

Bovine Vibriosis in Papua and New Guinea.

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Introduction.

As long ago as 1913, McFadyean and Stockman reported the isolation of a spirillum from cases of abortion in sheep and cattle in England. In 1919, American workers Smith and Taylor named a similar organism *Vibrio fetus*. *Vibrio fetus* has since been shown to be a cause of abortion and infertility in cattle and sheep in many parts of the world (Lawson 1959).

Recent investigations of an infertility problem on properties near Port Moresby have established the presence of vibriosis in Papua and New Guinea.

Materials and Methods.

Serological Investigations.

Vaginal mucus agglutination (V.M.A.) tests were carried out by a modification of the agar extraction method described by Laing (1956). Sterile glass pipettes were used for mucus collection. Antigen used in V.M.A. tests was supplied by the Division of Animal Health, C.S.I.R.O. A high titre donkey serum was used as a positive control.

Bacteriological Investigations.

Mucus samples obtained for V.M.A. tests were also cultured for the presence of *Vibrio fetus*. One ml. of mucus was spread as evenly as possible over the surface of tryptose blood agar plates and incubated in 10 per cent. CO₂ for three to six days.

Material from an aborted five and a half month foetus from a property where positive V.M.A. tests had been recorded, was inoculated onto tryptose blood agar plates. Blood peptone broth used in sub-cultures was prepared as described by Laing (1956). Catalase and H₂S production tests used were those described by Laing (1956).

Results.

Results of V.M.A. tests are presented in the following table:

Date.	Herd.	No. tested.	Positive.	Suspicious.
28.6.62	A	19	3	4
13.7.62	B	25	6	2
19.7.62	C	34	1	4
16.9.62	D	9		1

[Positive reactions are those with more than 75 per cent. clearing in the second tube (1/20 dilution). Suspicious reactors are those with 75 per cent. clearing in the first tube (1/10 dilution).]

Herds A and B had definite serological evidence of infection. In addition, *Vibrio fetus* was isolated from vaginal mucus and an aborted foetus in herd A. The serological evidence for vibriosis in herd C was equivocal, but certainly suspicious, since there was a history of the movement of breeding animals between herds B and C. The nine samples from herd D were from a low percentage of breeders on the property and the evidence was inconclusive.

Of 87 mucus samples cultured, only one yielded an organism considered to be *Vibrio fetus*. Mucus from one animal in herd A yielded an almost pure culture of gram negative spirillar organisms. Sufficient growth was obtained on sub-culture to semi-solid thiol medium to carry out a catalase test, which was positive. The remainder of mucus samples cultured failed to yield *Vibrio fetus*. Contamination by *Bacillus*, *Proteus* and *Streptococcus* was common.

Culture of the liver, abomasum contents, and placenta from the foetus aborted in herd A, yielded a good growth of a gram negative, spirillar and rapidly motile organism. The growth from the abomasum was virtually pure; that from the other two sites was contaminated

with *Streptococcus* and *Bacillus* sp. Initial growth was sub-cultured to blood agar plates in the case of the contaminated growths and to blood peptone broth from the pure culture.

Vibrio fetus was not cultured from the brain, lungs or peritoneal fluid of the foetus.

Biochemical tests showed that the *Vibrio* isolated was an active producer of catalase but did not produce H_2S . Newsam (1963), who examined a culture of the *Vibrio fetus* isolated from the aborted foetus, advised that it behaved exactly as the standard strain of *Vibrio fetus* (*venerealis*).

Discussion.

The most usual manifestation of vibriosis in a herd is the repeated return to service of recently infected animals. Intervals between heat periods tend to become irregular and four or five services over a period of as many months is not uncommon. Eventually the infected animal will conceive and bear a normal calf. Abortion is not a common result of vibriosis infection in cattle, although resorption of implanted fertilized ova may occur.

Of the three major diseases of cattle known to cause abortion and/or infertility, namely brucellosis, vibriosis and trichomoniasis, the first two have now both been positively identified in Papua and New Guinea. Brucellosis has virtually been eradicated from herds throughout the Territory by the application of a test and slaughter scheme (Egerton and Rothwell, 1963).

Vibriosis is primarily a venereal disease, and its control is best based on interrupting the cycle of infection which occurs when a bull serves an infected cow, becomes infected, and transmits the disease to non-infected females. The best means of interrupting this cycle is to use a mating system based on artificial insemination. If a supply of *Vibrio fetus* free semen can be ensured, vibriosis ceases to be a problem. Infected females can either be removed from the herd or be inseminated artificially. Conception will occur eventually in the majority of cases. Infected females do not constitute a danger to non-infected females if there is no bull in the herd.

Treatment with antibiotics has been claimed to be effective in curing vibriosis in both males and females. The evaluation of such treatment is made difficult by the inadequacy of cultural examination in proving the efficiency of such treatment. To prove that a bull has been cured, it is necessary to test-mate him with a group of virgin heifers and to show that vibriosis is not transmitted to these animals.

It is the intention of the department to initiate artificial insemination in herd A. The identification of vibriosis in the herd accentuates the necessity for the commencement of this project.

Summary.

Vibriosis has been diagnosed in cattle in Papua and New Guinea. Clinical, serological and cultural evidence has been presented to support this diagnosis.

(Received December, 1963.)

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