



# Summary of Results

## External Quality Assessment of Food Microbiology

### Public Health Scheme

**Distribution Number:** PH4  
**Sample Numbers:** PH0019, PH0020, PH0021,  
PH0022, PH0023, PH0024

Distribution Date:	July 2014
Results Due:	08 August 2014
Report Date:	13 August 2014
Samples prepared and QC tested by:	Morolake Adedeji Stephanie Foster Thamayanthy Ramesh Aneta Stranc Anitha Tallam
Data Analysed by:	Nita Patel
Report Compiled by:	Nita Patel
Authorised by:	Nita Patel

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**Public Health England**  
**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@phe.gov.uk

If you require general information about the scheme please refer to:

**Scheme Guide:**

[http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1265637229388](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1265637229388)

For more specific information about results assessments, scoring systems, statistics, and guidance on analysing your results for the proficiency testing samples please refer to:

**Guide to Scoring and Statistics:**

[http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1194947373355](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1194947373355)

**General guidance for z-scores:**

Participants' enumeration results are converted into z-scores using the following formula:

$$Z = \frac{(x-X)}{\sigma}$$

x = participants' result (expressed as a log<sub>10</sub> value)  
X = assigned value (participants' consensus median (expressed as a log<sub>10</sub> value))  
σ = the fixed standard deviation for the examination (calculated by FEPTU)

The σ-value expresses the acceptable difference between the individual participant's result and the participants' consensus median. The σ-value used for calculating z-scores for all parameters in the Public Health Scheme is 0.35. A guide to interpreting z-scores follows, although laboratories must interpret their scores in the context of their own laboratory situation.

z = -1.99 to +1.99                    **satisfactory**  
z = -2 to -2.99 or +2 to +2.99      **questionable**  
z = < -3.00 or > + 3.00              **unsatisfactory**

It is usually recommended that z-scores exceeding ±2 are investigated to establish the possible cause. As a general rule, PHE recommends that all questionable and unsatisfactory results are investigated.

**FEPTU Quality Control:** To demonstrate homogeneity of the sample, a minimum of 10 LENTICULE® discs, selected randomly from a batch, are tested in duplicate for parameters requiring enumeration and 10 LENTICULE discs are examined for pathogen detection.

To demonstrate stability of the sample, a minimum of nine LENTICULE discs, selected randomly from a batch, are examined throughout the distribution period, either for enumeration or pathogen detection.

FEPTU results are determined using methods based on ISO methods and are included in the 'intended results' letters which provide guidance for participants regarding the assigned values.

The FEPTU results are used for guidance in the preliminary intended results notification, letters are posted on the website immediately after every distribution; electronic notification of their availability is sent to all participants

If you experience difficulties with any of the examinations please refer to section 17.0 of the Scheme Guide

[http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1265637229388](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1265637229388)

All participants are reminded that reporting an incorrect or incomplete identification of pathogen from food or swab samples could have serious public health implications. Similarly, the levels of micro-organisms reported in the sample may affect the subsequent outcome for the product.

Please contact FEPTU staff for advice and information:

<b>Repeat samples</b>	Carmen Gomes or Kermin Daruwalla	<b>Tel:</b> +44 (0)20 8327 7119
<b>Data Analysis</b>	Nita Patel	<b>Fax:</b> +44 (0)20 8200 8264
<b>Microbiological advice</b>	Nita Patel or Morolake Adedeji	<b>Email:</b> foodeqa@phe.gov.uk
<b>General comments and complaints</b>	Nita Patel or Morolake Adedeji	
<b>Scheme consultants</b>	Nicola Elviss and Melody Greenwood	
<b>Scheme Co-ordinator</b>	Nita Patel	

**Outbreak details:** As of 30 June 2014, 12 people have advised the same local Health Authority of bloody diarrhoea, with two of them reporting a mild fever. Following a questionnaire analysis by the Environmental Health Officer, it was identified that all of them had four days prior to the onset of food poisoning symptoms eaten at a restaurant that specialises in home-made burger food. Food samples were taken for microbiological examination and a number of swabs were collected from various areas that are used to either to prepare or serve the food for examination.



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**Accreditation:** PHE Public Health EQA Scheme is accredited by the United Kingdom Accreditation Service (UKAS) to ISO/IEC Guide 17043:2010

## Food Sample: PH0019

**Sample type:** Hamburger made from beef mincemeat containing herbs, onions, paprika, salt, black pepper and vegetable oil

**Request:** Examine samples following your routine protocol for the above outbreak – enter the examination carried out and the results obtained below

### Contents:

*Escherichia coli* O157 (non-toxigenic) (wild type strain), *Enterobacter cloacae* (wild type strain), *Enterococcus faecium*

(wild type strain)

### Expected Results:

Examination	Expected Result	Your Result	Score for performance assessment	Z-score
<i>E.coli</i> O157	Detected			
Aerobic Colony Count (30°C)	1.2x10 <sup>2</sup> - 1.2x10 <sup>3</sup> cfu g <sup>-1</sup>			
<i>Enterobacteriaceae</i>	7.1x10 <sup>1</sup> - 7.1x10 <sup>2</sup> cfu g <sup>-1</sup>			
<i>Escherichia coli</i>	<10 cfu g <sup>-1</sup>			

### Comments on Performance:

#### *E.coli* O157

Total number of participants examining the sample for <i>E.coli</i> O157	7
Participants reporting correctly	7

#### Aerobic Colony Count (30°C)

Total number of participants examining the sample for Aerobic Colony Count (30°C)	6
Participants reporting correctly	5
Total participants reporting for Aerobic Colony Count (30°C)	5
Assigned value (participants' median)	3.8x10 <sup>2</sup> cfu g <sup>-1</sup> (2.58 log <sub>10</sub> )
Participants reporting a low censored value	1
Uncertainty of assigned value (Ux= log <sub>10</sub> cfu g <sup>-1</sup> )	0.04
Participants' mean	3.9x10 <sup>2</sup> cfu g <sup>-1</sup> (2.59 log <sub>10</sub> )
*Standard deviation of participants' results	0.07 log <sub>10</sub> cfu g <sup>-1</sup>
FEPTU QC median	3.5x10 <sup>2</sup> cfu g <sup>-1</sup> (2.54 log <sub>10</sub> )

