



HEALTH PROTECTION AGENCY

Centre for Infections


**FOOD SAFETY MICROBIOLOGY
LABORATORY**

USER MANUAL

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Authorised By:

Dr Jim McLauchlin
Director



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1. Introduction

The Food Safety Microbiology Laboratory (FSML) is part of the Health Protection Agency's Centre for Infections (Cfi), Colindale, London, United Kingdom.

The Food Safety Microbiology Laboratory works at local and regional, national and international levels to reduce the impact of food, water and environmentally-borne illnesses on people's health. Our activities include microbiological examinations of food, water and environmental samples and a range of specialist testing and typing services. Our staff also undertake research and support the work of others in developing better tests for the diagnosis of food, water and environmentally-borne illnesses and the development of molecular typing methods.

FSML staff work in partnership with colleagues from other organisations such as the National Health Service (NHS), Local Authorities Co-ordinators of Regulatory Services (LACORS), Food Standards Agency (FSA), Department of Health (DoH), Emergency Response teams, commercial companies and Veterinary Laboratory Agency laboratories. Our staff examine clinical specimens as well as food, water and environmental samples from the NHS, environmental health officers (EHOs), commercial and other laboratories or agencies throughout the UK and overseas for monitoring and investigating food-borne disease.

The Food Safety Microbiology Laboratory is able to offer expert advice, education and training on public health aspects of food and water microbiology and safety. The Centre for Infections (Cfi) and therefore the Food Safety Microbiology Laboratory is licensed by the Human Tissue Authority (HTA) to undertake examinations of post mortem samples submitted by clinical consultants and pathologists for the purpose of public health monitoring. Under the licence, relevant material may only be retained after the examination is completed if it is likely to be of value for public health monitoring purposes or for research under research ethics committee approval.

CPA standard E6.1e requires laboratories to review referral laboratories in terms of EQA performance and turnaround times. The CPA standards also state that "Referral laboratories should where possible, be accredited by CPA or equivalent accreditation body or meet the requirements of the sender's quality management system." Our CPA Accreditation Certificate to the new standards can be found at the following website address: http://www.hpa.org.uk/cfi/dgi/fsml_accreditation.pdf. There are no NEQAS schemes for the specialist assays performed within FSML. We do undertake an extensive IQA programme and, whenever possible, participate in formal and informal international EQAs with similar laboratories overseas. Overall performance is satisfactory. We can provide more specific information on EQA on separate request.

Address:	Food Safety Microbiology Laboratory Health Protection Agency Centre for Infections 61 Colindale Avenue London NW9 5EQ United Kingdom
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Telephone:	020 8200 4400	
Fax:	020 8327 7874	
Direct dial lines:	Main FSML Office,	020 8327 7116
	FAX FSML Main Office	020 8327 7112

Normal working hours: 9.00 – 17.30 Monday to Friday

Please contact the Director or appropriate senior staff for emergency work outside normal working hours.

The HPA offers a full range of external proficiency testing schemes for microbiological testing of food and environmental samples. Full details of the schemes can be obtained from www.hpa.org.uk/cfi/quality/eqa/default or by contacting (foodeqa@hpa.org.uk and legionellaeqa@hpa.org.uk).

2. Summary of FSML Activities

Foodborne Pathogens Reference Unit (FPRU)

The work of this Unit offers reference services and a research programmes :

Bacillus species
Clostridium botulinum
Clostridium perfringens
Clostridium tetani
Listeria species
Staphylococcus aureus associated with food poisoning
Staphylococcus aureus enterotoxin detection in foods
Scombrototoxin (Histamine)

Water and Environmental Microbiology Reference Unit (WEMRU).

WEMRU specialises in:

Assisting in investigation of outbreaks of waterborne disease (especially legionnaires' disease)

Advising on microbiological hazards associated with water

Providing teaching and organising training courses on water and environmental microbiology

Request forms for all laboratory services offered by the Food Safety Microbiology Laboratory are available from http://www.hpa.org.uk/cfi/dgi/FSML_Clinical.pdf and http://www.hpa.org.uk/cfi/dgi/FSML_FoodEnviron.pdf.

3. Services Available

3a. Food-borne Pathogens Reference Unit Services:

Bacillus species

The Food Safety Microbiology Laboratory offers services for the identification of *Bacillus* species.

What Samples or Specimens to Send

Pure cultures of *Bacillus* on agar slopes

All isolates from vomitus, faeces or foods suspected to be or linked with cases of food poisoning.

