

**DIAGNOSTIC
AND
LABORATORY SERVICES
(APRIL 2010)**



ANIMAL HEALTH LABORATORY DIVISION

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IMPORTANT: To ensure that samples are dealt with efficiently and that test results are not adversely affected by incorrect sampling, improper packaging of samples and / or poor transport conditions, please read the following carefully.

SPECIMEN SUBMISSION PROCEDURES

Specimen submission hours (we are closed on Saturdays, Sundays and Public Holidays):

Mon - Thu : 8:00 am – 5:00 pm	New Year's Eve,
Fri : 8:00 am – 4:30 pm	Chinese New Year's Eve
(Lunch Hour : 12:30 pm – 1:30 pm)	and Christmas Eve : 8.00 am – 12:00 pm
	(if they do not fall on Saturdays or Sundays)

Submission forms

1. On-line application for our laboratory services is available under '[Inspection and Laboratory e-Services](#)' at the [AVA website](#).
2. Specimens submitted to the Animal and Plant Health Centre (APHC) must be accompanied by the appropriate sample submission form completed on-line:
 - a. MAM - Mammals (Companion / Livestock / Exotic): for cats, dogs, pet birds, guinea pigs, etc.
 - b. FWL - Avian: for poultry, livestock, captive birds, etc.
 - c. BIO - Veterinary Vaccines: for vaccines and other biologics.
 - d. AQU - Aquatic Animals, Amphibians and Reptiles.
 - e. ENV - Environmental & Miscellaneous - for water, soil samples, etc.

In addition to the sample submission form, animal carcasses submitted to the APHC must be accompanied by the following (available from the AVA website under 'Testing of Animal Pathogens and Biologics'), whichever is appropriate:

- a. [Post-Mortem Examination Consent Form](#)
 - b. [Post-Mortem Examination Letter of Authorisation](#)
3. Please note that samples with incorrect labels or incomplete forms could result in delay of the turn-around time.

Sample submission

Due to risks to transport and laboratory personnel, please **DO NOT** send specimens in:



Syringes, with or without needles. Needles may cause injury while specimens in syringes without needles are prone to leakage.



Glass containers of any kind.



Wet ice in plastic bags. Please use sturdy insulated boxes for wet ice, or use cold packs instead.

SAMPLE SUBMISSION PROCEDURES (continued)

A. SAMPLES FOR VIROLOGY AND *CHLAMYDOPHILA*:

Due to the specific and stringent requirements of specimens for virus isolation, these are addressed separately on pages 6 to 7.

B. SAMPLES FOR BACTERIOLOGY AND OTHER EXAMINATIONS:

Note: All specimens for bacteriological culture should be collected **PRIOR TO ANTIBIOTIC TREATMENT** (unless monitoring treatment efficacy). As far as possible, collect these specimens aseptically (wear gloves), place them securely in sterile leak-proof containers and transport chilled to the APHC in a secondary container / bag on the day of collection. If there is a delay of delivery of specimens to the APHC for more than 24 hours, store at 2 to 8°C (temperature of a normal domestic refrigerator), unless otherwise stated below. **DO NOT FREEZE**. Where possible, **submit a specimen for each test requested for**, e.g. submit 2 swab samples from the same animal if both general aerobic culture and *Salmonella* culture are requested for.

1. SERUM / BLOOD / OTHER BODY FLUIDS:

Specimens should be sent in unbreakable leak-proof containers, preferably sterile and screw-capped with external threads. The specimens should be clearly labelled and identified. These specimens should match records on the submission form. Send to the APHC on ice (taking care to avoid freezing and leakage of melted ice into specimens) in an insulated container, or with a cold pack.

- a. Serum can be stored at 2 to 8°C for up to 72 hours.
- b. Clotted blood for serology: Tube should not be more than 2/3-full unless it contains clotting agents. Clotted blood can be transported at ambient temperatures within the same day of collection, or left at room temperature (approximately 25°C, or temperature of an air-conditioned room) for up to 24 hours. Place clotted blood tube at an angle above a flat surface to facilitate clotting. Allow blood to clot and release serum before placing it on ice. Avoid exposure to high temperatures and **DO NOT FREEZE**. **Please note that blood samples that are lysed would be rejected at the discretion of the APHC, as test results may be adversely affected by such condition of the samples.**
- c. Blood and other fluids for bacteriological culture: Specimens should be collected in sterile plain tubes and delivered to the APHC as soon as possible. Fluids other than blood may be stored at 2 to 8°C for up to 24 hours. **DO NOT FREEZE**. (See pages 6 to 7 for samples for virological testing.)

2. SWABS FOR BACTERIOLOGICAL CULTURE:

Ear swab: Use a sterile swab moistened with sterile Brain Heart Infusion Broth (BHI, available from the Bacteriology Laboratory of the APHC with advance notice, see page 29), or sterile saline (without preservatives) to remove any debris or crust. Obtain a sample by firmly rotating a fresh moistened swab in the canal.

Nasal swab: Rotate a sterile swab moistened with sterile BHI or sterile saline against the nasal mucosa.

Cloacal swab: Collect using a sterile swab moistened with sterile BHI. Ensure faecal material is present on the swab after collection.

Where specified in this booklet, swabs must be submitted in the appropriate transport media:

- a. *Campylobacter* transport medium: for isolation of *Campylobacter*.
- b. Amies transport medium with charcoal: for isolation of *Tylorella equigenitalis*, single swab.

- c. Buffered glycerol-saline transport medium or equivalent: for isolation of *Shigella*.

SAMPLE SUBMISSION PROCEDURES (continued)

The above transport media are available (by self-collection) from the APHC. Please contact the Bacteriology Laboratory at least 2 days in advance. A list of contact persons appears on page 29.

Note: Material sent on swabs is liable to desiccation. Where possible, a more generous amount of material should be submitted, such as biopsy material, several ml of pus, exudate or faeces. Otherwise, swabs should be collected in BHI or commercial transport medium (e.g. Stuart's or Amies).