#### *Enterobacteriaceae*

Total number of participants examining the sample for <i>Enterobacteriaceae</i>	6
Participants reporting correctly	6
Total participants reporting for <i>Enterobacteriaceae</i>	6
Assigned value (participants' median)	2.2x10 <sup>2</sup> cfu g <sup>-1</sup> (2.35 log <sub>10</sub> )
Uncertainty of assigned value (Ux= log <sub>10</sub> cfu g <sup>-1</sup> )	0.05
Participants' mean	2.2x10 <sup>2</sup> cfu g <sup>-1</sup> (2.34 log <sub>10</sub> )
*Standard deviation of participants' results	0.1 log <sub>10</sub> cfu g <sup>-1</sup>
FEPTU QC median	2.3x10 <sup>2</sup> cfu g <sup>-1</sup> (2.36 log <sub>10</sub> )

#### *Escherichia coli*

Total number of participants examining the sample for <i>Escherichia coli</i>	6
Participants reporting correctly	6

Total sent samples	8
Not examined	1
Non returns	0

The fixed standard deviation value (σ value) used for calculation of the z-scores is **0.35** for all parameters.

\* Robust SD based on median absolute deviation about the participants' median (MAD).

Note: enumeration parameters with less than 10 participants results are not scored. Please see explanation in the comments section.

\*\* No expected range calculated for this parameter due to the low number of participants reporting a results for this test.

**Food Sample: PH0020****Sample type:** Grilled chicken with a barbeque marinade**Request:** Examine samples following your routine protocol for the above outbreak – enter the examination carried out and the results obtained below**Contents:***Klebsiella pneumoniae* (wild type strain), *Serratia marcescens* (wild type strain), *Micrococcus varians* (wild type strain)**Expected Results:**

Examination	Expected Result	Your Result	Score for performance assessment	Z-score
<i>E.coli</i> O157	Not Detected			
Aerobic Colony Count (30°C)	3.2x10 <sup>3</sup> - 4.1x10 <sup>4</sup> cfu g <sup>-1</sup>			
<i>Enterobacteriaceae</i>	1.3x10 <sup>3</sup> - 1.3x10 <sup>4</sup> cfu g <sup>-1</sup>			
<i>Escherichia coli</i>	<10 cfu g <sup>-1</sup>			

**Comments on Performance:***E.coli* O157

Total number of participants examining the sample for <i>E.coli</i> O157	7
Participants reporting correctly	7

## Aerobic Colony Count (30°C)

Total number of participants examining the sample for Aerobic Colony Count (30°C)	6
Participants reporting correctly	6
Total participants reporting for Aerobic Colony Count (30°C)	6
Assigned value (participants' median)	1.1x10 <sup>4</sup> cfu g <sup>-1</sup> (4.06 log <sub>10</sub> )
Uncertainty of assigned value (Ux= log <sub>10</sub> cfu g <sup>-1</sup> )	0.12
No. of outlying counts	2 (2 low / 0 high)
Participants' mean	9.8x10 <sup>3</sup> cfu g <sup>-1</sup> (3.99 log <sub>10</sub> )
*Standard deviation of participants' results	0.28 log <sub>10</sub> cfu g <sup>-1</sup>
FEPTU QC median	1.9x10 <sup>4</sup> cfu g <sup>-1</sup> (4.28 log <sub>10</sub> )

*Enterobacteriaceae*

Total number of participants examining the sample for <i>Enterobacteriaceae</i>	6
Participants reporting correctly	6
Total participants reporting for <i>Enterobacteriaceae</i>	6
Assigned value (participants' median)	4.1x10 <sup>3</sup> cfu g <sup>-1</sup> (3.62 log <sub>10</sub> )
Uncertainty of assigned value (Ux= log <sub>10</sub> cfu g <sup>-1</sup> )	0.04
Participants' mean	4.1x10 <sup>3</sup> cfu g <sup>-1</sup> (3.61 log <sub>10</sub> )
*Standard deviation of participants' results	0.08 log <sub>10</sub> cfu g <sup>-1</sup>
FEPTU QC median	3.1x10 <sup>3</sup> cfu g <sup>-1</sup> (3.49 log <sub>10</sub> )

*Escherichia coli*

Total number of participants examining the sample for <i>Escherichia coli</i>	6
Participants reporting correctly	6

Total sent samples

8

Not examined

1

Non returns

0

The fixed standard deviation value (σ value) used for calculation of the z-scores is **0.35** for all parameters.

\* Robust SD based on median absolute deviation about the participants' median (MAD).

Note: enumeration parameters with less than 10 participants results are not scored. Please see explanation in the comments section.

\*\* No expected range calculated for this parameter due to the low number of participants reporting a results for this test.

