A Serological Survey for Brucellosis in Canadian Swine

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SUMMARY

The results of a survey which included the testing of 21,275 blood samples collected at various slaughter houses are described.

Sixty-three herds had a single reactor with a titre of 1:100 or higher to a tube or plate agglutination test. Investigations in forty-five of these herds failed to detect the presence of brucellosis in the remaining mature swine.

The prompt slaughter of the reactors may have eliminated possible sources of infection.

RÉSUMÉ

On décrit les résultats d'épreuves faites lors d'une enquête portant sur 21,275 échantillons de sang de porc adulte. Dans soixante trois troupeaux, on n'a décelé qu'un seul animal par troupeau réagissant 1:100 et plus aux épreuves lente et rapide.

Par la suite, on a rééprouvé quarante cinq de ces troupeaux sans pouvoir déceler la présence de brucellose dans ces porcs adultes.

Il semble donc que l'abattage immédiat des réacteurs élimine des sources possibles d'infection.

INTRODUCTION

The program for the control of brucellosis in cattle in Canada was instituted by the Canada Department of Agriculture in 1957. Hypothetically, the total eradication of this disease in a country would be possible only if all sources of infection in domestic animals and natural fauna could be traced and eliminated. In the United States the incidence in cattle and swine and consequently in humans has decreased significantly as a result of the eradication program (5).

Although no confirmed cases of brucellosis in swine have been reported in Canada, a survey similar to the one conducted in 1950 by Frank and others (1, 2, 3, 4), was undertaken in the provinces served by five laboratories of the Canada Department of Agriculture.

MATERIALS AND METHODS

Meat inspection personnel at packing plants collected and identified blood samples from mature sows and boars. These samples were sent to the nearest regional laboratory on the same day. Serum agglutination tests were done by the tube and rapid plate methods using standardized antigens prepared at the Animal Diseases Research Institute (A.D.R.I.), Hull, Quebec from smooth colonies of *Brucella abortus* strain No. 413. For the tube test a stock solution of 8 per cent bacterial cells in physiological saline containing 0.5 per cent phenol was diluted 1:200 on the day of the test with phenolized physiological saline. The antigen was dispensed in 2 ml. quantities in test tubes to which 0.08, 0.04, 0.02 and 0.01 ml. of serum per tube were added to produce dilutions of 1:25, 1:50, 1:100, 1:200. The tests were incubated at 37°C for 24 hours followed by overnight incubation at room temperature before reading. For the rapid plate test aliquots (0.03 ml.) of plate test antigen which contained 12 per cent bacterial cells suspended in 8 per cent sodium chloride solution with 0.5 per cent phenol added were mixed with the same quantities of serum, as cited

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TABLE I Number of Serum Samples Tested at Regional Laboratories and Number of Reactors in Various Dilutions.

Laboratory	No. Tested	Negative No.	Negative %	1:25 No.	1:25 %	1:50 No.	1:50 %	1:100 No.	1:100 %	1:200 No.	1:200 %
A.D.R.I.×	5132	4617	89.96	434	8.45	79	1.53	2	0.03	0	—
SACKVILLE	5599	5152	92.01	371	6.62	53	0.94	17	0.30	6	0.10
REGINA	504	399	79.16	80	15 87	24	4.76	1	0.19	0	—
LETHBRIDGE+	7331	6405	87.38	819	11.17	74	1.00	20	0.27	13	0.17
WINNIPEG	2709	2130	78.62	528	19.49	47	1.73	4	0.14	0	—
TOTAL	21275	18703	87.91	2232	10.49	277	1.30	44	0.20	19	0.08

×Animal Diseases Research Institute, (Eastern), Hull, Quebec.
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above, on a glass plate. The plates were incubated at 37°C in a high humidity incubator for 15 minutes. The amount of antigen used in the rapid plate test was calibrated to correspond to dilutions of 1:25, 1:50, 1:100 and 1:200 of the tube test. In both tests, samples showing more than 50 per cent agglutination were recorded as reactors in that dilution. When these reactions were detected in the 1:100 dilution or higher, the sample was reported as *suspicious*.

A clinical investigation was carried out by a veterinarian of the Health of Animals Branch in the swine herds in which a suspicious reactor had originated. Swine and other livestock were inspected. Signs of lameness, joint ailments or orchitis were noted. Details of purchases and sales of stock, the regularity of breeding cycles, pregnancies, abortions, births, and the size, health and fate of offspring were obtained. If negative test records were not available mature breeding stock was bled and the samples submitted to the laboratory for testing.

RESULTS

Table I indicates the number of slaughter house samples tested at the various laboratories and the number and percentages of reactors in the four serum dilutions. The reaction recorded is the highest reading obtained on either the tube or rapid plate test.

The results of this investigation indicated that 63 samples produced reactions of 1:100 or higher by either test. Under field conditions it was possible to trace and investigate 45 herds of origin. The results from the blood test drawn from breeding stock on revisits to these herds showed that all adult breeding stock on 19 out of 20 potentially infected premises were serologically negative. In one herd, comprised of 237 sows, 231 were negative while three animals had titres of 1:50 and three others had titres of 1:100. Titres of 1:25 or 1:50 were detected in a small number of animals in six other herds. Further investigation failed to establish the presence of brucellosis in these herds.

DISCUSSION

This survey has failed to detect the presence of brucellosis in Canadian swine.

Since bacteriological studies were not conducted this conclusion is based on serological evidence only. Investigations have shown that breeding stock which did not achieve the required reproductive efficiency were immediately eliminated by slaughter, thus lessening the chance of establishing a diagnosis. If this condition is present, outbreaks have not been reported or the disease has been localized to individual farms where it appears to have been successfully combated by the economic demands for efficient production in the swine industry.

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