

Summary of Results

External Quality Assessment for Food Microbiology

Staphylococcus aureus enterotoxin Scheme

Distribution Number: STA013

Sample Numbers: ST0025, ST0026

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Data analysed by:	Heena Shah
Report compiled by:	Heena Shah Nicola L. Lang Julie E. Russell

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Centre for Infections
Food and Environmental Proficiency Testing Unit (FEPTU)

61 Colindale Avenue

London

NW9 5EQ

Tel: +44 (0) 20 8327 7119

Fax: +44 (0) 20 8200 8264

Email: foodeqa@hpa.org.uk

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This Scheme provides external quality assessment (EQA) samples for laboratories that examine for *Staphylococcus aureus* enterotoxin in food samples. Staphylococcal food poisoning is an intoxication due to consumption of food or beverages containing pre-formed enterotoxins (SE). *S.aureus* is known to produce at least 14 different SEs (Leloir, Y., Baron, F. and Gautier, M. (2003) *Staphylococcus aureus* and food poisoning. *Genet. Mol. Res.* 2, 63 – 76).

The samples are prepared in collaboration with staff of the Food-borne Pathogens Reference Unit, Food Safety Microbiology Laboratory, Centre for Infections, Colindale. Strains were tested using the reverse passive latex agglutination (RPLA) and a modification of a PCR-based technique. (McLauchlin, J., Narayanan G.L., Mithani, V. and O'Neill, G. (2000) The detection of enterotoxins and toxic shock syndrome genes in *Staphylococcus aureus* by polymerase chain reaction. *J. Food Protect.* 63, 479 - 488). Copies of this publication are available to participants on request.

All participants are reminded that incorrect results for detection of *S.aureus* enterotoxin isolated from food samples could have serious public health implications.

If you experienced problems with the test please refer to the 'Troubleshooting Section' on page 7 and request a repeat sample.

Scores are not allocated for results reported for the *S.aureus* enterotoxin Scheme. Comments relating to performance are included in Table 1 on pages 3 - 6.

If you require further information on the scheme, samples or quality control please refer to the 'General Information Section' on page 8, contact details of FEPTU staff for advice and information are on page 7.

Information about other Health Protection Agency functions and services is available from the web-site www.hpa.org.uk

Sample: ST0025

Contents:

S.aureus (10³)

The level is presented as colony forming units (cfu) per ml reconstituted sample

Expected Results:

Examination	Expected Result	Your Result
<i>S.aureus</i> enterotoxin	<i>S.aureus</i> enterotoxin present (Group C)	

Comments on Performance:

Results are summarised in Table 1 (pages 3 - 6).

Total participants reporting for <i>S.aureus</i> enterotoxin (SET)	50
Total participants reporting correctly the presence of SET	20 (40%)
Participants identifying correctly the presence of SET group C	8

Total sent sample	55
Non-returns	2
Not examined	3

Sample: ST0026

Contents:

S.aureus (10³)

The level is presented as colony forming units (cfu) per ml reconstituted sample

Expected Results:

Examination	Expected Result	Your Result
<i>S.aureus</i> enterotoxin	<i>S.aureus</i> enterotoxin present (Group B)	

Comments on Performance:

Results are summarised in Table 1 (pages 3 - 6).

Total participants reporting for <i>S.aureus</i> enterotoxin (SET)	50
Total participants reporting correctly the presence of SET	48 (96%)
Participants identifying correctly the presence of SET group B	20

Total sent sample	55
Non-returns	2
Not examined	3

Table 1 - Participants' results for samples ST0025 and ST0026
(NE – not examined, NR – not returned)

Lab Number	ST0025	ST0026	Method used	Comment
18	Not detected	Detected	TECRA set	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
100	Not detected	Present (Group B)	DNase Agar	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
126	NE	NE		Samples not examined
175	Present	Present	VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result
212	Not detected	Detected	VIDAS	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
233	Not detected	Present	Transia plate	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
252	NE	NE		Samples not examined
264	Present	Present	VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result
279	Present	Present	VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result
291	Not detected	Detected	ELISA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
297	Present (Group C)	Present (Group B)	Ridascreen	ST0025 - Satisfactory result ST0026 - Satisfactory result
310	Not detected	Present	Tecra	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
355	Not detected	Present (Group B)	RPLA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
372	Not detected	Present	ELISA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
378	Not detected	Present	VIDAS	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
382	Present	Present (Group B)	VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result

Table 1 (cont'd) - Participants' results for samples ST0025 and ST0026
(NE – not examined, NR – not returned)

Lab Number	ST0025	ST0026	Method used	Comment
393	Not detected	Present (Group B)	VIDAS & RPLA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
401	Not examined	Present	Transia plate & VIDAS	ST0025 - Sample not examined ST0026 - Satisfactory result
411	Present	Present	VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result
422	Present (A – E)	Present (Group B)	VIDAS & TECRA	ST0025 - Satisfactory result ST0026 - Satisfactory result
441	NR	NR		Results not returned
451	Not detected	Present (Group A)	RPLA (Oxoid)	ST0025 - Unsatisfactory result ST0026 - Unsatisfactory result
459	Not detected	Present	ELISA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
463	Not detected	Present (Group B)	RPLA (Oxoid)	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
475	Present	Present	DNase	ST0025 - Satisfactory result ST0026 - Satisfactory result
511	Not detected	Present (Group B)		ST0025 - Unsatisfactory result ST0026 - Satisfactory result
558	NE	NE		Samples not examined
576	Present (Group C)	Present (Group B)	Ridascreen	ST0025 - Satisfactory result ST0026 - Satisfactory result
604	Present (Group C)	Present (Group B)	RPLA (Oxoid)	ST0025 - Satisfactory result ST0026 - Satisfactory result
627	Present	Present	VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result
644	Present (Group C)	Present (Group B)	VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result
646	Not detected	Present	VIDAS	ST0025 - Unsatisfactory result ST0026 - Satisfactory result

