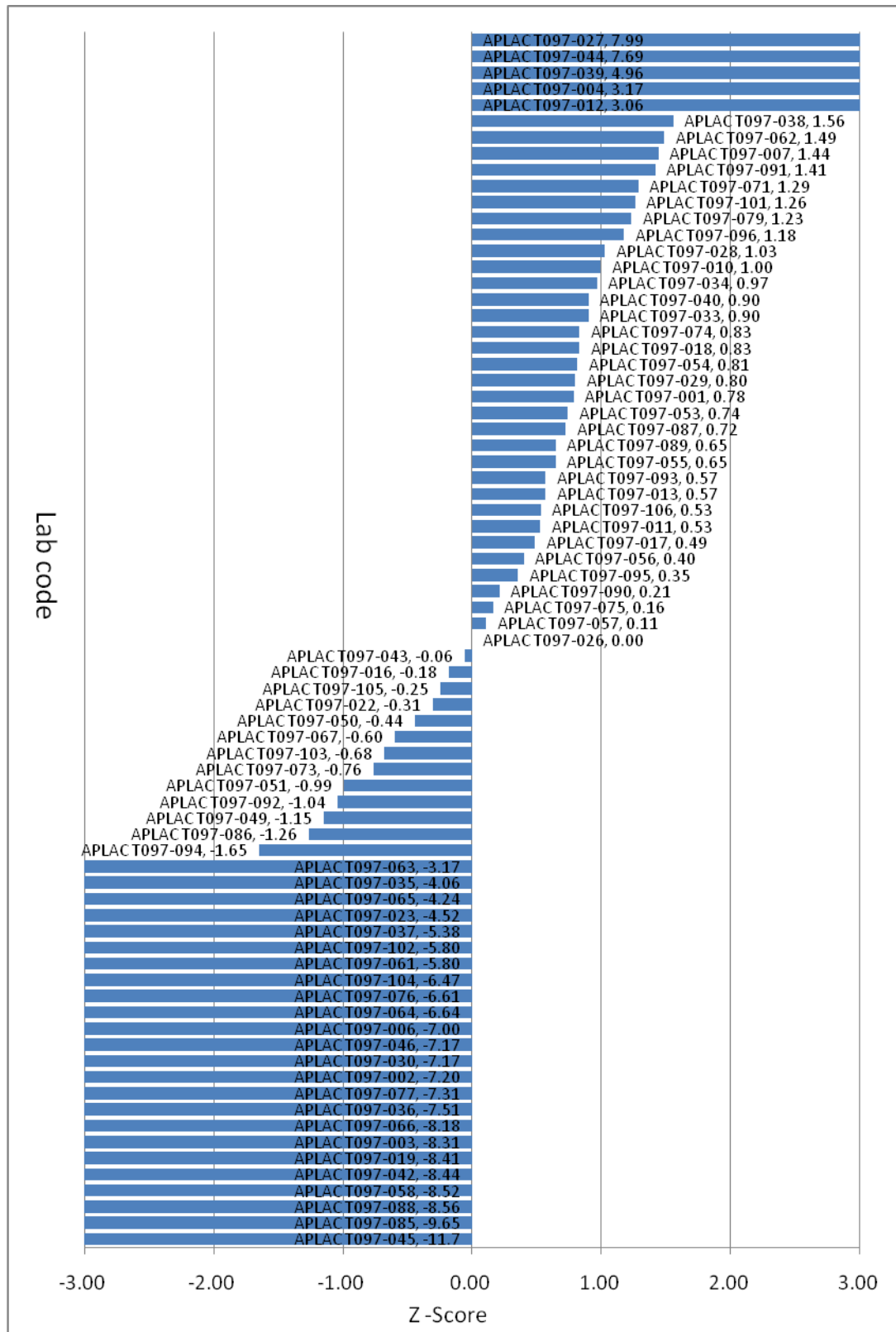


Figure 1-1 z-score of Aerobic Plate Count

Note: The lab code and its z-score are listed in the figure, eg. APLAC T097-057, 0.11.

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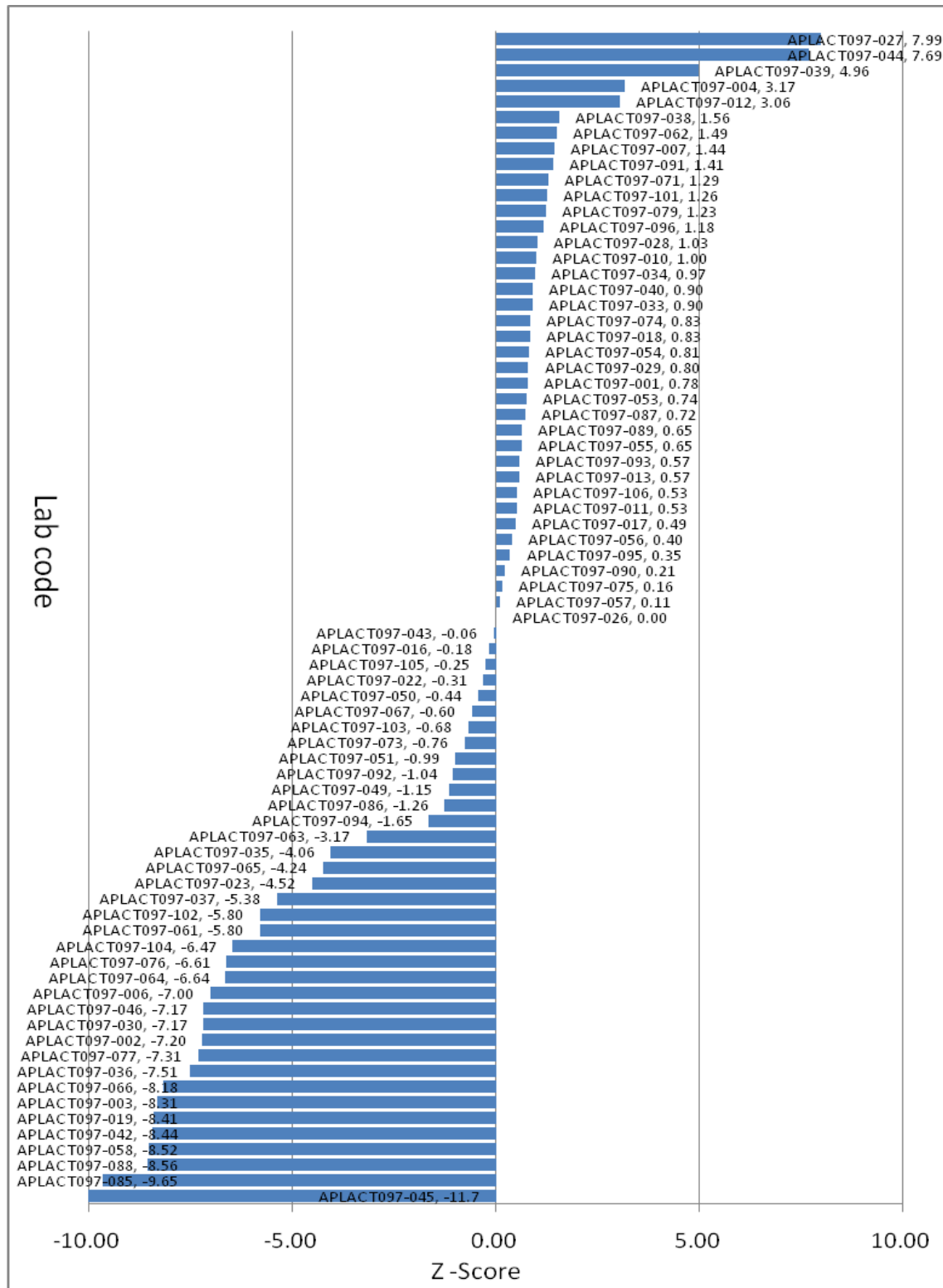