## Food Sample: PH0021

**Sample type:** Restaurant-made mustard dressing containing Dijon mustard, lemon juice, olive oil, salt and black pepper

**Request:** Examine samples following your routine protocol for the above outbreak – enter the examination carried out and the results obtained below

### Contents:

*Enterobacter cloacae* (wild type strain), *Staphylococcus xylosum* (NCIMB 13636)

### Expected Results:

Examination	Expected Result	Your Result	Score for performance assessment	Z-score
<i>E.coli</i> O157	Not Detected			
Aerobic Colony Count (30°C)	$2.0 \times 10^2 - 2.0 \times 10^3$ cfu g <sup>-1</sup>			
<i>Enterobacteriaceae</i>	$1.4 \times 10^2 - 1.4 \times 10^3$ cfu g <sup>-1</sup>			
<i>Escherichia coli</i>	<10 cfu g <sup>-1</sup>			

### Comments on Performance:

#### *E.coli* O157

Total number of participants examining the sample for <i>E.coli</i> O157	7
Participants reporting correctly	7

#### Aerobic Colony Count (30°C)

Total number of participants examining the sample for Aerobic Colony Count (30°C)	6
Participants reporting correctly	5
Total participants reporting for Aerobic Colony Count (30°C)	5
Assigned value (participants' median)	$6.4 \times 10^2$ cfu g <sup>-1</sup> (2.81 log <sub>10</sub> )
Participants reporting a low censored value	1
Uncertainty of assigned value (Ux= log <sub>10</sub> cfu g <sup>-1</sup> )	0.08
Participants' mean	$5.8 \times 10^2$ cfu g <sup>-1</sup> (2.77 log <sub>10</sub> )
*Standard deviation of participants' results	0.14 log <sub>10</sub> cfu g <sup>-1</sup>
FEPTU QC median	$5.7 \times 10^2$ cfu g <sup>-1</sup> (2.76 log <sub>10</sub> )

#### *Enterobacteriaceae*

Total number of participants examining the sample for <i>Enterobacteriaceae</i>	6
Participants reporting correctly	6
Total participants reporting for <i>Enterobacteriaceae</i>	6
Assigned value (participants' median)	$4.3 \times 10^2$ cfu g <sup>-1</sup> (2.64 log <sub>10</sub> )
Uncertainty of assigned value (Ux= log <sub>10</sub> cfu g <sup>-1</sup> )	0.04
Participants' mean	$4.3 \times 10^2$ cfu g <sup>-1</sup> (2.63 log <sub>10</sub> )
*Standard deviation of participants' results	0.09 log <sub>10</sub> cfu g <sup>-1</sup>
FEPTU QC median	$5.7 \times 10^2$ cfu g <sup>-1</sup> (2.76 log <sub>10</sub> )

#### *Escherichia coli*

Total number of participants examining the sample for <i>Escherichia coli</i>	6
Participants reporting correctly	6

Total sent samples	8
Not examined	1
Non returns	0

The fixed standard deviation value (σ value) used for calculation of the z-scores is **0.35** for all parameters.

\* Robust SD based on median absolute deviation about the participants' median (MAD).

Note: enumeration parameters with less than 10 participants results are not scored. Please see explanation in the comments section.

\*\* No expected range calculated for this parameter due to the low number of participants reporting a results for this test.

## Swab Sample: PH0022

**Sample type:** Template area swab (100 square cm) from the raw meat preparation area

**Request:** Examine samples following your routine protocol for the above outbreak – enter the examination carried out and the results obtained below

### Contents:

*Escherichia coli* O157 (non-toxigenic) (wild type strain), *Enterobacter cloacae* (wild type strain), *Staphylococcus aureus* (wild type strain)

### Expected Results:

Examination	Expected Result	Your Result	Score for performance assessment	Z-score
<i>E. coli</i> O157	Detected			
Aerobic Colony Count (30°C)	N/A**			
<i>Enterobacteriaceae</i>	N/A**			
<i>Escherichia coli</i>	<10 cfu cm <sup>2</sup>			

### Comments on Performance:

#### *E. coli* O157

Total number of participants examining the sample for <i>E. coli</i> O157	4
Participants reporting correctly	4

#### Aerobic Colony Count (30°C)

Total number of participants examining the sample for Aerobic Colony Count (30°C)	4
Participants reporting correctly	4
Total participants reporting for Aerobic Colony Count (30°C)	4
FEPTU QC median	1.2x10 <sup>2</sup> cfu cm <sup>2</sup> (2.09 log <sub>10</sub> )

#### *Enterobacteriaceae*

Total number of participants examining the sample for <i>Enterobacteriaceae</i>	3
Participants reporting correctly	3
Total participants reporting for <i>Enterobacteriaceae</i>	3
FEPTU QC median	7.7x10 <sup>1</sup> cfu cm <sup>2</sup> (1.89 log <sub>10</sub> )

#### *Escherichia coli*

Total number of participants examining the sample for <i>Escherichia coli</i>	4
Participants reporting correctly	4

Total sent samples

8

Not examined

1

Non returns

0

The fixed standard deviation value ( $\sigma$  value) used for calculation of the z-scores is **0.35** for all parameters.

\* Robust SD based on median absolute deviation about the participants' median (MAD).

Note: enumeration parameters with less than 10 participants results are not scored. Please see explanation in the comments section.

\*\* No expected range calculated for this parameter due to the low number of participants reporting a results for this test.

## Swab Sample: PH0023

**Sample type:** Random area swab taken from the mincing machine

**Request:** Examine samples following your routine protocol for the above outbreak – enter the examination carried out and the results obtained below

**Contents:**

*Escherichia coli* O157 (non-toxigenic) (wild type strain), *Bacillus subtilis* (wild type strain), *Lactobacillus plantarum* (wild type strain)

**Expected Results:**

Examination	Expected Result	Your Result	Score for performance assessment	Z-score
<i>E. coli</i> O157	Detected			
Aerobic Colony Count (30°C)	N/A**			
<i>Enterobacteriaceae</i>	N/A**			
<i>Escherichia coli</i>	<10 cfu cm <sup>2</sup>			

**Comments on Performance:**

*E. coli* O157

Total number of participants examining the sample for <i>E. coli</i> O157	7
Participants reporting correctly	7

Aerobic Colony Count (30°C)

Total number of participants examining the sample for Aerobic Colony Count (30°C)	1
Participants reporting correctly	1
Total participants reporting for Aerobic Colony Count (30°C)	1
FEPTU QC median	2.3x10 <sup>3</sup> cfu cm <sup>2</sup> (3.36 log <sub>10</sub> )

*Enterobacteriaceae*

Total number of participants examining the sample for <i>Enterobacteriaceae</i>	1
Participants reporting correctly	1
Total participants reporting for <i>Enterobacteriaceae</i>	1
FEPTU QC median	1.6x10 <sup>3</sup> cfu cm <sup>2</sup> (3.2 log <sub>10</sub> )

*Escherichia coli*

Total number of participants examining the sample for <i>Escherichia coli</i>	1
Participants reporting correctly	1

Total sent samples

8

Not examined

1

Non returns

0

The fixed standard deviation value (σ value) used for calculation of the z-scores is **0.35** for all parameters.

