

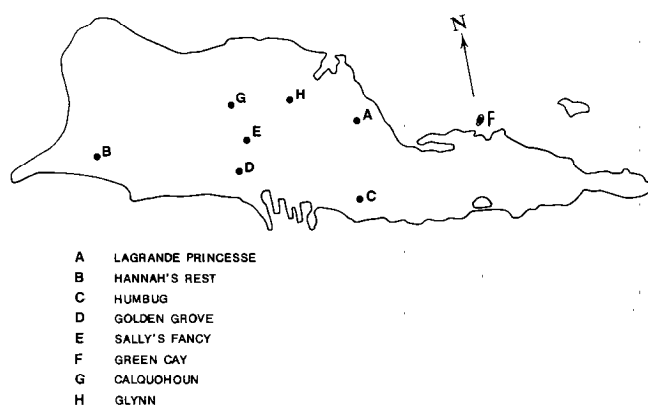
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Serological evidence for the presence of *Brucella* antibodies in sheep and goats on Saint Croix, U.S. Virgin Islands

AHL (A.S.), BARTLETT (P.C.), FRERICHS (W.M.). Preuve sérologique de la présence d'anticorps contre *Brucella* chez les petits ruminants à Sainte-Croix, Iles Vierges américaines. *Revue Elev. Méd. vét. Pays trop.*, 1993, 46 (1-2) : 61-63

Une prospection sérologique pour des anticorps contre *Brucella* chez des moutons et des chèvres a été exécutée à Sainte-Croix, Iles Vierges américaines. La séroprévalence (aux titres suspects ou positifs) d'anticorps contre *B.melitensis* était de 11,3 p. 100 pour les moutons et de 2,5 p.100 pour les chèvres. Ceci est le premier rapport, à notre connaissance, d'anticorps contre *B.melitensis* chez les petits ruminants dans les îles Caraïbes.

Mots clés : Ovin - Caprin - Technique immunologique - *Brucella melitensis* - Anticorps - Sainte-Croix.



Map1 : Saint Croix, USVI, location of goats and sheep used in this serological survey for *Brucella melitensis* antibodies.

INTRODUCTION

Brucella melitensis, a zoonotic disease, is usually carried by goats and sheep, although it is the least host-specific of the brucellosis-causing organisms. *B. melitensis* is well known in many developing and some developed nations. For example, this organism is known to occur in Egypt (4), Syria (11), Israel (6), India (2), Saudi Arabia (13), and sub-Saharan Africa (1, 5, 12). In the New World, it has been reported from Argentina, Peru, and Mexico (7). *B. melitensis* is not known to occur in the Caribbean islands. However, many sheep and goats were brought to this area from Old World countries known to have *B. melitensis*. With no specific *Brucella* surveillance efforts aimed at sheep and goats, it is possible that the bacteria were brought to the New World with their hosts and established in the region. This seroprevalence survey is an attempt to determine if further studies might be warranted.

MATERIALS AND METHODS

Saint Croix is the largest of the U.S. Virgin Islands, approximately 32 km long and 13 km at its widest dimension (8) (map 1). It is the largest of the Virgin Islands with

both rolling hills and level terrain which makes it more suitable for agriculture. Food animal agriculture includes dairy and beef cattle and an even larger population of sheep and goats. Most sheep and goats are maintained as backyard animals, tethered or fenced in small pastures or paddocks, usually in groups of fewer than 30 animals. Sheep and goats are often kept in the same enclosure.

The goat sera for this study were collected when goats were treated with anthelmintics or otherwise attended by a veterinarian from the USVI Department of Agriculture. The sheep included in this study were all from the University of the Virgin Islands (UVI) Agricultural Experiment Station flock. This flock was formed during 1985-87 by purchasing local sheep from several flocks on Saint Croix. The sheep have been kept together in the same corrals and pastures during the 2 years prior to this study.

Sera from a total of 161 goats from 9 herds were collected. Sera were obtained from 53 sheep in the UVI flock, representing 5 original flocks plus several sheep born into the UVI flock. The sera were frozen and shipped to the National Veterinary Services Laboratories in Ames, Iowa, for serological testing. Each sample was tested for *B. ovis* antibody by the complement fixation test (9), for *B. abortus* antibody by the standard plate test, and for *B. melitensis* antibody by the standard tube test (14).

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Titers were measured and interpreted as suspicious of a previous infection (suspect) or as evidence of previous infection (reactor) as outlined in tables I and II.

TABLE I Serological titers for *Brucella melitensis* in goats on Saint Croix, USVI. The location on the island and the titer interpretation are also shown.