Clinical isolates from blood cultures, or from sites that are normally sterile, or other sites where invasive or other diseases are confirmed or suspected.

Clinical and environmental isolates where cross-infection is suspected.

Isolates from foods or beverages with levels of *Bacillus* sp. including *B.cereus* of $\geq 10^4$ cfu per g or ml.

As foods may be contaminated simultaneously with several species of *Bacillus*, a selection of different colonial types should be sent to the Food Safety Microbiology Laboratory.

What Information to Send

Brief clinical and epidemiological information should be included with cultures from cases of infection.

Normal Turnaround Time

Identification of *Bacillus* spp

14 days

For cultures and foods requiring urgent attention, please telephone and ask for the appropriate member of staff (see page 24). Turnaround times may vary depending upon the clinical and public health urgency. Results of urgent requests will be communicated by telephone. Turnaround times quoted above are dependant upon receipt of sample and sample information as described above.

Food-borne Pathogens Reference Unit Services:

Clostridium botulinum

Services offered

The Food Safety Microbiology Laboratory offers services for the diagnosis of botulism in humans. This service comprises the detection of *C. botulinum* neurotoxins in clinical specimens, food and environmental samples together with the isolation and identification of *C. botulinum* from food, environmental samples and clinical specimens. Tests on food and referred isolates are UKAS accredited (UKAS testing laboratory No. 1595).

There are now five routes by which botulism can arise in humans: foodborne, intestinal colonisation, wound, accidental or deliberate.

Details on clinical presentation, diagnosis and laboratory tests for *C. botulinum* are now available on the HPA website, under Guidelines for deliberate release.

Antitoxin for treatment is available on request through the HPA Duty Doctor System (24 hrs tel: 020 8200 6868) for treatment of foodborne and wound botulism. Advice on treatment and prevention of infant botulism can also be obtained through the Duty Doctor System or from the Infant Botulism Treatment and Prevention Programme, California Department of Health (<http://www.infantbotulism.org/>).

What specimens or samples to send

Routine laboratory tests are not helpful and specimens should be sent immediately to the Reference laboratory. Please notify the Food Safety Microbiology Laboratory that samples for botulinum testing are being submitted so that preparations for testing can be made

Specimen and sample details

- Food and drink samples. Please transport refrigerated.
- Serum. At least 10ml collected as soon as possible after admission to hospital or at the acute stage of illness. Serum specimens must be collected before antitoxin is given.
- EDTA treated blood specimens are not suitable
- Faeces. At least 10g in a sterile container. Rectal washout may be required as patients with foodborne or intestinal colonisation botulism may have diarrhoea in the early stages, but this is followed by constipation.
- Vomitus, gastric washings or gut content. At least 10g in a sterile container.

- Pus or debrided tissue. If pus is not available, a swab of the lesion should be taken and put immediately into a transport medium or anaerobic culture medium.
- Post mortem specimens. Heart blood, if not haemolysed. Specimens of faeces, gut contents or infected wounds may be useful.
- For rapid detection of organism in faeces, tissue or food, samples can be inoculated into anaerobic culture media (pea sized sample in a 20ml Reinforced Clostridia Medium or Cooked Meat Broth) posted to FSML and tested by PCR on receipt.
- All cultures suspected of being *C. botulinum* should be sent in a cooked meat medium

What information to send

Brief clinical and epidemiological information should be provided with each sample. If botulism is suspected, by any route, it is essential that the local CCDC should be notified immediately.

Emergency Situations

During working hours contact a senior member of staff (see page 24 for appropriate urgent attention. Outside working hours, contact the CFI Duty Doctor (020 8200 6868)

Urgent transport of specimens or samples to the Food Safety Microbiology Laboratory by taxi or courier should be considered if a clinical diagnosis of food related botulism is likely.

The local CCDC should be notified if a diagnosis of botulism is suspected. Please also notify the Centre for Infections Duty Doctor, Phone 020 8200 6868

Normal Turnaround Time

<i>C. botulinum</i> neurotoxins in sera	5	days
<i>C. botulinum</i> neurotoxins in food/faeces	5	days
<i>C. botulinum</i> isolation and identification	9	days
<i>C. botulinum</i> identification of pure cultures	3	days

These turnaround times reflect the proportion of tests requiring prolonged observation in order to establish a negative result. Turnaround times quoted above are dependant upon receipt of sample and sample information as described above.