3. FRESH TISSUE / ORGANS:
Each tissue / organ should be individually packed in separate sterile leak-proof containers and clearly labelled with type and origin of tissue. These should match records on the submission form. Fresh tissues should preferably be chilled. **DO NOT** freeze.
4. ABSCESSSES / SKIN LESIONS FOR BACTERIOLOGICAL CULTURE:
Disinfect surface with 70% ethanol. About 3 ml of pus / material should be aspirated with a sterile syringe and fine needle. Place sample in a sterile container. Collect from recently formed abscesses. Pus at the centre of abscess is often sterile; a sample of the base of the lesion and a sample of the abscess wall is most productive. If swabs have to be used, place in BHI or commercial transport media immediately after collection and send to the APHC as soon as possible.
5. URINE FOR BACTERIOLOGICAL CULTURE:
Collect mid-stream sample in a sterile container. Send to the APHC as soon as possible.
6. TISSUES FOR HISTOPATHOLOGY:
Specimens should be sent in leak-proof, formalin-resistant plastic, appropriately sized container(s), in a 10% neutral-buffered formalin solution (tissue to formalin ratio of 1:10). Label the container(s) with the following:
 - i. identity and number of organs / tissues;
 - ii. animal species and animal identity;
 - iii. name of submitter i.e. owner, veterinarian or clinic.

Note: 10% neutral buffered formalin and containers can be obtained from the APHC in order to facilitate submission of histopathology samples (self-collection only). Please contact the Veterinary Pathology Laboratory of the APHC and give at least 1 day's notice (see page 29).
7. FAECAL SAMPLES FOR BACTERIOLOGICAL CULTURE AND PARASITOLOGY:
Send chilled samples, which are as fresh as possible, in a leak-proof sterile plastic container. For *Campylobacter* and *Shigella* isolation, fresh faecal samples should be transported directly to the laboratory within 2 hours after collection. If this is not possible, the appropriate transport medium should be used:
 - i. *Campylobacter* isolation: collect at least 5 g of FRESH specimen in 30 ml of Campylobacter transport medium, maintain at 2 to 8°C, and transport to the APHC by the following day.
 - ii. *Shigella* isolation: collect 10 to 20 g of FRESH specimen in 30 ml of buffered glycerol-saline transport medium or equivalent, maintain at 2 to 8°C, and transport to the APHC by the following day.
8. ANIMAL FEED SAMPLES FOR BACTERIOLOGICAL CULTURE:
Submit at least 500 g of sample. Chilling during transport and storage is not required.

SAMPLE SUBMISSION PROCEDURES (continued)

9. WATER SAMPLES FOR BACTERIOLOGICAL CULTURE:
Submit at least 500 ml of water in a leak-proof sterile container (kept chilled during transport and storage).
10. ANIMAL CARCASSES FOR POST-MORTEM EXAMINATION:
Keep the carcass at 2 to 8°C, package it securely in two layers of strong plastic bags, label the outer bag with the identification of the animal and name of submitter, i.e. owner, veterinarian or clinic, and submit the carcass to the APHC as soon as possible. **DO NOT** freeze the carcass.

(Arrangements to save certain carcasses for cremation can be made if indicated at time of submission. Please contact the Veterinary Pathology Laboratory of the APHC for more information - see page 29).
11.
 - a) AQUATIC ANIMALS (LIVE):
Send live fish packed in leak-proof bags filled with 2/3 air and 1/3 water. Avoid temperatures above 25°C during transport. Avoid sending recently fed fish, as vomiting and water fouling may occur during transport. Very sick fish are best transported as freshly dead chilled specimens (see 9b), as dissolved oxygen often drops during transport, especially in seawater.
 - b) AQUATIC ANIMALS (DEAD):
Only freshly dead specimens can be accepted, as putrefaction continues in cold-blooded animals even at chilled temperatures. Samples should be kept at 2 to 8°C, packed in leak-proof bags, and submitted preferably within 24 hours. Cold packs are recommended, although ice packed separately in leak-proof bags are acceptable during transport. **DO NOT** freeze.
12. OTHER LIVE ANIMALS:
The APHC does not accept live animals, apart from farmed fish and poultry.
13. A specimen may be rejected if improperly collected, packed, transported, labelled or deemed unsuitable for testing at the discretion of the APHC.
14. Specimens submitted will be considered the property of the APHC.
15. Unless otherwise requested for in writing, all containers and packaging material used in sample submissions will be considered the property of the APHC, and be disinfected or destroyed as deemed fit.

SAMPLE SUBMISSION PROCEDURES (continued) - Specimen Collection and Transport for Virology and *Chlamydomphila*

The ability to grow a cultivable virus present in a clinical specimen depends on maintaining the infectivity of the virus from the time the specimen is obtained until it arrives at the APHC for culture. Collecting the correct specimen by an appropriate method at the proper time during infection significantly enhances virus isolation frequency and improves the clinical relevance of the laboratory results.

General guidelines for specimen collection are listed below. Individual specimen collection procedures that differ from those listed below are indicated under the specific tests offered (see pages 11 to 27).

General considerations

1. VIRAL TRANSPORT MEDIA: Most viral specimens need to be transported in a medium to maintain viral activity. The need for transport medium and the appropriate type of medium to use are indicated under the specific tests offered (see pages 11 to 27). We provide 3 types of transport media for self-collection:
 - a. ND/AI transport media - for the isolation of avian viruses and Equine Influenza Virus.
 - b. *Chlamydia* transport media - for the isolation of *Chlamydomphila* spp.
 - c. Viral transport media - for isolation of other viruses.

Media is available from the Virology Laboratory of the APHC with at least 1 day's notice. A list of contact persons is shown on page 29.

2. COLLECTION AND TRANSPORT TEMPERATURE: Specimens should be collected as early as possible after symptoms appear and transported to the APHC as quickly as possible. This increases the chance of viral recovery because viruses are generally of the highest titre at this time.

When delays of more than 1 hour are anticipated in transporting specimens to the APHC, specimens should be maintained at 2 to 8°C. Temperatures in excess of room temperature (>25°C) or unintentional freezing can render a virus non-viable. Therefore, when a courier or other transport services are used, specimens must be protected from extremes of temperature possible in delivery vehicles or even in the open air. Insulated containers with ice or cold packs are adequate for this purpose.

Prolonged delays (>24 hours) may significantly compromise the ability to isolate certain labile enveloped viruses. It is therefore important that specimens are frozen at -70°C and below. DO NOT FREEZE at -20°C, in a frost-free freezer (of any temperature) or in the freezer compartment of a domestic refrigerator. Doing so can seriously compromise the recovery of some viruses.

3. SWABS: Do not use calcium alginate swabs for collection of samples for virus and *Chlamydomphila* isolations as this material inactivates *Chlamydomphila* and many enveloped viruses. Rayon or Dacron swabs are recommended; cotton swab is an acceptable alternative, although it may decrease the recovery of certain viruses. Swabs with wooden shafts are not recommended because wooden shafts may contain toxic resins and formaldehydes which can inhibit virus recovery.