\* Robust SD based on median absolute deviation about the participants' median (MAD).

Note: enumeration parameters with less than 10 participants results are not scored. Please see explanation in the comments section.

\*\* No expected range calculated for this parameter due to the low number of participants reporting a results for this test.

**Swab Sample: PH0024****Sample type:** Template area swab (100 square cm) taken from the sink draining board**Request:** Examine samples following your routine protocol for the above outbreak – enter the examination carried out and the results obtained below**Contents:***Enterococcus durans* (wild type strain), *Staphylococcus xylosum* (NCIMB 13636)**Expected Results:**

Examination	Expected Result	Your Result	Score for performance assessment	Z-score
<i>E.coli</i> O157	Not Detected			
Aerobic Colony Count (30°C)	N/A**			
<i>Enterobacteriaceae</i>	<10 cfu cm <sup>2</sup>			
<i>Escherichia coli</i>	<10 cfu cm <sup>2</sup>			

**Comments on Performance:***E.coli* O157Total number of participants examining the sample for *E.coli* O157

4

Participants reporting correctly

4

Aerobic Colony Count (30°C)

Total number of participants examining the sample for Aerobic Colony Count (30°C)

4

Participants reporting correctly

4

Total participants reporting for Aerobic Colony Count (30°C)

4

FEPTU QC median

8.5x10<sup>1</sup> cfu cm<sup>2</sup> (1.93 log<sub>10</sub>)*Enterobacteriaceae*Total number of participants examining the sample for *Enterobacteriaceae*

3

Participants reporting correctly

3

*Escherichia coli*Total number of participants examining the sample for *Escherichia coli*

4

Participants reporting correctly

4

Total sent samples

8

Not examined

1

Non returns

0

The fixed standard deviation value (σ value) used for calculation of the z-scores is **0.35** for all parameters.

\* Robust SD based on median absolute deviation about the participants' median (MAD).

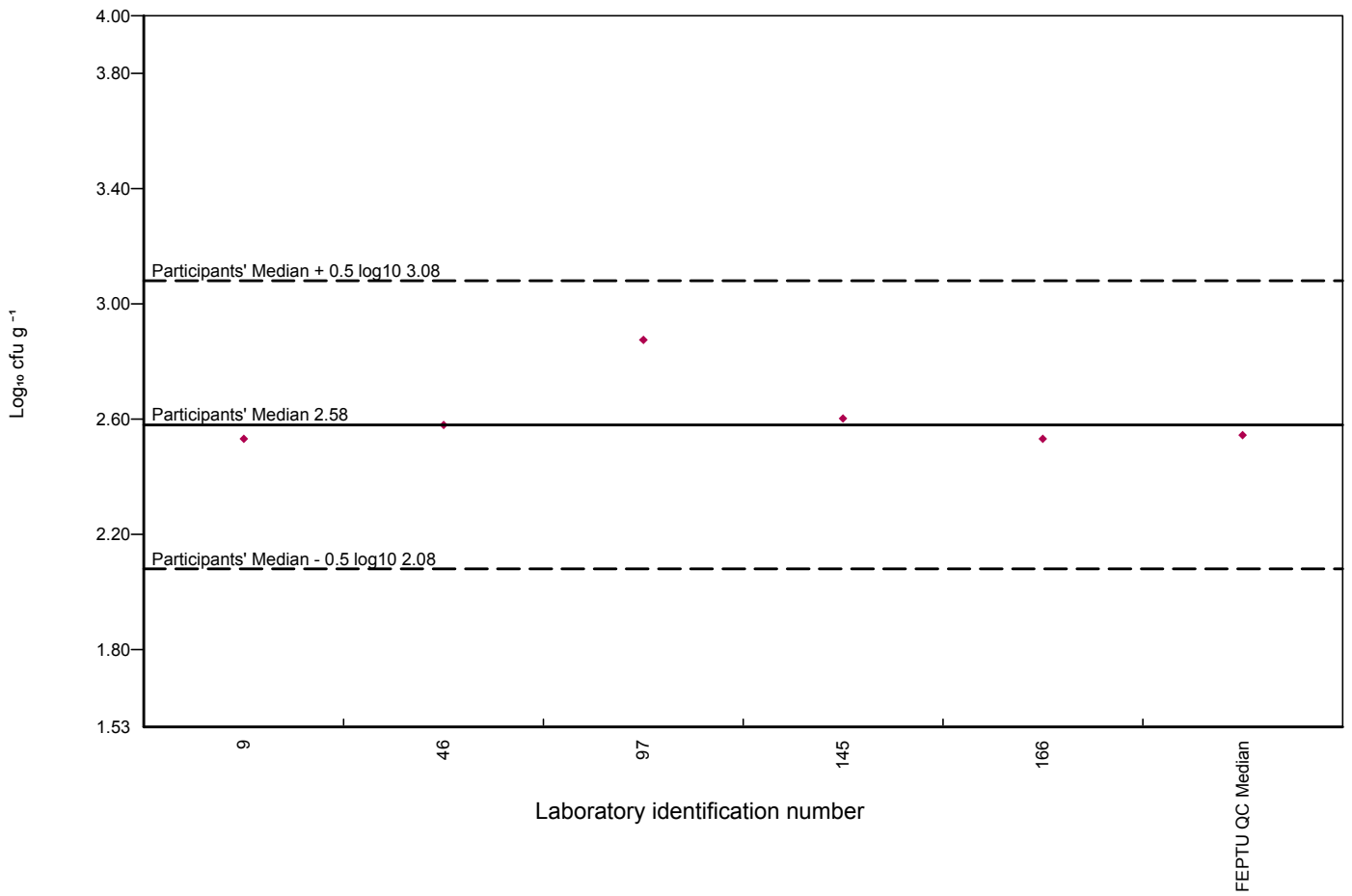
Note: enumeration parameters with less than 10 participants results are not scored. Please see explanation in the comments section.