If neurotoxin is detected, a turnround time of >5 days will be required to establish the toxin type, however, **positive results are reported immediately by telephone.**

Food-borne Pathogens Reference Unit Services:

Clostridium perfringens

Services Offered

The Food Safety Microbiology Laboratory offers services for the identification and molecular typing of *C. perfringens* detection of toxin genes in cultures, and detection of enterotoxin in faeces.

What Specimens or Samples to Send

Pure cultures of *C. perfringens* in cooked meat medium isolated from:

Faeces from cases of diarrhoea obtained after alcohol shock treatment or on direct isolation

Faeces, gut contents or gut biopsy in cases of suspected necrotising enterocolitis

Faeces and food may be contaminated with several types of *C. perfringens*. It is recommended that in cases of suspected food poisoning several colony picks (3-5) should be sent from faeces and food.

Faeces for enterotoxin detection in cases of diarrhoea, minimum sample \geq 1g or ml

Faeces, gut contents or gut biopsy in cases of suspected necrotising enterocolitis.

What Information to Send

Brief clinical and epidemiological information should be included from cases of *C. perfringens* diarrhoea. Please indicate if a relationship with other cases by common source is suspected and if the cases are suspected to be food-borne or as a result of person to person spread.

Normal Turnaround Time

Identification of pure cultures	7	days
Identification and molecular typing	10	days
Detection of enterotoxin in faeces	3	days
Isolation of <i>C. perfringens</i> from faeces	8	days

For further information or for the results from cultures requiring urgent attention, please telephone and ask for the appropriate member of staff (see page 24). Turnaround times may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. Turnaround times quoted above are dependant upon receipt of sample and sample information as described above.

Food-borne Pathogens Reference Unit Services:

Clostridium tetani

Services Offered

The Food Safety Microbiology Laboratory offers a service for the identification of toxigenic *C. tetani* and diagnosis of tetanus.

- Identification of toxigenic *C. tetani* (toxin gene detection)
- Detection of neurotoxin in serum

What Specimens to Send

- All cultures suspected to be *C.tetani* in cooked meat medium.
- Serum at least 2 ml collected as soon as possible after admission to hospital. Serum specimen must be collected before antitoxin is given and will be tested for the presence of tetanus antibodies before toxin detection is performed.

What Information to Send

Brief clinical and epidemiological information should be provided with each specimen/culture. For isolates from the environment please include details of source.

Normal Turnaround Time

Toxigenicity of pure cultures (toxin gene detection)	5 days
Detection of toxin in serum	5 days

This turnaround time reflects a proportion of tests requiring prolonged observation in order to establish a negative result. Urgent results will be reported by telephone. Turnaround times quoted above are dependant upon receipt of sample and sample information as described above.

Food-borne Pathogens Reference Unit Services:

Listeria

Services Offered

The Food Safety Microbiology Laboratory offers services for the identification of *Listeria* species, and the typing of *L.monocytogenes* and non-cultural diagnosis.

What Specimens to Send

Pure cultures on agar slopes.

Isolates from all cases of human listeriosis should be sent for sub-typing. All reports are incorporated into a database for cases of listeriosis.

Isolates of *L. monocytogenes* from foods should be sent for sub-typing in the following circumstances:

- When the organism is present at >100 cfu of *L. monocytogenes* per g;
- If the isolates form part of a co-ordinated survey or follow up investigation;
- If there is a particular concern with a specific food product;
- If there is an association with a case of listeriosis.

The Food Safety Microbiology Laboratory also offers a service for the identification of *Listeria* spp. and this may be helpful when laboratories are experiencing difficulties in this area. Isolates of *Listeria* spp other than *L. monocytogenes* where these are present at high numbers in food should also be sent to Food Safety Microbiology Laboratory.

Foods may be contaminated simultaneously by several species of *Listeria*, or several strains of *L. monocytogenes*, multiple (3-6) subcultures should therefore be examined for each sample.

Techniques (PCR) are available for non-cultural diagnosis using CSF or serum samples.

What Information to Send

Brief clinical and epidemiological information should be included with cultures from cases of human listeriosis. A more detailed questionnaire for completion will be sent for each case.

Normal Turnaround Time

Identification of pure cultures	7 days
Non-cultural diagnosis in CSF or serum	3 days

Further sub-typing on all isolates of *L.monocytogenes* submitted to the Food Safety Microbiology Laboratory is available where relationships between cultures are being established. For further information or for cultures requiring urgent attention, please telephone and ask for the appropriate member of staff (see page 24). Turnaround times

may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. Turnaround times quoted above are dependant upon receipt of sample and sample information as described above.