Figure 1-2 z-score of Aerobic Plate Count with larger z-score range

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Table A.2 Data analyze of *Staphylococcus aureus*

Lab code	Testing results (CFU/mL)	Testing results (log ₁₀ form)	z'-score	Testing method
APLAC T097-001	2.0×10 ⁴	4.301	0.00	ISO 6888-1:1991
APLAC T097-002	52	1.716	-9.68	ISO 6888-1
APLAC T097-003	450	2.653	-6.17	ISO 6888-1
APLAC T097-004	69000	4.839	2.01	ISO 6888-1
APLAC T097-006	36000	4.556	0.96	ISO 6888-1:1999 with amendment 1:2003
APLAC T097-007	1.6×10 ²	2.204	-7.85	ISO 6888-1:1999/Amd 1:2003
APLAC T097-010	29000	4.462	0.60	ISO 6888-2
APLAC T097-011	28000	4.447	0.55	ISO 6888-2
APLAC T097-012	220000	5.342	3.90	PN-EN ISO 6888-2:2001+A1:2004
APLAC T097-013	20000	4.301	0.00	PN-EN ISO 6888-2:2001+A1:2004
APLAC T097-016	16500	4.217	-0.31	UNI EN ISO 6888-2:2004
APLAC T097-017	29000	4.462	0.60	ISO 6888-1 1999/Amd 1 2003
APLAC T097-018	4200	3.623	-2.54	CCFRA 3.5.1
APLAC T097-019	19650	4.293	-0.03	/
APLAC T097-022	73	1.863	-9.13	ISO 6888-1:1999
APLAC T097-023	1	0.000	-16.1	ISO 6888-1:1999
APLAC T097-026	400000	5.602	4.87	ISO 6888-1(1999)&A1(2004)
APLAC T097-027	82800	4.918	2.31	ISO 6888-2
APLAC T097-028	310000	5.491	4.46	ISO 6888-1 (1999)
APLAC T097-029	25090	4.400	0.37	LVS EN ISO 6888-1+A1:2007
APLAC T097-030	150	2.176	-7.96	ISO 6888-1
APLAC T097-033	22000	4.342	0.16	ČSN EN ISO 6888-1
APLAC T097-034	35000	4.544	0.91	EN ISO 6888-1
APLAC T097-035	7600	3.881	-1.57	ISO 6888-2:1999, Amendment 1:2003
APLAC T097-036	50	1.699	-9.75	NMKL 66:2009
APLAC T097-037	4.7×10 ⁴	4.672	1.39	民國 102 年 9 月 6 日部授食字第 1021950329 號公告修正
APLAC T097-038	39000	4.591	1.09	MOHW 1021950329
APLAC T097-039	3.2×10 ⁴	4.505	0.76	MOHW Food No. 1021950329
APLAC T097-040	3.3×10 ⁴	4.519	0.81	MOHW No.1021950329 金黃色 葡萄球菌之檢驗
APLAC T097-042	230	2.362	-7.26	TS 6582-1 EN ISO 6888-1

APLAC T097 Proficiency Testing Programme
Food Microbiology Quantitative Scheme

Lab code	Testing results (CFU/mL)	Testing results (log ₁₀ form)	z'-score	Testing method
APLAC T097-043	29000	4.462	0.60	ISO 6888 -1:1999
APLAC T097-044	38000	4.580	1.04	ISO 6888-1:1999
APLAC T097-045	63	1.799	-9.37	ISO 6888:1999
APLAC T097-046	25000	4.398	0.36	TCVN 4830-1:2005
APLAC T097-049	35400	4.549	0.93	Spread plate method
APLAC T097-050	7300	3.863	-1.64	FDA, BAM Chapter 12
APLAC T097-051	300	2.477	-6.83	FDA, BAM Chapter 12
APLAC T097-053	13000	4.114	-0.70	IS 885/6
APLAC T097-054	70500	4.848	2.05	methods of microbiology examination of Food
APLAC T097-055	2200	3.342	-3.59	ISO 6888-2:1999
APLAC T097-056	73000	4.863	2.11	IDF 145A:1997
APLAC T097-057	33500	4.525	0.84	Tempo STA
APLAC T097-058	240	2.380	-7.19	AOAC 2003.07
APLAC T097-061	240	2.380	-7.19	I.S. EN ISO 6888-1:1999
APLAC T097-062	2300	3.362	-3.52	STX Petrifilm, AFNOR certificate number 3M 01/9-04/03 (as compared to EN ISO 6888-1)
APLAC T097-063	10000	4.000	-1.13	MFHPB-21
APLAC T097-064	9	0.954	-12.5	MFHPB-21
APLAC T097-065	360000	5.556	4.70	MFHPB-21, QA-9901-1003
APLAC T097-066	12	1.079	-12.1	MFHPB-21
APLAC T097-067	6300	3.799	-1.88	NF EN ISO 6888-2
APLAC T097-071	49000	4.690	1.46	ISO 6888-1:2003
APLAC T097-073	21000	4.322	0.08	GB4789.10-2010
APLAC T097-074	48000	4.681	1.42	ISO 6888
APLAC T097-075	43000	4.633	1.25	ISO 6888-2
APLAC T097-076	0	/	<-16.1	Japanese standard method
APLAC T097-079	13700	4.137	-0.62	MSZ EN ISO 6888-1:2008
APLAC T097-085	980000	5.991	6.33	IS 5887(P-II)1976
APLAC T097-086	32000	4.505	0.76	IS : 5887 (II)
APLAC T097-087	23	1.362	-11.0	ISO 6888-1:1999 AMD.-1:2003
APLAC T097-088	<100	<2.000	<-8.62	US FDA BAM CHAPTER 12
APLAC T097-089	55000	4.740	1.65	/

APLAC T097 Proficiency Testing Programme
Food Microbiology Quantitative Scheme

Lab code	Testing results (CFU/mL)	Testing results (log ₁₀ form)	z'-score	Testing method
APLAC T097-090	19000	4.279	-0.08	MFHPB-21
APLAC T097-091	12,000	4.079	-0.83	Bacteriological analytical method chapter 12
APLAC T097-092	31000	4.491	0.71	AS 5013.12.1
APLAC T097-093	480	2.681	-6.07	GB 4789.10-2010
APLAC T097-094	32000	4.505	0.76	GB4789.10-2010
APLAC T097-095	17000	4.230	-0.26	GB 4789.10-2010
APLAC T097-096	14000	4.146	-0.58	GB 4789.10-2010
APLAC T097-101	15000	4.176	-0.47	NF V08/057-1
APLAC T097-102	250	2.398	-7.13	ISO 6888-1
APLAC T097-103	29000	4.462	0.60	ISO 6888-1 (Spread plate)
APLAC T097-104	850	2.929	-5.14	ISO 6888-1:2009
APLAC T097-105	541	2.733	-5.87	BDS ISO 6888-1:2009
APLAC T097-106	23000	4.362	0.23	BDS ISO 6888-1:2009