Specimen collection

1. CLOACAL SWAB: Insert a dry sterile swab to the cloaca. Rotate the swab and carefully withdraw it. Faecal material should be present on the swab. Place the swab in the appropriate transport medium and cut the shaft so that the swab fits into the vial. For pooled samples, up to 5 swabs can be placed in the same vial. Send the specimen to the APHC on wet ice in an insulated container. Specimens may be stored for up to 48 hours at 2 to 8°C. If longer delays are anticipated, store at -70°C or below.

SAMPLE SUBMISSION PROCEDURES (continued) - Specimen Collection and Transport for Virology and *Chlamydia*

2. NASOPHARYNGEAL SWAB: A dry sterile flexible swab (wire shaft preferred) should be used. Hold the swab in place for 15 to 30 seconds, then rotate it 3 times. Place the swab in the appropriate transport medium and cut the shaft so that the swab fits into the vial. Send the specimen to the APHC on wet ice in an insulated container. Specimens may be stored for up to 48 hours at 2 to 8°C. If longer delays are anticipated, store at -70°C or below.
3. CONJUNCTIVA SWAB: Moisten a sterile fine swab with sterile saline. Carefully swab the lower conjunctiva to collect both cells and fluids. If both eyes are to be cultured, a separate swab should be used for the other eye. Place both swabs in the same vial containing the appropriate transport medium and send to the APHC on wet ice in an insulated container. Specimens may be stored for up to 48 hours at 2 to 8°C. If longer delays are anticipated, store at -70°C or below.
4. THROAT / TRACHEAL SWAB: Moisten a sterile swab with sterile saline. A moistened swab will have more cells adhered to it than a dry swab. Vigorously rub the swab across the tonsils and posterior pharynx. Place the swab in the appropriate transport medium and cut the shaft so that the swab fits into the vial. For pooled samples, up to 5 swabs can be placed in the same vial. Send specimen to the APHC on wet ice in an insulated container. Specimens may be stored for up to 48 hours at 2 to 8°C. If longer delays are anticipated, store at -70°C or below.
5. FAECAL MATERIAL: Collect 2 to 10 g of faeces in a clean container with a tight-fitting lid. Do not use preservatives. FAECAL SWABS: Roll a sterile swab thoroughly over freshly-voided faecal material, ensuring that the faecal material sticks to the swab. For caged birds, ensure the sample is representative of all birds in the cage by sampling from various areas of the cage. Place into transport medium. Specimens should be refrigerated to retard bacterial growth and sent to the APHC under chilled condition as soon as possible after collection.
6. TISSUES: Collect tissues aseptically, taking care to prevent cross-contamination when specimens are taken from multiple sites. Necropsy specimens should be collected within 24 hours from the time of death. Tissue specimens should be placed in a sterile container and covered with an adequate amount of viral transport medium to ensure that the specimen does not dry out during transport. (If transport medium is not available at the time the specimen is collected, sterile normal saline can be used). Send specimens to the APHC on wet ice or with a cold pack. Specimens may be stored for up to 24 hours at 2 to 8°C. If longer delays are anticipated, store at -70°C or below.
7. BLOOD: Collect in a sterile tube containing anti-coagulant such as ethylenediaminetetraacetic acid (EDTA) or acid citrate dextrose (ACD). Heparin should be avoided as it can interfere with some molecular diagnostic assays. Send the specimens to the APHC on wet ice or with a cold pack. Specimens may be stored for up to 24 hours at 2 to 8°C. If longer delays are anticipated, store at -70°C or below.
8. CEREBROSPINAL FLUIDS, PERICARDIAL FLUIDS, URINE AND OTHER BODY FLUIDS: Collect in a leak-proof sterile container. For urine, collect a freshly voided sample. Send the specimens to the APHC on wet ice in an insulated container. Specimens may be stored for up to 24 hours at 2 to 8°C.
9. OTHER SPECIMENS: Please contact the Virology Laboratory of the APHC (see page 29).
10. A specimen may be rejected if improperly collected, packed, transported, labelled or deemed unsuitable for testing at the discretion of the APHC.
11. Specimens submitted will be considered the property of the APHC.

TEST REPORTS

1. Performance standards: our performance standard is to **issue a test report within 10 days from the date of receipt of sample(s)**. In cases where results, by nature of the test method, take longer than 10 days to obtain, a preliminary report will be issued within 10 days, where appropriate. Turn-around times indicated in the tables on pages 9 to 27 refer to the number of **working days**.
2. Batch testing: test results of specimens submitted as a batch will be reported as a batch on the whole and not on individual specimens e.g. 4 out of 10 were positive. Where results of individual animals or specimens are required, e.g. Pig 1 = positive, Pig 2 = negative, etc., each specimen will incur a fee.
3. Please indicate on the submission form the preferred manner of receiving reports: by fax, mail or personal collection from the APHC (see page 29). If there is no indication, reports will be sent by **FAX ONLY**, or by MAIL ONLY (if the fax number is not provided or not accessible).
4. For reasons of confidentiality, reports will be sent only to the party being billed for the examination, except where a notifiable disease under the Animal and Birds Act is diagnosed, in which case, the relevant authorities will be notified.
5. Every report sent by fax from the APHC is documented with a confirmation of successful fax transmission. For customer-friendliness, one subsequent request for a 're-faxed' copy will be allowed gratis. **After that, each additional request for a faxed copy will be charged an administrative fee of \$9.45 (inclusive of GST).**
6. For a claim of unsuccessful mail delivery of a report, one CERTIFIED TRUE COPY can be issued gratis. The customer is encouraged to collect this report at the APHC as **any subsequent request for a copy of the report will be charged the administrative fee of \$9.45 (inclusive of GST).**









PAYMENT PROCEDURES

1. Modes of payment for laboratory services include NETS, GIRO, cashcard and on-line e-payment by credit card or Internet Banking.
2. For clients not residing in Singapore, please contact the APHC for payment arrangements (see page 29).
3. All fees listed in this booklet are inclusive of GST.
4. All fees listed in this booklet are subjected to change without prior notice. Customers are advised to check with the APHC (see page 29) for the current applicable fees.
5. Applications for payment by GIRO should be made in advance to allow time for processing. Please contact the APHC for the GIRO application form (see page 29).

