



Summary of Results

External Quality Assessment for Food Microbiology

Staphylococcus aureus enterotoxin Scheme

Distribution Number: STA015

Sample Numbers: ST0029, ST0030

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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 6 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 - 5.

If you require further information on the scheme, samples or quality control please refer to the 'General Information Section' on page 7, contact details of FEPTU staff for advice and information are on page 6.

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

Sample: ST0029

Contents:

S.aureus (10⁵)

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 not detected	

Comments on Performance:

Results are summarised in Table 1 (pages 3 - 5).

<i>S.aureus</i> enterotoxin	Total participants reporting for <i>S.aureus</i> enterotoxin	45
	Participants reporting correctly the absence of <i>S.aureus</i> enterotoxin	38

Total sent sample		51
Non-returns		2
Not examined		4

Sample: ST0030

Contents:

S.aureus (10⁵)

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 - 5).

<i>S.aureus</i> enterotoxin	Total participants reporting for <i>S.aureus</i> enterotoxin	45
	Participants reporting correctly the presence of <i>S.aureus</i> enterotoxin (Toxin group not specified)	19
	Participants reporting correctly the presence of set group C	12

Total sent sample		51
Non-returns		2
Not examined		4

Table 1 - Participants' results for samples ST0029 and ST0030
(NE – not examined, NR – not returned)

Lab Number	ST0029	ST0030	Method used	Comment
18	Not detected	Not detected	TECRA set	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
100	NE	NE		Samples not examined
126	Present Group C	Present Group C	Enzyme immunoassay	ST0029 - Unsatisfactory result ST0030 - Satisfactory result
175	Not detected	Present	VIDAS	ST0029 - Satisfactory result ST0030 - Satisfactory result
212	Not detected	Present	VIDAS	ST0029 - Satisfactory result ST0030 - Satisfactory result
233	Not detected	Not detected	Transia plate	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
264	Not detected	Present	VIDAS	ST0029 - Satisfactory result ST0030 - Satisfactory result
279	Not detected	Present	VIDAS	ST0029 - Satisfactory result ST0030 - Satisfactory result
291	Not detected	Not detected	Transia plate	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
293	Not detected	Present		ST0029 - Satisfactory result ST0030 - Satisfactory result
297	Present Group C	Present	VIDAS	ST0029 - Unsatisfactory result ST0030 - Satisfactory result
355	NE	NE		Samples not examined
372	Not detected	Present	ELISA	ST0029 - Satisfactory result ST0030 - Satisfactory result
378	Not detected	Present	VIDAS	ST0029 - Satisfactory result ST0030 - Satisfactory result
382	Not detected	Present Group C	TECRA set	ST0029 - Satisfactory result ST0030 - Satisfactory result
393	Not detected	Present Group C	RPLA	ST0029 - Satisfactory result ST0030 - Satisfactory result
401	NE	NE		Samples not examined
411	Not detected	Present Group C	VIDAS and TECRA	ST0029 - Satisfactory result ST0030 - Satisfactory result
422	Not detected	Present (A - E)	VIDAS and TECRA	ST0029 - Satisfactory result ST0030 - Satisfactory result
441	Not detected	Not detected	TECRA set	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
459	Not detected	Not detected	ELISA and Tranisa Plate	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
463	NE	NE		Samples not examined
511	Not detected	Present Group B	Latex agglutination	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
576	Present Group C	Present Group C	VIDAS	ST0029 - Unsatisfactory result ST0030 - Satisfactory result
604	Not detected	Present Group C	RPLA	ST0029 - Satisfactory result ST0030 - Satisfactory result

Table 1 (cont'd) - Participants' results for samples ST0029 and ST0030
(NE – not examined, NR – not returned)

Lab Number	ST0029	ST0030	Method used	Comment
644	Not detected	Present Group C	Transia Plate	ST0029 - Satisfactory result ST0030 - Satisfactory result
655	Not detected	Present	VIDAS	ST0029 - Satisfactory result ST0030 - Satisfactory result
660	Not detected	Present Group C	VIDAS, ELISA (Transia Plate) & PCR	ST0029 - Satisfactory result ST0030 - Satisfactory result
662	Not detected	Present Group C	VIDAS and RPLA	ST0029 - Satisfactory result ST0030 - Satisfactory result
698	Present	Not detected	Transia plate	ST0029 - Unsatisfactory result ST0030 - Unsatisfactory result
712	Not detected	Not detected	ELISA	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
718	Not detected	Not detected	VIDAS and Transia Plate	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
722	Not detected	Present	AOAC no. 070404	ST0029 - Satisfactory result ST0030 - Satisfactory result
777	Not detected	Present	VIDAS	ST0029 - Satisfactory result ST0030 - Satisfactory result
823	Not detected	Present Group C	VIDAS set	ST0029 - Satisfactory result ST0030 - Satisfactory result
861	Not detected	Present	VIDAS	ST0029 - Satisfactory result ST0030 - Satisfactory result
871	Not detected	Present	ELISA and Tranisa Plate	ST0029 - Satisfactory result ST0030 - Satisfactory result
875	Present	Not detected	RPLA	ST0029 - Unsatisfactory result ST0030 - Unsatisfactory result
876	Not detected	Not detected	ELISA	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
881	Not detected	Not detected	ELISA	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
883	NR	NR		Results not returned
918	Not detected	Present	ELISA	ST0029 - Satisfactory result ST0030 - Satisfactory result
971	Not detected	Present	VIDAS	ST0029 - Satisfactory result ST0030 - Satisfactory result
1282	Not detected	Present	VIDAS	ST0029 - Satisfactory result ST0030 - Satisfactory result
1293	Not detected	Not detected	VIDAS	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
1296	Not detected	Not detected	VIDAS	ST0029 - Satisfactory result ST0030 - Unsatisfactory result
1297	Not detected	Present Group C	PCR	ST0029 - Satisfactory result ST0030 - Satisfactory result
1306	Present	Present	ELISA	ST0029 - Unsatisfactory result ST0030 - Satisfactory result
1433	Not detected	Not detected	ELISA	ST0029 - Satisfactory result ST0030 - Unsatisfactory result

Table 1 (cont'd) - Participants' results for samples ST0029 and ST0030
(NE – not examined, NR – not returned)

Lab Number	ST0029	ST0030	Method used	Comment
1455	NR	NR		Results not returned
1460	Present	Present	VIDAS	ST0029 - Unsatisfactory result ST0030 - Satisfactory result

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	Nic Day or 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.



End of report