APLAC T097 Proficiency Testing Programme
Food Microbiology Quantitative Scheme

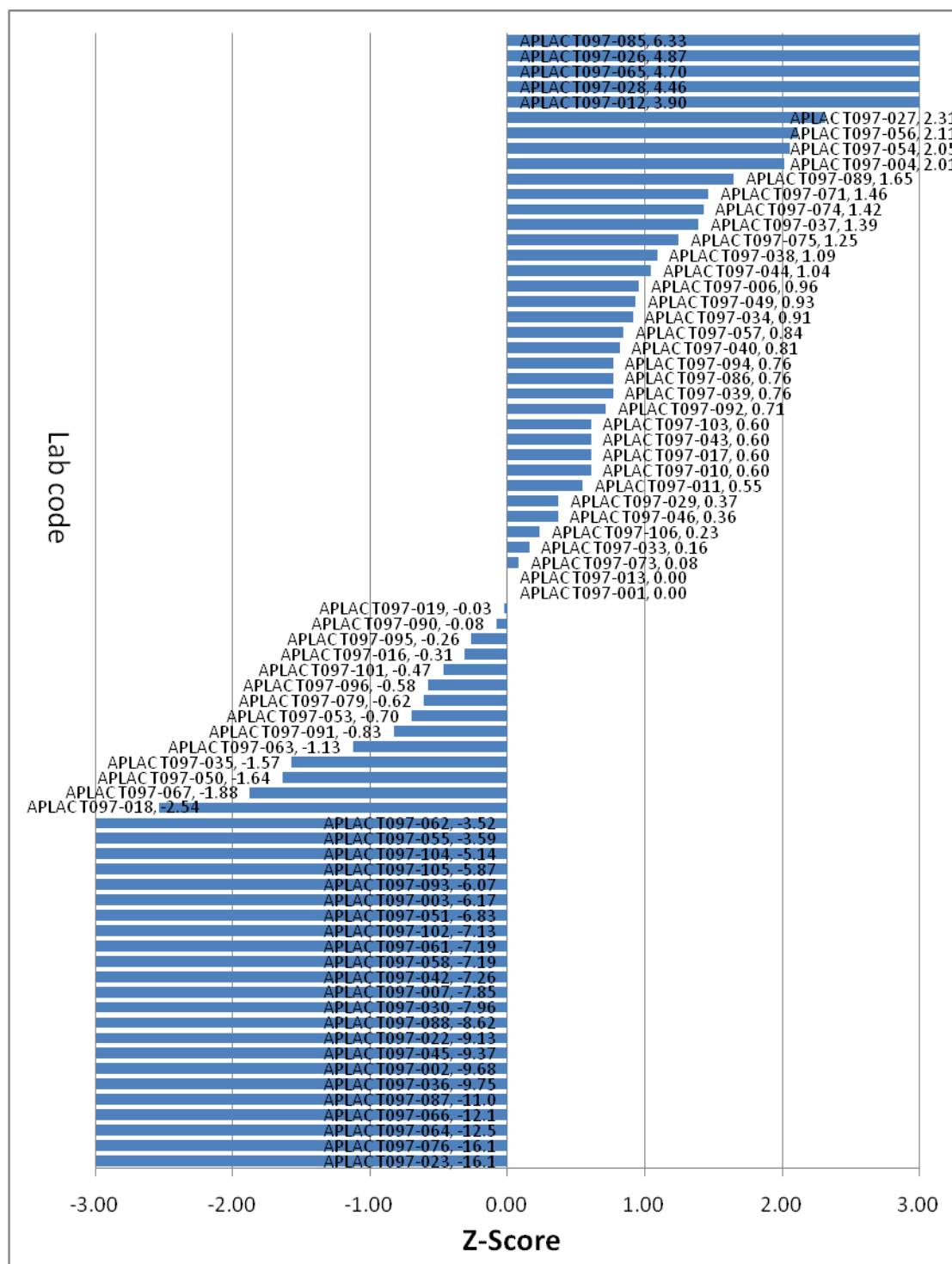


Figure 2-1 z'-score of *Staphylococcus aureus*

APLAC T097 Proficiency Testing Programme
Food Microbiology Quantitative Scheme

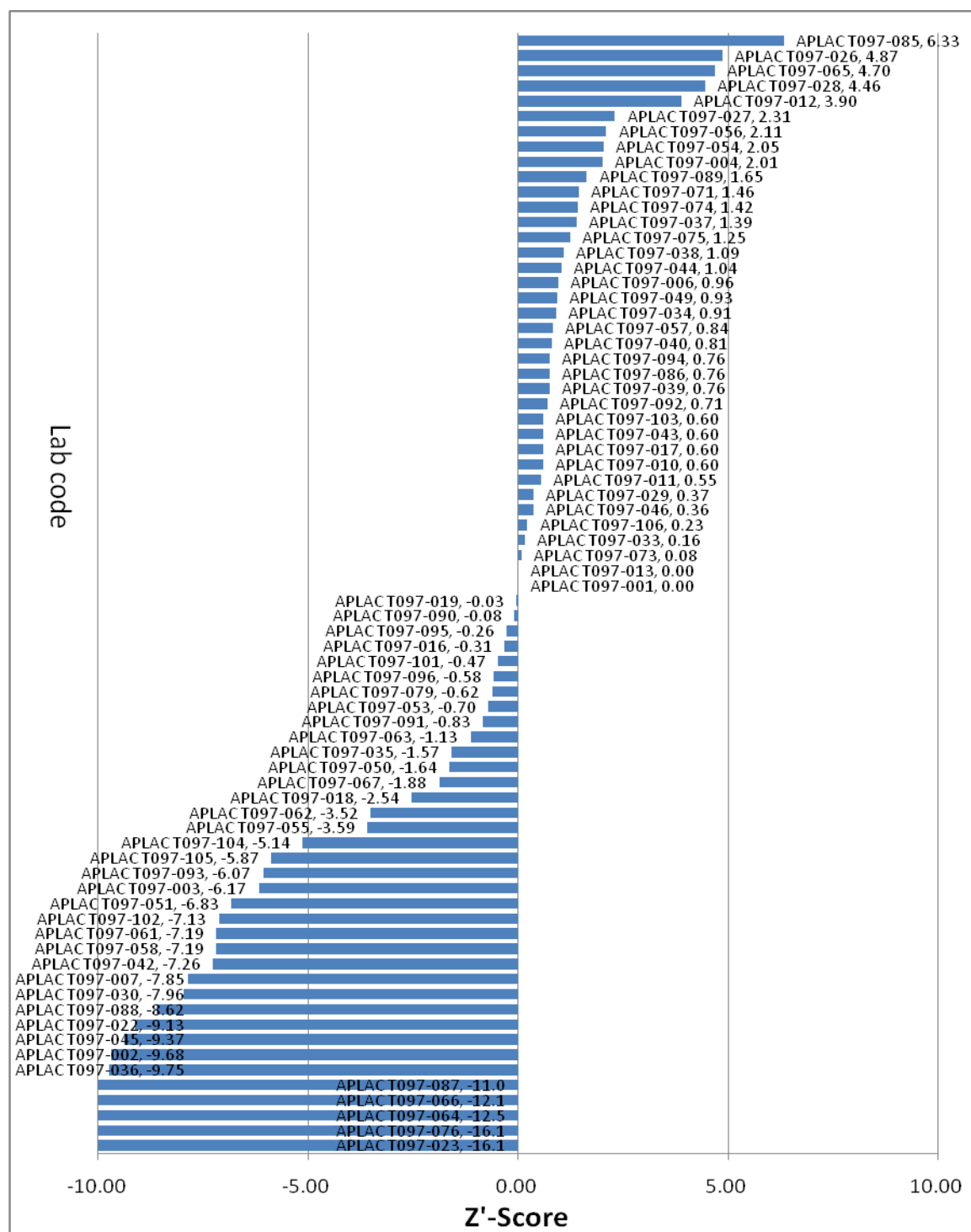


Figure 2-2 z'-score of *Staphylococcus aureus* with larger z'-score range

APLAC T097 Proficiency Testing Programme
Food Microbiology Quantitative Scheme

Table A.3 Data analyze of Sulphite-reducing *Clostridium*.