POST-MORTEM EXAMINATION

The post-mortem examination includes gross and microscopic analyses and may include additional laboratory tests as deemed appropriate by the laboratory veterinarian. Extra tests **specifically requested for by the customer** will incur an additional charge.



Please note that when carcasses are submitted as a batch, post-mortem findings will be reported on the batch as a whole and not on individual animals.

<i>Post-mortem of</i>	<i>Sample</i>	<i>Remarks</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
 Fish or other aquatic animals (AA) <500 g body weight	Live or freshly dead specimens		10 days	\$126.00 per batch
 Fish or other aquatic animals (0.5 kg to 10 kg body weight)	Freshly dead specimens		"	\$220.50 per batch
 Fish or other aquatic animals (>10 kg to 50 kg body weight)	Freshly dead specimens		"	\$220.50 per animal
 Large aquatic animals (>50 kg bodyweight)	Freshly dead specimens		"	\$294.00 per animal
 Companion animals			10 days – 5 weeks	\$112.35 per animal
 Equines, exotic mammals, ruminants and pigs (up to 4 months old)			"	\$112.35 per animal
 Equines, exotic mammals, ruminants and pigs (> 4 months old)			"	\$294.00 per animal
 Avian and laboratory animals			"	\$119.70 per batch of 10 animals or part thereof

HISTOPATHOLOGY , CYTOLOGY and PARASITOLOGY

<i>Test</i>	<i>Sample</i>	<i>Remarks</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
 Histopathology	Parafinised tissue samples		10 days	\$36.75 per organ
 Parasitology - haemoparasites (microscopy) - endoparasites (faecal flotation)	Blood or faecal sample		"	\$32.60 per test \$32.60 per test
 Parasitology (Fish)	Live fish preferable		2 days	\$32.60 per batch
 Cytology	Bodily fluid, fine needle aspirate (FNA) and impression smear; peripheral blood film		"	\$34.65 per origin of sample
 Special stains (cytology and histopathology) – 1 to 4 stains			"	\$23.10 per tissue block

MYCOLOGY

<i>Test</i>	<i>Sample</i>	<i>Remarks</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
 Routine culture (presence / absence of fungi only – identification is not carried out)	Various		10 - 21 days	\$30.45 per test
 Specialised culture - please contact the Bacteriology Laboratory of the APHC (see page 29) and specify fungi of interest upon sample submission	Various		14 - 28 days	\$54.60 per test

AQUATIC ANIMALS

Fish / shellfish professional consultations covering advice on farm health management, and disease prevention and investigations are available. For more information, please contact the Aquatic Animal Health Laboratory of the APHC (see page 29).

<i>Service/test</i>	<i>Sample</i>	<i>Remarks</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
➤ On-site consultation		Inclusive of travelling time		\$63.00 / hr (within office hours); \$133.00 / hr (outside office hours / urgent)
➤ Post-mortem: Fish or other aquatic animals (AA) <500 g body weight	Live or freshly dead specimens		10 days	\$126.00 per batch
➤ Post-mortem: Fish or other aquatic animals (0.5 kg to 10 kg body weight)	Freshly dead specimens		"	\$220.50 per batch
➤ Post-mortem: Fish or other aquatic animals (>10 kg to 50 kg body weight)	Freshly dead specimens		"	\$220.50 per animal
➤ Post-mortem: Large aquatic animals (>50 kg bodyweight)	Freshly dead specimens		"	\$294.00 per animal
➤ Virus isolation / detection	Whole fish	Minimum of 5 specimens or 1g of tissue should be submitted	21 days	\$73.50 per pool of samples
➤ Routine bacteriological culture - general aerobic culture	Live or freshly dead fish	Please specify at time of submission if sensitivity test is required	3 - 7 days	\$30.45 per test
➤ Specialised bacteriological culture - please specify bacteria of interest upon sample submission	Live or freshly dead fish	Please specify at time of submission if sensitivity test is required	3 - 10 days*	\$54.60 per test
➤ Parasitology (Fish)	Live fish preferable		2 days	\$32.60 per batch
➤ Histopathology	Fixed tissue samples		10 days	\$36.75 per wax block used

* Note that the culture of fastidious bacteria such as mycobacteria may take 8 weeks or more.

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AQUATIC ANIMALS (continued)

<i>Service/test</i>	<i>Sample</i>	<i>Remarks</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
➤ Molecular examination (Virology)	Live or freshly dead fish	DNA/RNA detection of each virus	3 - 10 days	\$262.50 per batch of 5 pools or part thereof; \$31.50 for each subsequent pool

Please refer to page 5 (paragraph 11):

- LIVE specimens should be packed in leak-proof bag filled with 2/3 air and 1/3 water.
- DEAD specimens should be transported as freshly dead specimens at 2 to 8°C in leak-proof bags. **DO NOT FREEZE.**

AVIAN SPECIES

* ND/AI and *Chlamydia* transport media: please refer to page 6

<i>PATHOGEN CULTURE</i>	<i>Sample</i>	<i>Test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
➤ Avian Influenza (AI) virus, Newcastle Disease virus (NDV) and other avian paramyxoviruses	Faecal, cloacal or tracheal swabs in ND/AI transport media*, max. 5 swabs per pool; or affected organs	Inoculation into SPF embryonated eggs: a) 2 passages for samples not of domestic chicken origin b) 1 passage for samples of domestic chicken origin	a) 12 - 14 days b) 5 - 7 days	\$52.50 per test
➤ Avian Influenza virus (Influenza A, AI subtype H5 or H7)	Please check with the Virology Laboratory of the APHC (see page 29)	Molecular examination	3 - 7 days	\$262.50 per batch of 5 samples or part thereof; \$31.50 for each subsequent sample
➤ Infectious Bursal Disease virus (Gumboro Disease)	Faecal or cloacal swabs in ND/AI transport media*, max. 5 swabs per pool; or affected organs	Inoculation into SPF embryonated eggs: 2 passages	10 - 21 days	\$52.50 per test

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AVIAN SPECIES (continued)

