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'The Quality Clinical Pathology Service'

Bacteriology Sampling in Practice

Good sampling procedures for bacteriology are paramount for the laboratory to provide accurate and useful results. Contamination with commensal organisms, post mortem invasion and/or faecal contamination presents a confounding issue for routine bacteriology.

Less fastidious species such as *Proteus species* are able to mask true pathogens by overgrowth on culture plates. Very mixed bacterial growth also presents problems in interpretation and will increase the time before results are available as a result of the need to subculture the different isolates grown.

A variety of different techniques are now available for bacterial isolation and identification but routine and selective culture on a variety of different media under different conditions is still by far the commonest approach. Examples of organisms requiring selective culture include *Listeria* spp, salmonellae, *Campylobacter* spp and in the case of fungi, dermatophytes.

Certain organisms such as *Mycoplasma* spp are more successfully detected by molecular methods or using Antigen capture techniques. New technologies such as PCR are likely to become mainstream in the future both for detection of organisms directly from samples and for identification purposes following culture.

Antibiotic treatment severely compromises bacteriology as although the organism may not be completely non-viable within the animal, growth in an in vitro situation is often not possible.

Therefore consider carefully whether bacteriology will yield a result and if in any doubt please contact the laboratory to discuss the case.

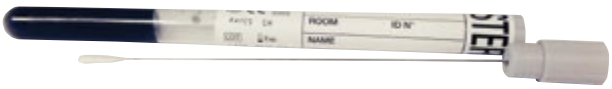
Samples

On the whole bacteriology samples are submitted either as swabs, fluid/exudate (including milk), hair/skin scrapes and faeces. For each of these some simple guidelines should be followed to assist the laboratory and to improve the success of the laboratory procedures;

1. **Use suitable sterile containers to submit the relevant samples**
2. **Clearly label the sample containers/ swabs with the owner and animal ID**
3. **Submit the appropriate volume of sample for testing (see the price guide for further information)**
4. **If using transport medium in swabs ensure the expiry date has not elapsed and you are using the correct media.**
5. **Submit samples as soon as possible after sampling. If this is not possible keep in a refrigerator or at least cool before dispatch.**

Swabs

A. Charcoal Transport Swab



B. Charcoal Mini Wire Tip Transport Swab

C. Viral transport swab

D. Dry swab

A. Charcoal Transport Swab (blue top)

This is the most suitable swab for bacterial culture. The charcoal in this medium absorbs any bacterial toxins and other toxic metabolites that may be present which may otherwise inhibit the growth of other organisms. Therefore with a charcoal transport swab false negative cultures are less likely to occur.

B. Charcoal Mini Wire Tip Transport Swab (grey top)

As above except the swab tip is much smaller, allowing inoculation from difficult to isolate places (or from smaller animals).

NB. Bacterial transport swabs are not suitable for PCR tests or virology.

C. Viral transport swab (green top)

This is only appropriate for virology and not bacteriology.

D. Dry swab (blue top)

It is possible to do a bacterial culture on a dry swab, however as there is no media to support bacterial growth it is not recommended, especially if there is a delay in submission. A dry swab may be used for the recovery of fungi such as *Aspergillus* sp. from certain sites. It is also possible to perform many PCR tests on dry swabs.

Sampling

Body cavity fluids/Exudates/ Joint fluid

Aspiration of fluid/exudate via syringe (+/- needle) and placing in a sterile container is all that is required. Take care to reduce any contamination by adequately preparing the site or in the case of a post mortem take the necessary samples before handling the material excessively.

Please do not submit samples with hypodermic needles still attached to syringes – this presents a significant hazard to our staff.

Faeces

Collection of faeces samples needs little discussion. Sampling early in the course of the disease will yield the best results. A faeces sample is the sample of choice as additional tests for other pathogens can be undertaken whereas a swab can really only be cultured. Please submit in a suitable plastic container and avoid submission in glass jars or in plastic gloves.

Abscess material

Abscesses can either be aspirated as previously described or cleanly incised and swabbed. Swabbing of the interior aspect of the capsule often harvests more bacteria aiding isolation/culture.