Lab code	Testing results (CFU/mL)	Testing results (log ₁₀ form)	z-score	Testing method
APLAC T097-003	2000	3.301	0.09	ISO 7937
APLAC T097-010	1800	3.255	-0.09	ISO 15213
APLAC T097-011	1900	3.279	0.00	ISO 7937
APLAC T097-012	2300	3.362	0.33	PN-ISO 15213:2005
APLAC T097-013	2200	3.342	0.25	PN-ISO 15213:2005
APLAC T097-016	1600	3.204	-0.30	NF V 08-061:2009
APLAC T097-017	1300	3.114	-0.66	NF V 08-061 2009
APLAC T097-018	1520	3.182	-0.39	CCFRA 2.8.1 :2007
APLAC T097-026	27000	4.431	4.61	ISO 15213(2003)
APLAC T097-027	136000	5.134	7.42	ISO 15213
APLAC T097-029	1545	3.189	-0.36	LVS EN ISO 7937:2005
APLAC T097-030	810	2.908	-1.48	ISO 15213
APLAC T097-033	1900	3.279	0.00	ČSN EN ISO 7937
APLAC T097-034	2030	3.307	0.11	EN ISO 7937
APLAC T097-035	4200	3.623	1.38	NMKL 56:2008, mod.
APLAC T097-036	1800	3.255	-0.09	NMKL 56:2015
APLAC T097-042	0	/	<-13.1	ISO 7937
APLAC T097-043	3400	3.531	1.01	ISO 15213:2003
APLAC T097-044	12	1.079	-8.80	ISO 7937-2004
APLAC T097-045	43	1.633	-6.58	ISO 7937:2004
APLAC T097-046	1300	3.114	-0.66	TCVN 4991:2005
APLAC T097-049	2000	3.301	0.09	Pour Plate Method
APLAC T097-050	20000	4.301	4.09	/
APLAC T097-051	140.0	2.146	-4.53	Compendium of Method for the Microbiological Examination of Food, Chapter 27
APLAC T097-053	2850	3.455	0.70	IS 885/9
APLAC T097-054	20000	3.301	0.09	methods formicrobiology examination of food
APLAC T097-055	2500	3.398	0.48	ISO 15213:2003
APLAC T097-056	1900	3.279	0.00	NMKL No. 95 5th ED 2009
APLAC T097-061	10000	4.000	2.88	I.S. EN ISO 7937:2004
APLAC T097-062	760	2.881	-1.59	ISO 7937:2004

APLAC T097 Proficiency Testing Programme
Food Microbiology Quantitative Scheme

Lab code	Testing results (CFU/mL)	Testing results (log ₁₀ form)	z-score	Testing method
APLAC T097-063	5800	3.763	1.94	MFHPB-23, API
APLAC T097-064	1700	3.230	-0.19	MFHPB-23
APLAC T097-067	<10	< 1.000	-9.12	NF EN ISO 7937
APLAC T097-071	3400	3.531	1.01	ISO 15213:2003(E)
APLAC T097-073	2200	3.342	0.25	NZTM 2:59.3
APLAC T097-074	2200	3.342	0.25	ISO 151213
APLAC T097-075	29000	4.462	4.73	Baumgart, 2012, modified
APLAC T097-076	720	2.857	-1.69	Japanese Standard Methods
APLAC T097-079	93	1.968	-5.24	MSZ 3640-16:1978
APLAC T097-086	1100	3.041	-0.95	IS : 5887(IV)
APLAC T097-087	1200	3.079	-0.80	ISO 15213:2003
APLAC T097-088	115	3.061	-0.87	USFDA BAM CHAPTER 16
APLAC T097-090	2,200	3.342	0.25	ISO-15213
APLAC T097-093	2200	3.342	0.25	SN/T 1071-2014
APLAC T097-095	3400	3.531	1.01	SN/T 1071-2002
APLAC T097-096	1.7×10 ³	3.230	-0.19	SRC monitoring work program for infant formula powder processing procedure
APLAC T097-101	1700	3.230	-0.19	NF EN ISO 7937
APLAC T097-102	2200	3.342	0.25	ISO 15213:2003
APLAC T097-103	30	1.477	-7.21	Drop plate