<i>PATHOGEN CULTURE</i>	<i>Sample</i>	<i>Test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
✦ Infectious Bronchitis virus (IBV)	Tracheal swabs in ND/AI transport media*, max. 5 swabs per pool; or affected organs	Inoculation into SPF embryonated eggs: up to 3 passages	14 - 28 days	\$52.50 per test
✦ Avian Herpesvirus	Tracheal swabs in ND/AI transport media*, max. 5 swabs per pool; or affected organs	Inoculation into CEL cell cultures: 2 passages	10 - 21 days	\$73.50 per test
✦ Avian Reoviruses and Adenoviruses	Faecal or cloacal swabs in ND/AI transport media*, max. 5 swabs per pool; or affected organs	Inoculation into CEL cell cultures: 2 passages	"	\$73.50 per test
✦ Fowl / Avian Pox virus	Skin, oral or tracheal lesions	Inoculation into SPF embryonated eggs: 2 passages	"	\$52.50 per test
✦ Avian Encephalomyelitis virus	Brain	Inoculation into SPF embryonated eggs: 2 passages	"	\$52.50 per test
✦ Other avian viruses		Please check with the Virology Laboratory of the APHC (see page 29)		Depending on type of test
✦ <i>Chlamydophila psittaci</i>	Faecal swabs, cloacal swabs or faecal material in <i>Chlamydia</i> transport media*	PCR	3 - 10 days	\$262.50 per batch of 5 samples or part thereof; \$31.50 for each subsequent sample

CEL = Chicken Embryo Liver	FA = Fluorescent Antibody
PCR = Polymerase Chain Reaction	SPF = Specific Pathogen Free

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AVIAN SPECIES (continued)

<i>SEROLOGY</i>	<i>Sample</i>	<i>Test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
✍ Avian Influenza virus	1- 2 ml serum or 2 - 3 ml blood	HI (subtype H5 or H7), AGPT	3 - 7 days	\$31.50 per batch of 5 samples or part thereof; \$6.30 for each subsequent sample
✍ Avian Leucosis viruses	"	ELISA	"	\$78.75 per batch of 5 samples or part thereof; \$15.75 for each subsequent sample
✍ Avian Paramyxovirus (Type 2)	"	HI	"	\$31.50 per batch of 5 samples or part thereof; \$6.30 for each subsequent sample
✍ Chicken Anaemia virus	"	ELISA	"	\$78.75 per batch of 5 samples or part thereof; \$15.75 for each subsequent sample
✍ Infectious Bronchitis virus (IBV)	"	SNT in embryonated eggs	7 - 14 days	\$132.50 per test
✍ Infectious Bursal Disease (IBD, Gumboro Disease) virus	"	SNT in tissue culture, SNT in embryonated eggs, ELISA	7 - 10 days 7 - 14 days 3 - 7 days	\$65.10 per test \$132.50 per test \$78.75 per batch of 5 samples or part thereof; \$15.75 for each subsequent sample
✍ Infectious Laryngotracheitis (ILT) virus	"	SNT in embryonated eggs	7 - 14 days	\$132.50 per test

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AVIAN SPECIES (continued)

<i>SEROLOGY</i>	Sample	Test	Turn-around time	Laboratory fee (inclusive of GST)
✎ Marek's Disease virus	1- 2 ml serum or 2 - 3 ml blood	AGPT	3 - 10 days	\$31.50 per batch of 5 samples or part thereof; \$6.30 for each subsequent sample
✎ Newcastle Disease virus (NDV)	"	HI	3 - 7 days	\$31.50 per batch of 5 samples or part thereof; \$6.30 for each subsequent sample
✎ Reticuloendotheliosis virus	"	ELISA	3 - 10 days	\$78.75 per batch of 5 samples or part thereof; \$15.75 for each subsequent sample
✎ Other avian pathogens		Please check with the APHC (see page 29)		Depending on type of test
✎ <i>Salmonella Pullorum</i>	"	RST	2 - 5 days	\$53.55 per batch of 10 samples or part thereof**

** Please refer to notes on "Batch testing" under "Test Reports", page 8.












AGPT	= Agar Gel Precipitin Test (also known as Agar Gel Immuno-diffusion [AGID])
ELISA	= Enzyme-linked Immuno-sorbent Assay (also known as Enzyme Immuno-assay [EIA])
HI	= Haemagglutination Inhibition
RST	= Rapid Slide Test
SNT	= Serum Neutralisation Test

<i>BACTERIOLOGY</i>	Sample	Remarks	Turn-around time	Laboratory fee (inclusive of GST)
✎ <i>Salmonella</i> culture	Faecal sample, faecal / cloacal swab	Please specify in submission form if antibiotic sensitivity testing is required	3 - 7 days	\$54.60 per test
✎ Routine bacteriological culture - general aerobic culture	Various	"	"	\$30.45 per test
✎ Specialised bacteriological culture - please specify bacteria of interest upon sample submission	Various	"	3 - 10 days***	\$54.60 per test

*** Note that the culture of fastidious bacteria such as mycobacteria may take 8 weeks or more.

CATS and DOGS







* *Chlamydia* transport media: please refer to page 6

Pathogen	Sample	Test	Turn-around time	Laboratory fee (inclusive of GST)
<u>CULTURE / DETECTION</u>				
 <i>Babesia canis / Babesia gibsoni</i>	1 ml blood in EDTA (chilled)	Peripheral blood smear	1 - 3 days	\$32.60 per test
  Canine and feline parvovirus	Faecal sample	PCR	3 - 10 days	\$262.50 per batch of 5 samples or part thereof; \$31.50 for each subsequent sample
  <i>Chlamydophila</i> spp.	Conjunctival swab, faecal swab or sample in <i>Chlamydia</i> transport media*	Inoculation into cell culture: 1 passage followed by FA staining	10 - 14 days	\$73.50 per test
 Canine heartworm (<i>Dirofilaria immitis</i>)	1 ml blood in EDTA (chilled)	i) Heartworm antigen test and ii) Knott's microfilaria test	3 - 7 days	\$71.40 for both tests
 Hookworm	Faecal sample	Faecal flotation test	1 - 3 days	\$32.60 per test
 Other parasites	Faecal sample	Faecal flotation test	"	\$32.60 per test
<u>SEROLOGY</u>				
 <i>Babesia gibsoni</i> antibody	2 ml serum or 4 - 5 ml blood	IFAT	3 - 7 days	\$120.75 per test
 <i>Ehrlichia canis</i> antibody screening at 1:20 single serum dilution only	"	IFAT	"	\$71.40 per test
 <i>Ehrlichia canis</i> - antibody titre	"	IFAT	"	\$88.20 per test

DNA = Deoxyribonucleic Acid
 FA = Fluorescent Antibody
 IFAT = Indirect Immuno-fluorescent Antibody Test
 PCR = Polymerase Chain Reaction

Continued on the next page....