\*\* No expected range calculated for this parameter due to the low number of participants reporting a results for this test.



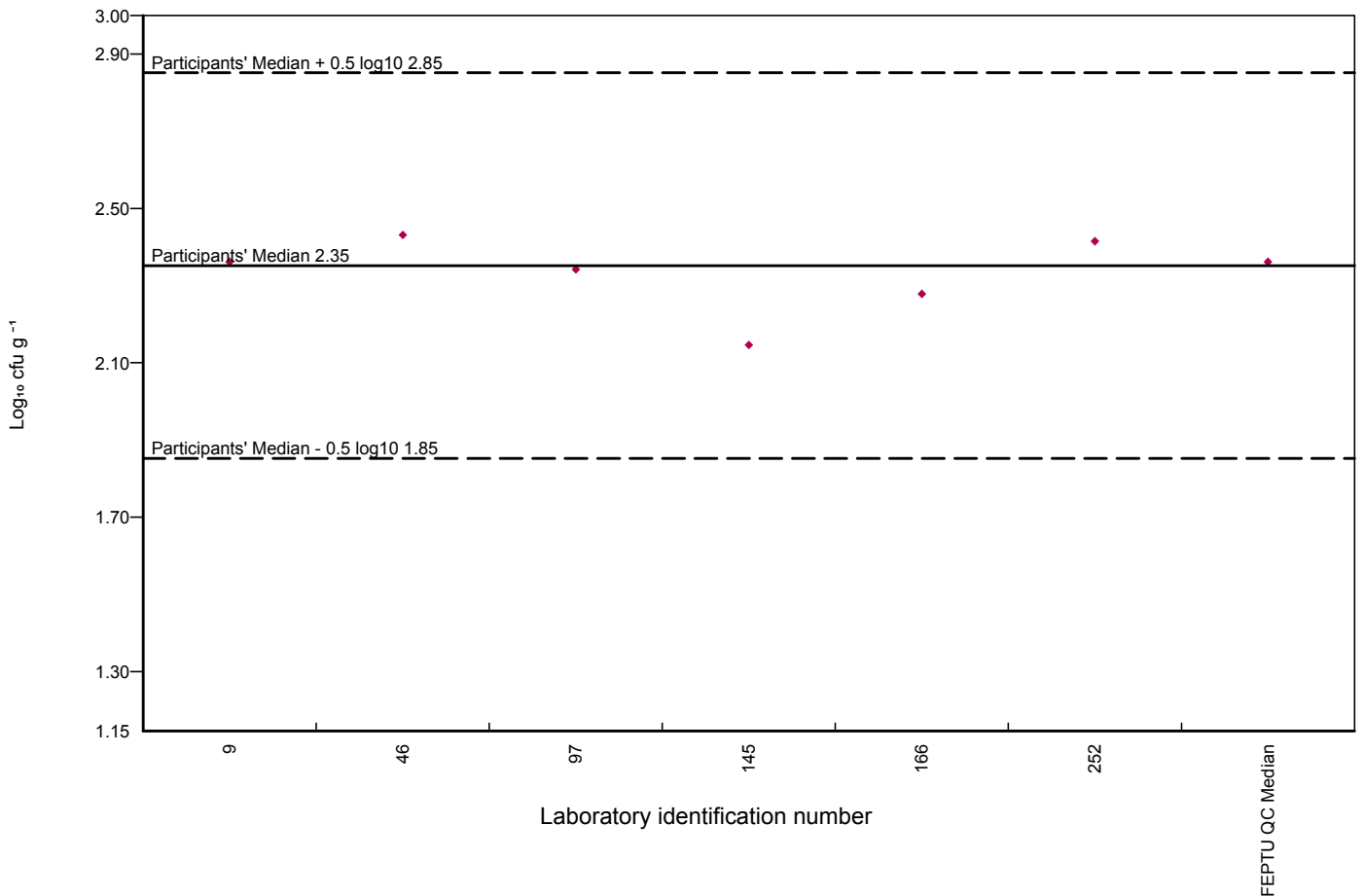
# PH0019 - Aerobic Colony Count (30°C)