APLAC T097 Proficiency Testing Programme
Food Microbiology Quantitative Scheme

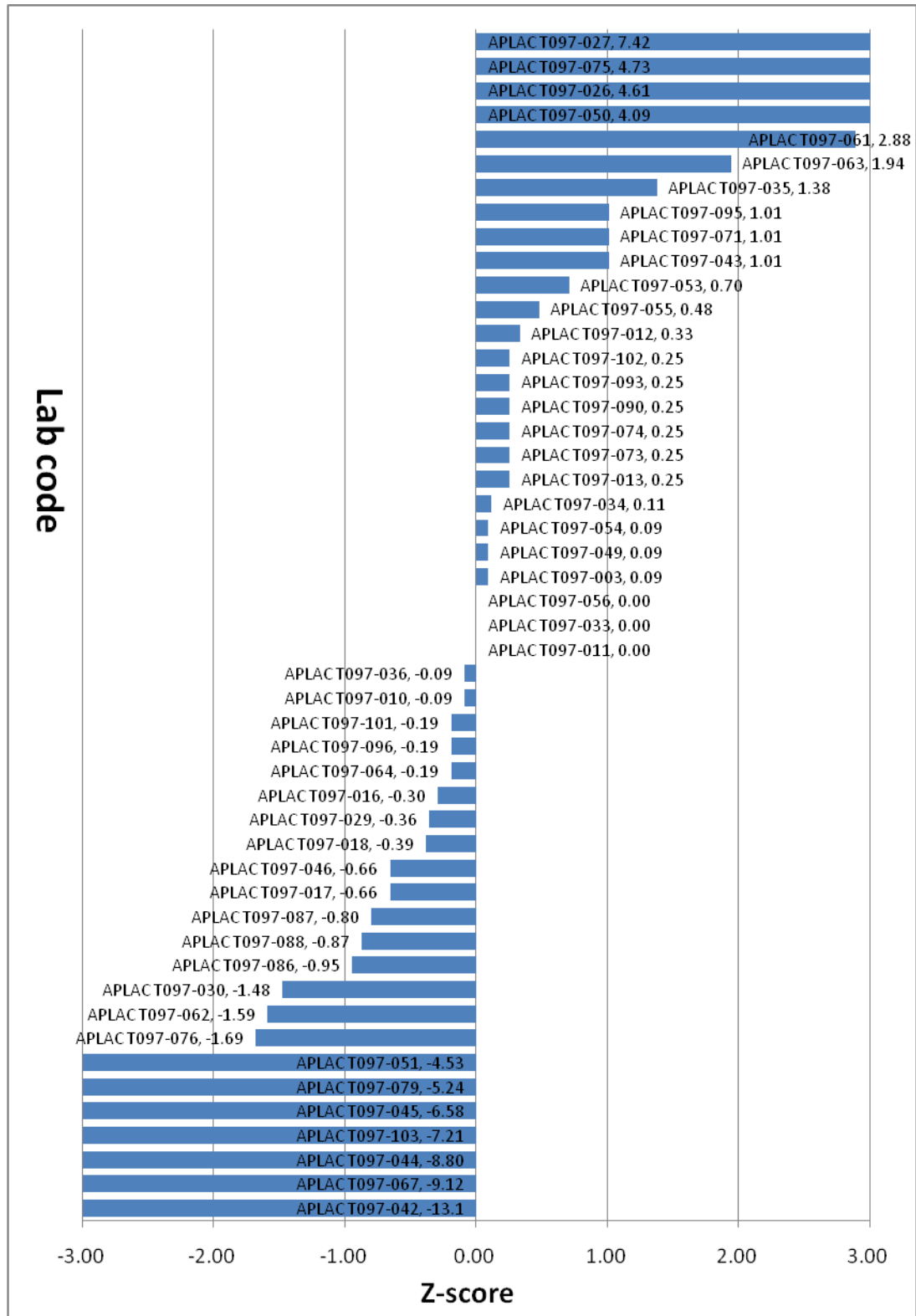


Figure 3-1 z-score of Sulphite-reducing *Clostridium*

APLAC T097 Proficiency Testing Programme
Food Microbiology Quantitative Scheme

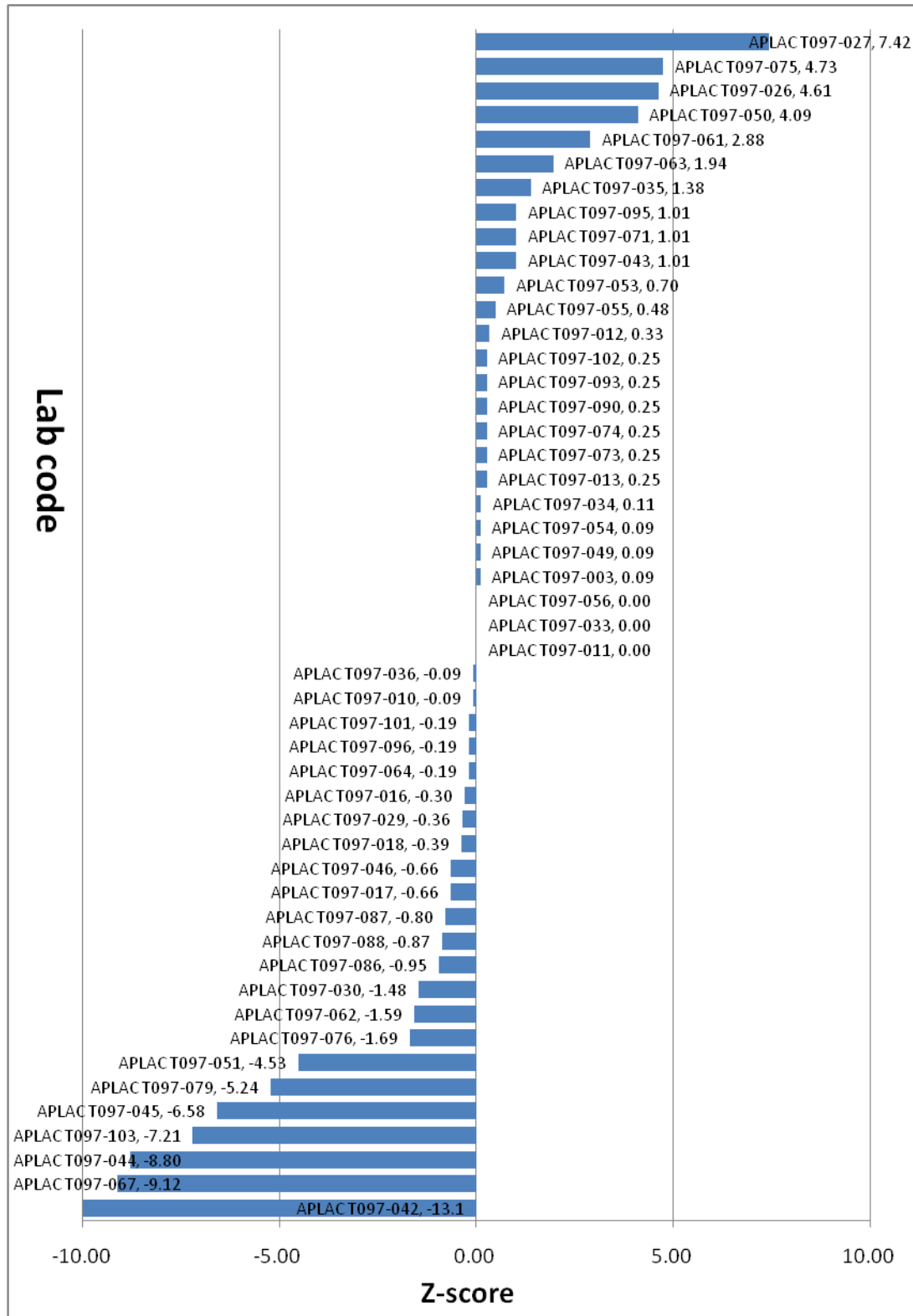


Figure 3-2 z-score of Sulphite-reducing *Clostridium* with larger z-score range

APLAC T097 Proficiency Testing Programme
“Food Microbiology Quantitative Scheme”

APPENDIX B Homogeneity Testing and Stability Check Results

Record number: APC-140811

Homogeneity Testing Results of Aerobic plate count

Homogeneity testing results of aerobic plate count															
The number of sample:				12	Units	CFU/mL	each sample has been tested replicated twice				Test item:	Aerobic plate count		Test method:	AOAC Official Method 990.12
Number			Result 1	Result 2	Result 3	Result 4	Result 5	Average Result	Within groups bias 1	Within groups bias 2				Between groups bias	Within groups range
j	x_{1j}	x_{2j}	x_{3j}	x_{4j}	x_{5j}	x_{6j}	x_{7j}	$\bar{x}_j$	$(x_{1j} - \bar{x}_j)^2$	$(x_{2j} - \bar{x}_j)^2$	$(x_{3j} - \bar{x}_j)^2$	$(x_{4j} - \bar{x}_j)^2$	$(x_{5j} - \bar{x}_j)^2$	$n_j(\bar{x}_j - \bar{x})^2$	$(x_{1j} - x_{2j})^2$
1	69000	74000	4.839	4.869				4.854	0.000231	0.000231				0.004113	0.000923
2	87000	69000	4.940	4.839				4.889	0.002534	0.002534				0.000208	0.010134
3	78000	82000	4.892	4.914				4.903	0.000118	0.000118				0.000025	0.000472
4	71000	76000	4.851	4.881				4.866	0.000218	0.000218				0.002225	0.000874
5	70000	78000	4.845	4.892				4.869	0.000552	0.000552				0.001897	0.002209
6	82000	89000	4.914	4.949				4.932	0.000316	0.000316				0.002075	0.001266
7	73000	69000	4.863	4.839				4.851	0.000150	0.000150				0.004667	0.000599
8	84000	87000	4.924	4.940				4.932	0.000058	0.000058				0.002114	0.000232
9	88000	81000	4.944	4.908				4.926	0.000324	0.000324				0.001468	0.001296
10	76000	83000	4.881	4.919				4.900	0.000366	0.000366				0.000001	0.001464
11	89000	84000	4.949	4.924				4.937	0.000158	0.000158				0.002804	0.000631
12	90000	82000	4.954	4.914				4.934	0.000409	0.000409				0.002399	0.001634
								$\bar{x}$	SUM1	SUM2				SUMs	SUMw
		$\bar{x}_i$	4.900	4.899				4.899	0.005433	0.005433				0.023996	0.021733

One-Way ANOVA							
	SS	f	MS	F	F critical value	confidence probability	STD
Between groups	0.023996	11	0.002181	2.41	2.72	0.95	0.025
Within groups	0.010867	12	0.000906				

ISO13528: 2005	
S_x	0.033
S_w	0.030
S_s	0.025

Conclusion: The homogeneity of Staphylococcus aureus is acceptable at a 95% Confidence Interval level.