Table 1 (cont'd) - Participants' results for samples ST0025 and ST0026
(NE – not examined, NR – not returned)

Lab Number	ST0025	ST0026	Method used	Comment
647	Present (Group B)	Present (Group C)	RPLA (Oxoid)	ST0025 - Unsatisfactory result ST0026 - Unsatisfactory result
655	Present (Group C)	Present (Group B)	VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result
660	Present (Group C)	Present (Group B)	PCR	ST0025 - Satisfactory result ST0026 - Satisfactory result
662	Not detected	Present (Group B)	RPLA and VIDAS	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
680	Present (Group C)	Present (Group B)	RPLA and VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result
712	Not detected	Decteded	ELISA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
722	Not detected	Detected	AOAC no. 070404	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
747	Not detected	Detected	TECRA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
777	Not detected	Detected	VIDAS	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
823	Detected	Present (Group B)	RPLA & VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result
848	Not detected	Present (Group B)	ELISA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
861	Not detected	Detected	VIDAS	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
863	Not detected	Present (Group B)	ELISA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
869	Not detected	Detected	ELISA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
873	Detected	Not detected	Transia plate	ST0025 - Satisfactory result ST0026 - Unsatisfactory result
874	Not detected	Detected	ELISA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result

Table 1 (cont'd) - Participants' results for samples ST0025 and ST0026
 (NE – not examined, NR – not returned)

Lab Number	ST0025	ST0026	Method used	Comment
875	Not detected	Not detected		ST0025 - Unsatisfactory result ST0026 - Unsatisfactory result
876	Not detected	Present (Group B)	RPLA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
878	Present (Group C)	Present (Group B)	RPLA	ST0025 - Satisfactory result ST0026 - Satisfactory result
880	Detected	Detected	VIDAS	ST0025 - Satisfactory result ST0026 - Satisfactory result
881	Not detected	Detected	ELISA	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
882	Not detected	Detected	VIDAS	ST0025 - Unsatisfactory result ST0026 - Satisfactory result
884	NR	NR		Results not returned

Troubleshooting

Checklist for Quality:

1. **Methods**
Are you using a standard or validated, clearly documented method?
2. **Culture Media**
Are your culture media allowing optimal isolation of the target micro-organisms? Do you have sufficiently challenging quality control procedures for your culture media?
3. **Equipment**
Is all the equipment used for the procedures (incubators, refrigerators, measuring instruments, spiral platers etc.) calibrated and monitored regularly?
4. **Staff Training**
Are the staff who perform the examinations fully trained and familiar with all the procedural steps?
5. **Internal Quality Control (IQC)**
Do you have adequate IQC procedures in place with documented guidelines for dealing with IQC failures?
6. **Good Laboratory Practice (GLP)**
Do staff adhere to GLP at all times?
If cross-contamination has occurred with EQA samples it can also occur with routine food samples.
7. **Clerical Procedures**
Are your laboratory numbering and clerical procedures adequate?
If you have reported EQA results incorrectly this may also happen with routine food samples.

Repeat Samples:

Participants should, where possible, determine the reason(s) for incorrect results and request repeat samples to ensure the cause has been eradicated. Repeat samples are free of charge, provided they are dispatched with the next distribution of samples; a handling fee will be charged for immediate dispatch.

Help and Advice:

The Scheme Organisers will help participants to resolve issues relating to the microbial testing of food samples. Participants may also contact FEPTU to discuss any issues relating to the schemes in general, data analyses or performance assessments.

Contact Details:

Repeat samples	Carmen Gomes	Tel: +44 (0)20 8327 7119
Data analysis	Heena Shah or Dr Nicola Lang	Fax: +44 (0)20 8200 8264
Microbiological advice	Dr Nicola Lang or Julie Russell	E-mail: foodeqa@hpa.org.uk
General comments and complaints	Dr Nicola Lang or Julie Russell	
Scheme Consultants	Prof. Eric Bolton Dr. Jim Mclauchlin	

General Information

Scheme: *S.aureus* enterotoxin

Sample Type: Freeze-dried culture of *S.aureus* in glass vials

Safety Data Sheet: Contact the organisers or www.hpa.org.uk/eqa

Examinations: Detection of *S.aureus* enterotoxin

FEPTU Quality Control: Minimum of 10 vials, selected randomly from the batch are examined for the test parameters as indicated on the request/report forms, using a range of Health Protection Agency (HPA) methods which are based on ISO methods. Detection of the *S.aureus* toxin gene is by PCR.

Commercial Kits: RPLA kits are normally able to detect only SEA, SEB, SEC and SED from cultures grown *in vitro*. ELISA kits (TECRA, Ridascreen, VIDAS) are available to detect a limited range of enterotoxins (SEA, SEB, SEC, SED and SEE). However, SEG and SEH, and less commonly SEE and SEI, have been detected in the absence of SEA, SEB, SEC and SED and account for up to half of the incidents in England and Wales compatible with staphylococcal food poisoning. Recent studies in France also commonly found SEG, SEH, SEI and SEJ (Rosec, J.P. and Gigaud, O (2002) Staphylococcal enterotoxin genes of classical and new types detected by PCR in France. *Int. J. Food Microbiol.* 77, 61-70).

Accreditation: The HPA *Staphylococcus aureus* enterotoxin EQA Scheme is accredited by the United Kingdom Accreditation Service (UKAS) to ISO/IEC Guide 43-1:1997 through assessment against ILAC G13: 2007.