Food-borne Pathogens Reference Unit Services:

***Staphylococcus aureus* enterotoxin gene detection and enterotoxin detection**

Details of Services Offered

The Food Safety Microbiology Laboratory, together with the Laboratory of Healthcare Associated Infections (LHCAI), offers a diagnostic service for the detection of staphylococcal enterotoxin genes (A, B, C, D, E, G, H, I and J) in cultures of *S.aureus* isolated from foods, faeces and vomitus, and a service for the detection of enterotoxins A, B, C, D or E in samples of food or beverages.

What Specimens or Samples to Send

Pure cultures of *S.aureus* on nutrient agar slopes from:

Food, beverages, patient's vomitus or faeces from cases of food poisoning;

Food handlers suspected to be associated with staphylococcal food poisoning;

Foods where *S. aureus* was recovered at $\geq 10^4$ cfu per g;

Food or beverages where staphylococcal food poisoning was suspected
Minimum sample size ≥ 5 mL or 5 g

Food samples should be kept refrigerated and sent in a cooled or insulated container to arrive refrigerated.

What Information to Send

Brief clinical and epidemiological information should be sent with cultures..

Normal Turnaround Time

Detection of enterotoxin genes in pure cultures 10 days

Detection of toxin (enterotoxins A,B, C ,D and E) 4 days
in food

For further information about toxin detection or for cultures requiring urgent attention, please telephone and ask for the appropriate staff (see page 24). Turnaround times may vary depending upon the clinical and public health urgency. Urgent results will be communicated by telephone. Turnaround times quoted above are dependant upon receipt of sample and sample information as described above.

Food-borne Pathogens Reference Unit Services:

Scombrototoxin Detection

Services Offered

The Food Safety Microbiology Laboratory offers a service for the detection of scombrototoxin (histamine). which is UKAS accredited (UKAS Testing Laboratory No. 1595).

What Samples to Send

Scombrototoxin (histamine) minimum 10 g fish, or fish products

Scombrototoxin can be produced by spoilage organism at 4⁰C. Therefore samples for scombrototoxin should be frozen and sent to arrive in a frozen state or refrigerated to arrive within 4 hours of collection.

What Information to Send

Brief clinical and epidemiological information of any suspected cases should be included with samples of food. In particular, information on the origin of the product, and batch and brand if a canned food should be sent.

Normal Turnaround Time

Scombrototoxin (histamine)	4	days
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For food requiring urgent attention, please telephone and ask for the appropriate member of staff (page 24). Turnaround times may vary depending upon the clinical and public health urgency and number of samples sent. Urgent results will be communicated by telephone. Turnaround times quoted above are dependant upon receipt of sample and sample information as described above.

3b. Water and Environmental Microbiology Reference Unit Services

The Water and Environmental Reference Unit undertakes and assists with the investigation of outbreaks of water borne disease, in particular legionnaires' disease. It provides advice on the microbiological hazards associated with all kinds of water use and the control of these hazards, in particular: all aspects of the control of *Legionella pneumophila* the cause of legionnaires' disease; the control of microbiological hazards in swimming, hydrotherapy and spa pools; and methods for the sampling and detection of microorganisms in water and the environment. The Unit also provides teaching and training courses on water and environmental matters.

Services Offered

Water and Environmental Microbiology Reference Unit provides national and international services for the investigation of waterborne infections. These services include:

Organisation and assistance in the investigation of outbreaks of water borne disease, in particular legionnaires' disease.

Advice on the microbiological hazards associated with all kinds of water use and the control of these hazards in particular: all aspects of the control of *Legionella pneumophila* the cause of legionnaires' disease;

Advice on the control of microbiological hazards in swimming, hydrotherapy and spa pools;

Advice on methods for the sampling and detection of microorganisms in water and the environment.

4. HELP US TO HELP YOU

The Centre for Infections routinely receives several hundred parcels containing pathological specimens every day.

To ensure that specimens are processed as rapidly as possible, please ensure that the name Food Safety Microbiology Laboratory is clearly identified on the address label. If in doubt, please use the telephone contacts directory listed at the end of this booklet to check on the appropriate identification.

Full details of the sample or specimen will ensure that all appropriate tests and interpretations are provided.

If a specimen or sample result is required urgently, prior telephone contact with the receiving unit or laboratory will ensure priority.