Test: Zhao Hongyang	Date: 2014.08.13	Statistical: Wang Xiujun	Date: 2014.08.15	Check: Lu Xing-an	Date: 2014.08.16
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APLAC T097 Proficiency Testing Programme
“Food Microbiology Quantitative Scheme”

Record number: staph-140811

Homogeneity Testing Results of Staphylococcus aureus

The number of sample:	12	Units:	CFU/mL	each sample has been tested replicated twice	Test item:	Staphylococcus aureus	Test method:	AOAC Official Method 2003.07
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Number			Result 1	Result 2	Result	Result	Result	Average Result	Within groups bias 1	Within groups bias 2				Between groups bias	Within groups range
j	x_{1j}	x_{2j}	x_{1j}	x_{2j}	x_{3j}	x_{4j}	x_{5j}	$\bar{x}_j$	$(x_{1j} - \bar{x}_j)^2$	$(x_{2j} - \bar{x}_j)^2$	$(x_{3j} - \bar{x}_j)^2$	$(x_{4j} - \bar{x}_j)^2$	$(x_{5j} - \bar{x}_j)^2$	$n_j(\bar{x}_j - \bar{\bar{x}})^2$	$(x_{1j} - x_{2j})^2$
1	9400	21000	3.973	4.322				4.148	0.030466	0.030466				0.039563	0.121865
2	21000	17000	4.322	4.230				4.276	0.002105	0.002105				0.000287	0.008422
3	26000	37000	4.415	4.568				4.492	0.005870	0.005870				0.082635	0.023479
4	29000	38000	4.462	4.580				4.521	0.003445	0.003445				0.108364	0.013779
5	19000	27000	4.279	4.431				4.355	0.005822	0.005822				0.008908	0.023290
6	23000	41000	4.362	4.613				4.487	0.015757	0.015757				0.079151	0.063029
7	19000	28000	4.279	4.447				4.363	0.007090	0.007090				0.011141	0.028360
8	9800	17000	3.991	4.230				4.111	0.014307	0.014307				0.063000	0.057228
9	15000	9900	4.176	3.996				4.086	0.008141	0.008141				0.081978	0.032564
10	8900	23000	3.949	4.362				4.156	0.042506	0.042506				0.035251	0.170022
11	22000	16000	4.342	4.204				4.273	0.004782	0.004782				0.000453	0.019128
12	9700	25000	3.987	4.398				4.192	0.042265	0.042265				0.018418	0.169059
								$\bar{\bar{x}}$	SUM1	SUM2				SUMs	SUMw
		$\bar{x}_j$	4.211	4.365				4.288	0.182556	0.182556				0.529150	0.730225

One-Way ANOVA							
	SS	f	MS	F	F critical value	confidence probability	S_s
Between groups	0.529150	11	0.048105	1.58	2.72	0.95	0.094
Within groups	0.365113	12	0.030426				

ISO13528: 2005	
S_x	0.155
S_w	0.174
S_s	0.094

Conclusion: The homogeneity of Staphylococcus aureus is acceptable at a 95% Confidence Interval level.

Test: Zhao Hongyang	Date: 2014.8.13	Statistical: Wang Xiujun	Date: 2014.8.15	Check: Lu Xing-an	Date: 2014.8.16
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APLAC T097 Proficiency Testing Programme
“Food Microbiology Quantitative Scheme”

Record number: M007/sulfite-reducing
clostridia-140811

Homogeneity Testing Results of Anaerobic sulfite-reducing clostridia

The number of sample:	12	Units:	CFU/mL	each sample has been tested replicated twice	Test item	Anaerobic sulfite-reducing clostridia	Test method	NMKL NO.56
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Number			Result 1	Result 2	Result 3	Result 4	Result 5	Average Result	Within groups bias 1	Within groups bias 2				Between groups bias	Within groups range
j	x_{1j}	x_{2j}	x_{1j}	x_{2j}	x_{3j}	x_{4j}	x_{5j}	$\bar{x}_j$	$(x_{1j} - \bar{x}_j)^2$	$(x_{2j} - \bar{x}_j)^2$	$(x_{3j} - \bar{x}_j)^2$	$(x_{4j} - \bar{x}_j)^2$	$(x_{5j} - \bar{x}_j)^2$	$n_j(\bar{x}_j - \bar{\bar{x}})^2$	$(x_{1j} - x_{2j})^2$
1	3000	4200	3.477	3.623				3.550	0.005338	0.005338				0.055956	0.021353
2	1700	2800	3.230	3.447				3.339	0.011741	0.011741				0.003892	0.046963
3	2100	2800	3.322	3.447				3.385	0.003902	0.003902				0.000006	0.015610
4	4200	3400	3.623	3.531				3.577	0.002105	0.002105				0.075617	0.008422
5	2200	1800	3.342	3.255				3.299	0.001899	0.001899				0.014136	0.007595
6	1900	2300	3.279	3.362				3.320	0.001721	0.001721				0.007857	0.006885
7	2700	1500	3.431	3.176				3.304	0.016291	0.016291				0.012543	0.065164
8	2800	2600	3.447	3.415				3.431	0.000259	0.000259				0.004636	0.001036
9	2100	3200	3.322	3.505				3.414	0.008366	0.008366				0.001893	0.033464
10	1200	2100	3.079	3.322				3.201	0.014767	0.014767				0.066408	0.059067
11	2200	3100	3.342	3.491				3.417	0.005546	0.005546				0.002308	0.022183
12	2900	1800	3.462	3.255				3.359	0.010725	0.010725				0.001160	0.042901
								$\bar{\bar{x}}$	SUM1	SUM2				SUMs	SUMw
		$\bar{x}_i$	3.363	3.403				3.383	0.082661	0.082661				0.246413	0.330642

One-Way ANOVA							
	SS	f	MS	F	F critical value	confidence probability	STD
Between groups	0.246413	11	0.022401	1.63	2.72	0.95	0.066
Within groups	0.165321	12	0.013777				

ISO13528: 2005	
S_x	0.106
S_w	0.117
S_s	0.066

Conclusion: The homogeneity of Staphylococcus aureus is acceptable at a 95% Confidence Interval level.

Test: Zhao Hongyang	Date: 2014.08.13	Statistical: Wang Xiujun	Date: 2014.08.14	Check: Lu Xing-an	Date: 2014.08.15
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APLAC T097 Proficiency Testing Programme
“Food Microbiology Quantitative Scheme”