CATS and DOGS (continued)

<i>Test</i>	<i>Sample</i>	<i>Remarks</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
<u><i>SEROLOGY (continued)</i></u>				
 <i>Brucella canis</i> antibody	2 ml serum or 4 - 5 ml blood	Tube agglutination test	3 - 7 days	\$53.55 per sample
 <i>Leptospira interrogans</i> serovar Canicola antibody	"	Microscopic agglutination test	"	\$53.55 per sample
 <i>Toxoplasma gondii</i> antibody screening	"	IFAT	3 - 7 days	\$112.35 per sample
 <i>Toxoplasma gondii</i> antibody end-point titration	"	IFAT	"	\$186.90 per sample
 <i>Leishmania infantum</i> and <i>Leishmania donovani</i> antibody	2 ml serum or 4 - 5 ml blood	ELISA	3 - 7 days	\$74.90 per test
 Nipah virus antibody (IgG)	0.5 ml serum or 1.5 ml blood	Indirect ELISA	3 - 10 days	\$78.75 per batch of 5 samples or part thereof; \$15.75 for each subsequent sample

DNA = Deoxyribonucleic Acid
 ELISA = Enzyme-linked Immuno-sorbent Assay (also known as Enzyme Immuno-assay [EIA])

Continued on the next page.....



CATS and DOGS (continued)

<i>Test</i>	<i>Sample</i>	<i>Remarks</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
<u><i>BACTERIOLOGY</i></u>				
  Routine bacteriological culture	Various	Please specify in submission form if antibiotic sensitivity testing is required	3 - 7 days	\$30.45 per test
  Specialised bacteriological culture - please specify bacteria of interest upon sample submission	Various	Please specify in submission form if antibiotic sensitivity testing is required	3 - 10 days**	\$54.60 per test
  Molecular examination	Various	Nucleic acid detection	3 - 10 days	\$262.50 per batch of 5 samples or part thereof; \$31.50 for each subsequent sample

** Note that the culture of certain fastidious bacteria such as *Leptospira* and mycobacteria may take 6 to 20 weeks.

HORSES

* Viral transport media: please refer to page 6

<i>Pathogen / Disease / Examination</i>	<i>Sample</i>	<i>Test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
<u><i>VIRUS ISOLATION</i></u>				
 Equine Influenza virus	Nasal, tracheal or nasopharyngeal swab in viral transport media*	Inoculation into SPF embryonated eggs: 2 passages	10 - 21days	\$52.50 per test
 Equine Herpes virus type 1 (EHV-1)	Nasal swab in viral transport media*, buffy coat cells	Inoculation into cell culture: 2 passages	"	\$73.50 per test
 Equine Herpes virus type 4 (EHV-4)	Nasal swab in viral transport media*, buffy coat cells	Inoculation into cell culture: 2 passages	"	\$73.50 per test
<u><i>SEROLOGY</i></u>				
 Equine Influenza virus H3N8 antibody	2 ml serum or 4 - 5 ml blood	HI	5 - 10 days	\$31.50 per batch of 5 samples or part thereof; \$6.30 for each subsequent sample
 Equine Influenza virus H7N7 antibody	"	HI	"	\$31.50 per batch of 5 samples or part thereof; \$6.30 for each subsequent sample
 Equine Infectious Anaemia (EIA) virus antibody	"	AGPT (Coggin's Test)	4 - 7 days	\$31.50 per batch of 5 samples or part thereof; \$6.30 for each subsequent sample
 Equine Herpesvirus (EHV) type 1 and 4 antibody	"	SNT in cell culture	7 - 10 days	\$65.10 per test

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HORSES (continued)

	<i>Pathogen / Disease / Examination</i>	<i>Sample</i>	<i>Test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
	Equine Viral Arthritis (EVA) virus antibody	2 ml serum or 4 - 5 ml blood	SNT in cell culture	7 - 10 days	\$65.10 per test
	Nipah virus IgG antibody	"	Indirect ELISA	3 - 10 days	\$78.75 per batch of 5 samples or part thereof; \$15.75 for each subsequent sample
	<i>Theileria equi</i> antibody	"	Competitive ELISA	"	\$110.25 per batch of 5 samples or part thereof
	<i>Babesia caballi</i> antibody	"	Competitive ELISA	"	\$110.25 per batch of 5 samples or part thereof
	<u>BACTERIOLOGY</u>				
	Routine bacteriological culture - general aerobic culture	Various	Please specify in submission form if antibiotic sensitivity testing is required	"	\$30.45 per test
	Specialised bacteriological culture - please specify bacteria of interest upon sample submission	Various	"	3 - 10 days**	\$54.60 per test

** Note that the culture of certain fastidious bacteria such as *Leptospira* and mycobacteria may take 6 to 20 weeks.










Continued on the next page...

HORSES (continued)

<i>Pathogen / Disease / Examination</i>	<i>Sample</i>	<i>Test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
 <i>Streptococcus equi</i> subsp. <i>equi</i> (Strangles)	Tracheal wash	Specialised bacterial culture	3 - 10 days	\$54.60 per test
 <i>Taylorella equigenitalis</i> (Contagious Equine Metritis)	Clitoral swabs, deep cervical swabs, swabs from penile sheath and urethra. Swabs must be placed in Amies transport medium with charcoal	Specialised bacterial culture	10 - 14 days	\$54.60 per test
 Molecular examination	Various	Nucleic acid detection	3 - 10 days	\$262.50 per batch of 5 samples or part thereof; \$31.50 for each subsequent sample
<u>PARASITOLOGY</u>				
 Equine Piroplasmiasis (<i>Theileria equi</i> or <i>Babesia caballi</i>)	1.5 ml blood in EDTA	Peripheral blood film	1 - 3 days	\$32.60 per test








AGPT = Agar Gel Precipitin Test (also known as Agar Gel Immuno-diffusion [AGID])
 ELISA = Enzyme-linked Immuno-sorbent Assay (also known as Enzyme Immuno-assay [EIA])
 HI = Haemagglutination Inhibition
 SNT = Serum Neutralisation Test
 SPF = Specific Pathogen Free