Key: ♦ Reported result



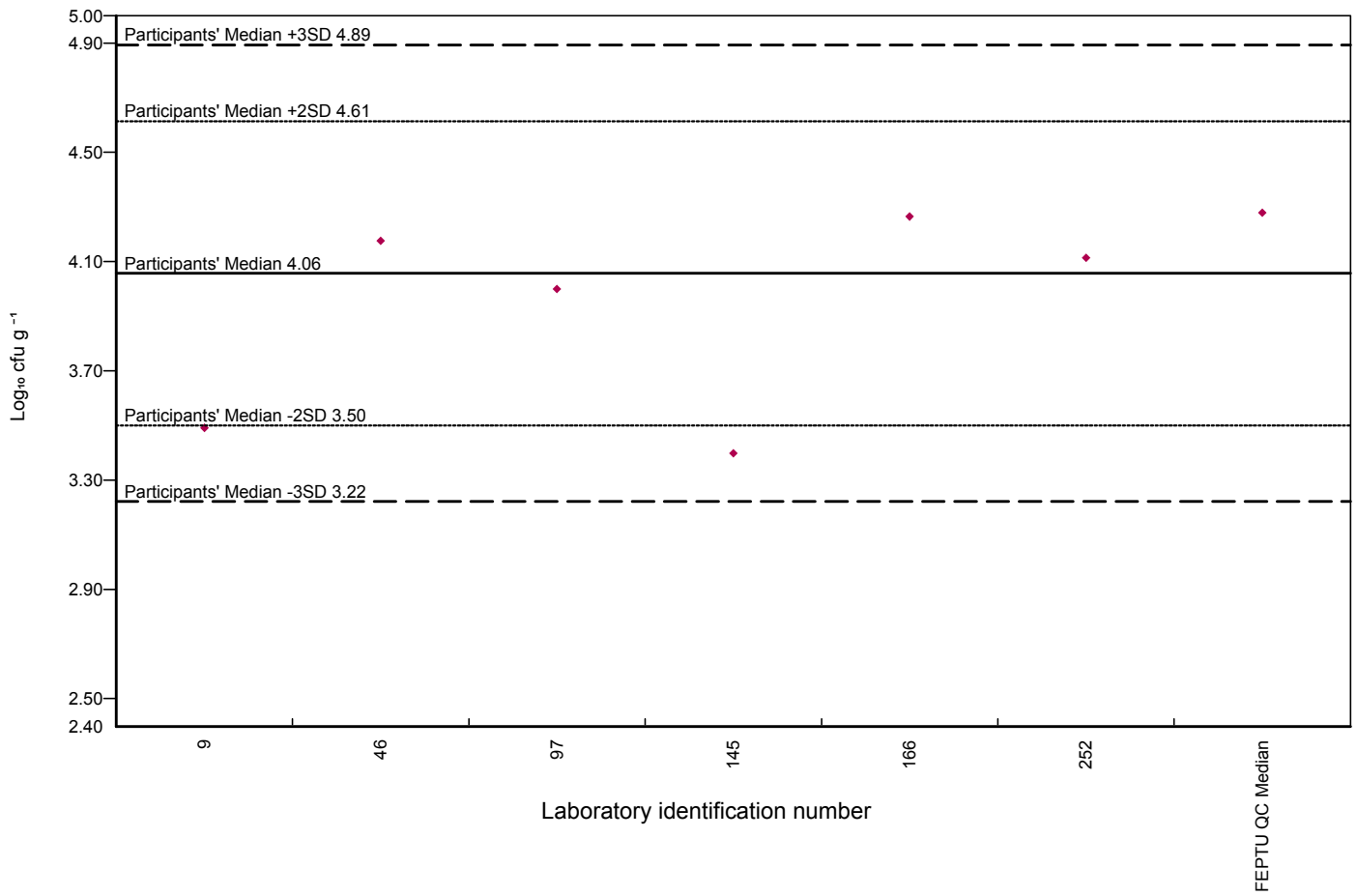
# PH0019 - *Enterobacteriaceae*

Key: ♦ Reported result



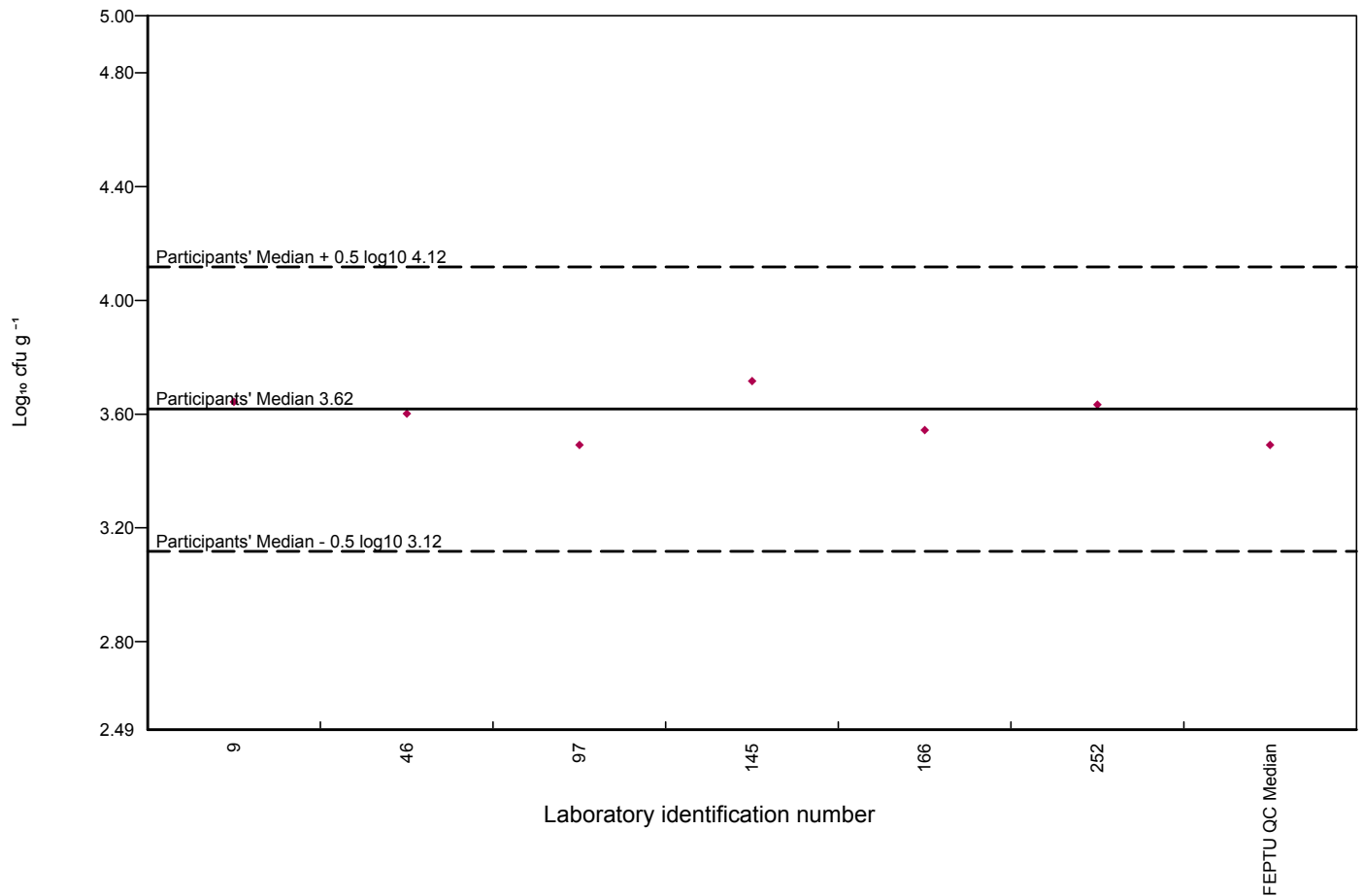
# PH0020 - Aerobic Colony Count (30°C)