Record Number: APC-140811

The stability check of Aerobic plate count

Homogeneity Testing completing date 2014/8/16

Test item: Aerobic plate count			s*		0.179	The sample batch number:	A(2)	Homogeneity Testing Result		$\bar{x}$ 4.899	LOG(CFU/mL)
Number	DATE	TEMP. (°C)	Days	Result1	Result2	Result1	Result2	Average Result	The total average	Absolute deviation	Ratio
i				x_{1i}	x_{2i}	x_{1i}	x_{2i}	$\bar{x}_i$	$\bar{\bar{x}}_i$	$\delta = \bar{x}_i - \bar{\bar{x}} $	δ / s^*
1	2014/8/13	4	1	74000	83000	4.869	4.919	4.894	4.924	0.025	0.142
				56000	87000	4.748	4.940	4.844			
				98000	120000	4.991	5.079	5.035			
	2014/9/13	4	30	110000	96000	5.041	4.982	5.012	4.920	0.021	0.117
				84000	72000	4.924	4.857	4.891			
				75000	69000	4.875	4.839	4.857			
	2014/11/13	4	90	110000	96000	5.041	4.982	5.012	4.927	0.028	0.159
				84000	81000	4.924	4.908	4.916			
				74000	69000	4.869	4.839	4.854			
	2015/2/13	4	180	67000	89000	4.826	4.949	4.888	4.924	0.025	0.140
				69000	78000	4.839	4.892	4.865			
				120000	91000	5.079	4.959	5.019			
2	2014/8/13	20	1	69000	74000	4.839	4.869	4.854	4.882	0.017	0.095
				87000	69000	4.940	4.839	4.889			
				78000	82000	4.892	4.914	4.903			
	2014/9/13	20	30	69000	79000	4.839	4.898	4.868	4.918	0.019	0.104
				69000	78000	4.839	4.892	4.865			
				120000	91000	5.079	4.959	5.019			
	2014/11/13	20	90	98000	110000	4.991	5.041	5.016	4.924	0.025	0.138
				67000	79000	4.826	4.898	4.862			
				86000	71000	4.934	4.851	4.893			
	2015/2/13	20	180	94000	82000	4.973	4.914	4.943	4.932	0.033	0.187
				110000	99000	5.041	4.996	5.019			
				71000	66000	4.851	4.820	4.835			
3	2014/8/13	36	1	77000	56000	4.886	4.748	4.817	4.873	0.026	0.148
				58000	89000	4.763	4.949	4.856			
				99000	78000	4.996	4.892	4.944			
	2014/8/28	36	15	87000	95000	4.940	4.978	4.959	4.926	0.027	0.150
				67000	81000	4.826	4.908	4.867			
				93000	86000	4.968	4.934	4.951			
	2014/9/13	36	30	77000	83000	4.886	4.919	4.903	4.864	0.035	0.196
				84000	79000	4.924	4.898	4.911			
				61000	59000	4.785	4.771	4.778			
	2014/8/13	42	1	89000	78000	4.949	4.892	4.921	4.921	0.022	0.121
				75000	89000	4.875	4.949	4.912			
				81000	89000	4.908	4.949	4.929			
4	2014/8/15	42	3	78000	65000	4.892	4.813	4.853	4.872	0.027	0.148
				62000	75000	4.792	4.875	4.834			
				91000	80000	4.959	4.903	4.931			
	2014/8/17	42	5	89000	83000	4.949	4.919	4.934	4.869	0.030	0.166
				62000	59000	4.792	4.771	4.782			
				81000	75000	4.908	4.875	4.892			
	2014/8/19	42	7	76000	68000	4.881	4.833	4.857	4.863	0.036	0.199
				75000	61000	4.875	4.785	4.830			
				72000	89000	4.857	4.949	4.903			

※0.179 is the summary statistic of ACAS-PT081 Proficiency Testing in 2014.

Test: Zhao Hongyang

Statistical: Wang Xiujun

Check: Lu xing-an

Date: 2014.8.13-2015.2.13 Date: 2015.2.15

Date: 2015.2.16

APLAC T097 Proficiency Testing Programme
“Food Microbiology Quantitative Scheme”

Record Number: staph-140811

The stability check of *Staphylococcus aureus*

Stability Testing completed 2014/8/16

Test item: Staphylococcus aureus			Ss		0.234	The sample batch	staph-140811	Homogeneity Testing Result		$\bar{\bar{x}}$ 4.288	LOG(CFU/mL)
Number	DATE	TEMP. (°C)	Days	Result1	Result2	Result1	Result2	Average Result	The total average	Absolute deviation	Ratio
i				x_{1i}	x_{2i}	x_{1i}	x_{2i}	$\bar{x}_i$	$\bar{\bar{x}}_i$	$\delta = \bar{x}_i - \bar{\bar{x}} $	δ / s^*
1	2014/8/13	4	1	9900	15000	3.996	4.176	4.086	4.318	0.030	0.129
				22000	31000	4.342	4.491	4.417			
				32000	25000	4.505	4.398	4.452			
	2014/9/13	4	30	10000	18000	4.000	4.255	4.128	4.256	0.032	0.138
				17000	21000	4.230	4.322	4.276			
				28000	19000	4.447	4.279	4.363			
	2014/11/13	4	90	12000	17000	4.079	4.230	4.155	4.323	0.035	0.150
				25000	32000	4.398	4.505	4.452			
				28000	19000	4.447	4.279	4.363			
	2015/2/13	4	180	17000	12000	4.230	4.079	4.155	4.332	0.044	0.190
				35000	26000	4.544	4.415	4.480			
				28000	19000	4.447	4.279	4.363			
2	2014/8/13	20	1	9400	21000	3.973	4.322	4.148	4.262	0.026	0.110
				21000	17000	4.322	4.230	4.276			
				19000	28000	4.279	4.447	4.363			
	2014/9/13	20	30	11000	17000	4.041	4.230	4.136	4.254	0.034	0.147
				15000	24000	4.176	4.380	4.278			
				19000	26000	4.279	4.415	4.347			
	2014/11/13	20	90	11000	17000	4.041	4.230	4.136	4.242	0.046	0.197
				16000	18000	4.204	4.255	4.230			
				21000	25000	4.322	4.398	4.360			
	2015/2/13	20	180	11000	16000	4.041	4.204	4.123	4.219	0.069	0.294
				16000	14000	4.204	4.146	4.175			
				21000	25000	4.322	4.398	4.360			
3	2014/8/13	36	1	27000	21000	4.431	4.322	4.377	4.315	0.027	0.114
				9900	15000	3.996	4.176	4.086			
				27000	34000	4.431	4.531	4.481			
	2014/8/28	36	15	19000	23000	4.279	4.362	4.320	4.326	0.038	0.161
				25000	31000	4.398	4.491	4.445			
				14000	19000	4.146	4.279	4.212			
	2014/9/13	36	30	18000	21000	4.255	4.322	4.289	4.203	0.085	0.365
				19000	13000	4.279	4.114	4.196			
				11000	16000	4.041	4.204	4.123			
	2014/8/13	42	1	25000	11000	4.398	4.041	4.220	4.262	0.026	0.109
				9500	16000	3.978	4.204	4.091			
				29000	31000	4.462	4.491	4.477			
	2014/8/15	42	3	9700	17000	3.987	4.230	4.109	4.241	0.047	0.199
				20000	27000	4.301	4.431	4.366			
				21000	15000	4.322	4.176	4.249			
	2014/8/17	42	5	9700	17000	3.987	4.230	4.109	4.225	0.063	0.271
				18000	25000	4.255	4.398	4.327			
				25000	12000	4.398	4.079	4.239			
	2014/8/19	42	7	17000	19000	4.230	4.279	4.255	4.205	0.083	0.354
				18000	15000	4.255	4.176	4.216			
				15000	13000	4.176	4.114	4.145			

※0.234 is the summary statistic of ACAS-PT081 Proficiency Testing in 2014.

Test: Zhao Hongyang

Statistical: Wang Xiujun

Check: Lu xing-an

Date: 2014. 8. 13-2015. 2. 13

Date: 2015. 2. 15

Date: 2015. 2. 16

APLAC T097 Proficiency Testing Programme
“Food Microbiology Quantitative Scheme”

