

<UROTUBE> VET. AND <ENTEROTUBE> II ROCHE RAPID AND PRACTICAL TOOLS

FOR DIAGNOSING BACTERIURIA IN SWINE

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1. Introduction

Since Kass (1956) defined the criteria of significant bacteriuria in human urinary tract infections, the use of quantitative assessments of the bacterial population as an aid to the differentiation between infection and contamination of the urine has gained wide acceptance. The pour-plate method is recognized as the standard technique for performing viable counts on urine, but requires trained staff for setting up the cultures. If misleading results are to be avoided, urine specimens must be cultured within an hour or two of collection, or be refrigerated. In general practice it is often difficult, if not impossible, to fulfil these requirements.

The introduction by Mackey and Sandys in 1965/66 of a dip-inoculum transport medium which had to be inoculated simply by dipping in the specimen, led to industrial production of such diagnostic aids, called dip-slides; one of these is <Urotube> vet., which is manufactured and sold by Roche.

2. Principle

<Urotube>vet. Roche is a dip-slide for the cultivation of microorganisms, consisting of a sterile plastic tube and a plastic carrier. The carrier is coated with three different agar layers. The plastic slide is built into the screw cap. The front side of the dip-slide is covered with a CLED agar for the determination of the total bacterial count; growth of gram-positive and gram-negative bacteria. The rear-side of the plastic carrier is divided in two by a plastic ridge, and contains a MacConkey agar for the selective growth of gram-negative bacteria, and as a third culture medium a Cetrimid agar for the selective growth of some strains of Pseudomonas, especially Pseudomonas aeruginosa.

The culture media are inoculated by dipping the slide into the fresh urine specimen.

3. Investigations

Berner, Haimberger, Petersen and Möller showed that septicemia and toxemia, also called milk-fever or MMA-Syndrom, is the most frequent disease of sows following parturition. One of the most important factors for this disease entity is the colonisation of the urinary tract with pathogenic microorganisms. The prevalence of urinary tract infections in sow-herds, as recognized by Petersen, is usually correlated with a higher incidence of puerperal diseases. Examination of the fresh urine of sows, by means of a dip-slide, has proved to be a practical and simple diagnostic aid in early detection of urinary tract infections, before farrowing (ante partum).

4. Sampling of urine, inoculation and interpretation

To achieve good urine samples the collection of mid-stream is the easiest and most practical method. After sampling, the dip-slide is inoculated by dipping it in the specimen. Thus the inoculated tube can be sent to a microbiological laboratory, since the original number of germs at the time of sampling is fixed; or the slide is incubated overnight at 37° C in the veterinarian's own laboratory. Findings can be interpreted by comparing the microbiological growth on the agars with pictures of reference as indicated in the package insert. Bacterial counts of 10⁴-10⁵ indicate an infection of the urinary tract.

5. Differentiation of microbes

In case of therapy, failures or to ensure the most efficient treatment, it may be necessary to isolate and differentiate the microorganisms found. The prevalence of gram-negative bacteria in urinary tract infections of sows makes it possible to apply ready-to-use identification systems, such as <Enterotube> Roche. Starting from pure culture of gram-negative bacteria, a colony is picked up with the inoculation needle of Enterotube. By drawing the needle through the twelve chambers of the system all media are inoculated at the same time. After incubation for 24-48 h at 37° C, identification is possible according to the biochemical reactions and colour changes of the media. By recording all reactions, interpretation can be made with the aid of a flow diagram and/or a numerical code system.

The practicability and accuracy of <Enterotube> II with conventional methods have been confirmed by the excellent results obtained in practice. (Ross et. al. (1981), Bauer W. et. al. (1980)).

6. Summary

Ready-to-use test systems like <Urotube> vet. and <Enterotube> II Roche have proved to be very useful diagnostic aids for the early detection of urinary tract infections in sows.

Since urinary tract infections are closely linked with post-parturient disturbances in sows, high losses of piglets are their most common consequences.

The early detection of such infections, together with appropriate and timely therapeutic control, help to avoid such costly losses, as Petersen was able to demonstrate impressively in practice.

Selected references:

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