Key: ♦ Reported result



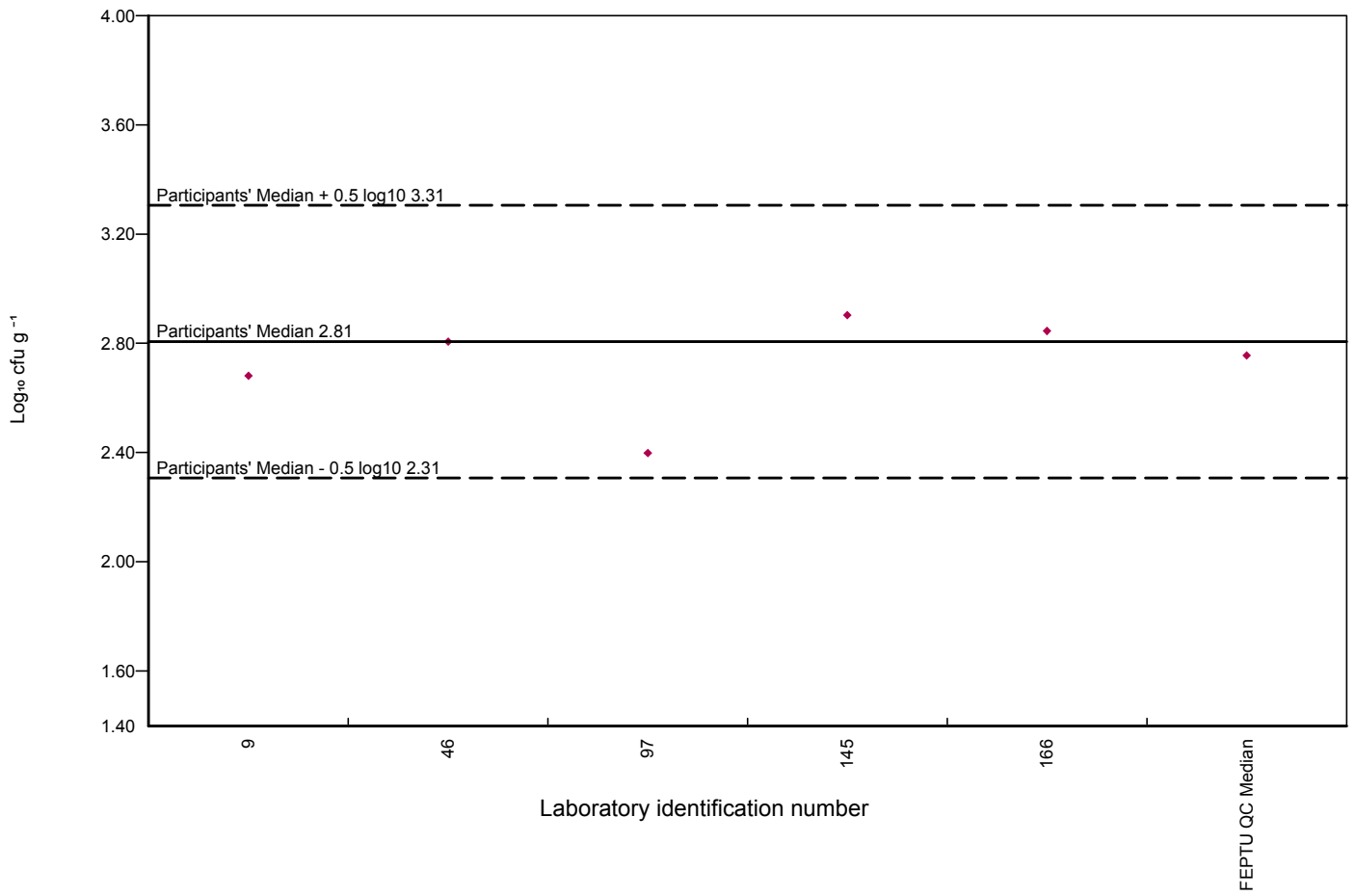
# PH0020 - Enterobacteriaceae

Key: ♦ Reported result



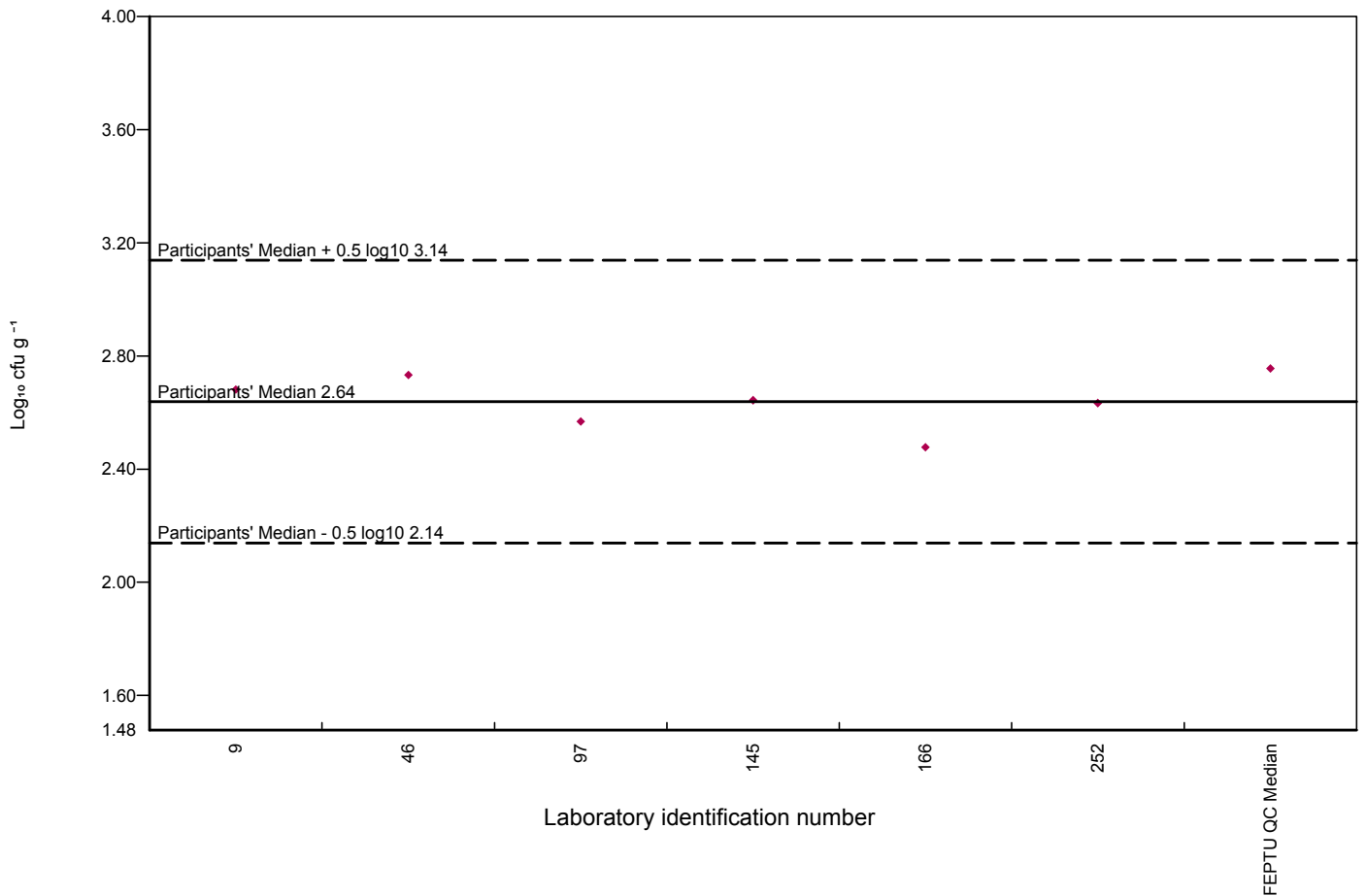
# PH0021 - Aerobic Colony Count (30°C)

Key: ♦ Reported result



# PH0021 - *Enterobacteriaceae*

Key: ♦ Reported result



#### **Comments for distribution PH4**

**Only seven laboratories analysed the samples from this distribution. All laboratories identified that Escherichia coli O157 (non-toxigenic strain) was the main food borne pathogen causing this outbreak.**

**In this outbreak the food type likely to have been implicated is the beef mince used to make the hamburger. Poor hygiene control contributed to areas within the food premises being contaminated with E. coli O157.**

The table below shows the additional examinations carried out by the participants and the reported results. Any incorrect results reported are shown in red.

Additional examination	Number of laboratories examining	Reported results	Number of laboratories examining	Reported results
	Sample PH0019 (Hamburger)		Sample PH0020 (Grilled chicken)	
<i>Bacillus cereus</i>	2	<100 (1) <200 (1)	2	<100 (1) <200 (1)
<i>Campylobacter</i> spp.	7	Not detected (7)	7	Not detected (7)
<i>Clostridium perfringens</i>	4	<10 (4)	4	<10 (4)
Coagulase-positive staphylococci	1	<20 (1)	1	<20 (1)
<i>Listeria</i> spp. (including mono)	1	<20 (1)	1	<20 (1)
<i>Salmonella</i> spp.	7	Not detected (7)	7	Not detected (7)
	Sample PH0021 (Mustard dressing)		Sample PH0022 (Template area swab taken the from the meat preparation area)	
<i>Bacillus cereus</i>	3	<10 (1) <100 (1) <200 (1)		
<i>Campylobacter</i> spp.	7	Not detected (7)		
<i>Clostridium perfringens</i>	4	<10 (4)		