Record Number: M007/sulfite-reducing
 clostridia-140811

The stability check of Anaerobic sulfite-reducing clostridia

Homogeneity Testing completed 2014/8/15

Test item: Anaerobic sulfite-reducing			※s* 0.179		The sample		M007-140811		Homogeneity Testing Result		$\bar{x}$ 3.383	LOG (CFU/mL)
Number	DATE	TEMP. (°C)	Days	Result1	Result2	Result1	Result2	Average Result	The total average result	Absolute deviation	Ratio	
i				x_{1i}	x_{2i}	x_{1i}	x_{2i}	$\bar{x}_i$	$\bar{\bar{x}}_i$	$\delta = \bar{x}_i - \bar{\bar{x}} $	δ/s^*	
1	2014/8/13	4	1	3200	2100	3.505	3.322	3.414	3.404	0.021	0.118	
				2800	2400	3.447	3.380	3.414				
				3100	1900	3.491	3.279	3.385				
	2014/9/13	4	30	2200	2700	3.342	3.431	3.387	3.406	0.023	0.128	
				2500	3500	3.398	3.544	3.471				
				2500	2100	3.398	3.322	3.360				
	2014/11/13	4	90	2200	2700	3.342	3.431	3.387	3.407	0.024	0.132	
				1500	2600	3.176	3.415	3.296				
				4100	2900	3.613	3.462	3.538				
	2015/2/13	4	180	2200	2800	3.342	3.447	3.395	3.416	0.033	0.182	
				1700	2500	3.230	3.398	3.314				
				4100	2900	3.613	3.462	3.538				
2	2014/8/13	20	1	1900	2300	3.279	3.362	3.320	3.363	0.020	0.110	
				1700	2800	3.230	3.447	3.339				
				2800	2600	3.447	3.415	3.431				
	2014/9/13	20	30	2500	1500	3.398	3.176	3.287	3.416	0.033	0.182	
				3100	2500	3.491	3.398	3.445				
				3700	2900	3.568	3.462	3.515				
	2014/11/13	20	90	2500	1800	3.398	3.255	3.327	3.351	0.032	0.178	
				2600	1900	3.415	3.279	3.347				
				2500	2300	3.398	3.362	3.380				
	2015/2/13	20	180	2300	1900	3.362	3.279	3.320	3.416	0.033	0.186	
				2300	2700	3.362	3.431	3.397				
				2900	4000	3.462	3.602	3.532				
3	2014/8/13	36	1	2800	3300	3.447	3.519	3.483	3.405	0.022	0.123	
				1800	2200	3.255	3.342	3.299				
				3500	2100	3.544	3.322	3.433				
	2014/8/28	36	15	1900	2700	3.279	3.431	3.355	3.406	0.023	0.127	
				3100	2100	3.491	3.322	3.407				
				3700	2200	3.568	3.342	3.455				
	2014/9/13	36	30	1800	2300	3.255	3.362	3.309	3.350	0.033	0.182	
				2500	1900	3.398	3.279	3.338				
				2300	2800	3.362	3.447	3.404				
5	2014/8/13	42	1	3500	2300	3.544	3.362	3.453	3.402	0.019	0.106	
				2100	2900	3.322	3.462	3.392				
				3100	1700	3.491	3.230	3.361				
	2014/8/15	42	3	2400	2200	3.380	3.342	3.361	3.360	0.023	0.126	
				2200	1600	3.342	3.204	3.273				
				3400	2300	3.531	3.362	3.447				
	2014/8/17	42	5	1700	2500	3.230	3.398	3.314	3.411	0.028	0.155	
				2300	3700	3.362	3.568	3.465				
				3500	2300	3.544	3.362	3.453				
	2014/8/19	42	7	1900	2500	3.279	3.398	3.338	3.348	0.035	0.196	
				2200	2600	3.342	3.415	3.379				
				2500	1800	3.398	3.255	3.327				

※0.179 is the summary statistic of ACAS-PT081 Proficiency Testing in 2014.

Test: Zhao Hongyang

Statistical: Wang Xiujun Check: Lu xing-an

Date: 2014.8.13-2015.2.13

Date: 2015.2.15

Date: 2015.2.16

APPENDIX C Relevant Documents

Instructions to Accreditation Bodies

1. Package of Samples (PTIs)

A package including all the samples to the nominees will be sent to the Nominating Accreditation Body.

The proficiency testing have three items, each participant will receive the relevant samples which items you participate in.

On receipt of the samples, check the package surface, and complete the “Receipt Form (for Accreditation Bodies)” and return it electronically to Coordinator of the proficiency testing provider acas_international@126.com cc to liuhanxia_cn@163.com.

2. Samples Distribution

The artifacts packages for participants are to be sent to the participating laboratories within three days of receipt date. There is no need to open the package. Since the artifacts are fragile, please take care in distribution process.

3. General Information

Additional information may be obtained from:

Name: MA Xiao (Emma) LIU Hanxia (Ph.D) LU Xing-an (Prof.)

Add.: A3, North Gaobeidianbeilu, Chaoyang District, Beijing, P.R. China 100123

E-mail: acas_international@126.com / liuhanxia_cn@163.com

Tel: (+86) 10 57487402 / (+86) 10 8578 1069

Fax: (+86) 10 8575 2707

Instructions to Participants

Dear XXXX:

Welcome to participate in Food Microbiology Quantitative Proficiency Testing Program of APLAC T097 organized by CNAS. The confidentiality is ensured to use the lab code throughout the program. Your lab code is APLAC T097-XXX.

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

1. Samples

The proficiency testing have three testing items, each item for one sample, the details:

- a. PT Sample A: Aerobic Plate Count
- b. PT Sample B: *Staphylococcus aureus*
- c. PT Sample C: Sulphite-reducing *Clostridium*

Each participant will receive the relevant samples which items you participate in. Sample description is as following.

The samples consist of freeze-dried bacteria and cryoprotectants in small glass vials, which are similar in nature to the food routinely tested by participating laboratories.

When receiving the artifacts, please check the package and the artifact in the receiving day, and log in website of ACAS to confirm the samples' receipt information. Guide for log in the website is introduced in item 4.

2. Testing Period and Storage Instruction

Testing should be conducted as soon as possible when the samples are received.

Store your samples in the original package in room temperature.

3. Testing Procedure

The freeze-dried sample needs to be rehydrated with 40 mL sterile diluent. By using aseptic technique, open the vial and add 4 mL sterile diluent immediately. After the sample is dissolved, transfer the sample into a sterile bottle and rinse the vial thoroughly with the left 36 mL sterile diluent to ensure that all sample has been transferred to the bottle. This liquid was treated as the sample for testing, which is equivalent of 40 mL test sample.

Participants should use plate count for the quantitative determination of Aerobic Plate Count, *Staphylococcus aureus* and Sulphite-reducing *Clostridium*.

The Sulphite-reducing *Clostridium* is a total count and can not be conducted heat treatment step.

Participants are expected to use the test method of their choice, which should be consistent with your routine testing.

4. Documents Submitting and Guide

Sample Confirmation and testing results should be submitted through website of ACAS following the guide below. Sample Confirmation should be confirmed once receive samples and inform your accreditation body. Results of testing, methods and original data should be submitted **by April 3rd 2015**.

Guide for documents submitting through website: Find the address of <http://www.acas.com.cn/verify/index.php/user/login>, click the English version, login with your user name (××××) and password (your Initial Password is ××××); find and click MY PROJECT, then click Sample Confirmation to fill in the blanks. When submitting the results of the testing, follow the steps of above statement and click TESTING RESULTS SUBMIT to provide the data needed.

5. General Information

Additional information may be obtained from:

Name: MA Xiao (Emma) LIU Hanxia (Ph.D) LU Xing-an (Prof.)

Add.: A3, North Gaobeidianbeilu, Chaoyang District, Beijing, P.R. China 100123

E-mail: acas_international@126.com / liuhanxia_cn@163.com

Tel: (+86) 10 57487402 / (+86) 10 8578 1069

Fax: (+86) 10 8575 2707

APLAC T097 Proficiency Testing Programme
“Food Microbiology Quantitative Scheme”

Sample Receipt Form (Accreditation Bodies)

Accreditation

Body: _____

Postal address: _____

Contact person: _____

Title

Given name

Surname

E-mail: _____

Print name/ _____

Signature: _____

Date: _____

Confirmation of Package Contents

I hereby acknowledge the receipt of sealed shipping package containing the proficiency test sample(s) box(es) for the APLAC proficiency testing programme (APLAC T097). The box contains:

The sealed shipping box(es) is/are Intact & Sealed / Broken / Missing*.(* Please delete as appropriate)

1. Instructions to Accreditation Bodies: ☐ Yes ☐ No

2. How many packages for participating laboratories:

Comments:

Upon receipt of the sample(s), please complete this form and return it electronically to the co-ordinator of the proficiency testing programme (E-mail: acas_international@126.com cc to liuhanxia_cn@163.com)

THE END