PIGS

<i>Pathogen / Disease / Examination</i>	<i>Sample</i>	<i>Test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
<u><i>VIRUS ISOLATION</i></u>				
 Aujeszky's Disease virus	Brain, lung, tonsil, spleen	Inoculation into cell culture: 2 passages	10 - 21 days	\$73.50 per test
 Classical Swine Fever virus	Tonsils, lymph node	Inoculation into cell culture: 2 passages	"	\$73.50 per test
<u><i>SEROLOGY</i></u>				
 Aujeszky's Disease virus antibody	2 ml serum or 4 - 5 ml blood	SNT in cell culture	7 - 10 days	\$65.10 per test
 Classical Swine Fever antibody	"	SF-NIF	7 - 14 days	\$65.10 per test
 Classical Swine Fever antibody	"	SF-NPLA	7 - 14 days	\$65.10 per test
 Nipah virus antibody (IgG)	"	Indirect ELISA	3 - 10 days	\$78.75 per batch of 5 samples or part thereof; \$15.75 for each subsequent sample
 Porcine Parvovirus antibody	"	HI	5 - 10 days	\$31.50 per batch of 5 samples or part thereof; \$6.30 for each subsequent sample
 Transmissible Gastroenteritis (TGE) / Porcine Coronavirus antibody (non-differential)	"	SNT in cell culture	7 - 10 days	\$65.10 per test
 <i>Brucella abortus</i>	"	Slide agglutination test	3 - 7 days	\$53.55 per batch of 10 samples or part thereof*
 <i>Brucella abortus</i>	"	Tube agglutination test	"	\$53.55 per sample
 <i>Leptospira interrogans</i>	2 ml serum or 4 - 5 ml blood	Microscopic agglutination test (maximum of 3 serovars)	7 - 10 days	\$53.55 per sample

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PIGS (continued)











<i>Pathogen / Disease / Examination</i>	<i>Sample</i>	<i>Test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
<u>SEROLOGY (continued)</u>				
 <i>Toxoplasma gondii</i>	"	Latex agglutination test	1 - 3 days	\$53.55 per batch of 10 samples or part thereof*
<u>BACTERIOLOGY</u>				
 Routine bacteriological culture - general aerobic culture	Affected tissue / organs	Please specify in submission form if antibiotic sensitivity testing is required	3 - 7 days	\$30.45 per test
 Specialised bacteriological culture - please specify bacteria of interest upon sample submission	"	"	3 - 10 days**	\$54.60 per test
 <i>Burkholderia pseudomallei</i> (Meliodosis)	"	Specialised bacterial culture	3 - 10 days	"
 <i>Salmonella</i>	"	"	"	"
 <i>Actinobacillus pleuropneumoniae</i> (APP)	"	"	"	"
 <i>Haemophilus parasuis</i>	"	"	"	"

* Please refer to notes on "Batch testing" under "Test Reports", page 8.

** Note that the culture of certain fastidious bacteria such as *Leptospira* and mycobacteria may take 6 to 20 weeks.

ELISA	= Enzyme-linked Immuno-sorbent Assay (also known as Enzyme Immuno-assay [EIA])
HI	= Haemagglutination Inhibition
NIF	= Neutralising Immuno-fluorescence
NPLA	= Neutralisation Peroxidase-linked Assay
SNT	= Serum Neutralisation Test






BOVINE

<i>Pathogen / Disease / Examination</i>	<i>Sample</i>	<i>Test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
<u>SEROLOGY</u>				
 <i>Brucella abortus</i>	2 ml serum or 4 - 5 ml blood	Slide agglutination test	3 - 7 days	\$53.55 per batch of 10 samples or part thereof*
 <i>Brucella abortus</i>	2 ml serum or 4 - 5 ml blood	Tube agglutination test	"	\$53.55 per sample
 <i>Leptospira interrogans</i>	2 ml serum or 4 - 5 ml blood	Microscopic agglutination test (maximum of 3 serovars)	7 - 10 days	\$53.55 per sample
 <i>Mycobacterium bovis</i> (tuberculosis)		Tuberculin test	2 visits on Day 0 and 3	Professional fees @ \$63.00 per hour + cost of antigen
<u>BACTERIOLOGY</u>				
 Routine bacteriological culture - general aerobic culture	Various	Please specify in submission form if antibiotic sensitivity testing is required	3 - 7 days	\$30.45 per test
 Specialised bacteriological culture - please specify bacteria of interest upon sample submission	Various	"	3 - 10 days**	\$54.60 per test
 <i>Salmonella</i>	Milk, faeces	Specialised bacterial culture	3 - 10 days	\$54.60 per test
 <i>Escherichia coli</i> O157:H7	Milk, faeces	"	"	\$54.60 per test
 <i>Listeria monocytogenes</i>	Milk, faeces, affected tissue / organs	"	"	\$54.60 per test
 Mycobacteria	Milk, affected tissue / organs	"	8 - 20 weeks	\$54.60 per test

* Please refer to notes on "Batch testing" under "Test Reports", page 8.

** Note that the culture of certain fastidious bacteria such as *Leptospira* and mycobacteria may take 6 to 20 weeks.

MULTIPLE SPECIES

<i>Pathogen / Disease / Examination</i>	<i>Sample</i>	<i>Test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
 Rabies	Brain, fixed brain smears	Antigen test by FAT	3 - 7 days	\$52.50 per test
 <i>Chlamydophila</i> spp.	Conjunctival swab, faecal swab or sample in <i>Chlamydia</i> transport media*	PCR	3 - 10 days	\$262.50 per batch of 5 samples or part thereof; \$31.50 for each subsequent sample
 Routine bacteriological culture - general aerobic culture	Various	Please specify in submission form if antibiotic sensitivity testing is required	3 - 7 days	\$30.45 per test
 Specialised bacteriological culture - please specify bacteria of interest upon sample submission	Various	"	3 - 10 days**	\$54.60 per test
 Molecular examination	Various	Nucleic acid detection	3 - 10 days	\$262.50 per batch of 5 samples or part thereof; \$31.50 for each subsequent sample

* *Chlamydia* transport media: please refer to page 6

** Note that the culture of certain fastidious bacteria such as *Leptospira* and mycobacteria may take 6 to 20 weeks.

DNA	= Deoxyribonucleic Acid
FA	= Fluorescent Antibody
FAT	= Fluorescent Antibody Test
HI	= Haemagglutination Inhibition
PCR	= Polymerase Chain Reaction

VACCINE QC

- Where applicable, vaccines are tested according to the ASEAN Standards for Animal Vaccines.
- For tests involving live animals, please call the Virology / Vaccine QC Laboratory of the APHC to make advance arrangements, as animals of suitable age must be pre-ordered (see page 29).