To ensure that specimens or samples are not subjected to needless postal delays, please always follow the National and International Postal Regulations (see page 21).

Samples may also be submitted through the Hayes DX System. The address of the Food Safety Microbiology Laboratory is:

HPA Colindale, SRMD (FSML)
DX 6530007
Colindale NW

The time taken to perform identification, detection and typing tests is dependent on the receipt of pure cultures. Cultures that require purification may increase turn-round time significantly.

5. IF THERE IS A PROBLEM OR YOU ARE NOT SATISFIED WITH THE SERVICE YOU HAVE RECEIVED

IN THE FIRST INSTANCE CONTACT APPROPRIATE SENIOR MEMBERS OF STAFF:

See Contact List page 24

NEXT CONTACT:

Director	J McLauchlin PhD	020 8327 7117
Foodborne Pathogens Reference Unit (FPRU)	K Grant PhD	020 8327 6505
Water and Environmental Reference Unit (WEMRU)	JV Lee PhD, MWMSoc	020 8327 7012
The Director's Secretary	D Gracias	020 8327 7116

Our endeavour is to be responsive to the changing needs of all users of our microbiology services and we welcome comments on how we can improve the provision of these services. Please contact any of the above.

If there is a major complaint please telephone, write e-mail or fax to the key member of staff who will initiate our laboratory complaints procedure.

6. CFI recognition of Caldicott recommendations

The recommendations of the Caldicott Report (1997) have been adopted by the Health Protection Agency as by the National Health Service as a whole. These recommendations relate to the security of patient identifying data (PID) and the uses to which they are put. The Centre for Infections observes Caldicott guidance in handling PID and has appointed its own Caldicott Guardian. He advises the Director, CFI, on confidentiality issues and is responsible for monitoring the physical security of PID in all parts of CFI. This also applies to the transfer of results of investigations to and from CFI whether by mail services, telephone or fax. The value of 'safe haven' arrangements or other means of the sender and receiver of information identifying themselves to each other before data is transferred is emphasised.

CFI is anxious to audit the security of its PID in collaboration with its customers. Customers are invited to review our arrangements in conjunction with individual laboratory directors and/or the CFI Caldicott Guardian. Customers are also asked to draw to the CFI Caldicott Guardian's attention any instances where PID security has been threatened or has broken down. Uses that PID are put to outside clinical diagnostic services generally allow patient identifiers to be removed before hand, and when PID is used for research purposes the proposals are considered first by the HPA Research Ethics Committee. All enquiries about the security and use of PID at CFI should be addressed to the Caldicott Guardian, Dr Barry Evans (ext 7459; e-mail:barry.evans@hpa.org.uk)

7. CFI POLICY ON FAXING REPORTS CONTAINING PATIENTS' DATA

The following guidelines have been prepared taking into account the Code of Practice on reporting patients' results by fax prepared by the Department of Health.

It is CFI policy that reports containing patients' data should **not** be sent by fax.

In **exceptional** circumstances, it may be necessary to send a result by fax. In this case, the following conditions must be adhered to after telephone discussion with the Food Microbiology Safety Laboratory.

- The patient's name must be conveyed separately using a linking patient identifier.
- The report must be sent to a "safe-haven" fax machine. This means that, if the location is in general use, consideration must be given to ensuring that unauthorised personnel are unable to read reports, accidentally or otherwise. Also, the room housing the fax machine must be a secure location which is locked if it is likely to be unattended at the time the fax is sent.
- Assurance must be sought from the intended recipient of the faxed report, preferably in writing, that the receiving fax machine is a safe-haven.
- Measures must be taken to minimise the risk of mis-dialling, either by double-checking numbers or having frequently used numbers available on the fax machine's memory dial facility.
- Confirmation must always be sought from the intended recipient that the fax has been received.

8. POSTAL REQUIREMENTS

Any organisation sending out cultures or diagnostic specimens has a legal duty to ensure that such items are sent in a safe manner. Infectious substances which break in transit can result in a major incident, putting those handling them and those in receipt of them at risk of infection. It is therefore vital that the correct postal requirements are followed.

Infectious substances and diagnostic specimens being sent to CFI must comply with UK Regulations (and sometimes International Regulations) for the carriage of dangerous goods. Hazard group 4 agents must not be sent without prior arrangement with the Virus Reference Division.