Goat	Location*	Tube Aggl. Titer	Interpretation
1	A	Inc ¹ 1:25	Suspicion of previous infection
2**	A	Inc 1:50	Evidence of previous infection
3	B	Pos ² 1:25	Evidence of previous infection
4	C	Inc 1:25	Suspicion of previous infection

* See map 1.

** This goat showed a titer of incomplete at 1:50 for *B. abortus*, interpreted as a borderline suspect for previous infection or possibly a cross-reaction with *B. melitensis*.

¹ Inc = Incomplete.

² Pos = Positive.

TABLE II Serological titers for *Brucella melitensis* in sheep on Saint Croix, USVI. The location represent the site of flock of origin for each sheep tested.

Sheep*	Location**	Titer	Interpretation
1	D	Inc ¹ 1:100	Evidence of previous
2	D	Inc 1:50	infection for all reported
3	D	Pos ² 1:25	titers in sheep
4	E	Inc 1:50	
5	F	Inc 1:50	
6	G	Pos 1:25	

*A seventh sheep, negative for *B. melitensis*, showed a positive 2+ titer at 1:10 for *B. ovis*; this sheep came originally from a flock at location H (map 1).

** See map 1.

¹ Inc = Increase.

² Pos = Positive.

RESULTS AND DISCUSSION

Four goats from 3 herds in 3 different areas of Saint Croix showed *B. melitensis* antibodies, with suspect or reactor titers. This gives a seroprevalence of 4/161 or 0.0248. Three of 9 herds had at least one goat with a reactor or suspect titer for a herd prevalence of 33 %. Map 1 shows locations of the herds from which animals were sampled. The location of these animals, titers, and interpretation of the titers are given in table I.

All goats were negative for *B. ovis* antibodies. One goat showed a *B. abortus* titer, incomplete at 1:50, which could be interpreted as a borderline suspect for previous infection with *B. abortus* or could possibly represent a cross-reaction with *B. melitensis*.

Of the 53 sheep tested, 6 showed titers high enough to use as evidence of previous infection with *B. melitensis*. One showed a 2+ titer at 1:10 for *B. ovis*; this animal originated in a flock at location H (map 1). Antibodies for *B. abortus* were not detected in the sheep. The titers and herd of origin for individual sheep are shown in table II. Since the sheep in the UVI flock represent a recently mixed flock, flock prevalence calculations are not appropriate. However, half of the positive sheep came originally from a single source flock located at D (map 1).

CONCLUSION

From a sample of sheep and goats on Saint Croix, we have found serological evidence for previous infection with *B. melitensis* for both species. It is possible that these titers represent cross-reactivity with other antigens. More definitive methods for diagnosis of *B. melitensis* in sheep and goats must be undertaken before the question of occurrence can be settled (3, 10).

On Saint Croix, the other Virgin Islands, and most of the Caribbean islands as well, sheep and goat owners live in close proximity to their animals and often practice backyard slaughter of animals for home consumption. If *B. melitensis* does occur in these animals, it would not be surprising to find cases of human brucellosis as well. The need for a comprehensive study of this agent in sheep and goats is suggested by the results of this serological survey.

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AHL (A.S.), BARTLETT (P.C.), FRERICHS (W.M.). Serological evidence of the presence of *Brucella* antibodies in sheep and goats on Saint Croix, U.S. Virgin Islands. *Revue Elev. Méd. vét. Pays trop.*, 1993, **46** (1-2) : 61-63

A serological survey for *Brucella* antibodies in sheep and goats was completed on Saint Croix, United States Virgin Islands (USVI). Seroprevalence (at suspect or reactor titer levels) for *B. melitensis* antibodies was 11.3 % for sheep and 2.5 % for goats. This is the first report, of which we are aware, of *B. melitensis* antibodies in sheep or goats in the Caribbean islands.

Key words : Sheep - Goat - Immunological technique - *Brucella melitensis* - Antibody - Saint Croix.

AHL (A.S.), BARTLETT (P.C.), FRERICHS (W.M.). Evidencia serológica de la presencia de anticuerpos de *Brucella* en cabras y ovejas en Santa Cruz, Islas Vírgenes de los E.U.A. *Revue Elev. Méd. vét. Pays trop.*, 1993, **46** (1-2) : 61-63

Se llevó a cabo un estudio serológico para la determinación de anticuerpos de *Brucella* en Santa Cruz, Islas Vírgenes de los E.U.A. (USVI). La seroprevalencia (con títulos de sospecha o de reacción) para anticuerpos contra *B. melitensis* fue de 11.3 % en ovejas y de 2.5 % en cabras. De acuerdo a nuestros conocimientos, se trata del primer reporte de anticuerpos contra *B. melitensis* en ovinos o caprinos de las islas del Caribe.

Palabras claves : Ovino - Caprino - Técnica inmunología - *Brucella melitensis* - Anticuerpo - Santa Cruz.