<i>Test</i>	<i>Maximum number of animals used per test</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
⚙ Sterility test: a. with test for <i>Mycoplasma</i> b. without test for <i>Mycoplasma</i>		a. 28 - 30 days b. 14 - 16 days	\$74.55 per test
⚙ Purity test in embryonated eggs		7 - 28 days	\$121.80 per test
⚙ Purity test in tissue culture		7 - 28 days	\$252.00 per test
⚙ Vaccine titre in embryonated eggs		7 - 21 days	\$121.80 per test
⚙ Vaccine titre in cell culture		7 - 21 days	\$252.00 per test

SUPPLY OF BIOLOGICS AND OTHER SERVICES

<i>Test</i>	<i>Remarks</i>	<i>Turn-around time</i>	<i>Laboratory fee (inclusive of GST)</i>
🔒 Verification of label, appearance, etc. for vaccines		1 - 3 days	\$63.00 / hr
🔒 Destruction of vaccines	Please give advance notification	Same day	\$63.00 / hr
🔒 Supply of <i>Salmonella</i> Pullorum stained K-polyvalent antigen for rapid slide agglutination test (for screening of <i>Salmonella</i> Enteritidis and <i>Salmonella</i> Pullorum antibodies in chicken whole blood, serum and egg yolk)	Please give advance notification		\$62.00 per bottle of 25 ml (25 ml is sufficient for 500 tests) \$20.00 packaging fee for dispatch to overseas destination (courier fee is not included)
🔒 Supply of other veterinary biologics	Please give advance notification		Please contact the APHC (see page 29)
🔒 Supply of SPF eggs	Subject to availability - please give advance notification		\$1.52 per egg
🔒 Egg freshness test		1 - 3 days	\$30.45 per batch of 10 samples

HANDLING SERVICE FOR SAMPLES TO OVERSEAS LABORATORIES

General notes

This service applies only to diagnostic samples that are required by the importing country to be packed by the veterinary authority of the exporting country.

For such samples, APHC provides a handling services to process, pack and ship sample(s) to a specified laboratory overseas. Please note that all shipping charges and cost of IATA-approved packaging will be borne by the owner. Cost of packaging will be determined by the shipper, and is dependent upon material classification, shipping temperature, quantity of samples, volume, etc.

Samples are all shipped in leak-proof, unbreakable screw-capped vials with external threads. The vials are disinfected prior to packing in an IATA-approved shipping container, together with all necessary documents i.e. sample submission form, import permit, disease declaration, customs declaration and commercial invoice.

Wherever possible, please notify the laboratory at least one week in advance to enable communication with the overseas laboratory and shipper, and ensure a valid import permit from the country of destination is in place.

All samples must be accompanied by a letter from a registered veterinarian or owner with the following details:

- i. history;
- ii. test required;
- iii. identification, age and sex of the animal;
- iv. any other relevant information.

Fee: \$84.00 per consignment (inclusive of GST), excluding courier / shipping charges, packaging and additional taxes at country of destination, if any.

The APHC will provide the following services:

1. Separate and inactivate serum samples.
2. Pack the sample according to IATA requirements.
3. Make arrangements with the laboratory concerned.
4. Make arrangements with the courier / shipper^a to collect and ship samples. Alternatively, you may make your own courier arrangements.
5. Prepare all accompanying documents.

Shipping and packaging charges will be billed directly by the shipping agent; please provide your courier account number for international shipping when submitting samples.

^a Shipper must be able to transport biological specimens.

For enquiries on shipping and packaging, please contact Ms Lin Yueh Nuo (lin_yueh_nuo@ava.gov.sg), Ms Wong Wai Kwan (wong_wai_kwan@ava.gov.sg) or Ms Amy Chan (amy_chan@ava.gov.sg). Please see page 29 for other contact details.

CONTACT US

Head: Mr Ong Keng Ho
 Telephone: 63165181
 E-mail: ong_keng_ho@ava.gov.sg

General enquiries:
 Tel: 63165168 or 63165188
 Fax: 63161090

Please contact the relevant laboratory / personnel for specific matters:

<i>Laboratory / Function</i>	<i>Contact (Telephone Number)</i>	<i>E-mail Address</i>
 Aquatic Animal Health (for all aquatic animal and fish post-mortem examinations, histopathology and parasitology)	Dr. Angeline Wong (63165164/165); Dr. Chong Shin Min (63165164/165); Dr. Diana Chee (63165164/165)	angeline_wong@ava.gov.sg chong_shin_min@ava.gov.sg diana_chee@ava.gov.sg
 Veterinary Pathology (for post-mortem examinations, histopathology, cytology and parasitology)	Dr. Charlene J. Fernandez (63165141); Mr Teo Kiat (63165171/172); Ms Amy Chan (63165172/171)	charlene_fernandez@ava.gov.sg teo_kiat@ava.gov.sg amy_chan@ava.gov.sg
 Bacteriology (and Mycology)	Ms Wong Wai Kwan (63165187); Ms Lee Wai Yee (63165177); Mdm Tay Yih Hong (63165179); Ms Tan Ee Leng (63165177)	wong_wai_kwan@ava.gov.sg lee_wai_yee@ava.gov.sg tay_yih_hong@ava.gov.sg tan_ee_leng@ava.gov.sg
Request for bacteriological transport media provided <u>(please call at least 2 working days in advance to order)</u>	Mdm Tay Yih Hong (63165179); Mrs Ong-Lee Swee Kiang (63165179)	tay_yih_hong@ava.gov.sg ong-lee_swee_kiang@ava.gov.sg
 Virology (including <i>Chlamydomphila</i> and <i>Rickettsia</i>) and Vaccine QC, verification and destruction	Ms Lin Yueh Nuo (63165187/186); Dr Huangfu Taoqi (63165134/186)	lin_yueh_nuo@ava.gov.sg tao_qi_huang_fu@ava.gov.sg
 Aquatic Virology	Ms Lin Yueh Nuo (63165187/186); Dr Chen Jing (63165134/186)	lin_yueh_nuo@ava.gov.sg chen_jing@ava.gov.sg
\$ Payment and billing enquiries	Mrs Chan Geok Hua (63165188); Mrs Koh-Yeo Swee Chear (63165189)	chan_geok_hua@ava.gov.sg koh-yeo_swee_chear@ava.gov.sg
 Submission of specimens	Go to the reception counter (63165168)	-
 Collection of laboratory test reports	Go to the reception counter (63165168)	-
 Service feedback	Mrs Yip-Ng Sou Cheng (63165148); Mrs Koh-Yeo Swee Chear (63165189)	yip-ng_sou_cheng@ava.gov.sg koh-yeo_swee_chear@ava.gov.sg