Coagulase-positive staphylococci	1	<20 (1)	1	4 (1)
<i>Salmonella</i> spp.	7	Not detected (7)	2	Not detected (2)
	Sample PH0023 (Random area swab taken from the mincing machine)		Sample PH0024 (Template area swab taken from the sink draining board)	
Coagulase-positive staphylococci			1	<10 (1)
<i>Salmonella</i> spp.	1	Not detected (1)	2	Not detected (2)

**Additional comments:**

**Reporting results for swabs**

Participants are advised that the standard international reporting of results where no growth is obtained in a swab sample is <100 from a random area swab and <1 from a template area swab (100sq cm).

**Statistical evaluation**

Participants are advised that for a robust statistical evaluation at least 20 reported results are required for a parameter. When statistical calculation is based on 10 – 19 result, they should be interpreted with caution as they may be overly influenced by outlying results. When there are fewer than 10 reported results, the statistics are not considered robust enough to enable scoring. Therefore for this scheme, participants will notice that for some sample parameters, the statistics have been calculated for information and is not scored.

If you do not return a result for a distribution, you will not be able to view all the participants' results data in your individualised report. Therefore, we will post generic reports on the website, which will be available for 12 months after the distribution has closed, so you can access the missing data.

**End of report**

Public Health England

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@phe.gov.uk

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