Some cultures (e.g. *E. coli* O157, *Clostridium botulinum*) have to be transported as UN 2814 'infectious substances affecting humans' which requires packing instruction 620, but most cultures and diagnostic specimens have been subject to a derogation by the HSE and should be transported as UN 3373 which requires packing instruction 650 as a minimum. CFI recommends packing everything to the 620 standard (see below) as the packaging is more robust, decreasing the likelihood of damage.

Labelling of packages for UN 3373 (Category B samples)

Those cultures/specimens known to fit the category of UN 3373 should be labelled clearly as 'Diagnostic specimens' and can be sent by Royal Mail or via the PDP Courier.

Labelling of packages for UN 2814 (Category A samples)

Those cultures known to fit the category of UN 2814 must be labelled:

- 'Infectious substance affecting humans'.
- With the UN number 'UN 2814'.
- With a biohazard diamond mark sign.
- Must be marked with any subsidiary hazards such as chemical hazards.

All samples must be sent by licenced courier. For samples of food where there is a strong suspicion that they contain *Clostridium botulinum* toxin, it would be prudent to consider these as Category A, but this should be done on a case by case basis.

Carriage

Diagnostic Specimens (UN 3373) can usually be sent via the postal service, but the post office must be informed and their own guidance must be followed. The primary receptacle must not contain more than 500g/ml.

Infectious material (no more than 50g/ml) being sent as UN 2814 must be sent by courier and must include:

- Name, description and quantity of material.
- Name, address and telephone number of consignee.

- Type of packaging.
- Handling information.
- Emergency contact person.

If substances are being transported by air, the courier must hold a dangerous goods licence and the relevant documentation for such transport must be completed.

Any infectious material being transported internationally must be accompanied by the relevant international paperwork.

Public transport must not be used. If your own vehicle is used, packaging requirements must still be met.

Packaging

- Watertight primary receptacle, if there is more than one, wrapped to avoid contact between them. If screw caps are used they must be reinforced with tape.
- Watertight secondary packaging.
- Absorbent material between primary and secondary receptacle sufficient to absorb contents.
- Only approved packaging to be used.
- If dry ice is used it must be placed around the secondary packaging. Use interior supports to secure secondary packaging after dry ice has dissipated. If ice is used, waterproof outer packaging must be used. If dry ice is used, the outer packaging must allow escape of CO₂. *An explosion may occur if dry ice is placed in the secondary packaging.*
- Accompanying referral forms must indicate the presence, or potential presence of, hazard group 3 agents, or any other safety information to enable CFI to assess the risks.

Further advice on Guidance and Packaging samples can be found at the HPA Website <http://www.hpa.org.uk/cfi/packaging.htm>.

The HPA currently has contracts with the following couriers, PDP (<http://www.pdpcouriers.com>) and TNT (<http://www.tnt.com>) who are with the European Agreements on transport of Dangerous Goods by Road (ADR) and the Regulations concerning the International Carriage of Dangerous Goods by Rail (RID).

These guidelines are not intended as a substitute for reading the advice given by DfT and DoH.

Use the links below for further information.

http://www.dft.gov.uk/stellent/groups/dft_freight/documents/page/dft_freight_611600.pdf

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_075439

<http://www.icao.int>

<http://www.unece.org>

9. KEY CONTACT STAFF EXTENSION NUMBERS

FSML Telephone No. Direct Dial 020 8327 7116
FSML Fax No. 020 8327 7112
CFI Telephone No. 020 8200 4400

		E-mail address	CFI ext No.
Director	Dr Jim McLauchlin, PhD	jim.mclauchlin@hpa.org.uk	7117
Water and Environmental Microbiology Reference Unit Head	Dr John V Lee PhD, MWMSoc	john.v.lee@hpa.org.uk	7012
Directors' PA/Office Manager	Daisy Gracias	daisy.gracias@hpa.org.uk	7116
Laboratory Manager	Stewart Reith, BSc, FIBMS	stewart.reith@hpa.org.uk	6110
General Office	S Fester, E Kuttab	susan.fester@hpa.org.uk elizabel.kuttab@hpa.org.uk	7115 7115
<i>Clostridium perfringens</i> <i>Bacillus</i>, <i>Listeria</i>, <i>Staphylococcus aureus</i> enterotoxins <i>C.botulinum</i>, <i>C.tetani</i>, <i>C.perfringens</i> and scombrototoxin	} Dr Kathie Grant PhD	kathie.grant@hpa.org.uk	6506 7118
	} Vina Mithani, BSc (Hons), FIBMS, CSci.	vina.mithani@hpa.org.uk	6521 7116