Milk

Collecting samples for milk bacteriology needs to be done with clean dry hands. If the teat from which the sample is to be taken is clearly dirty, this also should be washed and then immediately dried. The first two draws of milk should be discarded and the end of the teat then cleaned with a small piece of cotton wool dampened with surgical spirit, which is rubbed over the teat end until it is clean. The process should then be repeated with a second swab and then repeated again until the swab looks clean after use. One minute should then be allowed to elapse before the sample is taken.

When opening the sterile sample bottle, it is imperative to keep the lid clean; never put it open side down on a surface and preferably hold it in your hand without contaminating the open side. The sample bottle should be held at an angle to the teat and a further draw of milk discarded before the sample bottle is filled at least half full.

The lid should then be replaced without contaminating it. Finally, the sample bottle should be labelled with the cow's ID, the quarter sampled, the farmer's name and the date of sampling. After sampling, hands again should be washed thoroughly.

Post Mortem Tissue Sampling

It is almost inevitable that during the post mortem there will be some surface contamination of organs that need to be sampled. This surface contamination needs to be reduced before swabs are taken from the organ itself.

Figures 1-4 demonstrate the ideal way to take bacteriology samples from solid organs (in this case liver).Remove either the whole or part of the organ to be sampled depending upon size (this can be transported back to the practice if a field post mortem has been undertaken. Gently wash the surface under tap water to remove any gross contamination. Figure 1 shows a portable Bunsen burner and palate knife – heat the knife blade. Sear the surface of the organ (fig 2). Make a stab incision with a sterile scalpel blade through the seared site (fig 3) and insert a swab through the incision into the parenchyma (fig 4). Submit the swab in the usual way clearly marking with the relevant identification information.

Figure 1.

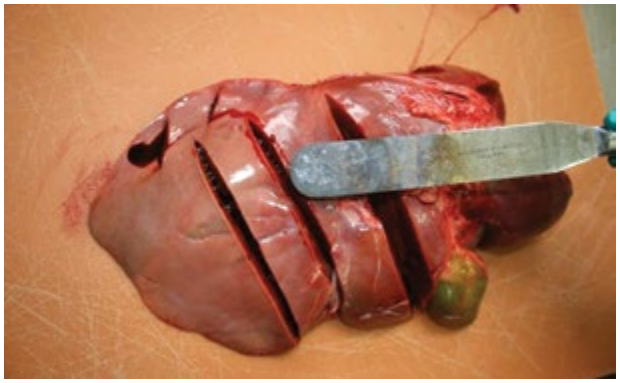


Figure 2.

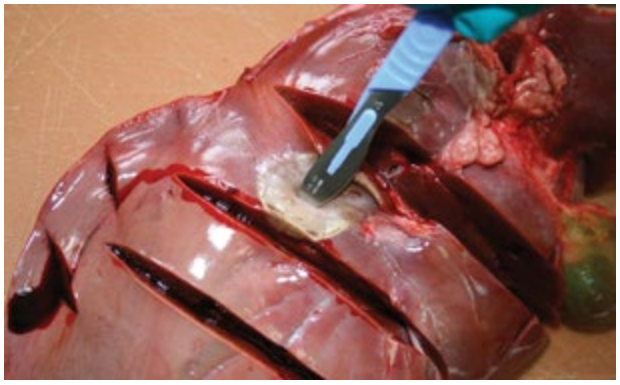


Figure 3.

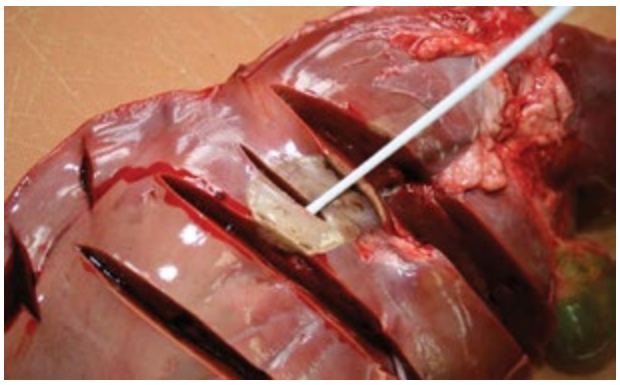


Figure 4.

Please refer to the Respiratory, CNS and Ovine and Bovine Abortion sampling information sheets for further information.

The submission of good quality samples will improve your results. If you have any queries please do not hesitate to contact the laboratory who can advise on appropriate sampling and submission.

Bacteriology Sampling in Practice

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